Bord na Móna

Decommissioning and Rehabilitation Plan for Derryfadda Bog, Co. Galway

Natura Impact Statement

March 2022

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Quality Assurance

The findings outlined within this report and the data we have provided are to our knowledge true and express our bona fide professional opinions. This report has been prepared and provided in accordance with the Chartered Institute of Ecology and Environmental Management (CIEEM) good practice guidelines. Where pertinent CIEEM Guidelines used in the preparation of this report include the *Guidelines for Ecological Report Writing* (CIEEM, 2017a), *Guidelines for Preliminary Ecological Appraisals* (CIEEM, 2017b) and *Guidelines for Ecological Impact Assessment in the UK and Ireland. Terrestrial, Freshwater, Coastal and Marine*, (CIEEM, 2019). CIEEM Guidelines include model formats for Preliminary Ecological Appraisal and Ecological Impact Assessment. Also, where pertinent, evaluations presented herein take cognisance of recommended Guidance from the EPA such as *Draft Guidelines on the information to be contained in Environmental Impact Assessment Reports* (EPA, 2017), and in respect of European sites, *Managing Natura 2000 sites. The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC* (European Commission, 2018).

Due cognisance has been given at all times to the provisions of the *Wildlife Act, 1976,* the *Wildlife (Amendment) Act, 2000*, the *European Union (Natural Habitats) Regulations. SI 378/2005*, the *European Communities (Birds and Natural Habitats) Regulations 2011-2021,* EU Regulation on Invasive Alien Species under *EU Regulation 1143/2014*, the EU Birds *Directive 2009/147/EC* and *Habitats Directive 92/43/EEC*.

No method of assessment can completely remove the possibility of obtaining partially imprecise or incomplete information. Any limitation to the methods applied or constraints however are clearly identified within the main body of this document.

Version	**Date**		**Name**	**Signature**
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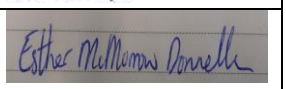
			Esther McMorrow Donnellan QCIEEM, MSc, BA	
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Title		Decommissioning and Rehabilitation Plan for Derryfadda Bog, Co. Galway – Natura Impact Statement		

Notice

This report was produced by INIS Environmental Consultants Ltd. (INIS) on behalf of Bord na Móna, the client, for the specific purpose of the proposed Decommissioning and Rehabilitation Plan for Derryfadda Bog, Co Galway, with all reasonable skill, care and due diligence within the terms of the contract with the client, incorporating our terms and conditions and taking account of the resources devoted to it by agreement with the client.

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1. INTRODUCTION

This Natura Impact Statement (NIS) report has been prepared by Inis Environmental Consultants Ltd. to identify if the proposed rehabilitation and decommissioning at Derryfadda Bog, co. Galway has the potential for any adverse effects on the integrity of any European designated sites.

This document includes the initial Screening for Likely Significant Effects (LSE) stage (Stage 1), which screens and evaluates LSE of the proposed development upon designated European sites. Where significant effects are considered likely, in view of the Qualifying Interests (Qis) or Special Conservation Interests (SCIs) and the respective Conservation Objectives (COs) of relevant European sites, they cannot be screened out during Stage 1, in which case Appropriate Assessment (Stage 2) is required to identify any potential adverse effects on the integrity of the European sites. Where Appropriate Assessment identifies potential for adverse effects on the integrity of a European site, this NIS report prescribes mitigation measures for the avoidance of adverse effects on the site's integrity. This report is conducted in line with the requirements of Article 6(3) of the EU Habitats Directive (92/43/EEC) and the National Parks and Wildlife Service (NPWS) Guidance for Planning Authorities (2010).

The preparation of this NIS report has had regard to current legislation and best practice guidance (as described in **Section 3** of this report), and supplementary data obtained during a desk study and field surveys in 2022.

1.1. Appropriate Assessment Process

Appropriate Assessment is the process through which the possible nature conservation implications of any plan or project on the Natura 2000 site network is considered by a Competent Authority, before a decision is made to allow that plan or project to proceed.

1.1.1. Stages of the Appropriate Assessment Process

Appropriate Assessment involves a number of steps and tests that are applied using a stage-by-stage approach. Each step or stage in the assessment process precedes and provides a basis for other steps. The four stages in an Appropriate Assessment (AA), are further described below.

Guidance on the Appropriate Assessment (AA) process was produced by the European Commission in 2002, which was subsequently developed into guidance specifically for Ireland by the Department of Environment, Heritage and Local Government (DoEHLG) (2010). These guidance documents identify a staged approach to conducting an AA, as shown in **Figure 1.1**.

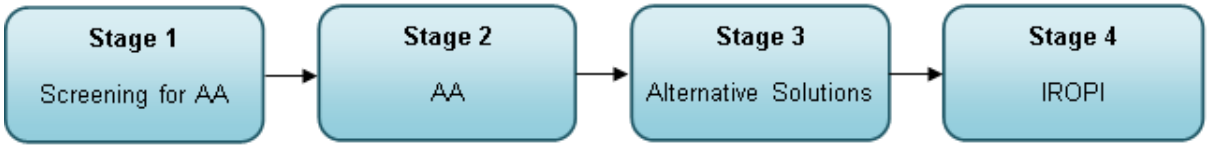

Figure 1.1: The Appropriate Assessment Process (from: Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities, DoEHLG, 2010).

1.1.1.1. Stage 1 – Screening for AA

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.

1.1.1.2. 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. Mitigation measures should be applied to the point where no adverse impacts on the site(s) remain.

1.1.1.3. Stage 3 – 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.

1.1.1.4. Stage 4 – IROPI

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. European case law highlights that consideration must be given to alternatives outside the project area in carrying out the IROPI test. It is a rigorous test which projects are generally considered unlikely to pass.

1.2. Statement of Authority

Ms Peig Healy BSc MSc co-wrote this report. She is an Assistant Ecologist with Inis Environmental Consultants and has a BSc in International Development and Food Policy from UCC and a M.Sc. in Environmental Leadership in NUI Galway. As part of her BSc and MSc, Peig has complied two dissertation projects relating to sustainability and environmental research. In association with these projects, Peig has carried out policy analysis, case study review, and reporting in relation to Fisheries Policy and EIA respectively. During her employment with Inis, Peig has been involved in a the preparation of a variety project reports, including AA Screening, NIS and EcIA.

Ms Esther McMorrow Donnellan BA MSc QCIEEM co-wrote this report. She is an Ecologist with Inis Environmental Consultants and has an MSc in Environmental Leadership in NUI Galway and a BA in History and Geography from NUI Galway. Esther has extensive bird survey experience, including

Vantage Point surveys and breeding wader walkover surveys, which are all undertaken following Best Practice Guidance and standardised methodologies (e.g. Hardey *et al.*, 2013; SNH, 2017). Esther also has extensive report writing experience, including the preparation of Ecology Reports, Screenings for Appropriate Assessment and Natura Impact Statements.

Mr Howard Williams MCIEEM BSc CEnv CBiol MRSB MIFM reviewed and signed off on this report. He is Lead Ecologist with Inis and has more than 20 years' experience as a professional ecologist, specialising in birds. Following his degree, he worked as a biologist for the ESB for three years (1997-2000). Mr Williams has completed in excess of 500 separate ecology assessments in Ireland and the UK since 2000. Mr Williams is a full member of the Chartered Institute of Ecology and Environmental Management (CIEEM). He is a Chartered Environmentalist (CEnv) with the Society for the Environment (Soc Env) and a Chartered Biologist (CBiol) with the Society of Biology. He is also a full member of the Institute of Fisheries Management. Mr Williams is principal ecologist with INIS Environmental Consultants Ltd and currently project manager on all INIS projects in the Republic of Ireland and the UK.

Dr Alex Copland BSc PhD MIEnvSc is Technical Director with INIS and revised this report)(following comments from Bord na Móna). He has over 25 years of professional experience working in both statutory and private companies, in third-level research institutions and with environmental NGOs. He is proficient in experimental design and data analysis and has managed several large-scale, multi-disciplinary ecological projects. These have included research and targeted management work for species of conservation concern, the design and delivery of practical conservation actions with a range of stakeholders and end-users, education and interpretation on the interface between people and the environment and the development of coordinated, strategic plans for birds and biodiversity. He has written numerous scientific papers, developed and contributed to evidence-based position papers, visions and strategies on birds and habitats in Ireland. He has supervised the successful completion of research theses for several post-graduate students, including doctoral candidates. He lectures to both undergraduate and post-graduate students at UCD, as well as being a collaborative researcher with both UCD and UCC. He also sits on the Editorial Panel of the scientific journal, Irish Birds, which publishes original ornithological research relevant to Ireland's avifauna.

He has been working on bird populations on cutaway peatland habitats in Ireland for over 12 years, covering both breeding and wintering birds at numerous sites. He managed breeding wader surveys on 11 Bord na Móna cutaway peatland sites in 2006 and 2012 and surveyed two additional Bord na Móna peatland sites for breeding wader in 2014. In 2010 and 2011, he undertook baseline bird recording at ten cutaway peatland sites, including bogs within the Derryarkin and Derryadd bog groups. In 2015 and 2016, Alex undertook breeding Curlew surveys at 14 individual bog sites. In collaboration with Bord na Móna, he has published several papers and abstracts in relation to the ecology of cutaway peatlands arising from several projects,

2. DESCRIPTION OF THE PROPOSED REHABILITATION PLAN

2.1. Location of the Proposed Plan

The proposed Decommissioning and Rehabilitation Plan is for the Derryfadda Bog, Co. Galway, bordering Co. Roscommon, is part of the Derryfadda Bog group. It is located approximately 4.5km northeast of Ahascragh, Co. Galway, 0.7km south of Ballyforan and 2km south of Dysart, Co. Roscommon.

Only a small portion of the whole Derryfadda Bog will be subject to the proposed decommissioning and rehabilitation under this plan (see **Appendix A**). The majority of Derryfadda Bog has been constrained out of the proposed decommissioning and rehabilitation due to alternative future land uses by Bord na Móna.

The Derryfadda bog site is considered to be comprised of bare peat, a mosaic of pioneer vegetation, and some scrub. Peat depths vary, with a small area in the north of the site containing peat in excess of 2.6m, while the remaining northern section of the site consisting of shallow bog with depths between 0 and 1m.

Currently, the main habitat types occupying the Derryfadda Bog area consist of: marginal raised bog (PB1); cutover bog (PB4); scrub (WS1); birch woodland (WN7); wet grassland (callows grassland) (GS4); improved grassland (GA1); riparian woodland (WN5); and conifer plantation (WD4) (BnM, 2021a and Fossitt et al. 2000). The site is considered to be suited to wetland development (Bord na Mona, 2021).

Derryfadda Bog is drained by the River Suck to the eastern section of the site, which flows into the River Shannon (Upper). The Killaderry stream flows through the northern section of the site, while the Lughanagh stream flows through the south of the site before joining the River Suck. There are some active drainage channels onsite, while part of the site has developed sections of open water (Bord na Mona, 2021a).

Derryfadda Bog is situated on the flood plains of the River Suck, regularly flooding in the wintertime and when river water levels are high (BnM, 2021a).

2.2. Description of the Proposed Rehabilitation

Derryfadda bog has been drained and extracted for peat production from the 1980's to 2020, with much of the site comprised of bare peat. Some of the site has formed some standing water, together with some pioneer peatland habitats. The proposed Decommissioning and Rehabilitation Plan consists of the rehabilitation of Derryfadda Bog as part of Bord na Móna's Peatlands Climate Action Scheme (PCAS), an obligation under the Environmental Protection Agency (EPA) Integrated Pollution Control (IPC) Licence, by raising water levels to the surface through internal drain blocking and other techniques (**Appendix A**). The objective of the proposed Decommissioning and Rehabilitation Plan is to remove all peat harvesting infrastructure, such as pumps, railway lines, etc. and tidy up the site (decommissioning), and achieve environmental stabilisation through supporting national policies and strategies regarding the reduction of carbon emissions, supporting biodiversity, and improving water quality (rehabilitation).

The works for the proposed Decommissioning and Rehabilitation Plan will be undertaken in 2022, by ecologists, hydrologists, and engineers, and will consist of the following:

- Decommissioning and removal of infrastructure on site, including railway lines and buildings, were required;
- Targeted fertiliser application to headlands and other areas, to support vegetation growth;
- Intensive water management and internal drain blocking, to raise water levels;
- Continued use of existing outlets;
- Boundary drains will be left unblocked to prevent negative effects on adjacent lands;
- Silt ponds will continue to be maintained;
- Rewetting of residual peat, to slow water movement, minimising silt contamination;
- Quarterly monitoring to assess (changing to bi-annual monitoring after two years):
    - general site status;
    - silt pond conditions;
    - proposed Plan;
    - natural colonisation progress;
    - any potential impacts on neighbouring lands; and
    - land security.
- Monitoring of biodiversity using specific indicators (such as breeding bird monitoring and development of pioneer habitats);
- Water quality parameters monitoring for a minimum of two years;
- Examination of the EPA WFD monitoring programme to determine whether pressure from peat production on the local river catchment (WFD) has been reduced; and
- The use of aerial survey for habitat condition assessment after rehabilitation will measure carbon emission reductions.
- Decommissioning of silt-ponds will be assessed and carried out, where required;

Decommissioning activities will be completed within a period of 12 months and are scheduled to be completed before the end of 2023. Rehabilitation activities will be completed within a period of approximately 12 months. In general activities proposed for FY23 i.e. 2022 will be carried out between the months of April and October inclusive.

The duration of activities provided are approximate and may be slightly shorter or longer, depending on weather conditions and progress on rehabilitation prescriptions. Activities may cease for the winter months due to rainfall and poor ground conditions, in line with typical Bord na Móna work practice and Health and Safety requirements. In any case, the rehabilitation works will take approximately 12 months. The proposed activities will be undertaken during daylight hours (between 08.00 and 17.30hrs) during the working week (Monday to Friday).

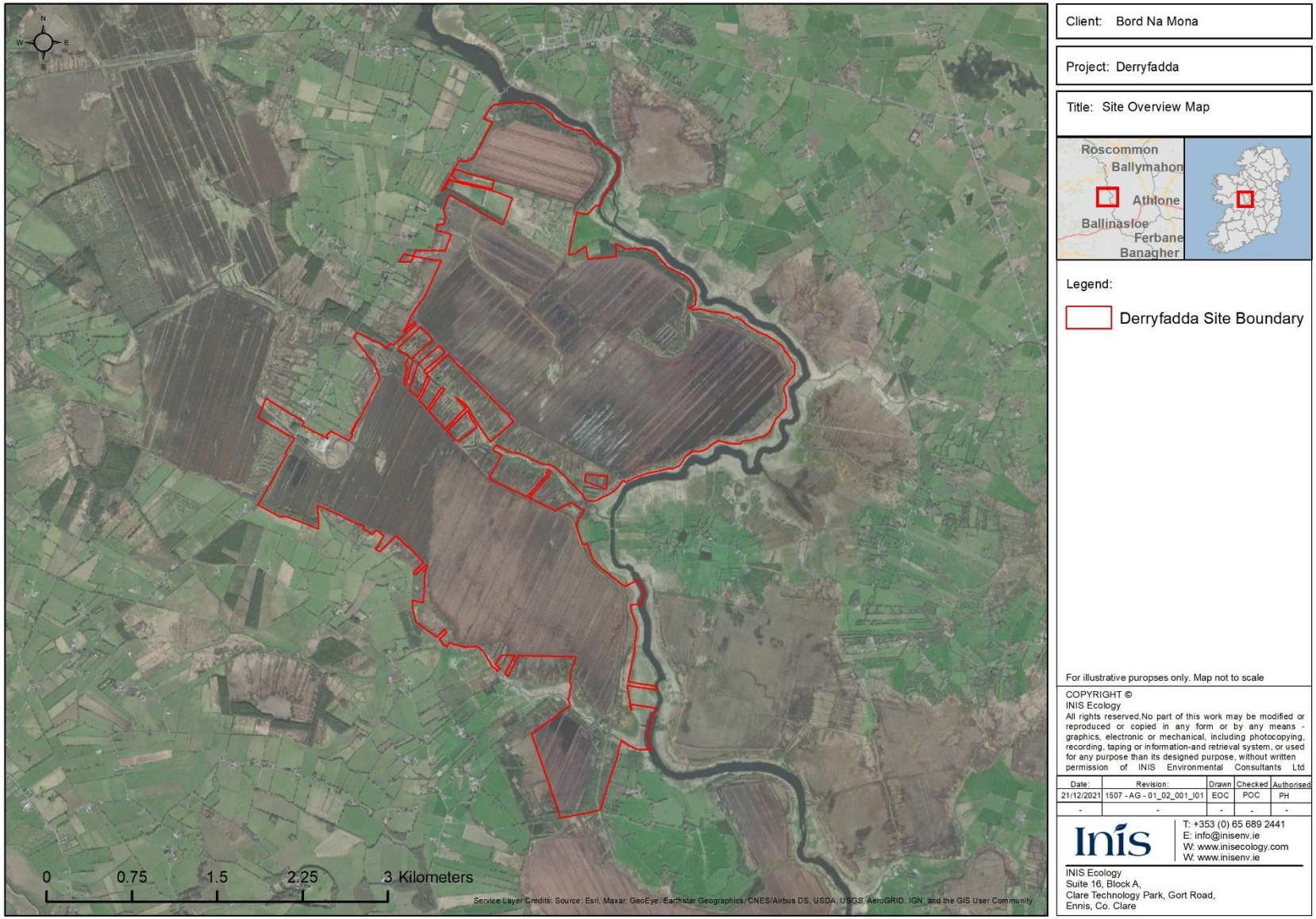

Figure 2.1: Site overview map of the boundary for the Derryfadda Bog, Co. Galway.

3. METHODOLOGY

3.1. Appropriate Assessment Guidance

EU and national guidance exist in relation to Member States' fulfilling their requirements under the EU Habitats Directive, with particular reference to Article 6(3) and 6(4) of that Directive. The methodology followed in relation to this AA has had regard to the following guidance:

- Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities. Department of Environment, Heritage and Local Government (DoEHLG, 2010);
- Communication from the Commission on the Precautionary Principle (European Commission, 2000);
- Managing Natura 2000 Sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC (known as MN2000), Office for Official Publications of the European Communities, Luxembourg (European Commission, 2019, 2018);
- Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Articles 6(3) and (4) of the Habitats Directive 92/43/EEC. Office for Official Publications of the European Communities, Brussels (European Commission, 2002, 2001);
- Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC – Clarification of the concepts of: alternative solutions, imperative reasons of overriding public interest, compensatory measures, overall coherence, opinion of the Commission (European Comission, 2007);
- Nature and biodiversity cases: Ruling of the European Court of Justice (European Commission, 2006);
- Interpretation Manual of European Union Habitats. Version EUR 28. European Commission (European Commission, 2013);
- Article 6 of the Habitats Directive: Rulings of the European Court of Justice (Sundseth & Roth, 2014).
- Practice Note PN01: Appropriate Assessment Screening for Development Management. OPR (2021).
- Part XAB of the Planning and Development Act 2000;
- Birds Directive (Council Directive 2009/147/EC);
- European Communities (Birds and Natural Habitats) Regulations 2011 (as amended);
- Communication from the Commission on the Precautionary Principle (European Commission, 2000);
- Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities. Department of the Environment, Heritage and Local Government (2010); and
- National Parks and Wildlife Service (NPWS) Guidance for Planning Authorities (2010).

3.2. Ecological Data

3.2.1. Desk Study

A desk study was completed to assess the potential for all Qualifying Interests (QI) and Special Conservation Interests (SCI) of European sites, given their ecological requirements identified by the National Parks and Wildlife Service (NPWS) (NPWS, 2019a, b, c). SCI Birds and mobile QI species can travel many kilometers from their core areas, and the desk study assessed the potential presence of such species beyond the European sites for which they are QIs/SCIs. The Desk study had particular regard to the following sources:

- Tabulated lists for all European sites in Ireland of SCIs and QIs, obtained through NPWS[1];
- Information on ranges of mobile QI populations in Volume 1 of NPWS' Status of EU Protected Habitats and Species in Ireland (NPWS, 2019a), and associated digital shapefiles;
- Mapping of European site boundaries and Conservation Objectives (CO) for relevant sites and beyond, as relevant, available online from the NPWS;
- Distribution records for QI and SCI species of European sites held online by the National Biodiversity Data Centre (NBDC)[2];
- Details of QIs/SCIs of European sites within the National Biodiversity Action Plan 2017-2021 (DoCHG, 2017); and
- Data including surface and ground water quality status, and river catchment boundaries available from the online database of the Environmental Protection Agency (EPA)[3];
- Information on groundwater aquifers, recharge, and vulnerability available from the online database of Geological Survey Ireland (GSI)[4];
- Boundaries for catchments with confirmed or potential freshwater pearl mussel (FWPM) *Margaritifera margaritifera* populations in GIS format available online from the NPWS[5].

3.2.2. Field Visit

A field visit was undertaken to Derryfadda Bog on 14th January to view the site and habitats. A particular emphasis was placed on viewing the silt ponds and water outflows from the site, in addition to reviewing the various locations and habitats where rehabilitation activities area proposed to be undertaken.

3.3. Relevant European Sites

The identification of relevant European sites to be included in this report was based on the identification of the Zone of Influence (ZoI) of the proposed Decommissioning and Rehabilitation Plan, a source-pathway-receptor model of effects, and the likely significance of any identified effects.

[1] *Available at https://www.npws.ie/protected-sites. Accessed in December 2021.*
[2] *Available at https://maps.biodiversityireland.ie/Map. Accessed in December 2021*
[3] *Available at https://gis.epa.ie/EPAMaps/. Accessed in December 2021*
[4] *Available at https://www.gsi.ie/en-ie/data-and-maps/Pages/Groundwater.aspx. Accessed in December 2021*
[5] *Available at https://www.npws.ie/maps-and-data/habitat-and-species-data. Accessed in December 2021*

3.3.1. Zone of Influence

The proximity of the proposed Decommissioning and Rehabilitation Plan to European sites, and more importantly QIs/SCIs of European sites, is of importance when identifying potentially likely significant effects. During the initial scoping of this report, a 15 km ZoI was applied for impact assessment. A conservative approach has been used, which minimises the risk of overlooking distant or obscure effect pathways, while also avoiding reliance on buffer zones within which all European sites should be considered. This approach assesses the complete list of all QIs/SCIs of European sites in Ireland (i.e. potential receptors), instead of listing European sites within buffer zones. This follows Irish departmental guidance on AA:

> "*For projects, the distance could be much less than 15 km, and in some cases less than 100m, but this must be evaluated on a case-by-case basis with reference to the nature, size and location of the project, and the sensitivities of the ecological receptors, and the potential for in combination effects*" (DoEHLG, 2010; p.32, para 1).

Following the guidance set out by the NRA (2009), the proposed Plan has been evaluated based on an identified ZoI with regard to the potential impact pathways to ecological features (e.g. mobile and static). The ZoI of the proposed Plan on mobile species (e.g. birds, mammals, and fish), and static species and habitats (e.g. saltmarshes, woodlands, and flora) is considered differently. Mobile species have 'range' outside of the European site in which they are QI/SCI. The range of mobile QI/SCI species varies considerably, from several meters (e.g. in the case of whorl snails *Vertigo* spp.), to hundreds of kilometers (in the case of migratory wetland birds). Whilst static species and habitats are generally considered to have ZoIs within close proximity of the proposed Plan, they can be significantly affected at considerable distances from an effect source; for example, where an aquatic QI habitat or plant is located many kilometers downstream from a pollution source.

Hydrological linkages between the proposed Plan area and European sites (and their QIs/SCIs) can occur over significant distances; however, any effect will be site specific depending on the receiving water environment and nature of the potential impact. A reasonable worst-case ZoI for water pollution from the proposed development site is considered to be the hydrological pathway from the proposed development until it reaches the first lenthic water body (e.g. lake), as the depositional nature of these water bodies would limit the transport capacity of any potential influences from the proposed development to European sites located downstream.

See **Figure 4.1** for the location of Natura 2000 sites within the identified ZoI.

3.3.2. Source-Pathway-Receptor Model

The likely effects of the proposed Decommissioning and Rehabilitation Plan on European sites has been appraised using a source-pathway-receptor model, where:

- A 'source' is defined as the individual element of the proposed Rehabilitation Plan that has the potential to impact on a European site, its qualifying features and its conservation objectives;
- A 'pathway' is defined as the means or route by which a source can affect the ecological receptor; and

- A 'receptor' is defined as the Special Conservation Interests of Special Protection Areas (SPA) or Qualifying Interests (QI) of Special Areas of Conservation (SAC) for which Conservation Objectives have been set for the European sites being screened.

A source-pathway-receptor model is a standard tool used in environmental assessment. In order for an effect to be likely, all three elements of this mechanism must be in place. The absence or removal of one of the elements of the mechanism results in no likelihood for the effect to occur. The source-pathway-receptor model was used to identify a list of European sites, and their QIs/SCIs, with potential links to European site. These are termed as 'relevant' European sites/QIs/SCIs throughout this report.

3.3.3. Likely Significant Effect

The threshold for a Likely Significant Effect (LSE) is treated in the screening exercise as being above *a de minimis* level[6]. The opinion of the Advocate General in CJEU case C-258/11 outlines:

> "*the requirement that the effect in question be 'significant' exists in order to lay down a de minimis threshold. Plans or projects that have no appreciable effect on a European site are thereby excluded. If all plans or projects capable of having any effect whatsoever on the site were to be caught by Article 6(3), activities on or near the site would risk being impossible by reason of legislative overkill.*"

In this report, therefore, 'relevant' European sites are those within the potential ZoI of activities associated with the proposed Rehabilitation Plan, where LSE pathways to European sites were identified through the source-pathway-receptor model.

3.4. Screening Process

The Screening for Appropriate Assessment will incorporate the following steps:

- Determining whether a project or plan is directly connected with or necessary to the conservation management of any European sites;
- Describing the project or plan;
- Identifying the European sites potentially affected by the project or plan;
- Identifying and describing any potential effects of the project or plan on European sites, alone, in-combination and cumulatively with other plans/projects; and
- Assessing the likelihood of significant effects on European sites.

[6] *Sweetman v. An Bord Pleanála (Court of Justice of the EU, case C-285/11). A de minimis effect is a level of risk that is too small to be concerned with when considering ecological requirements of an Annex I habitat or a population of Annex II species present on a European site necessary to ensure their favourable conservation condition. If low level effects on habitats or individuals of species are judged to be in this order of magnitude and that judgment has been made in the absence of reasonable scientific doubt, then those effects are not considered to be likely significant effects.*

4. RECEIVING ENVIRONMENT

4.1. Desk study

4.1.1. Protected and Invasive Species

A search was undertaken on the National Biodiversity Data Centre[2] for protected and invasive alien species presence within the vicinity of the proposed Decommissioning and Rehabilitation Plan. The Derryfadda Bog is located in the 10km grid square M84, and protected and invasive species records available for this location are shown in **Table 4.1** below (records exceeding 50 years were excluded from the table).

Table 4.1: NBDC records of protected and invasive species within the proposed Decommissioning and Rehabilitation Plan location.

Common Name	Scientific Name	Date of Record	Designation
Invasive Species			
Canadian Waterweed	*Elodea canadensis*	31/12/2010	Invasive Species >> Regulation S.I. 477 (Ireland)
Rhododendron	*Rhododendron ponticum*	10/04/2012	Invasive Species >> Regulation S.I. 477 (Ireland)
American Mink	*Mustela vison*	09/12/1991	Invasive Species >> Regulation S.I. 477 (Ireland)
Fallow Deer	*Dama dama*	10/04/2012	Invasive Species >> Regulation S.I. 477 (Ireland)
Sycamore	*Acer pseudoplatanus*	30/08/2016	Invasive Species:
Common Garden Snail	*Cornu aspersum*	14/08/1972	Invasive Species:
European Rabbit	*Oryctolagus cuniculus*	09/12/1991	Invasive Species
Greylag Goose	*Anser anser*	31/12/2001	Invasive Species: Invasive Species || Invasive Species: Invasive Species >> Regulation S.I. 477 EU Birds Directive >> Annex II, Annex III,
Mammals			
European Otter	*Lutra lutra*	23/05/2012	EU Habitats Directive >> Annex II, Annex IV
Birds			
European Golden Plover	*Pluvialis apricaria*	28/12/2012	EU Birds Directive >> Annex II, Annex III,
Greater White-fronted Goose	*Anser albifrons*	31/12/2011	EU Birds Directive >> Annex II, Annex III,

Common Name	Scientific Name	Date of Record	Designation
Bewick's Swan	*Cygnus columbianus subsp. bewickii*	31/12/2001	EU Birds Directive >> Annex I
Corn Crake	*Crex crex*	31/07/1972	EU Birds Directive >> Annex I
Dunlin	*Calidris alpina*	31/12/2001	EU Birds Directive >> Annex I
Whooper Swan	*Cygnus cygnus*	21/03/2021	EU Birds Directive >> Annex I
Mallard	*Anas platyrhynchos*	31/12/2011	EU Birds Directive >> Annex II, Annex III
Common Coot	*Fulica atra*	31/12/2011	EU Birds Directive >> Annex II, Annex III,
Common Pochard	*Aythya ferina*	31/12/2001	EU Birds Directive >> Annex II, Annex III,
Eurasian Teal	*Anas crecca*	31/12/2011	EU Birds Directive >> Annex II, Annex III,
Eurasian Wigeon	*Anas penelope*	28/12/2012	EU Birds Directive >> Annex II, Annex III,
Northern Pintail	*Anas acuta*	31/12/2011	EU Birds Directive >> Annex II, Annex III,
Tufted Duck	*Aythya fuligula*	31/12/2001	EU Birds Directive >> Annex II, Annex III,
Jack Snipe	*Lymnocryptes minimus*	31/12/2001	EU Birds Directive >> Annex II, Annex III
Common Snipe	*Gallinago gallinago*	31/12/2011	EU Birds Directive >> Annex II, Annex III, Birds of Conservation Concern - Red List
Eurasian Woodcock	*Scolopax rusticola*	31/12/2011	EU Birds Directive >> Annex II, Annex III, Birds of Conservation Concern - Red List
Northern Shoveler	*Anas clypeata*	31/12/2011	EU Birds Directive >> Annex II, Annex III, Birds of Conservation Concern - Red List
Gadwall	*Anas strepera*	31/12/2011	EU Birds Directive >> Annex II, Birds of Conservation Concern - Amber List
Eurasian Curlew	*Numenius arquata*	01/04/2021	EU Birds Directive >> Annex II, Birds of Conservation Concern - Red List
Northern Lapwing	*Vanellus vanellus*	28/12/2012	EU Birds Directive - Annex II, Birds of Conservation Concern - Red List

4.1.2. Aquatic Environment

The proposed Decommissioning and Rehabilitation Plan is located within the Upper Shannon Water Framework Directive (WFD) Catchment (26D) and Suck_SC_070 (26D_1) WFD Sub-catchment. Searches of the EPA Unified GIS Application[3] and the EPA Catchments database[7] were conducted for water bodies draining the area for the proposed Decommissioning and Rehabilitation Plan and their water quality for 2013-2018.

4.1.2.1. WFD River Water Bodies

There are three WFD river water bodies intersecting and/or in close proximity of the proposed Decommissioning and Rehabilitation Plan: the Suck_130 (IE_SH_26S071200), which runs through the eastern section of the site; and the Killaderry stream_010 (IE_SH_26K050940), which crosses, longitudinally, the central part of the Derryfadda Bog, before discharging into the Suck_130 and the Lughanagh_010 (IE_SH_26L530780) (**Table 4.2**).

Table 4.2: WFD river water bodies forming the hydrological pathway of the proposed Decommissioning and Rehabilitation Plan for Derryfadda Bog.

Name	EU Code	Water Quality Status 2013-2018
Suck_130	IE_SH_26S071200	Good
Killaderry stream_010	IE_SH_26K050940	Unassigned
Lughanagh_010	IE_SH_26L530780	Unassigned
Suck_140	IE_SH_26S071400	Moderate
Suck_150	IE_SH_26S071500	Moderate
Suck_160	IE_SH_26S071550	Unassigned
Shannon (Upper)_130	IE_SH_26S021920	Unassigned
Shannon (Lower)_010	IE_SH_25S012000	Unassigned
Shannon (Lower)_020	IE_SH_25S012060	Moderate
Shannon (Lower)_030	IE_SH_25S012350	Unassigned

[7] *Available at https://www.catchments.ie/. Accessed in January 2022.*
[9] *Available at https://airomaps.geohive.ie/ESM/. Accessed in January 2022.*

Monitoring is in place at a number of outflows from Derryfadda Bog. The main emission limit value associated with this bog is 35mg/l suspended solids, with trigger levels for ammonia of 3.7 mg/l and COD 100mg/l. Initial monthly ammonia concentrations from August 2020 to September 2021 have a range of .017 to 2.2 mg/l with an average of 0.342mg/l. Results for suspended solids for the same period indicate a range of >2 to 8mg/l with an average of 4.45mg/l. From an analysis of any monitoring over the past five years of the IPC licence environmental monitoring of some of the discharges from this bog, indicate that results were under the ELV for SS and Ammonia and broadly under the trigger levels for COD.

4.1.2.2. WFD Lake Water Bodies

Lough Derg TN (IE_SH_25_191a) is located 51km hydrologically downstream and to the south of the proposed Plan. The Ecological Status or Potential of this waterbody for the timeframe 2013-2018 is Moderate while the Chemical Surface Water Status for the same timeframe is Good.

4.1.3. European sites

Beyond the River Suck Callows SPA, which is intersected by proposed Decommissioning and Rehabilitation Plan, there are other 19 European sites within the considered ZoI, totalling 16 SACs and 4 SPAs (**Table 4.3; Figure 4.1; Figure 4.2**).

Table 4.3: Distance from European sites within ZoI and the proposed Decommissioning and Rehabilitation Plan.

Site code	Site name	Distance (straight-line) to proposed Decommissioning and Rehabilitation Plan activities
002339	Ballynamona Bog and Corkip Lough SAC	8.26km
002347	Camderry Bog SAC	14.75km
000609	Lisduff Turlough SAC	9.07km
002213	Glenloughaun Esker SAC	12.63km
002214	Killeglan Grassland SAC	2.33km
000588	Ballinturly Turlough SAC	12.82km
002350	Curraghlehanagh Bog SAC	14.44km
002199	Ballygar (Aghrane) Bog SAC	8.75km
002200	Aughrim (Aghrane) Bog SAC	9.46km
001242	Carrownagappul Bog SAC	12.61km
000610	Lough Croan Turlough SAC	5.74km

Site code	Site name	Distance (straight-line) to proposed Decommissioning and Rehabilitation Plan activities
001637	Four Roads Turlough SAC	5.35km
001625	Castlesampson Esker SAC	7.96km
000611	Lough Funshinagh SAC	10.89km
004097	River Suck Callows SPA	0.00km (within SPA)
004139	Lough Croan Turlough SPA	5.74km
004140	Four Roads Turlough SPA	5.35km
000216	River Shannon Callows SAC	18.8km
004096	Middle Shannon Callows SPA	18.9km
004058	Lough Derg (Shannon) SPA	39.1km
002241	Lough Derg, North-east Shore SAC	39.1km

Potential pathways between the proposed Decommissioning and Rehabilitation Plan and European sites within the ZoI are appraised in **Table 4.4**, including hydrological connectivity.

Table 4.4: Relevant European sites, Conservation Objectives and connectivity to the proposed plan.

Designated site [code]	Conservation Objectives version	Qualifying Interests [code]/Special Conservation Interests [code]	Connectivity with the proposed Decommissioning and Rehabilitation Plan
Ballynamona Bog and Corkip Lough SAC [002339]	Version 1, 23rd of September 2016 (NPWS, 2016)	Turloughs [3180]*	**No.** Beyond the Deffyfadda Bog being separated from the Corkip Lough SAC by approximately 8km, both locations are not hydrologically connected.
		Active raised bogs [7110]*	
		Degraded raised bog still capable of regeneration [7120]	
		Depressions on peat substrates of the *Rhynchosporion* [7150]	

Designated site [code]	Conservation Objectives version	Qualifying Interests [code]/Special Conservation Interests [code]	Connectivity with the proposed Decommissioning and Rehabilitation Plan
		Bog woodland [91D0]*	
Camderry Bog SAC [002347]	Version 1, 24th of November 2015 (NPWS, 2015a)	Active raised bogs [7110]*	**No.** Although the Camderry Bog SAC is hydrologically connected to the proposed Plan, the Camderry Bog SAC is located upstream and approximately 27.5km the proposed Plan.
		Degraded raised bog still capable of natural regeneration [7120]	
		Depressions on peat substrates of the Rhynchosporion [7150]	
Lisduff Turlough SAC [000609]	Version 1, 15th of January 2018 (NPWS, 2018a)	Turloughs [3180]*	**No.** The protected site is not hydrologically connected to the proposed rehabilitation measures
Glenloughaun Esker SAC [002213]	Version 1, 19th of June 2018 (NPWS, 2018b)	Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco brometalia*) (* important orchid sites) [6210]	**No.** The designated site is not hydrologically connected to the proposed rehabilitation measures.
Killeglan Grassland SAC [002214]	Version 1, 19th of June 2018 (NPWS, 2018c)	Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco brometalia*) (* important orchid sites) [6210]	**No.** The designated site is not hydrologically connected to the proposed rehabilitation measures..
Ballinturly Turlough SAC [000588]	Version 1, 29th of January 2018 (NPWS, 2018d)	Turloughs [3180]*	**No.** Although Ballinturly Turlough SAC is hydrologically connected to the proposed Plan, it is located ~28km hydrologically upstream from the proposed Plan..
		Active raised bogs [7110]*	**No.**

Designated site [code]	Conservation Objectives version	Qualifying Interests [code]/Special Conservation Interests [code]	Connectivity with the proposed Decommissioning and Rehabilitation Plan
Curraghlehanagh Bog SAC [002350]	Version 1, 30th of November 2015 (NPWS, 2015b)	Degraded raised bog still capable of regeneration [7120] Depressions on peat substrates of the Rhynchosporion [7150]	Although the European Site is hydrologically connected to the proposed Plan, it is located upstream from the proposed Plan.
Ballygar (Aghrane) Bog SAC [002199]	Version 1, 23rd of March 2021 (NPWS, 2021d)	Active raised bogs [7110]* Degraded raised bog still capable of regeneration [7120]	**No.** The designated site is not hydrologically connected to the proposed rehabilitation measures.
Aughrim (Aghrane) Bog SAC [002200]	Version 8.0, 23rd of March 2021 (NPWS, 2021e)	Degraded raised bog still capable of regeneration [7120]	**No.** The designated site is not hydrologically connected to the proposed rehabilitation measures.
Carrownagappul Bog SAC [001242]	Version 1, 2nd of November 2015 (NPWS, 2015c)	Active raised bogs [7110]* Degraded raised bog still capable of regeneration [7120] Depressions on peat substrates of the *Rhynchosporion* [7150]	**No.** Although the European Site is hydrologically connected to the proposed Plan, it is located upstream from the proposed Plan, with a separation distance of approximately 12.61km.
Lough Croan Turlough SAC [000610]	Version 1, 12th of January 2018 (NPWS, 2018e)	Turloughs [3180]*	**No.** The designated site is not hydrologically connected to the proposed rehabilitation measures..
Four Roads Turlough SAC [001637]	Version 1, 9th of February 2018 (NPWS, 2018f)	Turloughs [3180]*	**No.** Although the European Site is hydrologically connected to the proposed Plan, it is hydrologically upstream from the proposed Plan.

Designated site [code]	Conservation Objectives version	Qualifying Interests [code]/Special Conservation Interests [code]	Connectivity with the proposed Decommissioning and Rehabilitation Plan
Castlesampson Esker SAC [001625]	Version 1, 21st of October 2021 (NPWS, 2021f)	Turloughs [3180]*	**No.** The designated site is not hydrologically connected to the proposed rehabilitation measures.
		Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco brometalia*) (* important orchid sites) [6210]	
Lough Funshinagh SAC [000611]	Version 1, 19th of February 2018 (NPWS, 2018g)	Turloughs [3180]*	**No.** The designated site is not hydrologically connected to the proposed rehabilitation measures.
		Rivers with muddy banks with *Chenopodion rubri* p.p. and *Bidention* p.p. Vegetation [3270]	
River Suck Callows SPA [004097]	Version 1, 23rd of March 2021 (NPWS, 2021g)	Whooper Swan (*Cygnus cygnus*) [A038]	**Yes.** The proposed rehabilitation plan is within the boundary of this SPA.
		Wigeon (*Anas penelope*) [A050]	
		Golden Plover (*Pluvialis apricaria*) [A140]	
		Lapwing (*Vanellus vanellus*) [A142]	
		Greenland White-fronted Goose (*Anser albifrons flavirostris*) [A395]	
Lough Croan Turlough SPA [004139]	Version 1, 23rd of March 2021 (NPWS, 2021h)	Shoveler (*Anas clypeata*) [A056]	**Yes.** While the European site is not hydrologically connected to the proposed rehabilitation measures, there is suitable habitat (standing water) in the proposed rehabilitation area in Derryfadda Bog which is within the foraging ranges of Greenland White-fronted Goose (which can forage up
		Golden Plover (*Pluvialis apricaria*) [A140]	
		Greenland White-fronted Goose (*Anser albifrons flavirostris*) [A395]	

Designated site [code]	Conservation Objectives version	Qualifying Interests [code]/Special Conservation Interests [code]	Connectivity with the proposed Decommissioning and Rehabilitation Plan
			to 8km from roosting areas (SNH, 2016))..
Four Roads Turlough SPA [004140]	Version 1, 23rd of March 2021 (NPWS, 2021i)	Golden Plover (*Pluvialis apricaria*) [A140]	**Yes.** While the European site is hydrologically upstream from the proposed rehabilitation measures, there is suitable habitat (standing water) in the proposed rehabilitation area in Derryfadda Bog which is within the foraging ranges of Greenland White-fronted Goose (which can forage up to 8km from roosting areas (SNH, 2016)).
		Greenland White-fronted Goose (*Anser albifrons flavirostris*) [A395]	
River Shannon Callows SAC [000216]	Version 1, 18th January 2022 (NPWS, 2021a)	Molinia meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) [6410]	**Yes.** The European site is hydrologically connected with the proposed Plan, located approximately 32km downstream.
		Lowland hay meadows (*Alopecurus pratensis, Sanguisorba officinalis*) [6510]	
		Alkaline fens [7230]	
		Limestone pavements [8240]*	
		Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) [91E0]*	
		Otter (*Lutra lutra*) [1355]	
Middle Shannon Callows SPA [004096]	Generic Version 8.0, 23rd March 2021 (NPWS, 2021b)	Whooper Swan (*Cygnus cygnus*) [A038]	**Yes.** The European site is hydrologically connected with the proposed Plan,
		Wigeon (*Anas penelope*) [A050]	

Designated site [code]	Conservation Objectives version	Qualifying Interests [code]/Special Conservation Interests [code]	Connectivity with the proposed Decommissioning and Rehabilitation Plan
		Corncrake (*Crex crex*) [A122]	located approximately 32km downstream.
		Golden Plover (*Pluvialis apricaria*) [A140]	
		Lapwing (*Vanellus vanellus*) [A142]	
		Black-tailed Godwit (*Limosa limosa*) [A156]	
		Black-headed Gull (*Chroicocephalus ridibundus*) [A179]	
		Wetland and Waterbirds [A999]	
Lough Derg (Shannon) SPA [004058]	Generic Version 8.0, 23rd March 2021 (NPWS, 2021c)	Cormorant (*Phalacrocorax carbo*) [A017]	**Yes.** The European site is hydrologically connected with the proposed Plan, located 51.8km downstream.
		Tufted Duck (*Aythya fuligula*) [A061]	
		Goldeneye (*Bucephala clangula*) [A067]	
		Common Tern (*Sterna hirundo*) [A193]	
		Wetland and Waterbirds [A999]	
Lough Derg, North-east Shore SAC [002241]	Version 1, 24th April 2019 (NPWS, 2019d)	*Juniperus communis* formations on heaths or calcareous grasslands [5130]	**Yes.** The European Site is hydrologically connected with the proposed Plan, located 51.8km downstream.
		Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae* [7210]	
		Alkaline fens [7230]	
		Limestone pavements [8240]*	

Designated site [code]	Conservation Objectives version	Qualifying Interests [code]/Special Conservation Interests [code]	Connectivity with the proposed Decommissioning and Rehabilitation Plan
		Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) [91E0]*	
		Taxus baccata woods of the British Isles [91J0]	

* indicates a priority habitat under the Habitats Directive.

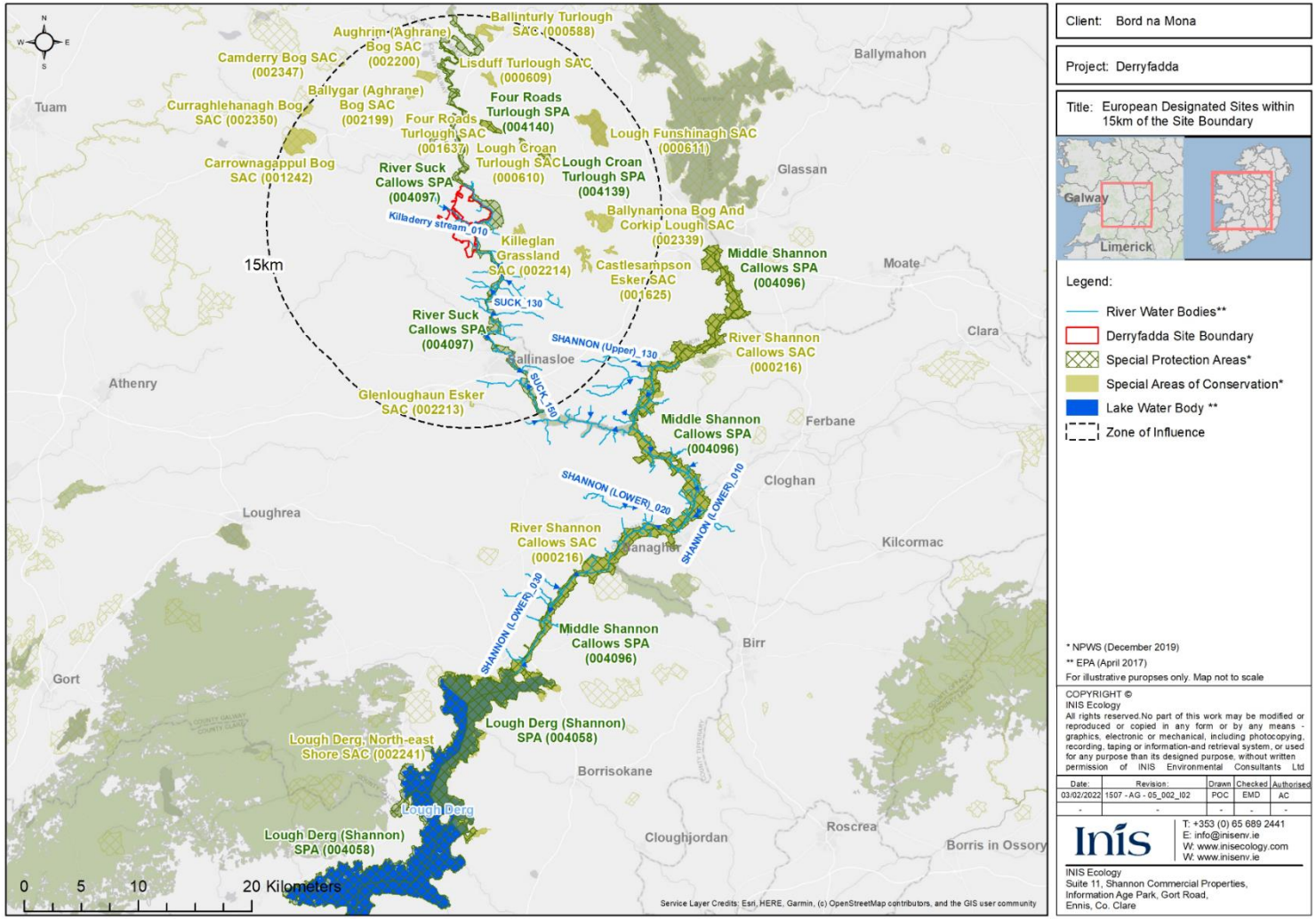

Figure 4.1: Designated sites within 15km of the proposed Plan and within its hydrological pathway.

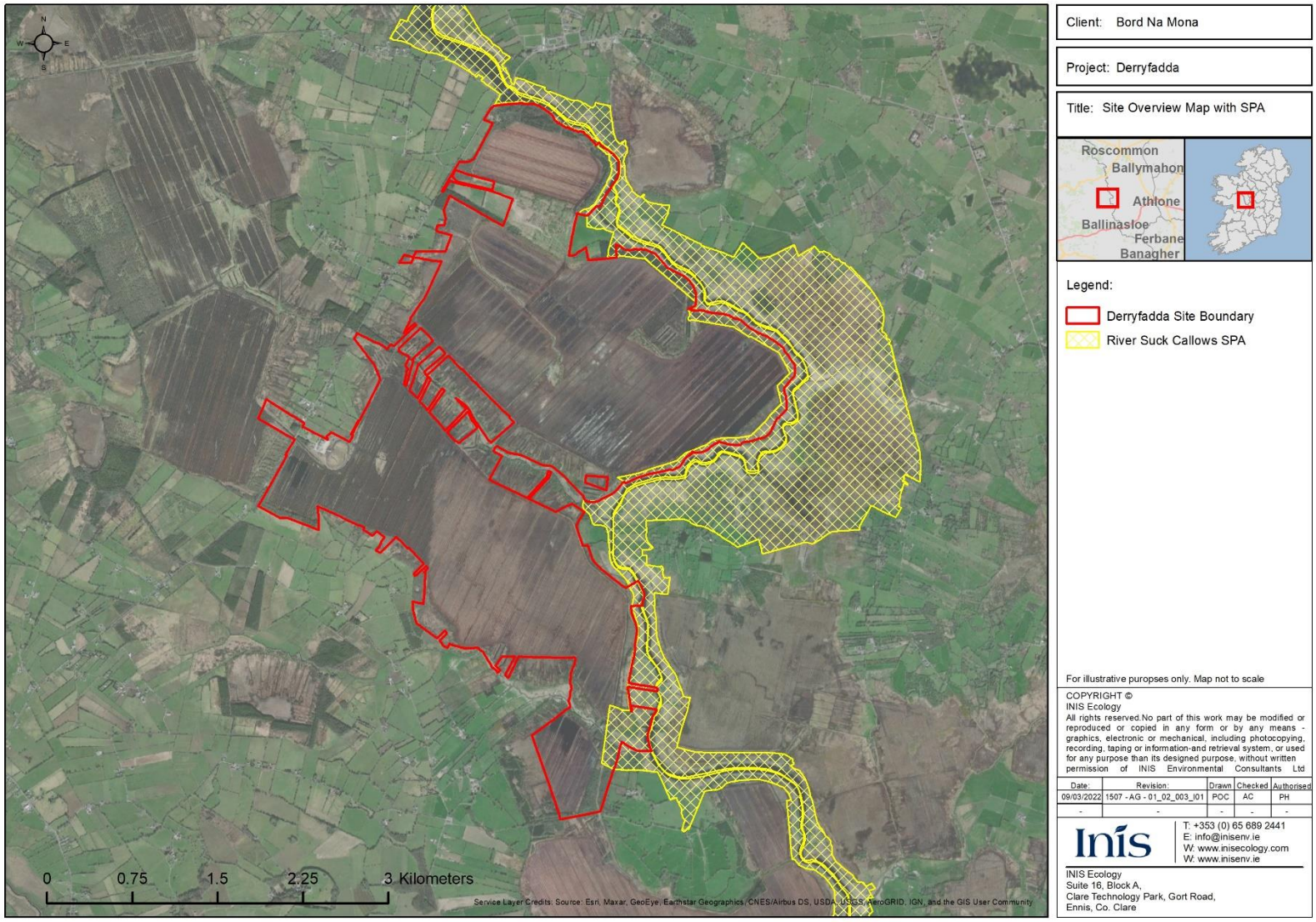

Figure 4.2: Overview of Derryfadda Bog boundary and River Suck callows SPA boundary.

5. STAGE 1: SCREENING OF LIKELY SIGNIFICANT EFFECTS

5.1. Screening Process

The Screening process examines the likely effects of the proposed Plan, as described, either alone or in combination, with other projects or plans, upon a Natura 2000 site and considers whether it can be objectively concluded that these effects will not be significant.

5.2. Screening: Is the Project Directly Connected to or Necessary for Management of a European site?

For a project or plan to be 'directly connected with or necessary to the management of the site', the 'management' component must refer to management measures that are for conservation purposes, and the 'directly' element refers to measures that are solely conceived for the conservation management of a site and not direct or indirect consequences of other activities.

Finding: **No**, the proposed Plan is not directly connected to, or necessary for the management of, a European site.

5.3. Assessment of Source-Pathway-Receptor Model

As described in the methodology (**Section 3**), the AA Screening Report appraisal adopts a comprehensive and precautionary approach for which the starting point is a complete list of all QIs/SCIs of European sites in Ireland. In this context, **Table 5.1** assesses a specific source-pathway-receptor model for this proposed Plan.

Table 5.1: Source-Pathway-Receptor Model for the Proposed Plan.

Source of Potential Effect	Description of Pathway	Potential Zone of Influence of the Effect
• **Noise, vibration;** • **Human presence; and** • **Movements of vehicles.**	Noise or other works-related disturbance could reduce the ability of populations of QI/SCI species to forage, roost or breed. Direct mortality resulting from machinery works, collision with vehicles, etc.	Varies by species. Generally assessed within 500 m of the proposed Plan footprint for wintering birds (see Madsen, 1985; Smit & Visser,1993; and Rees et al., 2005). However, distance can be significantly lower (e.g. 150 m for otter underground sites - NRA, 2006), or higher (e.g. Greenland White-fronted Goose may forage up to 8km from roosting areas (SNH, 2016)).

Source of Potential Effect	Description of Pathway	Potential Zone of Influence of the Effect
• **Use of contaminants (e.g. hydrocarbons).** • **Movement of soils and vehicles.**	Contamination through surface water runoff and/or percolation into groundwater.	• Surface water run-off carrying suspended silt or contaminants into local water bodies can be restricted to the first lentic waterbody which is hydrologically downstream from the proposed Plan.
• **Spread of Invasive Alien Species**	• Spread of IAS through surface water runoff and the movement of humans and vehicles.	• The Zone of Influence of effects for spread of terrestrial invasive species is difficult to accurately estimate, as plant fragments may be spread on tyre treads to distant unrelated sites. In relation to water-borne spread of vegetation, the Zone of Influence can be generally restricted to the first lentic waterbody which is hydrologically downstream from the proposed Plan.

5.4. Scoping of Effects

5.4.1. Disturbance to mobile QIs and SCIs

The noise, vehicle, machinery and personnel movement associated with the proposed rehabilitation can potentially disturb several SCIs on the River Suck Callows SPA (Whooper Swan, Wigeon, Golden Plover, Lapwing and Greenland White-fronted Goose), the Lough Croan Turlough SPA and the Four Roads Turlough SPA (both Greenland White-fronted Goose) and/or even incite their displacement during the winter months (all three screened-in SPAs are designated for the wintering populations of these species). Thus, it is believed that likely significant disturbance effects on the integrity of the SCI populations of European sites cannot be ruled out as a result of the proposed rehabilitation measures.

5.4.2. Contamination

The works associated with the proposed Plan may cause contamination of river waterbodies which are hydrologically connected with the proposed Plan. This potential contamination may be caused by siltation caused by the release of soil/earth in the form of suspended sediments in addition to the accidental leakage of hydrocarbons onsite (e.g. fuel, oil) or any other contaminant used on the land (e.g. fertiliser). As the proposed Plan is located within the boundary of the River Suck Callows SPA, these contaminants can potentially reach this European Site and further potentially contaminate European sites that are hydrologically downstream. In this event, potential likely significant effects are

expected on River Suck Callows SPA; River Shannon Callows SAC; Middle Shannon Callows SPA; Lough Derg (Shannon) SPA; and Lough Derg, North-east Shore SAC.

5.4.3. Spread of Invasive Non Native Species

The works associated with the proposed Plan may cause the spread of IAS (such as Canadian Waterweed or Rhododendron) which have been recorded in proximity to Derryfadda Bog (see Table 4.1). This may be caused by the accidental spread of IAS onsite (e.g. on vehicles or human clothing). As the proposed Plan is within the River Suck Callows SPA boundary, Invasive Non Native Species (INNS) can potentially reach this European Site and further potentially spread to European sites that are hydrologically downstream. In this event, potential likely significant effects are expected on the River Suck Callows SPA; River Shannon Callows SAC; Middle Shannon Callows SPA; Lough Derg (Shannon) SPA; and Lough Derg, North-east Shore SAC.

5.5. In-Combination Effects

Legislation, guidance and case law (**Section 1.1** and **Section 3.1**) requires that in-combination effects with other plans or projects are considered. On this basis, a range of other plans and projects were considered in terms of their potential to have in-combination effects with the proposed Plan.

5.5.1. Galway County Development Plan 2022-2028

The Galway County Development Plan (Galway County Council, 2021) sets the protection of biodiversity and European Sites as the following objectives:

- *Protect and where possible enhance the natural heritage sites designated under EU Legislation and National Legislation (Habitats Directive, Birds Directive, European Communities (Birds and Natural Habitats) Regulations 2011 and Wildlife Acts) and extend to any additions or alterations to sites that may occur during the lifetime of this plan.*

- *Protect and, where possible, enhance the plant and animal species and their habitats that have been identified under European legislation (Habitats and Birds Directive) and protected under national Legislation (European Communities (Birds and Natural Habitats) Regulations 2011 (SI 477 of 2011), Wildlife Acts 1976-2010 and the Flora Protection Order (SI 94 of 1999).*

- *Support the protection, conservation and enhancement of natural heritage and biodiversity, including the protection of the integrity of European sites, that form part of the Natura 2000 network, the protection of Natural Heritage Areas, proposed Natural Heritage Areas, Ramsar Sites, Nature Reserves, Wild Fowl Sanctuaries (and other designated sites including any future designations) and the promotion of the development of a green/ ecological network.*

As it is a legal requirement, it is expected that every planning application developed within the Galway County Council authority will assess the potential for in-combination effects and impacts on ecological receptors. Therefore, the proposed Plan is not likely to have an in-combination effect with the Galway County Council development plan.

5.5.2. Projects

A search of planning applications (projects) was conducted within the vicinity of the proposed Plan, using the Galway County Council planning portal map viewer[8], the Roscommon County Council planning map viewer[9], the Offaly County Council planning portal map viewer[10] and the Department of Housing, Planning and Local Government EIA portal map viewer[11]. The search was limited to projects with potential to have in-combination impacts on European sites within the ZoI in a five year period preceding the date of issue of this report. Incomplete, withdrawn, and refused project applications were excluded. The search revealed no projects in the vicinity of the project area or hydrological pathway that would likely to contribute towards in-combination effects with the proposed Plan.

Two SIDs are located within the vicinity of the considered hydrological pathway from the proposed Plan, adjacent to Lough Derg (Shannon) SPA and the River Shannon Callows SAC. Both planning applications are windfarm developments, both of which being accompanied by a NIS and an EIAR which are available on the An Bord Pleanála website[12]. The EIAR document associated with planning application 2020029 concluded that 'The development will not have significant effects on any KOR (Key Ornithological Receptors) recorded either in isolation or cumulatively with other plans and projects.' The EIAR document associated with planning application 2020136 concluded that 'The ongoing operation of the wind farm up to the end-of-life of the project will have no significant negative impacts on the surface receiving waters, with any impacts occurring being slight and not significant. This will also be true of the decommissioning stage provided all recommended mitigation measures are implemented.'[13]

Regarding NPWS raised bog projects, there are no designated sites located within the European Sites assessed within the ZoI for the proposed rehabilitation works at Derryfadda Bog. Therefore, in-combination effects are considered unlikely as the bog is not hydrologically connected with any NPWS raised bogs. Furthermore, there will be no displacement or disturbance of SCIs or QIs from the proposed rehabilitation works, as all have been screened out in this assessment.

Table 5.2. presents projects that have been granted planning permission or whose planning application has been submitted in the region of the proposed Plan or the river waterbodies which are hydrologically downstream from the proposed Plan. A further 13 bogs are proposed for rehabilitation by Bord na Mona – Knappoge Bog, Noggusboy Bog, Gilltown Bog, Derraghan Bog, Prosperous Bog, Carranstown Bog, Kilaranny Bog, Bloomhill Bog, Derrinboy Bog, Bunahily-Kilgarvin Bog, Derrybrat Bog, Clooneeny Bog and Begnagh Bog. Supporting documents, i.e. environmental reports, for projects assessed specify that significant or adverse effects, either directly or in-combination, to local ecology or hydrologically connected European sites will not be likely.

[8] *Available at https://www.arcgis.com/apps/webappviewer/index.html?id=3570e45b0e354cf0b740ecbc7505adb2 Accessed in January 2022*
[9] *Available at https://roscoco.maps.arcgis.com/apps/webappviewer/index.html?id=84b0356c3b45483c9da36ecccbd3aa93 Accessed in January 2022*
[10] *Available at https://www.arcgis.com/apps/webappviewer/index.html?id=a9badef1ed474100ae1340b33ea9a729 Accessed in January 2022*
[11] *Available at https://housinggovie.maps.arcgis.com/apps/webappviewer/index.html?id=d7d5a3d48f104ecbb206e7e5f84b71f1 Accessed in January 2022*
[12] *Available at https://www.pleanala.ie/en-ie/case/306706 Accessed in January 2022.*
[13] *Available at https://www.pleanala.ie/en-ie/case/308019 Accessed in January 2022.*

Table 5.2: Relevant projects with potential for in-combination adverse effects to European sites.

Planning Application /Case Reference Number	Project/Applicant Name and Proposed Location	Brief Development Description	Approximate Distance from Proposed Plan	Date Planning Application Granted
161322	Waterways Ireland, Meelick County Galway	for weir repairs and the replacement of the damaged walkway at Meelick Weir on the River Shannon, in the townland of Keeloge, County Galway. The works shall consist of the construction of a new steel walkway approximately 300m long to replace the existing structure	*ca. 31.6km*	03/07/2017
2019051	McKeons Sand and Gravel Ltd., McKeons Quarry, Culliaghbeg and Culliaghmore, Ballinasloe, Co. Roscommon	A continuation/resumption of use and the operation of an existing quarry	*ca. 16.1km*	-
2020029	Bord na Móna Powergen Ltd., Derrinlough, and other townlands County Offaly	Wind farm development of 21 no. turbines, 110kv substation, all associated works including amenity pathway and carpark	*ca. 35.7km*	26/08/2021
2020136	Gort Windfarms Ltd., Coppanagh, Slieveanore, Loughatorick North, Boleyneendorrish, Kilbeg, Toormacnevin, Funshadaun, Derrybrien North, Derrybrien South, Bohaboy, Derrybrien West, Derrybrien East, Derreennamucka, County Galway.	the constructed (1) Derrybrien wind farm and all on-site works; (2) a 110kV electricity grid connection; (3) all ancillary works	*ca. 41.5km*	-

5.6. Stage One Screening Conclusion

The Stage 1 Screening of Likely Significant Effects provided herein has examined potential effects via source pathway linkages on designated SACs and SPAs within 15km and beyond of the proposed development during the construction and operation phases, either alone or in-combination with other plans or projects.

In total, seven European sites are within the considered Zone of Influence of the proposed development:

- River Suck Callows SPA [004097];
- Lough Croan Turlough SPA [004139];
- Four Roads Turlough SPA [004140];
- River Shannon Callows SAC [000216];
- Middle Shannon Callows SPA [004096];
- Lough Derg (Shannon) SPA [004058]; and
- Lough Derg, North-east Shore SAC [002241].

Following the screening process, it has been determined that impact pathways exist between the proposed development and European sites, both during the construction and operation of the proposed development. As such, likely significant effects on European sites cannot be screened out. Therefore, **the recommendation of the screening process is to proceed to Stage 2 Appropriate Assessment** for the European sites listed above.

6. STAGE 2: APPROPRIATE ASSESSMENT REPORT

This Stage 2 Appropriate Assessment Report (Natura Impact Statement) examines the potential for adverse effects of the proposed Plan on European sites, based on the source-pathway-receptor model, evaluated in **Section 5.3** and further scoped in **Section 5.4**.

Three sources of effects have been appraised and associated with different potential zones of influence. This report will specifically appraise the potential for adverse effects on integrity on the QIs and SCIs of European sites within each of these zones of influence and their associated Conservation Objectives.

6.1. Sources for Adverse Effects on Integrity

The Stage 1 Screening for LSE process, following the Source-Pathway-Receptor model conceptualized for the proposed rehabilitation (**Section 5.4.1)** identified three types of sources for adverse effects on European sites:

1. Noise, vibration; human presence; and movements of vehicles.
2. Spillage of contaminants (e.g. hydrocarbons) and/or sediment/silt (e.g. from moving peat around the site or from failure of berms).
3. Spread of Invasive Alien Species via hydrological pathways.

6.2. Pathways for Adverse Effects on Integrity

Potential pathways/connectivity have also been identified between the proposed rehabilitation and European sites (**Table 4.3**). As mentioned in **Section** Error! Reference source not found., hydrological connectivity was considered unlikely if established beyond the first lenthic water body in the hydrological pathway.

The nature, limited extent and scale of the proposed rehabilitation, allow for the definition of limits for two pathways associated with the sources for adverse effects:

1. Terrestrial.
2. Surface water run-off (including running into groundwater).

6.2.1. Terrestrial Pathways

Terrestrial pathways for potential adverse effects on European sites from the proposed rehabilitation are associated with the construction works and activities potentially causing disturbance to QIs and SCIs, potentially affecting the following European sites:

- River Suck Callows SPA [004097];
- Lough Croan Turlough SPA [004139]; and
- Four Roads Turlough SPA [004140];

6.2.2. Hydrological Pathways

As established in **Section** Error! Reference source not found., adverse effects to European sites from the proposed development during the construction phase through surface water interactions relate to potential contamination of the surface water bodies and the negative effects this would have on QI habitats, QI species and SCIs, potentially affecting the following European sites:

- River Suck Callows SPA [004097];
- River Shannon Callows SAC [000216];
- Middle Shannon Callows SPA [004096];
- Lough Derg (Shannon) SPA [004058]; and
- Lough Derg, North-east Shore SAC [002241].

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6.3. European sites' QIs/SCIs Potentially Affected by the Proposed Rehabilitation

For the appraisal of the likelihood of significant effects on the Conservation Objectives (CO) of the European sites described in **Section 5**, through the pathways identified in **Section 6.2**, from the sources listed in **Section 6.1**, the CO attributes of each European site with hydrological connectivity and/or close proximity with the proposed Plan have been considered (**Table 4.4**).

It is considered that, without the incorporation of mitigation measures, the proposed rehabilitation could potentially result in adverse effects on the integrity of European sites identified view of their CO attributes highlighted in **Table 6.1**.

Table 6.1: Relevant European sites and respective Conservation Objectives attributes for which a pathway with the proposed Plan have been identified (potentially adverse effects from the proposed Plan are anticipated to highlighted CO/attributes).

European site [Code] (CO)	Qualifying Interests [code]/Special Conservation Interests [code]	Conservation Objective Attribute[14]	Potentially Adverse Effects[15]		
			Disturbance of QIs and SCIs	Contamination of surface water	Spread of Invasive Alien Species
River Suck Callows SPA [004097]	Whooper Swan (*Cygnus cygnus*) [A038]	Population Trend	**No.** Due to the scale and duration of the plan disturbance will not give rise to adverse effects on the population trends of the Whooper Swan.	**Yes.** Due to the proximity of the works to the River Suck Callows SPA, it is possible that water runoff will cause the release of contaminants and/or earth into the river water body. This is likely to give rise to illness or mortality in exposed individuals (SCIs) resulting in adverse effects on the population trend of the SCI.	**Yes.** With Rhododendron recorded on the proposed rehabilitation area, due to the proximity of the works to the River Suck Callows SPA, it is possible that water runoff will cause the release of IAS fragments into the river water body giving rise to adverse effects on the population trend of Whooper Swan.
		Distribution	**Yes.** As there is suitable habitat located within and adjacent to the proposed plan, disturbance may occur, giving rise to a reduction in the SCIs distribution.	**Yes.** Due to the proximity of the works to the River Suck Callows SPA, it is possible that water runoff will cause the release of contaminants and/or earth into the river water body. This may give rise to illness or mortality in exposed individuals (SCIs) resulting in adverse effects on the	**Yes.** With Rhododendron recorded on the proposed rehabilitation area, due to the proximity of the works to the River Suck Callows SPA, it is possible that water runoff will cause the release of IAS fragments into the river water body giving rise to adverse

[14] *Where targets and attributes for the conservation of the relevant SCI species are available in detailed Conservation Objectives for other SPAs(e.g. River Shannon and River Fergus Estuaries SPA004077) these site specific conservation objectives have been referenced for the purposes of this assessment.*

[15] *Sources identified in* ***Section 6.1.1.****.*

European site [Code] (CO)	Qualifying Interests [code]/Special Conservation Interests [code]	Conservation Objective Attribute[14]	Potentially Adverse Effects[15]		
			Disturbance of QIs and SCIs	Contamination of surface water	Spread of Invasive Alien Species
				distribution of the Whooper Swan.	effects on the distribution of Whooper Swan.
	Wigeon (*Anas penelope*) [A050]	Population Trend	**No.** Due to the scale and duration of the plan disturbance will not give rise to adverse effects on the population trends of the Wigeon.	**Yes.** Due to the proximity of the works to the River Suck Callows SPA, it is possible that water runoff will cause the release of contaminants and/or earth into the river water body. This is likely to give rise to illness or mortality in exposed individuals (SCIs) resulting in adverse effects on the population trend of the SCI.	**Yes.** With Rhododendron recorded on the proposed rehabilitation area, due to the proximity of the works to the River Suck Callows SPA, it is possible that water runoff will cause the release of IAS fragments into the river water body giving rise to adverse effects on the population trend of Wigeon**.**
		Distribution	**Yes.** As there is suitable habitat located within and adjacent to the proposed plan, disturbance may occur, giving rise to a reduction in the SCIs distribution.	**Yes.** Due to the proximity of the works to the River Suck Callows SPA, it is possible that water runoff will cause the release of contaminants and/or earth into the river water body. This may give rise to illness or mortality in exposed individuals (SCIs) resulting in adverse effects on the distribution of the Wigeon.	**Yes.** With Rhododendron recorded on the proposed rehabilitation area, due to the proximity of the works to the River Suck Callows SPA, it is possible that water runoff will cause the release of IAS fragments into the river water body giving rise to adverse effects on the distribution of Wigeon.

European site [Code] (CO)	Qualifying Interests [code]/Special Conservation Interests [code]	Conservation Objective Attribute[14]	Potentially Adverse Effects[15]		
			Disturbance of QIs and SCIs	Contamination of surface water	Spread of Invasive Alien Species
	Golden Plover (*Pluvialis apricaria*) [A140]	Population Trend	**No.** Due to the scale and duration of the plan disturbance will not give rise to adverse effects on the population trends of the Golden Plover.	**Yes.** Due to the proximity of the works to the River Suck Callows SPA, it is possible that water runoff will cause the release of contaminants and/or earth into the river water body. This is likely to give rise to illness or mortality in exposed individuals (SCIs) resulting in adverse effects on the population trend of the SCI.	**Yes.** With Rhododendron recorded on the proposed rehabilitation area, due to the proximity of the works to the River Suck Callows SPA, it is possible that water runoff will cause the release of IAS fragments into the river water body giving rise to adverse effects on the population trend of Golden Plover.
		Distribution	**Yes.** As there is suitable habitat located within and adjacent to the proposed plan, disturbance may occur, giving rise to a reduction in the SCIs distribution.	**Yes.** Due to the proximity of the works to the River Suck Callows SPA, it is possible that water runoff will cause the release of contaminants and/or earth into the river water body. This may give rise to illness or mortality in exposed individuals (SCIs) resulting in adverse effects on the distribution of the Golden Plover.	**Yes.** With Rhododendron recorded on the proposed rehabilitation area, due to the proximity of the works to the River Suck Callows SPA, it is possible that water runoff will cause the release of IAS fragments into the river water body giving rise to adverse effects on the distribution of Golden Plover.
	Lapwing (*Vanellus vanellus*) [A142]	Population Trend	**No.** Due to the scale and duration of the plan disturbance will not give rise to adverse effects on	**Yes.** Due to the proximity of the works to the River Suck Callows SPA, it is possible that water runoff will cause the release of	**Yes.** With Rhododendron recorded on the proposed rehabilitation area, due to the proximity of the works

European site [Code] (CO)	Qualifying Interests [code]/Special Conservation Interests [code]	Conservation Objective Attribute[14]	Potentially Adverse Effects[15]		
			Disturbance of QIs and SCIs	Contamination of surface water	Spread of Invasive Alien Species
			the population trends of the Lapwing.	contaminants and/or earth into the river water body. This is likely to give rise to illness or mortality in exposed individuals (SCIs) resulting in adverse effects on the population trend of the SCI.	to the River Suck Callows SPA, it is possible that water runoff will cause the release of IAS fragments into the river water body giving rise to adverse effects on the population trend of Lapwing.
		Distribution	**Yes.** As there is suitable habitat located within and adjacent to the proposed plan, disturbance may occur, giving rise to a reduction in the SCIs distribution.	**Yes.** Due to the proximity of the works to the River Suck Callows SPA, it is possible that water runoff will cause the release of contaminants and/or earth into the river water body. This may give rise to illness or mortality in exposed individuals (SCIs) resulting in adverse effects on the distribution of the Lapwing.	**Yes.** With Rhododendron recorded on the proposed rehabilitation area, due to the proximity of the works to the River Suck Callows SPA, it is possible that water runoff will cause the release of IAS fragments into the river water body giving rise to adverse effects on the distribution of Lapwing.
	Greenland White-fronted Goose (*Anser albifrons flavirostris*) [A395]	Population Dynamics	**No.** Due to the scale and duration of the plan disturbance will not give rise to significant effects on the population dynamics of the	**Yes.** Due to the proximity of the works to the River Suck Callows SPA, it is possible that water runoff will cause the release of contaminants and/or earth into the river water body. This is likely to give rise to illness or mortality in exposed individuals (SCIs)	**Yes.** With Rhododendron recorded on the proposed rehabilitation area, due to the proximity of the works to the River Suck Callows SPA, it is possible that water runoff will cause the release of IAS fragments

European site [Code] (CO)	Qualifying Interests [code]/Special Conservation Interests [code]	Conservation Objective Attribute[14]	Potentially Adverse Effects[15]		
			Disturbance of QIs and SCIs	Contamination of surface water	Spread of Invasive Alien Species
			Greenland White-fronted Goose.	resulting in significant effects on the population dynamics of the SCI.	into the river water body giving rise to adverse effects on the population dynamics of Lapwing.
		Natural Range	**Yes.** As there is suitable habitat located within and adjacent to the proposed plan, disturbance may occur, giving rise to a reduction in the SCIs natural range.	**Yes.** Due to the proximity of the works to the River Suck Callows SPA, it is possible that water runoff will cause the release of contaminants and/or earth into the river water body. This is likely to give rise to illness or mortality in exposed individuals (SCIs) resulting in significant effects on the natural range of the Greenland White-fronted Goose.	**Yes.** With Rhododendron recorded on the proposed rehabilitation area, due to the proximity of the works to the River Suck Callows SPA, it is possible that water runoff will cause the release of IAS fragments into the river water body giving rise to adverse effects on the natural range of Lapwing.
		Suitable large habitat	**No.** Due to the scale and duration of the plan disturbance will not give rise to significant effects on the availability of suitable large habitat.	**Yes.** Due to the proximity of the works to the River Suck Callows SPA, it is possible that water runoff will cause the release of contaminants and/or earth into the river water body. This is likely to give rise to illness or mortality in exposed individuals (SCIs) resulting in significant effects on the availability of suitable large habitat.	**Yes.** With Rhododendron recorded on the proposed rehabilitation area, due to the proximity of the works to the River Suck Callows SPA, it is possible that water runoff will cause the release of IAS fragments into the river water body giving rise to adverse effects on the availability of

European site [Code] (CO)	Qualifying Interests [code]/Special Conservation Interests [code]	Conservation Objective Attribute[14]	Potentially Adverse Effects[15]		
			Disturbance of QIs and SCIs	Contamination of surface water	Spread of Invasive Alien Species
					suitable large habitat for Lapwing.
	Wetlands and Waterbirds (A999)[16]	Natural Range	**Yes.** As there is suitable habitat located within and adjacent to the proposed plan, disturbance may occur, giving rise to a reduction in the waterbirds natural range.	**Yes.** Due to the proximity of the works to the River Suck Callows SPA, it is possible that water runoff will cause the release of contaminants and/or earth into the river water body. This is likely to give rise to illness or mortality in exposed individuals resulting in potentially adverse effects on the natural range of the waterbirds	**Yes.** With Rhododendron recorded on the proposed rehabilitation area, due to the proximity of the works to the River Suck Callows SPA, it is possible that water runoff will cause the release of IAS fragments into the river water body giving rise to adverse effects on the natural range of Waterbirds and their wetland habitats.
		Existence of structure and functions necessary for maintenance	**No.** The potential QI and SCI disturbance effects from the proposed Plan are only applicable to SCIs and QI species.	**Yes.** Due to the proximity of the works to the River Suck Callows SPA, it is possible that water runoff will cause the release of contaminants and/or earth into the river water body. This is likely to give rise to illness or mortality in exposed individuals resulting in	**Yes.** With Rhododendron recorded on the proposed rehabilitation area, due to the proximity of the works to the River Suck Callows SPA, it is possible that water runoff will cause the release of IAS fragments into the river water body giving rise to adverse

[16] The River Shannon and River Fergus Estuaries site specific conservation objectives for Wetland and Waterbirds only include an assessment of wetlands; generic targets and attributes have therefore been retained for this SCI throughout.

European site [Code] (CO)	Qualifying Interests [code]/Special Conservation Interests [code]	Conservation Objective Attribute[14]	Potentially Adverse Effects[15]		
			Disturbance of QIs and SCIs	Contamination of surface water	Spread of Invasive Alien Species
				potentially adverse effects on the site for waterbirds	effects on the structure and function of the site for waterbirdss.
		Favourable conservation status of typical species present	**Yes.** As there is suitable habitat located within and adjacent to the proposed plan, disturbance may occur, giving rise to a reduction in the conservation status of certain waterbird SCI species	**Yes.** Due to the proximity of the works to the River Suck Callows SPA, it is possible that water runoff will cause the release of contaminants and/or earth into the river water body. This is likely to give rise to illness or mortality in exposed individuals resulting in potentially adverse effects on the availability of suitable large habitat.	**Yes.** With Rhododendron recorded on the proposed rehabilitation area, due to the proximity of the works to the River Suck Callows SPA, it is possible that water runoff will cause the release of IAS fragments into the river water body giving rise to adverse effects on the availability of suitable large habitat for Waterbirds and their wetland habitats.
Lough Croan Turlough SPA [004139]	Shoveler (*Anas clypeata*) [A056]	Population Trend	**No.** Due to the scale and duration of the plan disturbance will not give rise to adverse effects on the population trends of the Shoveler.	**No.** As the SPA is hydrologically upstream from the proposed Plan and due to a terrestrial separation distance of 5.74km, adverse effects resulting from spillages and contamination are not likely.	**No.** As the SPA is hydrologically upstream from the proposed Plan and due to a terrestrial separation distance of 5.74km, adverse effects resulting from the spread of IAS are not likely.
		Distribution	**No.** Although there is suitable habitat for use	**No.** As the SPA is hydrologically upstream from the proposed Plan	**No.** As the SPA is hydrologically upstream

European site [Code] (CO)	Qualifying Interests [code]/Special Conservation Interests [code]	Conservation Objective Attribute[14]	Potentially Adverse Effects[15]		
			Disturbance of QIs and SCIs	Contamination of surface water	Spread of Invasive Alien Species
			by the SCIs within and adjacent to the proposed Plan, due to the separation distance of 5.74km it is unlikely that disturbance will occur, resulting in alterations to the distribution of the Shoveler.	and due to a terrestrial separation distance of 5.74km, adverse effects resulting from spillages and contamination are not likely.	from the proposed Plan and due to a terrestrial separation distance of 5.74km, adverse effects resulting from the spread of IAS are not likely.
	Golden Plover (*Pluvialis apricaria*) [A140]	Population trend	**No.** Due to the scale and duration of the plan disturbance will not give rise to significant effects on the population trend of the Golden Plover.	**No.** As the SPA is hydrologically upstream from the proposed Plan and due to a terrestrial separation distance of 5.74km, significant effects resulting from spillages and contamination are not likely.	**No.** As the SPA is hydrologically upstream from the proposed Plan and due to a terrestrial separation distance of 5.74km, adverse effects resulting from the spread of IAS are not likely.
		Distribution	**No.** Although there is suitable habitat for use by the SCIs within and adjacent to the proposed rehabilitation, due to the separation distance of 5.74km it is unlikely that disturbance will occur, resulting in alterations to	**No.** As the SPA is hydrologically upstream from the proposed Plan and due to a terrestrial separation distance of 5.74km, adverse effects resulting from spillages and contamination are not likely.	**No.** As the SPA is hydrologically upstream from the proposed Plan and due to a terrestrial separation distance of 5.74km, adverse effects resulting from the spread of IAS are not likely.

European site [Code] (CO)	Qualifying Interests [code]/Special Conservation Interests [code]	Conservation Objective Attribute[14]	Potentially Adverse Effects[15]		
			Disturbance of QIs and SCIs	Contamination of surface water	Spread of Invasive Alien Species
			the distribution of the Golden Plover.		
	Greenland White-fronted Goose (*Anser albifrons flavirostris*) [A395]	Population dynamics	**No.** Due to the scale and duration of the plan disturbance will not give rise to adverse effects on the population dynamics of the Greenland White-fronted Goose.	**No.** As the SPA is hydrologically upstream from the proposed Plan and due to a terrestrial separation distance of 5.74km, adverse effects resulting from spillages and contamination are not likely.	**No.** As the SPA is hydrologically upstream from the proposed Plan and due to a terrestrial separation distance of 5.74km, adverse effects resulting from the spread of IAS are not likely.
		Natural Range	**Yes.** As there is suitable habitat for use by the SCIs within and adjacent to the proposed rehabilitation and it is within the foraging range for this SCI species (of up to 8km (SNH, 2016)), adverse effects may occur, resulting in alterations to the natural range of the SCI.	**No.** As the SPA is hydrologically upstream from the proposed Plan and due to a terrestrial separation distance of 5.74km, adverse effects resulting from spillages and contamination are not likely.	**No.** As the SPA is hydrologically upstream from the proposed Plan and due to a terrestrial separation distance of 5.74km, adverse effects resulting from the spread of IAS are not likely.
		Suitably Large Habitat	**No.** Due to the scale and duration of the plan disturbance will not give rise to adverse effects on	**No.** As the SPA is hydrologically upstream from the proposed Plan and due to a terrestrial separation distance of 5.74km, adverse	**No.** As the SPA is hydrologically upstream from the proposed Plan and due to a terrestrial separation distance of

European site [Code] (CO)	Qualifying Interests [code]/Special Conservation Interests [code]	Conservation Objective Attribute[14]	Potentially Adverse Effects[15]		
			Disturbance of QIs and SCIs	Contamination of surface water	Spread of Invasive Alien Species
			the availability of suitably large habitat.	effects resulting from spillages and contamination are not likely.	5.74km, adverse effects resulting from the spread of IAS are not likely.
	Wetlands and Waterbirds (A999)	Natural Range	**Yes.** As there is suitable habitat located within and adjacent to the proposed plan, disturbance may occur, giving rise to a reduction in the natural range of certain waterbird species (e.g. Whooper Swan and Greenland White-fronted Goose; SNH, 2016).	**No.** As the SPA is hydrologically upstream from the proposed Plan and due to a terrestrial separation distance of 5.74km, adverse effects resulting from spillages and contamination are not likely.	**No.** As the SPA is hydrologically upstream from the proposed Plan and due to a terrestrial separation distance of 5.74km, adverse effects resulting from the spread of IAS are not likely.
		Existence of structure and functions necessary for maintenance	**No.** The potential QI and SCI disturbance effects from the proposed Plan are only applicable to SCIs and QI species.	**No.** As the SPA is hydrologically upstream from the proposed Plan and due to a terrestrial separation distance of 5.74km, adverse effects resulting from spillages and contamination are not likely.	**No.** As the SPA is hydrologically upstream from the proposed Plan and due to a terrestrial separation distance of 5.74km, adverse effects resulting from the spread of IAS are not likely.

European site [Code] (CO)	Qualifying Interests [code]/Special Conservation Interests [code]	Conservation Objective Attribute[14]	Potentially Adverse Effects[15]		
			Disturbance of QIs and SCIs	Contamination of surface water	Spread of Invasive Alien Species
		Favourable conservation status of typical species present	**Yes.** As there is suitable habitat located within and adjacent to the proposed plan, disturbance may occur, giving rise to adverse effects on the conservation status of certain waterbird species (e.g. Whooper Swan and Greenland White-fronted Goose; SNH, 2016).	**No.** As the SPA is hydrologically upstream from the proposed Plan and due to a terrestrial separation distance of 5.74km, adverse effects resulting from spillages and contamination are not likely.	**No.** As the SPA is hydrologically upstream from the proposed Plan and due to a terrestrial separation distance of 5.74km, adverse effects resulting from the spread of IAS are not likely.
Four Roads Turlough SPA [004140]	Golden Plover (*Pluvialis apricaria*) [A140]	Population trend	**No.** Due to the scale and duration of the plan disturbance will not give rise to significant effects on the population dynatrendmics of the Golden Plover.	**No.** As the SPA is hydrologically upstream from the proposed Plan and due to a terrestrial separation distance of 5.29km, significant effects resulting from spillages and contamination are not likely.	**No.** As the SPA is hydrologically upstream from the proposed Plan and due to a terrestrial separation distance of 5.29km, significant effects resulting from the spread of IAS are not likely.
		Distributione	**No.** Although there is suitable habitat for use by the SCIs within and adjacent to the proposed rehabilitation, due to the separation distance of 5.29km it is unlikely that disturbance will occur,	**No.** As the SPA is hydrologically upstream from the proposed Plan and due to a terrestrial separation distance of 5.29km, significant effects resulting from spillages and contamination are not likely	**No.** As the SPA is hydrologically upstream from the proposed Plan and due to a terrestrial separation distance of 5.29km, significant effects

European site [Code] (CO)	Qualifying Interests [code]/Special Conservation Interests [code]	Conservation Objective Attribute[14]	Potentially Adverse Effects[15]		
			Disturbance of QIs and SCIs	Contamination of surface water	Spread of Invasive Alien Species
			resulting in alterations to the distribution of the Golden Plover.		resulting from the spread of IAS are not likely.
	Greenland White-fronted Goose (*Anser albifrons flavirostris*) [A395]	Population dynamics	**No.** Due to the scale and duration of the plan disturbance will not give rise to significant effects on the population dynamics of the SCI.	**No.** As the SPA is hydrologically upstream from the proposed Plan and due to a terrestrial separation distance of 5.29km, significant effects resulting from spillages and contamination are not likely.	**No.** As the SPA is hydrologically upstream from the proposed Plan and due to a terrestrial separation distance of 5.29km, significant effects resulting from the spread of IAS are not likely.
		Natural Range	**Yes.** As there is suitable habitat for use by the SCIs within and adjacent to the proposed rehabilitation and it is within the foraging range for this SCI species (of up to 8km (SNH, 2016)), adverse effects may occur, resulting in alterations to the natural range of the SCI.	**No.** As the SPA is hydrologically upstream from the proposed Plan and due to a terrestrial separation distance of 5.29km, significant effects resulting from spillages and contamination are not likely.	**No.** As the SPA is hydrologically upstream from the proposed Plan and due to a terrestrial separation distance of 5.29km, significant effects resulting from the spread of IAS are not likely.
		Suitably Large Habitat	**No.** Due to the scale and duration of the plan disturbance will not give rise to significant effects	**No.** As the SPA is hydrologically upstream from the proposed Plan and due to a terrestrial separation distance of 5.29km,	**No.** As the SPA is hydrologically upstream from the proposed Plan and due to a terrestrial

European site [Code] (CO)	Qualifying Interests [code]/Special Conservation Interests [code]	Conservation Objective Attribute[14]	Potentially Adverse Effects[15]		
			Disturbance of QIs and SCIs	Contamination of surface water	Spread of Invasive Alien Species
			on the availability of suitably large habitat.	significant effects resulting from spillages and contamination are not likely.	separation distance of 5.29km, significant effects resulting from the spread of IAS are not likely.
	Wetlands and Waterbirds (A999)	Population Dynamics	**No.** Due to the scale and duration of the plan disturbance will not give rise to significant effects on the population dynamics of waterbirds.	**No.** As the SPA is hydrologically upstream from the proposed Plan and due to a terrestrial separation distance of 5.29km, adverse effects resulting from spillages and contamination are not likely.	**No.** As the SPA is hydrologically upstream from the proposed Plan and due to a terrestrial separation distance of 5.29km, adverse effects resulting from the spread of IAS are not likely.
		Natural Range	**Yes.** As there is suitable habitat located within and adjacent to the proposed plan, disturbance may occur, giving rise to a reduction in the natural range of certain waterbird species (e.g. Whooper Swan and Greenland White-fronted Goose; SNH, 2016).	**No.** As the SPA is hydrologically upstream from the proposed Plan and due to a terrestrial separation distance of 5.29km, adverse effects resulting from spillages and contamination are not likely.	**No.** As the SPA is hydrologically upstream from the proposed Plan and due to a terrestrial separation distance of 5.29km, adverse effects resulting from the spread of IAS are not likely.

European site [Code] (CO)	Qualifying Interests [code]/Special Conservation Interests [code]	Conservation Objective Attribute[14]	Potentially Adverse Effects[15]		
			Disturbance of QIs and SCIs	Contamination of surface water	Spread of Invasive Alien Species
		Suitable large habitat	**No.** Due to the scale and duration of the plan disturbance will not give rise to significant effects on the availability of suitable large habitat.	**No.** As the SPA is hydrologically upstream from the proposed Plan and due to a terrestrial separation distance of 5.29km, adverse effects resulting from spillages and contamination are not likely.	**No.** As the SPA is hydrologically upstream from the proposed Plan and due to a terrestrial separation distance of 5.29km, adverse effects resulting from the spread of IAS are not likely.
River Shannon Callows SAC [000216]	Molinia meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) [6410]	Habitat area	**No.** The potential QI and SCI disturbance effects from the proposed Plan are only applicable to SCIs and QI species.	**Yes.** The toxicity of the potential spillages in addition to sedimentation caused by the release of silt/earth into adjacent river waterbodies could affect these COs as the QI habitat is seasonally flooded.	**Yes.** The spread of IAS could affect the se COs as the QI habitat is seasonally flooded.
		Habitat distribution			
		Vegetation composition: positive indicator species			
		Vegetation composition: negative indicator species			
		Vegetation composition: non-native species			
		Vegetation composition: moss species			
		Vegetation composition: woody specie sand bracken			
		Vegetation structure: broadleaf herb: grass ratio			
		Vegetatio nstructure: sward height			

European site [Code] (CO)	Qualifying Interests [code]/Special Conservation Interests [code]	Conservation Objective Attribute[14]	Potentially Adverse Effects[15]		
			Disturbance of QIs and SCIs	Contamination of surface water	Spread of Invasive Alien Species
		Vegetation structure: litter			
		Physical structure: bare ground			
		Physical structure: grazing or disturbance			
	Lowland hay meadows (*Alopecurus pratensis, Sanguisorba officinalis*) [6510]	Habitat Area	**No.** The potential QI and SCI disturbance effects from the proposed Plan are only applicable to SCIs and QI species.	**Yes.** The toxicity of the potential spillages in addition to sedimentation caused by the release of silt/earth into adjacent river waterbodies could affect these COs as the QI habitat is seasonally flooded.	**Yes.** The spread of IAS could affect the se COs as the QI habitat is seasonally flooded.
		Habitat Distribution			
		Vegetation composition: positive indicator species			
		Vegetation composition: negative indicator species			
		Vegetation composition: non-native species			
		Vegetation composition: woody species and bracken			
		Vegetation structure: broadleaf herb: grass ratio			
		Vegetation structure: sward height			
		Vegetation structure: litter			
		Physical structure: bare soil			

European site [Code] (CO)	Qualifying Interests [code]/Special Conservation Interests [code]	Conservation Objective Attribute[14]	Potentially Adverse Effects[15]		
			Disturbance of QIs and SCIs	Contamination of surface water	Spread of Invasive Alien Species
		Physical structure: disturbance			
	Alkaline fens [7230]	Habitat area	**No.** The potential QI and SCI disturbance effects from the proposed Plan are only applicable to SCIs and QI species.	**Yes.** As the QI habitat is located adjacent to the River Shannon and is a water dependent habitat, the toxicity of the potential spillages in addition to sedimentation caused by the release of silt/earth into adjacent river waterbodies could affect these COs.	**Yes.** As the QI habitat is located adjacent to the River Shannon and is a water dependent habitat, the spread of IAS could affect these COs..
		Habitat distribution		**Yes.** As the QI habitat is located adjacent to the River Shannon and is a water dependent habitat, The toxicity of the potential spillages in addition to sedimentation caused by the release of silt/earth into adjacent river waterbodies could affect the habitat distribution.	**Yes.** As the QI habitat is located adjacent to the River Shannon and is a water dependent habitat, the spread of IAS could affect the habitat distribution.
		Ecosystem function: soil nutrients		**Yes.** As the QI habitat is located adjacent to the River Shannon and is a water dependent habitat, The toxicity of the potential spillages in addition to sedimentation caused by the release of silt/earth into	**Yes.** As the QI habitat is located adjacent to the River Shannon and is a water dependent habitat, the spread of IAS could affect the ecosystem function: soil nutrients.

European site [Code] (CO)	Qualifying Interests [code]/Special Conservation Interests [code]	Conservation Objective Attribute[14]	Potentially Adverse Effects[15]		
			Disturbance of QIs and SCIs	Contamination of surface water	Spread of Invasive Alien Species
				adjacent river waterbodies could affect the ecosystem function: soil nutrients.	
		Ecosystem function: peat formation		**Yes.** As the QI habitat is located adjacent to the River Shannon and is a water dependent habitat, The toxicity of the potential spillages in addition to sedimentation caused by the release of silt/earth into adjacent river waterbodies could affect the ecosystem function: peat formation.	**Yes.** As the QI habitat is located adjacent to the River Shannon and is a water dependent habitat, the spread of IAS could affect the ecosystem function: peat formation.
		Ecosystem function: hydrology -groundwater levels		**No.** As the proposed Plan does not involve the abstraction of groundwater, contamination of surface water will not give rise to effects on this attribute.	**No.** As the proposed Plan does not involve the abstraction of groundwater, spread of IAS will not give rise to effects on this attribute.
		Ecosystem function: hydrology -surface water flow		**No.** As the proposed Plan does not involve drainage, contamination of surface water will not give rise to effects on this attribute.	**No.** As the proposed Plan does not involve drainage, spread of IAS will not give rise to effects on this attribute.
		Ecosystem function: water quality		**Yes.** As the QI habitat is located adjacent to the River Shannon and is a water dependent	**Yes.** As the QI habitat is located adjacent to the River Shannon and is a

European site [Code] (CO)	Qualifying Interests [code]/Special Conservation Interests [code]	Conservation Objective Attribute[14]	Potentially Adverse Effects[15]		
			Disturbance of QIs and SCIs	Contamination of surface water	Spread of Invasive Alien Species
				habitat, The toxicity of the potential spillages in addition to sedimentation caused by the release of silt/earth into adjacent river waterbodies could affect the ecosystem function: water quality.	water dependent habitat, the spread of IAS could affect the ecosystem function: water quality.
		Vegetation composition: community diversity		**Yes.** As the QI habitat is located adjacent to the River Shannon and is a water dependent habitat, The toxicity of the potential spillages in addition to sedimentation caused by the release of silt/earth into adjacent river waterbodies could affect the vegetation composition: community diversity.	**Yes.** As the QI habitat is located adjacent to the River Shannon and is a water dependent habitat, the spread of IAS could affect the vegetation composition: community diversity.
		Vegetation composition: typical brown mosses		**Yes.** As the QI habitat is located adjacent to the River Shannon and is a water dependent habitat, The toxicity of the potential spillages in addition to sedimentation caused by the release of silt/earth into adjacent river waterbodies could affect the vegetation	**Yes.** As the QI habitat is located adjacent to the River Shannon and is a water dependent habitat, the spread of IAS could affect the vegetation composition: typical brown mosses.

European site [Code] (CO)	Qualifying Interests [code]/Special Conservation Interests [code]	Conservation Objective Attribute[14]	Potentially Adverse Effects[15]		
			Disturbance of QIs and SCIs	Contamination of surface water	Spread of Invasive Alien Species
				composition: typical brown mosses.	
		Vegetation composition: typical vascular plants		**Yes.** As the QI habitat is located adjacent to the River Shannon and is a water dependent habitat, The toxicity of the potential spillages in addition to sedimentation caused by the release of silt/earth into adjacent river waterbodies could affect the vegetation composition: typical vascular plants.	**Yes.** As the QI habitat is located adjacent to the River Shannon and is a water dependent habitat, the spread of IAS could affect the vegetation composition: typical vascular plants.
		Vegetation composition: native negative indicator species		**Yes.** As the QI habitat is located adjacent to the River Shannon and is a water dependent habitat, The toxicity of the potential spillages in addition to sedimentation caused by the release of silt/earth into adjacent river waterbodies could affect the vegetation composition: native negative indicator species.	**Yes.** As the QI habitat is located adjacent to the River Shannon and is a water dependent habitat, the spread of IAS could affect the vegetation composition: native negative indicator species.
		Vegetation composition: non-native species		**Yes.** As the QI habitat is located adjacent to the River Shannon and is a water dependent	**Yes.** As the QI habitat is located adjacent to the River Shannon and is a

European site [Code] (CO)	Qualifying Interests [code]/Special Conservation Interests [code]	Conservation Objective Attribute[14]	Potentially Adverse Effects[15]		
			Disturbance of QIs and SCIs	Contamination of surface water	Spread of Invasive Alien Species
				habitat, The toxicity of the potential spillages in addition to sedimentation caused by the release of silt/earth into adjacent river waterbodies could affect the vegetation composition: non-native species.	water dependent habitat, the spread of IAS could affect the vegetation composition: non-native species.
		Vegetation composition: native trees and shrubs		**Yes.** As the QI habitat is located adjacent to the River Shannon and is a water dependent habitat, The toxicity of the potential spillages in addition to sedimentation caused by the release of silt/earth into adjacent river waterbodies could affect the vegetation composition: native trees and shrubs.	**Yes.** As the QI habitat is located adjacent to the River Shannon and is a water dependent habitat, the spread of IAS could affect the vegetation composition: native trees and shrubs.
		Vegetation composition: algal cover		**Yes.** As the QI habitat is located adjacent to the River Shannon and is a water dependent habitat, The toxicity of the potential spillages in addition to sedimentation caused by the release of silt/earth into adjacent river waterbodies could	**Yes.** As the QI habitat is located adjacent to the River Shannon and is a water dependent habitat, the spread of IAS could affect the vegetation composition: algal cover.

European site [Code] (CO)	Qualifying Interests [code]/Special Conservation Interests [code]	Conservation Objective Attribute[14]	Potentially Adverse Effects[15]		
			Disturbance of QIs and SCIs	Contamination of surface water	Spread of Invasive Alien Species
				affect the vegetation composition: algal cover.	
		Vegetation structure: vegetation height		**No.** As the proposed Plan does not involve livestock grazing, contamination of surface water will not give rise to effects on this attribute.	**No.** As the proposed Plan does not involve the grazing of livestock, spread of IAS will not give rise to effects on this attribute.
		Physical structure: disturbed bare ground		**No.** As the proposed Plan does not involve livestock grazing, contamination of surface water will not give rise to effects on this attribute.	**No.** As the proposed Plan does not involve the grazing of livestock, spread of IAS will not give rise to effects on this attribute.
		Physical structure: tufa formations		**Yes.** As the QI habitat is located adjacent to the River Shannon and is a water dependent habitat, The toxicity of the potential spillages in addition to sedimentation caused by the release of silt/earth into adjacent river waterbodies could affect the physical structure: tufa formations.	**Yes.** As the QI habitat is located adjacent to the River Shannon and is a water dependent habitat, the spread of IAS could affect the physical structure: tufa formations.
		Indicators of local distinctiveness		**Yes.** As the QI habitat is located adjacent to the River Shannon and is a water dependent habitat, The toxicity of the potential spillages in addition to	**Yes.** As the QI habitat is located adjacent to the River Shannon and is a water dependent habitat, the spread of IAS could

European site [Code] (CO)	Qualifying Interests [code]/Special Conservation Interests [code]	Conservation Objective Attribute[14]	Potentially Adverse Effects[15]		
			Disturbance of QIs and SCIs	Contamination of surface water	Spread of Invasive Alien Species
				sedimentation caused by the release of silt/earth into adjacent river waterbodies could affect the indicators of local distinctiveness.	affect the indicators of local distinctiveness.
		Transitional areas between fen andadjacent habitats		**Yes.** As the QI habitat is located adjacent to the River Shannon and is a water dependent habitat, The toxicity of the potential spillages in addition to sedimentation caused by the release of silt/earth into adjacent river waterbodies could affect the transitional areas between fens and adjacent habitats.	**Yes.** As the QI habitat is located adjacent to the River Shannon and is a water dependent habitat, the spread of IAS could affect the transitional areas between fens and adjacent habitats.
	Limestone pavements [8240]*	Habitat area	**No.** The potential QI and SCI disturbance effects from the proposed Plan are only applicable to SCIs and QI species.	**No.** The proposed plan does not involve ground excavations and the contamination of surface water will not give rise to likely significant effects on this attribute.	**No.** The proposed plan does not involve ground excavations and the spread of IAS will not give rise to likely significant effects on this attribute.
		Distribution			
		Vegetation composition: positive indicator species			
		Vegetation composition: bryophyte layer			
		Vegetation composition: negative indicator species			
		Vegetation composition: non-native species			

European site [Code] (CO)	Qualifying Interests [code]/Special Conservation Interests [code]	Conservation Objective Attribute[14]	Potentially Adverse Effects[15]		
			Disturbance of QIs and SCIs	Contamination of surface water	Spread of Invasive Alien Species
		Vegetation composition: scrub			
		Vegetation composition: bracken cover			
		Vegetation structure: woodland canopy			
		Vegetation structure: deadwood			
		Physical structure: disturbance			
		Indicators of local distinctiveness			
	Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) [91E0]*	Habitat Area	**No.** The potential QI and SCI disturbance effects from the proposed Plan are only applicable to SCIs and QI species.	**Yes.** As the QI habitat is dependent on hydrological systems, contamination of surface water may give rise to effects on this attribute.	**Yes.** As the QI habitat is dependent on hydrological systems, the spread of IAS may give rise to effects on this attribute.
		Habitat Distribution		**Yes.** As the QI habitat is dependent on hydrological systems, contamination of surface water may give rise to effects on this attribute.	**Yes.** As the QI habitat is dependent on hydrological systems, the spread of IAS may give rise to effects on this attribute.
		Woodland size		**Yes.** As the QI habitat is dependent on hydrological systems, contamination of	**Yes.** As the QI habitat is dependent on hydrological systems, the spread of IAS

European site [Code] (CO)	Qualifying Interests [code]/Special Conservation Interests [code]	Conservation Objective Attribute[14]	Potentially Adverse Effects[15]		
			Disturbance of QIs and SCIs	Contamination of surface water	Spread of Invasive Alien Species
				surface water may give rise to effects on this attribute.	may give rise to effects on this attribute.
		Woodland structure: cover and height		**Yes.** As the QI habitat is dependent on hydrological systems, contamination of surface water may give rise to effects on this attribute.	**Yes.** As the QI habitat is dependent on hydrological systems, the spread of IAS may give rise to effects on this attribute.
		Woodland structure: community diversity and extent		**Yes.** As the QI habitat is dependent on hydrological systems, contamination of surface water may give rise to effects on this attribute.	**Yes.** As the QI habitat is dependent on hydrological systems, the spread of IAS may give rise to effects on this attribute.
		Woodland structure: natural regeneration		**Yes.** As the QI habitat is dependent on hydrological systems, contamination of surface water may give rise to effects on this attribute.	**Yes.** As the QI habitat is dependent on hydrological systems, the spread of IAS may give rise to effects on this attribute.
		Hydrological regime: flooding depth/height of water table		**No.** The proposed Plan does not involve changes to the hydrological flow of the river system supporting this habitat and contamination of surface water will not give rise to likely significant effects on this attribute.	**No.** The proposed Plan does not involve changes to the hydrological flow of the river system supporting this habitat and the spread of IAS will not give rise to likely significant effects on this attribute.
		Woodland structure: dead wood		**No.** The contamination of surface water will not give rise to	**Yes.** As the QI habitat is dependent on hydrological

European site [Code] (CO)	Qualifying Interests [code]/Special Conservation Interests [code]	Conservation Objective Attribute[14]	Potentially Adverse Effects[15]		
			Disturbance of QIs and SCIs	Contamination of surface water	Spread of Invasive Alien Species
				likely significant effects on this attribute.	systems, the spread of IAS may give rise to effects on this attribute.
		Woodland structure: veteran trees		**No.** The contamination of surface water will not give rise to likely significant effects on this attribute.	**Yes.** As the QI habitat is dependent on hydrological systems, the spread of IAS may give rise to effects on this attribute.
		Woodland structure: indicators of local distinctiveness		**No.** The contamination of surface water will not give rise to likely significant effects on this attribute.	**Yes.** As the QI habitat is dependent on hydrological systems, the spread of IAS may give rise to effects on this attribute.
		Woodland structure: indicators of overgrazing		**No.** The contamination of surface water will not give rise to likely significant effects on this attribute.	**No.** The spread of IAS will not give rise to likely significant effects on this attribute.
		Vegetation composition: native tree cover		**Yes.** As the QI habitat is dependent on hydrological systems, contamination of surface water may give rise to effects on this attribute.	**Yes.** As the QI habitat is dependent on hydrological systems, the spread of IAS may give rise to effects on this attribute.
		Vegetation composition: typical species		**Yes.** As the QI habitat is dependent on hydrological systems, contamination of surface water may give rise to effects on this attribute.	**Yes.** As the QI habitat is dependent on hydrological systems, the spread of IAS may give rise to effects on this attribute.

European site [Code] (CO)	Qualifying Interests [code]/Special Conservation Interests [code]	Conservation Objective Attribute[14]	Potentially Adverse Effects[15]		
			Disturbance of QIs and SCIs	Contamination of surface water	Spread of Invasive Alien Species
		Vegetation composition: negative indicator species		**Yes.** As the QI habitat is dependent on hydrological systems, contamination of surface water may give rise to effects on this attribute.	**Yes.** As the QI habitat is dependent on hydrological systems, the spread of IAS may give rise to effects on this attribute.
		Vegetation composition: problematic native species		**Yes.** As the QI habitat is dependent on hydrological systems, contamination of surface water may give rise to effects on this attribute.	**Yes.** As the QI habitat is dependent on hydrological systems, the spread of IAS may give rise to effects on this attribute.
	Otter (Lutra lutra) [1355]	Distribution	**No.** As the European site is located outside of the foraging range of the QI species, disturbance is not likely to effect these attributes.	**Yes.** Contamination of surface water may give rise to adverse effects on the distribution of Otter via a reduction in water quality and the availability of prey.	**Yes.** The spread of IAS may give rise to adverse effects on the distribution of Otter via a reduction in suitable river habitat and the availability of prey.
		Extent of terrestrial habitat		**No.** The proposed Plan does not involve alterations to river bank habitat and it is not likely that contamination to surface water will give rise to adverse effects on this attribute.	**Yes.** The spread of IAS may give rise to adverse effects on the extent of terrestrial habitat for Otters.
		Extent of freshwater (river) habitat		**Yes.** Contamination of surface water may give rise to adverse effects on the extent of freshwater (river) habitat via a reduction in water quality.	**Yes.** The spread of IAS may give rise to adverse effects on the extent of freshwater (river) habitat.

European site [Code] (CO)	Qualifying Interests [code]/Special Conservation Interests [code]	Conservation Objective Attribute[14]	Potentially Adverse Effects[15]		
			Disturbance of QIs and SCIs	Contamination of surface water	Spread of Invasive Alien Species
		Couching sites and holts		**No.** The proposed Plan does not involve alterations to river bank habitat and it is not likely that contamination to surface water will give rise to adverse effects on this attribute.	**Yes.** The spread of IAS may give rise to adverse effects on the availability of habitat suitable for couching sites and holts.
		Fish biomass available		**Yes.** Contamination of surface water may give rise to adverse effects on the availability of fish biomass habitat via a reduction in water quality.	**Yes.** The spread of IAS may give rise to adverse effects on the availability of fish biomass.
		Barriers to connectivity		**No.** It is not likely that contamination to surface water will give rise to adverse effects on this attribute.	**No.** It is not likely that the spread of IAS will give rise to adverse effects on this attribute.
Middle Shannon Callows SPA [004096]	Whooper Swan (*Cygnus cygnus*) [A038]	Population trend	**No.** Due to a terrestrial separation distance of ~18.8km between the European Site and the proposed Plan, disturbance is not likely to give rise to adverse effects on this attribute.	**Yes.** Contamination of surface water may give rise to adverse effects on population dynamics of Whooper Swan via a reduction in water quality.	**Yes.** With Rhododendron recorded on the proposed rehabilitation area, it is possible that water runoff will cause the release of IAS fragments into the river water body giving rise to adverse effects on the population dynamics of Whooper Swan.
		Distribution		**Yes.** Contamination of surface water may give rise to adverse	**Yes.** With Rhododendron recorded on the proposed

European site [Code] (CO)	Qualifying Interests [code]/Special Conservation Interests [code]	Conservation Objective Attribute[14]	Potentially Adverse Effects[15]		
			Disturbance of QIs and SCIs	Contamination of surface water	Spread of Invasive Alien Species
				effects on Whooper Swan via a reduction in water quality.	rehabilitation area, it is possible that water runoff will cause the release of IAS fragments into the river water body giving rise to adverse effects on the natural range of Whooper Swan.
	Wigeon (*Anas penelope*) [A050]	Population trend		**Yes.** Contamination of surface water may give rise to likely significant effects on this attribute via a reduction in water quality.	**Yes.** With Rhododendron recorded on the proposed rehabilitation area, it is possible that water runoff will cause the release of IAS fragments into the river water body giving rise to adverse effects on the population dynamics of Wigeon.
		Distribution		**Yes.** Contamination of surface water may give rise to likely significant effects on this attribute via a reduction in water quality.	**Yes.** With Rhododendron recorded on the proposed rehabilitation area, it is possible that water runoff will cause the release of IAS fragments into the river water body giving rise to adverse effects on the natural range of Wigeon.

European site [Code] (CO)	Qualifying Interests [code]/Special Conservation Interests [code]	Conservation Objective Attribute[14]	Potentially Adverse Effects[15]		
			Disturbance of QIs and SCIs	Contamination of surface water	Spread of Invasive Alien Species
	Corncrake (*Crex crex*) [A122]	Population dynamics		**No.** Contamination of surface water is unlikely to cause adverse effects on this attribute via a reduction in water quality as Corncrakes are not wetland species (they only occur on the SPA when it is dry) and any contamination from floodwater is likely to be attenuated in the soil during flood events..	**No.** The spread of IAS are unlikely to cause adverse effects on Corncrake population dynamics due to the extent of alternative, suitable habitats for Corncrakes to use.
		Natural Range		**No.** Contamination of surface water is unlikely to cause adverse effects on this attribute via a reduction in water quality as Corncrakes are not wetland species (they only occur on the SPA when it is dry) and any contamination from floodwater is likely to be attenuated in the soil during flood events..	**No.** The spread of IAS are unlikely to cause adverse effects on Corncrake natural range as Corncrakes are a migratory species and will be able to use alternative habitats in the locality.
		Suitably Large Habitat		**No.** Contamination of surface water is unlikely to cause adverse effects on this attribute via a reduction in water quality as Corncrakes are not wetland species (they only occur on the SPA when it is dry) and any contamination from floodwater	**No.** The spread of IAS are unlikely to cause adverse effects on Corncrakes as they are not reliant on large habitat areas, often using small habitat mosaics..

European site [Code] (CO)	Qualifying Interests [code]/Special Conservation Interests [code]	Conservation Objective Attribute[14]	Potentially Adverse Effects[15]		
			Disturbance of QIs and SCIs	Contamination of surface water	Spread of Invasive Alien Species
				is likely to be attenuated in the soil during flood events..	
	Golden Plover (*Pluvialis apricaria*) [A140]	Population trend		**Yes.** Contamination of surface water may give rise to likely significant effects on this attribute via a reduction in water quality.	**Yes.** With Rhododendron recorded on the proposed rehabilitation area, it is possible that water runoff will cause the release of IAS fragments into the river water body giving rise to adverse effects on the population dynamics of Golden Plover.
		Distribution		**Yes.** Contamination of surface water may give rise to likely significant effects on this attribute via a reduction in water quality.	**Yes.** With Rhododendron recorded on the proposed rehabilitation area, it is possible that water runoff will cause the release of IAS fragments into the river water body giving rise to adverse effects on the natural range of Golden Plover.
	Lapwing (*Vanellus vanellus*) [A142]	Population trend		**Yes.** Contamination of surface water may give rise to likely significant effects on this attribute via a reduction in water quality.	**Yes.** With Rhododendron recorded on the proposed rehabilitation area, it is possible that water runoff will cause the release of IAS

European site [Code] (CO)	Qualifying Interests [code]/Special Conservation Interests [code]	Conservation Objective Attribute[14]	Potentially Adverse Effects[15]		
			Disturbance of QIs and SCIs	Contamination of surface water	Spread of Invasive Alien Species
					fragments into the river water body giving rise to adverse effects on the population dynamics of Lapwing.
		Distribution		**Yes.** Contamination of surface water may give rise to likely significant effects on this attribute via a reduction in water quality.	**Yes.** With Rhododendron recorded on the proposed rehabilitation area, it is possible that water runoff will cause the release of IAS fragments into the river water body giving rise to adverse effects on the natural range of Lapwing.
	Black-tailed Godwit (*Limosa limosa*) [A156]	Population trend		**Yes.** Contamination of surface water may give rise to likely significant effects on this attribute via a reduction in water quality.	**Yes.** With Rhododendron recorded on the proposed rehabilitation area, it is possible that water runoff will cause the release of IAS fragments into the river water body giving rise to adverse effects on the population dynamics of Black-tailed Godwit.
		Distribution		**Yes.** Contamination of surface water may give rise to likely significant effects on this	**Yes.** With Rhododendron recorded on the proposed rehabilitation area, it is

European site [Code] (CO)	Qualifying Interests [code]/Special Conservation Interests [code]	Conservation Objective Attribute[14]	Potentially Adverse Effects[15]		
			Disturbance of QIs and SCIs	Contamination of surface water	Spread of Invasive Alien Species
				attribute via a reduction in water quality.	possible that water runoff will cause the release of IAS fragments into the river water body giving rise to adverse effects on the natural range of Black-tailed Godwit.
	Black-headed Gull (*Chroicocephalus ridibundus*) [A179]	Population dynamics		**Yes.** Contamination of surface water may give rise to likely significant effects on this attribute via a reduction in water quality.	**Yes.** With Rhododendron recorded on the proposed rehabilitation area, it is possible that water runoff will cause the release of IAS fragments into the river water body giving rise to adverse effects on the population dynamics of Black-headed Gull.
		Natural Range		**Yes.** Contamination of surface water may give rise to likely significant effects on this attribute via a reduction in water quality.	**Yes.** With Rhododendron recorded on the proposed rehabilitation area, it is possible that water runoff will cause the release of IAS fragments into the river water body giving rise to adverse effects on the natural range of Black-headed Gull.

European site [Code] (CO)	Qualifying Interests [code]/Special Conservation Interests [code]	Conservation Objective Attribute[14]	Potentially Adverse Effects[15]		
			Disturbance of QIs and SCIs	Contamination of surface water	Spread of Invasive Alien Species
		Suitably Large Habitat		**Yes.** Contamination of surface water may give rise to likely significant effects on this attribute via a reduction in water quality.	**Yes.** With Rhododendron recorded on the proposed rehabilitation area, it is possible that water runoff will cause the release of IAS fragments into the river water body giving rise to adverse effects on the availability of suitable large habitat for Black-headed Gull.
	Wetland and Waterbirds [A999]	Natural Range	**No.** The potential QI and SCI disturbance effects from the proposed Plan are only applicable to SCIs and QI species.	**Yes.** Contamination of surface water may give rise to likely significant effects on this attribute via a reduction in water quality.	**Yes.** With Rhododendron recorded on the proposed rehabilitation area, it is possible that water runoff will cause the release of IAS fragments into the river water body giving rise to adverse effects on the population dynamics of Waterbirds and their wetland habitats.
		Existence of structure and functions necessary for maintenance		**Yes.** Contamination of surface water may give rise to likely significant effects on this attribute via a reduction in water quality.	**Yes.** With Rhododendron recorded on the proposed rehabilitation area, it is possible that water runoff will cause the release of IAS fragments into the river

European site [Code] (CO)	Qualifying Interests [code]/Special Conservation Interests [code]	Conservation Objective Attribute[14]	Potentially Adverse Effects[15]		
			Disturbance of QIs and SCIs	Contamination of surface water	Spread of Invasive Alien Species
					water body giving rise to adverse effects on the natural range of Waterbirds and their wetland habitats.
		Favourable conservation status of typical species present		**Yes.** Contamination of surface water may give rise to likely significant effects on this attribute via a reduction in water quality.	**Yes.** With Rhododendron recorded on the proposed rehabilitation area, it is possible that water runoff will cause the release of IAS fragments into the river water body giving rise to adverse effects on the availability of suitable large habitat for Waterbirds and their wetland habitats.
Lough Derg (Shannon) SPA [004058]	Cormorant (*Phalacrocorax carbo*) [A017]	Population dynamics	**No.** Due to a terrestrial separation distance of 39.1km between the proposed Plan and the SPA, it is not likely that disturbance will give rise to significant effects on this attribute.	**Yes.** Contamination of surface water may give rise to likely significant effects on this attribute via a reduction in water quality.	**No.** The spread of IAS are unlikely to cause adverse effects on Cormorant population dynamics due to the extent of alternative, suitable habitats for Cormorant to use.
		Natural range		**Yes.** Contamination of surface water may give rise to likely significant effects on this attribute via a reduction in water quality.	**No.** The spread of IAS are unlikely to cause adverse effects on Cormorant natural range as they will be

European site [Code] (CO)	Qualifying Interests [code]/Special Conservation Interests [code]	Conservation Objective Attribute[14]	Potentially Adverse Effects[15]		
			Disturbance of QIs and SCIs	Contamination of surface water	Spread of Invasive Alien Species
					able to use alternative habitats in the locality.
		Suitably large habitat		**Yes.** Contamination of surface water may give rise to likely significant effects on this attribute via a reduction in water quality.	**No.** The spread of IAS are unlikely to cause adverse effects on Cormorants as they tolerate wooded (for nesting) and deep water (for foraging) habitats and IAS are unlikely to impact either of these habitats..
	Tufted Duck (*Aythya fuligula*) [A061]	Population dynamics		**Yes.** Contamination of surface water may give rise to likely significant effects on this attribute via a reduction in water quality.	**Yes.** With Rhododendron recorded on the proposed rehabilitation area, it is possible that water runoff will cause the release of IAS fragments into the river water body giving rise to adverse effects on the population dynamics of Tufted Duck.
		Natural range		**Yes.** Contamination of surface water may give rise to likely significant effects on this attribute via a reduction in water quality.	**Yes.** With Rhododendron recorded on the proposed rehabilitation area, it is possible that water runoff will cause the release of IAS fragments into the river water body giving rise to

European site [Code] (CO)	Qualifying Interests [code]/Special Conservation Interests [code]	Conservation Objective Attribute[14]	Potentially Adverse Effects[15]		
			Disturbance of QIs and SCIs	Contamination of surface water	Spread of Invasive Alien Species
					adverse effects on the natural range of Tufted Duck.
		Suitably large habitat		**Yes.** Contamination of surface water may give rise to likely significant effects on this attribute via a reduction in water quality.	**Yes.** With Rhododendron recorded on the proposed rehabilitation area, it is possible that water runoff will cause the release of IAS fragments into the river water body giving rise to adverse effects on the availability of suitable large habitat for Tufted Duck.
	Goldeneye (*Bucephala clangula*) [A067]	Population dynamics		**Yes.** Contamination of surface water may give rise to likely significant effects on this attribute via a reduction in water quality.	**Yes.** With Rhododendron recorded on the proposed rehabilitation area, it is possible that water runoff will cause the release of IAS fragments into the river water body giving rise to adverse effects on the population dynamics of Goldeneye.
		Natural range		**Yes.** Contamination of surface water may give rise to likely significant effects on this	**Yes.** With Rhododendron recorded on the proposed rehabilitation area, it is possible that water runoff

European site [Code] (CO)	Qualifying Interests [code]/Special Conservation Interests [code]	Conservation Objective Attribute[14]	Potentially Adverse Effects[15]		
			Disturbance of QIs and SCIs	Contamination of surface water	Spread of Invasive Alien Species
				attribute via a reduction in water quality.	will cause the release of IAS fragments into the river water body giving rise to adverse effects on the natural range of Goldeneye.
		Suitably large habitat		**Yes.** Contamination of surface water may give rise to likely significant effects on this attribute via a reduction in water quality.	**Yes.** With Rhododendron recorded on the proposed rehabilitation area, it is possible that water runoff will cause the release of IAS fragments into the river water body giving rise to adverse effects on the availability of suitable large habitat for Goldeneye.
	Common Tern (*Sterna hirundo*) [A193]	Population dynamics		**Yes.** Contamination of surface water may give rise to likely significant effects on this attribute via a reduction in water quality.	**Yes.** With Rhododendron recorded on the proposed rehabilitation area, it is possible that water runoff will cause the release of IAS fragments into the river water body giving rise to adverse effects on the population dynamics of Common Tern.
		Natural range		**Yes.** Contamination of surface water may give rise to likely	**Yes.** With Rhododendron recorded on the proposed

European site [Code] (CO)	Qualifying Interests [code]/Special Conservation Interests [code]	Conservation Objective Attribute[14]	Potentially Adverse Effects[15]		
			Disturbance of QIs and SCIs	Contamination of surface water	Spread of Invasive Alien Species
				significant effects on this attribute via a reduction in water quality.	rehabilitation area, it is possible that water runoff will cause the release of IAS fragments into the river water body giving rise to adverse effects on the natural range of Common Tern
		Suitably large habitat		**Yes.** Contamination of surface water may give rise to likely significant effects on this attribute via a reduction in water quality.	**Yes.** With Rhododendron recorded on the proposed rehabilitation area, it is possible that water runoff will cause the release of IAS fragments into the river water body giving rise to adverse effects on the availability of suitable large habitat for Common Tern.
	Wetland and Waterbirds [A999]	Natural Range	**No.** The potential QI and SCI disturbance effects from the proposed Plan are only applicable to SCIs and QI species.	**Yes.** Contamination of surface water may give rise to likely significant effects on this attribute via a reduction in water quality.	**Yes.** With Rhododendron recorded on the proposed rehabilitation area, it is possible that water runoff will cause the release of IAS fragments into the river water body giving rise to adverse effects on the

European site [Code] (CO)	Qualifying Interests [code]/Special Conservation Interests [code]	Conservation Objective Attribute[14]	Potentially Adverse Effects[15]		
			Disturbance of QIs and SCIs	Contamination of surface water	Spread of Invasive Alien Species
					natural range of Waterbirds and their wetland habitats.
		Existence of structure and functions necessary for maintenance		**Yes.** Contamination of surface water may give rise to likely significant effects on this attribute via a reduction in water quality.	**Yes.** With Rhododendron recorded on the proposed rehabilitation area, it is possible that water runoff will cause the release of IAS fragments into the river water body giving rise to adverse effects on the structure and functions necessary for maintenance of Waterbirds and their wetland habitats.
		Favourable conservation status of typical species present		**Yes.** Contamination of surface water may give rise to likely significant effects on this attribute via a reduction in water quality.	**Yes.** With Rhododendron recorded on the proposed rehabilitation area, it is possible that water runoff will cause the release of IAS fragments into the river water body giving rise to adverse effects on the conservation status of Waterbirds and their wetland habitats.
Lough	*Juniperus communis* formations on heaths or	Habitat area habitat distribution	**No.** The potential QI and SCI disturbance effects	**No.** It is not likely that contamination to surface water	**Yes.** The spread of IAS may give rise to likely significant

European site [Code] (CO)	Qualifying Interests [code]/Special Conservation Interests [code]	Conservation Objective Attribute[14]	Potentially Adverse Effects[15]		
			Disturbance of QIs and SCIs	Contamination of surface water	Spread of Invasive Alien Species
	calcareous grasslands [5130]	Juniper formation size	from the proposed Plan are only applicable to SCIs and QI species.	will give rise to effects on these attributes.	effects on this attribute via a reduction in the presence of these attributes.
		Vegetation structure: female fruiting plants			
		Vegetation structure: seedling recruitment			
		Vegetation structure: live Juniper			
		Vegetation structure: negative indicator species			
		Physical structure: germination niches			
		Formation structure: browning/die-back of plants			
		Formation structure: evidence of browsing and bark stripping			
		Indicators of local distinctiveness			
	Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae* [7210]	Habitat Area	No. The potential QI and SCI disturbance effects from the proposed Plan are only applicable to SCIs and QI species.	**Yes.** Contamination of surface water may give rise to likely significant effects on this attribute via a reduction in water quality.	**Yes.** The spread of IAS may give rise to likely significant effects on this attribute via a reduction in the presence of typical flora species as a result of competition.
		Habitat distribution		**Yes.** Contamination of surface water may give rise to likely significant effects on this attribute via a reduction in water quality.	**Yes.** The spread of IAS may give rise to likely significant effects on this attribute via a reduction in the presence of typical flora species as a result of competition.

European site [Code] (CO)	Qualifying Interests [code]/Special Conservation Interests [code]	Conservation Objective Attribute[14]	Potentially Adverse Effects[15]		
			Disturbance of QIs and SCIs	Contamination of surface water	Spread of Invasive Alien Species
		Ecosystem function: peat formation		**No.** The proposed Plan does not involve alterations to the water level and surface water contamination is not likely to give rise to significant effects on this attribute.	**Yes.** The spread of IAS may give rise to likely significant effects on this attribute via a reduction in the presence of typical flora species as a result of competition.
		Ecosystem function: hydrology-groundwater levels		**No.** The proposed Plan does not involve ground excavations and surface water contamination is not likely to give rise to significant effects on this attribute.	**No.** It is not anticipated that the spread of IAS will have significant effects on this attribute.
		Ecosystem function: hydrology-surface water flow		**No.** The proposed Plan does not involve alterations to the water level and surface water contamination is not likely to give rise to significant effects on this attribute.	**No.** It is not anticipated that the spread of IAS will have significant effects on this attribute.
		Ecosystem function: water quality		**Yes.** Contamination of surface water may give rise to likely significant effects on this attribute.	**No.** It is not anticipated that the spread of IAS will have significant effects on this attribute.
		Vegetation composition: typical species		**Yes.** Contamination of surface water may give rise to likely significant effects on this attribute.	**Yes.** The spread of IAS may give rise to likely significant effects on this attribute via a reduction in the presence

European site [Code] (CO)	Qualifying Interests [code]/Special Conservation Interests [code]	Conservation Objective Attribute[14]	Potentially Adverse Effects[15]		
			Disturbance of QIs and SCIs	Contamination of surface water	Spread of Invasive Alien Species
					of typical flora species as a result of competition.
		Vegetation composition: native negative indicator species		**Yes.** Contamination of surface water may give rise to likely significant effects on this attribute.	**Yes.** The spread of IAS may give rise to likely significant effects on this attribute via a reduction in the presence of typical flora species as a result of competition.
		Vegetation composition: non-native species		**Yes.** Contamination of surface water may give rise to likely significant effects on this attribute.	**Yes.** The spread of IAS may give rise to likely significant effects on this attribute via a reduction in the presence of typical flora species as a result of competition.
		Vegetation composition: trees and shrubs		**Yes.** Contamination of surface water may give rise to likely significant effects on this attribute.	**Yes.** The spread of IAS may give rise to likely significant effects on this attribute via a reduction in the presence of typical flora species as a result of competition.
		Physical structure: disturbed bare ground		**No.** The proposed Plan does not involve the grazing of livestock and surface water contamination is not likely to give rise to significant effects on this attribute.	**Yes.** The spread of IAS may give rise to likely significant effects on this attribute via a reduction in the presence of typical flora species as a result of competition.

European site [Code] (CO)	Qualifying Interests [code]/Special Conservation Interests [code]	Conservation Objective Attribute[14]	Potentially Adverse Effects[15]		
			Disturbance of QIs and SCIs	Contamination of surface water	Spread of Invasive Alien Species
		Indicators of local distinctiveness		**Yes.** Contamination of surface water may give rise to likely significant effects on this attribute.	**Yes.** The spread of IAS may give rise to likely significant effects on this attribute via a reduction in the presence of typical flora species as a result of competition.
	Alkaline fens [7230]	Habitat area	No. The potential QI and SCI disturbance effects from the proposed Plan are only applicable to SCIs and QI species.	**Yes.** Contamination of surface water may give rise to likely significant effects on this attribute.	**Yes.** The spread of IAS may give rise to likely significant effects on this attribute.
		Habitat distribution		**Yes.** Contamination of surface water may give rise to likely significant effects on this attribute.	**Yes.** The spread of IAS may give rise to likely significant effects on this attribute.
		Ecosystem function: soil nutrients		**Yes.** Contamination of surface water may give rise to likely significant effects on this attribute.	**Yes.** The spread of IAS may give rise to likely significant effects on this attribute.
		Ecosystem function: peat formation		**No.** The proposed Plan does not involve alterations to the water level and surface water contamination is not likely to give rise to significant effects on this attribute.	**Yes.** The spread of IAS may give rise to likely significant effects on this attribute.
		Ecosystem function: hydrology – ground water levels		**No.** The proposed Plan does not involve alterations to the water level and surface water	**No.** It is not anticipated that the spread of IAS will have

European site [Code] (CO)	Qualifying Interests [code]/Special Conservation Interests [code]	Conservation Objective Attribute[14]	Potentially Adverse Effects[15]		
			Disturbance of QIs and SCIs	Contamination of surface water	Spread of Invasive Alien Species
				contamination is not likely to give rise to significant effects on this attribute.	significant effects on this attribute.
		Ecosystem function: hydrology – surface water flow		**No.** The proposed Plan does not involve alterations to the water level and surface water contamination is not likely to give rise to significant effects on this attribute.	**No.** It is not anticipated that the spread of IAS will have significant effects on this attribute.
		Ecosystem function: water quality		**Yes.** Contamination of surface water may give rise to likely significant effects on this attribute.	**No.** It is not anticipated that the spread of IAS will have significant effects on this attribute.
		Community diversity		**Yes.** Contamination of surface water may give rise to likely significant effects on this attribute.	**Yes.** The spread of IAS may give rise to likely significant effects on this attribute.
		Vegetation composition: brown mosses		**Yes.** Contamination of surface water may give rise to likely significant effects on this attribute.	**Yes.** The spread of IAS may give rise to likely significant effects on this attribute.
		Vegetation composition: typical vascular plants		**Yes.** Contamination of surface water may give rise to likely significant effects on this attribute.	**Yes.** The spread of IAS may give rise to likely significant effects on this attribute.

European site [Code] (CO)	Qualifying Interests [code]/Special Conservation Interests [code]	Conservation Objective Attribute[14]	Potentially Adverse Effects[15]		
			Disturbance of QIs and SCIs	Contamination of surface water	Spread of Invasive Alien Species
		Vegetation composition: native negative indicator species		**Yes.** Contamination of surface water may give rise to likely significant effects on this attribute.	**Yes.** The spread of IAS may give rise to likely significant effects on this attribute.
		Vegetation composition: non-native species		**Yes.** Contamination of surface water may give rise to likely significant effects on this attribute.	**Yes.** The spread of IAS may give rise to likely significant effects on this attribute.
		Vegetation composition: native trees and shrubs		**Yes.** Contamination of surface water may give rise to likely significant effects on this attribute.	**Yes.** The spread of IAS may give rise to likely significant effects on this attribute.
		Vegetation composition: soft rush and common reed cover		**Yes.** Contamination of surface water may give rise to likely significant effects on this attribute.	**Yes.** The spread of IAS may give rise to likely significant effects on this attribute.
		Vegetation composition: litter		**Yes.** Contamination of surface water may give rise to likely significant effects on this attribute.	**Yes.** The spread of IAS may give rise to likely significant effects on this attribute.
		Physical structure: disturbed bare ground		**No.** The proposed Plan does not involve the grazing of livestock and surface water contamination is not likely to give rise to significant effects on this attribute.	**Yes.** The spread of IAS may give rise to likely significant effects on this attribute.

European site [Code] (CO)	Qualifying Interests [code]/Special Conservation Interests [code]	Conservation Objective Attribute[14]	Potentially Adverse Effects[15]		
			Disturbance of QIs and SCIs	Contamination of surface water	Spread of Invasive Alien Species
		Physical structure: tufa formations		**Yes.** Contamination of surface water may give rise to likely significant effects on this attribute.	**Yes.** The spread of IAS may give rise to likely significant effects on this attribute.
		Indicators of local distinctiveness		**Yes.** Contamination of surface water may give rise to likely significant effects on this attribute.	**Yes.** The spread of IAS may give rise to likely significant effects on this attribute.
	Limestone pavements [8240]*	Habitat area Habitat distribution Vegetation composition: positive indicator species Vegetation composition: bryophyte layer Vegetation composition: negative indicator species Vegetation composition: non-native species Vegetation composition: scrub Vegetation composition: bracken cover Vegetation composition: woodland canopy Vegetation composition: deadwood	**No.** The potential QI and SCI disturbance effects from the proposed Plan are only applicable to SCIs and QI species.	**No.** It is not anticipated that the contamination of surface water will have significant effects on these attributes.	**Yes.** The spread of IAS may give rise to likely significant effects on these attributes.

European site [Code] (CO)	Qualifying Interests [code]/Special Conservation Interests [code]	Conservation Objective Attribute[14]	Potentially Adverse Effects[15]		
			Disturbance of QIs and SCIs	Contamination of surface water	Spread of Invasive Alien Species
		Physical structure: disturbance Indicators of local distinctiveness			
	Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) [91E0]*	Habitat Area	**No.** The potential QI and SCI disturbance effects from the proposed Plan are only applicable to SCIs and QI species.	**Yes.** Contamination of surface water may give rise to likely significant effects on this attribute.	**Yes.** The spread of IAS may give rise to likely significant effects on this attribute.
		Habitat distribution		**Yes.** Contamination of surface water may give rise to likely significant effects on this attribute.	**Yes.** The spread of IAS may give rise to likely significant effects on this attribute.
		Woodland size		**No.** It is not anticipated that the contamination of surface water will have significant effects on this attribute.	**Yes.** The spread of IAS may give rise to likely significant effects on this attribute.
		Woodland structure: cover and height		**No.** It is not anticipated that the contamination of surface water will have significant effects on this attribute.	**Yes.** The spread of IAS may give rise to likely significant effects on this attribute.
		Woodland structure: community diversity and extent		**No.** It is not anticipated that the contamination of surface water will have significant effects on this attribute.	**Yes.** The spread of IAS may give rise to likely significant effects on this attribute.
		Woodland structure: natural regeneration		**No.** It is not anticipated that the contamination of surface water will have significant effects on this attribute.	**Yes.** The spread of IAS may give rise to likely significant effects on this attribute.

European site [Code] (CO)	Qualifying Interests [code]/Special Conservation Interests [code]	Conservation Objective Attribute[14]	Potentially Adverse Effects[15]		
			Disturbance of QIs and SCIs	Contamination of surface water	Spread of Invasive Alien Species
		Hydrological regime: flooding depth/height of water table		**No.** It is not anticipated that the contamination of surface water will have significant effects on this attribute.	**Yes.** The spread of IAS may give rise to likely significant effects on this attribute.
		Woodland structure: deadwood		**No.** It is not anticipated that the contamination of surface water will have significant effects on this attribute.	**Yes.** The spread of IAS may give rise to likely significant effects on this attribute.
		Woodland structure: veteran trees		**No.** It is not anticipated that the contamination of surface water will have significant effects on this attribute.	**Yes.** The spread of IAS may give rise to likely significant effects on this attribute.
		Woodland structure: indicators of local distinctiveness		**No.** It is not anticipated that the contamination of surface water will have significant effects on this attribute.	**Yes.** The spread of IAS may give rise to likely significant effects on this attribute.
		Woodland structure: indicators of overgrazing		**No.** It is not anticipated that the contamination of surface water will have significant effects on this attribute.	**No.** It is not anticipated that the spread of IAS will have significant effects on this attribute.
		Vegetation composition: native tree cover		**Yes.** Contamination of surface water may give rise to likely significant effects on this attribute.	**Yes.** The spread of IAS may give rise to likely significant effects on this attribute.
		Vegetation composition: typical species		**Yes.** Contamination of surface water may give rise to likely	**Yes.** The spread of IAS may give rise to likely significant effects on this attribute.

European site [Code] (CO)	Qualifying Interests [code]/Special Conservation Interests [code]	Conservation Objective Attribute[14]	Potentially Adverse Effects[15]		
			Disturbance of QIs and SCIs	Contamination of surface water	Spread of Invasive Alien Species
				significant effects on this attribute.	
		Vegetation composition: negative indicator species		**Yes.** Contamination of surface water may give rise to likely significant effects on this attribute.	**Yes.** The spread of IAS may give rise to likely significant effects on this attribute.
		Vegetation composition: problematic native species		**Yes.** Contamination of surface water may give rise to likely significant effects on this attribute.	**Yes.** The spread of IAS may give rise to likely significant effects on this attribute.
	Taxus baccata woods of the British Isles [91J0]	Habitat area	**No.** The potential QI and SCI disturbance effects from the proposed Plan are only applicable to SCIs and QI species.	**No.** It is not anticipated that the contamination of surface water will have significant effects on this attribute.	**Yes.** The spread of IAS may give rise to likely significant effects on this attribute.
		Habitat distribution		**No.** It is not anticipated that the contamination of surface water will have significant effects on this attribute.	**Yes.** The spread of IAS may give rise to likely significant effects on this attribute.
		Woodland size		**No.** It is not anticipated that the contamination of surface water will have significant effects on this attribute.	**Yes.** The spread of IAS may give rise to likely significant effects on this attribute.
		Woodland structure: cover and height		**No.** It is not anticipated that the contamination of surface water will have significant effects on this attribute.	**Yes.** The spread of IAS may give rise to likely significant effects on this attribute.

European site [Code] (CO)	Qualifying Interests [code]/Special Conservation Interests [code]	Conservation Objective Attribute[14]	Potentially Adverse Effects[15]		
			Disturbance of QIs and SCIs	Contamination of surface water	Spread of Invasive Alien Species
		Woodland structure: community diversity and extent		**No.** It is not anticipated that the contamination of surface water will have significant effects on this attribute.	**Yes.** The spread of IAS may give rise to likely significant effects on this attribute.
		Woodland structure: natural regeneration		**No.** It is not anticipated that the contamination of surface water will have significant effects on this attribute.	**Yes.** The spread of IAS may give rise to likely significant effects on this attribute.
		Woodland structure: dead wood		**No.** It is not anticipated that the contamination of surface water will have significant effects on this attribute.	**Yes.** The spread of IAS may give rise to likely significant effects on this attribute.
		Woodland structure: veteran trees		**No.** It is not anticipated that the contamination of surface water will have significant effects on this attribute.	**Yes.** The spread of IAS may give rise to likely significant effects on this attribute.
		Woodland structure: indicators of local distinctiveness		**No.** It is not anticipated that the contamination of surface water will have significant effects on this attribute.	**Yes.** The spread of IAS may give rise to likely significant effects on this attribute.
		Woodland structure: indicators of grazing		**No.** It is not anticipated that the contamination of surface water will have significant effects on this attribute.	**No.** It is not anticipated that the spread of IAS will have significant effects on this attribute.
		Vegetation composition: native tree cover		**No.** It is not anticipated that the contamination of surface water	**Yes.** The spread of IAS may give rise to likely significant effects on this attribute.

European site [Code] (CO)	Qualifying Interests [code]/Special Conservation Interests [code]	Conservation Objective Attribute[14]	Potentially Adverse Effects[15]		
			Disturbance of QIs and SCIs	Contamination of surface water	Spread of Invasive Alien Species
				will have significant effects on this attribute.	
		Vegetation composition: negative indicator species		**No.** It is not anticipated that the contamination of surface water will have significant effects on this attribute.	**Yes.** The spread of IAS may give rise to likely significant effects on this attribute.

7. MITIGATION

The proposed mitigation measures are aimed at preventing the potential for the proposed Plan to cause adverse effects to the European sites and their COs, and avoiding the sources identified in **Section 6.1**.

All rehabilitation actions will fully comply with Best Practice/Industry Standards such as from Inland Fisheries Ireland (IFI), the Construction Industry Research and Information Association (CIRIA) and UK Pollution Prevention Guidelines, in respect of the protection of Water Quality, the reduction of emissions and the prevention of noise. As such, all works will comply with CIRIA standards as follows:

- CIRIA Report C502 Environmental Good Practice on Site;
- CIRIA Report C532 Control of Water Pollution from Construction Sites;
- CIRIA Report C648 Control of Pollution from Rehabilitation Plan; Technical Guidance;
- CIRIA Handbook C650 Environmental good practice on site;
- CIRIA Handbook C651 Environmental good practice on site checklist;
- CIRIA Report C609 – SuDS – hydraulic, structural & water quality advice; and
- CIRIA Report C697 – The SuDS Manual.

Pollution Prevention Guidance Notes (PPGs):

- PPG01 General guide to the prevention of water pollution;
- PPG05 Works in near or liable to affect watercourses;
- PPG07 Refuelling Facilities;
- PPG11 Preventing pollution at industrial sites;
- PPG18 Control of spillages and fire-fighting run-off;
- PPG20 Dewatering underground ducts and chambers;
- PPG21 Pollution Incident Response Planning;
- PPG23 Maintenance of Structures over Water; and
- PPG26 Pollution Prevention Storage and Handling of Drums & Intermediate Bulk Containers.

A suite of Standard Operating Procedures (SOPs) has also been prepared by Bord na Móna that are specific to the proposed rehabilitation being undertaken as part of the Peatland Climate Action Scheme (PCAS) that are relevant to the proposed rehabilitation being undertaken at Derryfadda:

- Dust Mitigation Procedure;
- Emergency Response Clean-up Procedure;
- Peat Loading Procedure;
- Stockpile Decommissioning Procedure;
- Protection of Otter Procedure; and
- Vegetation Clearance Procedure;

Considering the distance between the proposed rehabilitation and the nearest European sites, an Environmental Management Plan (see **Appendix C**), separate and in addition to the rehabilitation plan, will be updated prior to the commencement of construction activities. This document will address all the potential environmental risks and the proposed environmental construction strategies that are to be carried out before and during the construction phase of the proposed development. It will include best practice measures in relation to preventing environmental impacts and management.

This will be a live document that will be updated according to changing circumstances on the project to reflect activities on site. This rehabilitation plan will include all the mitigation measures addressing the sources identified in Section 6.1.1, described herein.

7.1.1. General Management

- The site manager will be briefed regarding the potential for contamination of the designated sites, and the effects to QIs/SCIs identified in **Section 6.1.**, that can potentially occur as a consequence of the proposed Plan; and
- All rehabilitation actions will be undertone by Bord na Móna, who will ensure that all personnel working on site are trained in pollution incident control response. A regular review of weather forecasts of heavy rainfall is required and Bord na Mona will be required to prepare a contingency plan for before and after such events.

7.1.2. Mitigation against contaminant spillages

- As existing surface water outlets (silt ponds) are located within the flooding area during winter months and when the River Suck is in flood, and at these times the outlets present hydrological connectivity with European sites adjacent to and downstream from the proposed rehabilitation, no rehabilitation (including fertiliser application (note that Best Practice Guidance on the use of fertilisers have been prepared (**Appendix D**))) will take place during heavy rain and/or flood events and no rehabilitation actions will take place during the winter season (except for maintenance of silt ponds as required to maintain optimal fuction)
- Following works and the fertilization process, water outlets will be treated and all silt and peats will be cleared out;
- No rehabilitation work will take place inside the River Suck SPA;
- If re-fuelling of vehicles and/or machinery takes place on-site, all will be refilled in a bunded or hardstand area using a drip tray or mobile bund;
- Any spillage of fuels will be immediately contained and properly disposed of. Drip trays and spill kits will be kept available on site;
- In the event of accidental hydrocarbon or contaminant spillages, the Emergency Response Clean-up Procedure will be followed (**Appendix E**);
- Any run-off will be directed towards silt ponds, with no run off allowed to run directly into the SPA; and
- Bord na Móna will ensure that no harmful materials will be deposited within 50m of the SPA.

7.1.3. Mitigation against disturbance of QIs and SCIs

- No rehabilitation or decommissioning actions will take place within the wintering season (October to March inclusive) to avoid disturbance to the wintering bird populations indicated as SCIs for the River Suck SPA, the Lough Croan Turlough SPA and the Four Roads Turlough SPA
- Operational stage activities which may be carried out during the winter months may only

comprise non-intrusive environmental & ecological monitoring (including surface water monitoring and vegetation monitoring)

- Minimal, essential repair works, suhh as repairs to existing peat blockages, adjustment of overflow pipes (where required) may be carried out at any time of the year; and
- Maintenance of existing silt ponds to reduce emissions to local water bodies, as conditioned by the existing IPC license, will still be required at any time of the year.

8. CONCLUSION

This Natura Impact Statement has been prepared to provide sufficient objective scientific information in support of the proposed Plan, in order to allow an Appropriate Assessment determination in the context of Article 6(3) of the Habitats Directive, in view of existing case law. The report has been prepared in order to evaluate the significance of potential effects on European sites from the proposed Plan, alone and/or in-combination with other plans or works.

Appropriate Assessment Stage One Screening of all European sites identified within a 15km radius of the proposed Plan evaluated that the potential for significant effects on the Qualifying Interests of the River Suck Callows SPA [004097], Lough Croan Turlough SPA [004139], Four Roads Turlough SPA [004140], River Shannon Callows SAC [000216], Middle Shannon Callows SPA [004096], Lough Derg (Shannon) SPA [004058] and Lough Derg, North-east Shore SAC [002241] could not be excluded.

In particular, the potential for effects via surface water contamination and disturbance to SCIs and QIs have been appraised. Thus, the above elements were brought forward for further critical examination in the Natura Impact Statement Report to inform the Appropriate Assessment process.

It is determined that, following the implementation of mitigation measures for the protection of designated QIs and SCIs, as outlined in **Section 7**, the effects of the proposed Plan on water quality and QI and SCI disturbance are unlikely to be significant. Accounting for the mitigation proposed for the avoidance of adverse effects on the QIs and SCIs of relevant European sites mentioned above, it is concluded that the proposed Plan, as described, will not result in direct, indirect or cumulative effects.

The provisions of Article 6 of the 'Habitats' Directive 92/43/EC defines integrity as the '*coherence of the sites ecological structure and function, across its whole area, or the habitats, complex of habitats and/or population of species for which the site is classified*'. It is clear that, given the application of prescribed protective measures for the avoidance of impacts and the implementation of the required mitigation measures, the proposed Plan will not give rise to adverse effects on the integrity of a Natura 2000 site or sites evaluated herein.

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APPENDIX A: PROPOSED PLAN LAYOUT

BNM-DR-23-12-05: Enhanced Rehab Measures

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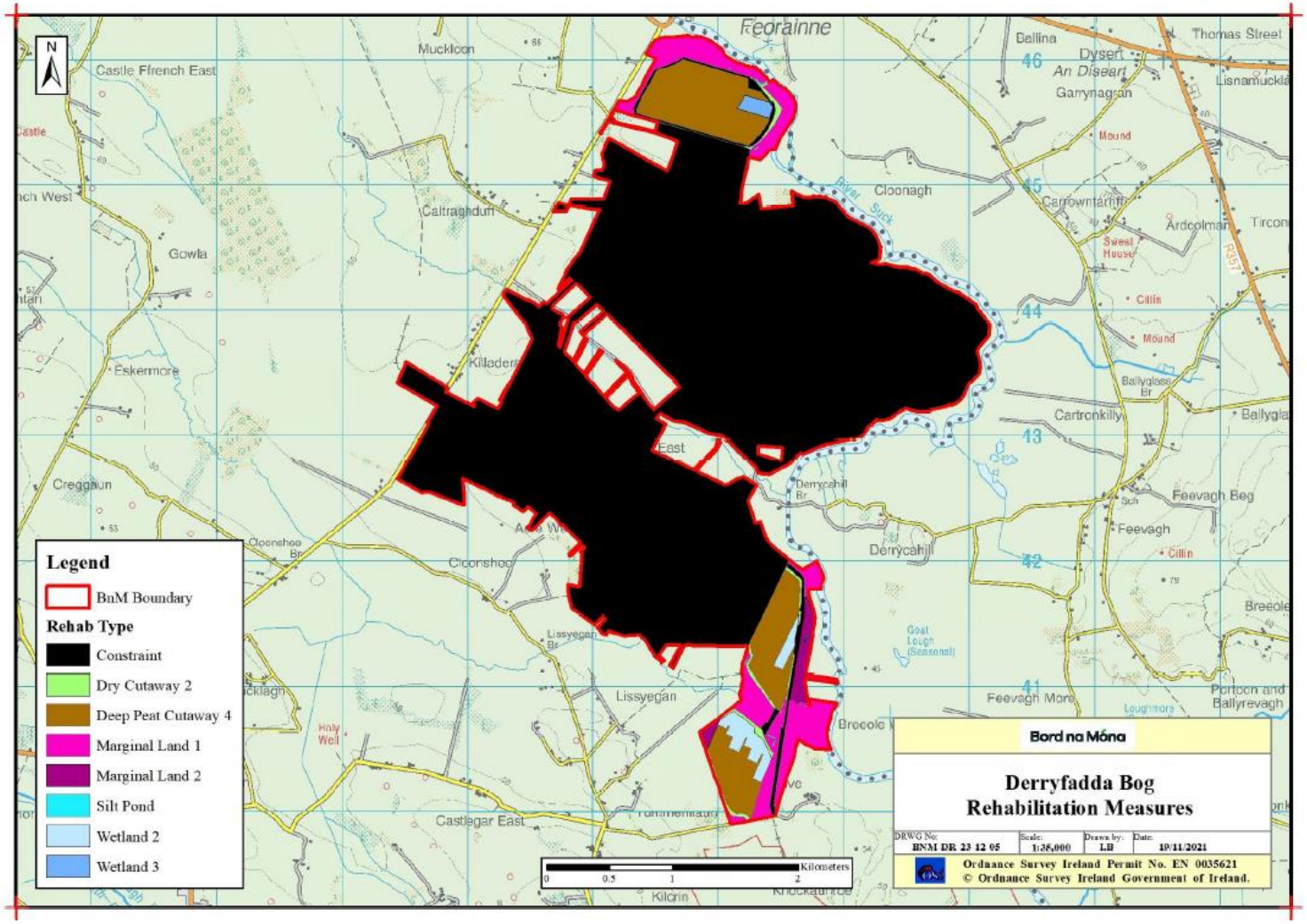

APPENDIX B: REHABILITATION PLAN FOR DERRYFADDA BOG

Bord na Móna

Derryfadda Bog

Cutaway Bog Draft Decommissioning and Rehabilitation Plan

2021

This document seeks to address the requirements of Condition 10.2 of IPC License Ref. P0502-01:

> "*The licensee shall prepare, to the satisfaction of the Agency, a fully detailed and costed plan for permanent rehabilitation of the cutaway boglands within the licensed area.*"

This licence condition requires Bord na Móna agree with the EPA the measures that will provide for rehabilitation, i.e. stabilisation of Derryfadda Bog upon cessation of peat production and compliments the licence requirement to decommission the site.

***Rehabilitation** generally comprises site stabilisation with natural colonisation with or without targeted management.*

Industrial peat production has now permanently ceased at Derryfadda Bog.

In addition, to preparing this document to comply with Condition 10 of IPC Licence Ref. P0502-01, due regard was also given to the proposed Peatlands Climate Action Scheme (PCAS) announced by the Minster. This Scheme will see the Minister support, via the Climate Action Fund and Ireland's National Recovery and Resilience Plan, Bord na Móna in developing a package of measures, 'the Scheme', for enhanced decommissioning, rehabilitation and restoration of cutaway peatlands referred to as, the Peatlands Climate Action Scheme'. However, only the additional costs associated with the additional and enhanced rehabilitation, i.e, measures which go beyond the existing standard mandatory decommissioning and rehabilitation requirements arising from Condition 10 will be eligible for support. The additional costs of the Scheme will be supported by Government, administered by the Department of Environment, Climate and Communications (DECC), while the National Parks and Wildlife Service (NPWS) will act as the Scheme regulator.

While this document outlines the enhanced rehabilitation measures planned for the Derryfadda bog, activities which goes beyond that required by Condition 10 in the Licence, rehabilitation necessary to comply with the 'standard' requirement of Condition 10 (in the absence of the Scheme) is also included, to estimate costs. The inclusion of the 'standard' rehabilitation together with the enhanced rehabilitation in this document allows the Scheme Regulator to distinguish and objectively determine the specific activities (and their associated costs) eligible for support under the Scheme.

Bord na Móna have defined the key rehabilitation outcome at Derryfadda Bog as environmental stabilisation, re-wetting and setting the bog on a trajectory towards development of naturally functioning peatland and wetland habitats.

Any consideration of any other future after-uses for Derryfadda Bog, such as renewable energy, will be conducted in adherence to the relevant planning guidelines and consultation with relevant authorities and will be considered within the framework of this rehabilitation plan.

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Name(s):			
Date:			
Rev. 1.1	**Author(s):**	**Checked By:**	**Approved By:**
Name(s):			
Date:			

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Non-technical summary

- Industrial peat harvesting is now finished at Derryfadda Bog, located in Co. Galway. This bog is located approximately 4.5 km northeast of Ahascragh Co. Galway, 0.7 km south of Ballyforan and 2 km southwest of Dysart County Roscommon.
- Bord na Móna is planning to rehabilitate Derryfadda Bog.
- This is happening as Bord na Móna are obliged to carry out peatland rehabilitation via an IPC License issued by the Environmental protection Agency. In addition, the Government has agreed to support peatland rehabilitation via the establishment of the Peatland Climate Action Scheme (PCAS). This is funded via the government and by Bord na Móna.
- The key objective of peatland rehabilitation is environmental stabilisation. This means developing habitats and vegetation back onto the bare peat, and minimising impacts to downstream. The bog was drained in the past to allow peat production. Better results for water quality improvements, climate action, the reduction of carbon emissions and biodiversity are achieved when the remaining peat is re-wetted. This means drain-blocking and other measures to raise water levels to the surface of the bog and to encourage the natural colonisation of vegetation.
- In general, soggy ground conditions are preferred. This means the remaining peat is wet and that plants that prefer wetter conditions, like bog cotton and reeds will thrive.
- Many Bord na Móna bogs can not be restored back to raised bog, as so much peat has been removed and the environmental conditions have been modified. However, other natural habitats will develop like shallow wetlands with reedbeds and birch woodland, and in time a naturalised peatland can be restored.
- Re-wetting peat is also better for climate action. This reduces carbon emissions as re-wetting the remaining peat reduces carbon losses such as the production of Carbon Dioxide, the main Greenhouse Gas. The site is expected to still be a reduced carbon source for some time, but eventually the carbon sink function can re-establish in suitable conditions as peat-forming conditions are restored. This will take some time.
- The development of a range of habitats in Derryfadda Bog will support biodiversity including plants, insects, birds and mammals. This includes some species that are rare and protected in the wider landscape. It will increase the national area of native woodland. Many wetland habitats in the wider landscape have been reclaimed for agriculture and other uses and peatland rehabilitation is an opportunity to create new wetland habitats.
- Derryfadda Bog was drained and developed for industrial peat production in the 1980's. Peat production ceased in 2020. Therefore, much of the site currently comprises of bare peat. A small part of the site has already established pioneer peatland habitats, as well as some surface water.
- Measures proposed for Derryfadda Bog include internal drain blocking and other measures required to raise water levels to the surface of the peat (changing levels of pipes for example). Some fertiliser will be spread on headlands and other areas (a small part of the overall area) to encourage vegetation growth.
- Bord na Mona plan to carry out this work in 2022.
- These rehabilitation measures will be planned by a team consisting of ecologists, hydrologists and engineers. It is a principle of Bord na Móna rehabilitation planning that no actions will be taken that would negatively impact on adjacent land. No boundary drains will be blocked. Water will still leave the site via the existing outlets.
- It will take some time for vegetation and habitats to fully develop at Derryfadda, and a peatland ecosystem to be restored. However, it is expected that most of the site will be developing pioneer habitats after 5-10 years.

- This is a peatland rehabilitation plan. Bord na Móna continually reviews its land-bank to consider future commercial or industrial developments, such as renewable energy. Bord na Móna are reviewing the potential to develop a potential renewable energy project at Derryfadda Bog. It is expected that this review will be completed in 1-2 years. In advance of this review of renewable energy potential, it is proposed to rehabilitate part of Derryfadda Bog in 2022-2024 that is not constrained (see drawing number BNM-DR-23-12-05: Enhanced Rehab Measures and BNM-DR-23-12-20: Standard Rehab Measures). The remaining area will be rehabilitated after the renewable energy review is complete. Any other proposed development will planned in adherence to relevant planning guidelines and will consider the rehabilitation and the condition of the site.
- A local community group based at Ballyforan have proposed to develop an amenity walkway crossing Derryfadda Bog. This walkway would be based on decommissioned BnM raillines and on headlands. Bord na Móna are currently liaising with this group regarding this proposal.
- Bord na Móna continually reviews its land-bank to consider future commercial or industrial developments, such as renewable energy. Any other proposed development will be planned in adherence to relevant planning guidelines and will consider the rehabilitation and the condition of the site.
- Peatland rehabilitation of these bogs will bring a range of benefits to the local community via improvements to the local landscape and is also important for supporting national policies and strategies in relation to reduction of carbon emissions from these peatlands, supporting biodiversity and improvements to water quality.

SUMMARY

Name of bog: Derryfadda **Area:** 610ha

Site description:

- Derryfadda Bog was drained and developed for industrial peat production in the 1980's. It formerly supplied milled horticultural peat and fuel peat. Industrial peat production ceased in 2020.
- Derryfadda has a pumped drainage regime to support industrial peat extraction.
- The former peat production footprint now comprises bare peat, mosaics of pioneer vegetation and some emergent scrub habitats. Parts of the eastern section has developed areas of open water since the cessation of peat production in 2020. Some active drainage channels are present on site.
- Peat depths are varied across the site. A small area of bog to the north of the site contains peat depths in excess of 2.6 metres. Much of the large northern parcel contains shallow peat, largely between 0 and 1 metre. The southern section of the bog contains large areas of deep peat, with the eastern part containing peat depths of 1-2.5 metres and the central and western section containing peat depths in excess of 2.6 metres.
- Derryfadda bog is drained by the River Suck, located adjacent to the to the east of the site boundary. This river is a tributary of the River Shannon (Upper), with the confluence located at Shannonbridge. The northern part of the site is bisected by the Killaderry stream, a tributary of which also occurring within the cutaway. The most southern parcel of the bog is separated by the Lughanagh stream, which enters the River Such to the east of the site.

Rehabilitation goals and outcomes

Bord na Móna is committed to discharging the obligations arising from Condition 10 of the IPC licence. This is defined as:

- Meeting conditions of the IPC licence;
- Stabilisation or improvement in water quality parameters (e.g. suspended solids);
- Environmental stabilisation.
- Optimising hydrological conditions in the former area recently in industrial peat production for the further development of wetland, Reed swamp, wet woodland and fen habitats on shallow cutaway peats, along with management of existing wetlands.
- Optimising hydrological conditions for the protection of exposed archaeological structures, their retention in situ and preservation into the future.
- Supporting potential future amenity.
- Rehabilitation will support the National Policies on Climate Action and Green House Gas (GHG) mitigation by maintaining and enhancing the current condition peat storage capacity of the bog (locking the carbon into the ground). In time, it is expected that the bog will develop as a reduced carbon source. The development of carbon sink function is dependent on the restoration of peat-forming conditions. It will also support Ireland's commitments towards Water Framework Directive and the National River Basin Management Plan 2018-2021.

Scope of rehabilitation

The principal scope of this rehabilitation plan is defined by:

- The area of Derryfadda Bog available for rehabilitation in 2022.
- EPA IPC Licence - Ref. PO-502-01. As part of Condition 10.2 of this license, a rehabilitation plan must be prepared for permanent rehabilitation of the boglands within the licensed area. The key objective of 'rehabilitation', as required by this licence, is achieved by the **environmental stabilisation** of the bog.

- Bord na Móna are reviewing the potential to develop a potential renewable energy project at Derryfadda Bog. It is expected that this review will be completed in 1-2 years. In advance of this review of renewable energy potential, it is proposed to rehabilitate **part** of Derryfadda Bog in 2022 that is not constrained (see drawing number BNM-DR-23-12-05: Enhanced Rehab Measures and BNM-DR-23-12-20: Standard Rehab Measures). The remaining area will be rehabilitated after the renewable energy review is complete. The peatland rehabilitation will either be in association with a potential renewable energy project, with peatland rehabilitation integrated into the proposed project, or will be completed in the absence of any proposed renewable energy project.
- The enhanced rehabilitation measures defined in the Scheme (PCAS), which are designed to exceed/meet the standard stabilisation requirements as defined by the IPC Licence and to enhance the ecosystem services of Derryfadda Bog, in particular, optimising **climate action benefits**.
- The local environmental conditions of this bog. Derryfadda Bog has variable environmental characteristics with a range of residual peat depths, and variable hydrology and topography. Derryfadda is suited to cutaway wetland development, particularly in the eastern sections in close proximity to the River Suck.
- The key goals and outcomes of rehabilitation at this bog outlined above in the preceding paragraph.
- Minimising potential impacts on neighbouring land. Some boundary drains around Derryfadda Bog will be left unblocked as blocking boundary drains could affect adjacent land.
- Some of the callows grassland located at the south-eastern side of the side are not part of the scope of rehabilitation. These are subject to individual grazing agreements.

Criteria for successful rehabilitation:

The Criteria for successful rehabilitation for IPC Licence validation and for climate action verification have been defined as:

- Rewetting of residual peat in the former area of industrial peat production to slow water movement across the site to retain silt, accelerating the development of vegetation cover via natural colonisation, and reducing the area of bare exposed peat (IPC Licence validation) through the creation of compatible fen, reed swamp, wet woodland and other wetland and peatland habitats.
- Stabilising or reducing key emissions to water (e.g. potential run-off of suspended solids) This will be measured via water quality monitoring (suspended solids and ammonia) for at least 2 years after the rehabilitation has been completed (IPC Licence validation).
- Reducing pressure from peat production on the local river catchment (WFD) (IPC Licence validation). This will be measured by the EPA WFD monitoring programme.
- Optimising the extent of suitable hydrological conditions to optimise climate action (Climate action verification).
- Reduction in carbon emissions (Climate action verification). This will be measured by an aerial survey after rehabilitation has been completed.
- Setting the site on a trajectory towards establishment of a mosaic of compatible habitats including fen, reed swamp, wet woodland, heath, scrub, embryonic *Sphagnum*-rich peat forming communities, birch woodland habitats, where conditions are suitable, and eventually towards a reduced carbon source/carbon sink (Climate action verification). These habitats will generally establish initially as pioneer vegetation. It will take some time for stable naturally functioning peatland habitats to fully develop at Derryfadda Bog.
- Improvement in biodiversity and ecosystem services. (Climate action verification).

Summary of measures:

The below section is a summary of measures proposed for rehabilitation.

- Planning actions, including developing a detailed site plan and carrying out a drainage management assessment.
- Carry out an ecological appraisal of the potential impacts of the planned rehabilitation.
- Carry out proposed measures, which will be a combination of targeted drain blocking, peat field re-profiling, modifying outfalls and water level management.
- Phase 2 measures may include fertiliser application targeting bare peat areas on headlands, high fields and other areas, and further water level management.
- Silt ponds will continue to be maintained during the rehabilitation and decommissioning schedule.
- Evaluate success of short-term rehabilitation measures outlined above and remediate, where necessary.
- Decommissioning of silt-ponds will be assessed and carried out, where required.

Timeframe:

- 2021-2022. Short-term planning actions.
- 2022. Short-term practical actions.
- 2022-2024. Long term practical actions. Evaluate success of short-term rehabilitation measures outlined above and remediate, where necessary.
- 2024. Decommission silt-ponds, if necessary.

Monitoring, after-care and maintenance

The monitoring, after-care and maintenance programme for Derryfadda Bog, as required to meet Condition 10 of the IPC Licence, is defined as:

- There will be initial quarterly monitoring assessments of the site to determine the general status of the site, the condition of the silt-ponds, assess the condition of the rehabilitation work, asses the progress of natural colonisation, monitoring of any potential impacts on neighbouring land and general land security. The number of site visits will reduce after 2 years to bi-annually. These site visits will assess the need to any additional rehabilitation.
- **Water quality monitoring** will be established. Monitoring of key water quality parameters will include: Ammonia, Phosphorous, Suspended solids (silt), pH and conductivity.
- Where other uses are proposed for the site, these will be assessed by Bord na Móna in consultation with interested parties. Other after-uses can be proposed for licensed areas and must go through the required assessment and planning procedures.

Additional Monitoring:

- The monitoring and validation of re-vegetation via natural colonisation and changes in bog condition will be carried out using an aerial survey, after rehabilitation measures are implemented. It is proposed that sites can be monitored against this baseline in the future.
- Biodiversity Ecosystem services will be monitored using specific indicators.
- Carbon emissions monitoring only be carried out on a small proportion of BnM sites to develop better understanding of carbon emissions and GHG emission factors from different types of BnM sites and will be developed on association with other established research programmes. Reduction in carbon emissions will be modelled by a combination of habitat condition assessment and application of appropriate carbon emission factors derived from other sites. Baseline monitoring (habitat condition) will be carried after rehabilitation is completed (during the Scheme). It is proposed that sites can be monitored against this baseline in the future.
- Monitoring as part of Climate Action Verification is dependent on support from PCAS or other external funding.

Validation and IPC Licence surrender

Reporting to the EPA will continue until the IPC License is surrendered. The bog will be included in the full licence surrender process as per the Guidance to Licensees on Surrender, Cessation and Closure of Licensed Sites EPA, 2012, when:

- The planned rehabilitation has been completed.
- Water quality monitoring demonstrates that water quality of discharge is stabilising or improving.
- The site has been environmentally stabilised.

1. INTRODUCTION

Derryfadda Bog is located in Co. Galway, approximately 4.5km northeast of Ahascragh Co. Galway, 700 metres south of Ballyforan and 2km southwest of Dysart County Roscommon, Drawing no. *BnM_DR23_12_01 'Bog Site Location'*, Appendix XIII. Bord na Móna operates under IPC Licence issued and administered by the EPA to extract peat within the Derryfadda bog group, a sub-group of the Blackwater bog group (Ref. PO-502-01). As part of Condition 10.2 of this license, a rehabilitation plan must be prepared for permanent rehabilitation of the cutaway boglands within the licensed area. The bog is part of the Derryfadda bog group, a sub-group of the Blackwater bog group (see Appendix II for details of the bog areas within the Derryfadda bog group).

This document seeks to address the requirements of Condition 10.2 of IPC License Ref. Ref. PO 502-01:

> "*The licensee shall prepare, to the satisfaction of the Agency, a fully detailed and costed plan for permanent rehabilitation of the cutaway boglands within the licensed area.*"

This plan is a specific rehabilitation plan for the bog and outlines:

- Description of site management and status;
- Main issues and approaches to rehabilitation;
- Consultation to date with interested parties;
- Interaction with other policy and legislative frameworks;
- The planned rehabilitation goals and outcomes:
- The scope of the rehabilitation plan;
- Criteria which define the successful rehabilitation and key targets to validate rehabilitation.
- Proposed rehabilitation actions;
- Proposed timeframe to implement these actions;
- Budget and Costings; and
- Associated aftercare, maintenance and monitoring.

It is proposed by Government that Bord na Móna carry out a Peatlands Enhanced Decommissioning, Rehabilitation and Restoration Scheme on its peatlands. Note this proposal is also known colloquially as the 'Peatlands Climate Action Scheme' (PCAS). The additional costs of the Scheme will be supported by Government through the Climate Action Fund and Ireland's National Recovery and Resilience Plan, administered by the Department of Environment, Climate and Communications (DECC), while the National Parks and Wildlife Service (NPWS) will act as the Scheme regulator. Bord na Móna have identified a footprint of 33,000 ha as peatlands suitable for this scheme. This Scheme will significantly go beyond what is required to meet rehabilitation and decommissioning obligations (Appendix VII & IX) under existing EPA IPC licence conditions. Improvements supported by the Scheme will ensure that environmental stabilisation is achieved (meaning IPC obligations are met), and importantly, significant additional benefits, particularly relating to climate action and other ecosystem services, will also be delivered.

Only the costs associated with the additional, enhanced and accelerated rehabilitation, i.e. those measures which go beyond the existing decommissioning and rehabilitation requirements arising from Condition 10, will be eligible for support under the Scheme. Bord na Móna have now announced the complete cessation of industrial peat production across its estate (January 2021).

It is expected that the PCAS will have benefits accruing from biodiversity provision, water quality and storage attenuation as well as increased carbon storage, reduced carbon emissions and acceleration towards carbon

sequestration. The Scheme will also facilitate monitoring of carbon fluxes (Greenhouse Gases and fluvial carbon) in selected areas (in addition to other established Research programmes), to monitor changes in where the interventions will accelerate the trajectory towards a naturally functioning peatland ecosystem.

It is envisaged that the PCAS will support activities, interventions, or measures across the Bord na Móna cutaway peatlands which accelerate the original timelines. Selected rehabilitation measures will take account of site environmental conditions, which can vary significantly. These measures potentially include:

- more intensive management of water levels through outfall management, drain-blocking and management of water levels within the bog;
- re-profiling/re-wetting of extant deep peat that will deliver suitable conditions for development of wetlands, fens and bog habitats;
- targeted fertiliser applications,
- seeding of targeted vegetation; and
- proactive inoculation of suitable peatland areas with *Sphagnum.*

These are collectively designed to optimise hydrological conditions (ideally and where possible water-levels <10 cm) for climate action benefits and to accelerate the trajectory of the site towards a naturally functioning ecosystem, and eventually a reduced carbon source/carbon sink again. (In some areas of dry cutaway this trajectory will be significantly longer and it is not feasible in the short-term to re-wet some areas. These areas will develop other habitats. The key to optimising climate action benefits is the restoration of suitable hydrological conditions and more intensive intervention means that the extent of suitable hydrological conditions can be optimised.

These measures are designed to encourage the development of peat-forming habitats, where possible. They are also designed to further slow the movement of water across the site (with the site acting similarly to a constructed wetland), slowing the release of water (improving local water attenuation) and water quality is also expected to improve as the site returns to a naturally functioning peatland ecosystem. The measures will also accelerate the development of new habitats for a range of species under pressure in the wider landscape and will have the potential to develop habitats (e.g. Annex I raised bog, wetlands that support wader water birds of conservation interest) that will contribute towards the delivery of national biodiversity objectives.

Derryfadda Bog is proposed to be part of this this Scheme (PCAS) and this rehabilitation plan outlines the approach taken.

1.1 Constraints and Limitations

This document only covers the area of Derryfadda Bog, see Drawing no. *BnM_DR23_12_01 'Bog Site Location'*, Appendix XIII.

Industrial peat extraction at Derryfadda Bog permanently ceased in 2020. Currently the former peat production area comprises both bare peat, some re-vegetated areas and open water. The combination of active rehabilitation measures and natural colonisation will quickly establish and/or increase the extent of pioneer vegetation and will be planned to accelerate environmental stabilisation. Nevertheless, it will take some time (30-50 years) for naturally functioning peatland ecosystems to fully re-establish.

Areas of cutover bog, i.e. remnant high bog areas at the site margins have also been identified as constraints, as these will not be subject to rehabilitation measures. This is largely due to the variation in topography (usually

higher in elevation to the remainder of the bog), the small area they cover or the limited effectiveness of rehabilitation measures in these small areas.

Bord na Móna are reviewing the potential to develop a potential renewable energy project at Derryfadda Bog. It is expected that this review will be completed in 1-2 years. In advance of this review of renewable energy potential, it is proposed to rehabilitate part of Derryfadda Bog in 2022 that is not constrained (see drawing number BNM-DR-23-12-05: Enhanced Rehab Measures and BNM-DR-23-12-20: Standard Rehab Measures). The remaining area will be rehabilitated after the renewable energy review is complete. The peatland rehabilitation will **either** be in association with a potential renewable energy project, with peatland rehabilitation integrated into the proposed project, **or** will be completed in the absence of any proposed renewable energy project. It is expected that Bord na Móna will revise and update rehabilitation plan for Derryfadda when this renewable energy review is complete. Bord na Móna remain fully committed to rehabilitating the whole bog and meeting the conditions of the IPC Lisence. Any consideration of any other future after-uses for Derryfadda Bog, such as renewable energy, will be conducted in adherence to the relevant planning guidelines, and consultation with relevant authorities, and will be considered within the framework of this rehabilitation plan.

2. METHODOLOGY

This rehabilitation plan was developed with a combination of desktop and field surveys, consultations with internal and external stakeholders and cognisance of the Scheme (PCAS). The development of this rehabilitation plan considered **recently published** guidance issued by the EPA in 2020 – **Guidance on the process of preparing and implementing a bog rehabilitation plan**.

The ecological information and site information collected during the Bord na Móna ecological baseline survey, additional confirmatory site visits and monitoring and desktop analysis forms the basis for the development of the rehabilitation plan for the bog, along with:

- Experience of 40 years of research on the after-use development and rehabilitation of the Bord na Móna cutaway bogs (Clarke, 2010; Bord na Móna, 2016);
- Significant international engagement during this period with other counties in relation to best-practise regarding peatland rehabilitation and after-use through the International Peat Society and the Society for Ecological Restoration (Joosten & Clarke, 2002; Clarke & Rieley, 2010; Gann *et al*., 2019);
- Consultation and engagement with internal and external stakeholders;
- GIS Mapping;
- BNM drainage surveys;
- Bog topography and LIDAR data:
- Hydrological modelling; and
- The development of a **Methodology Paper (draft) outlining the Scheme (PCAS)**. This rehabilitation includes enhanced measures defined in the Methodology Paper which are designed to exceed the standard stabilisation requirements as defined by the IPC Licence and to enhance the ecosystem services of Derryfadda Bog, in particular, optimising **climate action benefits**.

2.1 Desk Study

The desk study involved collecting all relevant environmental and ecological data for the study area. The development of the rehabilitation plan also takes account of research, experience and engagement with other peatland restoration and rehabilitation projects and peatland research including Irish, UK, European and International best-practise guidance (full citations are in the References Section):

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Additional on-line resources were also incorporated into the desk study, including:

- Mount Dillon Integrated Pollution Control Licence;
- Mount Dillon Annual Environmental Reports;
- Review of the National Biodiversity Data Centre (NBDC) webmapper;
- Inland Fisheries Ireland (IFI) Reports;
- Environmental Protection Agency database (www.epa.ie);
- EPA Guidance on Requests for Alterations to a Licensed Industrial or Waste Activity;
- BirdWatch Ireland online data (including I-WeBS and CBS datasets; www.birdwatchireland.ie);
- Geological Survey of Ireland - National Draft Bedrock Aquifer map;
- Geological Survey of Ireland - Groundwater Database (www.gsi.ie);
- National Parks & Wildlife Services Public Map Viewer (www.npws.ie);
- Water Framework Directive catchments.ie/maps/ Map Viewer (www.catchments.ie);
- OPW Indicative Flood Maps (www.floodmaps.ie);
- CFRAM Preliminary Flood Risk Assessment (PFRA) maps (www.cfram.ie);
- River Basin Management Plan for Ireland 2018 – 2021;

- Bord na Móna Annual Report 2021;
- Spatial data in respect of Article 17 reporting, available online at https://www.npws.ie/maps-and-data/habitat-and-species-data/article-17.

2.2 Consultation

A number of stakeholders have been identified during the course of Bord na Móna's rehabilitation and Biodiversity Action Plan activities and will be contacted during the rehabilitation planning process for their views. See Section 4.

2.3 Field Surveys

Bord na Móna carried out a baseline ecological survey of all of its properties in 2009-2012 and developed habitat maps. Additional ecological walk-over surveys and visits have taken place at Derryfadda Bog in 2021 to inform rehabilitation planning and habitat maps have been updated, where required. This rehabilitation plan is informed by the original baseline survey as well as subsequent site walk-over surveys and visits, and updates to baseline data.

Habitat mapping followed best-practise guidance from Smith *et al*. (2011). Map outputs including all habitat maps and target notes were produced using GIS software application packages (ArcGIS). General marginal habitats and other habitats that had not been modified significantly by industrial peat extraction were classified using Fossitt *et al*. (2000). Plant nomenclature for vascular plants follows Stace (2010), while mosses and liverworts nomenclature follows identification keys published by the British Bryological Society (2010). A more detailed Bord na Móna classification system was developed for classifying pioneer cutaway habitats as Fossitt categories were deemed not to be detailed enough for cutaway bog (much of cutaway bog could be classified as Cutover Bog - PB4). Much of the pioneer cutaway vegetation is still at an early stage of its development and cannot be assigned to Fossitt Level 3 categories yet.

A detailed ecological baseline survey report for Derryfadda Bog is contained in Appendix II.

3. SITE DESCRIPTION

Derryfadda Bog is located south of Ballyforan and southwest of Dysart County Roscommon. The bog is located between the L3406 and the River Suck, Drawing no. *BnM_DR23_12_01 'Bog Site Location'*, Appendix XIII. The location of Derryfadda bog within the Derryfadda bog group is provided in Drawing no. *BnM_DR23_12_24 'Bog group map'*, Appendix XIII.

The surrounding landscape comprises of a mosaic of low-lying agricultural land (pasture) interspersed with other raised bogs, many of which have also been managed by Bord na Móna for peat production. Several sections of remnant raised bog are located along the margins of the site, see Drawing no. MnM_DR23_12_17 '*Current habitat map*', Appendix XIII. Some areas within and adjacent to the centre of the site (mostly outside of the BnM ownership boundary) are actively used for the production of domestic turf. Some small areas of plantation forestry also occur in the wider area, outside the west of the site.

Derryfadda bog is drained by the River Suck, located adjacent to the east of the site boundary. As such, Derryfadda bog forms part of the flood plain of the River Suck, regularly flooding during winter and occasionally at other times when the water levels on the river are high. This bog is a pumped bog with the water table lower than the surrounding area. The adjacent River Suck is a tributary of the River Shannon (Upper), with the confluence located at Shannonbridge. A narrow band of raised bog remnant and some Birch woodland separates the site from the River Suck to the east. The northern part of the site is bisected by the Killaderry stream, EPA reference code: IE_SH_26K050940, a tributary of which also occurring within the cutaway. The most southern parcel of the bog is separated by the Lughanagh stream, which enters the River Such to the east of the site.

The Lughanagh River flows through the southern section of the site. This river is bounded by wet grassland and riparian woodland, with some small areas of remnant raised bog also located close to the river. A small mineral island is located to the east of the works facility. This area has been used in the past for storing machinery. The main vegetation type consists of calcareous grassland with occasional small trees.

The Killaderry stream separates the southern section of the site from the norther sections of the bog. This river is mainly bounded by remnant sections of raised bog, cutover bog, scrub and wet grassland. Significant areas of cutover bog and remnant raised bog in this area are not in the ownership of Bord na Móna and are used for domestic turf cutting.

The central/northern section of the site is dominated by bare peat. A mineral island is located in the centre of the site and is accessed by way of a bog track; a small works area is also located on this mineral island. This area was previously owned by the Sugar Company, who planted the entire area with conifers. The conifers were removed prior to the commencement of peat production by BnM.

A number of silt ponds occur in close proximity to the north eastern boundary of the site. In addition, two small ponds are also located in close proximity to the northeast boundary of the site and are also shown on the 25 inch OSI map.

A ridge of mineral land separates the large northern section of Derryfadda from a smaller area of cutaway to the extreme north, Drawing no. BnM_DR23_12_17 '*Current habitat map*', Appendix XIII. A fenced off compound is present in this location. A network of small fields surround the compound and are managed for agriculture.

The most northerly section of the site is the smallest production area within Derryfadda Bog. This area was previously owned by the Irish Sugar Company who produced grass meal and planted the entire area with conifers. These trees were removed by BnM in the early 1980's. This section of bog was used to produce "red" or "*Sphagnum*" peat. A fringe of conifer woodland still exists around much of the boundary of the site. However, it

is severely affected by wind throw. A strip of riparian woodland occurs between the conifer plantation and the River Suck to the north. The riparian woodland is an important biodiversity feature of the area and supports a population of red squirrel.

Derryfadda is linked to Gowla bog to the west and Castlegar bog to the south by an industrial railway line and/or a machinery travel path. The railway line runs in a general northwest to southeast direction, see Drawing number BNM-DR-23-12-02: Structures and Sampling, Appendix XIII. A minor public road runs along much of the western edge of the bog. Two bog tracks cross the bog dividing it into three sections.

3.1 Status and Situation

3.1.1 Site history

Derryfadda Bog formerly supplied milled horticultural peat and fuel peat. The existing northwest-southeast rail line through Derryfadda is still maintained to facilitate access through Bord na Mona properties.

3.1.2 Current land-use

Industrial peat production has now permanently ceased at Derryfadda Bog. A large works area is located along the western edge of the site. This area once contained a tippler where peat was loaded onto lorries for transport to Lough Ree Power in Lanesborough, Co. Longford.

Biodiversity and ecosystem services have currently been identified as the primary land-use.

As described above, the River Suck is located in close proximity to the eastern boundary of the site, with a small area of wet grassland (under BnM ownership) extending from the site to the River Suck. The grassland is grazed under agreement.

Some small areas of turbary and former licenced plots also occur within the site boundary, notably within the centre of the site along an existing access road.

3.1.3. Socio-Economic conditions

Bord na Móna has historically been a vital employer for the rural community of the Midlands of Ireland. Bord na Móna compiled a report on the role of peat extraction in the midlands historically in which they report that in 1986, by the end of Bord na Móna's Third Development Programme, a total of twenty-three work locations had been established around the country. The company had an average employment of approximately 4,688 in the mid 1980's, with a peak employment of 6,100 during the production season, which placed it among the country's largest commercial employers. The importance of such levels of employment were largely due to its regional concentration in the Midlands and the lack of alternative employment opportunities at the time.

According to the Energy Crop Socio-Economic Study undertaken by Fitzpatrick Associates in 2011, there were an estimated 1,443 jobs supported by the peat-to-power industry in Ireland at the time, some 81% of which were located in the catchment areas of the three peat-fired generating stations (Lough Ree, West Offaly, and Edenderry Power Stations). These constituted jobs in the plants and in peat extraction, jobs indirectly supported in upstream supply industries and jobs induced through the trickle-down effects of the wages and salaries of those supported directly or indirectly.

In respect of Derryfadda Bog, jobs included in the above study would have included those to facilitate extraction of peat at this site, and associated processing and transfer to the relevant power station.

As the primary employer in many Midland counties, Bord na Móna played a central role in building communities through several initiatives, including Education bursaries, support of local sporting clubs, the provision of community gain funds, charity programmes and the provision and building of amenity areas."

These job numbers have now declined with the cessation of peat extraction at this bog. It is anticipated that the Scheme (PCAS) will provide some employment for a team of workers at this site for a period of time (> 1 year).

3.2 Geology and Peat Depths

3.2.1 Sub-soil geology

GSI data indicates that Derryfadda is underlain by Visean limestone and the Lucan Formation. The Visean limestone is classified as regionally important aquifer as it is subject to karstification (conduit)..

The underlying soils and sub-soils are classed as 'Raised Bog Cutover Peat'. The peat is underlain by glacial deposits, lacustrine clays and green plastic clay. Coring also suggests that the marl is underlain by lacustrine clay The glacial deposits generally consist of grey gravelly clay/silt and are exposed as gravel mounds and ridges in places. Coring data indicates that the areas underlain these elevated ridges to contain clayey material, therefore this material has been interpreted as glacial till (based on comparable features present in the surrounding areas). Gravel has also been exposed at several locations through the bog where there are ridges and mounds. These are particularly notable within the centre of the largest northern parcel and along the western boundary of the largest southern parcel. Both of these parcels also contain a gravel island, Drawing reference no. BnM DR23_12_04 '*Peat depth' in the Map book*, Appendix XIII of this report.

3.2.2 Peat type and depths

As described above, peat depths have been mapped across the site and are provided in Drawing reference no. BnM DR23_12_04 '*Peat depth'*. Commercial milled peat extraction was undertaken at Derryfadda Bog up until 2020. As a result of the harvesting programme in place at Derryfadda, peat depths are varied across the site. The Derryfadda group of bogs are relatively "young" in terms of peat production (1981-1985) and therefore have a significant depth of peat remaining in most areas. The large southern section contains deeper peat reserves,

particularly within the centre and west. Approximately 80% of the peat reserves in the northern section are in excess of 1-2.5m in depth. The remainder of the southern portion of Derryfadda Bog contains peat reserves of 0-1m in depth, much of which is associated with a gravel ridges that runs southeast to northwest along the bog margin with the Killaderry stream. Much of the large northern section of Derryfadda contains shallow peat reserves. Peat depths of 0-1m occur over approximately 80% of the large northern section. However, some small areas of deeper peat, 1.1-2.6m in depth, still persist. The smallest parcel at the extreme north of the site holds the deepest peat, with consistent peat depths of 2.6 metres + occurring this area.

3.3 Key Biodiversity Features of Interest

The majority of the site can be rated as local importance (lower value) (NRA, 2009) as the majority of the site comprises bare peat and was managed primarily for industrial peat production until 2020. Some of the marginal lands within the site boundary, containing remnant bog, cutover bog, woodland or grassland have been assessed as of local importance (higher value) in a local context (NRA, 2009). Some small areas of the Derryfadda cutaway bog are beginning to develop pioneer cutaway wetland habitats (poor fen, reed swamp, birch scrub). Where parts of the east of the site are located within the Suck River Callows NHA and Suck River Callows SPA boundary, these areas have been rated as having an international ecological value, due to their designation. However, the boundaries of the designated sites only overlap with the marginal lands within the Bord na Mona boundary.

Habitats along the margins of the site include bog woodland (WN7), scrub (WS1), remnant sections of raised bog (PB1), lowland depositing river (FW2) and wet grassland (GS4). The areas of Birch woodland and scrub are dominated by birch (*Betula pubescence*), gorse (*Ulex europaeus*), willow (*Salix* sp.), bracken (*Pteridium aquilinum*) and bramble (*Rubus fruticosus* agg.). The sections of remnant raised bog are small and dry and dominated by ling heather (*Calluna vulgaris*). The wet grassland within the mineral ridge to the north, and that adjacent to the River Such to the southeast, are managed for agriculture by local farmers.

Both the Lughanagh stream to the south and the Killaderry stream in the centre of the site are important wildlife corridors for a variety of flora and fauna in the area. These habitats are ecologically important in a local context and support a wide variety of specie, including otter (*Lutra lutra*), white-clawed crayfish (*Austropotamobius pallipes*).

Adjacent habitats include lowland depositing river (FW2) i.e. the River Suck, wet grassland (GS4), improved agricultural grassland (GA1), cutaway bog (PB4), conifer plantation and remnant raised bog (PB1).

It is expected that the overall ecological value of this site will increase in the future as the site re-vegetates, matures and forms semi-natural habitats, such as more extensive areas of fen and reed swamp.

3.3.1 Current habitats

A habitat map of Derryfadda Bog is shown in Drawing reference no. BnM DR23_12_17 '*Current habitat map' in the Map book*, Appendix XIII of this report. The majority of the site is dominated by bare peat, with natural revegetation and areas of remnant raised bog occurring along the bog margins.

Central and small Northern sections

The Killaderry stream, see Plate 3.1, separates the southern sections of the site from the central and northern sections. This stream is mainly bounded by remnant sections of raised bog, cutover bog, scrub and wet grassland, see Plate 3.2. Significant areas of cutover bog and remnant raised bog in this area are not in the ownership of Bord na Móna and are used for domestic turf cutting, see Drawing reference no. BnM DR23_12_17 '*Current habitat map'*.

The central section of the site is dominated by bare peat, see Plate 3.3. A mineral island is located in the centre of the site and is accessed by way of a bog track; a small works area is located on the mineral island.

Plate 3.1 The Killaderry stream separates the southern sections of the site from the central and northern sections.

Plate 3.2 Example of remnant sections of raised bog, cutover bog, scrub and birch dominated woodland occurring both north and south of the Killaderry stream

Plate 3.3 Example of the central section of the site dominated by bare peat.

Plate 3.4 Example of cutover bog with dry heath type vegetation occurring within the north-eastern part of the site.

Plate 3.5 Example of dry grassland and scrub occurring on part of the mineral island that separates the central section from the most northern parcel.

Plate 3.6 Example of cutaway bare peat occurring within the south of the site. This section contains large areas of deep sphagnum peat.

An area of cutover bog is located in the north-eastern part of this section, see Plate 3.4. This area consists of dry heath type vegetation with some scrub along the edges. Some areas of the scrub consisted of birch with an understory of bramble, bracken and bluebell. This area had been in peat production in the past.

Two small ponds are located close to the north eastern boundary of the site. These features are unusual in that they were not connected to any other watercourse but contained fish. The small areas of open water were surrounded by a mix of wet grassland and scrub. These features are visible on the 25 inch OSI maps for Galway.

A ridge of mineral land separates the central section from the northern section. The mineral land was the site of the proposed briquette factory and a fenced off compound is present in this location. A network of small fields surround the compound, some of the small fields are actively grazed but a few do not appear to be managed and had encroaching scrub. The small, most northerly section, of the site is the smallest production area within Derryfadda Bog and still contains deep peat.

Southern Section

The southern section of Derryfadda Bog is mainly comprised of bare peat, see Plate 3.6. The Lughanagh stream flows through this southern section of the site close to the south eastern corner. This river is bounded by wet grassland and riparian woodland, with some small areas of remnant sections of raised bog also located close to the river. The wet grassland consisted of common reed (*Phragmites australis*), lesser tussock sedge (*Carex diandra*) and reed canary grass (*Phalaris arundinaceae*) with occasional willows scattered throughout. The river is important habitat for species such as mallard, otter and mute swan. Evidence that white-clawed crayfish (*Austropotamobius pallipes*) has also previously been recorded at this location.

3.3.2 Species of conservation interest

A number of species of conservation concern utilize the habitats available at Derryfadda Bog. The following is a summary of the records of these species available within BnM records.

Multiple mammal species have been recorded at Derryfadda Bog. Evidence of badger (*Meles meles*), fox (*Vulpes Vulpes*), fallow deer (*Dama dama*), pine marten (*Martes martes*), hare (*Lepus timidus hibernicus*), otter (*Lutra lutra*), red squirrel (*Sciurus vulgaris*) and common frog (*Rana temporaria*) were observed on site during BnM walkover surveys.

Lepidopteran (butterfly) and Odonata (dragonflies and damselflies) species recorded on site included; marsh fritillary butterfly, ringlet (*Aphantopus hyperantus*), green-veined white (*Pieris napi*), meadow brown butterfly (*Maniola jurtina*), orange tip butterfly (*Anthocharis cardamines*), large white butterfly (*Pieris brassicae*), blue tailed damselfly (*Ischnura elegans*), brown hawker (*Aeshna grandis*), common darter (Sympetrum striolatum) and four-spotted chaser (*Libellula quadrimaculata*). Buff-tailed bumblebee (*Bombus terrestris*) has also been recorded commonly. During a BnM walkover surveys in August 2021, a marsh fritillary butterfly larval web was recorded in suitable habitat to the northwest of the site, indicating the presence of a population within the site. Additional areas of suitable habitat occur at other locations across the site, primarily along railway verges, remnant high bog at the margins and along site access tracks.

Common frog (*Rana temporaria*) has also been recorded within the site during walkover surveys undertaken in 2201.

Ringed plover (*Charadrius hiaticula*) and snipe (*Gallinago gallinago*) have been recorded during the breeding season on site. It is possible that kestrel could also breed on site, as suitable habitat exists at the margins, Other more common species recorded within the site include buzzard (*Buteo buteo*), willow warbler (*Phylloscopus trochilus*), mallard (*Anas platyrhynchos*), wood pigeon (*Columba palumbus*), swallow (*Hirundo rustica*), long-tailed tit (*Aegithalus caudatus*), green finch (*Carduelis chloris*), hooded crow (*Corvus cornix*), grasshopper warbler (*Locustella naevia*), mute swan (*Cygnus olor*), skylark (*Alauda arvensis*), jay (*Garrulus glandarius*), pheasant (*Phasianus colchicus*), blue tit (*Cyanistes caeruleus*) and grey heron (*Ardea cinerea*).

3.3.3 Invasive Alien Species

The only non-native invasive species, listed on the Third Schedule of the EC Birds and Natural Habitats Regulations, identified within the site during Bord na Mona site visits was *Rhododendron ponticum*. A stand of individual plants was located within an area of cutover bog in 2012.

3.4 Statutory Nature Conservation Designations

There is regular overlap between Derryfadda and the Suck River Callows NHA (site code 000222) and the Suck River Callows SPA (site code 0004097). Suck River Callows SPA has been designated for its importance for wintering wildfowl and species of conservation importance including; wigeon (*Anas penelope*), golden plover (*Pluvialis apricaria*), lapwing (*Vanellus vanellus*), Greenland white-fronted goose (*Anser albifrons flavirostris*) and whooper swan (*Cygnus cygnus*).

There are Special Areas of Conservation (SAC) located within or adjacent to Derryfadda Bog. The nearest SCA to Derryfadda Bog is Killeglan Grassland SAC, located to the east of the River Suck.

Due to its location within the catchment, Derryfadda is hydrologically connected to the Suck River Callows SPA located to the east of the site. In addition, both the River Shannon Callows SAC and Middle Shannon Callows SPA are located in excess of 30km (surface water distance) downstream of Derryfadda via the River Suck.

This rehabilitation plan has been subject to the Appropriate Assessment process, as per Article 6 of the EU Habitats Directive 92/43/EEC. The Appropriate Assessment has been provided as part of the accompanies documentation. A full list of EU Designated Sites occurring within the likely zone of impact of Derryfadda bog is provided in the accompanying Appropriate Assessment documentation.

No non-statutory designated sites i.e. proposed Natural Heritage Areas (pNHAs) occur in the wider area around Derryfadda bog.

3.5 Hydrology and Hydrogeology

Derryfadda bog is drained by the River Suck, located adjacent to the east of the site boundary. As such, Derryfadda bog forms part of the flood plain of the River Suck, regularly flooding during winter and occasionally at other times when the water levels on the river are high. This bog is a pumped bog with the water table lower than the surrounding area. The adjacent River Suck is a tributary of the River Shannon (Upper), with the confluence located at Shannonbridge. A narrow band of raised bog remnant and some Birch woodland separates the site from the River Suck to the east. The northern part of the site is bisected by the Killaderry stream, EPA reference code: IE_SH_26K050940, a tributary of which also occurring within the cutaway. The most southern parcel of the bog is separated by the Lughanagh stream, which enters the River Such to the east of the site.

Derryfadda forms part of the Upper Shannon Catchment (Catchment ID : 26D) as defined by the EPA under the Water Framework Directive (WFD) and is situated within the Suck_SC_070 Sub-Catchment. The bog is located along the floodplain of the river Suck north of the town of Ballinasloe. The bog contains several drainage pathways which primarily drain in a south-easterly direction towards the River Suck. Derryfadda is a pumped bog (see Drawing no. MnM_DR23_12_02 '*Structures and sampling*', Appendix XIII).

Regional hydrological data suggest that Derryfadda receives average precipitation of 990mm/yr (1981-2010), with an estimated evapotranspiration rate of c. 513mm/yr, leaving an average effective precipitation of 477mm/yr. Assuming no recharge to groundwater and no groundwater contribution to discharge from the bog, the available precipitation that may become runoff (assuming no change in storage) is 477mm/yr, which equates to an annual runoff rate of c. 4,770m3/ha.

GSI data indicates that Derryfadda is underlain by Visean limestone and the Lucan Formation. The Visean limestone is classified as regionally important aquifer as it is subject to karstification (conduit). The Lucan formation is a Locally Important Aquifer as it is Moderately Productive only in Local. There is a mapped karst features on the bog (swallow hole) along with several karst features in the surrounding area including enclosed depressions, turloughs and swallow holes.

Groundwater Vulnerability is a term used to represent the intrinsic geological and hydrogeological characteristics that determine the ease with which groundwater may be contaminated by human activities. Groundwater vulnerability maps are based on the type and thicknesses of subsoils (sands, gravels, glacial tills (or boulder clays), peat, lake and alluvial silts and clays), and the presence of karst features. Groundwater is most at risk where the subsoils are absent or thin and, in areas of karstic limestone, where surface streams sink underground at swallow holes.

Quaternary Sediment maps show Derryfadda underlain by peat, yet surrounded by inorganic deposits, including Till derived chiefly from Limestone and alluvium to the east (along the River Shannon). Lacustrine marl deposits have also been mapped within the bog. GSI groundwater vulnerability mapping indicates that there is generally low vulnerability in the area of the bog however there are areas of high and extreme vulnerability both within and immediately adjacent to the bog, owing to the presence of karstified limestone features, bedrock close to the ground surface and the mapped swallow hole within the bog. While Groundwater Vulnerability is typically used to indicate the susceptibility to groundwater pollution, it can provide a useful proxy indication of likely groundwater flow rates in the surrounding area.

3.6 Emissions to surface-water and water-courses

Drainage is an important feature of industrial peat production and there were extensive field drains maintained throughout bog areas to facilitate industrial peat production annually, each of which eventually drains into a

terminal silt pond that allows for settlement of suspended solids before entering the main river systems. In accordance with the existing Integrated Pollution Control licence, all drainage water from boglands in a licensed area is discharged via an appropriately designed silt pond treatment arrangement as required in Condition 6.6. of the licence.

Silt ponds are the key silt control infrastructure to control potential emissions from industrial peat production sites. As required under licence, BNM have a number of procedures for how it manages and maintains its silt pond network. The silt that builds up in silt ponds is excavated on a regular basis by Bord na Móna to facilitate an efficient level of silt control. Silt ponds will continue to be maintained during the rehabilitation and decommissioning period. Silt pond decommissioning will be considered when sites are deemed to be on a trajectory of environmental stability and peatland rehabilitation has been completed.

Derryfadda/Killaderry bog has 16 treated surface water outlets to the River Suck. There are 7 direct to the River Suck (IE_SH_26S071200 SUCK_130), 5 to the Killaderry Stream (IE_SH_26K050940) and the balance of 4 to the Lughanagh Stream (IE_SH_26L530780).

Details of silt ponds, associated surface water emission points and those being monitored and sampled as part of the PCAS scheme are detailed on the accompanying structures map along with water quality map. See Drawing number BNM-DR-23-12-02 titled **Derryfadda Bog: Structures and Sampling**, along with Drawing number BNM-DR-23-12-WQ01 titled **Derryfadda Bog: Water Quality Map** included in the accompanying Mapbook, which illustrate the various drainage and water quality infrastructure present at Derryfadda.

There is a robust monitoring program to track and verify any changes in baseline water quality conditions pre and post decommissioning and rehabilitation so that the success or otherwise can be tracked and verified for the National Parks & Wildlife Service, Environmental Protection Agency and Local Authority Water Program, amongst a range of stakeholders.

The main emission limit value associated with this bog is 35mg/l suspended solids, with trigger levels for ammonia of 3.7 mg/l and COD 100mg/l.

Initial monthly ammonia concentrations from August 2020 to September 2021 have a range of .017 to 2.2 mg/l with an average of 0.342mg/l.

Results for suspended solids for the same period indicate a range of >2 to 8mg/l with an average of 4.45mg/l.

From an analysis of any monitoring over the past 5 yrs. of the IPC licence environmental monitoring of some of the discharges from this bog, indicate that results were under the ELV for SS and Ammonia and broadly under the trigger levels for COD.

Bog	SW	Monitoring	pH	SS mg/l	TS mg/l	Ammonia mg/l	TP mg/l	COD mg/l	Colour
Derryfadda	SW-107	Q3 19	7	<5	171	1.3	0.06	82	337
Killaderry	SW-108	Q3 19	7	26	258	0.28	<0.05	89	349
Killaderry	SW-109	Q3 19	6.6	5	162	1.4	<0.05	96	319
Killaderry	SW-110	Q3 19	7	<5	186	0.27	0.06	91	406
Killaderry	SW-111	Q3 19	6.5	8	165	0.098	<0.05	89	387
Killaderry	SW-112	Q3 19	6.5	7	101	0.717	<0.05	77	315
Killaderry	SW-113	Q3 19	6.8	5	289	0.572	<0.05	98	672
Killaderry	SW-114	Q3 19	6.8	5	133	0.86	<0.05	78	296
Killaderry	SW-115	Q3 19	6.7	<2	126	0.741	<0.05	64	267
Derryfadda	SW-99	Q4 19	6.7	7	91	0.285	<0.05	45	229
Derryfadda	SW-100	Q4 19	7.4	<2	343	0.009	<0.05	68	285
Derryfadda	SW-101	Q4 19	6.4	<2	74	0.247	<0.05	47	218
Derryfadda	SW-102	Q4 19	6.5	3	246	0.128	<0.05	98	397
Derryfadda	SW-103	Q4 19	6.6	2	109	0.281	<0.05	42	225
Derryfadda	SW-107	Q2 18	7.6	5	234	2.2	0.05	56	176
Killaderry	SW-108	Q2 18	7.7	5	252	0.27	0.05	51	113
Killaderry	SW-109	Q2 18	7.7	5	220	1.2	0.05	69	197
Killaderry	SW-110	Q2 18	7.8	5	230	0.34	0.05	60	124
Killaderry	SW-114	Q2 18	7.7	5	214	1.7	0.05	73	227
Killaderry	SW-115	Q2 18	7.8	5	284	2.8	0.07	28	124
Killaderry	SW-111	Q2 18	7.5	5	198	0.1	0.05	71	223
Killaderry	SW-112	Q2 18	7.4	5	190	0.78	0.05	33	177
Killaderry	SW-113	Q2 18	7.7	6	288	0.28	0.05	70	210
Derryfadda	SW-99	Q3 18	5.9	5	104	0.79	0.05	66	195
Derryfadda	SW-100	Q3 18	7.1	5	110	0.64	0.05	62	286
Derryfadda	SW-101	Q3 18	7.3	5	134	0.29	0.07	57	165
Derryfadda	SW-102	Q3 18	7.2	5	156	0.02	0.05	78	302
Derryfadda	SW-103	Q3 18	7.3	5	164	0.91	0.05	62	181
Derryfadda	SW-100	Q1 16	6.4	5	86	0.44	0.09	123	139
Derryfadda	SW-101	Q1 16	6.4	5	116	0.43	0.05	46	145
Derryfadda	SW-102	Q1 16	7.6	5	364	0.07	0.05	41	125
Derryfadda	SW-103	Q1 16	7.4	5	186	0.97	0.05	42	126
Derryfadda	SW-104	Q1 16	7.3	5	174	0.86	0.06	48	145
Derryfadda	SW-105	Q1 16	7.4	5	210	1.2	0.05	49	118
Derryfadda	SW-106	Q1 16	7.5	5	270	2.3	0.05	31	98
Derryfadda	SW-107	Q2 16	7.9	6	178	0.02	0.05	48	119
Killaderry	SW-108	Q2 16	7.1	16	262	0.12	0.08	78	174
Killaderry	SW-109	Q2 16	7.5	5	224	1.8	0.05	47	136
Killaderry	SW-110	Q2 16	7.6	5	170	0.44	0.05	52	183
Killaderry	SW-111	Q2 16	7.3	10	160	0.18	0.05	93	238
Killaderry	SW-112	Q2 16	7.1	5	156	0.87	0.05	82	314
Killaderry	SW-113	Q2 16	7.5	5	132	0.41	0.05	46	181
Killaderry	SW-114	Q3 16	6.8	5	236	0.94	0.05	67	178
Killaderry	SW-115	Q3 16	7.2	5	144	1.1	0.05	65	208
Killaderry	SW-99	Q4 15	5.2	5	50	0.53	0.05	71	166

Decommissioning and Rehabilitation Programme Water Quality Monitoring.

The licence obligation of quarterly sampling regime on a selected number of ponds to be sampled over a 3 year cycle will not be sufficient to be able to appropriately track the changing water chemistry that will occur as part of this enhanced rehabilitation programme, so this sampling regime will occur on a monthly basis.

In order to assist in monitoring surface water quality from this bog, it was agreed to increase the existing licence monitoring requirements of the IPC Licence, to sampling for the same parameters every month.

This new sampling programme commenced in November 2020 and is enabling a baseline to be established, with sampling to progress during the scheduled works, and for a period of up to 2 years post rehabilitation. Depending on the period required to confirm that the main two parameters, suspended solids and ammonia as remaining compliant with the licence emission and trigger limit values and there is an improving trajectory in these two parameters i.e. reduction in concentration, the monitoring programme and intensity will be periodically reviewed and amended.

In the preparation of this monitoring programme, Bord na Mona have been providing the Local Authority Water Programme (LAWPRO) with details of the surface water emissions points associated with this bog and will be amending some of the proposed monitoring locations on foot of this engagement. LAWPRO have in turn provided details of their 2021 monitoring programme and these are included in the Water Quality Map.

This is necessary to ensure that there is alignment with the WFD monitoring programme and that where possible, the monitoring programme will enable any improvements in water quality or establishing trends to be quantified against any available WFD monitoring data. It will also enable the periodic sharing of data which will inform the monitoring reports, success criteria and enable LAWPRO under the Water Framework Directive to track any changes in pressures and be aware of changes in water chemistry.

This enhanced monitoring programme will aim to include a minimum of 70% of a bog's drainage catchments, whatever number of surface water outlets these include.

Monitoring results will be maintained, trended every six months and reported on each year and as required, as part of the requirement to report on Condition 10.1 of the IPC Licence on Bog Rehabilitation in the Annual Environmental Report, and will be provided to LAWPRO and the EPA as required to inform progress and national monitoring requirements under the WFD. These results will also be available in April each year as a requirement of the Annual Environmental Report at www.epa.ie.

The parameters to be included as per condition 6.2 of the IPC Licence include monthly monitoring for pH, Flow, Suspended Solids, Total Solids, Total Phosphorus, Total Ammonia, Colour & COD. In addition, DOC has been included as a parameter to try and identify any changes in carbon in the surface water, and where required by LAWPRO, to assist in investigating other changes in water chemistry, the series of parameters can be reviewed and amended.

Water quality of water discharges from restored/rehabilitated peatlands normally improves as a result of bog rehabilitation and restoration measures and the restoration of natural peatland processes (Bonn *et al*., 20017). Peatland rehabilitation is also expected to improve water attenuation of the site as the drains are blocked, slowing water movement and water release from the site. Restored peatlands help slow the release of water and aid the natural regulation of floods downstream (Minayeva *et al*., 2017). The National River Basin Management Plan (NRBMP) 2018-2021 (DHPCLG, 2017) is the key national plan for Ireland to achieve the objectives of the Water Framework Directive (WFD). The NRBMP outlines how key actions such as the Bord na Móna Raised Bog Restoration Project and ongoing Bord na Móna rehabilitation is expected to have a positive impact on water quality and help the NWBMP deliver its objectives in relation to the WFD.

Water will still discharge from designated emission points when rehabilitation at Derryfadda Bog has been completed. The existing silt the silt pond will continue to be maintained and operated as long as required, or such point as they can be decommissioned, with no change in outfall type This discharge will have improving water quality and there will be increased wetland attenuation, meaning slower release of water. This is expected to have a positive impact on status of the key downstream water body receptors, and is expected to support the improvement of the current and future status of Silver River, currently assessed as being of Moderate Status.

3.7 Fugitive Emissions to air

None

The bog is no longer in industrial peat production. Rehabilitation of the cutaway peatland will seek to re-wet the dry peat where possible, and re-vegetate all areas (whether wet or dry). Collectively, ceasing industrial peat production, re-wetting and re-vegetating will minimise any risk of emission to air from dust.

3.8 Carbon emissions

The bog is likely to be a carbon source as it is a drained (degraded) peatland with currently active drainage, which facilitates the oxidation of peat. Peat extraction generally transforms a natural raised bog which acts as a modest carbon sink into a cutaway ecosystem which is a large source of carbon dioxide (2–5 t C/ha/year) (Waddington & McNeil, 2002; Alm *et al*., 2007; Wilson *et al*., 2007, Wilson *et al*., 2015). Furthermore, they are also a significant source of methane (Huttunen *et al*., 2003; Laine *et al*., 2007a) as a consequence of the conditions within the peat body that provide a suitable environment for the microbial breakdown of plant litter and root exudates. Degraded peatlands also release carbon/GHG emissions via the fluvial/aquatic pathway (Dissolved Organic Carbon – DOC, Suspended Solids/Particulate Matter, degassing of GHGs from water).

The EPA-funded CarbonRestore Project (Renou-Wilson et. al. 2012) found that rewetting of drained peatlands can lead to restoration of functional peatland, such as the return of typical plant and animal species, which in turn may lead to the restoration of peat-formation and the C-sink function.

It is expected that Derryfadda Bog can become a reduced carbon source following rehabilitation. The potential of any cutaway site to develop as a reduced carbon source/carbon sink in the longer-term depends on the success of the rehabilitation measures, the extent of development of *Sphagnum*-rich or other peat-forming habitats, the balance of carbon fluxes from different cutaway habitats and future climatic conditions. The site is expected to develop Reed Swamp and fen habitats. Birch woodland is expected to develop on the drier mounds and peripheral headlands.

4. CONSULTATION

4.1 Consultation to date

Consultation will seek to engage an audience of relevant stakeholders at both a national and local level. National stakeholders have been identified from varied bog restoration and rehabilitation efforts undertaken by Bord na Móna over the past 40 years, with particular emphasis on engagement with stakeholders during their Biodiversity Action Plan programme since 2010. National Stakeholders includes relevant government departments and agencies, relevant semi-state bodies, NGOs and other environmentally-focused groups with a national remit. Stakeholders can be emailed a copy of this draft plan when it has been finalised internally by Bord na Móna, and invited to make submissions on the objectives and content of this plan in relation to Derryfadda Bog.

There has been ongoing consultation about rehabilitation, biodiversity and other general issues over the years about the Blackwater group bogs including Derryfadda Bog with various stakeholders in relation to:

- General consultation with range of stakeholders at annual Bord na Mona Biodiversity Action Plan review days 2010-2018.
- Foss, P.J., Crushell, P. & Gallagher, M.C. (2017). Counties Longford &Roscommon Wetland Study. Report prepared for Longford and Roscommon County Councils.
- Midlands & East Regional WFD Operational Committee (River Basin Management Plans).
- Sub-committee on Shannon Flooding Work Programme and Measures (OPW, Waterways Ireland, ESB, LA's, Fisheries Ireland, NPWs etc).
- Archaeological Liaison Committee (National Museum of Ireland & Dept of Culture Heritage and the Gaeltacht).
- Ballyforan local community group – in relation to the development of a walkway amenity across Derryfadda Bog (2020-2021).

Local stakeholders will continue to be identified through ongoing engagement with neighbours whose land adjoins Derryfadda Bog. Additionally, local representatives of national bodies (such as Regional National Parks and Wildlife staff) and relevant offices in County Councils (such as the Heritage or Environmental Offices) will be contacted. Any identified local interest groups will also be sought and informed of the opportunity to engage with this rehabilitation plan, and when identified will be invited to submit their comments or observations in relation to the proposed rehabilitation at Derryfadda Bog.

All correspondence received will be acknowledged and evaluated against the rehabilitation work proposed here, and the final draft of the Derryfadda Bog Rehabilitation Plan will contain a review of the consultation.

4.2 Issues raised by Consultees

N/A. Not issued to consultees yet.

4.3 Bord na Móna response to issues raised during consultation

N/A

5. REHABILITATION GOALS AND OUTCOMES

The rehabilitation goals and outcomes outline what Bord na Móna want to achieve by implementing the rehabilitation. These include:

- Meeting conditions of IPC Licence.
- Stabilisation or reduction in water quality parameters of water discharging from the site (e.g. suspended solids).
- Reducing pressure on receiving water-bodies that have been classified as At Risk from peatlands and from peat extraction, via stabilization or improving water-quality from this bog, and therefore, reducing pressures.
- Optimising hydrological conditions for **climate action benefits as part of PCAS**. Optimising hydrology for the development of embryonic *Sphagnum*-rich vegetation communities on deep peat, and eventually naturally functioning and peatland habitats.
- Optimising hydrological conditions for the development of reed swamp and fen on shallow more alkaline peat and other subsoils.
- Optimising hydrological conditions for the protection of exposed archaeological structures, their retention in situ and preservation into the future, where possible.
- Supporting ongoing and future amenity land-use planning. Integrating rehabilitation measures with proposed amenity infrastructure on site. It is not proposed to carry out any rehabilitation actions to change or negatively affect any amenity infrastructure.
- Taking account of potential future Bord na Móna land-uses, such as renewable energy.
- The main goal and outcome of this plan is the successful rehabilitation (environmental stabilisation) of peatlands used for industrial peat production at the bog in a manner that is acceptable to both external stakeholders and to Bord na Móna and which optimise climate action and other ecosystem service benefits.

The rehabilitation goals and outcomes take account of the following issues.

- It will take some time for stable naturally functioning habitats to fully develop at Derryfadda Bog. This will happen over a longer time-frame than the implementation of this rehabilitation plan.
- Re-wetting residual peat will initially maintain and enhance the carbon storage capacity of the bog. There is scientific consensus that restoration of hydrology in damaged bog can improve carbon storage, water storage and attenuation and help support biodiversity both on the site and in the catchment (see Section 3.8). This will reduce carbon emissions from the site from a larger carbon source to a smaller carbon source. In time, the site has the capacity to develop in part as a carbon sink. PCAS is expected to deliver significant contributions to Ireland's climate action.
- It is not expected that the site has the potential to develop active raised bog (ARB) analogous to the priority EU Habitats Directive Annex I habitat within the foreseeable future (c.50 years). However, extensive areas of deep Sphagnum peat do remain within the southern and most northern parcels of the bog and do have potential to develop *Sphagnum*-rich habitats in this timeframe. Areas within the centre of the site have been largely cur away with shallow peat. In addition, areas of shell marl and fen peat remain in this area and as such, are likely to develop more fen and reedbed type habitats in the future. Nevertheless, re-wetting across the entire bog, as part of the Scheme, will improve habitat conditions of

the whole bog, making the overall bog wetter. Other peatland habitats will develop in a wider mosaic that reflects underlying conditions.

- Rehabilitating former industrial peat production bog will also in the longer-term support other ecosystem services such as such the development of new habitat to support biodiversity and local attenuation of water flows from the bog.
- WFD status in receiving water bodies can be affected by peatlands and peat extraction but is also affected by other sources such as agriculture. In addition, receiving water bodies that are assessed as At Risk from peatlands and from peat extraction are likely to have several contributary sources of impacts (private peat extraction and Bord na Móna).
- Re-wetting in general will benefit the future preservation of most known and unknown archaeological features.
- Bord na Móna are also planning rehabilitation measures, in 2021, in Castlegar bog located adjacent to the south of Derryfadda. There are expected to be cumulative water quality and other ecosystem service benefits to receiving water bodies such as the River Suck, associated tributaries and the downstream River Shannon (Upper), from rehabilitation more than one bog in the same catchment.

6. SCOPE OF REHABILITATION

The principal scope of this rehabilitation plan is to rehabilitate the bog. This is defined by:

- The area of Derryfadda Bog targeted for peatland rehabilitation (Drawing reference no. DR23_12_01 '*Bog site location', Appendix XIII of this report*).
- EPA IPC Licence - Ref. PO-502-01. As part of Condition 10.2 of this license, a rehabilitation plan must be prepared for permanent rehabilitation of the cutaway boglands within the licensed area. Derryfadda bog is part of the Derryfadda bog group, a sub-group of the Blackwater bog group.
- The Scheme is designed to exceed the stabilisation requirements as defined by the IPC Licence. This Scheme is designed to enhance the ecosystem services of Derryfadda Bog, in particular, optimising **climate action benefits**. The proposed interventions will mean that environmental stabilisation is achieved (meaning IPC obligations are met) and, in addition, significant other ecosystem service benefits particularly for climate action will be accrued.
- The local environmental conditions of Derryfadda Bog identify cutaway re-wetting as the most suitable rehabilitation approach for the shallow peat areas within the site. In some central parts of the site, where shallow peat depths remain, there is an alkaline influence on the water chemistry. This means that re-wetting will lead to the development of fen, reed swamp and other associated wetland/peatland habitats.
- Exposed gravel ridges within the site will further benefit from targeted drain blocking and water management measures to facilitate revegetation.
- The BnM review of a potential renewable energy project at Derryfadda Bog is a temporal constraint on the scope of rehabilitation. It is expected that the decision to develop a renewable energy project at Derryfadda Bog will take place within 1-2 years.
- The key objective of rehabilitation, as defined by this licence, is **environmental stabilisation** of the bog. Bord na Móna have defined the key goal and outcome of rehabilitation at Derryfadda Bog as **environmental stabilisation** and **optimising suitable hydrological conditions, and setting the site on a trajectory towards the development of naturally functioning peatland habitats (fen, reed swamp and other associated wetland habitats).**
- Rehabilitation of Derryfadda Bog will support multiple National strategies of climate action, biodiversity action and other key environmental strategies such as the Water Framework Directive.
- The time frame for the delivery of the planned rehabilitation will be undertaken according to available resources and appropriate constraints.
- Some rehabilitation measures are proposed on the marginal cutover bog zone at the peripheries of the bog.

6.1 Key constraints

Bog conditions. Rehabilitation outcomes of sites are constrained by the environmental characteristics of these particular areas. For example, there is potential for raised bog restoration at some bogs where there has not been significant industrial peat extraction and the peat body is largely intact (deep peat sites that are drained). At other bogs, most of the peat mass has been removed, the environmental characteristics of these areas have therefore changed radically (peat depths, hydrology, water chemistry, substrate type, nutrient status), and there will therefore be different habitat outcomes (wetlands, fen, heathland, grassland and birch woodland).

- At Derryfadda Bog, much of the bog has been cutaway, particularly the central section. There are local factors that will influence the future trajectory of this site (it was always a relatively 'wet' bog due to its proximity to the River Suck, and is therefore being pumped to manage water levels) which need to be considered as part of the wider rehabilitation work.
- **Potential land-use.** Bord na Móna are reviewing the potential to develop a potential renewable energy project at Derryfadda Bog. It is expected that this review will be completed in 1-2 years. In advance of this review of renewable energy potential, it is proposed to rehabilitate **part** of Derryfadda Bog in 2022 that is not constrained (see drawing number BNM-DR-23-12-05: Enhanced Rehab Measures and BNM-DR-23-12-20: Standard Rehab Measures).
- Bord na Móna remain committed to rehabilitating all of Derryfadda Bog and to meeting IPC Licence conditions for this bog. The remaining area will be rehabilitated after the renewable energy review is complete. The peatland rehabilitation will **either** be in association with a potential renewable energy project, with peatland rehabilitation integrated into the proposed project, **or** will be completed in the absence of any proposed renewable energy project. Phasing rehabilitation in way has the potential to support additional climate action measures (integrating renewable energy). At this stage, it is not anticipated that any future potential land-use on the site will impact on the proposed rehabilitation.
- **Potential land-use.** A walkway amenity is being proposed for this site. Re-wetting will be planned as to facilitate potential future amenity. Future amenity does not constrain re-wetting at this site as the walkway is being proposed for decommissioned walkways and headlands, which would not be targeted for re-wetting.
- **Surrounding landscape and neighbours.** Another key constraint is the interaction between the Bord na Móna sites and the surrounding landscape. Care must be taken that no active rehabilitation management is carried out that could negatively and knowingly impact on surrounding land. This includes any hydrological management on neighbouring farmland. It is anticipated that the work proposed here (blocking drains and re-wetting cutaway peatlands) will not have any flooding impacts on adjacent land. For example, commercial Coillte forestry plantation occurs outside of, but adjacent to, the northeast corner of Derryfadda bog.
- **Archaeology**. The discovery of monuments or archaeological objects during peatland rehabilitation may potentially constrain the rehabilitation measures proposed for a particular area. If this occurs, rehabilitation measures will be reviewed and adapted. An archaeological impact assessment of the proposed rehabilitation at Derryfadda Bog will be carried out (see Appendix XII).
- **Public Rights of Way**. Where a public right of way or similar burden exists on Bord na Móna property, consideration will be given to ensuring that this remain intact where possible. In some instances, depending upon previous land-uses and management, alternative solutions may be required. These will be explored in consultation with local communities and statutory bodies during the consultation work associated with the decommissioning and rehabilitation work described here.

6.2 Key Assumptions

- It is assumed that Bord na Móna will have all resources required to deliver this project.
- It is expected that weather conditions will be within normal limits over the rehabilitation plan timeframe. Long periods of wet weather have the capacity to significantly affect ground conditions and constrain practical rehabilitation.

6.3 Key Exclusions

The scope of this rehabilitation plan does not cover:

- The longer-term raised bog restoration trajectory of the site. The plan covers the short-term rehabilitation **actions** and **an additional monitoring and after-care programme** to monitor the rehabilitation during the Scheme and to respond to any needs (failure of environmental stabilisation for example). It is expected that this rehabilitation plan will set the site on an enhanced and accelerated trajectory towards environmental stabilisation and wetland creation. The plan does not set any goals or outcomes, for example, the extent (specific area) of active raised bog habitat (ARB) that may develop at this site in the long-term. This is beyond the scope of this rehabilitation plan.
- This plan is not intended to be an after-use or future land-use plan for Derryfadda Bog.
- The longer-term management of this site, potentially as a nature conservation site, or for amenity, or for other uses in the future. This will require further engagement with stakeholders.

7. CRITERIA FOR SUCCESSFUL REHABILITATION

This section outlines what criteria will be used to indicate successful rehabilitation and what key criteria/targets will be used to mark the achievement of the rehabilitation goals and outcomes and validate the completion of the rehabilitation.

A key objective of this rehabilitation plan is **environmental stabilisation** and the stabilisation of any emissions from the site that related to the former industrial peat extraction activities.

Rehabilitation is generally defined by Bord na Móna as

- stabilisation of bare peat areas via targeted active management (e.g. drain-blocking/re-wetting) slowing movement of water across the site and encouraging natural colonisation, and,
- mitigation of key emissions (e.g. suspended solids).

In addition, Bord na Móna wish to optimise climate action and other ecosystem service benefits via enhanced rehabilitation measures.

7.1. Criteria for successful rehabilitation to meet EPA IPC licence conditions:

- Rewetting of residual peat in the former area of industrial peat production to offset potential run off of suspended solids and to encourage development of vegetation cover via natural colonisation, and reducing the area of bare exposed peat. Table 7.1 provides a summary of the criteria for successful rehabilitation and associated monitoring. The target will be the delivery of measures and this will be measured by an aerial survey after rehabilitation is completed.
- That there is a stabilizing/improving concentration of suspended solids and ammonia in discharges from Bord na Móna sites, associated with the measures undertaken to stabilize the peat surface by the blocking of the internal drainage system and the maximized rewetting of the peat surface.This will be demonstrated by developing a stable or downward trajectory of water quality indicators (suspended solids and ammonia) towards what would be typical of a re-wetted cutaway bog. This will be measured via water quality monitoring (suspended solids and ammonia) for at least 2 years after the rehabilitation has been completed.
- Receiving water bodies have been classified under the River Basin Management Plan and this classification includes waters that are At Risk from peatlands and peat extraction. The success criteria will be that the At Risk classification will see improvements in the associated pressures from this peatland or if remaining At Risk, that there is an improving trajectory in the pressure from this peatland. This will be measured by the EPA Water Framework Directive monitoring programme.

With regard to predicting and estimating likely trends that might materialise or could be considered as a target, monitoring of surface water ammonia emissions from Longfordpass bog in Littleton over 3 yrs., post cessation of peat extraction with ongoing rehabilitation, were considered. These are indicating a downward trend in Ammonia concentrations, see Plate 7.1.

Similarly monitoring of surface water ammonia emissions from a Corlea bog in Mountdillon over 3 yrs. post cessation of peat extraction with ongoing rehabilitation, indicate downward trends, see Plate 7.2.

As the monthly monitoring program at Derryfadda continues in 2022 during the rehabilitation works, and data from the 2021 monitoring program is compiled, further trending will be produced to verify any ongoing trends.

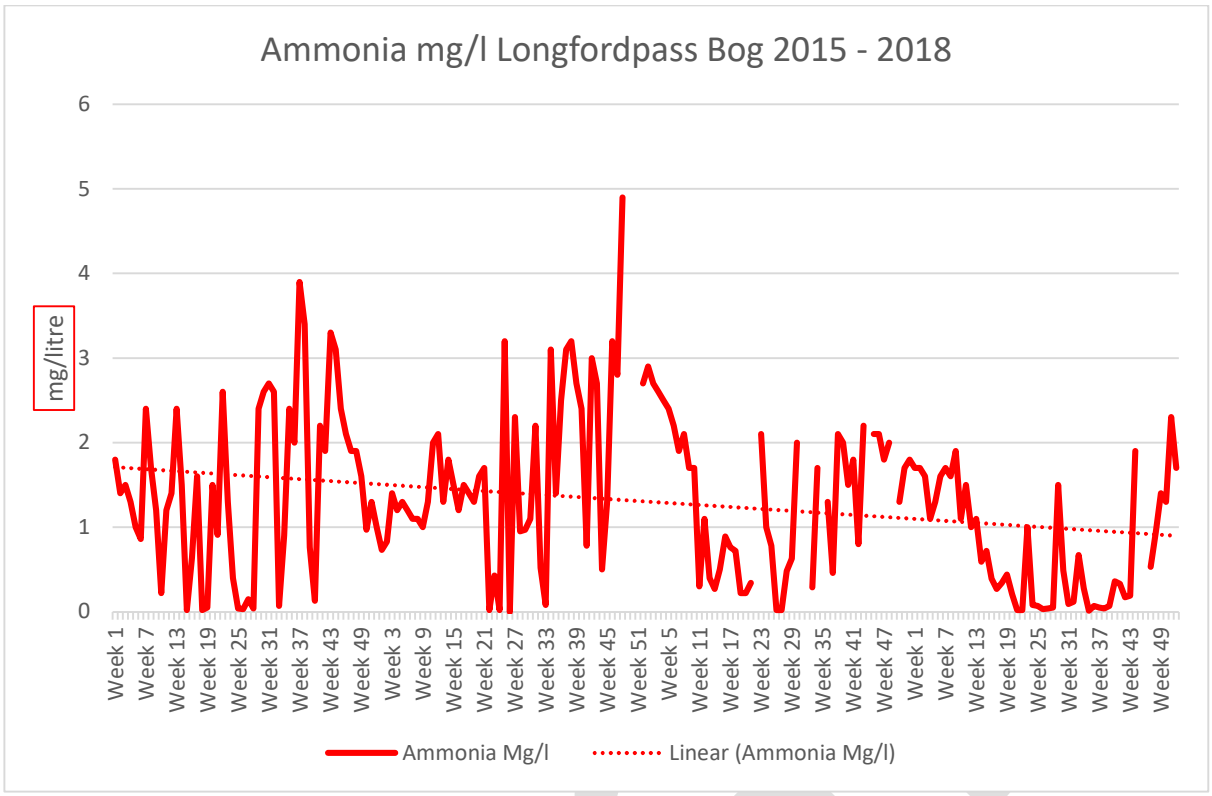

Plate 7.1 Example of decreasing ammonia emissions at Longfordpass bog following cessation of peat extraction and commencement of rehabilitation.

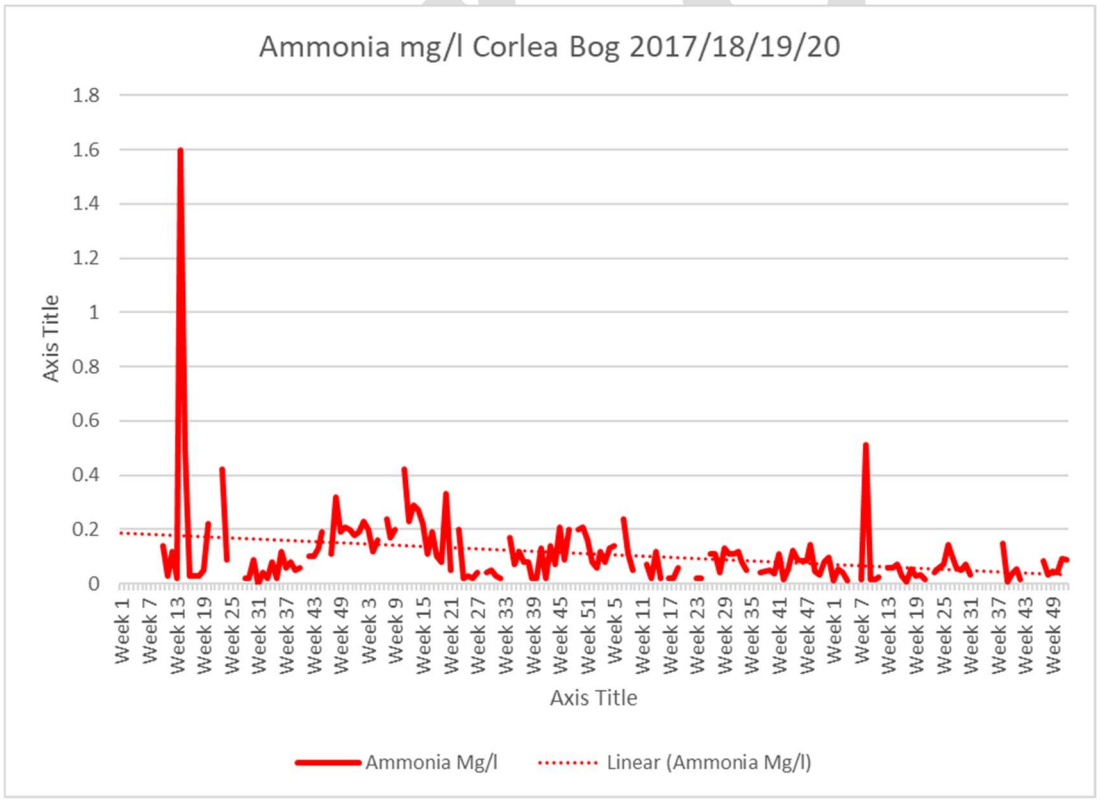

Plate 7.2 Example of decreasing ammonia emissions at Corlea bog following cessation of peat extraction and commencement of rehabilitation.

7.1.1 Additional criteria for successful rehabilitation for the optimisation of climate action and other ecosystem service benefits:

- Optimising the extent of suitable hydrological conditions to optimise climate action and other ecosystem service benefits (optimising residual peat re-wetting). This will be measured and demonstrated by site monitoring (updated aerial photography) to measure the extent of suitable hydrological conditions.
- Accelerating the trajectory of the site towards becoming reduced carbon source. This will be measured through habitat mapping and the development of cutaway bog condition assessment. This cutaway bog condition assessment will include assessment of environmental and ecological indicators such as vegetation cover, vegetation communities, presence of key species, *Sphagnum* cover, bare peat cover and water levels (similar to ecotope mapping).
- Reduction in carbon emissions. This will be estimated via a combination of habitat condition assessment and application of appropriate carbon emission factors derived from other sites. Baseline monitoring (habitat condition) will be carried after rehabilitation is completed (during the Scheme). It is proposed that sites can be monitored against this baseline in the future.
- Setting the site on a trajectory towards establishment of a mosaic of compatible habitats including, fen, reed swamp, wet woodland, heath, scrub, birch woodland, and embryonic *Sphagnum*-rich peatland communities, where conditions are suitable. These habitats will generally establish initially as pioneer vegetation. It will take some time for stable naturally functioning habitats to fully develop at Derryfadda Bog. This will be demonstrated by the reduction in bare peat and the establishment of further pioneering habitats. This will be measured via aerial photography, habitat mapping and cutaway/habitat condition assessment.
- Improvement in biodiversity and ecosystem services. This will be demonstrated by metrics outlined in Section 9.1 that can be used to measure changes in ecosystem services (e.g. water quality parameters, development of pioneer habitats, breeding bird monitoring etc). This will be measured by collecting a range of scientific data that can then quickly be adapted and into metrics that can be used to measure changes in various ecosystem services. Baseline monitoring will be carried after rehabilitation is completed (during the Scheme). It is proposed that sites can be monitored against this baseline in the future. These metrics will be defined in the context of the overall Scheme resources and after consultation with stakeholders.

Table 7.1. Summary of Success criteria, targets, how various success criteria will be measured and expected time-frames.

Criteria type	Criteria	Target	Measured by	Expected Time-frame
IPC validation	Rewetting in the former area of industrial peat production	Delivery of rehabilitation measures Reduction in bare peat.	Aerial photography after rehabilitation has been completed – to demonstrate measures (drain-blocking) Establishment of a baseline for future monitoring of bare peat, vegetation establishment and habitat condition.	2022-2025
IPC validation	Key water quality parameters Ammonia, Phosphorous, Suspended solids (silt), pH and conductivity	Reduction or stabilisation of key water quality parameters	Water quality monitoring. Started in advance of the proposed rehabilitation.	2020-2023
IPC validation	Reducing pressure from peat production on the local river catchment (WFD)	No decline in the WFD status of the local river catchment	EPA WFD monitoring programme	WFD schedule
Climate action verification	Optimising the extent of suitable hydrological conditions to optimise climate action	Optimal extent of suitable hydrological conditions	Aerial photography and Habitat mapping to map extent of suitable hydrological conditions. Baseline monitoring to be carried out during the Scheme when rehabilitation is complete. Sites can be re-monitored in the future and compared against this baseline.	2022-2025
Climate action verification	Reduction in carbon emissions.	Reduction in carbon emissions	Carbon emissions – estimated using a high bog condition assessment and appropriate carbon emission factors.	2022-2025

Criteria type	Criteria	Target	Measured by	Expected Time-frame
Climate action verification	Setting the site on a trajectory towards establishment of a mosaic of compatible habitats	Establishment of compatible cutaway habitats	Habitat map, Cutaway bog condition map Baseline monitoring to be carried out during the scheme when rehabilitation is complete. Sites can be re-monitored in the future and compared against this baseline.	2022-2025
Climate action verification	Biodiversity and ecosystem services. Habitat establishment Presence of key species – Sphagnum Wintering birds	Improvement in biodiversity and ecosystem services.	Metrics that relate to selected biodiversity and ecosystem services (to be defined). Presence of key species – Sphagnum – Walkover survey Baseline monitoring to be carried out during the Scheme when rehabilitation is complete. Sites can be re-monitored in the future and compared against this baseline.	2022-2025

Meeting climate action verification criteria and monitoring of these criteria after the Scheme has been completed is dependent on support from PCAS or other sources of funding. Note that monitoring and verification of the overall Scheme will be stratified – not all these criteria will be measured at each individual site.

7.2. Critical success factors needed to achieve successful rehabilitation as outlined in the plan

The achievement of successful rehabilitation as outlined in the plan requires:

- **Funding to pay for resources required to deliver the planned rehabilitation (Bord na Móna and external).** Bord na Móna maintains a Provision on its balance sheet to pay for these future costs when industrial peat extraction ceases. Bord na Móna is fully committed to meeting its obligations relating to rehabilitation and decommissioning under the Integrated Pollution Control Licence. It is expected that additional costs of enhanced rehabilitation will be supported by Government through the Climate Action Fund and Ireland's National Recovery and Resilience Plan.
- **Bord na Móna to have sufficient resources (staff and training) to deliver the planned rehabilitation with required associated skills and competencies.**
- **Bord na Móna to have sufficient resources (suitable machinery) and staff to maintain this machinery.**
- **Weather conditions to be within normal limits over the rehabilitation plan timeframe.** Long periods of wet weather have the capacity to significantly affect ground conditions and constrain the delivery of

rehabilitation. The potential impact of wet weather on ground conditions can be reduced by appropriate planning and management. Bord na Móna have significant experience of managing these issues through 70 years of working in these peatland environments.

- **Rehabilitation measures to be effective.** The rehabilitation measures proposed in this plan are based on 40 years of Bord na Móna experience of peatland management and best practise applied internationally in peatland management. Measures proposed in this plan have already been shown to be affective at other sites. Bord na Móna will apply a flexible and adaptable approach to the more innovative rehabilitation measures proposed in this plan**.** If measures are not initially effective, Bord na Móna will review any requirement for additional practical rehabilitation.
- **Natural colonisation of vegetation to develop semi-natural habitats at a rate within the normal limits.** The development of naturally functioning semi-natural habitats on cutaway peatland takes time. Pioneer vegetation can develop relatively quickly (3-10 years) and wetland habitats can develop relatively quickly. Birch woodland make take 20-30 years to develop. However, it may take 50 years for active raised bog vegetation to re-develop on ground that was previously cutaway. Different environmental conditions will have a significant impact on the rate of natural colonisation, and as a result of the combination of different environmental conditions and the application of different rehabilitation measures, there will be a variety of habitat outcomes.
- Rehabilitation measures have been designed to accelerate and work with natural colonisation and other natural processes. Bord na Móna experience of rehabilitation has shown that re-wetting improves conditions for natural colonisation and that natural colonisation is accelerated where the environmental conditions are most suitable. Rehabilitation measures have been designed to modify the conditions of areas within sites where conditions are less suitable for natural colonisation (modifying hydrology, topography, nutrient status or availability of potential seed sources).
- **Monitoring to be robust and effective.** Rehabilitation Monitoring will be established to validate the success of rehabilitation as required by Condition 10 of the IPC Licence and to verify the benefits of the proposed measures to optimise climate action. This will focus on a collecting a range of scientific data that can then quickly be adapted and into metrics that can be used to measure changes in various ecosystem services.

8. REHABILITATION ACTIONS AND TIME FRAME

Peatland rehabilitation requires detailed planning and the use of data from desktop surveys and field surveys. This data in association with remaining peat depths, topographical and hydrological modelling (see Drawing no's. BnM DR23_12_04 '*Peat Depths*', BnM DR23_12_03 *LiDAR map and BNM-DR-23-12-09: Depression Analysis*) will be important in planning the future peatland landscapes and planning the use of the most appropriate rehabilitation methodologies to maximise climate action benefits. Hydrological modelling (BNM-DR-23-12-09: Depression Analysis, *Appendix XIII*) indicates those areas that are likely to re-wet when drains are blocked, based on the current topography, and areas where water levels may have to be modified, where needed. Enhanced rehabilitation measures will look to optimise hydrological conditions for re-wetting peat in other areas. This planning is also essential for matching the most sustainable rehabilitation methodology to the most suitable cutaway environment to maximise the benefits of the resource outlay (maximising cost/benefit).

The rehabilitation actions will be a combination of PCAS measures to re-wet peat. The distribution of these measures is provisionally outlined in Drawing no. BnM DR23_12_05 '*Proposed rehab measures*', *Appendix XIII*. (Note that the actual distribution of these measures may be subject to change in response to stakeholder consultation and refinement of the enhanced rehabilitation measures.)

These enhanced measures for Derryfadda Bog will include:

- Re-assessment of the pumping regime and removing pumps if this desired and has no significant external impact. Initial hydrological modelling indicates that a parts of the east of the site, in close proximity to the River Suck, will develop a mosaic of open water and wetland habitats with permanent deeper water. Hydrological management will look to optimise summer water levels to maximise the development of wetland vegetation (by looking to set water depths at < 0.5 m, where possible). It is inevitable that some sections will naturally have deeper water due to the topography at this site. Water-levels will be adjusted at outfalls and by adjusting piped drainage. More sustainable permanent gravity drainage solutions will be examined. Some targeted bunding may be required. It is expected that a natural seasonal regime of water fluctuation will develop, with water-levels fluctuating in association with levels in the adjacent River Ruck.
- Intensive drain blocking around existing wetland or standing water to create/promote the spread of wetland habitats.
- Re-wetting some areas of the bog through regular field drain blocking using a dozer/excavator to create three peat barriers every 100 m along each field drain.
- Peat field re-profiling to reduce the camber of the fields and cell-bunding between high fields to manage/optimise water levels for revegetation.
- Re-alignment of piped drainage.
- Blocking drains in targeted existing pioneering vegetation mosaics, to accelerate re-wetting, and/or manage water levels to the correct height to accelerate the current trajectory towards reed swamp and fen, using a dozer/excavator.
- The creation of berms across some sections of the bog to control/retain water levels. This measure seeks to retain shallow (< 10 cm) water conditions across multiple fields.
- Re-wetting some deep peat areas of the bog through regular more intensive drain blocking using an excavator to create up to a maximum of seven peat dams/blockages every 100 m along each field drain, along with field re-profiling and drain infilling if required;
- Re-wetting the deep peat areas of the bog using berms, drain blocking and field re-profiling. This enhanced measure seeks to create large (c. 45m x 60m) flat areas or cells of shallow (< 10 cm) water

conditions on bare peat, across multiple fields that are enclosed by shallow berms to retain shallow surface water;

- Assessment of potential to remove/prevent the spread of the invasive species Rhododendron (*Rhododendron ponticum*) from the cutover bog within the centre of the site and the implementation of relevant control measures.
- Targeted fertiliser applications to accelerate vegetation establishment on areas of bare peat on headlands and high fields as required, see Drawing no. DR23_12_28 '*Targeted fertiliser map*', Appendix XIII.
- Modifying water levels at outfalls, as it may be desirable to change and control water levels at the site over time, e.g. to increase water levels as the site becomes increasingly vegetated. This will further slow the movement of water through and out of Derryfadda Bog. There is some blocking of drains in marginal (degraded) remnant raised high bog areas proposed as part of this plan, although they are small in size and degraded nature.
- The existing silt ponds will be retained and maintained during the rehabilitation phase. During the monitoring and verification phase the silt ponds will be continually inspected and maintained, where appropriate. When it is deemed that the silt ponds are not required, as the bog has been successfully stabilised and there is no run-off of suspended solids, the condition of the silt ponds will be reviewed. The silt ponds will either be de-watered (water levels lowered to a level where the silt pond will naturally develop as a small wetland feature), left in situ, or infilled (where discharges do not require silt control).
- Seeding of vegetation and inoculation of *Sphagnum* will be undertaken where required. In some areas where vegetation has already established, seeding of vegetation is not required.

Table 8.1: Types of and areas for enhanced rehabilitation measures at Derryfadda Bog.

Type	Code	Enhanced Rehabilitation Measure	Extent (Ha)
Dry cutaway	DCT2	Regular drain blocking (3/100 m) + blocking outfalls and managing water levels with overflow pipes + targeted fertiliser treatment	7.12
Wetland	WLT2	Turn off or reduce pumping to re-wet cutaway + blocking outfalls and managing water levels with overflow pipes + Targeted blocking of outfalls within a site	11.74
Wetland	WLT3	Turn off or reduce pumping to re-wet cutaway + blocking outfalls and managing water levels with overflow pipes + Targeted blocking of outfalls within a site + constructing larger berms to re-wet cutaway + transplanting Reeds and other rhizomes	3.01
Deep Peat	DPT4	Berms and field re-profiling (45m x 60m cell) + blocking outfalls and managing overflows with a controlled weir outfall + drainage channels for excess water + + Sphagnum inoculation	85.96
Marginal land	MLT1	No work required (Marginal land including Silt Ponds)	62.75
Marginal land	MLT2	More intensive drain blocking (7/100 m)	9.32
Constrained areas		Rehabilitation aligned to constraints	932.56
Silt ponds		Silt ponds	0.48
Total			**1112.94**

8.1 Short-term planning actions (0-1 years)

- Seek formal approval of the enhanced plan, noting the alternative adapted standard plan should funding from the Scheme not materialise, from the EPA.
- Agree an *ex ante* budget of eligible costs (based on the approved enhanced plan) with the Scheme regulator.
- Develop a detailed site plan with detailed site drawings outlining how the various rehabilitation methodologies (with the Scheme) will be applied to Derryfadda Bog. This will take account of peat depths, topography, drainage and hydrological modelling. (See Drawing no. BNM-DR-23-12-05: Enhanced Rehab Measures, Appendix XIII, for an indicative view of the application of different rehabilitation methodologies).
- Carry out a hydrology and drainage management assessment of the proposed enhanced rehabilitation measures;
- An Archaeological Impact Appraisal (AIA) will be undertaken. This will carry out a review of known archaeology and an archaeological impact appraisal of the proposed rehabilitation. Incorporate the results of this appraisal into the rehabilitation plan to minimise known archaeological disturbance, where possible;

- Carry out a review of issues that may constrain rehabilitation such as known rights of way, turbary and existing land agreements. There are no known rights of way at Derryfadda bog.
- Carry out a review of remaining milled peat stocks. It is expected that all peat stocks will eventually be removed or decommissioned.
- Carry out an ecological appraisal of the potential impacts of the planned rehabilitation, such as the presence of sensitive ground-nesting bird breeding species (e.g. curlew, ringed plover or lapwing) or marsh fritillary butterfly larval webs, etc. The scheduling of rehabilitation operations will be adapted, if needed. Surveys will be scoped and carried out based on the baseline ecological survey and previous knowledge of sites.
- Ensure all activities comply with the environmental protection requirements of the IPC Licence.
- An Appropriate Assessment (AA) of the Rehabilitation Plan will be undertaken. Incorporate any required mitigation measures from the AA in the plan for the delivery of rehabilitation and decommissioning across the site in accordance with the phasing and timeframe of the rehabilitation plan.
- Track implementation and enforcement of the relevant IPC Licence conditions, the mitigation measures (AA) and other environmental control measures during the implantation of the rehabilitation plan.

8.2 Short-term practical actions (0-2 years)

- Carry out proposed measures as per the detailed site plan. This will include a combination of hydrological management, drain blocking, peat field re-profiling and cell-bunding. All rehabilitation will be carried out with regard to best practice environmental control measures (Appendix IV).
- Monitor the success of rehabilitation measures in relation to developing suitable hydrological conditions.
- Carry out the proposed monitoring, as outlined in Section 9 of this report and accompanying documents.
- While natural colonisation is expected to commence almost immediately once peat production ceases, Phase 2 actions will be carried out in targeted areas to accelerate re-vegetation and colonisation of target species. Phase 2 actions will include fertiliser application on high fields and headlands (where there is bare peat).
- Silt-ponds will be monitored during this period and there will be continued maintenance and cleaning to prevent run-off of suspended solids from the site during the rehabilitation phase.
- Submit an *ex post* report to the Scheme regulator to verify the eligible measures to be carried out in year 1 of the Scheme, and an *ex ante* estimate for year 2 of the Scheme; and so on for each year of the Scheme

8.3 Long-term (>3 years)

- Evaluate success of short-term rehabilitation measures outlined above and remediate where necessary.
- Delivery of a monitoring, aftercare and maintenance programme (See section 10.2 below).
- Decommissioning of silt-ponds will be assessed and carried out, where required.
- Reporting to the EPA will continue until the IPC License is surrendered.

8.4 Timeframe

- 2021-2022. Short-term planning actions.
- 2022. Short-term practical actions.
- 2022-2025. Long term practical actions. Evaluate success of short-term rehabilitation measures outlined above and remediate where necessary.
- 2025. Long term practical actions. Decommission silt-ponds, if necessary.

8.5 Budget and costing

Bord na Móna (BnM) appreciates the Minister's intention to support Bord na Móna in developing a package of measures, 'the Scheme', for enhanced decommissioning, rehabilitation and restoration of cutaway peatlands referred to as, the Peatlands Climate Action Scheme'. *However, only the additional costs associated with the additional and enhanced rehabilitation, i.e, measures which go beyond the existing standard mandatory decommissioning and rehabilitation requirements arising from Condition 10 will be eligible for support.*

The enhanced decommissioning, rehabilitation and restoration of the peatlands funded by the Scheme will deliver benefits across climate action (GHG mitigation through reduced carbon emissions and acceleration towards carbon sequestration), enrich the State's natural capital, increase eco-system services, strengthen biodiversity, improve water quality and storage attenuation as well as developing the amenity potential of the peatlands.

Bord na Móna maintains a provision on its balance sheet to pay for the future costs of **standard** rehabilitation and decommissioning when industrial peat extraction ceases. This is updated every year - for more information see the Bord na Móna Annual Report (Bord na Móna 2021). Bord na Móna is fully committed to meeting its obligations relating to rehabilitation and decommissioning under the Integrated Pollution Control Licence.

At this time, a 'standard' rehabilitation provision (sufficient to discharge the requirement of Condition 10 in the licence) has been be allocated to the site based on the area of deep peat habitats, wetland habitats, shallow cutaway areas, drier areas, and regenerating bog communities across the bog (See Appendix I).

9. AFTERCARE AND MAINTENANCE

9.1 Programme for monitoring, aftercare and maintenance

This programme for monitoring, aftercare and maintenance has been designed to meet the Conditions of the IPC Licence. This is defined as:

- There will be **initial quarterly monitoring assessments** of the site to determine the general status of the site, the condition of the silt-ponds, assess the condition of the rehabilitation work, monitoring of any potential impacts on neighbours land, general land security, boundary management, dumping and littering.
- The number of these site visits will reduce after 2 years to bi-annually (two per year). This will further reduce to a single visit each year after 5 years.
- These monitoring visits will consider any further requirements for practical rehabilitation measures.
- The **baseline condition of the site will be established** post-rehabilitation implementation by using an aerial survey to take an up to date aerial photo, when rehabilitation is completed. The extent of bare peat will be assessed using this baseline data, and habitat maps will be updated.
- **Water quality monitoring** at the bog will be established. This will start in advance of the proposed rehabilitation. The main objective of this water quality monitoring will be to establish a baseline and then monitor the impact of peatland rehabilitation on water quality from the bog.
- In order to assist in monitoring surface water quality from this bog, it is planned to increase the existing licence monitoring requirements to sampling for the same parameters to every month during the scheduled activities and for a period up to two years. post rehabilitation, depending on the period required to confirm that the main two parameters, suspended solids and ammonia are remaining compliant with the licence emission and trigger limit values and there is an improving trajectory in these two parameters i.e. reduction in concentration.
- Water quality monitoring will aim to include up to 70% of a bog's drainage catchments.
- Monitoring results will be maintained, trended and reported on each year as part of the requirement to report on Condition 10.1 of the IPC Licence on Bog Rehabilitation in the Annual Environmental Report, which will be available in April each year at www.epa.ie.
- The parameters to be included (as per condition 6.2 of the IPC Licence) include monthly monitoring for pH, Suspended Solids, Total Solids, Total Phosphorus, Total Ammonia, Colour, COD and DOC.
- This monthly sampling regime on a selected number of silt ponds will be carried out over a three-year cycle. The original (licence) requirement was for a quarterly sampling regime but this has been increased to a monthly regime to appropriately track the changing water chemistry that will occur as part of this rehabilitation. In addition, DOC will be included as a parameter to try and identify any changes in carbon in the surface water.
- If, after two years, key targets for successful rehabilitation are being achieved, then the water quality monitoring programme will be reviewed, with consideration of potential ongoing scientific research on site. The water quality data, the aerial surveys and the habitat mapping will be collated and will be submitted to the EPA as part of the final validation report.
- If, after two years, key targets for successful rehabilitation have **not** been achieved, then the rehabilitation measures and status of the site will be evaluated and enhanced, where needed. This evaluation may indicate no requirement for additional enhancement of rehabilitation measures, but may demonstrate that more time is required before key targets for successful rehabilitation has been achieved. Monitoring of water quality will then also continue for another period to be defined.

- Where other uses are proposed for the site, these will be assessed by Bord na Móna in consultation with interested parties. Other after-uses can be proposed for licensed areas and must go through the required assessment process and planning procedures.

Additional monitoring measures are also proposed to monitor ecosystem service benefits that have been derived by rehabilitation. These proposed monitoring measures will be funded by the Scheme or additional other funding. Monitoring of climate action and other ecosystem service benefits will be designed to take account of the requirements of monitoring benefits of the overall Scheme and will be stratified; that is not all monitoring will be carried out in each site. These are defined as:

- Vegetation and habitat monitoring after rehabilitation is completed using a cutaway bog condition assessment (Similar to ecotope mapping). This assessment will include assessment of on environmental and ecological indicators such as vegetation cover, vegetation communities, presence of key species, Sphagnum cover, bare peat cover and water levels. It is proposed that sites can be monitored against this baseline in the future.
- The condition of the bog can be assessed using the condition assessment and suitable Greenhouse Gas (GHG) emission factors can be assigned to different habitats. GHG emission factors have been determined for various peatland habitats in Ireland (Wilson *et al*., 2015) and are constantly being refined with more and more research. BnM is actively supporting research into GHG fluxes in different rehabilitated peatland habitats. This means that potential GHG emissions can be estimated from the site, as the site continues along its trajectory towards a naturally functioning peatland ecosystem.
- It is proposed to monitor the improvement of some biodiversity ecosystem services. To be defined in relation to monitoring of the overall Scheme and after consultation with stakeholders.

9.2 Rehabilitation plan validation and licence surrender – report as required under condition 10/4

IPC License Condition 10.4. *A final validation report to include a certificate of completion for the Rehabilitation Plan, for all or part of the site as necessary, shall be submitted to the Agency within six months of execution of the plan. The licensee shall carry out such tests, investigations or submit certification, as requested by the Agency, to confirm that there is no continuing risk to the environment.*

Reporting to the EPA will continue until the IPC License is surrendered. The bog will be included in the full licence surrender process as per the Guidance to Licensees on Surrender, Cessation and Closure of Licensed Sites EPA, 2012, when:

- The planned rehabilitation has been completed.
- The key criteria for successful rehabilitation has been achieved and key targets have been met;
- Water quality monitoring demonstrates that water quality of discharge is stabilising or improving; and
- The site has been environmentally stabilised.

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APPENDIX I: A STANDARD PEATLAND REHABILITATION PLAN TO MEET CONDITIONS OF THE IPC LICENCE

In the event that the Scheme (PCAS) is not supported by additional funding, Bord na Móna is still obligated to carry out peatland rehabilitation to meet the conditions of the IPC Licence. Under its EPA licences and following cessation of peat extraction, BnM is mandated to 'decommission' its operations by removing materials 'that may result in environmental pollution' and establish that 'rehabilitation' measures have environmentally stabilised peat production areas.

This proposed standard peatland rehabilitation plan is outlined here to **estimate potential costs**. Bord na Móna will still be expected to cover the costs that would have accrued from standard decommissioning and rehabilitation activities, as part of its original obligations. The existing costs associated with both the removal of potentially polluting materials and the environmental stabilisation of the peatlands resides with Bord na Móna. However, the expenditure necessary to deliver the additional and enhanced decommissioning, rehabilitation and restoration and the benefits that flow from these measures and interventions/improvements will be eligible for funding by government through the Climate Action Fund and Ireland's National Recovery and Resilience Plan.

The same process as outlined in Section 2 will be followed.

Scope of rehabilitation

The principal scope of this rehabilitation plan is to rehabilitate the bog. This is defined by:

- EPA IPC Licence - Ref. P0502-01. As part of Condition 10.2 of this license, a rehabilitation plan must be prepared for permanent rehabilitation of the boglands within the licensed area. Derryfadda bog is part of the Derryfadda bog group, a sub-group of the Blackwater bog group.
- A key objective of rehabilitation, as defined by this licence, is **environmental stabilisation** of the bog.
- The area of former industrial peat production at Derryfadda Bog as defined by Drawing no. BnM_DR23_12_01 '*Bog Site Location*', Appendix XIII. Industrial peat production has now permanently ceased at Derryfadda Bog.
- Minimising potential impacts on neighbouring land. Some boundary drains around Derryfadda Bog will be left unblocked as blocking boundary drains could affect adjacent land.
- Future land-use: Bord na Móna are reviewing the potential to develop a potential renewable energy project at Derryfadda Bog. It is expected that this review will be completed in 1-2 years. In advance of this review of renewable energy potential, it is proposed to rehabilitate part of Derryfadda Bog in 2022 that is not constrained. The remaining area will be rehabilitated after the renewable energy review is complete. The peatland rehabilitation will **either** be in association with a potential renewable energy project, with peatland rehabilitation integrated into the proposed project, **or** will be completed in the absence of any proposed renewable energy project.
- Future land-use. An amenity walkway is proposed for this site. Any amenity will be integrated with peatland rehabilitation.

Rehabilitation goals and outcomes

The key rehabilitation goal and outcome for Derryfadda Bog is environmental stabilisation of the site via re-wetting. This is defined as:

- Carrying out drain blocking to re-wet peat and slow runoff.

- Stabilising potential emissions from the site (e.g. suspended solids).
- Environmental stabilisation.

The outcome is setting the site on a trajectory towards establishment of natural peatland habitats.

Criteria for successful rehabilitation:

- Rewetting of residual peat in the former area of industrial peat production to offset potential run off of suspended solids and to encourage development of vegetation cover via natural colonisation, and reducing the area of bare exposed peat.
- That there is a stabilising/improving concentration of suspended solids and ammonia associated with the measures undertaken to stabilise the peat surface by the blocking of the internal drainage system and the maximised rewetting of the peat surface. This will be demonstrated by developing a stable or downward trajectory of water quality indicators (suspended solids and ammonia) towards what would be typical of a re-wetted cutaway bog. This will be measured via water quality monitoring (suspended solids and ammonia).
- Receiving water bodies have been classified under the River Basin Management Plan and this classification includes waters that are At Risk from peatlands and peat extraction. The success criteria will be that the At Risk classification will see improvements in the associated pressures from this peatland or if remaining At Risk, that there is an improving trajectory in the pressure from this peatland.

Rehabilitation targets

- Demonstrating the delivery of the rehabilitation through site visits and through updated aerial photography (indicating presence of peat barriers, elevated water levels and re-wetting).
  Stabilising potential emissions from the site (run-off of suspended solids). The key target will be developing a stable or downward trajectory of water quality indicators (suspended solids and ammonia) towards what would be typical of a re-wetted cutaway bog. This will be demonstrated by water quality monitoring results.

Rehabilitation measures: (see Figure BNM-DR-23-12-20 *Standard Rehab Measures*)

- Blocking field drains in the former industrial production area and creating regular peat barriers (three barriers per 100 m) along each field drain.
- Re-alignment of piped drainage.
- Realignment of gravity outfalls (where needed).
- Fertiliser treatment of high fields and headlands (typically slow to naturally re-colonise) to encourage natural colonisation, if needed.
- No measures are planned for the surrounding marginal peatland habitats.
- Silt ponds will continue to be maintained during the rehabilitation and decommissioning.
- Evaluate success of short-term rehabilitation measures and enhance where necessary.
- Decommissioning of silt-ponds will be assessed and carried out, where required.

Timeframe:

- 2022. 1st phase of rehabilitation. Field drain blocking with dozer/excavator.
- 2022. 2nd phase. Further realignment of piped drainage and other re-wetting measures dependent on success of 1st phase re-wetting, as determined by ongoing monitoring of water levels and re-vegetation.
- Other enhancement measures such as fertiliser treatment will be carried out, if needed. These will be determined by ongoing monitoring.
- 2024-2025. Evaluate success of short-term rehabilitation measures outlined above and remediate where necessary.
- 2024-2025. Decommission silt-ponds, if necessary.

Budget and Costing

- Bord na Móna maintains a Provision on its balance sheet to pay for the future costs of rehabilitation and decommissioning when industrial peat extraction ceases. This is updated every year. For more information see the Bord na Móna Annual Report (Bord na Móna, 2021). Bord na Móna is fully committed to meeting its obligations relating to rehabilitation and decommissioning under the Integrated Pollution Control Licence.
- At this time, a standard rehabilitation provision has been allocated to the site based on the area of different cutaway types across the bog.

Table AP-1. Rehabilitation measures and target area.

Type	Code	Description	Area (Ha)
Dry Cutaway	DCT1	Limited drain blocking, Blocking outfalls and managing water levels with overflow pipes	7.1
Deep Peat	DPT1	Regular drain blocking (3/100 m) + blocking outfalls and managing water levels with overflow pipes	86.0
Wetland	WLT1	Turn off or reduce pumping to re-wet cutaway + blocking outfalls and managing water levels with overflow pipes	14.8
Marginal land	MLT1	No work required	72.1
Silt ponds		Silt-ponds	0.48
Constrained areas		Constrained areas	932.56
Total			1112.94

Monitoring, after-care and maintenance

- There will be initial quarterly monitoring assessments of the site to determine the general status of the site, the condition of the silt-ponds, assess the condition of the rehabilitation work, asses the progress of natural colonisation, monitoring of any potential impacts on neighbouring land and general land security. The number of site visits will reduce after 2 years to bi-annually. These site visits will assess the need to any additional rehabilitation.
- Water quality monitoring will be established.
- Monitoring results will be maintained, trended and reported on each year as part of the requirement to report on Condition 10.1 of the IPC Licence on Bog Rehabilitation in the Annual Environmental Report, which will be available in April each year at www.epa.ie.

- The parameters to be included (as per condition 6.2 of the IPC Licence) include monthly monitoring for pH, Flow, Suspended Solids, Total Solids, Total Phosphorus, Total Ammonia, Colour, and Chemical Oxygen Demand (COD).
- This sampling regime on a selected number of silt ponds will be carried out over a two-year cycle. The original (licence) requirement was for a quarterly sampling regime.
- Where other uses are proposed for the site, these will be assessed by Bord na Móna in consultation with interested parties. Other after-uses can be proposed for licensed areas and must go through the required assessment and planning procedures.

Validation and IPC Licence surrender

Reporting to the EPA will continue until the IPC License is surrendered. The bog will be included in the full licence surrender process as per the Guidance to Licensees on Surrender, Cessation and Closure of Licensed Sites EPA, 2012, when:

- The planned rehabilitation has been completed.
- The water quality monitoring demonstrates that water quality of discharge is stabilising or improving.
- The site has been environmentally stabilised.

APPENDIX II: BOG GROUP CONTEXT

The Blackwater Bog Group IPC Licensed area is made up of three sub-groups (Attymon, Blackwater and Derryfadda) and have been in industrial peat production for several decades. The majority of sites are situated alongside the Shannon and Suck Rivers within counties Roscommon, Galway, Westmeath and Offaly and cover an overall area of 15,515 ha. Each bog area further comprises a range of habitats from bare milled peat production areas to re-colonising cutaway to workshops areas and transport infrastructure. Industrial peat extraction from these sites mainly supplied ESB power stations at Shannonbridge (WOP) and Lanesborough (LRP).

Industrial peat extraction in the Blackwater Bog Group ceased in 2019. Remaining milled peat stocks were supplied to Shannonbridge (WOP) and Lanesborough (LRP) during 2020. Both power stations closed at the end of 2020. Decommissioning and rehabilitation for the Blackwater Bog Group at part of PCAS started in 2021. Several bog had been rehabilitated in previous years.

A number (6) of bogs were initially drained but have never been used for industrial peat production (three former development bogs (Kellysgrove, Tirrur-Derrymore and Newtown-Loughgore), Clonboley, Killeglan and Derrydoo-Woodlough). The latter three bogs are classed as restored raised bogs, still contain active bog habitat (that qualifies as the Annex I EU Habitats Directive habitat) and now form the core of the Bord na Móna Raised Bog Restoration Project due to their high biodiversity value and bog restoration potential. NPWS have identified the Clonboley bog cluster as having high ecological value within the recent assessment of raised bog SACs, NHAs and non-designated sites (NPWS 2014[1]).

Several sections of Tirrir-Derrymore bog have been leased to NPWS for domestic turf cutting as part of the SAC turf-cutting compensation scheme. Turf-cutters from neighbouring SACs have been relocated to this site by NPWS. Several other bogs are being assessed for similar use.

The depth of remnant peat within Blackwater bog units will have a very significant impact on the development of these sites, with deeper peat (Derryfadda milled peat production bogs) having potential for the establishment of embryonic peat-forming (*Sphagnum*-rich) vegetation communities. Milled peat cutaway (such as at Blackwater) develops in a somewhat different way as in places the underlying gravel is exposed, there is significant alkaline influence on the water chemistry and in many of these cutaway bogs will develop fen and wetlands due to the local topography, hydrology and water chemistry.

A breakdown of the component bog areas for the Blackwater Bog Group IPC License Ref. PO502-01 is outlined in Table Ap-2.

Table Ap-2a: Blackwater Bog Group names, area and indicative status (Attymon sub-group)

Bog Name	Area (ha)	Stage of development	Land-Use and History	Peat Production Cessation	Rehab Plan Status
Attymon	336	Cutover Bog Industrial peat production commenced at Attymon Bog in 1941 and ceased in 2019. Attymon is a deep peat cutover bog.	Attymon Bog formerly supplied fuel sod peat. Coillte have developed a portion of the former production area for conifer forestry. Rehabilitation ongoing	2109	Finalised 2018

[1] http://www.npws.ie/peatlandsturf-cutting/nationalraisedbogsacmanagementplan/

Cloonkeen	252	Cutover Bog Industrial peat production commenced at Cloonkeen Bog in 1953 and ceased in 2019. Cloonkeen Bog is a deep peat cutover bog.	Cloonkeen Bog formerly supplied fuel sod peat. Coillte have developed a portion of the former production area for conifer forestry. Rehabilitation ongoing	2019	Finalised 2018
Derrydoo-Woodlough	452	Development Bog Derrydoo-Woodlough Bog was drained in the 1980s in anticipation of industrial peat production. No industrial peat harvesting ever took place.	Bog restoration was carried out in 2013-2014 Rehabilitation (bog restoration) now complete.	N/A	Finalised 2012
Tirrur-Derrymore	422	Development Bog This bog was drained in the 1980s in anticipation of industrial peat production. No industrial peat harvesting ever took place.	This bog has significant raised bog restoration potential. Section leased to NPWS as a SAC turf-cutting relocation site.	N/A	Updated 2020
Newtown-Loughgore	448	Development Bog This bog was drained in the 1980s in anticipation of industrial peat production. No industrial peat harvesting ever took place.	Some sod turf production Bog restoration was carried out in 2019-2020 Rehabilitation (bog restoration) nearly complete.	2020	Finalised 2018
Killeglan	581	Development Bog This bog was drained in the 1980s in anticipation of industrial peat production. No industrial peat harvesting ever took place.	Bog restoration was carried out in 2013-2014 Rehabilitation (raised bog restoration) complete	N/A	Finalised 2016
Cloonboley 1	675	Development Bog This bog was drained in the 1980s in anticipation of industrial peat production. No industrial peat harvesting ever took place on the main section.	A small sub-section has been used for sod turf production. Bog restoration was carried out in 2013-2014 Rehabilitation (raised bog restoration) complete	2020	Finalised 2014
Cloonboley2	203	Development Bog This bog was drained in the 1980s in anticipation of industrial peat production. No industrial peat harvesting ever took place.	Bog restoration was carried out in 2013-2014 Rehabilitation (raised bog restoration) complete	N/A	Finalised 2016

Table Ap-2b: Blackwater Bog Group names, area and indicative status (Blackwater sub-group)

Bog Name	Area (ha)	Stage of development	Land-Use and History	Peat Production Cessation	Rehab Plan Status
Ballaghhurt	597	Cutaway Bog Industrial peat production commenced at Ballaghhurt Bog in 1981. The majority of the site is	Ballaghhurt Bog formerly supplied a range of commercial functions including horticultural peat and fuel peat. Pioneer cutaway vegetation communities are naturally developing on some cutaway areas.	2020	Draft 2017

		cutaway with some residual deeper peat			
Belmont	316	Cutaway Bog Industrial peat production commenced at Belmont Bog during the 1950's. The majority of the site is cutaway.	There are some areas of pioneer cutaway vegetation communities naturally colonising cutaway sections. Coilte have developed a portion of the bog for forestry.	2020	Finalised 2021
Blackwater	2,303	Cutaway Bog Industrial peat production commenced at Blackwater Bog during the 1950's. The majority of the site is cutaway.	Bloomhill Bog formerly supplied milled horticultural peat and fuel peat. There is extensive development of emergent cutaway vegetation communities across the former production area. The site has been used for experimental forestry (BOGFOR) and other conifer plantations. Part of the site was rehabilitated with lake and wetland creation. An ash facility took ash from Shannonbridge Power station	2020	To be updated 2021
Bloomhill	883	Cutover Bog Industrial peat production commenced at Bloomhill Bog during 1981. The majority of the site still has relatively deep residual peat.	Bloomhill Bog formerly supplied milled horticultural peat and fuel peat. Much of the former peat production area is bare peat.	2020	To be updated 2021
Bunahinly-Kilgarvan	389	Cutover Bog Industrial peat production commenced at Bunahinly-Kilgarvan Bog during the 1990's. Residual Deep peat remains on these bogs.	Bunahinly-Kilgarvan formerly supplied milled horticultural peat and fuel peat. Much of the former production area is bare peat. Part of Bunihinly has been re-wetted.	2020	To be updated 2021
Glebe	132	Cutover Bog Industrial peat production commenced at Glebe Bog during the 1990's. Residual deep peat remains on these bogs.	Glebe Bog formerly supplied milled; horticultural peat and fuel peat. Glebe bog is still listed as a pNHA. Much of the former production area is bare peat.	2020	Draft 2017
Clooniff	523	Cutover & cutaway Bog Industrial peat production commenced at Clooniff Bog during the 1970's. A mosaic of variable peat depths remains on this bog.	Clooniff Bog formerly milled fuel peat. Much of the former production area is bare peat or wetland. Some emergent vegetation communities are naturally colonising cutaway areas. Reduced pumping has created a large wetland in one area.	2020	Finalised 2021
Cornafulla	460	Cutover Bog Industrial peat production commenced at Cornafulla Bog in 1987. This bog still retains relatively deep residual peat.	Cornafulla Bog formerly supplied milled horticultural peat and fuel peat. Much of the former production area or cutaway is bare peat.	2020	Draft 2017
Cornaveagh	492	Cutover Bog Industrial peat production commenced at Cornaveagh Bog in 1970's and ceased in 2020. This	Cornaveagh Bog formerly supplied milled horticultural peat and fuel peat. Much of the former production area footprint or cutaway is bare peat.	2020	Draft 2017

		bog still retains relatively deep residual peat.			
Culliaghmore	442	Cutover Bog Industrial peat production commenced at Culliaghmore Bog in 1960's and ceased in 2020. Much of this bog is cutaway, with some pockets of deeper residual peat.	Culliaghmore Bog formerly supplied milled horticultural peat and fuel peat. Much of the former production area footprint or cutaway is bare peat. Some pioneer cutaway vegetation communities are naturally colonising cutaway areas.	2020	Draft 2017
Garryduff	970	Cutaway Bog Industrial peat production commenced at Garryduff Bog in 1960's. The majority of this bog is cutaway.	Much of the former production area footprint or cutaway is bare peat. Extensive natural development of pioneer cutaway vegetation communities is present on cutaway areas. Rehabilitation measures have commenced at Garryduff in 2021.	2020	Finalised 2021
Kellysgrove	201	Development Bog Kellysgrove Bog was drained in the 1980s in anticipation of industrial peat production. No peat harvesting ever took place.	The site retains degraded raised bog vegetation. Kellysgrove Bog retains significant raised bog restoration potential. A way-marked walking trail is positioned along the old Ballinasloe Canal. Rehabilitation measures have been completed at Kellysgrove in 2021.	2020	Finalised 2021
Kilmacshane	1,294	Cutaway Bog Industrial peat production commenced at Kilmacshane Bog in 1960's. The majority of this bog is cutaway with some pockets of deeper peat remaining.	Kilmacshane Bog formerly supplied milled horticultural peat and fuel peat. Some pioneer cutaway vegetation communities are naturally colonising cutaway areas and water levels have risen as pumping reduced, creating wetlands. Rehabilitation measures have commenced at Kilmacshane in 2021.	2014	Finalised 2021
Lismanny	449	Cutaway Bog Industrial peat production commenced at Lismanny Bog in 1960's. The majority of this bog is cutaway with some pockets of deeper peat remaining.	Lismanny Bog formerly supplied milled horticultural peat and fuel peat. Much of the former production area footprint is bare peat. Some pioneer cutaway vegetation communities are naturally colonising cutaway areas.	2020	Draft 2021

Table Ap-2c: Blackwater Bog Group names, area and indicative status (Derryfadda sub-group)

Bog Name	**Area (ha)**	**Stage of development**	**Land-Use and History**	**Peat Production Cessation**	**Rehab Plan Status**
Derryfadda	610	Cutover bog Industrial peat production commenced at Derryfadda Bog in 1980's. This bog still retains residual deep peat.	Derryfadda Bog formerly supplied milled horticultural peat and fuel peat. Much of the former production area is bare peat. Some pioneer cutaway vegetation communities are naturally colonising cutaway areas.	2020	To be updated 2021
Boughill	415	Cutover bog Industrial peat production commenced at Boughill Bog in 2008.	Boughill Bog formerly supplied milled horticultural peat and fuel peat.	2020	Draft 2017

		This bog still retains residual deep peat.	Much of the former production area footprint or cutaway is bare peat.		
Castlegar	517	Cutover bog Industrial peat production commenced at Castlegar Bog in 2001. This bog still retains residual deep peat.	Castlegar Bog formerly supplied milled horticultural peat and fuel peat. Much of the former production area is bare peat. The adjacent Annaghbeg Bog NHA is an intact undrained raised bog Rehabilitation measures have commenced at Castlegar in 2021.	2019	Finalised 2021
Gowla	650	Cutover bog Industrial peat production by BnM commenced at Gowla Bog in 1970's. Development for sugar production was in place at Gowla since the 1950's. This bog still retains residual deep peat.	Gowla Bog formerly supplied milled horticultural peat and fuel peat. Much of the former production area footprint is bare peat.	2020	Draft 2017

APPENDIX III: ECOLOGICAL SURVEY REPORT

Ecological Survey Report

Note: This report outlines an ecological survey of the bog. This report should not be taken as a management plan for the site as other land-uses may still be considered. Information within this report may inform the development of other land-uses and identify areas with particular biodiversity value.

Bog Name:	**Derryfadda**	**Area (ha):**	1111ha
Works Name:	Derryfadda	**County:**	Galway
Recorder(s):	DF	**Survey Date(s):**	10th & 11th April 2012

Habitats present (in order of dominance)

The most common habitats present at this site include:

1. Bare peat (BP) (Codes refer BnM classification of pioneer habitats of production bog. See Appendix I).
2. Riparian zones (RIP)
3. Pioneer Purple Moorgrass-dominated grassland (gMol)
4. Pioneer Soft Rush-dominated poor fen (pJeff)
5. Pioneer dry heath (dHeath)
6. Bog timber

The most common habitats found around the margins of the site include:

7. Marginal raised bog (PB1) (Codes refer to Heritage Council habitat classification, Fossitt 2000), See Appendix I.)
8. Cutover bog (PB4)
9. Scrub (WS1)
10. Birch woodland (WN7)
11. Wet grassland (callows grassland) (GS4)
12. Improved grassland (GA1)
13. Riparian woodland (WN5)
14. Conifer plantation (WD4)

Description of site

Derryfadda Bog is located approximately three kilometres south west of Ballyforan in Co. Galway (the River Suck forms the county boundary between Roscommon and Galway). The Suck forms a boundary along the north and eastern edge of the bog, with the bog being located on the Galway side of the River. Derryfadda is part of the Derryfadda group of bogs and a rail link connects Derryfadda Bog with Castlegar Bog to the south and Gowla Bog to the west. A minor public road runs along much of the western edge of the bog. Two bog tracks cross the bog dividing it into three sections. Peat production first began on Derryfadda Bog in 1981. Several sections of remnant raised bog are located along the margins of the site; these areas are small and dry and are actively used for the production of domestic turf.

The southern section of Derryfadda Bog is mainly comprised of bare peat. A large works area is located along the western edge of the site. This area contains a tippler where peat is loaded onto lorries for transport to Lough Ree

Power in Lanesborough, Co. Longford. The Castlefrench river flows through this section of the site close to the south eastern corner. This river is bounded by wet grassland and riparian woodland, with some small areas of remnant sections of raised bog also located close to the river. The wet grassland consisted of Common Reed, Lesser Tussock Sedge and Reed Canary Grass with occasional Willow scattered throughout. The river has been canalised and had recently been cleaned out, as a result there was no in-stream vegetation. The river is important habitat for species such as Mallard, Otter and Mute Swan. There is some evidence that White-Clawed Crayfish are present also.

A large section of Birch woodland is also located in the south eastern corner of the site and the railway link between Derryfadda and Castlegar bogs passes through this woodland. This woodland, marked on the OS map as Dalysgrove, consists mainly of Birch but also contains Willow, Holly, Scot's Pine, Gorse and Hawthorn with an understory of Bramble and Ivy. Some patches of Laurel have become established within the woodland.

A small mineral island is located to the east of the works. This area has been used in the past for storing machinery. The main vegetation type consists of calcareous grassland with occasional small trees.

The Taghboy River separates the southern section of the site from the central section. This river is mainly bounded by remnant sections of raised bog, cutover bog, scrub and wet grassland. Significant areas of cutover bog and remnant raised bog in this area are not in the ownership of Bord na Móna and are used for domestic turf cutting.

The central section of the site is dominated by bare peat. A mineral island is located in the centre of the site and is accessed by way of a bog track; a small works area is located on the mineral island. This area was previously owned by the Sugar Company, who planted the entire area with conifers. The conifers were removed prior to the commencement of peat production by BnM.

An area of cutover bog is located in the north eastern part of this section. This area consists of dry heath with some scrub along the edges. Some areas of the scrub consisted of Birch with an understory of Bramble, Bracken and Bluebell. This area had been in peat production in the past.

Two small ponds were located close to the north eastern boundary of the site. These features were unusual in that they were not connected to any other watercourse but contained fish. The small areas of open water were surrounded by a mix of wet grassland and scrub. These features are visible on the 25 inch OSI maps for Galway.

A ridge of mineral land separates the central section from the northern section. The mineral land was the site of the proposed briquette factory and a fenced off compound is present in this location. A network of small fields surround the compound, some of the small fields are actively grazed but a few do not appear to be managed and had encroaching scrub.

The northern section of the site is the smallest production area within Derryfadda Bog. This area was previously owned by the Sugar Company, who planted the entire area with conifers. These trees were removed by BnM in the early 1980's. This section of bog is still producing "red" or "Sphagnum" peat. A fringe of conifer woodland still exists around much of the boundary of the site but it is severely affected by wind throw. A strip of riparian woodland runs between the conifer plantation and the River Suck. The riparian woodland is an important biodiversity feature of the area and is home to a population of Red Squirrel. A more detailed account of the riparian woodland is given in the forestry section.

Designated areas on site (cSAC, NHA, pNHA, SPA other)

There is regular overlap between Derryfadda and the Suck River Callows NHA (NPWS site code 000222) and SPA (NPWS site code 0004097). This site has been designated for its importance for wintering wildfowl and species of conservation importance such as Greenland White-fronted Geese and Whooper Swan.

Adjacent habitats and land-use

Cutover bog (PB4), Birch woodland (WN7), scrub (WS1), raised bog (PB1), improved agricultural grassland (GA1) and wet grassland (GS4) all border the site. There is a significant amount of callows type wet grassland to the east of the site adjacent to the River Suck. There is private domestic turf cutting at many locations along the site boundary.

Watercourses (major water features on/off site)

1. The Taghboy and Castlefrench Rivers flow through the site. These rivers are tributaries of the River Suck.

Peat type and sub-soils

Peat depths vary across the site. The northern and southern sections have in excess of 2m peat remaining while the central section has on average less than 1m of peat remaining.

Fauna biodiversity

Birds

Several bird species were noted on the site during the survey.

1. Willow Warbler
2. Swallow
3. Grasshopper Warbler
4. Mute Swan nesting
5. Mallard 15+
6. Skylark
7. Jay
8. Other more common species include Grey Crow, Pheasant, Blue Tit, Wood Pigeon, Raven

Mammals

Signs of several mammal species were noted on the site during the survey.

9. Fallow Deer
10. Pine Marten
11. Otter
12. Badger
13. Fox
14. Hare
15. Red Squirrel

Other species

Frog

Fish (likely coarse)

References

European Commission (1996). Interpretation manual of European Union habitats. Brussels. European Commission, DGXI.

Fossitt, J. (2000). A guide to habitats in Ireland. Kilkenny. The Heritage Council.

HABITAT DESCRIPTIONS

(See Habitats Description Document for detailed description of each vegetation community not described in this section.)

HABITAT DESCRIPTIONS

APPENDIX IV: ENVIRONMENTAL CONTROL MEASURES TO BE APPLIED TO BOG REHABILITATION

1. Bog restoration/rehabilitation measures will be restricted to within the footprint of the proposed rehabilitation area.
2. The proposed rehabilitation will have due regard to noise limits and hours of operation (i.e. dusk and dawn) to minimise any potential disturbance on resident and local fauna that utilise the site and immediate environs.
3. The proposed activities will be restricted to daylight hours and there will be no requirement for artificial lighting.
4. All plant and equipment for use will comply with the Construction Plant and Equipment Permissible Noise Levels Regulations (SI 359/1996).
5. Silt ponds will be inspected and maintained as per the IPC Licence.
6. During periods of heavy precipitation and run-off, activities will be halted.
7. Measures will be carried out using a suitably sized machine and in all circumstances, excavation depths and volumes will be minimised where possible.
8. All machines will be regularly checked and maintained prior to arrival at the site to prevent hydrocarbon leakage.
9. Hoses and valves will be checked regularly for signs of wear and will be closed and securely locked when not in use.
10. Fuelling and lubrication of equipment shall only be carried out in designated areas away from surface water drainage features and ecologically sensitive areas.
11. Waste oils and hydraulic fluids will be collected in leak-proof containers and removed from the site for disposal or re-cycling.
12. Vehicles will never be left unattended during refuelling.
13. No direct discharges to waters will be made. No washings from vehicles, plant or equipment will be carried out on site.
14. All plant refuelling will take place using mobile fuel bowsers. Only dedicated trained and competent personnel will carry out refuelling operations.
15. Mobile storage such as fuel bowsers will be bunded to 110% capacity to prevent spills. Tanks for bowsers and generators shall be double skinned. When not in use, all valves and fuel trigger guns from fuel storage containers will be locked. All pumps using fuel or containing oil will be locally and securely bunded where there is the possibility of discharge to waters.
16. Potential impacts caused by spillages etc. during rehabilitation will be reduced by keeping spill kits and other appropriate equipment on-site.
17. Site activities will be carried out in accordance with 'best practice'. In order to ensure compliance and implementation of 'best practice', these measures will be communicated to relevant Bord na Móna staff and updated as required.

APPENDIX V: BIOSECURITY

The only invasive species recorded at the site was Rhododendron (*Rhododendron ponticum*). This species is listed under Regulations 49 and 50 of the EC Birds and Natural Habitats Regulations which prohibits the introduction, breeding, release or dispersal of the species listed on Part 1 the 'Third Schedule'.

The potential for importation or introduction of non-native plant species (such as Japanese Knotweed, Himalayan Balsam, etc.) during future rehabilitation management, such as drain-blocking using excavators, has the potential to result in the establishment of invasive species within the site.

This section aims to reduce the risk from, and impacts of, invasive species and protecting biodiversity on lands under Bord na Móna ownership. Rehabilitation and decommissioning in the bog will have due regard to the relevant biosecurity measures outlined below:

- Records of problematic invasive species within the various bog units will be marked out with signs to highlight areas of infestation to personnel.
- All plant machinery will be restricted from disturbing known colonies of invasive species.
- All plant machinery will avoid unnecessary crossings to adjoining lands.
- Good site hygiene will be employed to prevent the introduction and spread of problematic invasive alien plant species (i.e. Japanese Knotweed (*Fallopia japonica*), Himalayan Balsam (*Impatiens glandulifera*), Himalayan Knotweed (*Persicaria wallichii*), etc.) by thoroughly inspecting and washing vehicles prior to entering sites.

The biosecurity measures outlined above are in line with best practice guidelines issued by the National Roads Authority (NRA, 2010) – *The Management of Noxious Weeds and Non-native Invasive Plant Species on National Roads* and broadly based on the Environment Agency's (2013) – *The Knotweed Code of Practice: Managing Japanese Knotweed on Development Sites* (Version 3, amended in 2013, accessed on the Environment Agency's website on the 11th of July 2016).

In addition to the above, Best Practise measures around the prevention and spread of Crayfish plague[2] and Zebra Mussel will be adhered with throughout all rehabilitation measures and activities.

[2] https://www.biodiversityireland.ie/projects/invasive-species/crayfish-plague/

APPENDIX VI: POLICY AND REGULATORY FRAMEWORK

Bord na Móna Plc is a publicly owned company, originally established in 1934 to develop some of Ireland's extensive peat resources for the purposes of economic development and to support energy security, In the decades since its establishment the company has employed tens of thousands of people in its fuel, energy, and horticultural growing media businesses. For much of its history the company's support of important national policy aims has been enabled and encouraged in a variety of ways by Government.

Today, Bord na Móna is undertaking a number of highly significant actions in support of climate policy. These actions involve a radical transformation and decarbonisation of nearly the entire Bord na Móna business. This transformation will be driven by unlocking the full potential of our land and creating significant value for Ireland and the Midlands in particular.

Bord na Móna is an integral part of the economic, social, and environmental fabric of Ireland and Irish life. As a key employer in the Midlands, the company is conscious that its obligations go beyond purely commercial and environmental – there is also a social responsibility to employees and the communities served by Bord na Móna. It is the company's role and absolute priority to ensure that its long-term strategy delivers on all of these important areas in a robust and balanced way.

There are a wide range of policies, plans, legislation and land designations that inform the development of this Bord na Móna peatland rehabilitation plan. Bord na Móna have also developed and operate various policies and strategies that also inform the development of this rehabilitation plan.

1 EPA IPC Licence

Bord na Móna operates under IPC Licence issued and administered by the EPA to extract peat within the Mount Dillon bog group (Ref. PO-504-01). As part of Condition 10.2 of this license, a rehabilitation plan must be prepared for permanent rehabilitation of the boglands within the licensed area. The bog is part of the Mount Dillon group. This regulatory requirement is the main driver of the development of this rehabilitation plan.

2 The Peatlands Climate Action Scheme (PCAS)

Bord na Móna (BnM) understand that it is the Minister's (DECC) intention to impose an obligation on Bord na Móna to develop a programme of measures, 'the Scheme', for the enhanced decommissioning, rehabilitation and restoration of boglands previously used to supply peat for electricity generation within the State. The enhanced decommissioning, rehabilitation and restoration of the peatlands funded by the Scheme (PCAS) will deliver benefits across climate action (GHG mitigation through reduced carbon emissions and acceleration towards carbon sequestration), enrich the State's natural capital, increase eco-system services, strengthen biodiversity, improve water quality and storage attenuation as well as developing the amenity potential of the peatlands.

It is envisaged that Bord na Móna carry out an enhanced decommissioning, rehabilitation and restoration, under the Scheme (PCAS), and supported by the Climate Action Fund and Ireland's National Recovery and Resilience Plan across a footprint of 33,000 ha. This scheme will significantly go beyond what is required to meet rehabilitation and decommissioning obligations under existing EPA IPC licence conditions. Interventions and measures supported by the Scheme will ensure that environmental stabilisation is achieved (meaning IPC obligations are met), and importantly, significant additional benefits, particularly relating to climate action and other ecosystem services, will also be delivered. However, only the additional costs associated with the additional

and enhanced rehabilitation, i.e., those activities which go beyond the existing decommissioning and rehabilitation requirements arising from Condition 10 will be eligible for support under the Scheme.

The proposed enhanced rehabilitation detailed in this document, are predicated on the understanding that the element of the activities, over and above the 'standard' rehabilitation necessary to comply with pre-existing Condition 10 IPC Licence requirements, will be deemed eligible costs by the Scheme regulator and funded by the Climate Action Fund and Ireland's National Recovery and Resilience Plan.

For the avoidance of doubt, should the Scheme and the associated statutory obligation on Bord na Móna not materialise, Bord na Móna will not carry out the enhanced decommissioning, rehabilitation and restoration measures described in this plan. Bord na Móna will instead plan to complete an adapted standard decommissioning and rehabilitation measures required under Condition 10 and outlined in Appendix I.

3 National Climate Policy

The National Policy Position establishes the fundamental national objective of achieving a transition to a competitive, low carbon, climate-resilient and environmentally sustainable economy by 2050. It sets out:

- the context for the objective;
- clarifies the level of GHG mitigation ambition envisaged; and
- establishes the process to pursue and achieve the overall objective.

The evolution of climate policy in Ireland will be an iterative process based on the adoption by government of a series of national plans over the period to 2050. GHG mitigation and adaptation to the impacts of climate change are to be addressed in parallel national plans – respectively through the National Climate Action Plan. The plans will be continually updated, as well as being reviewed on a structured basis at appropriate intervals and, at a minimum, every five years. This will include early identification and ongoing updating of possible transition pathways to 2050 to inform sectoral strategic choices.

Bord na Móna is following a decarbonisation programme aimed at reducing the carbon emissions from its activities. Industrial peat production has now ceased and several other decarbonisation measures are being implemented. The company aims to further develop renewable energy and resource recovery markets with a key objective of reducing the carbon intensity of all products. In addition, the carbon emission mitigation benefits associated with the post-peat extraction rehabilitated peatland following re-wetting, revegetation and colonisation of significant areas with native woodland will make a significant contribution to achieving the State's carbon emission reduction targets.

4 National Peatlands Strategy

The National Peatlands Strategy (2015) contains a comprehensive list of actions, necessary to ensure that Ireland's peatlands are preserved, nurtured and become living assets within the communities that live beside them. It sets out a cross-governmental approach to managing issues that relate to peatlands, including compliance with EU environmental law, climate change, forestry, flood control, energy, nature conservation, planning, and agriculture. The Strategy has been developed in partnership between relevant Government Departments/State bodies and key stakeholders through the Peatlands Council.

The strategy recognises that Ireland's peatlands will continue to contribute to a wide variety of human needs and to be put to many uses. It aims to ensure that Ireland's peatlands are sustainably managed so that their benefits

can be enjoyed responsibly. It aims to inform appropriate regulatory systems to facilitate good decision making in support of responsible use. It also aims to inform the provision of appropriate incentives, financial supports and disincentives where required. The strategy attempts to strike an appropriate balance between different needs, including local stakeholders like turf-cutters and semi-state bodies such as Bord na Móna.

In line with a National Peatlands Strategy recommendation, a Peatlands Strategy Implementation Group (PSIG), was established, assisted in the finalisation of the Strategy, is overseeing subsequent implementation and will report to Government on an annual basis on the implementation of the actions and principles contained within the Strategy.

Bord na Móna is a key stakeholder in the National Peatlands Strategy and the Peatlands Strategy Implementation Group. The strategy recognises the potential for some Bord na Móna sites to be restored and to contribute to the national SAC and NHA network of protected raised bog sites. The strategy (agreed in 2015) also recognises the various different values of cutaway bog and developed six key principles (with Bord na Móna) for the after-use of cutaway bog.

- Bord na Móna will continue to assess and evaluate the potential of the company's land bank, using a land use review system. The assessment will help prepare a set of evidence-based management plans for the various areas of peatland. These plans will also inform its cutaway bog rehabilitation.
- The policy of Bord na Móna is not to open up any undrained new bogs for peat production.
- Lands identified by Bord na Móna as having high biodiversity value and/or priority habitats will be reserved for these purposes as the principal future land use.
- Generally, Bord na Móna cutaway bogs that flood naturally will be permitted to flood unless there is a clear environmental and/or economic case to maintain pumped drainage.
- In deciding on the most appropriate afteruse of cutaway peatlands, consideration shall be given to encouraging, where possible, the return to a natural functioning peatland ecosystem.
- This will require re-wetting of the cutaway peatlands which may lead in time to the restoration of the peatland ecosystem.
- Environmentally, socially and economically viable options should be analysed to plan the future use of industrial cutaway peatlands, in conjunction with limiting factors as outlined in Bord na Móna's Strategic Framework for the Future Use of Peatlands.

The National Peatlands Strategy highlights the importance and value of developing peatland rehabilitation plans for Bord na Móna cutaway sites and implementing this peatland rehabilitation. Some of these principles have now been superseded by the company's decision to cease industrial peat extraction. The National Peatlands Strategy is currently being reviewed by Government.

5 National River Basin Management Plan 2018-2021 (Water Framework Directive)

The National River Basin Management Plan (2018-2021) (Department of Housing, Planning, Community and Local Government 2017) is the key national plan for Ireland to achieve the objectives of the Water Framework Directive (WFD). In broad terms, the objectives of the WFD are (1) to prevent the deterioration of water bodies and to protect, enhance and restore them with the aim of achieving at least good status and (2) to achieve compliance with the requirements for designated protected areas.

The NRBMP outlines how peat extraction can be a potentially significant pressure on various water quality parameters. Peatland rehabilitation of Bord na Móna cutaway (in addition to other measures) is part of the WFD

(2018-2021) programme of measures. The NRBMP takes account of the fact that Bord na Móna is in the process of phasing out the extraction of peat for energy production, that it set a target to rehabilitate 9,000 ha of cutaway bogs (covering 25 peatlands) by 2021 (in 2018) and will look to implement best-available mitigation measures to further reduce water quality impacts caused by peat extraction while the phasing-out process is taking place. This NRBMP rehabilitation target is set to be superseded by the acceleration of the Bord na Móna de-carbonisation programme and the Scheme **(PCAS)**.

The development of site rehabilitation plans and the delivery of peatland rehabilitation by Bord na Móna is expected to have a positive impact on water quality and will help the NWBMP deliver its objectives in relation to the Water Framework Directive and is one of the five key principle actions.

The cessation of industrial peat extraction by Bord na Móna in 2021 is expected to have a significant positive impact on water quality of receiving water courses by reducing the impact of peat extraction as a key pressure on particular water courses.

6 National Biodiversity Action Plan 2016-2021

The National Biodiversity Action Plan 2016-2022 has a 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. Ireland's 2nd National Biodiversity Action Plan outlines the main policies, strategies, actions and targets in relation to biodiversity. This plan has several Bord na Móna specific objectives and actions including implementing the BnM Biodiversity Action Plan 2016-2021 and overlaps with both the National Peatlands Strategy and the National Raised Bog Special Areas of Conservation Management Plan 2017-2022.

The delivery of rehabilitation via PCAS is expected to significantly contribute in the future to actions and targets of the National Biodiversity Action Plan 2016-2021, particularly in relation to peatland restoration and creation of new habitats such as wetlands and woodlands.

7 National conservation designations

Bord na Móna operates in a wider landscape that also includes a network of European and National nature conservation sites (Special Areas of Conservation (SACs), Special Protection Areas (SPAs), National Heritage Areas (NHAs, cNHAs) and National Nature Reserves). Bord na Móna will take account of this network of conservation objectives and their conservation objectives when developing these rehabilitation plans. It is expected that peatland rehabilitation will, in general, benefit the conservation objectives of this network of nature conservation sites.

8 National Raised Bog Special Area of Conservation Management Plan 2017-2022.

The National Raised Bog Special Area of Conservation Management Plan 2017-2022 sets out a roadmap for the long-term management, restoration and conservation of protected raised bogs in Ireland. The Plan strikes an appropriate balance between the need to conserve and restore Ireland's raised bog network as part of Ireland's commitments towards the EU Habitats Directive, and the needs of stakeholders and gives recognition to the important role that communities have to play in the conservation and restoration of raised bogs. The National Raised Bog Special Areas of Conservation (SACs) Management Plan 2017-2022 is part of the measures being

implemented in response to the on-going infringement action against Ireland in relation to the implementation of the EU Habitats Directive, with regard to the regulation of turf cutting on the Special Areas of Conservation (SACs). The then Minister for Arts, Heritage and the Gaeltacht, also published a **Review of Raised Bog Natural Heritage Area Network** in 2014.

Bord na Móna has played a key role in the development of the National Raised Bog Special Area of Conservation Management Plan 2017-2022 and the Review of the Raised Bog Natural Heritage Area Network. Several Bord na Móna sites were assessed by the National Parks and Wildlife Service as part of the above Plan and Review and there is an expectation that several Bord na Móna sites will be designated as SACs and NHAs in the future. This will reinforce the network of protected raised bog sites and replace in part sites that will be de-designated as they have been deemed to be significantly damaged and are deemed to have no raised bog restoration prospects. PCAS is expected to restore several sites that will contribute to The National Raised Bog Special Areas of Conservation (SACs) Management Plan 2017-2022 targets in relation to the restoration of raised bog habitat.

Bord na Móna has also responded to the needs of the NRBMP and provided several sites to the government for the relocation of turf-cutters from SACs. This is part of a suite of ongoing bog conservation measures in the NRBMP to manage turf-cutting in protected sites. Bord na Móna and the National Parks and Wildlife Service continues to engage regarding the ongoing relocation of turf-cutters from protected raised bog sites.

9 All-Ireland Pollinator Plan 2015-2020

The All-Ireland Pollinator Plan 2015-2020 outlines key objectives and actions to protect and support pollinating insects and the habitats they rely on. There are several Bord na Móna specific actions in this plan including the adoption of pollinator-friendly management within the Bord na Móna network of sites. One action to help achieve this objective is habitat rehabilitation and restoration, where possible, of pollinator-friendly habitats, including peatland habitats.

10 Land-use planning policies

As Bord na Móna operates in many counties across Ireland, it is important to note the respective development plans in these counties. Many of the existing development plans recognise the potential that exists in the after-use of cutover/cutaway peatlands. Bord na Móna seeks to work with all of the relevant local authorities to ensure that the most appropriate after-uses are reflected in local planning policy. The following areas of consistent importance are of both direct and indirect relevance to Bord na Móna: heritage, tourism, biodiversity/conservation, landscape, renewable energy, and economy/enterprise.

Derryfadda Bog is located in an area zoned by Longford County Council as open countryside.

11 National Archaeology Code of Practise

Bord na Móna operates under an agreed Code of Practice regarding archaeology with the Department of Arts, Heritage and the Gaeltacht and the National Museum of Ireland which provides a framework to enable the Company to progress peat extraction whilst carrying out archaeological mitigation. (https://www.archaeology.ie/sites/default/files/media/publications/cop-bord-na-mona-en.pdf

The Code replaced a set of Principles agreed with the Department of Arts, Heritage and the Gaeltacht in the 1990s. Under the Code Bord na Móna, the Minister and Director work together to ensure that appropriate archaeological mitigation is carried out in advance of peat extraction.

- BNM must ensure that any monuments or archaeological objects discovered during peat extraction are protected in an appropriate manner by following the Archaeological Protection Procedures.
- BNM must ensure that any newly discovered monuments on Bord na Móna lands are reported in a timely manner to the National Monuments Service of the Department of Arts, Heritage and the Gaeltacht.
- BNM must ensure that any archaeological objects discovered on Bord na Móna lands are reported immediately to the Duty Officer of the National Museum of Ireland.
- Bord na Móna will adhere to the Archaeology Code of Practise relating to management of any archaeological finds that may arise during cutaway peatland rehabilitation and decommissioning.

12 Bord na Móna Biodiversity Action Plan 2016-2021

Rehabilitation of industrial peatlands is a key objective of the Bord na Móna Biodiversity Action Plan 2016-2021. This action plan outlines the main objectives and actions around biodiversity on Bord na Móna lands. The Bord na Móna Biodiversity Action Plan also outlines key International and European policy in relation to biodiversity. This includes the **United Nations Convention on Biodiversity 2011-2020 (CBD)** and **European Biodiversity Strategy to 2020**. Further details of these policies and Bord na Móna s responses can be found in the Bord na Móna Biodiversity Action Plan (Bord na Móna 2016). Both policy documents highlight targets such as reducing pressure on biodiversity, promoting sustainability, habitat restoration and benefits of ecosystem services.

One example of a key CBD target is:

- *"Restore at least 15% of degraded areas through conservation and restoration activities."*

The EUs headline target for progress by 2020 is to:

- *"halt the loss of biodiversity and the degradation of ecosystems in the EU by 2020, restore them as far as feasible, while stepping up the EU contribution to averting global biodiversity loss."*

This rehabilitation plan is aligned to the CBD target and the EU Biodiversity Strategy target and will help Ireland meet its commitment to these international Biodiversity polices.

13 Bord na Móna commitments

Bord na Móna made the commitment in 2009 not to develop any new peatland sites for industrial peat production. The company has continued to work with different stakeholders.

The company announced that industrial peat production would be cut by over 50 percent in 2019 and would entirely cease over most of its lands by the mid-2020s. Rehabilitation measures would continue to be carried out with the focus on re-wetting and rehabilitation of cutover and cutaway areas in line with national policies (such as the National Peatland Strategy, the National Biodiversity Action Plan, the Climate Action Plan 2019, the Water Framework Directive, etc.) and rehabilitation guidelines set down by the Environmental Protection Agency. To date, 15,000 hectares of cutaway and cutover bog have been rehabilitated using this approach with 5,000 hectares in active rehabilitation.

In line with Bord na Móna's accelerated decarbonisation programme, the company made a further commitment to a significantly larger rehabilitation target. This was reflected in our plans to rehabilitate a further 20,000 hectares of cutaway and cutover bog to wetland and woodland mosaics by 2025. In addition, we planned to restore a further 1,000 hectares of raised bog habitat by 2025.

The above commitments have now been followed by the decision by the company to cease industrial peat extraction and rehabilitate a target of 33,000 ha between 2021-2025.

These commitments outline the importance of peatland rehabilitation to Bord na Móna. The company will continue to demonstrate environmental responsibility and continue to deliver on these commitments in relation to peatland rehabilitation and in relation to the future management of these lands to maximise their benefits, particularly their ecosystem service benefits, along with the sustainable development of a portion of the land bank for other uses, such as renewable energy.

14 Bord na Móna Strategic Framework for the future use of cutaway peatlands 2020 (Draft)

The general after-use strategy of Bord na Móna is outlined in the Bord na Móna Strategic Framework for Future-Use of Cutaway Bogs 2020 (draft document). This document outlines how Bord na Móna's cutover peatland estate is complex in nature with great variability in terms of peat depths, peat types, drainage, subsoil condition and environmental value. Thus, future options require consideration on a site-specific basis, also bearing in mind the considerable internal variation within bogs. The development of the land-bank will also take account of national needs, while also taking account of the various national legislation, policies and plans related to the management of peatlands. In general, Bord na Móna will seek to balance and optimise commercial, social, and environmental value of these sites, and develop integrated land-uses, while taking account of the need for sustainability and their biodiversity value.

Any consideration of other future after-uses for Bord na Móna land such as development or other mixed uses will be conducted following the relevant planning guidelines and consultation with relevant authorities and will be considered within the framework of this peatland rehabilitation plan.

APPENDIX VII. DECOMMISSIONING

1. Condition 10 Decommissioning

This is a requirement of the applicable Integrated Pollution Control Licence issued by the Environmental Protection Agency. This condition 10.1 requires the following:

10.1 Following terminfation of use or involvement of all or part of the site in the licensed activity, the licensee shall:

10.1.1 Decommission, render safe or remove for disposal/recovery, any soil, subsoils, buildings, plant or equipment, or any waste, materials or substances or other matter contained therein or thereon, that may result in environmental pollution.

The main success criteria pertaining to successfully complying with this condition is ensuring that no environmental liability remains from this infrastructure and material and that the bog can be deemed suitable for surrender of the licence under section 95 of the EPA Acts. This is achieved by Bord na Móna identifying and quantifying any mechanical and infrastructural resources that were installed in the bog to enable the development and production operation at the site. This list is then refined to identify any items that would be deemed as possibly resulting in environmental pollution, should they not be removed.

Typically, these items/infrastructures would be any remaining, unconsolidated plant, equipment and attachments, waste materials, unused raw materials such as land drainage pipes, remaining peat stockpiles, stock pile covering, pumps, septic tanks and fuel tanks.

In relation to this bog, the list and tasks would be as follows:

Item	Description	Derryfadda Decommissioning Plan
1	Clean-up of remaining or unconsolidated waste or materials located in Bogs, Yards, Buildings and Offices	Clean-up of Bog
2	Cleaning Silt Ponds	Cleaning Silt Ponds
3	Decommissioning Peat Stockpiles	Peat Stockpile Management via Levelling
4	Decommissioning or Removal of Buildings and Compounds	Decommission and Removal of Porto-cabin tea centre and materials store
5	Decommissioning Fuel Tanks and associated facilities	Decommissioning and De-Gassing Mobile Fuel Tanks
6	Decommissioning and Removal of Bog Pump Sites	Not Applicable
7	Decommissioning or Removal of Septic Tanks	De-sludge Septic Tank

In addition, condition 7 of the licence requires these now defined waste items to be disposed of or recovered as follows:

7.1 Disposal or recovery of waste shall take place only as specified in *Schedule 2(i) Hazardous Wastes for Disposal/Recovery* and *Schedule 2(ii) Other Wastes for Disposal/Recovery* of this licence and in accordance with the appropriate National and European legislation and protocols. No other waste shall be disposed of/recovered either on-site or off-site without prior notice to, and prior written agreement of, the Agency.

7.2 Waste sent off-site for recovery or disposal shall only be conveyed to a waste contractor, as agreed by the Agency, and only transported from the site of the activity to the site of recovery/disposal in a manner which will not adversely affect the environment.

7.3 A full record, which shall be open to inspection by authorized persons of the Agency at all times, shall be kept by the licensee on matters relating to the waste management operations and practices at this site. This record shall as a minimum contain details of the following:

7.3.1 The names of the agent and transporter of the waste.

7.3.2 The name of the persons responsible for the ultimate disposal/recovery of the

waste.

7.3.3 The ultimate destination of the waste.

7.3.4 Written confirmation of the acceptance and disposal/recovery of any hazardous waste consignments sent off-site.

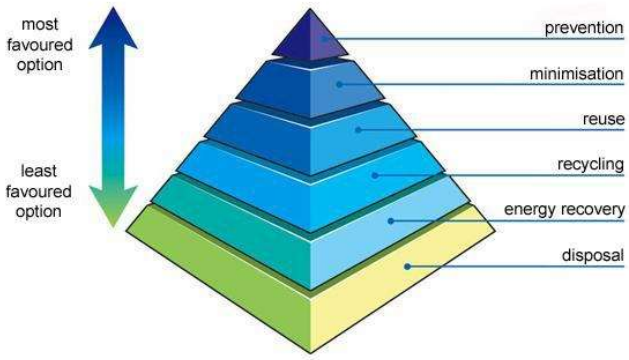
7.3.5 The tonnages and EWC Code for the waste materials listed in *Schedule 2(i) Hazardous Wastes for Disposal/Recovery* and *Schedule 2(ii) Other Wastes for Disposal/Recovery* sent off-site for disposal/recovery.

7.3.6 Details of any rejected consignments.

A copy of this Waste Management record shall be submitted to the Agency as part of the AER for the site.

As required by the licence, these waste items will be removed for recycling or disposal, using external contractors with the required waste collection permits, approved under 7.2, with waste records maintained as required under 7.3.

Where possible, Bord na Móna will utilize the appropriate waste hierarchy to identify waste that can reused or recycled ahead of disposal.



The validation of the success of condition 10.1 is carried out through an Independent Closure Audit (ICA), followed by and EPA Exit Audit (EA) and the eventual partial or full surrender of the licence.

2. Enhanced Decommissioning.

The remaining infrastructure does not constitute a risk to the environment and would not be a requirement of condition 10 of the licence. The removal of these are deemed as enhanced measures. These may enhance the future afteruse of the bog for amenity value, security against access for illegal and unsocial activities and general State and community benefit. In relation to this bog, this would include the infrastructure defined below:

Item	Enhanced Decommissioning Type	Derryfadda Decommissioning Plan
1	Removal of Railway Lines	Removal of Railway Lines
2	Decommissioning Bridges and Underpasses	Not Applicable
3	Decommissioning Railway Level Crossing	Decommissioning Railway Level Crossing
4	Restricting Access (bogs and silt ponds)	Restricting Access to Bog.
5	Removal of High Voltage Power Lines	Not Applicable

Railway lines will be removed from the internal Bord na Mona industrial railway network. However, the foundation of the railway (the stone base) will remain unaffected and will be left in place to facilitate potential future amenity development (greenways etc).

APPENDIX VIII. GLOSSARY

Cutaway Bog: A Bord na Móna site generally becomes cutaway when it is economically unviable to continue industrial peat extraction or when the majority of peat has been removed.

Deep peat cutover bog. Deep peat cutaway bog is defined as former raised bogs that have been in industrial peat production, where production has ceased but the residual peat depth is typically in excess of 2m. *Sphagnum* mosses are key species of raised bogs and the majority of the peat mass is formed from these mosses. *Sphagnum* species and other raised bog species are a key part of raised bog habitat function and prefer more acidic, nutrient poor, water-logged conditions. Typical raised bog *Sphagnum* mosses and other bog species do not thrive with the more typical alkaline water chemistry of cutaway bog but do grow well in these more acidic conditions where peat has been re-wetted. There is potential to re-develop *Sphagnum*-rich plant communities in these conditions if the peat can be re-wetted. This brings the opportunity of re-developing *Sphagnum*-rich vegetation communities that are considered Carbon sinks or peat-forming habitats and restoring the carbon sequestration function of these sites.

Dry cutaway bog: Cutaway bog is categorised as dry cutaway where it is not practical or feasible to re-wet these areas completely. It is inevitable that some areas of cutaway will remain relatively dry due to the heterogenous topography of the cutaway, as well as requirements for continued drainage on site for identified after-uses, or off site in relation to neighbouring lands or other infrastructure. Ridges and mounds of glacial deposits can become exposed during peat extraction and form a heterogenous topographical mosaic separated by basins. Dry cutaway may have very thin or no residual peat where ridges and mounds have been exposed. The exposed sub-soils are a mix of glacial gravels, muds and tills that can be quite free-draining. Dry cutaway may also have deeper residual peat but in a location (i.e. at the margin) where the peat can not be re-wetted due to boundary constraints. Dry cutaway may also develop in situations where there a relatively steep slope that inhibits re-wetting. The majority of dry cutaway will develop towards grassland, heath, scrub and dry woodland habitats.

Enhanced decommissioning: This is defined as decommissioning carried out under Scheme, which is proposed to externally funded.

Enhanced rehabilitation: This is defined as rehabilitation carried out under Scheme, which is proposed to be externally funded. It is proposed by Government that Bord na Móna be obligated to carry out enhanced decommissioning, rehabilitation and restoration on peatlands. This Scheme will significantly go beyond what is required to meet rehabilitation and decommissioning obligations under existing EPA IPC licence conditions. Interventions and activities supported by the Scheme will ensure that environmental stabilisation is achieved (meaning IPC obligations are met), and importantly, significant additional benefits, particularly relating to climate action and other ecosystem services, will also be delivered. However, only the costs associated with the additional, enhanced and accelerated measures, i.e., those interventions which go beyond the existing decommissioning and rehabilitation requirements arising from Condition 10 will be eligible for support under the Scheme.

Environmental stabilisiation: The key objective of peatland rehabilitation is environmental stabilisation. This means developing habitats and vegetation back onto the bare peat, slowing water movement across the bog, minimising effects to downstream waterbodies and meeting the conditions of the IPC Lisence. This is achieved by a combination of re-wetting, where possible, and natural colonisation of the former cutaway, with or without intervention**.** Habitats will develop that reflect the underlying environmental conditions. Other after-use development may also serve to act as environmental stabilisiation.

Marginal land. Marginal land is defined as land around the margin of the industrial peat production area. This margin generally contains a range of habitats including scrub, Birch woodland, cutover bog and raised bog remnants. It has a variety of land-uses including turf-cutting (private turbary). The Scheme will consider potential rehabilitation and restoration actions (e.g. drain blocking) within marginal land zones, where appropriate.

Rehabilitation: Rehabilitation is defined in general by Bord na Móna as environmental stabilisation of the former cutaway. This is generally achieved via re-wetting, where possible, and natural colonisation of the former cutaway, with or without intervention. It is not possible to restore raised bog habitats on BnM cutaway in general in the short-term. In general, most of the peat mass has been removed from many BnM cutaway sites and the environmental characteristics of these areas have therefore changed radically (peat depths, hydrology, water chemistry, substrate type, nutrient status. This means there will therefore be different habitat outcomes (wetlands, fen, heathland, grassland and Birch woodland). Other after-use development may also serve to act as rehabilitation.

Restoration: Ecological restoration to defined as the process of re-establishing to the extent possible the structure, function and integrity of indigenous ecosystems and the sustaining habitats they provide" (SER 2004). Defined in this way, restoration encompasses the repair of ecosystems (Whisenant 1999) and the **improvement of ecological conditions in damaged wildlands** through the **reinstatement of ecological processes**. In general, Bord na Móna cutaway peatlands cannot be restored back to raised bog in a reasonable timeframe as their environmental conditions has changed so radically (with the removal of the acrotelem – the living layer and much of the peat mass). However, they can be returned to a **trajectory** towards a naturally functioning peatland system (Renou-Wilson 2012). **Raised bog restoration** is an objective of some BnM sites where there is residual natural raised bog vegetation and where the majority of the peat is still intact.

Standard rehabilitation: This is defined as rehabilitation that is designed to meet the conditions of the EPA IPC Licence. The key objective of rehabilitation is environmental stabilisation. This is achieved by a combination of re-wetting, where possible, and natural colonisation of the former cutaway, with or without intervention**.** Other after-use development may also serve to act as rehabilitation.

Standard decommissioning: This is defined as decommissioning that is designed to meet the conditions of the EPA IPC Licence. This is defined as to render safe or remove for disposal/recovery, any soil, subsoils, buildings, plant or equipment, or any waste, materials or substances or other matter contained therein or thereon, that may result in environmental pollution.

Wetland cutaway bog. Wetland cutaway bog is defined as former raised bogs that have been in industrial peat production, where production has ceased and the majority of peat has been cutaway, and where this cutaway has the potential to be re-wetted. A significant number of Bord na Móna sites have pumped drainage and these sites are likely to develop a mosaic of wetland habitats when pumping in reduced or stopped. The water chemistry of wetland cutaway frequently is strongly influenced by the more alkaline sub-soils that have been exposed during peat production. This means that pioneer vegetation is more typical of fen and wetland, rather than raised bog. Wetland cutaway will have a broad range of hydrological conditions depending on the local topography. In some cases, these wetlands may form deep water (> 0.5 m) whilst other areas may have the water table at or just below the surface of the ground.

APPENDIX IX. EXTRACTIVE WASTE MANAGEMENT PLAN

(Minimisation, treatment, recovery and disposal)

Objective:
The objective of this generic plan is to comply with the requirements of regulation 5 of the Waste Management (Management of Waste from Extractive Industries) Regulations, and to prevent or reduce waste production and its harmfulness.

Scope:
This plan covers IPPC Licence's Ref. P0502 -01, Derryfadda Bog Group in County Galway.

1.0 Extractive Waste:
Waste classified as extractive waste from peat extraction operations arise from three operations associated with this activity.

1.1 Silt Pond excavations and maintenance.
All peat extraction activities in Mount Dillon are serviced by silt lagoons/ponds. During the excavation of these silt ponds, pre IPPC Licensing in 1999 and since licensing, the excavated material is stored adjacent to the silt pond, where it either remains in situ ores levelled out. As required by condition 6.6, these silt lagoons are cleaned twice per annum or more often if inspections dictate. These silt cleanings are also deposited on the same location, adjacent to the silt pond, where they may be levelled periodically to allow room for subsequent cleanings. These mounds of silt pond excavation material and cleanings are generally no higher that 2-3 metres.

1.2 Power Station screenings:
Peat from the bogs is screened prior to processing. This screening removes oversized peat, stones and bogs timbers. Schedule 3 (ii) of the IPPC licence permits disposal of these peat screenings back to the bog, where it is levelled and graded into the surrounding peat landscape. These locations have been agreed with the Agency as per condition 7.4 of the IPPC Licence, and as per the attached locations.

1.3 Bog Timbers:
During peat extraction operations, bog timbers often arise in the bog surface and are required to be cleared. These timbers consist of bog pine, oak and some yew. Some of these timbers, such as the oak and yew are removed for use in the wood craft industry, with the remaining bog pine stockpiled in locations at the opposite end of each bog, where it generally becomes a habitat for flora and fauna. These piles of timber are generally no higher than 1-2 metres.

2.0 P0502-01 IPPC Licence Extractive Waste Conditions

2.1 Condition 7.5 Extractive Waste Management
The licensee shall draw up a Waste Management Plan (to be known as an Extractive Waste Management Plan) for the minimisation, treatment, recovery and disposal of extractive waste. This Plan shall meet the requirements of regulation 5 of the Waste Management (Management of Waste from the Extractive Industries) Regulations,2009. The Plan shall be submitted for agreement by the Agency by the 31' December2012. The Plan shall be reviewed at least once every five years thereafter in a manner agreeable to the Agency and amended in the event of substantial changes to the operation of a waste facility or to the waste deposited. Any amendments shall be notified to the Agency.
All extractive waste shall be managed in accordance with the Extractive Waste Management Plan. A report on the implementation of the Extractive Waste Management Plan shall be provided in the AER.

2.2 Condition 7.6 Waste Facility
(i) No new waste facility may be developed or an existing waste facility modified unless agreed by the Agency.
(ii) The licensee shall ensure that all existing waste .facilities are managed and maintained to ensure their physical stability and to prevent pollution or contamination of soil, air, surface water or groundwater.
(iii) The licensee shall ensure that all new waste facilities are constructed, managed and maintained to ensure their physical stability and to prevent pollution or contamination of soil, air, surface water or groundwater.
(iv) Operational measures shall be continuously employed to prevent damage to waste facilities from personnel, plant or equipment.
(v) The licensee shall establish and maintain a system for regular monitoring and inspection of waste facilities.
(vi) All records of monitoring and inspection of waste facilities, as required under the licence, shall be maintained on-site in order to ensure the appropriate handover of information in the event of a change of operator or relevant personnel.

2.3 Condition 7.7 Excavation Voids
7.7.1 Unless otherwise agreed by the Agency, only extractive waste shall be placed in excavation voids.
7.7.2 When placing extractive waste into excavation voids for rehabilitation and construction purposes, the licensee shall, in accordance with regulation 10 of the Waste Management (Management of Waste from the Extractive Industries) Regulations, 2009, and the Extractive Waste Management Plan:
1. Secure the stability of the waste
2. Put in place measures to prevent pollution of soil, surface water and ground water.
3. Carry out monitoring of the extractive waste and excavation void.

Condition 7.5. Extractive Waste Management Plan. 5 (1)

3.0 Minimisation.
3.1 Silt pond excavation material and cleanings.
IPPC Licence conditions require all production areas to be serviced by an appropriately designed silt pond based on storage volume and retention time. Condition 6.6 requires all ponds to be cleaned bi-annually and more often if inspections dictate, so the only opportunity for minimisation of same is through Standard Operating Procedures. These are required under condition 2.2.2 (i) regarding minimisation of suspended solids, and are in-place to minimise the generation of silt, which in-turn will minimise the generation of silt pond waste.

3.2 Power Station Screenings.
These screenings cannot be minimised as they are a consequence of peat production, stones, timbers and oversize peat materials are naturally occurring on the bog and are required to be removed prior to processing.

3.3 Bog Timbers.
Bog timbers are also naturally occurring materials within a bog and are required to be removed prior for production. The volume of these bog timbers varies from bog to bog and as such their minimisation is not controllable or quantifiable.

4.0 Treatment
4.1 Silt pond excavation material and cleanings.
The silt pond excavation material and silt cleanings do not require any treatment for its end use which will be either backfilling these silt pond voids as per condition 7.7.1 above as part of the Bog Rehabilitation Plan, or reincorporated into the surrounding peatlands.

4.2 Power Station Screenings.
The factory screenings are permitted to be returned to the bog as they were naturally occurring materials from the bog, and as such do not require any treatment to serve this purpose.

4.3 Bog Timbers
As per 1.3 above, these timbers are stockpiled at two locations in each bog, as per the attached list of sites and become habitats for various flora and fauna.

5.0 Recovery
5.1 Silt pond excavation material and cleanings.
Condition 2.2.2 (vi) requires the reuse of silt pond waste to be examined. This was undertaken in 2006, the outcome of which was that this waste peat silt material, as a fuel, was contaminated with sub-soils, rendering it unsuitable for combustion. In addition, volumes are small compared to overall peat production volumes.

5.2 Power Station Screenings.
Given the nature of these screenings as outlined in 1.2 above, there is no further use identified and they are permitted to be disposed of back to the bog.

5.3 Bog Timbers
Investigations into processing these materials into smaller fractions for potential heating purposes did not yield any viable results. In addition, these older stockpiles are now classified as habitats and as such would not be considered for reuse as a fuel.

6.0 Disposal
6.1 Silt pond excavation material and cleanings.
Schedule 3 (ii) permits the disposal of silt pond cleanings (Lagoon Sediments) to the bog and these locations, adjacent to the silt pond site, are presented in the attached spreadsheet, with associated grid coordinates.

6.2 Power Station Screenings.
Schedule 3 (ii) permits the disposal of screenings (Peat Screenings) to the bog at designated locations agreed under Condition 7.4, and these locations, are presented in the attached spreadsheet, with associated grid coordinates.

6.3 Bog Timbers
These naturally occurring bog timbers are stockpiled at locations in each bog, grid coordinates attached.

7.0 Extractive Waste Management Plan

5 (2a)(i)
The vast majority of peat extraction bogs were all designed and drained for production prior to the 1960's and as such the production fields layout cannot' be altered. Under our Cleaner Reduction Procedures, various design changes have been implemented to the production machines and process to reduce lost peat which eventually is captured in the silt ponds and requires removal as waste peat silt. This along with training and ongoing research and development will continuously reduce waste peat and subsequently waste silt pond cleanings. Bog timbers are present naturally in various volumes and quantities in different bogs and as peat production involves stripping peat in layers, the exposure, generation and removal of these timbers is unavoidable. Work has been undertaken recently into project looking at grinding of these bog timbers in situ using a timber miller, and if this project becomes viable it will contribute to the reduction of bog timbers.

5 (2a)(ii)
Given the nature and expanse of peat bogs, the stockpiling and storage of these waste materials do not present a visual, storage or stability problem. As required under Condition 10 of the IPPC Licence, the silt pond excavations and screenings will be utilised to backfill the silt pond voids once the bogs have finished and stabilised in accordance with out Bog Rehabilitation Plan. Storage of these wastes in the interim, open to the elements does not present a change on the nature of these wastes that will threaten the environment or prevent their reuse during the bog rehabilitation process.

5 (2a)(iii)
Under Condition 10 of the IPPC Licence, all silt ponds will be decommissioned once the bog surface has stabilised, in agreement with the Agency. This will involve the removal of weirs and flow controls, returning the silt pond back to its original drain or removing the silt pond from the drainage system. Both of these activities will involve placing the silt pond extraction and cleaning material back into the excavation void.

5 (2a)(iv)
The peat bogs do not contain any topsoil, so this is not required.

5 (2a)(v)
Peat mineral resources do not undergo any treatment.

5 (2b)
These three extractive waste are all being reused and recovered back to their original extraction points and have not undergone any physical, chemical, or biological change.

5 (2c)(i, ii & iii)
These three extractive wastes, stored on the bog for reuse or recovery during the bog rehabilitation phase, do not require any management or monitoring during the operation of these bogs. Silt pond excavations and cleanings are stored adjacent to the silt pond and quickly revegetated and stabilise, the screenings are graded back into the bog at the agreed locations upon disposal and the bog timbers do not prevent any water or airborne danger to the environment.

5 (3)
The three extractive wastes arising from peat extraction operations at this site are classified wastes from mineral non-metalliferous excavation, with an EWC code of 0101 02. The materials are not classified as hazardous under Directive 91/689/EEC20, and do not contain substances or preparations classified as dangerous under Directives 67/548/EEC5 or 1999/45/EC6 above a certain threshold.
The peat excavations and cleanings are stored in locations and in a manner that they could not collapse and are remote in their nature. The stockpiles are located adjacent to silt ponds that are cleaned regularly and as such these stockpiles are managed and levelled to facilitate further cleanings.
Therefore, the material stored at these waste facilities would not be considered to be a Category A waste facility.

Classification in accordance Annex II.

Waste Material	Description	**C**lassification	Chemical Process treatment	Deposition description	Transport System
Silt Pond Excavations and cleanings	Peat and mineral soils associated with peatlands. Stored for reuse during bog rehabilitation, with no displacement of overburden	01 01 02	None	Excavated from silt ponds by excavator and deposited adjacent to the silt pond.	Excavator
Peat Screenings	Stones, timbers and oversized peat particles, reincorporated into low areas, agreed with the Agency, and stabilized under normal natural bog conditions	01 01 02	None	Removed by screen at the factory and transported by tractor and trailer to the designated and agreed locations	Tractor and trailer.
Bog Timbers	Pine, Oak and Yew species, stored at locations in each bog. Not subject to any stability issues due to exposure to atmospheric/meteorological conditions.	01 01 02	None	Removed from the bog surface by excavator and transported by tractor and trailer to the agreed locations	Tractor and Trailer

Description of operations.
Silt pond excavations arise from the requirement to have silt ponds treating all peat extraction sites. Silt pond cleanings arise from the removal of peat silt from silt ponds as required under IPPC Licence. Bog timbers arise from preparation of the bogs surface for peat production. Estimated quantities of materials are below:

Closure plan. (Bog Rehabilitation Plan).
Condition 10.1 – 10.3 of the IPPC Licence requires the following:
1. 10.1 Following termination of use or involvement of all or part of the site in the licensed activity, the licensee shall:
2. 10.1.1 Decommission, render safe or remove for disposal/recovery, any soil, subsoils, buildings, plant or equipment, or any waste, materials or substances or other matter contained therein or thereon, that may result in environmental pollution.
3. 10.1.2 Implement the agreed cutaway bog rehabilitation plan (refer Condition 10.2).

10.2 Cutaway Bog Rehabilitation Plan:
1. 10.2.1 The licensee shall prepare, to the satisfaction of the Agency, a fully detailed and costed plan for permanent rehabilitation of the cutaway boglands within the licensed area. This plan shall be submitted to the Agency for agreement within eighteen months of the date of grant of this licence.
2. 10.2.2 The plan shall be reviewed every two years and proposed amendments thereto notified to the Agency for agreement as part of the AER. No amendments may be implemented without the written agreement of the Agency.

10.3 The Rehabilitation Plan shall include as a minimum, the following:

1. 10.3.1 A scope statement for the plan; to include outcome of consultations with relevant Agencies, Authorities and affected parties (to be identified by the licensee).
2. 10.3.2 The criteria which define the successful rehabilitation of the activity or part thereof, which ensures minimum impact to the environment.
3. 10.3.3 A programme to achieve the stated criteria.
4. 10.3.4 Where relevant, a test programme to demonstrate the successful implementation of the rehabilitation plan.
5. 10.3.5 A programme for aftercare and maintenance.

10.4 A final validation report to include a certificate of completion for the Rehabilitation Plan, for all or part of the site as necessary, shall be submitted to the Agency within six months of execution of the plan. The licensee shall carry out such tests, investigations or submit certification, as requested by the Agency, to confirm that there is no continuing risk to the environment. This plan including maps and ecological classifications are available on file at the Mount Dillon IPPC Licence Coordinators office.
The location in relation to the silt pond excavations and cleanings are adjacent to the silt ponds, which are considered under the Shannon River Basin Management Plan in accordance with the requirements of Directive 2000/60/EC.
Screenings and bog timbers are all naturally occurring elements of peatland and there placement back to the bog in smaller concentrated designated waste facilities does not constitute a risk to the prevention of water compliance.
The lands under where these materials are deposited are peatlands and are un-effected by the placing of this material.

Review.
This plan will be reviewed every five years, the first review to take place in September 2017. This review will entail an inspection of these waste facilities to ensure their placing, management, maintenance and stability comply with the requirements of the Extractive Waste Management requirements and condition 7.5, 7.6 and 7.7 of the Mount Dillon IPPC Licence Ref. PO504 -01.

APPENDIX X. MITIGATION MEASURES FOR THE APPLICATION OF FERTILISER

- Any fertiliser used will be Rock Phosphate and will not be applied in the following conditions:
  - The land is waterlogged;
  - The land is flooded, or it is likely to flood;
  - The land is frozen, or covered with snow;
  - Heavy rain is forecast within 48 hours (forecasts will be checked from Met Éireann).
  - The ground slopes steeply and there is a risk of water pollution, when factors such as surface run-off pathways, the presence of land drains, the absence of hedgerows to mitigate surface flow, soil condition and ground cover are taken into account.

1. No fertiliser will be spread on land within 2 metres of a surface watercourse.
2. Buffer zones in respect of waterbodies, as specified on https://www.epa.ie/about/faq/name,57156,en.html, will be adhered with at all times with regard to fertiliser application. Reproduced as follows:

Water body / Feature	Buffer zone
Any water supply source providing 100m^3 or more of water per day, or serving 500 or more people	200 metres (or as little as 30 metres where a local authority allows)
Any water supply source providing 10m^3 or more of water per day, or serving 50 or more people	100 metres (or as little as 30 metres where a local authority allows)
Any other water supply for human consumption	25 metres (or as little as 30 metres where a local authority allows)
Lake shoreline	20 metres
Exposed cavernous or karstified limestone features (such as swallow holes or collapse features)	15 metres
Any surface watercourse where the slope towards the watercourse exceeds 10%	10 metres
Any other surface waters	5 metres*

An map of the areas identified for targeted fertiliser application is provided in the Mapbook (**BNM-DR-23-12-28: Fertiliser Application Map**).

APPENDIX XI. CONSULTATION SUMMARIES

Table APXI -1 Consultees contacted

Bog Name	Contact Organisation	Contact Name	Date of Issue	Communication Format	Date Response Received	Response format

APPENDIX XII. ARCHAEOLOGY

Role of the Archaeological Liaison Officer

1. To communicate this Code of Practice and the *Archaeological Protection Procedures* (Appendix IV) to all personnel operating on the bog.
2. To ensure that all notices relating to the *Archaeological Protection Procedures* are posted and maintained at appropriate locations on the bog.
3. To report any stray finds, presented to the Liaison Officer from his/her group of bogs, to the Duty Officer of the National Museum of Ireland.
4. To provide for the appropriate protection of the stray find, whether in-situ or removed from the bog, as directed by the Duty Officer of the National Museum of Ireland.

Code of Practice

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Code of Practice

5. To arrange for the delivery or collection of the stray find, as directed by the Duty Officer of the National Museum of Ireland.

6. To complete the Report of Discovery of Archaeological Object(s) in Bogs (Appendix V), as directed by the Duty Officer of the National Museum of Ireland.

7. To maintain a file of all stray finds and associated documentation and provide copies to the Project Archaeologist.

8. To provide assistance, where required, to the Department during archaeological surveys.

9. To provide assistance, where required, to Bord na Móna's Consultant Archaeologists, during investigation and mitigation of monuments.

10. To report to the Bord na Móna members on the Archaeology Management Liaison Committee any planned developments or new activities on cutaway peatland areas within his/her group of bogs.

Bord na Móna	**Procedure: ENV017**	**Rev: 1**
Title: Archaeological Findings	**Approved: EM**	**Date: 13/10/2020**

1. Purpose

The purpose of this procedure is to describe the arrangements in Bord na Móna for findings of Archaeological material (Stray Finds).

All objects, sites or monuments, no matter how fragmentary, are important elements of our heritage.

2. Procedure

1. Check whether there are any known archaeological monuments in your area.
2. Be vigilant at all times - objects or traces of structures can be found on the field surfaces, in the drain faces, on the bog margins or caught within the mechanics of machinery.
3. If an object is found leave it in place, if it is safe to do so, note its position and immediately contact your Archaeological Liaison Officer who will assess the situation and contact the Duty Officer of the National Museum of Ireland.
4. Resist the temptation to investigate the find spot as this may disturb fragile archaeological deposits.
5. If the object is already dislodged or is in imminent danger, remove it carefully, mark its find spot and report it immediately to your Archaeological Liaison Officer.
6. Objects made of wood, leather or textile, which are removed from peat should be kept in conditions similar to those in which they are found. This can be done by packing them in peat or, if waterlogged, placing them in a clean basin of water and sealing the container. Resist the temptation to clean or remove peat from the object.
7. If timbers or other materials, such as gravel or stones, which could be part of a man-made structure are noted on the bog, mark the location and report it immediately to your Archaeological Liaison Officer. If you suspect the find is of archaeological importance, resist the temptation to expose it any further as this could result in damage to the structure.
8. Report anything that looks unnatural in the bog – your Archaeological Liaison Officer will decide whether it should be referred to the appropriate authorities.

NOTE: Our archaeological heritage is a finite, non-renewable resource. Once a site is destroyed its information is lost forever and we have lost the chance to understand a little more about our past, where we have come from and perhaps the opportunity to learn for the future.

Your Archaeological Liaison Officer is ……

9. Records

Revision Index			
Revision	Date	Description of change	Approved
1	13/10/2020	First release	EMcD

APPENDIX C: ENVIRONMENTAL MANAGEMENT PLAN

Bord na Móna

Peatland Climate Action Scheme

Environmental Management Plan

Prepared by

Bord na Móna, Civil Engineering Office

Bord na Móna

DOCUMENT CONTROL SHEET

Client	Bord na Móna					
Project Title	Peatland Climate Action Scheme					
Document Title	Environmental Management Plan					
Document No.	PCAS-RP-23-XX-04-EMP					
This Document Comprises	DCS	TOC	Text	List of Tables	List of Figures	No. of Appendices
	1	1	19	4	0	2

Rev.	Status	Author(s)	Reviewed By	Approved By	Office of Origin	Issue Date
-	Draft	DM	EMcD/MMcC/ DK/CC	PN	BnM Engineering Dept.	28-04-2021
A	Final	DM	EMcD/MMcC/ DK/CC	PN	BnM Engineering Dept.	11-10-2021
A	Final FY23	DM	EMcD/MMcC/ DK/CC	PN	BnM Engineering Dept.	03-11-2021

Contents

1.0 Introduction

Bord na Móna have identified a footprint of 33,000 ha of their estate as peatlands suitable for enhanced rehabilitation. This proposed Peatlands Climate Action Scheme (PCAS) will significantly exceed the requirements of the rehabilitation and decommissioning obligations under existing Environmental Protection Agency (EPA) Integrated Pollution Control (IPC) Licence Conditions. Improvements supported by PCAS will ensure that environmental stabilisation is achieved, and significant additional benefits are realised through optimising climate action benefits. This decommissioning, rehabilitation and restoration process will be referred to in subsequent sections of this report as 'the works'.

The objectives of the Environmental Management Plan (EMP) are to:

a) Identify management responsibilities and reporting requirements for environmental management;
b) Identify the relevant Environmental Commitments;
c) Set out the environmental protection measures to be implemented;
d) Outline how compliance with the EMP will be achieved; and
e) Promote best environmental practices for the duration of the development.

This Environmental Management Plan should be read in conjunction with the following site-specific documents for the relevant bog where works are taking place:

- Cutaway Bog Decommissioning and Cutaway Bog Decommissioning and Rehabilitation Plan,
- Site Characterisation Report,
- GIS Map Book,
- Drainage Management Plan,
- Preliminary Health & Safety Plan,
- Engineering Construction Package,
- Environmental File,
- Ecology File,
- Associated IPC Licence,
- Training Pack,

The *Cutaway Bog Decommissioning and Cutaway Bog Decommissioning and Rehabilitation Plan* gives details on the proposed works and outlines control measures and associated monitoring in order to mitigate against any detrimental impacts that may arise on site during the works. It also outlines Bord na Móna's responsibilities under the existing IPC Licence Conditions with respect to peatland rehabilitation.

2.0 Proposed Rehabilitation Works

The enhanced rehabilitation measures are outlined and detailed in the site-specific Cutaway Bog Decommissioning and Rehabilitation Plan, Engineering Construction Package, Environmental File & Ecology File. These measures are grouped into rehabilitation packages and their suitability for the deployment in different 'high level' categories of land types are outlined in Table 2-1. The Standard Rehab Methodology Drawings in Table 2-2 should be followed with respect to the execution of the various mythologies on site.

Table 2-1 Rehabilitation Packages

Code	Description
Deep Peat Cutover Bog	
DPT1	Regular drain blocking (3/100 m) + blocking outfalls and managing water levels with overflow pipes
DPT2	More intensive drain blocking (7/100 m) + blocking outfalls and managing overflows with a controlled weir outfall + Sphagnum inoculation
DPT3	More intensive drain blocking (7/100 m), + field reprofiling + blocking outfalls and managing overflows with a controlled weir outfall + + Sphagnum inoculation
DPT4	Berms and field re-profiling (45m x 60m cell) + blocking outfalls and managing overflows with a controlled weir outfall + drainage channels for excess water + + Sphagnum inoculation
DPT5	Cut and Fill cell bunding (30m x 30m cell) + blocking outfalls and managing overflows with a controlled weir outfall + drainage channels for excess water + Sphagnum inoculation
Dry Cutaway	
DCT1	Blocking outfalls and managing water levels with overflow pipes
DCT2	Regular drain blocking (3/100 m) + blocking outfalls and managing water levels with overflow pipes + targeted fertiliser treatment
DCT3	More intensive drain blocking (7/100 m) + blocking outfalls and managing overflows with a controlled weir outfall + targeted fertiliser treatment
Wetland	
WLT1	Turn off or reduce pumping to re-wet cutaway + blocking outfalls and managing water levels with overflow pipes
WLT2	Turn off or reduce pumping to re-wet cutaway + blocking outfalls and managing water levels with overflow pipes + Targeted blocking of outfalls within a site
WLT3	Turn off or reduce pumping to re-wet cutaway + blocking outfalls and managing water levels with overflow pipes + Targeted blocking of outfalls within a site + constructing larger berms to re-wet cutaway + transplanting Reeds and other rhizomes
WLT4	More intensive drain blocking (7/100 m), + blocking outfalls and managing overflows with a controlled weir outfall + transplanting Reeds and other rhizomes

WLT5	More intensive drain blocking (7/100 m), + field reprofiling + blocking outfalls and managing overflows with a controlled weir outfall + transplanting Reeds and other rhizomes
Marginal Land	
MLT1	No work required
MLT2	More intensive drain blocking (7/100 m)

Table 2-2 – Schedule of Standard Rehab Methodology Drawings

Drawing No.	Drawing Title
PCAS-0100-001	Rehabilitation Method DPT1
PCAS-0100-002	Rehabilitation Method DPT2
PCAS-0100-003	Rehabilitation Method DPT3A
PCAS-0100-004	Rehabilitation Method DPT3B
PCAS-0100-005	Rehabilitation Method DPT4A
PCAS-0100-006	Rehabilitation Method DPT4
PCAS-0100-007	Rehabilitation Method DPT5
PCAS-0100-008	Rehabilitation Method DCT2
PCAS-0100-009	Rehabilitation Method DCT3
PCAS-0100-010	Rehabilitation Method WLT3
PCAS-0100-011	Rehabilitation Method WLT4
PCAS-0100-012	Rehabilitation Method WLT5
PCAS-0100-013	Rehabilitation Method MLT2
PCAS-0100-014	Modifying of Outfalls & Managing Water Levels
PCAS-0100-015	Field Re-profiling
PCAS-0100-016	Boundary Berm

3.0 Envisaged Sequence of Works

This section provides an outline of the envisaged sequence of works associated with the project. Bord na Móna Operations Risk Assessment Method Statements (RAMS) should include a detailed description of the works, particularly those works which have the potential to impact public spaces. Mitigation measures for these impacts should also be proposed within the RAMS.

3.1 Site Preparation Works

Bord na Móna Operations will be responsible for security of the site and as such, will be required to carry out, among others, the following tasks:

- Ensure that a relevant and robust site induction process is in place for all site personnel and visitors.
- Ensure that all site personnel have valid Safe Pass card, and valid CSCS card where applicable.
- Ensure that access to the site by unauthorised persons is restricted, by appropriate means.

The site compound may be used as a storage area for various materials throughout the course of the works. Typical materials to be stored include fuels, plant and equipment. Temporary water supply, electricity and sewerage to be satisfied by Bord na Móna Operations as required.

3.2 General Description of Works

The works involves the construction of peat dams, berms and the adoption of various peat bunding techniques in addition to monitoring activities as per the IPC Licence requirements.

The scope of works is described as, but are not limited to, the following:

- Silt pond inspections fortnightly and cleaning bi-annually.
- Sampling of the silt pond outlet every month.
- Refuelling of machines.
- Unloading of fuel from supplier into a double skinned tank onsite.
- Unloading of oil barrels from a pick-up and depositing into the oils store.
- Other materials being delivered to site by BNM and third parties.
- Idle travel out the bog bringing operators to machines to facilitate welfare breaks.
- Collection of loose polythene out the bog and stockpile at the centre.
- Collection of old unused concrete pipes and transport back to centre.
- Remove old machines from bogs, returning to the centre for cutting and collection by a scrap contractor.
- Lifting and collecting unused sections of rail line along mainline.
- Lifting laid permanent rail line and polythene.
- Decommissioning works including, but not limited to plastic clean up, lifting of rail lines etc.
- Provision of temporary welfare facilities for the Bord na Móna staff.
- Construction of peat dams within existing drains.

- Construction of peat bunds and berms.

4.0 Management & Mitigation Measures

4.1 Site Management

The works shall be managed and supervised by competent and qualified personnel and all works shall be carried out under appropriate supervision, best practice, current health and safety measures and also suitable quality control. Facilities for site employees shall be provided within the site compound.

Implementation of the mitigation measures for the works will be the responsibility of Bord na Móna Operations and supervision of the works will be carried out by this Bord na Móna Department incorporating Site Supervisors and the Project Supervisor Construction Stage (PSCS).

In addition, implementation of the mitigation measures will be monitored and inspected by Bord na Móna Environmental, Ecology and Engineering Departments, who are independent of Bord Na Móna Operations. Project Ecologists, Engineers and Environmental Compliance Officers are appointed for each bog and they will ensure that measures are carried out in accordance with this Environmental Management Plan. The Project Ecologist, Environmental Compliance Officer, Engineer, H & S Manager, Site Supervisor and PSCS will have a 'stop works' authority.

4.2 Health & Safety

All works shall be carried out so as to comply with all the requirements of the Safety and Health at Work Act 2005 and any subsequent regulations or amendments and with the requirements of the Health and Welfare at Work (Construction) Regulations, (SI 291 of 2013), any subsequent amendments and any other relevant Health and Safety legislation. All construction staff on site shall have a current Safe Pass card and relevant CSCS card. All works shall be carried out in a safe manner and in accordance with the above legislation and any other guidance notes issued by the Health and Safety Authority. In particular, all excavation works shall be carried out in accordance with the *HSA Publication: A Guide to Safety in Excavations.*

The PSCS will provide a site-specific Construction Stage Safety and Health Plan and will provide risk assessments and method statements for the works. On completion of the works the PSCS shall prepare a detailed safety file.

All site personnel/site visitors will be required to wear Personal Protective Equipment (PPE) and undergo the established site induction process prior to entering the site.

Bord Na Móna Operations should ensure that regular audits are carried out at the site, to ensure that measures and process outlined in the site health and safety plan are adhered to. Dangerous occurrences, incidents, near misses and unsafe acts should be recorded, with recorded action taken to prevent all further occurrences.

4.3 Restricted Activities

Species-specific seasonal restrictions on the proposed activities may be required in line with elements highlighted in the site-specific Rehabilitation Measures & Ecology File.

Regarding vegetation clearance, should it be required, all works will comply with Section 40 of the Wildlife Act. Please refer to Vegetation Clearance SOP ECO-004 for specific guidance. For the avoidance of doubt – no felling works will be carried out as part of the proposed works.

There may also be a requirement to protect other ecological receptors such as colonies of breeding Marsh Fritillary (a butterfly species), the breeding or resting places of Otter and possibly amphibians or reptiles which utilise locations such as drains or other water features.

Where clearance is required during the restricted period, the Department of Agriculture, Food and Marine advise that under Section 37 of the Forestry Act, 1946:

> *It is illegal to uproot any tree over ten years old or to cut down any tress of any age (including trees which form part of a hedgerow) unless a Felling Notice has been lodged at the Garda Station nearest to the trees at least 21 days before felling commences.*

The Closed Period "*40(1) (a) it shall be an offence for a person to cut, grub, burn or otherwise destroy during the period beginning on the 1st day of March and ending on the 31st day of August in any year, any vegetation growing on any land not then cultivated. (b) it shall be an offence for a person to cut, grub, burn or otherwise destroy any vegetation growing in any hedge or ditch during the period mentioned in paragraph (a) of this subsection"*

As per guidance from Inland Fisheries Ireland, any instream works proposed to be undertaken in any rivers streams and watercourses should be undertaken between July and September and in all cases must be agreed in advance with Inland Fisheries Ireland.

Measures to avoid the inadvertent transfer of alien invasive species (aquatic or terrestrial) will be required.

The Project Ecologist or Environmental Manager will advise Bord na Móna Operations on site-specific application of these restrictions to individual sites.

4.4 Archaeology

The discovery of monuments or archaeological objects during the works can constrain the rehabilitation measures proposed for a particular area. If this occurs, rehabilitation measures will be reviewed and adapted where required. An archaeological impact assessment for the site has been carried out and is included in the site-specific Cutaway Bog Decommissioning and Rehabilitation Plan. The recommendations of this assessment have been incorporated into the site-specific Cutaway Bog Decommissioning and Rehabilitation Plan, Engineering Construction Package, Environmental File & Ecology File to minimise impacts on known archaeology.

In addition, Bord na Móna Operations will adhere to the Archaeology Code of Practise relating to management of stray archaeological finds that may arise during the works.

4.5 Ground Water & Surface Water Management

A key component of the works is the potential hydrological impact rehabilitation may have on the bog, surrounding lands and lands downstream which may be hydrologically linked to the bog.

Measures should be taken to protect groundwater and surface water at the site during the works. Drip trays, spill kits and mobile bund systems should be used where required to prevent loss of chemicals/fuels to ground. Plant and equipment should be refilled in a bunded or hardstand area using a drip tray or mobile bund.

Damaged containers should be removed from site and disposed of appropriately to avoid further use. Fuels and oils on site should be stored securely to avoid damage. Relevant staff have received emergency response training for pollution events and be trained in the use of spill kits and handling and refuelling.

Management Activities will comply with Condition 6 of the IPC Licence as follows:

- Intensive sampling of 70% of our bog catchments
- Monthly sampling silt pond outlets
- Fortnightly silt pond inspections
- Bi-annual silt pond maintenance as per procedure

All works should be carried out in line with the site-specific Engineering Construction Package, Environmental File & Ecology File in addition to the *Inland Fisheries "Guidelines on protection of fisheries during construction works in and adjacent to waters".*

4.6 Drainage Management Plan Measures

Drainage Management Plans (DMP) have been developed for each bog to establish the baseline hydrological performance of the bog and the surrounding drainage network. The plan sets out the characterisation of the bog and surrounding lands, the existing performance of the drainage network and the level of flood risk. The plan identifies the potential hydrological zone of influence of the bog and the objectives, risks and opportunities associated with the rehabilitation of the bog.

The plan assesses the potential impact of the various rehabilitation measures which are proposed on the local drainage network and flood risk. It sets out, where necessary, mitigation measures required to reduce impacts to an acceptable level. The plan sets out the measures which are required to be delivered in parallel with the Cutaway Bog Decommissioning and Rehabilitation Plan as well as the long-term operation and retention of the drainage network and associated infrastructure. The plan assesses the level of residual risk, the potential impact due to climate change and the adaptability of measures in response to these climate change impacts.

The DMP forms the basis of the detailed design drawings, included in the Engineering Construction Package, and should be read in conjunction with this report.

4.7 Traffic & Transport Management

All machines will be regularly checked and maintained prior to arrival at the site to prevent hydrocarbon leakage. No direct discharges to waters will be made.

4.8 Noise Management

Notwithstanding that there is little likelihood of a significant adverse impact, noise generation is expected as part of the works. It is envisaged that the main noise sources at the site will include earthworks plant and equipment and associated traffic.

Management Activities will comply with Condition 8 of the IPC Licence as follows:

- Activities on-site shall not give rise to noise levels off site at any noise sensitive location which exceed the following sound pressure limits ($L_{eq,30min}$):
  - Day-time: 55 dB(A)
  - Night-time: 45 dB(A)
- There shall be no clearly audible tonal component or impulsive component in the noise emission from the activity at any noise sensitive location.

The works will be restricted to within the footprint of the proposed rehabilitation area. The works will have due regard to noise limits and hours of operation (i.e. dusk and dawn) to minimise any potential disturbance on resident and local fauna that utilise the site and immediate environs. The proposed measures will be restricted to daylight hours and there will be no requirement for artificial lighting.

Bord na Móna Operations will be obliged to take specific noise abatement measures as part of the works and in line with the recommendations of BS5228-1 2009. These measures will typically include:

- No plant used on site will be permitted to cause an ongoing public nuisance due to noise
- The best means practicable, including proper maintenance of plant, will be employed to minimise the noise produced by on site operations.

4.9 Dust Management

Dust generation is not expected as part of the works. The nature of the proposed works will naturally reduce the production of dust on site, as reprofiling site levels encourages settlement of water on the surface of the bog.

Activities that could give rise dust will be managed under the relevant conditions under Condition 5 of the IPC licence as follows:

- The licensee shall ensure that all operations on-site shall be carried out in a manner such that air emissions and/or dust do not result in significant impairment of, or significant interference with amenities or the environment beyond the site boundary.
- Activities on-site shall not give rise to dust levels off site at any Dust Sensitive Location which exceed an emission limit of 350 mg/m^2/day. [The sampling method to be in accordance with German TA Luft Immission Standards for Particle Deposition (IW1)].

4.10 Fuel Management

Fuels and oils used for plant and equipment on the site shall be stored in a bunded area within the site compound as required. This area shall be inspected regularly, and the bund shall be adequate to contain a minimum of 110% of the volume of the largest container of oil and fuel stored. Spill protection equipment such as absorbent mats, shall be available on site to contain any oil spill that may occur, and procedures shall be in place to deal with any such spillage. All plant shall be provided with drip trays and spill kits. Plant operators shall carry out a visual inspection of their vehicle daily and shall be trained in how to deal with any uncontrolled spillage of oil.

All plant refuelling will take place using mobile fuel bowsers or fixed bunded tanks. Only dedicated trained and competent personnel will carry out refuelling operations. Fuelling and lubrication of equipment shall only be carried out in designated areas away from surface water drainage features and ecologically sensitive areas. Hoses and valves will be checked regularly for signs of wear and will be closed and securely locked when not in use.

Fuel management to ensure no impact on the environment will be managed in accordance with Condition 9 of the IPC Licence as follows:

- No potentially polluting substance or matter shall be permitted to discharge to off-site surface waters, off site storm drains or groundwaters.
- The loading and unloading of fuel oils shall be carried out in designated areas protected against spillage and leachate run-off. While awaiting disposal, all materials shall be collected and stored in designated areas protected against spillage and leachate run-off.
- The licensee shall have in storage an adequate supply of containment booms and/or suitable absorbent material to contain and absorb any spillage.
- The licensee shall maintain a log of bi-annual inspections of all rail and tractor transported fuelling units. These inspections as a minimum should record any damage or leaks or flaws in rolling stock that could result in accidental spillage.

4.11 Waste Management

All waste arising from the works shall be managed and disposed of in a way that ensures the provisions of the Waste Management Act 1996 and associated amendments and regulations are applied.

Waste Management will be conducted in accordance with Condition 7 of the IPC Licence as follows:

- Disposal or recovery of waste shall take place only as specified in Schedule 2(i) Hazardous Wastes for Disposal/Recovery and Schedule 2(ii) Other Wastes for Disposal/Recovery of this licence and in accordance with the appropriate National and European legislation and protocols. No other waste shall be disposed of/recovered either on-site or off-site without prior notice to, and prior written agreement of, the Agency.
- Waste sent off-site for recovery or disposal shall only be conveyed to a waste contractor, as agreed by the Agency, and only transported from the site of the activity to the site of recovery/disposal in a manner which will not adversely affect the environment.

- A full record, which shall be open to inspection by authorised persons of the Agency at all times, shall be kept by the licensee on matters relating to the waste management operations and practices at this site. This record shall as a minimum contain details of the following.
    - The names of the agent and transporter of the waste.
    - The name of the persons responsible for the ultimate disposal/recovery of the waste.
    - The ultimate destination of the waste.
    - Written confirmation of the acceptance and disposal/recovery of any hazardous waste consignments sent off-site.
    - The tonnages and EWC Code for the waste materials listed in Schedule 2(i), Hazardous Wastes for Disposal/Recovery and Schedule 2(ii) Other Wastes for Disposal/Recovery sent off-site for disposal/recovery.
    - Details of any rejected consignments.

4.12 Soil Management

If soil contamination is encountered during the works arising from an accidental fuel spillage, this should be managed in accordance with Conditions 4, 7 & 9 of the IPC Licence as follows:

- The licensee shall notify the Agency by both telephone and email to the Agency's Headquarters, or to such other Agency office as may be specified by the Agency, as soon as practicable after the occurrence of any of the following:
    - Any release to atmosphere resulting in significant impairment of, or significant interference with amenities or the environment.
    - Any emission which does not comply with the requirements of this licence.
    - Any incident with the potential for environmental contamination of surface water or groundwater, or posing an environmental threat to air or land, or requiring an emergency response by a Local Authority.
    - The licensee shall include as part of the notification, date and time of the incident, details of the occurrence, and the steps taken to minimise the emissions and avoid recurrence.
- The licensee shall make a record of any incident as set out in above. The notification given to the Agency shall include details of the circumstances giving rise to the incident and all actions taken to minimise the effect on the environment and minimise wastes generated.
- A summary report of reported incidents shall be submitted to the Agency as part of the AER. The information contained in this report shall be prepared in accordance with any relevant guidelines issued by the Agency.
- In the case of any incident as set out above which relates to discharges to water, the licensee shall notify the appropriate Regional Fisheries Board, as soon as practicable after such an incident.
- In the event of any incident, as set out above having taken place, the licensee shall notify the appropriate Local Authority as soon as practicable, after such an incident.

- In the case of any incident, as set out above, which has the potential to impact the conservation objectives of the Special Areas of Conservation and Natural Heritage Areas identified in Attachment 10.1 of the IPC application having taken place, the licensee shall notify Dúchas of the Department of Arts, Heritage, Gaeltacht and the Islands as soon as practicable after such an incident.
- The licensee shall as part of their AER, or more frequently as may be necessary, notify and supply maps to the Agency of boglands, and discharges from same, intended to be included in the subsequent years' development and operational programmes.

4.13 Fire Safety

The ***Bord na Móna Fire Prevention & Fire Fighting Procedures*** in addition to the ***Bord na Móna Fire and Environmental Plan*** outline requirements for fire prevention and fighting in peat bogs and works locations.

It is the intention of Bord na Móna to identify the potential for and take all practicable measures to prevent the outbreak of fire by means of ensuring:

- Implementation of the above policy and procedures.
- Activities are risk assessed to identify potential fire hazards and allow for implementation of suitable control measures to eliminate or reduce to a minimum associated risk.
- Selection of suitable equipment and machinery which is used appropriately and adequately inspected and maintained by competent personnel.
- Installation, where appropriate, of fire-fighting equipment.
- Proper use, storage, and disposal of flammable materials.
- Use of permit to work system, as appropriate, where hot works are to be undertaken.

Bord na Móna Operations must ensure that all fire egress and access points are kept clear and free from obstruction. Emergency access to the various works zones shall be provided and maintained for the duration of the project.

- Unobstructed fire egress during the project.
- Adequate fire safety procedures.
- Access/egress for emergency vehicles.

5.0 Maintenance Access Requirements

The site-specific Drainage Management Plan (DMP) indicates that the effectiveness of a hydraulic break depends upon the drain's ability to convey water away.

The hydraulic breaks identified in the site-specific Engineering Construction Package will require routine monitoring by Bord na Móna, following the works, to ensure the drain is functioning as intended.

6.0 Protection of Existing Vegetation

Where peat extraction has ceased on a site several years ago it is typical for pioneer vegetation to have established on site via natural colonisation, which was encouraged by the cessation of disturbance from peat extraction activity. During this period, the field drainage system naturally breaks down in certain areas, accelerating natural colonisation. The development of pioneer habitats reflects the underlying environmental conditions with the key factor being topography and hydrology.

Regarding vegetation clearance, should it be required, all works will comply with Section 40 of the Wildlife Act. Please refer to Vegetation Clearance SOP ECO-004 for specific guidance. For the avoidance of doubt – no felling works will be carried out as part of the proposed works.

The Closed Period "40(1) (a) it shall be an offence for a person to cut, grub, burn or otherwise destroy during the period beginning on the 1st day of March and ending on the 31st day of August in any year, any vegetation growing on any land not then cultivated. (b) it shall be an offence for a person to cut, grub, burn or otherwise destroy any vegetation growing in any hedge or ditch during the period mentioned in paragraph (a) of this subsection"

The site-specific Ecology File will detail the application of these restrictions to individual sites where required.

7.0 Protected Habitats

Bord na Móna is committed to protecting the diverse habitats in proximity to our estate on which a wide range of Ireland's native animals and plants depend. Sites in proximity to SACs and NHAs have been identified in the site-specific Cutaway Bog Decommissioning and Rehabilitation Plan, Engineering Construction Package, Environmental File & Ecology File for the relevant bog where works are taking place.

Bord na Móna Operations shall incorporate appropriate mitigation measures from the NIS into the CEMP as required to mitigate against adverse impacts on these protected habitats where required, in particular any measures stipulated in Appropriate Assessment reporting.

8.0 Ecology

Measures should be taken by Bord na Móna Operations to protect flora and fauna during the works are outlined in the site-specific Ecology File. The works should be limited to daylight hours, in proximity to watercourses, to allow otters, foxes and other wildlife to forage along the watercourses at dawn, dusk and during the night.

Works will take cognisance of any identified Ecological Restriction Zones (ERZ's) to protect sensitive ecological receptors such as birds (breeding or non-breeding), amphibians or reptiles, invertebrates (e.g. Marsh Fritillary) or mammals (such as Otter) and any particularly sensitive habitats.

In advance of works, all site personnel will receive a toolbox talk with regards to the protection of sensitive receptors onsite, and the prevention of the spread of invasive species.

In addition, implementation of the mitigation measures will be monitored and inspected by Bord na Móna Environmental, Ecology and Engineering Departments, who are independent of Bord Na Móna Operations. Project Ecologists, Engineers and Environmental Officers will be appointed for each bog and they will ensure that measures are carried out in accordance with this Environmental Management Plan. The Ecologist, Environmental Compliance Officer, Engineer, H & S Manager, Site Supervisor and PSCS will have a 'stop works' authority

In addition, it is the responsibility of Bord na Móna to undertake any or all measures stipulated in Appropriate Assessment Reporting where required. Refer to the site-specific Environmental and/or Ecology File for specific guidance.

9.0 Peat Dam and Peat Berm Construction

Refer to ***Engineering Methods for Peatland Rehabilitation*** in the Engineering Construction Package for specific guidance on Peat Dam and Peat Berm Construction. The main objective of peat dam construction, as a rehabilitation measure, is to block drains with peat to raise water levels, re-wetting peat and slowing water movements through the site. Peat berm construction follows a similar principle to create large (e.g. 45m x 60m) cells to retain shallow surface water. The creation of cells helps retain surface water, keeping peat wet and slows water movement through the bog.

Geotechnical failures of peat embankments and dams can occur by the lateral displacement of an intact block of peat material due to reductions in the embankment self-weight following partial drying of the crest material and an increase in the active hydrostatic pressures following an increase in the depth of retained water after an intense rainfall event. These factors must be considered when carrying out horizontal and vertical stability calculations for peat embankments and dams.

It is important to create a 'key' for the dam / berm to mitigate against local failures of the peat material used in the construction when subject to associated hydraulic forces from the water being retained. This

technique also improves the overall strength of the dam by creating a foundation and reduces sub-surface flows through the area.

Risk mitigation against dam and berm failure will be employed initially via design, whereby maximum water levels for each site will be specified in the site-specific Engineering Construction Package. Following construction, regular inspections of berms will be carried out.

If a local failure to a peat dam or berm occurs, the water will follow a pathway towards the nearest silt pond allowing any peat sediment from the local failure to be captured in the silt pond prior to discharging from the bog.

Where the risk cannot be mitigated against (in the case where the bog sits on an existing flood plain for example) emergency measures will be outlined in the Bord na Móna Emergency Response Procedure document.

10.0 Biosecurity

The potential for importation or introduction of non-native plant species (such as Japanese Knotweed, Himalayan Balsam, etc.) during the works has the potential to result in the establishment of invasive species within the site.

Section 49 of the European Communities (Birds and Natural Habitats) Regulations 2011 prohibits the introduction and dispersal of invasive alien species (particularly plant species) listed on Part 1 (third column) of the 'Third Schedule'.

This section aims to reduce the risk from, and impacts of, invasive species and protecting biodiversity on bogs identified under PCAS. The works will have due regard to the relevant biosecurity measures as follows:

- Records of problematic invasive species identified within the bog units will be marked out with signs to highlight areas of infestation to personnel, including a buffer.
- All plant machinery will be restricted from disturbing known colonies of invasive species.
- All plant machinery will avoid unnecessary crossings to adjoining lands.
- Good site hygiene will be employed to prevent the introduction and spread of problematic invasive alien plant species (i.e. Japanese Knotweed (Fallopia japonica), Himalayan Balsam (Impatiens glandulifera), Himalayan Knotweed (Persicaria wallichii), etc.) by thoroughly inspecting and/or washing vehicles prior to entering the work area.
- Plant shall be inspected upon arrival and departure from site.
- All site users shall be made aware of these procedures and appropriate treatment methodologies.

The biosecurity measures outlined above are in line with best practice guidelines issued by the National Roads Authority (NRA, 2010) – The Management of Noxious Weeds and Non-native Invasive Plant Species on National Roads and broadly based on the Environment Agency's (2013) – The Knotweed

Code of Practice: Managing Japanese Knotweed on Development Sites (Version 3, amended in 2013, accessed on the Environment Agency's website on the 11th of July 2016).

In order to prevent the introduction and spread of aquatic invasive species, biosecurity will be required for all PPE, equipment, plant and machinery components before entering (or which are likely to enter) drains and watercourses on the site and again before leaving the site:

- Protective gloves should be worn when using any disinfectant solution in any of the procedures listed below.
- Visually inspect all equipment that has come into contact with the water for evidence of attached plant or animal material, or adherent mud or debris. This should be done before leaving the site.
- Remove any attached or adherent material (vegetation and debris) before leaving the site of operation.
- Ensure that all water is drained from any live wells and other water retaining compartments, tanks and other equipment before transportation elsewhere.
- It is recommended to apply disinfectant to the undercarriage and wheels of the vehicle/machine after steam cleaning or power hosing.
- Wet or live wells and other water retaining compartments in survey boats must be cleaned, rinsed or flushed with a 1% solution of Virkon Aquatic or another proprietary disinfection product. Alternatively, a 5% solution (100 ml / 20 litre solution) of chlorine bleach should be used. Rinse thoroughly with clean water.
- Footwear should be dipped in or scrubbed with a disinfectant solution (e.g. 1% solution of Virkon Aquatic or another proprietary disinfection product) and thoroughly dried afterwards.
- All PPE should be visually inspected and any attached vegetation or debris removed. Where appropriate, the gear should be wiped down with a cloth soaked in 1% solution of Virkon Aquatic or another proprietary disinfection product. Alternatively, a 5% solution (100 ml / 20 litre solution) of chlorine bleach should be used. Rubber gloves must be worn when undertaking this procedure.
- Survey equipment should also be sprayed with 1% solution of Virkon Aquatic.

11.0 Emergency Response Procedures

It is the intention of Bord na Móna to identify the potential for and take all practicable measures to prevent the occurrence of an emergency situation. However, in preparation for this possible occurrence, an Emergency Response Procedure will be prepared, implemented, maintained, and periodically reviewed by Bord na Móna Operations to minimise the potential for injury and ensure safe evacuation of persons.

Emergency Response Procedures are outlined in Appendix A

12.0 Reporting

Bord na Móna have a defined methodology for delivering the Peatland Climate Action Scheme. This is facilitated via adherence to our robust quality systems and project execution plans that have been developed to apply LEAN project management processes to our design and documentation. Bord na Móna teams adopt these key tools to the benefit of all projects and will adopt a formal reporting mechanism in line with the requirements of the IPC Licence. These reporting mechanisms are outlined in the site-specific Engineering Construction Package, Environmental File & Ecology File.

It is Bord na Móna policy to report, and where necessary, investigate any environmental incidents.

APPENDIX A – STANDARD OPERATING PROCEDURES (SOPs)

Bord na Móna Standard Operating Procedures with respect to Environmental & Biodiversity activities should be followed including, but not limited to, the documents listed in Table A-1 and Table A-2.

Table A-1 – Schedule of Biodiversity Standard Operating Procedures (SOP)

Code	Description
ECO 0001	Protection of Otter
ECO 0002	Prevention of disturbance (Birds)
ECO 0003	Protection of Marsh Fritillary
ECO 0004	Vegetation Clearance
ECO 0005	Protection of Amphibians and Reptiles
ECO 0006	Invasive Species

Table A-2 – Schedule of Environmental Standard Operating Procedures (SOP)

Code	Description
ENV017	Archaeological Findings
EP 5.0	General Emergency Preparedness & Response
SPIP	Silt Pond Inspection Procedure
SPMP	Silt Pond Maintenance Procedure
	Waste Management Procedure
	Gas Oil Loading Procedure

BORD NA MÓNA Naturally Driven	**Procedure: ECO-001**	**Rev: 1**
Title: Protection of Otter	**Approved:**	**Date: 16/03/21**

1) Purpose

To describe the environmental measures required to protect Otter across the Peatlands Climate Action Scheme (PCAS).

2) Scope

To avoid likely significant effects of disturbance, displacement or physical injury to Otter which occur or are likely to occur at any locations where Bord na Móna may be carrying out PCAS activities with the potential for effects.

The potential for negative effects will be avoided through adherence to Best Practice measures and the use of confirmatory surveys to establish any requirements such as derogations and/or restriction zones around confirmed breeding or resting sites as appropriate.

This Procedure should be read in association with any other pertinent procedures, in particular around vegetation clearance and working near water.

3) Related Documents

Bord na Mona Silt Pond Maintenance Procedure

Bord na Mona Silt Pond Inspection Procedure

National Roads Authority (2006). Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes. The National Roads Authority, Dublin.

National Roads Authority (2008.) Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes. The National Roads Authority, Dublin.

Highways Agency (1999). Design Manual for Roads and Bridges - Nature Conservation Advice in Relation to Otters HA81/99. The Highways Agency, London.

4) Procedure

<u>Environmental Controls</u>

1. The PCAS project team will liaise with the Bord na Móna Ecology Team who will approve and provide guidance on all on site activities which could have an ecological impact.
2. All PCAS staff will receive environmental training and/or an Environmental site induction/Toolbox talk before being allowed to work on a Bord na Móna bog.
3. Work will only be able to take place once the Bord na Móna Ecology Team has signed off on the installation of any required mitigation measures.
4. Adherence to any specified mitigation measures are to be subject to audit by the Bord na Móna Ecology Team and/or Site Supervisor/Environmental Officer or PSCS as appropriate.
5. Implementation of the mitigation measures for the works will be the responsibility of Bord na Móna Operations and supervision of the works will be carried out by this Bord na Móna Department incorporating Site Supervisors and the Project Supervisor Construction Stage (PSCS).

6. In addition, implementation of the mitigation measures will be monitored and inspected by Bord na Móna Environmental, Ecology and Engineering Departments, who are independent of Bord Na Móna Operations. Project Ecologists, Engineers and Environmental Compliance Officers will be appointed for each bog and they will ensure that measures are carried out in accordance with this Environmental Management Plan. The Project Ecologist, Environmental Compliance Officer, Engineer, H & S Manager, Site Supervisor and PSCS will have a 'stop works' authority.
7. Where non-compliance is detected, a system of follow up and corrective action will be implemented.

Preparation

1. Confirmatory surveys will be carried out 150m upstream and downstream of suitable Otter habitat where relevant activities are programmed to occur. This will include silt ponds (cleaning and maintenance), channelized sections of watercourses and bog drainage channels with connectivity to suitable habitat. These confirmatory Otter surveys will be undertaken no more than 12 months in advance of proposed activities, during the period November and April when vegetation cover is reduced. For silt ponds surveys will include an area comprising the pond plus a 50m buffer.
2. Confirmatory surveys will be undertaken by a suitably qualified ecologist.
3. The results of surveys will be communicated to the site manager responsible for scheduling activities on a need to know basis.
4. Zones or locations containing confirmed breeding or resting locations (holts/couches) are to be delineated with signage at an appropriate distance (150m) to prevent disturbance.
5. In addition, any restriction zones are to be digitised and provided in shapefile format for upload to machine/site supervisor PDA's where this facility is available.
6. These Ecological Restriction Zones (ERZs) will be marked out at regular intervals using a combination of appropriate signage or visual markers as appropriate, prior to works or activities commencing during the identified sensitive period.
7. The above will be carried out by a suitably qualified Ecologist/ Bord na Móna Ecology Team.
8. Surveys results will be confirmed no less than 3 days prior to scheduled activities commencing.
9. If required any derogation applications will be made by the Bord na Móna Ecology Team/designated project manager.

Operator Training

1. All PCAS operators will receive a toolbox talk by a suitably qualified Ecologist/ Bord na Móna Ecology Team, to educate them on any relevant restrictions prior to the commencement of activities.
2. This will include any restricted areas, the requirement for same, the location of reference documentation such as the schedule of mitigation measures, and the procedure to follow if in doubt as to the locations of activities in respect of any restricted areas.
3. A copy or map illustrating the restriction zones per bog, and periods wherein activities can be undertaken will be available at all times at the site office.

4. Where pertinent, a schedule of Mitigation Measures per bog will also be available at all times in the site office.

Responsibilities

1. The appointed PCAS Site Supervisor/PSCS as appropriate will be responsible for recording attendance at toolbox talks and making sure all operators have access to the required reference material, including drawings of restricted areas/ ERZ's.
2. The appointed PCAS Site Supervisor /PSCS as appropriate as will be responsible for the scheduling of activities
3. The appointed PCAS Site Supervisor /PSCS as appropriate must be aware of any other site-specific [1]mitigation around Otter
4. The Bord na Móna Ecology Team or Project Ecologist is responsible for conformance auditing.
5. If a derogation is required, any activities under same will be overseen by the Bord na Móna Ecology Team or appointed Project Ecologist.
6. Local NPWS will be made aware of any derogated works/activities before commencement.

Carrying out Activities

1. No works or activities are to be carried out in restricted areas or identified ERZ's during the relevant period as specified by the project ecologist. No works will be carried out within 150m of an active holt.
2. NPWS will be notified of any confirmed active holts.
3. As per NRA (2006) guidelines, following consultation with NPWS, works or activities closer to such breeding holts may take place – provided appropriate mitigation measures are in place, e.g. screening and/or restricted working hours on site;
4. No wheeled or tracked vehicles (of any kind) will be used within 20m of active, but non-breeding, otter holts. Light work, such as digging by hand or scrub clearance will not take place within 15m of such holts, except under licence (NRA, 2006);
5. Where holts are present in close proximity to invasive activities, but are determined not to require destruction, such activities may commence once recommended alternative mitigation measures to address otters have been complied with (NRA, 2006);
6. Only operators who have received the required training and toolbox talks are to be assigned duties within the above period.
7. Conformance will be audited through compliance checks by the Bord na Móna Ecology Team /Project Ecologist with 'stop-works' authority.
8. Activities will only be carried out between 08.00 and 17.30 to minimise the potential for disturbance.

5) Records

Evidence of approval (electronic)
Archive files

[1] F

BORD NA MÓNA Naturally Driven	**Procedure: ECO-001**	**Rev: 1**
Title: Protection of Otter	**Approved:**	**Date: 16/03/21**

Revision Index			
Revision	Date	Description of change	Approved

BORD NA MÓNA Naturally Driven	**Procedure: ECO-002**	**Rev: 1**
Title: Disturbance to Birds of Conservation Concern	**Approved:**	**Date: 06/04/21**

1) Purpose

To describe the environmental measures required to avoid significant disturbance to bird species of conservation concern during the PCAS scheme.

2) Scope

To avoid likely significant effects of disturbance or displacement at a scale likely to result in significant effects to breeding or wintering bird species of conservation concern, which occur or are likely to occur at any locations where Bord na Móna may be carrying out PCAS activities.

The potential for negative effects will be avoided through adherence to Best Practice measures and the use of confirmatory surveys to establish any requirements such as restricted areas and/or restriction zones around confirmed breeding or roosting sites as appropriate. Suitable restriction buffers have been derived from a review of Best Practice and is provided as an Appendix to this document.

This Procedure should be read in association with any other pertinent procedures, in particular around vegetation clearance and working near water.

3) Related Documents

Bord na Mona Silt Pond Maintenance Procedure

Bord na Mona Silt Pond Inspection Procedure

National Roads Authority (2008.) Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes. The National Roads Authority, Dublin.

Livezey KB, Ferna´ndez-Juricic E, Blumstein DT. Database of bird flight initiation distances to assist in estimating effects from human disturbance and delineating buffer areas. Journal of Fish and Wildlife Management 7(1):181-191; e1944-687X. doi: 10.3996/082015-JFWM-078

Hardey, J., Crick, H., Wernham, C., Riley, H., Etheridge, B. & Thompson, D. 2013. Raptors: a field guide to survey and monitoring (3rd Edition). The Stationery Office, Edinburgh.

Gilbert, G., Gibbons, D.W. & Evans, J. 2011 Bird Monitoring Methods. The Royal Society for the
Protection of Birds, Sandy, England.

Scottish National Heritage (2016) Dealing with Construction and birds. Guidance Version 3. SNH, Battleby, Scotland.

4) Procedure

<u>Environmental Controls</u>

1. The PCAS project team will liaise with the Bord na Móna Ecology Team who will approve and provide guidance on all on site activities which could have an ecological impact.
2. All PCAS staff will receive environmental training and/or an Environmental site induction/Toolbox talk before being allowed to work on a Bord na Móna bog.

3. Work will only be able to take place once the Bord na Móna Ecology Team has signed off on the installation of any required mitigation measures.
4. Adherence to any specified mitigation measures are to be subject to audit by the Bord na Móna Ecology Team and/or PCAS Site Supervisor/Environmental Officer or PSCS as appropriate.
5. Where non-compliance is detected, a system of follow up and corrective action will be implemented.

Preparation

1. Desktop review to check available baseline data to identify potential disturbance risks from proposed PCAS activities to breeding or wintering birds. If there is potential for disturbance risks, then confirmatory surveys are required.
2. Confirmatory surveys will be undertaken by a suitably qualified ecologist to identify the presence of any bird species of conservation concern which may potentially be disturbed. The survey will typically include habitats suitable for ground nesting birds, in particular sensitive species (e.g. Lapwing/Ringed Plover/Curlew/Red Grouse) but also buildings scheduled for decommissioning, potential winter period feeding or roosting areas for Wildfowl, roosting areas for Hen Harrier etc.
3. All surveys will take place prior to the commencement of any scheduled activities, and will follow Best Practice survey techniques.
4. The results of surveys will be communicated to the PCAS PSCS/ Site Supervisor/Environmental Officer (as appropriate) responsible for scheduling activities. For highly sensitive species such as nesting Curlew or roosting Hen Harrier precise locations of nesting or roosting will not be disseminated.
5. Zones or locations containing confirmed nesting attempts by species including but not limited to Lapwing, Ringed Plover, Black-headed Gull, Common Sandpiper, Curlew, Merlin are to be delineated at an appropriate distance to prevent disturbance.
6. Alternatively, the extent of any zones may be provided by the Ecology Team via ArcGis online Cloud for use on tablets by PCAS operators/Site Supervisor as appropriate.
7. These Ecological Restriction Zones (ERZs) (e.g. 800m around identified Curlew nests) will be marked out at regular intervals using a combination of appropriate signage or visual markers as appropriate, prior to works commencing during the identified sensitive period.
8. Any buildings will similarly be identified.
9. The above will be carried out by a suitably qualified Ecologist and/or under supervision by a suitably qualified ecologist.
10. Surveys results will be confirmed where appropriate prior to scheduled activities commencing.

Operator Training

1. All PCAS operators will receive a toolbox talk by a suitably qualified Ecologist/ Bord na Móna Ecology Team, to educate them on any relevant restrictions prior to the commencement of activities.

2. This will include any restricted areas, the requirement for same, the location of reference documentation such as the schedule of mitigation measures, and the procedure to follow if in doubt as to the locations of activities in respect of any restricted areas.
3. A copy or map illustrating the restriction zones per bog, and periods wherein activities can be undertaken will be available at all times at the site office.
4. Where pertinent, a schedule of Mitigation Measures per bog will also be available at all times in the site office.

Responsibilities

1. The appointed PCAS Site Supervisor/PSCS as appropriate will be responsible for recording attendance at toolbox talks and making sure all operators have access to the required reference material, including drawings of restricted areas/ ERZ's.
2. The appointed PCAS Site Supervisor /PSCS as appropriate as will be responsible for the scheduling of activities.
3. The appointed PCAS Site Supervisor PSCS as appropriate must be aware of any other site specific mitigation around disturbance to birds.
4. The Bord na Móna Ecology Team or Project Ecologist is responsible for conformance auditing.
5. If a derogation is required, any activities under same will be overseen by the Bord na Móna Ecology Team or appointed Project Ecologist.
6. Local NPWS will be made aware of any derogated or licensed works/activities before commencement.

Carrying out Activities

1. No PCAS works or activities are to be carried out in restricted areas or identified ERZ's during the relevant period as specified by the project ecologist.
2. Only operators who have received the required training and toolbox talks are to be assigned duties within the above period.
3. Conformance will be audited through compliance checks by the Project Ecologist/ PSCS/Environmental Officer as appropriate (with 'stop-works' authority).
4. Certain Activities may occur in ERZ's in instances where breeding attempts have finished/birds are no longer present – this can only occur following confirmation from the Project Ecologist that it is OK for activities to proceed. In general the use of headlands for travel through, and /or rail lines will be permitted within ERZ's where it is considered birds may be habituated to such regular movements.
5. Activities will only be carried out between 08.00 and 17.30 to minimise the potential for disturbance.

5) Records

Evidence of approval (electronic)
Archive files

Revision Index			
Revision	Date	Description of change	Approved

BORD NA MÓNA Naturally Driven	**Procedure: ECO-003**	**Rev: 1**
Title: Protection of Marsh Fritillary	**Approved:**	**Date: 22/04/21**

1) Purpose

To describe the environmental measures required to protect Marsh Fritillary during PCAS activities.

2) Scope

To avoid effects of disturbance/physical injury to and secondary habitat loss in respect of Marsh Fritillary which occur or are likely to occur at PCAS decommissioning and rehabilitation locations. This includes in situ larvae and adults, in known or previously identified colony locations.

The potential for negative effects will be avoided through adherence to Best Practice measures and the use of confirmatory surveys pre-commencement of PCAS activities to establish any requirements such as restriction zones around colonies/areas of suitable habitat containing larval webs etc.

This SOP should be read in association with other sheets, in particular around vegetation clearance.

3) Related Documents

SOP for vegetation clearance – ECO-004

National Roads Authority (2008.) Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes. The National Roads Authority, Dublin.

Fowles & Smith, (2006) Mapping the habitat quality of patch networks for the marsh fritillary Euphydryas aurinia (Rottemburg, 1775) (Lepidoptera, Nymphalidae) in Wales, Journal of Insect Conservation 10:161-177.

Warren, M.S (1994) The UK status and suspected metapopulation structure of a threatened European butterfly, the marsh fritillary Eurodryas aurinia. Biological Conservation 67, 239-249.

Harding, J.M. (2008). Discovering Irish Butterflies & their Habitats. Published by Jesmond Harding.

4) Procedure

<u>Environmental Controls</u>

1. The PCAS project team will liaise with the Bord na Móna Ecology Team who will approve and provide guidance on all on site activities which could have an ecological impact.
2. All PCAS staff will receive environmental training and/or an Environmental site induction/Toolbox talk before being allowed to work on a Bord na Móna bog.
3. PCAS work will only be able to take place once the Bord na Móna Ecology Team has signed off on the installation of any required mitigation measures.
4. Adherence to any specified mitigation measures are to be subject to audit by the Bord na Móna Ecology Team and/or PCAS Site Supervisor/Environmental Officer or PSCS as appropriate.

5. Where non-compliance is detected, a system of follow up and corrective action will be implemented.

Preparation

1. Desktop review to check available baseline data to identify potential disturbance risks from proposed PCAS activities to Marsh Fritillary. If there is potential for disturbance risks, then confirmatory surveys are required before any activities are carried out.
2. Confirmatory surveys will be undertaken by a suitably qualified ecologist to confirm the presence of any previously identified Marsh Fritillary colonies.
3. All surveys will take place prior to the commencement of any scheduled PCAS activities and will follow Best Practice survey techniques.
4. The results of surveys will be communicated to the PCAS PSCS/ Site Supervisor/Environmental Officer (as appropriate) responsible for scheduling activities.
5. Zones or locations containing confirmed Marsh Fritillary Colonies are to be delineated with signage at an appropriate distance to prevent disturbance.
6. Alternatively, the extent of any zones may be provided by the Ecology Team via ArcGis online Cloud for use on tablets by PCAS operators/Site Supervisors.
7. These Ecological Restriction Zones (e.g. 50m around identified colonies will be marked out at regular intervals using a combination of appropriate signage or visual markers as appropriate, prior to works commencing during the identified sensitive period.
8. The above will be carried out by a suitably qualified Ecologist and/or under supervision by a suitably qualified ecologist.
9. Surveys results will be confirmed where appropriate prior to scheduled activities commencing.

Operator Training

1. All PCAS operators will receive a toolbox talk by a suitably qualified Ecologist/ Bord na Móna Ecology Team, to educate them on any relevant restrictions prior to the commencement of activities.
2. This will include any restricted areas, the requirement for same, the location of reference documentation such as the schedule of mitigation measures, and the procedure to follow if in doubt as to the locations of activities in respect of any restricted areas.
3. A copy or map illustrating the restriction zones per bog, and periods wherein activities can be undertaken will be available at all times at the site office.
4. Where pertinent, a schedule of Mitigation Measures per bog will also be available at all times in the site office.

Responsibilities

1. The appointed PCAS site supervisor/PSCS as appropriate will be responsible for recording attendance at toolbox talks and making sure all operators have access to the required reference material, including drawings of restricted areas/ ERZ's.
2. The appointed PCAS site supervisor/PSCS as appropriate as will be responsible for the scheduling of activities
3. The appointed PCAS site supervisor/PSCS as appropriate must be aware of any other site specific mitigation around disturbance to invertebrates.

4. The Bord na Móna Ecology Team or Project Ecologist is responsible for conformance auditing
5. If a derogation/license is required, any activities under same will be overseen by the Bord na Móna Ecology Team or appointed Project Ecologist.
6. Local NPWS will be made aware of any derogated or licensed works/activities before commencement.

Carrying out Activities

1. No PCAS works or activities are to be carried out in restricted areas or identified ERZ's during the relevant period as specified by the project ecologist.
2. Only PCAS operators who have received the required training and toolbox talks are to be assigned duties within the above period.
3. Conformance will be audited through compliance checks by the Project Ecologist/ PSCS/Environmental Officer as appropriate (with 'stop-works' authority).
4. Activities may occur in ERZ's in instances where breeding has finished or larvae are confirmed by the Project Ecologist as not present – this can only occur following confirmation from the Project Ecologist that it is OK for activities to proceed.

5 Certain activities may be permitted once no usage of vehicles with the potential for trampling ground areas are being used i.e. activities by hand, carried out on foot etc, or activities of a H&S nature.

5) Records

Evidence of approval (electronic)
Archive files

Revision Index			
Revision	Date	Description of change	Approved

BORD NA MÓNA Naturally Driven	**Procedure: ECO-004**	**Rev: 1**
Title: Vegetation Clearance	**Approved:**	**Date: 04/05/21**

1) Purpose

To describe the environmental measures required for vegetation clearance during PCAS activities.

2) Scope

Section 40 of the Wildlife Act 1976, as amended by Section 46 of the Wildlife (Amendment) Act 2000, restricts the cutting, grubbing, burning or destruction by other means of vegetation growing on uncultivated land or in hedges or ditches during the nesting and breeding season for birds and wildlife, from 1st March to 31st August, inclusive.

The scope of this SOP is to ensure the protection of bird species using scrub, hedgerow or ground vegetation during PCAS activities.

The potential for negative effects will be avoided through adherence to Best Practice measures.

Typical exemptions will still apply for example, for health and safety reasons, the destruction of noxious weeds, during works permitted under statute etc.

This SOP should be read in association with other sheets, in particular around Marsh Fritillary, Birds and invasive species.

3) Related Documents

SOP for protection of Marsh Fritillary – ECO-003
SOP for Protection of Birds – ECO-002
SOP for treatment of Invasive Species – ECO-005

National Roads Authority (2008.) Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes. The National Roads Authority, Dublin.

Section 40 of the Wildlife Act 1976, as amended by Section 46 of the Wildlife (Amendment) Act 2000,

4) Procedure

<u>Environmental Controls</u>

1. The PCAS project team will liaise with the Bord na Móna Ecology Team who will approve and provide guidance on all on site activities which could have an ecological impact.
2. All PCAS staff will receive environmental training and/or an Environmental site induction/Toolbox talk before being allowed to work on a Bord na Móna bog.
3. PCAS Work will only be able to take place once the Bord na Móna Ecology Team has signed off on any required mitigation measures.
4. Adherence to any specified mitigation measures are to be subject to audit by the Bord na Móna Ecology Team and/or Site Supervisor/Environmental Officer or other specified person as appropriate.

5. Where non-compliance is detected, a system of follow up and corrective action will be implemented.

Preparation

1. Zones or locations containing confirmed sensitive receptors/areas to be avoided completely during the bird nesting season are to be delineated with signage at an appropriate distance to prevent disturbance.
2. Alternatively, the extent of any zones may be provided by the Ecology Team via ArcGis online Cloud for use on tablets by operators.
3. The above will be carried out by a suitably qualified Ecologist and/or under supervision by a suitably qualified ecologist.
4. Surveys results will be confirmed where appropriate prior to scheduled activities commencing.

Operator Training

1. All PCAS operators will receive a toolbox talk by a suitably qualified Ecologist/ Bord na Móna ecology team, to educate them on any relevant restrictions prior to the commencement of activities.
2. This will include any restricted areas, or areas where (if known) a confirmatory survey by an Ecologist is required in advance of vegetation clearance
3. A copy or map illustrating the restriction zone~~s~~'s per bog, and periods wherein activities can be undertaken will be available at all times at the site office.
4. Where pertinent, a schedule of Mitigation Measures per bog will also be available at all times in the site office.

Responsibilities

1. The appointed PCAS site supervisor/PSCS as appropriate will be responsible for recording attendance at toolbox talks and making sure all operators have access to the required reference material, including drawings of restricted areas/ ERZ's.
2. The appointed PCAS site supervisor//PSCS as appropriate as will be responsible for the scheduling of activities
3. The appointed PCAS site supervisor//PSCS as appropriate must be aware of any other site specific mitigation around vegetation clearance.
4. The Bord na Móna ecology team or Project Ecologist is responsible for conformance auditing
5. If a derogation/license is required, any activities under same will be overseen by the Bord na Móna ecology team or appointed Project Ecologist.
6. Local NPWS will be made aware of any derogated or licensed works/activities before commencement.

Carrying out Activities

1. The following approach will be taken in order to comply with the Wildlife Acts:

2. Where practical, vegetation clearance will be carried out outside of the restricted period (1st March to 31st August).
3. Where activities are required within the closed season, it is the responsibility of the Site Supervisor/Manager to inform the Project Ecologist and seek consultation as to compliance with Section 40.
4. If necessary, a survey will then be carried out by the Project Ecologist for the presence of active birds' nests (i.e. nests with eggs or young birds) as deemed likely to occur within a suitable timeframe preceding activities.
5. If such are found, where feasible the area will be avoided until the nesting attempt/breeding is complete. If avoidance is not feasible, the Project Ecologist will seek a derogation license from the NPWS. Such works cannot take place until this derogation license is received.
6. The locations of any temporarily restricted areas may be provided via ArcGIS cloud for Site Supervisor oversight.
7. Fire prevention must govern all work practices on or near all areas of gorse, bog and forestry.
8. The Project Ecologist can provide Guidance on when works may proceed.

5) Records

Evidence of approval (electronic)
Archive files

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Revision	Date	Description of change	Approved

BORD NA MÓNA Naturally Driven	**Procedure: ECO-005**	**Rev: 1**
Title: Protection of Amphibians and Reptiles	**Approved:**	**Date: 04/05/21**

1) Purpose

To describe the environmental measures required to protect Amphibians and Reptiles during Peatland Climate Action Scheme (PCAS) activities.

2) Scope

To avoid effects of disturbance/physical injury to and secondary habitat loss in respect of Amphibians and Reptiles which occur or are likely to occur at PCAS activities. This includes in situ spawn and adults, in suitable habitat or previously identified locations.

The potential for negative effects will be avoided through adherence to Best Practice measures and the use of confirmatory surveys pre-commencement of activities to establish any requirements such as restriction zones around colonies/areas of suitable habitat containing known Amphibian and Reptiles, and if required translocation in line with Best Practice.

This SOP sheet should be read in association with other sheets, in particular around vegetation clearance.

3) Related Documents

SOP for vegetation clearance – ECO-004

National Roads Authority (2008.) Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes. The National Roads Authority, Dublin.

'Amphibian Habitat Management Handbook'. John Baker, Trevor Beebee, John Buckley, Tony Gent and David Orchard (2011). Amphibian and Reptile Conservation, Bournemouth, ISBN: 978-0-9566717-1.

Meehan, (2013) National Smooth Newt Survey 2013 Report, Irish Wildlife Trust

4) Procedure

<u>Environmental Controls</u>

1. The PCAS Project Team will liaise with the Bord na Móna Ecology Team who will approve and provide guidance on all on site activities which could have an ecological impact.
2. All PCAS staff will receive environmental training and/or an Environmental site induction/Toolbox talk before being allowed to work on a Bord na Móna bog.
3. PCAS Work will only be able to take place once the Bord na Móna Ecology Team has signed off on the installation of any required mitigation measures.
4. Adherence to any specified mitigation measures are to be subject to audit by the Bord na Móna Ecology Team and/or Site Supervisor/Environmental Officer or PSCS as appropriate.
5. Where non-compliance is detected, a system of follow up and corrective action will be implemented.

<u>Preparation</u>

1. Confirmatory surveys will be undertaken by a suitably qualified ecologist to identify the presence of Amphibians and Reptiles.
2. All surveys will take place prior to the commencement of any scheduled PCAS activities and will follow Best Practice survey techniques.
3. The results of surveys will be communicated to the PCAS PSCS/ Site Supervisor/Environmental Officer or PSCS (as appropriate) responsible for scheduling activities.
4. Zones or locations containing confirmed high usage areas (e.g. drains containing frog spawn / Newts) are to be delineated with signage at an appropriate distance to prevent disturbance.
5. Alternatively, the extent of any zones may be provided by the Ecology Team via ArcGis online Cloud for use on tablets by operators.
6. These Ecological Restriction Zones (e.g. 5m around identified colonies will be marked out at regular intervals using a combination of appropriate signage or visual markers as appropriate, prior to works commencing during the identified sensitive period.
7. The above will be carried out by a suitably qualified Ecologist and/or under supervision by a suitably qualified ecologist.
8. Surveys results will be confirmed where appropriate prior to scheduled activities commencing.

Operator Training

1. All PCAS operators will receive a toolbox talk by a suitably qualified Ecologist/ Bord na Móna Ecology Team, to educate them on any relevant restrictions prior to the commencement of activities.
2. This will include any restricted areas, the requirement for same, the location of reference documentation such as the schedule of mitigation measures, and the procedure to follow if in doubt as to the locations of activities in respect of any restricted areas.
3. A copy or map illustrating the restriction zones per bog, and periods wherein activities can be undertaken will be available at all times at the site office.
4. Where pertinent, a schedule of Mitigation Measures per bog will also be available at all times in the site office.

Responsibilities

1. The appointed PCAS Site Supervisor /PSCS as appropriate will be responsible for recording attendance at toolbox talks and making sure all operators have access to the required reference material, including drawings of restricted areas/ ERZ's.
2. The appointed PCAS Site Supervisor /PSCS as appropriate as will be responsible for the scheduling of activities
3. The appointed PCAS Site Supervisor /PSCS as appropriate must be aware of any other site specific mitigation around disturbance to amphibians or reptiles.
4. The Bord na Móna Ecology Team or Project Ecologist is responsible for conformance auditing
5. If a derogation/license is required, any activities under same will be overseen by the Bord na Móna Ecology Team or appointed Project Ecologist.

6. Local NPWS will be made aware of any derogated or licensed works/activities before commencement, such as translocation.

Carrying out Activities

1. Should PCAS activities be proposed and scheduled for areas proximal to previously identified habitat suitable for breeding common frog or smooth newt during the species' respective breeding seasons (frogs: January-March and newts: March-May), confirmatory surveys following standardised methodologies will be required at those locations to confirm the presence/absence of breeding adults and/or spawn. Licenses may be required for certain survey types.
2. If evidence of frog or newts is confirmed proximal to the work locations, it is essential the areas are fenced off with appropriate signage in order to protect these areas during construction activities;
3. Protecting the hydrological regime of the habitat is particularly important. Thus, it is particularly important that the Project Ecologist/Site Supervisor has a clear understanding of the drainage characteristics of wet areas such as ponds, pools and drains which have the potential to support breeding amphibians along the route to ensure that these areas are maintained into the future;
4. No works or activities are to be carried out in restricted areas or identified ERZ's during the relevant period as specified by the project ecologist.
5. Only operators who have received the required training and toolbox talks are to be assigned duties within the above period.
6. Conformance will be audited through compliance checks by the PCAS Project Ecologist/ PSCS/Site supervisor as appropriate (with 'stop-works' authority).
7. Activities may occur in ERZ's in instances where breeding has finished or species are confirmed by the Project Ecologist as not present – this can only occur following confirmation from the Project Ecologist that it is OK for activities to proceed
8. Certain activities may be permitted once no usage of vehicles with the potential for trampling ground areas are being used i.e. activities by hand, carried out on foot etc.
9. As a conservation measure, translocation should be an option of last resort, and any necessary license should be obtained before undertaking translocation, following consultation with NPWS.

10. NPWS may require notification of the receiving location in advance of issuing a license.
11. NPWS License link is as follows:
12. https://www.npws.ie/licences/disturbance/breeding-places
13. See also Appendix I for extracted translocation procedure from the 'Amphibian Habitat Management Handbook'

5) Records

Evidence of approval (electronic)
Archive files

Revision Index

Revision	Date	Description of change	Approved

Appendix 1 Translocation Procedures

Translocation of Common Frog spawn

- Site security: Proposed translocation sites should have a sympathetic land owner and appropriate land management plus, ideally, nature reserve status and statutory nature conservation designation.
- Habitat quality both aquatic and terrestrial habitats should meet the criteria outlined in Section 9 of the 'Amphibian Habitat Management Handbook' or be readily restorable to such condition. Any necessary restoration should be completed prior to translocation.
- Predators and competitors: Large populations of predators such corvids, gulls, rats and aquatic invertebrates should be absent from a reintroduction site and its environs.
- Consultation and agreements: It is essential to consult widely with and gain the approval of all interested parties including landowners and managers of recipient sites.
- Preparing a reintroduction site: Where necessary the terrestrial habitat should be managed to meet the necessary criteria before ponds are created. Preference should be given to creating scrapes of differing depths based on the natural water table rather than using lined pools. An advantage of lined pools is that they may be topped up with water artificially and, even if not needed for the long term, temporary lined pools may be a useful insurance against desiccation at the start of a project. Artificial refugia should be provided to help maximise the number of froglets surviving to disperse from the damp pond margins. Discarded roof tiles, slightly raised to allow froglets to crawl beneath or leafy branches, e.g. sycamore, which dry to provide many hiding places, should be laid around the water's edge.
- Translocating Spawn: The donor population should be the closest one to the new site and certainly within the same geographical area. To ensure the best chance of success a reintroduction should take place over three successive years. This establishes a mixed-age structure in the new population relatively rapidly. The equivalent to at least approximately 4,000-8,000 eggs, should be obtained from the donor site.
- Freshly laid spawn is best because it travels well. Sections should be cut with sharp scissors and transported in a bucket containing approximately 5 l of water (at a depth of approximately 5-10 cm) from the ponds in which the spawn originated. Buckets with snap-on lids make good transport containers. A hole cut in the centre of the lid allows ventilation but prevents water spillage during transport. Spawn should be moved to the recipient site rapidly, certainly within one or two days. During transportation care should be taken to avoid exposing the spawn to extreme temperatures (for example leaving it in the sun).
- Free swimming tadpoles without any signs of limb development can also be moved. Well-developed spawn, or tadpoles showing signs of metamorphosis, should not be translocated because mortality during transportation can be high in these developmental stages. Tadpoles are susceptible to suffocation and should be moved in cool water with minimal amounts of dissolved or suspended organic matter.

Translocation of Smooth Newts

NRA (2008) provides guidance on mitigation, compensation and enhancement measures (at p80) which should be considered.

"In those situations where capturing and relocating important newt populations is considered appropriate, breeding ponds should be encircled by drift fencing and pitfall traps prior to the spring migration period, and newts captured on their way to breed. Netting and draining-down of ponds should also take place to remove as many of the remainder as possible.
Where large populations of newts are found close to the proposed works, amphibian-proof fencing can be helpful in protecting the resident animals. Permanent fencing can also be used to guide newts to purpose-built tunnels and other safe crossing structures, although their effectiveness for newts remains largely unknown."

BORD NA MÓNA Naturally Driven	**Procedure: ECO-006**	**Rev: 1**
Title: Invasive Species	**Approved:**	**Date: 04/05/21**

1) Purpose

To describe the Environmental/Biosecurity Measures required to avoid the introduction, establishment and spread of non-native invasive species (Terrestrial Flora) from activities associated with the PCAS Scheme.

2) Scope

To avoid likely significant effects from the introduction, establishment and spread of non-native invasive species to Bord na Mona works during activities undertaken under PCAS.

The potential for negative effects will be avoided through adherence to Best Practice measures and the use of confirmatory surveys pre-commencement of activities to establish any requirements such as e.g. restriction zones (15m) around Invasive Plant species infestation locations as appropriate.

This SOP should be read in association with other sheets, in particular around vegetation clearance.

3) Related Documents

SOP for vegetation clearance – ECO-004

Waste Management Procedures

Managing Japanese knotweed on development sites - The Knotweed Code of Practice produced by the Environmental Agency (2013);

NRA Guidelines on The Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads (2010);

Managing Invasive Non-native Plants in or near Freshwater, Environment Agency (2010);

Best Practice Management Guidelines Japanese knotweed *Fallopia japonica*, Invasive Species Ireland (2015);

4) Procedure

<u>Environmental Controls</u>

1. The PCAS Project Team will liaise with the Bord na Móna Ecology Team who will approve and provide guidance on all on site activities which could have an ecological impact.
2. All PCAS staff will receive environmental training and/or an Environmental site induction/Toolbox talk before being allowed to work on a Bord na Móna bog.
3. PCAS Work will only be able to take place once the Bord na Móna Ecology Team has signed off on the installation of any required mitigation measures.
4. Adherence to any specified mitigation measures are to be subject to audit by the Bord na Móna Ecology Team and/or PCAS Site Supervisor/Environmental Officer or PSCS as appropriate.

5. Where non-compliance is detected, a system of follow up and corrective action will be implemented.

Preparation

1. Desktop review to check available baseline data to identify potential disturbance risks from proposed PCAS activities to known infestations of invasive species. If there is potential for disturbance risks, then confirmatory surveys are required.
2. Confirmatory surveys will be undertaken by a suitably qualified ecologist to identify the presence of any infestations or locations of invasive species.
3. All surveys will take place prior to the commencement of any scheduled PCAS activities, and will follow Best Practice survey techniques.
4. Unknown infestations that are recorded during the scheme will also be managed in the same way.
5. The results of surveys will be communicated to the PCAS PSCS/ Site Supervisor/Environmental Officer responsible for scheduling activities.
6. Zones or locations containing confirmed invasive species are to be delineated with signage at an appropriate distance to prevent disturbance.
7. Alternatively, the extent of any zones may be provided by the Ecology Team via ArcGIS online Cloud for use on tablets by operators/supervisors.
8. These Ecological Restriction Zones (e.g. 15m around identified Japanese Knotweed) will be marked out at regular intervals using a combination of appropriate signage or visual markers as appropriate, prior to activities commencing.
9. The above will be carried out by a suitably qualified Ecologist and/or under supervision by a suitably qualified ecologist.
10. Surveys results will be confirmed where appropriate prior to scheduled activities commencing.

Operator Training

1. All PCAS operators will receive a toolbox talk by a suitably qualified Ecologist/ Bord na Móna Ecology Team, to educate them on any relevant restrictions prior to the commencement of activities.
2. This will include any restricted areas, the requirement for same, the location of reference documentation such as the schedule of mitigation measures, and the procedure to follow if in doubt as to the locations of activities in respect of any restricted areas.
3. A copy or map illustrating the restriction zones per bog, and periods wherein activities can be undertaken (if applicable) will be available at all times at the site office.
4. Where pertinent, a schedule of Mitigation Measures per bog will also be available at all times in the site office.

Responsibilities

1. The appointed PCAS Site Supervisor/PSCS as appropriate will be responsible for recording attendance at toolbox talks and making sure all operators have access to the required reference material, including drawings of restricted areas/ ERZ's.
2. The appointed PCAS Site Supervisor /PSCS as appropriate as will be responsible for the scheduling of activities

3. The appointed PCAS Site Supervisor /PSCS as appropriate must be aware of any other site specific mitigation around invasive species, such as steam clean protocols.
4. The Bord na Móna Ecology Team /Project Ecologist or Environmental Officer is responsible for conformance auditing.

Carrying out Activities

Invasive terrestrial Flora such as Japanese Knotweed

1. A toolbox talk will be provided by the invasive Project Ecologist with the PSCS, Site engineers and general operatives to explain about all invasive species identified within the bog and the restrictions that will apply for the duration of any planned activities.
2. The toolbox talk will cover all pertinent topics including all relevant invasive species close to activities or works and the biosecurity measures to be implemented while working. The invasive species toolbox talk will cover the full lifecycle of every activity.
3. If required any Japanese Knotweed infestations will be treated or suitably contained.
4. This will take place under supervision from the Project Ecologist/Site Supervisor/Environmental Manager.
5. All surveys will take place prior to the commencement of activities and will follow Best Practice survey techniques.
6. No General Operative will be allowed to work without completing the toolbox talk;
7. The PSCS/Site Manager will ensure that only licensed hauliers are collecting and disposing or any potentially contaminated materials;
8. The Schedule of Mitigation Measures per bog will also be available at all times in the site office.

5) Records

Evidence of approval (electronic)
Archive files

Revision Index			
Revision	Date	Description of change	Approved

BORD NA MÓNA Naturally Driven	**Procedure: ENV017**	**Rev: 1**
Title: Archaeological Findings	**Approved: EM**	**Date: 13/10/2020**

1) Purpose

The purpose of this procedure is to describe the arrangements in Bord na Móna for findings of Archaeological material (Stray Finds).

All objects, sites or monuments, no matter how fragmentary, are important elements of our heritage.

2) Procedure

1. Check whether there are any known archaeological monuments in your area.
2. Be vigilant at all times - objects or traces of structures can be found on the field surfaces, in the drain faces, on the bog margins or caught within the mechanics of machinery.
3. If an object is found leave it in place, if it is safe to do so, note its position and immediately contact your Archaeological Liaison Officer who will assess the situation and contact the Duty Officer of the National Museum of Ireland.
4. Resist the temptation to investigate the find spot as this may disturb fragile archaeological deposits.
5. If the object is already dislodged or is in imminent danger, remove it carefully, mark its find spot and report it immediately to your Archaeological Liaison Officer.
6. Objects made of wood, leather or textile, which are removed from peat should be kept in conditions similar to those in which they are found. This can be done by packing them in peat or, if waterlogged, placing them in a clean basin of water and sealing the container. Resist the temptation to clean or remove peat from the object.
7. If timbers or other materials, such as gravel or stones, which could be part of a man-made structure are noted on the bog, mark the location and report it immediately to your Archaeological Liaison Officer. If you suspect the find is of archaeological importance, resist the temptation to expose it any further as this could result in damage to the structure.
8. Report anything that looks unnatural in the bog – your Archaeological Liaison Officer will decide whether it should be referred to the appropriate authorities.

NOTE: Our archaeological heritage is a finite, non-renewable resource. Once a site is destroyed its information is lost forever and we have lost the chance to understand a little more about our past, where we have come from and perhaps the opportunity to learn for the future.

Your Archaeological Liaison Officer is ……

3) Records

Revision Index			
Revision	Date	Description of change	Approved
1	13/19/2020	First release	EMcD
2			

EP 5.0 General Emergency Preparedness & Response

Has an Emergency Situation Occurred?

Yes

Refer to :
ERP 02 Spill Clean-up Procedure
ERP 03 Fire / Explosion Procedure
ERP 04 Unforeseen Emergencies

The Licence Holder assumes role of Site Incident Controller

Assess Scale of Incident

Inform Emergency Services

Direct rescue and fire-fighting operations

In absence of Licence Holder – deputy shall assume this role

Site Incident Controller records details of incident

Environmental Incident?

Yes

Refer to Environmental Communications Procedure

Complete EPA Incident Notification Form on Alder Webportal (https://alder.edenireland.ie/Login.aspx)

Emergency Contact List for AES Rosslare

EPA Headquarters, PO Box 3000, Johnstown Castle Estate, Co. Wexford. Tel. 053 916 0600/1890 335599, Fax. 053 916 0699
Email: https://alder.edenireland.ie/Login.aspx

Wexford Co.Co., County Hall, Spawell Road, Wexford
Tel. 053-9176500, Fax. 053-9143406
Email: postmaster@wexfordcoco.ie

Inland Fisheries Ireland
Citywest Business park, 3044 Lake Drive, Dublin 24
Tel. 01 8842600, Fax. +353 (0)1 278 7025
Email: blackrock@fisheriesireland.ie

Environmental Non-Conformance

Yes

No

Refer to Environmental Non-Conformance Procedure

Refer to Environmental Corrective/Preventive Action Procedure

Ref. EPA Incident Notification Form on Alder Webportal (https://alder.edenireland.ie/Login.aspx)

Complete Compliance Log with details

Discharge to Water?

Yes

Notify Local Authorities & Inland Fisheries Ireland

All emergency response equipment should be checked on a weekly basis

Out of Hours Emergency?

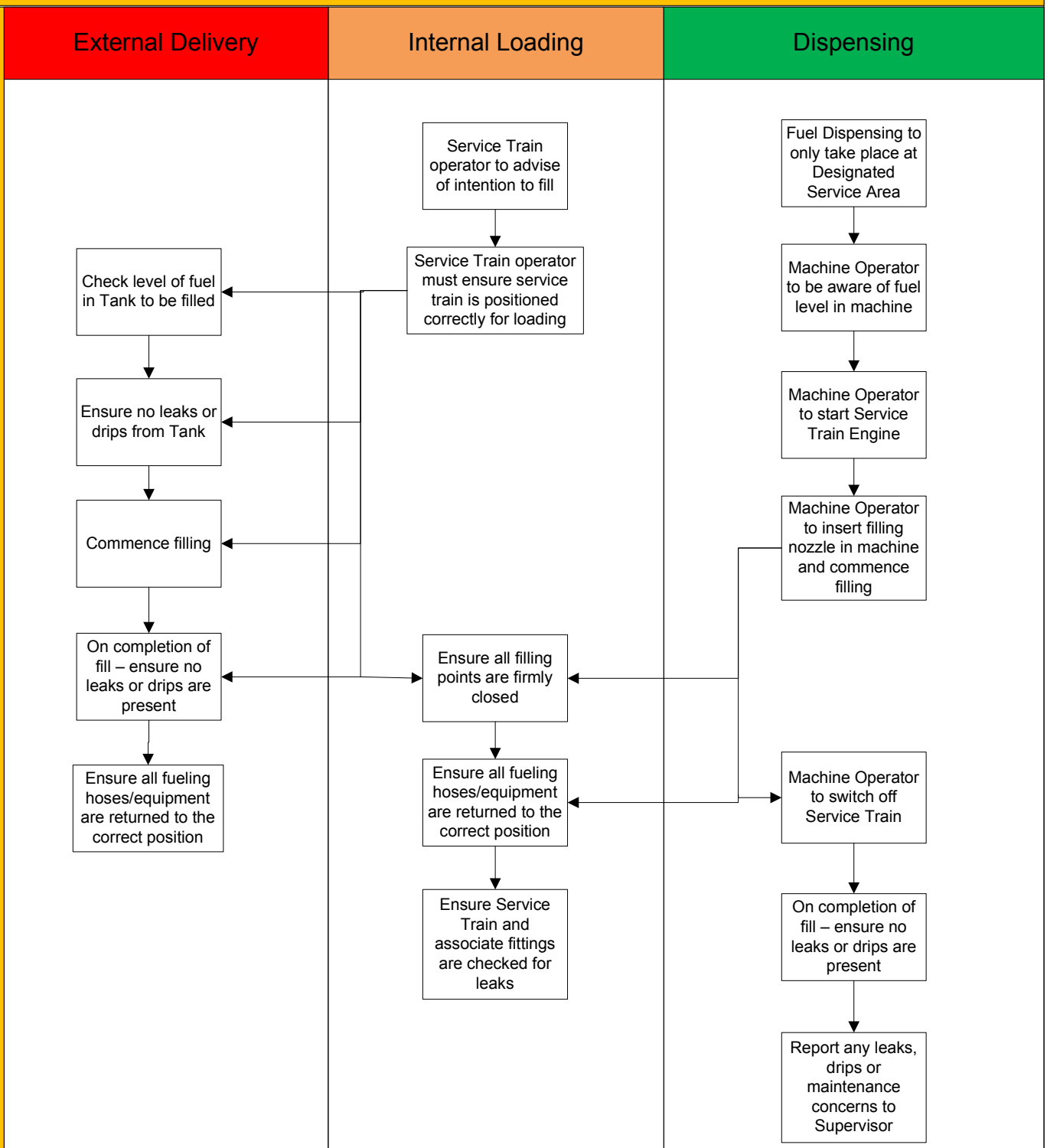
Yes

Contact Designated On-Call Person

BORD NA MÓNA
Naturally Driven

Gas Oil Loading Procedure – Rev.1

PROCEDURE



Notes:

1. Drivers must have correct permits.
2. Lorry must contain a spill kit.
3. Delivery driver to remain present at all times during filling operation.
4. Bord na Mona employees to remain present at all times during filling operation. and be aware of the location of BnM Spill Kits.
5. Bord na Mona employees must be aware of BnM Emergency Response Procedures.
6. Where Fuel Management System in place – correct user key to be used.
7. Service Trains must display Emergency Response Procedure – Spills.

BORD NA MÓNA

BORD NA MÓNA ENERGY LIMITED

Procedure: SPIP

Operations Manager _____

Page: 1 of 1

Date: _____

Rev: 3

Silt Pond
Inspection Procedure

1. Purpose

The purpose of this procedure is to provide for visual inspection of all silt ponds on a fortnightly basis in accordance with Condition 6.7 of the Bord na Mona Energy Ltd IPC Licence's P0499-01 to P0507-01. This will be used for determining the silt pond de-silting roster.

2. Scope

The scope of this procedure covers all silt ponds treating drainage water from production bogs across the licence areas P0499-01 to P0507-01. .

3. Responsibility

It is the responsibility of the Operations Leader and the Team Leader to ensure all silt ponds are inspected on a fortnightly basis and that these inspections are returned to the Environmental Co-ordinator for filing at the facility office.

4. Procedure

4.1 Record the Silt Pond identification number on the Inspection Log.

4.2 Inspect the full length of the Silt Pond including inlets and outlet, noting the location of peat silt visible on the surface.

4.3 Tick the appropriate box on the Inspection Log to indicate the condition of the pond and record the date and time.

4.4 For ponds in series, the final pond should be clean at all times.

4.5 If a pond is observed as being 3/4 full during the fortnightly inspection, or at any other time arrangements should be made for the de-silting of the pond immediately.

4.6 Inspect the Outfall from the silt pond to the receiving water (River) and record any observations.

4.7 Once the silt pond has been cleaned, the date of de-silting should be logged on the Inspection Log and recorded on the Silt Pond Wall Chart.

Procedure:SPMP

Operations Manager

Date: _____ **Rev: 3**

Silt Pond
Maintenance Procedure

1. Purpose.

The purpose of this procedure is to provide for a maintenance procedure of all silt ponds associated with IPC Licence's P0499-01 to P0507-01. Pond cleaning will be determined by the silt pond inspection procedure.

2. Scope.

The scope of this procedure covers all silt ponds treating drainage water from the Licence areas P0499-01 to P0507-01.

3. Responsibility.

It is the responsibility of the Operations Manager to ensure ponds are cleaned as required by the silt pond inspection procedure.

4. Procedure

4.1 If the silt pond system has a by-pass channel or a stand-by pond then the drainage should be diverted through these. If not, then the inlet to the pond should be blocked using a gate valve or by switching off any applicable pumps, for the duration of the maintenance activity.

4.2 If the outlet from the pond has a weir then the level should be lowered so as to de-water the silt. If not, then the outlet pipe should be blocked.

4.3 The pond should be cleaned from the inlet to the outlet either from one side, if the width allows, or from both sides, if not.

4.4 The silt should be deposited as far back from the silt pond as possible on top of the existing silt pond or retained in a peat berm, if sludge is at risk of leaking back into the silt pond.

4.5 When the pond has been cleaned the inlet should be opened and the pond allowed to fill before lowering the outlet weir.

4.6 If the drainage was diverted during the maintenance, then it should be redirected back into the pond.

4.7 If there are signs of peat silt deposited upstream or downstream of the pond, within the site boundary, then they should also be cleaned, starting up-stream. This should occur once the pond has been cleaned and before the outlet weir has been lowered.

4.8 Once cleaned, the date should be entered on to the inspection log.

4.9 All machine operators must be fully versed with the above procedure with a copy posted in the machine.

Waste Management Procedure

1. Purpose

To define the correct procedure to be followed when removing and disposing of wastes from sites across all licenced bogs.

2. Scope

The scope of this procedure covers all bogs in the Licence areas P0499-01 to P0507-01, and Waste Facilities WL0049-02 and WL0199-02. It also covers the requirements of Condition 7 of these IPC licences and is detailed in Bord na Mona Peat/AES Service Level Agreement (SLA).

3. Responsibility

The implementation of this Procedure is the responsibility of the Resource Manager or his/her deputy.

4. Reporting

- Prior to the recovery and handling of waste, please liaise with your Environmental Coordinator and/or Compliance Operations Lead to schedule and coordinate its disposal.
- Ensure that a record of all waste receipts is maintained and a copy provided to the relevant Environmental Coordinator.
- On a monthly basis, stores shall provide the relevant IPC Licence Coordinator with a copy of all waste receipts for the Waste Management file.
- On a quarterly basis, AES shall provide each store and the IPC Licence Coordinator with a quarterly report as per the SLA.

5. Waste Collection Procedure

Table 1 outlines the procedures for the handing of waste and subsequent disposal routes.

6. Reference Documents

Attachment 1: AES Service Level Agreement (SLA).

Litter Action Plan: Prevention and control of litter arising from Bord na Mona's activities and from unauthorised dumping on and around its property.

Table 1: Waste Management Plan		
Waste Type	**Waste Handling Procedure**	**Disposal Route**
Plant & Equipment	• All production equipment shall be transferred to tea centers/workshops for assessment for retention, sale or scrapping.	-
	• Tractors, trailers, excavators, dozers identified for D&R work, peat sales or drainage/silt pond maintenance shall be retained at the main works.	
Hazardous Waste	• Hazardous materials/liquids/batteries shall be removed from all machinery identified for scrap.	-
	• All waste or unused fuels, oils, greases, batteries etc shall be brought into the main works and deposited into existing hazardous waste receptacles i.e. barrels, waste oils tanks, battery boxes etc.	AES/ENVA
Transformers	• Redundant transformers shall be transported to workshops. Prior to disposal, transformer oils shall be testing for the presence of PCB's. Only third part contractors ENVA ltd shall be permitted to pump and disposed of transformer oils. • Transformer shall be then send for metals recycling	AES/ENVA/ (Subcontractor - metals recycling)
Scrap Metal	• All scrap metal collected shall be stored in short to medium term designated areas with adequate hard standing, space and access for collection by AES contractors using heavy equipment (scissors, grab, articulated trucks). **Note:** to maximise the potential scrap value, store scrap loose and do not deposited into skips	AES (Subcontractor - metals recycling)
Polythene	• All waste polythene, rolled and loose shall be gathered and stored at designated areas with adequate hard standing, access and easy reach for collection. In order of preference, polythene shall be disposed of as follows: 1. **Rolled Polythene** – collected by ADN Ltd for recovery/recycling - **qualifies for a financial rebate.** 2. **Loose Polythene** - collected by ADN Ltd for recovery/recycling - no financial rebate due to transportation costs. 3. **Contaminated Polythene** – polythene rejected by ADN Ltd shall be disposed of to landfill via AES ltd.	ADN Ltd / AES
Polybrane	• All waste polybrane recovered from both permanent and temporary rail shall be stored separately to polythene and assessed for reuse/ disposal. Polybrane designated for disposal shall be directly transferred to Drehid landfill.	Reuse – to be determined Disposal - Drehid Landfill
Tyres	• All used tyres shall be gathered and stored in a suitable hard standing area for collection	AES

Concrete Pipes	• Redundant concrete pipes shall be:
	  • collected and transported to the nearest compound for reuse (D&R projects/Drainage/neighboring farm use).
	  • Crushed in-situ.
		-

Asbestos	• Removal and disposal of asbestos carried out by specialist's waste contractors only. If found, do not handle or disturbed and ensure Health & safety guidelines are adhered to.	Specialist's waste contractors

C&D Waste	• All C&D waste shall be segregated to ensure disposal costs are minimised as follows:
	  • Remove of all internal appliances, furniture, windows, roof felt, guttering etc to general waste skip.
	  • Segregate timber from concrete and place in separate skips
	  • Segregate metals and transport to nearest loose metals storage compound
		AES (Subcontractor - metals recycling)

Peat Stockpiles	• Unsalable stockpiles shall be leveled/decommissioned as per SOP FS-BM-02 "Bog Maintenance Plan"	Operations
Illegal fly tipping	• The locations of illegal dumping and fly tipping sites shall be documented and reported to local BnM environmental officers. Note: The local county council should be notified of the dumping and a landfill levy exemption letter requested prior to the removal or disposal of waste.	AES

APPENDIX D: BEST PRACTICE GUIDANCE FOR THE APPLICATION OF FERTILISERS

Fertiliser application to accelerate natural colonisation of vegetation

Natural colonisation of vegetation is generally the best and most sustainable method for stabilising bare peat surfaces. This means that species that are suited to the underlying environmental conditions colonise specific areas. In some instances, however, cutaway bog areas are very slow to colonise naturally. For example, some areas of Drumman Bog remained devoid of vegetation for at least 15 years after industrial peat production ceased. These areas where vegetation is slower to naturally colonise tend to be drier areas such as headlands and high fields that dry out in the summer, or areas that are prone to water fluctuations.

Trials at Drumman Bog, Cavemount Bog, Ballycon Bog and Lullymore Bog have shown that a key limiting factor that inhibits natural colonisation of these specific bare peat areas is the nutrient status of the peat, in particular Phosphorous. Addition of fertiliser to bare peat areas has accelerated natural colonisation at these sites. Seed of pioneer species (Rushes and Bog Cotton) have not been a limiting factor. It is likely that the increased nutrients support seedling establishment and growth during the autumn and spring growing season and these larger plants are better able to survive during the sometimes harsh summer conditions when drought becomes inhibiting. Pioneer vegetation will then act as a "nurse crop" and will naturally develop into other habitat types through ecological succession.

Fertilisers have been used by other peatland restoration and rehabilitation projects in Canada, UK and Germany. It is accepted that while the application of fertiliser can bring a short-term risk of potential negative downstream impacts on water quality and can also affect the nutrient status of the peat and favour non-target species ('weeds'), this is balanced by the positive impact of environmentally stabilising bare peat areas, creating pioneer vegetation, reducing silt loss from these areas, accelerating the trajectory towards naturally functioning peatland ecosystems and having positive impacts on downstream water quality in the longer-term. The potential environmental risks of fertiliser use can also be mitigated in several ways with the use of slow-release fertilisers (Rock Phosphate), targeted use of fertiliser (to specific areas) and phased applications to different areas in different years (to reduce the overall fertiliser load in a single years). Fertiliser application follows guidelines produced by the Forest Service (XXX) for the application of fertiliser on peat for forestry.

In general, the use of fertiliser should be minimised where possible. Long-term fertiliser use is not considered as a desirable or sustainable management option. Fertiliser applications would only be applied in a targeted manner to a portion of the overall site.

It is proposed to use fertiliser to help accelerate natural colonisation on headlands (the area around the edges of the production bogs) and on high fields (former stockpile fields). Both areas are prone to drying in the summer, inhibiting vegetation establishment and growth. It is also proposed to use fertiliser to help accelerate the natural colonisation of newly formed bunds. Accelerating vegetation growth on these newly formed bunds will help consolidate, stabilise and strengthen them, increase their functionality and help them retain water within cells. This enhanced measure will be combined with other measures described in this section to optimise ecosystem service benefits.

*Figure **Error! No text of specified style in document.**-1 - Drumman Bog. Pictures of high fields from 2010 and from 2013 (right). Fertiliser was applied in 2010. This supported the natural colonisation of rushes and other pioneer vegetation, environmentally stablishing this bare peat area.*

*Figure **Error! No text of specified style in document.**-2 - Cavemount Bog. Pictures of fields from 2015 and from 2016 (right). Fertiliser was applied in 2015. This supported the natural colonisation of rushes and other pioneer vegetation, helping to stablish this bare peat area.*

*Figure **Error! No text of specified style in document.**-3 - Ballycon Bog. Pictures of high field from 2013 and from 2016. Fertiliser was applied in 2013. This supported the natural colonisation of rushes and other pioneer vegetation, environmentally stablishing this bare peat area.*

It is proposed to use slow-release fertiliser in particular instances to accelerate natural colonisation and the development of pioneer vegetation cover. Suitable areas for fertiliser applications include headlands, high fields and newly constructed berms.

APPENDIX E: EMERGENCY RESPONSE CLEAN-UP PROCEDURE

Emergency Response Clean-up procedures.

PROCEDURE

Fuel/Oil Spillage

Isolate/switch off fuel/oil spillage source

Obtain access to closest oil-spillage kit located at _____

Travel to closest downstream receiving river bridge and deploy/ secure booms across river width, if spillage has potential to extend to local river.

Assess extent of fuel spillage and deploy booms at associated drain, silt pond inlet or closest outfall or furthest spill extent

Switch off any associated bog pumps.

Depending on spillage source location, construct peat berm to contain spillage

Use adsorbent pads to commence soaking of fuel/ contaminated water

Store depleted absorbent pads in wheelie bin for hazardous waste disposal

Continue to monitor spillage source, contaminated soils, deployed booms and receiving water and change kit as required.

Peat Spillage

Isolate source of peat spillage (silt pond, failed berm, failed drain block)

Assess extent of peat spill and follow to local receiving water.

Switch off any associated bog pumps.

Construct dry peat berms around extent of peat flow and monitor.

Deploy silt curtain on receiving water if peat spillage has potential to extended to local river.

Continue clean-up as instructed by/under direction of Local Authority / Inland Fisheries Ireland/EPA

BORD NA MÓNA
Naturally Driven

Fuel/Oil spill kit (containment booms and adsorbent materials)

Fuel/oil booms

Adsorbent Pads

Adsorbent socks

Boom securing pegs

Spill kit

Silt Curtain