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Bord na Móna

Derryadd, Derryaroge and Lough Bannow Bogs – Application for Substitute Consent

Remedial Appropriate Assessment Screening Report

March 2025

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1. INTRODUCTION

1.1 BACKGROUND

This remedial Appropriate Assessment Screening Report (rAASR), prepared by TOBIN on behalf of Bord na Móna, assesses the potential for significant effects on European sites which comprise Special Areas of Conservation (SACs) and Special Protection Areas (SPAs)[1] resulting from peat extraction and ancillary activities from 1994 until present day at Derryadd, Derryaroge, and Lough Bannow Bogs in Co. Longford (herein referred to as the 'Application Site') since 1994. This Report also assesses the implementation of the Cutaway Bog Decommissioning and Rehabilitation Plans for the Application Site, which are required to be implemented under Condition 10 of the Environmental Protection Agency (EPA) Integrated Pollution Control (IPC) Licence (P0504-01), following the cessation of peat extraction in July 2019. All elements of the activities and works at the Application Site are referred to herein collectively as the 'Project'. This report also considers potential effect of the Project in-combination with other past, current and planned projects and plans. This rAASR is submitted in support of an application for Substitute Consent by Bord na Móna for historic peat extraction activities and all ancillary works, at the Application Site. The application for Substitute Consent is also supported by a remedial Environmental Impact Assessment Report (rEIAR).

The Application Site form part of a larger bog group, owned and operated by Bord na Móna, known as the Mountdillon Bog Group. The lands at the Application Site have been used historically primarily to produce milled peat to supply the Lanesborough Power Station, and subsequently the Lough Ree Power Station, both owned and operated by ESB. The Application Site occupies an area of 2,244 hectares (ha), comprising primarily of cutaway bog and bare peat, buildings, yards, railway lines, and surface water drainage systems including silt ponds and drainage channels. Since peat extraction ceased in 2019, activities at the Application Site have shifted from peat extraction to ongoing decommissioning efforts, primarily focused on the removal of peat stockpiles and the decommissioning of infrastructure to facilitate rehabilitation of the site.

Screening for Appropriate Assessment (AA) is required under Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (the 'Habitats Directive') and Part XAB of the Planning and Development Act 2000, as amended.

Article 6(3) of the Habitats Directive states that

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

[1] SACs and SPAs are respectively designated under the Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (commonly referred to as the Habitats Directive) and Council Directive 79/409/EEC on the conservation of wild birds, which was later amended by Directive 2009/147/EC) (commonly referred to as the Habitats Directive). Collectively, SACs and SPAs comprise the Natura 2000 network of protected sites. SACs and SPAs are referred to as European site under national legislation. It should be noted that the terms, Natura 2000 Sites and European are often used interchangeably in national guidance on Appropriated Assessment.

provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public'.

The information used to inform this rAASR was obtained through a series of desk studies. Using this information, the assessment presented here has been made of the potential for likely significant effects of the Project on European sites, in the absence of any best practice, mitigation or preventative measures, as a result of peat extraction activities and all ancillary works, including the implementation of the Cutaway Bog Decommissioning and Rehabilitation Plans for the bogs.

The Habitats Directive (Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora) came into force in Ireland on 10th June 1994, following the adoption of the Directive by the European Union. This was the date by which all EU member states, including Ireland, were required to comply with the directive's provisions and integrate them into their national legislation. Although the Directive came into force in 1994, it was not fully transposed into Irish law until 1997 through the European Communities (Natural Habitats) Regulations, 1997 (S.I. No. 94/1997). Consequently, 1994 marks the earliest point at which AA could have been required for the Project, and a remedial AA of likely significant effects is being conducted from that point onward. Specifically, the likely significant effects of the Project, including effects from 1994 onwards on European Sites are considered under the following three distinct Project phases:

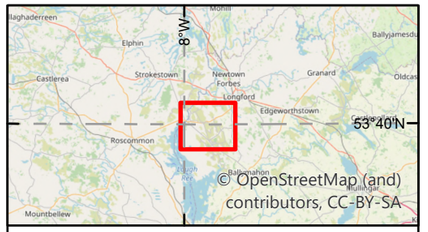
- **Peat Extraction Phase (June 1994 – July 2019) -** includes all works undertaken from 1994 to the cessation of peat extraction in July 2019. As outlined above, June 1994 is the earliest date by which AA would have been required.
- **Current Phase (July 2019 – Present Day)** - includes all ongoing and future decommissioning activities and site management at the Application Site since the cessation of peat extraction in July 2019 to the present day.
- **Remedial Phase (Future)** – future implementation of the Cutaway Bog Decommissioning and Rehabilitation Plans for the Application Site, as required under Condition 10 of its EPA Licence P0504-01, following the cessation of peat extraction activities.

The potential effects of the activities in combination with other plans and projects are also fully considered.

This rAASR has been prepared in compliance with Part XAB of the Planning and Development Act 2000 (as amended), the Planning and Development Regulations 2001 (as amended) and relevant jurisprudence of the European and Irish Courts, and in accordance with the following:

- Assessment of plans and projects in relation to Natura 2000 sites - Methodological guidance on Article 6(3) and (4) of the Habitats Directive 92/43/EEC (European Commission (EC), 2021)
- Managing Natura 2000 Sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC (EC, 2018)
- Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities (Department of the Environment, December 2009, amended 11 February 2010)

- Appropriate Assessment Screening for Development Management (Office of the Planning Regulator (OPR), 2021)



Legend

Application Site

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NOTES

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

Rev	Date	Description	By	Chkd
A	05/03/2025	First issue	S.P	C.N

Client: Bord na Móna

Project: Derryadd, Derryaroge and Lough Bannow Bogs - Application for Substitute Consent

Title: Figure 1-1 Boundary of the Application Site

Scale @ A3: 1:40,000

Prepared by:	Checked by:	Date:
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Draft: A

1.2 APPROPRIATE ASSESSMENT PROCESS

1.2.1 Stage 1 Screening for Appropriate Assessment

Screening is a fundamental process used to determine whether an AA is required for a particular plan or project.

According to Part XAB of the Planning and Development Act 2000, as amended, this screening process must be carried out by the Competent Authority. In line with Section 177U of the Act, it states:

- *'A screening for appropriate assessment shall be carried out by the competent authority to assess, based on the best available scientific knowledge, whether the land use plan or proposed development, either alone or in combination with other plans or projects, is likely to have a significant effect on a European site'.*

The screening process is critical in ensuring that any potential **significant effects** on European sites are adequately considered before progressing with any development activities.

The Competent Authority's decision to determine if an AA is necessary must be based on objective, reliable, and verifiable information, and it should be properly recorded for transparency.

If needed, the Competent Authority has the right to request further information from the project proponent or consultant to facilitate the screening process and ensure that a thorough assessment is undertaken.

The European Commission's '*Assessment of Plans and Projects in Relation to Natura 2000 Sites - Methodological Guidance on Article 6(3) and (4) of the Habitats Directive 92/43/EEC'* (EC, 2021) provides a clear and structured approach to Stage 1 Screening, which consists of the following four main steps:

1. **Ascertain if the plan or project is directly connected to, or necessary for, the management of a European site**.
   This step seeks to determine whether the proposed plan or project is specifically linked to the management or conservation efforts of the European site, and whether it is an essential part of maintaining the site's conservation objectives.
   European sites comprise SACs and SPAs, designated under the EU Habitats Directive and EU Birds Directive respectively.
2. **Provide a detailed description of the plan or project and its potential impact factors.**
   This step involves provision of a clear and comprehensive description of the proposed plan or project, including its scope, activities, and potential impacts. This will help in identifying possible interactions between the development and European sites, and how these could influence the conservation values of the sites.
3. **Identify which European site may be impacted by the plan or project.**
   This step involves identifying all the European sites that could potentially be affected by the proposed plan or project. This includes evaluating the geographical proximity and the nature of any potential impacts on the European sites.

4. **Assess whether likely significant effects can be ruled out in light of the conservation objectives set for the European sites.**
   The final step evaluates whether the proposed plan or project is likely to have significant effects on European sites, considering their specific conservation objectives. If no significant effects to the European sites are identified, the Competent Authority may determine that an AA is not required.

AA Screening for the Project

1. In relation to **Step 1** above, the Project is not, nor was it, directly connected with, or necessary for, the management of any European site. Consequently, the Project has been subject to a remedial AA Screening process.
2. To address **Step 2**, a description of the Project is provided in **Section 2** below.
3. For **Step 3** above, **Section 3** identifies European sites relevant to the assessment of likely significant effects from the Project.
4. **Section 4** below addresses the final step of the Screening process (i.e. **Step 4**) and determines if the Project will have likely significant effects on European sites.

This Article 6(3) rAASR has been prepared in compliance with the provisions of Section 177U[2] of the Planning and Development Act 2000 (as amended).

1.2.2 Stage 2 Appropriate Assessment

Where it cannot be excluded beyond reasonable scientific doubt at the Screening stage, that a plan or project, individually or in combination with other plans and projects, would have a significant effect on the conservation objectives of a European site, an AA is required, or in this case a remedial Appropriate Assessment.

Where an AA is required, the Competent Authority may require the applicant to prepare a NIS. An NIS, as defined in Section 177T of the Planning and Development Act, 2000 as amended, is a statement for the purposes of Article 6(3) of the Habitats Directive of the implications of a proposed development, on its own and in combination with other plans and projects, for a European site in view of its conservation objectives. Stage 2 AA considers potential **adverse effects** and the **integrity** of the site

The NIS, where required, should be underpinned by the best scientific data, information and analysis necessary to reach a definitive determination as to:

1. the implications of the plan or project, alone or in combination with other plans and projects, for a European site in view of its conservation objectives, and
2. whether there will be **adverse effects on the integrity** of a European site.

The NIS should be underpinned by best scientific knowledge, objective information and adopt the precautionary principle.

[2] While the Planning and Development Act 2000 (as amended), specifically Section 177G of the Act, refers to 'revised Natura Impact Statements' in relation to Substitute Consent applications the Act does not specifically refer to Appropriate Assessment Screening. Section 177G of the Act is discussed in Section 1.2.2.

Section 177G of the Planning & Development Act 2000 (as amended) states the following with respect to the **revised NIS**[3] shall contain:

- *'a statement of the significant effects, if any, on the relevant European site which have occurred or which are occurring or which can reasonably be expected to occur because the development the subject of the application for substitute consent was carried out*
- *details of any appropriate remedial or mitigation measures undertaken or proposed to be undertaken by the applicant to remedy or mitigate any significant effects on the environment or on the European site;*
- *details of the period of time within which any such proposed remedial or mitigation measures shall be carried out by or on behalf of the applicant.*

To address requirements of Section 177G of the Planning & Development Act 2000 (as amended) for the Substitute Consent application a remedial Natura Impact Statement has been prepared.

1.3 Information Used to Inform the Remedial Appropriate Assessment Screening

The following section outlines the desk study conducted for this assessment, which included a comprehensive review of available information relevant to the Application Site and its surrounding area, as well as consultations.

1.3.1 Desktop Studies

The desk study undertaken for the Project included a review of available data relevant to the Application Site and surrounding area. The desk study aimed to establish an understanding of the Project, and the environmental context and potential impacts associated on relevant European sites.

Section 2.1 and Section 2.2 below present a summary of the Project, while a detailed description of the Project as presented for the rEIAR is included as Appendix 1.

To establish the environmental context of the Project the desk study encompassed a review of the following:

- Bord na Móna ecology surveys at the Application Site
  - The Application Site was subject to detailed habitat surveys by Bord na Móna ecologists between 2010 - 2012 (see Appendix 2)
    - Derryaroge Bog: Site surveyed on 03/09/2012 (Appendix 3b).
    - Derryadd Bog: Site surveyed on 26/07/2012 and 27/07/2012 (Appendix 2b).
    - Lough Bannow Bog: Site surveyed on 27/07/2010 and 29/07/2010 (Appendix 2c).
- Bord na Móna Cutaway Bog Decommissioning and Rehabilitation Plans (included in Appendix 3)
    - Derryaroge Bog –Cutaway Bog Decommissioning and Rehabilitation Plan 2023 (Appendix 3a).

[3] Section 177G uses the term '*revised Natura Impact Statement*'.

  - Derryaroge Bog – Draft Cutaway Bog Decommissioning and Rehabilitation Plan 2025 (Appendix 3a)
  - Derryadd Bog – Draft Cutaway Bog Decommissioning and Rehabilitation Plan 2025 (Appendix 3b).
  - Lough Bannow Bog – Draft Cutaway Bog Decommissioning and Rehabilitation Plan 2025 (Appendix 3c).
- Aerial Maps from 1973 to 2019 (included in Appendix 4).
- Review of historic 6 inch and 25 inch maps of the Application Site and surrounding area available through Ireland's National Geospatial Data Hub[4].
- Review of the publicly available National Biodiversity Data Centre (NBDC) web-mapper[5].
- Review of online web-mappers and datasets from key environmental agencies, including the National Parks and Wildlife Service (NPWS)[6], EPA[7,8], and Inland Fisheries Ireland[9] (IFI).
- Review of NPWS Article 17 reporting and mapping for 2019[10], 2013[11] and 2007[12].
- Review of NPWS Article 12 mapping data for 2013 - 2018[13] and 2008 to 2012[14],
- IFI Reports, where available.
- Review of relevant of publicly available Plans, including the:
  - Ireland's 4th National Biodiversity Action Plan 2023-2030 [15].
  - Longford County Development Plan 2021–2027[16]
  - Longford County Development Plan 2015–2021[17]
  - Longford County Development Plan 2009–2015[18]

[4] Available at: https://www.geohive.ie/. Accessed January 2025.
[5] Available at: https://maps.biodiversityireland.ie/Map. Accessed February 2025.
[6] Available at: https://www.npws.ie/maps-and-data. Accessed January 2025.
[7] Available at: https://gis.epa.ie/EPAMaps/. Accessed January 2025.
[8] Available at: https://www.catchments.ie/maps/. Accessed February 2025.
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[16] Available at: https://www.longfordcoco.ie/services/planning/longford-county-development-plan-2021-2027/volume-1-compressed.pdf. Accessed February 2025.
[17] Available at: https://www.longfordcoco.ie/services/planning/previous-plans-county-town-local-area-/development-plan-2015-2021/. Accessed February 2025.
[18] Available at: https://www.longfordcoco.ie/services/planning/previous-plans-county-town-local-area-/county-development-plan-2009-2015/. Accessed February 2025.

- Longford County Development Plans dated from 1990 onwards. Chapter 2 - Methodology of the rEIAR prepared for the Substitute Consent provides a summary of historic plans.

1.3.2 Scoping and Consultation

TOBIN undertook a scoping and consultation exercise in 2022 and again in 2024 during preparation of the Substitute Consent application. A full description of consultations undertaken are described in Section 2.4 of Chapter 2 Methodology of the rEIAR. The consultation undertaken with the Development Application Unit (DAU) was of relevance to the AA of the Project. The full consultation response from the DAU is provided in Appendix 5 while a summary of same is included in Table 1.1 below.

Table 1.1: Scoping and Consultation Reponses

Consultee	Response/ Observations/ Recommendations
Development Application Unit (DAU), Department of Housing, Local Government and Heritage (DoHLGH)	A response was received from the DAU on 22/08/2024 acknowledging receipt of the consultation request. The DAU response outlined the following key 'heritage-related observations/recommendations': • AA and NIS must be detailed, scientifically robust, and leave no uncertainty regarding impacts on conservation objectives. • The rEIAR should be cognisant of previous Department comments on similar substitute consent applications. • Historical, current, and future water level management should be assessed for ecological impacts, particularly on wintering and breeding birds. • Baseline field surveys are needed to assess the ecological effects of drainage and its connection to Natura 2000 sites. • The assessment should consider carbon sequestration potential, as compliance with existing licences does not guarantee biodiversity protection.

1.4 STATEMENT OF AUTHORITY

This rAASR was authored by Senior Ecologists Joao Martins (B.E. (Hons), M.Sc.) and Dr. James Forde (B.Sc. (Hons), M.Sc., Ph.D., MCIEEM), and reviewed by Senior Ecologist Áine Sands (B.Sc. (Hons), MCIEEM).

Joao is a Senior Ecologist in TOBIN's Environment and Planning (E&P) division and holds a B.E. (Hons) in Environmental and Natural Resources Engineering and an M.Sc. in Environmental Engineering (Freshwater ecology). Joao has over 14 years' experience in freshwater ecology, associated with monitoring for the EU Water Framework Directive (e.g. macroinvertebrates, habitat/hydromorphology) and projects of scientific nature, in Germany, Portugal and Ireland. He has worked for over 7 years in environmental consultancy, developing his expertise in AA, Ecological Impact Assessments (EcIA) and Environmental Impact Assessment Reports (EIAR). Joao has also conducted and coordinated bird surveys (e.g. I-WeBS, Vantage Point (VP), Countryside Bird Surveys (CBS) Woodcock (*Scolopax rusticola*) surveys etc.), botanical and habitat surveys, mammal surveys (bats and non-volant) and inland fisheries (electrofishing).

James is Senior Ecologist and Technical Director of the TOBIN E&P division. James holds a B.Sc. (hons) and M.Sc. degrees in marine ecology, and a Ph.D. in ecology. James is also a full member

of the Chartered Institute of Ecology and Environmental Management (CIEEM). James has almost 20 years' academic and environmental consultancy experience. He has an extensive understanding of ecology and appreciation of the objectives and mechanisms of national and international environmental legislation and policy. He has significant experience in preparing and reviewing ecological reports including Screenings for AA, NIS and EcIA reporting, and EIAR. James has provided strategic technical and environmental advice for developments across a wide range of sectors, including onshore and offshore renewables, telecommunications, flood relief schemes, port and harbour developments, energy generation and transmission.

This report was senior reviewed by Áine Sands B.E. B.Sc. (Hons), a Senior Ecologist in the TOBIN E&P division, with ten years of post-graduate experience in ecology and environmental consultancy. has predominantly been involved in large renewable energy projects, such as wind, solar and hydrogen developments, where she has acted as Lead Ecologist. Áine has extensive experience in preparing and reviewing ecological reports such as Screenings for Appropriate Assessments, Natura Impact Statements and Ecological Impact Assessments. Áine also has a strong understanding of National and European legislation associated with biodiversity and is cognisant of relevant rulings by the Court of Justice of the European Union (CJEU). Áine also has experience with undertaking ecological surveys for protected habitats and species.

2. DESCRIPTION OF THE PROJECT

Section 2.1 and Section 2.2 below presents a summary of the Project. This summary is based on a detailed description of the Project presented in Chapter 4 Project Description of the rEIAR prepared for the Project. The rEIAR chapter is included in full in Appendix 1 below

The rEIAR adopts July 1988 as the assessment baseline, as this was the year when the European Communities EIA Directive was required to be transposed into Irish law. While the description of the Project in the rEIAR and Appendix 1 includes extensive information on activities at the Application Site from 1949. This marked the commencement of the installation of the drainage at the Application Site to facilitate industrial peat extraction. This rAASR assesses activities within the Application Site from 1994 onwards when the Habitats Directive came into force (as described in Section 1 above). It should be noted, however, that the majority of the information presented to establish the 1988 baseline used in the rEIAR is relevant for establishing the 1994 baseline and beyond, as peat extraction continued until 2019. Appendix 1 includes descriptions of:

- activities at the Application Site from 1949 at the onset of site preparation up to July 1988;
- the rEIAR baseline as of July 1988;
- activities from 1988 to the cessation of peat extraction in July of 2019;
- management of the Application Site since July 2019;
- activities intended to be carried out at the Application Site into the future.

2.1 DESCRIPTION OF THE APPLICATION SITE

The Application Site, covering 2,244 ha, consists of three bogs, which form part of a larger bog group known as the Mountdillon Bog Group, Derryaroge Bog to the north, Derryadd Bog in the center, and Lough Bannow Bog to the south .

Drainage works and clearance of vegetation commenced at the Application Site from 1949 in Derryaroge Bog and from 1960 in Derryadd and Lough Bannow Bogs. Prior to this time the Application Site would have likely consisted of uncut raised bog, however, no survey data are available for this time period.

By 1988, the Application Site was well established as an industrial peat extraction area, with all bogs fully drained, milled peat extraction underway in most locations, and railway infrastructure in place. In 1988 the once natural bog landscape was dominated by cutover bog and drained peatlands, where large sections of the bog were subject to peat extraction, leaving behind areas of bare peat. Peat extraction was ongoing in most locations, with a network of drainage channels installed to facilitate the process. The presence of railway infrastructure further reinforced the site's industrial character, allowing for the transportation of extracted peat. By 1994 the land use at the Application Site was well established as industrial peat extraction, with all bogs fully drained, with milled peat extraction underway and railway infrastructure in place. The Application Site in 1994 was predominantly bare peat and cutover bog, with small sections of remnant raised bog. These remnants of bog, however, would have been degraded due to the impact of drainage and peat extraction. In some of the abandoned or less intensively worked

sections, early signs of recolonisation by pioneer species may have been evident, with mosses, grasses, and low shrubs possibly establishing in areas.

From 1988 to 2019, the Application Site was subject to the same industrial peat extraction activities, with peat extraction remaining the primary function of the site. The landscape and habitats supported would have seen little change and in 1994 was characterised by cutover bog, bare peat areas and drained peatlands, with the site continuing to support peat extraction as the dominant activity.

At present day, the majority of the Application Site consists of cutaway bog, where the vegetation was cleared, and peat has been removed. There are several smaller areas of various habitats remaining including coniferous forestry, cutover bog with all vegetation cleared but some peat remaining and uncut bog. The Application Site also includes small areas of remnant raised bog.

The Application Site is situated at the boundary between two Water Framework Directive (WFD) sub-catchments:

- Upper Shannon 26C – Covers most of the site, with surface water primarily draining into this catchment.
- Upper Shannon 26E – Extends to the south, receiving drainage from the southern part of the site.

These catchments define the flow of surface water within and around the site, impacting local rivers, streams, and lakes. The WFD ensures that water quality in these catchments is regularly monitored and assessed against ecological and chemical standards.

Key surface water bodies within these catchments include:

- Shannon (Upper) and its tributaries – Located to the north and northwest of the site.
- Ballynakill River – Found north and east of the Derryadd and Derryaroge bogs.
- Lough Bannow Stream and its tributaries – Located west of Lough Bannow.
- Fallan River – Situated 1 km east of the site, draining into the River Shannon at Cloondara.
- Ledwithstown (Bilberry) River – Originates near Lough Bannow's southern boundary, flowing southwest into Lough Ree.

Derryaroge Bog

Derryaroge Bog (approximately 863ha) is located 1km east of Lanesborough, County Longford. It is divided into western and eastern sections by a privately owned mineral island, which lies outside the Application Site boundary. Derryaroge Bog is separated from the Derryadd Bog to the southeast of Lanesborough by the N63 road. The main access point to Derryaroge Bog was off the N63.

Derryaroge Bog was in industrial peat production since the 1950s, with satellite imagery and annual reports confirming active extraction in 1988. By this time, the bog consisted largely of cutover areas dominated by bare peat, supported by established drainage and rail infrastructure. Aerial imagery (Appendix 4 and Appendix 5) further highlights the extent of cutover bog and peat extraction during this period.

Drainage of the bog to facilitate peat extraction was already in place by 1988, predominantly orientated in a northwest-southeast direction and several pumps were in operation.

Railway infrastructure was laid in the bog (since the 1950s), terminating at the Mountdillon Works at Derryaroge Bog which included canteens, workshops, welfare facilities, and fixed fuel tanks.

A pumped drainage system in operation in 1988 at Derryaroge Bog remains in place, with nine surface water pumps. There were artificial silt ponds, and surface water emission points which remain in situ today.

Derryadd Bog

Derryadd Bog (approximately 649ha) lies 4km southeast of Lanesborough. The bog is separated from Derryaroge Bog by the N63 road. It is a single peatland block with two privately owned mineral islands (Annaghmore).

A rail link connects Derryadd Bog to both Derryaroge (to the north) and Lough Bannow (to the south). In addition, a rail line running in an east-west direction, dividing the bog into a larger northern section and a smaller southern section, remain in-situ today. Hydrological management, historically supporting industrial peat extraction, continues through active pumping infrastructure.

Lough Bannow Bog

Lough Bannow Bog (approximately 731ha) is situated 7km southeast of Lanesborough. It is bordered by the R392 Regional Road to the west, the R398 Regional Road to the north, and the L1136 Local Access Road (Keenagh Road) to the south. The Royal Canal and Greenway are located 500m east.

Two large privately owned mineral islands exist within the site. A rail line crosses the southern part of the bog in an east-west direction.

Lough Bannow Bog had hydrological management via pumping to support peat extraction. Pumping continues today as required, with three pumps (one to the south and two along the northern boundary). Some eastern drains have been excavated down to limestone bedrock.

2.2 Overview of Peat Extraction Activity at the Application Site

The Habitats Directive came into force in 1994. This section reviews the changes in the spatial extent of peat extraction at the Application Site, focusing on the period from 1994 onwards. Aerial imagery of the Application Site are available for the years 1973, 1988, 1995, 2004, and 2019. The data serve as the baseline reference for evaluating changes in peat extraction over time highlighting the Application Site has evolved over the years and underscores the potential ecological recovery processes that began after the cessation of all peat extraction in 2019.

Between 1973 and 2019, the extent of peat extraction at the Application Site underwent significant changes, as detailed in Table 2.1. The area subject to peat extraction peaked in 1988, covering an area of 1,963ha. However, from that point onward, the areas subject to peat extraction gradually decreased to 269.4ha at the point of the cessation of peat extraction in 2019. This reflects a clear transition from active peat extraction to the areas out of production,

allowing for potential habitat regeneration and gradual ecological transition in some areas from bare peat to early-stage or pioneer habitats, with early colonising species such as rush and patchy scrub.

The reduction in peat extraction from 1988 onwards, through 1995 to 2019 has allowed the recovery of previously disturbed areas (see Appendix 4 and Appendix 5). While earlier 1988 imagery is of limited resolution, it is still evident that the site began undergoing significant ecological changes after this time, with high-resolution aerial imagery from 1995 to 2019 confirming some transition.

Further details on the peat extraction activities during the assessment period are provided in Appendix 1

Table 2.1: Bord na Móna Estimates of Peat Extraction Extents (ha) at the Application Site

Area Type	1973	1988	1995	2004	2019
Neither drained nor subject to peat extraction	12.93	12.93	12.93	12.93	12.93
Subject to peat extraction	1,907.6	1,963	1,826.7	1,353.2	269.4
Drained but not subject to peat extraction	56.7	0	136.3	610.4	1,695.38

2.3 PEAT EXTRACTION VOLUMES 1994-2019

Bord na Móna records indicate that from 1994 to 1999 (inclusive) the average extraction was at the Application Site was approximately 274,756 tonnes per year, with a total of 7,143,656 tonnes extracted over the period (see Table 2.2).

Further details of peat extraction activity at the Application Site during the period are provided in Appendix 2.

Table 2.2: Annual peat production quantities for the period 1994 to 2019

Year	Extraction (Tonnes)	Year	Extraction (Tonnes)
1994	291,430	2007	241,904
1995	600,739	2008	253,686
1996	386,862	2009	171,506
1997	167,239	2010	375,757
1998	134,561	2011	265,415
1999	395,820	2012	151,635
2000	355,023	2013	437,822
2001	361,257	2014	269,654
2002	124,952	2015	179,391
2003	329,375	2016	154,839
2004	348,936	2017	199,266
2005	312,112	2018	268,062

Year	Extraction (Tonnes)	Year	Extraction (Tonnes)
2006	282,405	2019	84,008*
Total	**7,143,656**		

***** Peat extraction at the Application Site came to an end in mid-2019, resulting in significantly lower extraction volumes compared to previous year

3. IDENTIFICATION OF RELEVANT EUROPEAN SITES WITHIN THE LIKELY ZONE OF INFLUENCE

3.1 ASSESSMENT APPROACH OVERVIEW

To inform this rAASR, a range of Geographic Information System (GIS) spatial datasets and mapping tools were utilised to identify potential interactions between the Application Site and European sites.

The key steps undertaken in this assessment are outlined below. The methodology was based on relevant guidance as outlined in Section 1 above. The key steps undertaken in this assessment are outlined below. The structured approach applied ensures that all potential interactions between the Application Site and European sites are systematically evaluated, in line with the requirements of the Habitats Directive and relevant national legislation.

- **Spatial Data Collection and Mapping**:

  The most up-to-date GIS spatial datasets for European sites, as well as Water Framework Directive (WFD) Surface Water Bodies (SWBs) and Lake Water Bodies, are sourced from the NPWS website[19] and the EPA website[20,].

  These datasets were integrated into the assessment process to establish spatial relationships between the Application Site and European sites, enabling an informed evaluation of potential impact pathways.

- **Identification of European Sites Using a Source-Pathway-Receptor Model:**

  A Source-Pathway-Receptor model was applied to systematically identify all European sites that could potentially be affected by activities at the Application Site. To provide spatial context for the assessment, European Sites surrounding the Application Site are mapped in Figure 3-1.

  European sites located at greater distances from the Application Site were also examined to assess potential connectivity. However, for these more remote sites, no complete source-pathway-receptor chain was identified, and therefore, they were not considered further in the impact assessment.

- **Assessment of Connectivity with SACs:**

  To establish potential hydrological and ecological connectivity between the Application Site and SACs, Water WFD SWBs, including RWBs and LWBs, were mapped to determine whether both waterborne pathways existed. The relevant SWBs, GWBs, and ecological corridors are shown in Figure 3.1 an Figure 3.2. This comprehensive assessment considered surface water flows, groundwater interactions, and potential pathways for hydrological and hydrogeological connectivity.

  The assessment of connectivity also considered ecological pathways, such as the movement of species and habitats, as well as riparian corridors that might facilitate biological

[19] Available at: https://www.npws.ie/maps-and-data. Accessed January 2025.
[20] Available at: https://gis.epa.ie/GetData/Download. Accessed February 2025.

connectivity across the landscape. This approach ensures that all possible routes, whether hydrological, hydrogeological, or ecological, are accounted for

- **Assessment of Connectivity with SPAs:**

In the absence of specific European or Irish guidance on assessing connectivity between projects and SPAs, the NatureScot (formally Scottish Natural Heritage [SNH]) document *Assessing Connectivity with Special Protection Areas* (SPA) (SNH, 2016[21]) was consulted. This document establishes a framework for assessing connectivity between a project and designated SPAs by considering the typical dispersal and foraging ranges of bird species protected under the Birds Directive. It accounts for the distance species may travel beyond SPA boundaries and provides insights into their movement patterns. The assessment applied species-specific knowledge to evaluate whether qualifying bird species associated with SPAs could be affected by the Project.

This document provides a framework for assessing connectivity between a project and designated SPAs by considering the typical dispersal and foraging ranges of bird species protected under the Birds Directive. It outlines guidance for identifying connectivity between the Application Site and SPAs, taking into account the distances species may travel beyond SPA boundaries. The guidance also provides information on the dispersal and foraging ranges of bird species frequently encountered in environmental assessments. The assessment incorporated species-specific movement patterns to determine whether qualifying bird species associated with SPAs could be affected by the Project.

- **Assessment of Likely Significant Effects on European Sites:**

Since the Project is not located within any European sites, there are no direct effects anticipated. However, indirect effects remain a possibility, and the assessment evaluates how species from nearby European sites could be impacted, especially if they use the Project site for activities such as foraging, breeding, or migration.

Habitat Loss and Fragmentation:

Although the Project does not directly affect European sites, land-use changes, including peat removal, could disrupt habitats used by species from the European sites that forage, breed, or migrate to or from these sites. Such activities may result in habitat fragmentation or disrupt ecological corridors, indirectly affecting species that rely on these habitats for survival.

Disturbance to Species:

The operations associated with peat extraction, such as machinery noise, human activity, and other disturbances, could affect species from European sites that use the Project site for foraging or other purposes. These disturbances could lead to behavioural changes, displacement, or reduced foraging success, potentially compromising the health and viability of these species.

[21] Available at: https://www.nature.scot/sites/default/files/2022-12/Assessing%20connectivity%20with%20special%20protection%20areas.pdf. Accessed February 2025.

Furthermore, the disturbance could also include the generation of dust during peat extraction activities. Dust particles can travel over large distances and settle on vegetation, water bodies, leading to changes in habitat quality. Species that rely on these habitats could be affected, if dust impacts feeding or breeding environments.

Water Quality and Hydrological Changes:

While the Project is not located within European sites, changes to hydrology resulting from peat extraction—such as alterations in surface water flow and groundwater levels—could affect species that depend on water bodies for feeding or breeding.

Indirect impacts on water quality could also impact adjacent habitats connected to European sites, potentially limiting species' access to essential resources.

Hydrological and Hydrogeological Connectivity:

Though the Project does not fall within European sites, hydrological changes like modifications to groundwater recharge or surface water flows could impact nearby habitats linked to these sites. Such changes may disrupt the availability of suitable habitats for species that depend on wetland, river, or aquatic ecosystems, especially if species from European sites use the area for foraging.

Increased Pollution:

Activities related to the Project could lead to increased runoff or pollution, potentially affecting nearby watercourses or wetlands that are connected to European sites. The influx of nutrients or sediment could degrade water quality, negatively impacting species from European sites that rely on these habitats for feeding or breeding.

- **Consideration of In-combination Impacts:**

The assessment examined the potential for in-combination impacts resulting from historical peat extraction activities and associated works at the Application Site. When considered together with other projects in the region, the cumulative effects of the Project could exacerbate indirect impacts on European sites.

Nearby projects might amplify hydrological changes, habitat fragmentation, or disturbance to species. For example, multiple developments in the area could further disrupt ecological corridors or increase pressures on species that use both the Project site and European sites during various stages of their life cycle. The potential for in-combination effects with other historic, ongoing or planned projects and plans was also considered, with findings detailed in Section 4 of this report.

- **Review of Site Synopsis Report, Site Conservation Objectives and Supporting Documentation:**

The site synopses, conservation objectives and conservation objectives supporting documents for the relevant European Sites, as published by the NPWS[22], were reviewed at the time of preparing this report.

[22] Available at: https://www.npws.ie/protected-sites. Accessed February 2025.

These documents provided essential information on the ecological sensitivities and conservation priorities of sites, informing the assessment of potential impacts.

- **Establishing the Likely Zone of Influence:**

Where pathways for potential likely significant effects were identified, such as habitat loss, hydrological connectivity, or disturbance to qualifying species of the European site, the affected sites were included within the likely Zone of Influence for further assessment.

3.2 RELEVANT EUROPEAN SITES

Three European sites are considered 'relevant' based on source-pathway-receptor relationships, meaning that there are identifiable and viable connections between the activities associated with the Project and the ecological integrity of these sites. These sites are listed in Table 3.1 below.

As detailed in Section 3.1, European sites located farther from the Application Site were also evaluated for potential connectivity and the likelihood of impacts. These sites were examined in terms of the potential for source-pathway-receptor linkages, with particular consideration given to hydrological and ecological connections.

While some of the more distant sites were initially considered, no direct or indirect pathways that could facilitate significant impacts were identified. For example, if there are no hydrological connections between the Application Site and these more distant European sites, then the there is no potential for significant indirect impacts.

Similarly, if species from these distant sites do not use the Application Site for essential activities like foraging, breeding, or migration, then these sites do not meet the criteria for inclusion in the impact assessment. As a result, the more distant European sites, due to the absence of complete source-pathway-receptor linkages, are not deemed 'relevant' in the impact assessment. This means that the potential effects of the Project on these sites are considered negligible or highly unlikely, and therefore, they are not included in the detailed evaluation of significant effects. The assessment ensures that only those European sites that are directly or indirectly connected to the Project through a source-pathway-receptor mechanism are considered, providing a targeted evaluation of potential significant effects.

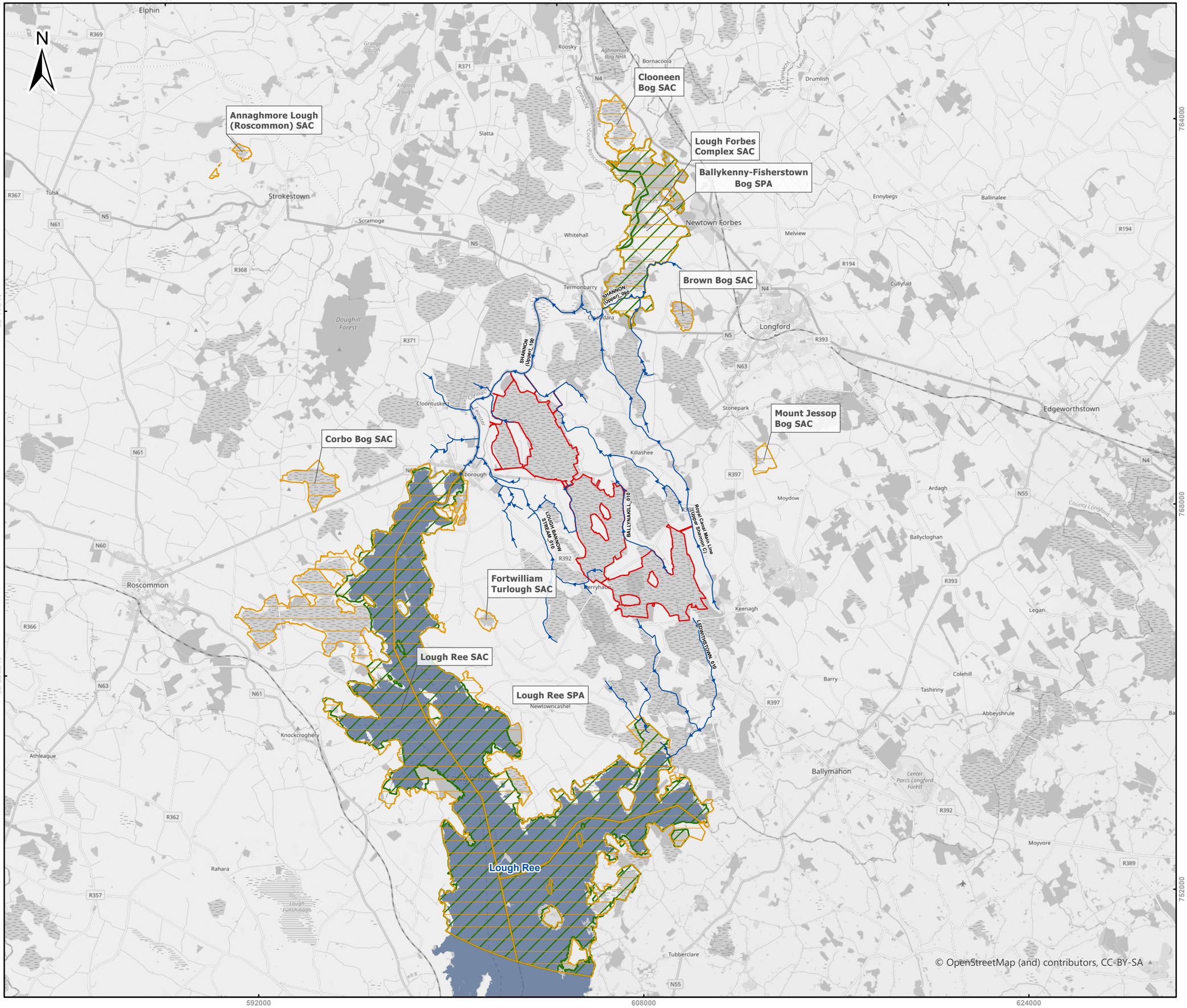
Section 3.2.1 below provides an analysis of the source-impact-receptor linkages used to identify relevant European sites, while Section 3.2.2 assesses the potential for significant effects.

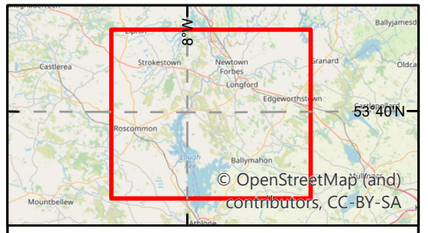
Specifically, Section 3.2.2 outlines how activities associated with the Project from 1994 to the present day, as well as future rehabilitation efforts, could result in significant effect on designated European sites, their habitats, and species. It describes the mechanisms through which these impacts could occur and the associated receptors that may be affected.

Table 3.1: Relevant European Sites

European Site (Site code)	Distance from Application Site	References (accessed February 2025)	Year Designated
Lough Ree SPA (004064)	0.9km southwest	NPWS 2022a[23], NPWS 2015[24]	1995[25]
Lough Ree SAC (000440)	0.9km southwest	NPWS 2016[26], NPWS 2019[27]	2002[28]
Ballykenny-Fishertown Bog SPA (004101)	4.4km northeast	NPWS, 2022b[29], NPWS, 2012[30]	1996[31]

[23] Lough Ree SPA - Fist Order Site-specific Conservation Objectives. https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004064.pdf
[24] Lough Ree SPA - Site Synopsis. https://www.npws.ie/sites/default/files/protected-sites/synopsis/SY004064.pdf
[25] Lough Ree SPA - Natura 2000 - Standard Data Form - https://eunis.eea.europa.eu/sites/IE0004064
[26] Lough Ree SAC - Site-specific Conservation Objectives - https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO000440.pdf
[27] Lough Ree SAC – Site Synopsis. https://www.npws.ie/sites/default/files/protected-sites/synopsis/SY000440.pdf
[28] Lough Ree SAC - Natura 2000 - Standard Data Form - https://www.npws.ie/sites/default/files/protected-sites/natura2000/NF000440.pdf
[29] Ballykenny-Fisherstown Bog SPA - Fist Order Site-specific Conservation Objectives. https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004101.pdf
[30] Ballykenny-Fisherstown Bog SPA- Site Synopsis. https://www.npws.ie/sites/default/files/protected-sites/synopsis/SY004101.pdf
[31] Ballykenny-Fisherstown Bog SPA – Natura 2000 - Standard Data Form - https://www.npws.ie/sites/default/files/protected-sites/natura2000/NF004101.pdf





Legend

- Application Site
- Special Areas of Conservation (SACs)
- Special Protection Areas (SPAs)
- WFD - River Water Bodies
- WFD - Lake Water Bodies

0 2.5 5
Kilometers

NOTES

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

Rev	Date	Description	By	Chkd.
A	05/03/2025	First issue	S.P	C.N

Client: Bord na Móna

Project: Derryadd, Derryaroge and Lough Bannow Bogs - Application for Substitute Consent

Title: Figure 3-1 European Sites surrounding the Application Site relative to WFD RWB and LWB

Scale @ A3:	1:145,000	
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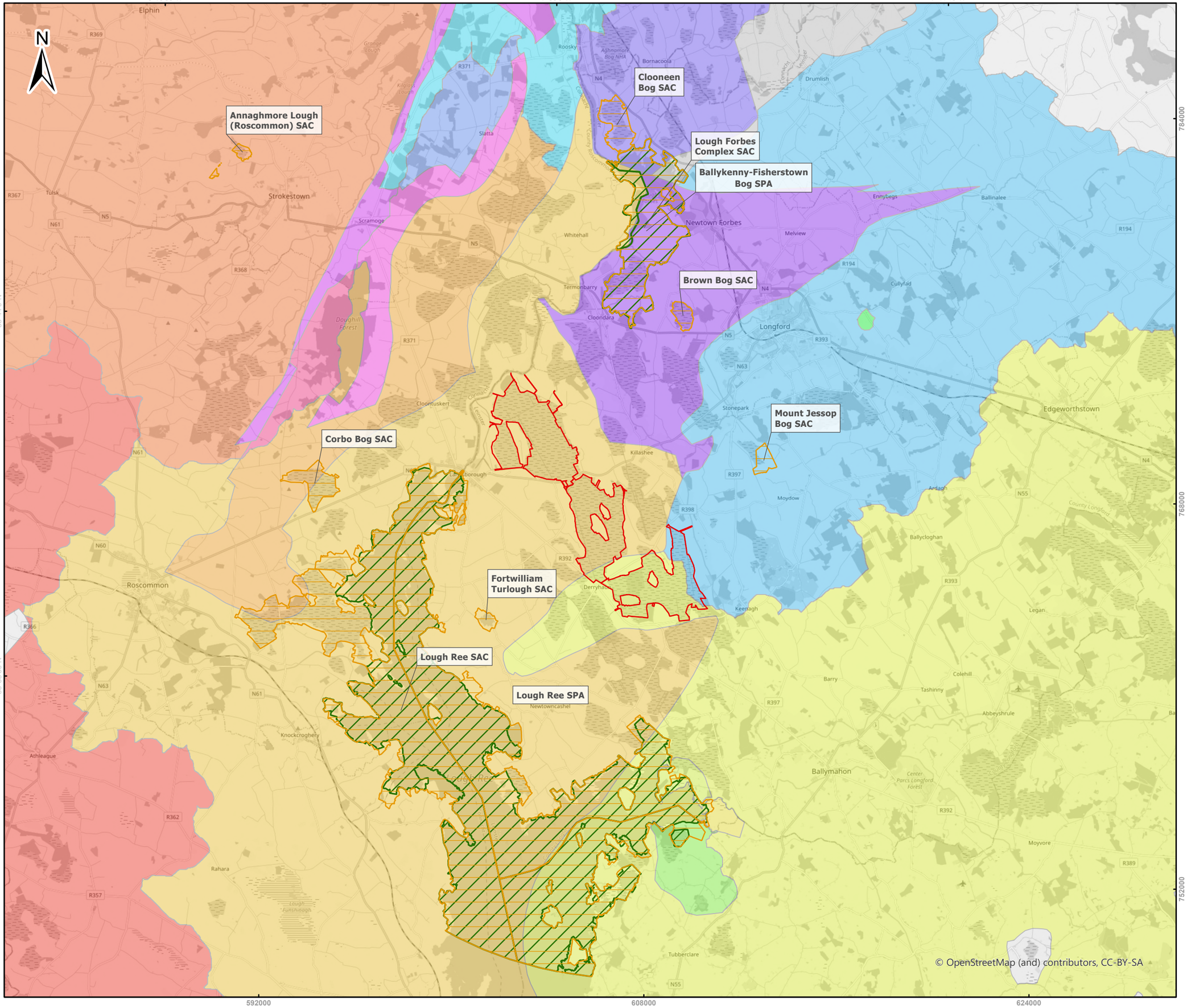
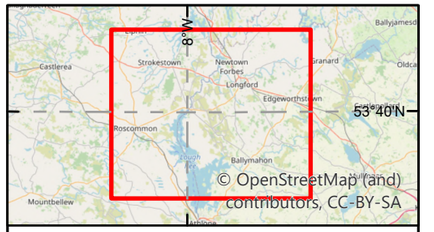
Map Ref: 11400-002.AASr-EU.S-RWB..LWB-TOB-A

Draft: A





Legend

- Application Site
- Special Areas of Conservation (SACs)
- Special Protection Areas (SPAs)

WFD - Groundwater Bodies

- Annaghmore
- Carrick on Shannon
- Curraghroe
- Funshinagh
- GWDTE-Lough Ree Fen 10 (SAC000440)
- GWDTE-Lough Ree Fen 12 (SAC000440)
- GWDTE-Lough Ree Fen 9 (SAC000440)
- Historic Waste Facility (S22-02489)
- Inny
- Kilglass Dromod
- Longford Ballinalee
- Lough Ackrick
- Mohill
- Newtown Forbes
- Scramoge North
- Scramoge South
- Slieve Bawn Telton
- Suck South

0 2.5 5
Kilometers

NOTES

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2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE\
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4. ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Rev	Date	Description	By	Chkd
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Title: Figure 3-2 European Sites surrounding the Application Site relative to WFD GWB

Scale @ A3: 1:145,000

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Map Ref: 11400-003.AASr-EU.S-GWB-TOB-A

Draft: A

3.2.1 Impact Sources and Pathways

3.2.1.1 Peat Extraction Phase (June 1994 – July 2019)

Between 1994 and 2019 the Application Site was subject to industrial peat extraction activities, with peat extraction remaining the primary function of the site. During peat extraction, impacts on hydrology, water quality, and habitat quality occurred at the Application Site disrupting natural drainage patterns, altered water retention, and degraded local ecosystems.

Peat extraction during this phase likely altered drainage patterns, potentially reducing water flow to European sites or changing their hydrological conditions, affecting wetland habitats and species. It also likely increased sedimentation, peat silt, and nutrient runoff, deteriorating water quality in hydrologically linked European sites and impacting sensitive aquatic habitats. These effects may have indirectly impacted the European sites due to water quality deterioration in watercourses within and downstream of the Application Site, which discharge into Lough Ree. Changes in water quality, habitat structure, or hydrology at the Application Site could have had consequences for the SCI and QI species designated within these linked European sites.

Operational noise and increased human activity during peat extraction likely disturbed mobile species, such as Otters and birds from the Lough Ree SAC and Ballykenny-Fisherstown Bog SPA that may have been using the Application Site. This disturbance could have impacted their foraging, breeding, and movement patterns, potentially displacing species from suitable habitats.

Direct habitat loss occurred through the removal of peat, may have been impacted habitats used by species of adjacent European sites dependent on aquatic and peatland ecosystems, such as the Greenland White-fronted Goose and Otters, leading to a loss of suitable habitat for breeding, feeding, and roosting.

3.2.1.2 Current Phase (July 2019 – Present Day)

Since July 2019, activities at the Application Site have focused on decommissioning. Since the cessation of peat extraction at the Application Site in July 2019, the potential for the release of suspended sediments and the pollution of water quality, including both watercourses and groundwater, had been greatly reduced compared to earlier Project Phase when peat extraction was underway.

While effects from historical activities during the Peat Extraction Phase may continue to affect habitat suitability for species dependent on water quality and the hydrological conditions at the Application Site, including mobile species from European sites.

Ongoing decommissioning and required drainage infrastructure maintenance activities are unlikely to transfer pollutants at levels that would disrupt aquatic habitats or species at the European Sites. Consequently, no significant effects on adjacent European sites, such as Lough Ree SAC, Lough Ree SPA and Ballykenny-Fisherstown Bog SPA, are anticipated.

Decommissioning activities may temporarily generate noise and human disturbances, potentially affecting sensitive species at the Application Site, including Otters and birds from

European sites that rely on the area for feeding, breeding, and movement. Disturbance could displace species and interfere with their normal behaviours.

3.2.1.3 Remedial Phase (Future)

Changes in watercourse restoration or drainage infrastructure will improve water retention on the site allowing for restoration of habitats at the Application Site. These changes may enhance water quality and availability, benefiting species dependent on stable aquatic habitats, such as Otters and other water-dependent species within the SAC. No negative effects to European site are anticipated.

Future rehabilitation activities, including site restoration, could introduce temporary disturbances to the local environment at the Application Site disrupting species movement and habitat use at the site in the short term.

Activities during the Remedial Phase are unlikely to result in release of suspended sediments and the pollution of water, including both watercourses and groundwater, connected to European Sites.

Changes to vegetation and habitat restoration will enhance habitat recovery and stability thereby by reducing runoff and erosion. Any potential impacts on habitat suitability for species dependent on peatland, wetland, and aquatic environments will be temporary and non-significant with rehabilitation efforts ultimately support long-term habitat restoration and ecological improvement at the Application Site.

Operational noise and human activity during peat extraction will be at level that are unlikely disturbed mobile species, such as Otters and birds from the Lough Ree SAC and Ballykenny-Fisherstown Bog SPA. The rehabilitation activities are not expected to introduce pollutants at levels that would disrupt aquatic habitats or species within the European Sites. With effective stabilisation and water management measures in place, the risk of contamination is minimal, and no significant adverse effects on adjacent European Sites are anticipated.

3.2.2 Receptors of European sites

Table 3.2 below provides a detailed description of the impact sources associated with activities undertaken during the various phases of the Project, including the period from 1994 to 2019, from 2019 to the present, and the planned future rehabilitation efforts.

Table 3.2: Relevant European sites within the Likely Zone of Influence

Site Name [Site code]	Distance to site (km)	Qualifying Interest/ Special Conservation Interest (* indicate spriority QI)	Source-Pathway-Receptor links and Assessment of Likely Significant Effects
Lough Ree SAC [Site code: 00440] (NPWS, 2016)	0.9	•Otter *Lutra lutra* [1355] •Natural eutrophic lakes with *Magnopotamion* or *Hydrocharition* - type vegetation [3150] •Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (* important orchid sites) [6210] •Degraded raised bogs still capable of natural regeneration [7120] •Alkaline fens [7230] •Limestone pavements* [8240] •Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0] •Bog woodland*	Lough Ree SAC is located within the Ree WFD LWB, which is hydrologically connected to the Application Site. There is hydrological connectivity between the Application Site and this SAC through drainage ditches and watercourses within the Application Site. <u>Potential in-situ Effects QI Habitats</u> 1) Peat Extraction Phase Effects The peat extraction and drainage activities at the Application Site from 1994 to 2019 had the potential for pollutant runoff that could have negatively influenced the water quality of hydrologically linked watercourses, resulting in **likely significant in-situ effects** to QI habitats. 2) Current Phase Effects: During this phase activities have switched from extraction to decommissioning and maintenance of existing drainage infrastructure. No likely significant effects to European sites are anticipated from these activities. 3) Remedial Phase Effects No likely significant effects to European site are anticipated during this Phase. <u>Potential in-situ Effects QI species</u> 1) Peat Extraction Phase Effects The peat extraction and drainage activities at the Application Site from 1994 to 2019 could have negatively influenced the water quality of hydrologically linked watercourses used by the Otter resulting in **likely significant in-situ effects** . 2) Current Phase Effects

Site Name [Site code]	Distance to site (km)	Qualifying Interest/ Special Conservation Interest (* indicate spriority QI)	Source-Pathway-Receptor links and Assessment of Likely Significant Effects
			Decommissioning and maintenance of existing drainage are not anticipated to have negatively affected Otter. Consequently, no likely significant effects to the species are anticipated. 3) Remedial Phase (Future) Effects: No significant negative effects to Otter are anticipated during this Phase. Consequently, no likely significant effects to the species are anticipated. <u>Potential ex-situ Effects to QI Species</u> 1) Peat Extraction Phase Effects The peat extraction and drainage activities at the Application Site from 1994 to 2019 could have resulted in **likely significant ex-situ effects** to Otter due to disturbance and impacts on aquatic habitats at the Application Site due to the deterioration of surface and groundwater quality caused by pollutant runoff. <u>Assessment Conclusion</u> Given these above potential effects, Lough Ree SAC falls within the likely Zone of Influence of the Application Site. Following the precautionary principle, the potential for likely significant effect of Peat Extraction Phase activities on QIs exists. Likely significant effect to the QI habitat and species are considered further in the **rNIS**. No likely significant effects from either the Current Phase or Remedial Phase on QIs are anticipated, and therefore, further assessment in the rNIS is not required.
Lough Ree SPA [Site code: 004064] (NPWS, 2022)	0.9	• Little Grebe *Tachybaptus ruficollis* [A004] • Whooper Swan *Cygnus cygnus* [A038]	Lough Ree SPA is located within the Ree WFD LWB and is hydrologically connected to the Application Site through a network of drainage ditches and watercourses that eventually discharge into the Lough Ree system.

Site Name [Site code]	Distance to site (km)	Qualifying Interest/ Special Conservation Interest (* indicate spriority QI)	Source-Pathway-Receptor links and Assessment of Likely Significant Effects
		• Wigeon *Anas Penelope* [A050] • Teal *Anas crecca* [A052] • Mallard *Anas platyrhynchos* [A053] • Shoveler *Anas clypeata* [A056] • Tufted Duck *Aythya fuligula* [A061] • Common Scoter *Melanitta nigra* [A065] • Goldeneye *Bucephala clangula* [A067] • Coot *Fulica atra* [A125] • Golden Plover *Pluvialis apricaria* [A140] • Lapwing *Vanellus vanellus* [A142] • Common Tern *Sterna hirundo* [A193] Wetland and waterbirds [A999]	<u>Potential in-situ Effects</u> 1) Peat Extraction Phase Effects The peat extraction and drainage activities at the Application Site from 1994 to 2019 had the potential for pollutant runoff that could have negatively influenced the water quality of hydrologically linked watercourses at the European site, resulting in **likely significant effects** to SCI species and habitat. 2) Current Phase Effects: During this phase activities have switched from extraction to decommissioning and maintenance of existing drainage infrastructure. No likely significant effects to European sites are anticipated from these activities. 3) Remedial Phase Effects No likely significant effects to European site are anticipated during this phase. <u>Potential ex-situ Effects to SCI Species</u> The Application Site features habitat types that could be used by the SCI species for which the SPA is designated. These habitats may support feeding grounds, roosting areas, or nesting sites. 1) Peat Extraction Phase Effects The peat extraction and drainage activities from 1994 to 2019 could have negatively changed habitat structure, hydrology, or water quality within the Application Site resulting in **likely significant ex-situ effects** for the SCIs by either directly altering habitat suitability or indirectly affecting the watercourse that the SCI species use. 2) Current Phase Effects:

Site Name [Site code]	Distance to site (km)	Qualifying Interest/ Special Conservation Interest (* indicate spriority QI)	Source-Pathway-Receptor links and Assessment of Likely Significant Effects
			In this phase, the focus has transitioned from extraction to the decommissioning and maintenance of the existing drainage infrastructure. No likely significant effects on European sites are anticipated from these activities. 3) Remedial Phase Effects No likely significant effects to European site are anticipated during this phase <u>Assessment Conclusion:</u> Given these above potential effects, Lough Ree SPA falls within the likely Zone of Influence of the Application Site. Following the precautionary principle, the potential for likely significant effect of activities associated with the Peat Extraction Phase on SCIs exists. Potential **likely significant ex-situ effects** to the SCIs are considered further in the **rNIS**. No likely significant effects from either the Current Phase or the Remedial Phase on SCIs are anticipated, and therefore, further assessment in the rNIS is not required.
Ballykenny-Fisherstown Bog SPA [Site code: 004101] (NPWS, 2022)	4.4	Greenland White-fronted Goose *Anser albifrons flavirostris* [A395]	Although the Ballykenny-Fisherstown Bog SPA is situated upstream and is therefore not affected by any hydrological influences from the Application Site, the area nonetheless provides habitat that may be used by the Greenland White-fronted Goose of the SPA during the winter months. Research by Fox et al. (2006) indicates that Greenland White-fronted Goose shows a strong preference for boglands as wintering grounds. Such bog habitats are present not only within the Application Site itself but also in the nearby landscape, offering suitable foraging and resting areas for the geese during their seasonal migrations. In the absence of specific European or Irish guidance on establishing ecological connectivity to SPAs, NatureScot (SNH, 2016) guidance was consulted. This document offers valuable guidance on identifying ecological connectivity between development sites and SPAs, particularly considering the distances species may travel beyond their roosts, and provide information on the dispersal and foraging ranges of bird species frequently

Site Name [Site code]	Distance to site (km)	Qualifying Interest/ Special Conservation Interest (* indicate spriority QI)	Source-Pathway-Receptor links and Assessment of Likely Significant Effects
			encountered in project assessments. NatureScot (2016) highlights that "in most cases, the core range should be used when determining whether there is connectivity between the proposal and the qualifying interests". If SPAs are located farther from the site than the core foraging distances of the species listed as a SCI, it suggests there is no likely ecological connectivity, and the SPAs would fall outside the Zone of Influence. As outlined in *Table 2 – Summary of foraging distances during winter season* in NatureScot (SNH, 2016), the core foraging distances for the Greenland white-fronted Goose is typically between 5-8 km from their night roost. Given the typical foraging distance of Greenland White-fronted Geese and the recorded preference of the species for bog habitats (Fox *et al.*, 2006), individuals from the SPA may utilise the Application Site and its surroundings, and so the areas may play a role in supporting the SPA population. Potential ex-situ Effects to SCI Species 1) Peat Extraction Phase Effects Changes in land use at the Application Site since 1994 to 2019 may have affected habitat quality while disturbance levels may also potentially impacting the availability and suitability of the habitats for the species. Therefore, the potential for indirect effects on the Greenland White-fronted Goose population cannot be ruled out. Following the precautionary principle, the potential for likely significant effects on the QI is deemed to exist; further assessment of **likely significant ex-situ effect** is required. 2) Current Phase Effects: Activities during this focus on decommissioning and maintenance of the existing drainage infrastructure. No likely significant effects on European sites are anticipated from these activities. 3) Remedial Phase Effects

Site Name [Site code]	Distance to site (km)	Qualifying Interest/ Special Conservation Interest (* indicate spriority QI)	Source-Pathway-Receptor links and Assessment of Likely Significant Effects
			No likely significant effects are anticipated. <u>Assessment Conclusion:</u> Given these above potential effects, Ballykenny-Fisherstown Bog SPA falls within the likely Zone of Influence of the Application Site. Following the precautionary principle, the potential for significant effects on SCI exists. Potential **likely significant ex-situ effects** to the SCI species are considered further in the **rNIS**. No likely significant effects from either the Current Phase or the Remedial Phase on the SCI are anticipated, and therefore, further assessment in the rNIS is not required.

4. LIKELY CUMULATIVE IMPACTS OF THE PROJECT ON EUROPEAN SITES, IN-COMBINATION WITH OTHER PLANS AND PROJECTS

4.1 ASSESSMENT PROCESS

A comprehensive evaluation of the likely in-combination effects of peat extraction activities and all associated works, and proposed rehabilitation at the Application Site was conducted, taking into account historic, existing and proposed plans (see Table 4.1) and projects (Table 4.2) in the surrounding area.

This evaluation specifically focuses on how these activities, when considered together, could lead to combined environmental impacts that might not be evident when examining each project individually. To ensure a thorough assessment, an extensive review of online Planning Registers was carried out to identify past, present, and future plans and projects that could contribute to in-combination environmental effects. The analysis considered various factors, including:

- The nature of activities within the surrounding area,
- The spatial and temporal overlap of these activities with the Project,
- Their potential ecological consequences, particularly in relation to habitat integrity, water quality, hydrology, on European site conservation, and specifically the species and habitats for which the sites are designated.

Cumulative Effects refer to the combined impact of actions of plans or projects over time or in a specific area. These effects can result from individual developments or activities that, when taken together, cause a larger or more significant impact on the environment than they would have if considered separately. Cumulative effects can be both direct (e.g., habitat destruction) or indirect (e.g., water quality degradation). The evaluation also accounts for cumulative effects by considering the overall accumulation of impacts from past, present, and future activities in the region.

In-Combination Effects specifically refer to the impact that arises from the interaction of impact sources of two or more projects, plans, or activities. While a single project may not have significant effects, its combined effect with other projects, plans, or activities could give rise to significant effects that would not have occurred if the projects were assessed in isolation. In this context, the assessment focused on how the Project and plans and other projects that might interact to produce effects that would not have been anticipated from individual projects alone.

This holistic approach ensures a comprehensive understanding of peatland ecosystem alterations, which include:

- Loss and fragmentation of peatland habitats,
- Changes in hydrology and water retention capacity,
- Displacement of species reliant on intact peatland environments, and
- Potential knock-on effects on water quality and aquatic ecosystems downstream.

By integrating the analysis, the assessment ensures that all potential cumulative and in-combination environmental effects—such as habitat degradation, impacts to water quality, hydrological alterations, and species displacement are fully considered within the overall impact assessment.

In essence, cumulative effects look at the overall accumulation of impacts over time, while in-combination effects focus on the interaction between plans and project or activities.

4.2 ASSESSMENT OF PLANS

The review of relevant plans focused on evaluating policies and objectives that have the potential for impacting European sites in-combination with the peat extraction and associated activities at the Application Site. The sources of information on such policies and objectives were:

- Objectives relevant to ecology and biodiversity in:
    - Longford County Development Plan 2021–2027[32]
    - Longford County Development Plan 2015–2021[33]
    - Longford County Development Plan 2009–2015[34]
    - Longford County Development Plans dated from 1990 onwards.
- Relevant policies in Ireland's 4th National Biodiversity Action Plan 2023-2030 (DoCHG, 2024).

This assessment aimed to determine how existing regulatory frameworks support ecological preservation and mitigate potential environmental impacts. In addition to biodiversity-focused policies, the review examined objectives related to peatland conservation and sustainable land use practices, particularly those that influence the maintenance and enhancement of surface water quality.

To provide a structured summary of the findings, an overview of relevant plans and their key environmental considerations is presented in Table 4.1. This table outlines how various planning documents incorporate conservation principles, highlighting their relevance to biodiversity protection, peatland management, and water quality preservation. The insights gained from this review contribute to a broader understanding of the policy landscape influencing land-use decisions and environmental management in areas of ecological sensitivity.

A detailed review of the Longford County Development Plans was conducted, including examining policies related to conservation and the protection of European sites. This assessment aimed to determine how these policies apply to historical and ongoing land-use activities within the Application Site and their alignment with broader environmental objectives. The peat extraction activities, which took place from 1994 until 2019 at varying levels of intensity across different sections of the bog, were carefully evaluated in this context. Based on this analysis, these activities are not considered to be in conflict with the relevant policies and objectives outlined in the Longford County Development Plans.

The implementation of the Cutaway Bog Decommissioning and Rehabilitation Plans for the Application Site is expected to yield significant ecological benefits, contributing positively to European sites. Additionally, the rehabilitation of the bogs will enhance ecosystem functions, including carbon sequestration and water retention, further supporting regional conservation efforts. In particular, the rehabilitation plans also has the potential to generate positive effects on nearby European sites that are hydrologically connected to the Application Site. The restoration of

[32] https://www.longfordcoco.ie/services/planning/longford-county-development-plan-2021-2027/volume-1-compressed.pdf. Accessed January 2025.
[33] https://www.longfordcoco.ie/services/planning/previous-plans-county-town-local-area-/development-plan-2015-2021/. Accessed January 2025.
[34] https://www.longfordcoco.ie/services/planning/previous-plans-county-town-local-area-/county-development-plan-2009-2015/. Accessed January 2025

natural hydrological conditions is expected to improve water quality, reduce sedimentation, and enhance habitat conditions for aquatic and wetland species. By minimising habitat fragmentation and mitigating historical environmental disturbances, the rehabilitation process will contribute to broader conservation objectives of the European sites. These anticipated outcomes align closely with the policies and objectives outlined within the Longford County Development Plans, reinforcing commitments to sustainable land management, biodiversity protection, and ecological resilience.

Table 4.1: Assessment of Plans

Longford County Development Plan 2021–2027	The following provide summary of key relevant County Policy Objectives (CPOs) listed in Chapter 12 - Natural Heritage and Environment • **General Natural Heritage Protection** ▪ **CPO 12.1 - 12.4:** Protect and enhance biodiversity, habitats, landscapes, and geological sites. Promote public awareness and conduct habitat mapping. • **Protection of Designated Sites** ▪ **CPO 12.5 - 12.14:** Safeguard SACs, SPAs, NHAs, and proposed NHAs. Ensure developments comply with Appropriate Assessment (AA) and EU conservation laws. Establish buffer zones and undertake habitat surveys. • **Conservation of Wetlands, Turloughs, and Watercourses** ▪ **CPO 12.29 - 12.33:** Protect wetlands from degradation and require mitigation measures for developments near sensitive water habitats. Prevent unauthorised drainage of wetlands. • **Peatland Conservation** ▪ **CPO 12.50 - 12.55:** Conserve designated peatlands and support National Peatlands Strategy. Work with stakeholders for sustainable peatland management and require planning permission for wetland modifications. • **Invasive Species Management** ▪ **CPO 12.82 - 12.85**: Implement control measures, increase public awareness, and require invasive species management in development projects. • **Biodiversity and Nature Conservation** ▪ **CPO 12.57 - 12.70:** Support national biodiversity plans, require ecological assessments for developments, and promote habitat restoration, wildlife corridors, and native planting initiatives
Longford County Development Plan 2015–2021	Longford County's Development Plan 2015-2021 includes several objectives aimed at conserving and enhancing biodiversity. Policies and plans highlight the County's commitment to environmental sustainability. The Longford County Council Biodiversity Action Plan Discussion Paper outlines the steps needed to develop a comprehensive biodiversity strategy. This aligns with the National Biodiversity Action Plan and includes securing funding, forming a biodiversity working group, and engaging the public in consultations to ensure effective implementation. Additionally, the Longford County Council Climate Action Plan 2024-2029 sets out key biodiversity goals, such as promoting nature-based climate solutions, protecting green infrastructure, and restoring peatlands. Specific actions include appointing a Biodiversity Officer, implementing a Local Biodiversity Action Plan, and continuing efforts to control invasive species. These initiatives demonstrate Longford County's commitment to integrating biodiversity considerations into its planning and development strategies.
Longford County Development Plan 2009–2015	The Longford County Development Plan 2009-2015 outlines several objectives aimed at protecting and enhancing the county's biodiversity and natural heritage. Key objectives include:

	• **Protection and Enhancement:** Safeguarding and improving biodiversity, encompassing wildlife (flora and fauna), habitats, landscapes, and natural resources such as water. • **Appropriate Management:** Encouraging proper management and enhancement of the county's natural heritage. • **Protection of Designated Sites:** Safeguarding sites designated under national and European legislation, such as SACs and SPAs.
Ireland's 4th National Biodiversity Action Plan (NBAP) for 2023-2030	Five strategic objectives to guide biodiversity conservation efforts: 1. **Adopt a Whole of Government, Whole of Society Approach to Biodiversity**: This objective emphasises the need for collective action across all sectors of government and society to effectively address biodiversity challenges. 2. **Meet Urgent Conservation and Restoration Needs**: Focusing on immediate actions required to conserve and restore Ireland's biodiversity, this objective aims to halt further loss and promote recovery of vital ecosystems. 3. **Secure Nature's Contribution to People**: Recognising the essential services that nature provides, this objective seeks to ensure the sustainable use of natural resources, benefiting both people and the environment. 4. **Enhance the Evidence Base for Action on Biodiversity**: This objective highlights the importance of strengthening scientific research and data collection to inform effective biodiversity policies and actions. 5. **Strengthen Ireland's Contribution to International Biodiversity Initiatives**: Aiming to bolster Ireland's role in global biodiversity efforts, this objective focuses on active participation and contribution to international conservation initiatives. These objectives collectively aim to deliver transformative changes in how Ireland values and protects its natural heritage. The NBAP also introduces a public sector duty on biodiversity, as mandated by the Wildlife (Amendment) Act 2023. This legislation requires all public service bodies, including government departments, agencies, and local authorities, to integrate biodiversity considerations into their plans, policies, and programs, and to report on their progress.

4.3 ASSESSMENT OF PROJECTS

A full list of the projects consider in this assessment are summarised in Table 4.2 below. In addition to the projects listed in Table 4.2 the impact assessment also considered the following:

Future use of lands at the Application Site

The future use of the lands within the Application Site is expected to be managed as separate and standalone projects. These projects are therefore considered for the purpose of this application. It is anticipated that the lands will be developed for renewable energy projects in

the future, alongside enhanced rehabilitation efforts on the bogs as part of the Peatland Climate Action Scheme[35,36] (PCAS), where relevant.

Derryadd Wind Farm

The future development of the lands for renewable energy, referred to as the Derryadd Wind Farm, will be subject to a separate planning consent application. This application will be accompanied by an EIAR which will include an assessment of the implementation of the rehabilitation measures at the Application Site in conjunction with the construction, operation, and decommissioning of the proposed wind farm.

33kV Grid Connection Cable

Planning permission has been obtained by Harmony Solar Longford Ltd. for the construction of an underground 33kV grid connection cable, which passes through Derryaroge Bog. The future construction of this development has the potential to interact with the planned future rehabilitation of the site as well as the planned renewable energy development and is therefore also considered within this assessment of in-combination effects.

[35] Information available at: https://www.bnmpcas.ie/. Accessed January 2025

[36] Information available at: https://cieem.net/wp-content/uploads/2021/05/The-Peatlands-Climate-Action-Scheme-%E2%80%93-New-developments-in-peatland-rehabilitation.pdf. Accessed January 2025

Table 4.2: Assessment of Projects

Planning Authority	App Ref.	Proposal	Address	Grant Date
Longford County Council	00405	Permission for the construction of car showrooms.	Ballyminion Faranyoogan, Cloontirm Longford	03/01/2001
Longford County Council	01151	Permission for housing development of 30 no. dwelling houses, garages, access road, formation of new entrance, boundary walls, prop. waste water treatment plant, percolation area & ancillary works.	Killashee and Aghakeeran, Killashee, Co. Longford	08/04/2002
Longford County Council	01492	Permission for 33 detached two-storey dwellings and 5 no. two-storey block of coach houses and all associated development.	The Old Workhouse Site, Ballymahon, Co. Longford	08/08/2002
Longford County Council	0281	Permission to development a new 110 KV Station Control Building, including additional control cable ducting, and all associated works.	Lanesboro Generating Stat, Aghamore Td., Lanesboro Co. Longford	28/05/2002
Longford County Council	0481	Permission for a railway level crossing to facilitate the haulage of milled peat.	Templeton Glebe, Killashee , Co. Longford	13/07/2004
Longford County Council	04272	Permission to demolish existing mushroom tunnels and to erect housing development consisting of 12 no. two storey, three b/r semi-detached dwellings, 1 no. two storey three b/r detached dwelling, 6 no. two storey four b/r semi-detached dwellings and 12 no. two storey two b/r semi-detached dwellings, and all associated development.	Knock, Lanesboro, Co. Longford	15/08/2005
Longford County Council	04733	Permission to construct 8 No. semi-detached two storey dwellings, 4 No. single storey detached dwellings, formation of entrance onto public road, access roadway (estate roadway), waste water pumping station, rising main situate in public road verge, connection to adjoining utility services, site services, landscaping, boundary walls/fences and ancillary site works.	Mosstown, Kenagh, Co. Longford	10/05/2005

Planning Authority	App Ref.	Proposal	Address	Grant Date
Longford County Council	04700071	Permission to construct 27 No. two storey dwellings and all ancillary site works.	Abbeycartron TD, Longford	26/09/2005
Longford County Council	04884	Permission for housing development for 23 No. dwelling houses consisting of 22 No. two storey semi-detached dwelling houses, 1 No. two storey type dwelling house, formation of access road and entrance, boundary fence/wall, onsite sewerage treatment system with percolation area, connection to public watermain, decommissioning of existing septic tank servicing existing dwelling house and connection of existing dwelling house to onsite sewerage treatment system servicing the proposed development and ancillary site works.	Killashee, Co. Longford	22/02/2005
Longford County Council	05217	Permission for a filling station and shop, forecourt c/w fuel pumps, canopy and ancillaries for sale of fuels, fuel storage tanks and ancillaries, car wash facilities and ancillaries, car parking, formation of new entrances onto public road, storm water drainage attenuation and infiltration system, proposed foul drainage system and ancillaries including connection to adjoining pump station and raising main approved under PL04/733 and site works.	Mosstown, Kenagh , Co. Longford	29/08/2006
Longford County Council	05438	Permission for the extension between existing Battery Room and existing Switch Room at Aghamore 38kv Station.	Knock, Lanesboro, Co. Longford	23/11/2005
Longford County Council	0673	Permission for retention and completion of existing disposal site. Materials to be disposed of will be inert materials, soils and subsoil and whereby it is proposed to increase the existing ground level of the site so that the new ground level will be approximately level with the existing adjacent public road and complete the filling of the site within two years.	Cloonfiugh, Killashee, Co. Longford	23/02/2007

Planning Authority	App Ref.	Proposal	Address	Grant Date
Longford County Council	0688	Permission to deposit/recycle sub-soil on site and raise the level to not less 0.3 m below road level together with all necessary site works.	Tullyvrane & Lehery, Lanesboro, Co. Longford	17/05/2006
Longford County Council	06533	Permission for housing development consisting of 5 no. dormer bungalows, 8 no. two storey detached dwellings, 18 no. two storey semi-detached dwellings, formation of a new entrance onto the N63, pumping station, connection to mains services, associated signage and site works.	Knock, Lanesboro, Co. Longford	27/11/2006
Longford County Council	08/623	Grant of permission for a wind monitoring mast at Derryaroge. This permission was for a period of five years.	Derryaroge, Lanesborough, Co. Longford.	20/03/2009
Roscommon County Council	10/507 (ABP-PL20.239743)	Windfarm of 20 wind turbines and communications masts, etc.	21 townlands,Strokestown, Co. Roscommon	27/03/2012
Longford County Council	14/35	Grant of permission for retention of a wind monitoring mast at Derryaroge. This refers to the same mast as permitted under 08/623. This revised permission was granted for a period of 10 years.	Derryaroge Bog, Derryaroge, Co. Longford.	06/05/2014
Longford County Council	15/86	Grant of permission (dated 25/08/15) for a wind monitoring mast at Derrynaskea (Lough Bannow Bog). This permission was granted for a period of five years.	Lough Bannow Bog, Derrynaskea, Co. Longford	25/08/2015

Planning Authority	App Ref.	Proposal	Address	Grant Date
Longford County Council	16256	Permission for development of a distillery and visitor centre on 0.2814ha site including refurbishment works and all associated works.	The Old Post Office, Main Street, Lanesboro	31/01/2017
Longford County Council	16303 (ABP-249090)	Demolish all existing pig/livestock houses and ancillary structures and to construct 3. No. pig houses and 2. No. ancillary manure storage tanks in accordance with animal welfare and nitrates regulations together with all ancillary works.	Ballynakill, Killashee , Co. Longford	16/05/2018
Longford County Council	1747 (ABP-248470)	Ten year permission for a solar farm with an export capacity of 11.1MW.	Cleggil, Longford, Co. Longford	22/03/2018
Longford County Council	17198	Permission for enabling works at the existing Ballymahon 38kV electrical substation and all associated works.	Cornacarta, Ballymahon , Co. Longford	16/10/2017
Roscommon County Council	ABP-300493	Permission for N5 Ballaghaderreen to Scramoge Road Development and associated CPO.	Ballaghaderreen to Scramoge, Co. Roscommon	16/01/2019
Longford County Council	17320	Permission to the capacity of the operational Ash Disposal Facility to allow for the deposition of 130,000 tonnes of dry ash over and above the 550,000 tonnes permitted under Longford County Council Reg. Ref. 01/115.	Derraghan Beg and Derraghan More, Co. Longford	28/03/2018
Longford County Council	18139	Permission for development along the existing Cloon to Lanesboro 110 kV Overhead Line which is approximately 65 kilometres long and all associated works.	Aghamore (Rathcline By), Co. Longford	27/09/2018
Roscommon County Council	10/507 (ABP-PL20.239743)	Windfarm of 20 wind turbines and communications masts, etc.	21 townlands, Strokestown, Co. Roscommon	27/03/2012
Longford County Council	16256	Permission for development of a distillery and visitor centre on 0.2814ha site including refurbishment works and all associated works.	The Old Post Office, Main Street, Lanesboro	31/01/2017

Planning Authority	App Ref.	Proposal	Address	Grant Date
Longford County Council	16303 (ABP-249090)	Demolish all existing pig/livestock houses and ancillary structures and to construct 3. No. pig houses and 2. No. ancillary manure storage tanks in accordance with animal welfare and nitrates regulations together with all ancillary structures.	Ballynakil, Killashee, Co. Longford.	16/05/2018
Longford County Council	1747 (ABP-248470)	Ten-year permission for a solar farm with an export capacity of 11.1MW.	Cleggil, Longford, Co. Longford.	22/03/2018
Longford County Council	17198	Permission for enabling works at the existing Balyymahon 38kV electrical substation nd all associated works.	Cornacarta, Ballymahon , Co. Longford	16/10/2017
Roscommon County Council	ABP-300493	Permission for N5 Ballaghaderreen to Scramoge Road Development and associated CPO.	Ballaghaderreen to Scramoge, Co. Roscommon	16/01/2019
Longford County Council	17320	Permission to the capacity of the operational Ash Disposal Facility to allow for the deposition of 130,000 tonnes of dry ash over and above the 550,000 tonnes permitted under Longford County Council Reg. Ref. 01/115.	Derraghan Beg and Derraghan More, Co. Longford	28/03/2018
Longford County Council	18139	Permission for development along the existing Cloon to Lanesboro 110 kV Overhead Line which is approximately 65 kilometres long and all associated works.	Aghamore (Rathcline By), Co. Longford.	27/09/2018
Longford County Council	1888 (ABP-302554)	Permission for the extension to an existing manufacturing facility consisting of warehousing , offices and ancillary staff areas.	Longford Business & Technology Park, Ballinalee Road, Longford, N39 V880.	24/01/2019
Roscommon County Council	18320 (ABP-302597)	Permission for development along the existing Cloon to Lanesboro 110 kV Overhead Line which is approximately 65 kilometres long and all associated works.	Ballyleague, Co. Roscommon	19/03/2019
Longford County Council	18157 (ABP-303611)	Permission for a battery energy storage system (BESS)	Ballykenny, Co. Longford.	06/06/2019

Planning Authority	App Ref.	Proposal	Address	Grant Date
Roscommon County Council	19311	Permission for development consisting of change of use planning application to convert existing Waterways Ireland storage shed to an outdoor recreational centre/lake access centre facility to Lough Ree.	Ballyleague , Lanesborough , Co. Roscommon	12/09/2019
Longford County Council	19201	Permission for the redevelopment of the existing Lanesboro 110kV AIS substation with a new 110 kV Gas Insulated Switchgear (GIS) substation and all associated works.	Aghamore, Lanesborough, Longford	01/07/2020
Roscommon County Council	19546	Permission for the upgrade of the Tarmonbarry Wastewater Treatment Plant and all associated works.	Tarmonbarry Wastewater Treatment Plant, Ballytoohey Townland, Tarmonbarry	29/01/2020
Longford County Council	19222 (ABP-305969)	Ten year permission for a 9MW solar farm and associated works.	Ballykenny, Co Longford	08/05/2020
Longford County Council	2020	Permission for the development consisting of a single-storey retail unit; six number two-storey three bedroomed semi-detached houses, one detached two-storey three bedroomed house; and all associated works.	Mosstown, Kenagh, Co Longford	16/04/2021
Longford County Council	20152	Permission to dispose of materials which will be inert materials, soils & subsoil on the lands to which this application relates so as to raise the existing ground level by a maximum of two meters, creation of entrance with access road all associated ancillary works.	Ballyclare, Killashee, Co Longford	29/09/2020
Longford County Council	20183	Continued use of an existing guyed wind monitoring mast, with instruments, 100m in height for a further period of three years, the purpose of the mast is to assess the suitability of the company's adjacent lands for wind farm development, previous planning application number 15/86.	Lough Bannow Bog, Derrynaskea, Co Longford	05/11/2020

Planning Authority	App Ref.	Proposal	Address	Grant Date
Longford County Council	2074 (ABP-307880)	Permission for the construction of 37 dwelling houses.	Dunaras & Marian Terrace/Marian Villas, Ballymahon, Co Longford	14/12/2020
Longford County Council	20215	Permission to dispose of material which will be inert waste material on land 17000 cubic metres of (Class 1) (Table 1) so to raise the existing ground level by a maximum of one 1.5 mts into cells and return land back to agricultural use and all associated works.	Carrowmanagh, Killashee, Co Longford	14/12/2020
Longford County Council	20302	Permission for the construction of 5 no. houses and all associated works.	Tailors Lawn, Kenagh, Co Longford	07/04/2021
Roscommon County Council	21417	PART 8 development - Provision of Public Realm Enhancement Scheme. Redesign the existing carriageway & paved area along the N5 within the Village to provide a traffic calming effect & improve pedestrian infrastructure & safety.	N5 Termonbarry, Co Roscommon	
Longford County Council	21225	Ten year permission for a solar farm and all associated works.	Townlands of Ballynakill, Bunacloy and Middleton, near Killashee	20/10/2021
Roscommon County Council	21529	Part 8 development - Mid-Shannon Wilderness Park Greenway and associated works.	Cloontuskert , Ballyleague , Co. Roscommon	
Longford County Council	2275 (ABP-315485)	Permission for the demolition of Lough Ree Power Station (previously approved under ABP ref. PL14.125540). Construct and operate electricity grid services consisting of a battery storage system (BESS) and a synchronous condenser (Sync Con) and associated site works.	Aughamore, And Lanesborough , Co Longford	13/10/2023
Longford County Council	22160	Permission to demolish all existing pig/livestock houses and ancillary structures and to construct 3. No. pig houses and 2. No. ancillary manure storage tanks in accordance with animal	Ballynakill, Killashee, Co. Longford	24/08/2022

Planning Authority	App Ref.	Proposal	Address	Grant Date
		welfare and nitrates regulations together with all ancillary structures.		
Roscommon County Council	22581	Permission to demolish and dispose of existing structures on site consisting of 21 no. mushroom houses and an office building and store rooms and permission to construct 26 no. houses and all associated works.	Ballyleague Td., Lanesboro , Co. Roscommon	20/12/2023
Longford County Council	22275	Permission for an underground electrical cable and transformer compound which will connect permitted solar farms to the national grid via the proposed transformer compound at Lough Ree Power Station.	Kilnacarrow Ballynakill Cloonkeel Derryaroge Cloonbearla Mount Davys Cloonbony Aghamore, Lanesborough , Co Longford	19/05/2023
Longford County Council	22290 (ABP-316270)	Permission for the provision of 10 No. prefabricated glamping pods and all associated works.	Glebe, Cloondara, Co Longford	03/09/2024
Longford County Council	2360056	Permission for the construction of a Gas Insulated Switchgear (GIS) compound and all associated works.	Existing Lanesboro Air Insulted Switchgear Substation and site of the former Lanesborough Power Station, townlands of Aghamore and Lanesborough, Lanesborough County Longford	15/09/2023
Longford County Council	2360108	Permission for the replacement (“restringing”) of the existing overhead line circuit conductor wires with a new higher capacity conductor and all associated works.	Lanesborough Town , and Aghamore Townland , County Longford	27/10/2023
Roscommon County Council	23342	Permission for works to uprate the existing Lanesboro - Sliabh Bawn 100kV overhead line (OHL).	Sliabh Bawn, Co Roscommon	10/11/2023

Planning Authority	App Ref.	Proposal	Address	Grant Date
Longford County Council	23/108	Continued use of an existing guyed wind monitoring mast, with instruments, 100m in height for a further period of three years. The purpose of the mast is to assess the suitability of the company's adjacent lands for wind farm development. Previous planning application numbers: 15/86 and 20/183 on its lands.	Lough Bannow Bog, Derrynaskea, Co. Longford	09/01/2024
Longford County Council	2360124	Permission for the replacement ("restringing") of the existing overhead line circuit conductor wires with a new higher capacity conductor and all associated works.	Lanesborough Aghamore Knock Gorteengar Tullyvrane Lehery Magheraveen Cloonfore Derrygeel Derryshannoge Derraghan More Derraghan Beg Derryad Derrylough Derryweagh Foygh Cornacarta Tirlickeen Lismacmurrogh Lislom Moygh Drinan, Knappoge Barry Agharanag	17/11/2023
Longford County Council	ABP-318314	Permission for a 500 seat outdoor community amphitheatre.	Former Council Depot at Commons North Lime Quarry, Lanesborough, Co. Longford.	Undecided
Longford County Council	245	Permission for the construction of a holiday lodge site consisting of 9 no. 3 bed lodges, 4 no. 2 bed lodges, a manager's office, plant room and laundry, site entrance, internal road & footpaths, lighting, play area, boundary fence, wastewater treatment system and all associated works.	Foygh, Keenagh, Co. Longford	27/08/2024

Planning Authority	App Ref.	Proposal	Address	Grant Date
Longford County Council	2460040	Permission for the construction of an indoor equestrian arena and associated works	Derryshannogue, Lanesborough, Longford	22/05/2024
Longford County Council	2460132	Permission for the delivery of a network of walking and cycling trails on Bord Na Móna lands.	Bord Na Móna lands within the townlands of Cloonbony, Kilnacarrow Ballynakill Begnagh Corragarrow, and Cloonmore County Longford	07/01/2025
Longford County Council	2460168	Permission for a new Water Pumping Station (WPS) and associated infrastructure.	Lands off the L1164, east of Turreen Cross in the townlands of Lehery and Turreen, in County Longford	22/10/2024
Longford County Council	2460164 (ABP-320882)	Permission for change of use and building works to alter the building to create 11 apartments with all associated site development works.	Lands at Market Square, Longford Town, Co. Longford	Undecided
Roscommon County Council	2460534	Permission for the proposed construction of a floating jetty together with associated jetty ramp & footpath and all ancillary works.	Ballyleague, Lanesborough, Co. Roscommon.	Undecided
Longford County Council	2453	Permission to construct a steel framed community gym and all ancillary site works	Ballyrevagh, Newtowncashel, Co. Longford	12/02/2025
Roscommon County Council	2460559	Permission for works to uprate approximately 35.7km of the overall 35.82km of the existing Athlone to Lanesboro 110 kV overhead line (OHL) circuit.	Athlone 110kV substation in the townland of Monksland , Knockrocghery Moher Gardentown Toberreeoge Toberdan Feamore Corraclogh Kilteevan Kellybrook Srah Corboley Curry Cloontogher	Undecided

Planning Authority	App Ref.	Proposal	Address	Grant Date
			Derrycarbry Carrigeens Cloonaddra Clonsellan Lisfelim Coolshaghtena Co	
Longford County Council	2460287	Permission for works to uprate approximately 35.7km of the overall 35.82km of the existing Athlone to Lanesboro 110 kV overhead line (OHL) circuit.	Lanesboro 110 kV substation townlands of Aghamore and Lanesborough, Co. Longford	22/01/2025
Longford County Council	2460302	Permission for the demolition of existing out-buildings and the construction of 28no.residential units and all associated works.	Lands adjacent to Cois Abhann, Cloondara, Co.Longford	Undecided
Longford County Council	2460315	Permission for a battery energy storage system (BESS) comprising up to 896 no. battery energy storage enclosures and all associated works.	a c. 4.63 ha site within the former Lough Ree Power (LRP) Station , in the townlands of Aghamore and Lanesborough, Lanesborough (Lanesboro) Co. Longford	Undecided
Longford County Council	2460325	A 10 Year Planning Permission for a solar farm and energy storage compound with a total area of circa 130 hectares and all associated works.	Cornacarta Doonacurry Foygh Kilcommock Glebe Ledwithstown and Tirlickeen, Keenagh and Ballymahon, County Longford	Undecided

4.4 Conclusion of Assessment on Cumulative and In-combination Effects

Table 4.3 below presents conclusion of **1)** In-Combination Effects and **2)** Cumulative Effects.

Table 4.3: Assessment Conclusion

Aspect	Conclusion	Further Assessment Needed
1) Risk of In-Combination Effects	There is a potential risk of in-combination effects on the Lough Ree SAC (Site code: 00440), Lough Ree SPA (Site code: 004064), and Ballykenny-Fisherstown Bog SPA (Site code: 004101) when considered in combination with the plans and projects listed in Section 4.2 and Section 4.3. This conclusion was derived from a comprehensive evaluation of potential environmental historic and future impacts from the Project, taking into account historic, current and future activities in the surrounding area. The risk is associated with the interaction between the Project and other developments or plans that may affect the integrity of these European sites. The assessment identifies the need for further investigation into potential in-combination effects, such as changes to hydrology and impacts on species conservation.	Further investigation is required to evaluate specific in-combination effects including effects on water quality, hydrology, or species disturbance. These potential interactions should be monitored and analysed further, especially regarding temporal overlaps with surrounding developments. **Potential in-combination effects with the Peat Extraction Phase are assessed further in the rNIS**
2) No Significant Cumulative Effects	The assessment of other plans and projects in the surrounding area determined that the Project does not have the potential to contribute, nor has it contributed, to any significant negative cumulative effects on any European sites when considered in combination with other existing or proposed developments. No connections were identified between the Project and surrounding developments that could lead to additional or negative cumulative impacts on these sites.	Based on the assessment of surrounding plans and projects, no significant negative cumulative impacts on any European sites have been identified, and no connections were found between the Project and other developments that could lead to additional or adverse effects. **Therefore, no further assessment is deemed necessary.**
	Furthermore, no significant negative cumulative effects are expected from the combination of the future rehabilitation plans of the Project with other ongoing or future developments in the region. This conclusion emphasises that, despite the potential risk of in-combination effects (see 1 above) there are no significant cumulative impacts that would harm the integrity of the European sites. The integrity of the designated areas remains intact when all developments are considered together.	No significant cumulative effects are expected from the Project's rehabilitation plans combined with other developments. **Therefore, no further assessment is deemed necessary.** It should be noted that the rehabilitation plans for the Application Site include for ongoing monitoring. This will help ensure that no unforeseen cumulative impacts arise from the Project. This could include tracking any emerging impacts on water quality, habitat conditions, or species conservation.

5. APPROPRIATE ASSESSMENT SCREENING CONCLUSIONS

Following a thorough examination, analysis, and evaluation of the relevant data concerning the Application Site and its surrounding area, this rAASR has concluded that, based on the best available scientific knowledge, objective information, and the conservation objectives of the relevant European sites, it cannot be excluded beyond reasonable scientific doubt that the peat extraction activities and ancillary works undertaken during the Peat Extraction Phase (July 1988 – July 2019) either individually or in combination with other plans and projects, may have had or may have significant effects on the integrity of these European sites. This rAASR concludes that further assessment is required to understand the full scope of these potential impacts. The European sites for which risk of potential significant effects to SCIs and QIs are deemed to exist are:

- Lough Ree SPA (004064)
- Lough Ree SAC (000440)
- Ballykenny-Fishertown Bog SPA (004101)

In light of this, it was concluded that a remedial NIS is required to assess whether activities since 1994 to 2019 at the Application Site, have, had or could potentially have likely adverse effects on the integrity of the above listed European sites.

The examination also concluded that the activities associated with Peat Extraction Phase (July 1988 – July 2019) as well as Current Phase (July 2019 – Present Day), will not have likely significant effects on any European Site; consequently, activities associated with the Current Phase and Remedial phase are screened out.

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NPWS (2018) Natura 2000 Standard Data Form for Lough Ree SAC [Site Code: 000440]. Dublin: Department of Housing, Local Government and Heritage.

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NPWS (2022) Conservation Objectives for Lough Ree Special Protection Area (SPA) [Site Code: 004064]. Dublin: Department of Housing, Local Government and Heritage.

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Appendix 1 PROJECT DESCRIPTION

TOBIN

BUILT ON KNOWLEDGE

Bord na Móna

Derryadd, Derryaroge and Lough Bannow Bogs – Application for Substitute Consent

Remedial Environmental Impact Assessment Report

Chapter 4 – Project Description

March 2025

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4.0 PROJECT DESCRIPTION

4.1 INTRODUCTION

As described in Chapter 1, the July 1988 is taken as the baseline assessment year for this rEIAR as this is the latest date that the EIA Directive (Council Directive 85/337/EEC) was required to be transposed into Irish legislation. This approach has been taken on a precautionary basis and strictly without prejudice, as EIA may not have been a legal requirement at that time. The assessment period for the rEIAR is from the July 1988 to the present day.

This chapter of the rEIAR provides a description of:

- The activities employed at the Application Site from 1949 at the onset of preparation works up to July 1988 (described in Section 4.5);
- The baseline environment as of July 1988 (described in Section 4.6);
- Peat extraction and related activities from July 1988 to the cessation of peat extraction in July of 2019 (described in Section 4.7);
- The management of the Application Site since July 2019 (described in Section 4.8); and,
- The activities intended to be carried out at the Application Site into the future (described in Section 4.9).

The elements of the Project as described in this chapter are the baseline as of July 1988, the activities from July 1988 to the cessation of peat extraction in July 2019, the management of the Application Site since July 2019, and the activities relating to historic peat extraction intended to be carried out into the future (as described in Sections 4.5 to 4.9 inclusive).

Section 177E of the *Planning and Development Act 2000*, as amended, permits an application to be made for Substitute Consent in respect of development which has been carried out where an EIA, screening for EIA and/or AA was or is required.

Neither the EIA Directive (*Directive 85/337/EEC* repealed by *Directive 2011/92/EU* and codified by *Directive 2014/52/EU*) nor the Habitats Directive (*Directive 92/43/EEC*) has retrospective effect; neither Directive imposes legal requirements to have carried out prior assessments of projects which had already commenced or been completed. There was, therefore, no legal requirement for EIA, screening for EIA or AA in respect of *any* project prior to the latest dates for transposition of the Directives. In the case of the EIA Directive, the latest date for transposition was 3rd July 1988. In the case of the Habitats Directive, the latest date for transposition was 10th June 1994.

Accordingly, this application for substitute consent is, of necessity, confined to the development which took place after those dates. The baseline against which the environmental effects of the development required to be assessed has therefore been identified as being the position as of July 1988 (being the earlier of the transposition dates of the relevant Directives).

However, as the Project formed part of a project which commenced many years prior to those dates, in order to facilitate as complete an assessment as is possible of the project since July 1988, a description of the Application Site and the peat extraction activities and all ancillary works which took place there up to July 1988 are included in this chapter (see Section 4.5).

Although no EIA or AA can be required of development which took place prior to the latest date for transposition of the Directives, it is clear that in considering cumulative or in combination effects of development to which the Directives do apply, it is necessary to consider the effects of that development cumulatively or in combination with existing development, even

development which took place before the Directives came into force: see Case C-142/16, *Commission v Germany*. Moreover, where an application for consent relates to development which is functionally interdependent on another development such that they should be considered part of the same project, it is necessary to carry out a cumulative assessment of the separate parts of that project: see *O'Grianna v An Bord Pleanála* [2014] IEHC 632; *Fitzpatrick v An Bord Pleanála* [2019] 3 IR 617.

In this case, therefore, in carrying out any EIA or AA, it will be necessary to consider the cumulative or in-combination effects of the development which has taken place since July 1988 with that which had already taken place prior to that date in order to properly consider those cumulative or in-combination effects. Since development which took place before and after that date are part of a single project. It is necessary and appropriate, therefore, that the development which took place before 3rd July 1988 is adequately described to enable that cumulative or in-combination assessment to be completed.

The historic activities described within this chapter include the peat extraction processes, the construction, operation, and maintenance of supporting infrastructure, a description of ancillary activities undertaken and decommissioning works which have been carried out to date. Current onsite activities and infrastructure as well as the likely proposed future remedial measures (see Section 4.8 and Section 4.9) which will be implemented at the Application Site in the form of draft and final Cutaway Bog Decommissioning and Rehabilitation Plans, subject to the agreement of the EPA, required under Condition 10 of the IPC Licence for the Mountdillon Bog Group (Reg. No. P0504-01), are also described. Please see Appendix 4.1 for a copy of the IPC Licence, including Amendments.

The peat extraction activities are historic, with a considerable number of activities and site preparation works pre-dating both the commencement of the formal Irish planning system (i.e., were first carried out prior to establishment of the *Planning & Development Act 1963* (which was enacted on 1st October 1964)) as well as the EIA and Habitats Directive transposition dates in 1988 and 1994, respectively. Other infrastructure such as workshops, storage and loading facilities were also developed prior to the commencement of the formal planning system, while other ancillary services and infrastructure such as electricity distribution infrastructure, workshops, peat storage and loading facilities are located outside of the Application Site boundary and were previously granted their own respective planning consents, where required (refer to Section 4.4.5, which discusses the location of relevant ancillary structures and features in relation to the Application Site boundary, and the Planning Report (Appendix 4.2) for the full planning history associated with the Application Site). This infrastructure is included below and considered within the overall rEIAR assessment.

4.1.1 Statement of Authority

This chapter of the EIAR has been prepared by Caroline Naughton. Caroline is a Senior Project Manager in TOBIN's Environmental & Planning Division. Caroline holds a BSC (Hons) in Environmental Science/Geology from University College Cork. Caroline has over 15 years' experience in environmental science and consultancy working with leading companies across a range of industries including construction, waste and pharmaceutical. She has extensive industry experience with a strong technical background and is experienced in the preparation of planning applications for a variety of environmental projects including Wind Farms, Solar Farms, Substations and Waste Facilities.

4.2 INFORMATION SOURCES

The following information sources were used in compiling this Chapter:

- Mountdillon Bog Group EPA IPC Licence (Reg. No. P0504-01) (included in Appendix 4.1);
- Appendix 4.2 - Planning Report
- Bord na Móna Cutaway Bog Decommissioning and Rehabilitation Plans, (included in Appendix 4.3):
    - Derryaroge Bog Cutaway Bog Decommissioning and Rehabilitation Plan 2023;
    - Derryadd Bog Draft Cutaway Bog Decommissioning and Rehabilitation Plan 2025;
    - Derryaroge Bog Draft Cutaway Bog Decommissioning and Rehabilitation Plan 2025; and
    - Lough Bannow Bog Draft Cutaway Bog Decommissioning and Rehabilitation Plan 2025.
- Bord na Móna Annual Reports which contain information relevant to the Application Site;
- Clarke, Donal, *Brown Gold, A History of Bord na Móna and the peat industry in Ireland* (2010);
- IPC Licence, Annual Environmental Reports (AERs) 2000 to 2023 (included in Appendix 4.4) (AERs from 2018 to 2023 are also publicly available[1]);
- Inspection of extraction records at Mountdillon Works;
- Aerial Maps from 1973 to 2019 (included in Appendix 4.5);
- Bord na Móna, *IPC Licence Environmental Code of Practice for Peat Energy Works* (included in Appendix 4.6);
- Bord na Móna, *Bord na Móna Biodiversity Action Plan 2016-2021* (2016) Brosna Press, Ferbane
- Personal communication with former Bord na Móna Employees;
- Harkins, Jim, *Silt Control Report for Peat Energy Division* (Internal Bord na Móna Report) (1991) (Appendix 4.7);
- Silt Control Study No. 1 – Internal Bord na Móna Report 1983 (included in Appendix 4.8);
- Silt Committee, Interim Report Recommended Measures 1976 (included in Appendix 4.9);
- Silt Committee Meeting Records Derrygreenagh 1984(included in Appendix 4.10)
- Silt Committee, Excavator records 1984 (included in Appendix 4.11);
- Drainage Study with Particular Reference to Pumping – Internal Bord na Móna Report 1983 (included in Appendix 4.12);
- Bord na Móna, *Environmental and Operational Procedures for the Protection of Surface Water* (included in Appendix 4.13);
- Industrial Cutaway Bog Land-Use Studies (Clonsast) – Internal Bord na Móna Report 1978 (included in Appendix 4.14);
- Peco Harvester Tests – Internal Bord na Móna Report 1986 (included in Appendix 4.15);
- Distribution and Nature of Ash Material in a Milled Peat Stockpile – Internal Bord na Móna Report 1982 (included in Appendix 4.16);
- Regional Administration in Relation to Milled Peat Operation – Internal Bord na Móna Report 1988 (included in Appendix 4.17);
- Irish Engineers Journal Supplement 1970 (p.13-15);
- Bord na Móna Living History website[2];
- Bord na Móna Peat Development in Ireland 1954 (included in Appendix 4.18);

[1] Annual Environmental Reports 2018-2023 available at: https://leap.epa.ie/licence-profile/P0504/compliance

[2] Available at: https://www.bordnamonalivinghistory.ie/

- Planning Drawing Pack (included as Appendix 4.19);
- IPC Licence Compliance Training Programme (included as Appendix 4.20).

4.3 PROJECT DESCRIPTION

This rEIAR is prepared in support of an application for Substitute Consent for peat extraction activities and all ancillary works carried out by Bord na Móna on lands at the Application Site since July 1988. The Application Site is located approximately 1 km east of Lanesborough in County Longford as outlined in Chapter 1 Figure 1-1.

The peat extraction activities and all ancillary works undertaken at the Application Site, which comprise the Project for which Substitute Consent is being sought and for which this rEIAR is prepared, consist of the following:

- Installation of surface water drainage infrastructure at Mountdillon Bog Group, specifically at Derryadd, Derryaroge and Lough Bannow Bogs to facilitate peat extraction activities from 1988 to present day;
- Vegetation clearance to facilitate peat extraction activity from 1988 to July 2019;
  - Industrial scale peat extraction (milled peat);
- Use and maintenance of pre-existing ancillary supporting infrastructure and services to facilitate peat extraction (e.g., railway infrastructure, fixed fuel tanks, drainage (drains, silt ponds, pumps), machine passes etc.), from 1988 to July 2019;
  - Control Measures associated with the above, inclusive of the IPC Licence measures (Ref. P0504-01) which commenced from 2000 onwards to the present day; and,
  - All associated site development and ancillary works.

4.3.1 Project Phases

For the purposes of this rEIAR, the Project is defined under three different timeframes termed 'phases':

- 'Peat Extraction Phase': peat extraction activities and all ancillary works at the Application Site from July 1988 to the cessation of peat extraction in July of 2019 (July 1988 – July 2019). The Peat Extraction Phase is described in detail in Section 4.7.
- 'Current Phase': the management of the Application Site since July 2019 (July 2019 to present). The Current Phase is described in detail in Section 4.8.
- 'Remedial Phase': the activities intended to be carried out at the Application Site into the future. The Remedial Phase is described in detail in Section 4.9.

4.4 OVERVIEW OF THE PEAT EXTRACTION PROCESS

4.4.1 Surveying and Drainage

A description of the surveying and drainage methodologies and machinery used across the Bord na Móna bogs, including at the Application sites, is outlined on the Bord na Móna Living History website[3] and in the Irish Engineers Journal Supplement, 1970, p.13-15.

The key approach and outputs of the surveying works were the following:

- The lateral extent of the bog deposit was determined using traditional surveying techniques;

[3] Brown Gold 'A History of Bord na Móna and the Irish Peat Industry', 2010 Clarke, Donal, Chapter 10 Pg 206

- The peat types or the stratification to the bog floor (i.e., the degree of decomposition as expressed on an international scale of humification) was determined. This scale ranges from H.1 to H.10 (the higher the number, the greater degree of decomposition);
- Levels were taken at 100-yard (approx. 91m) intervals or closer along parallel section lines 250 yards (approx. 228m) apart on midlands bogs (the Application Site comprises midlands bogs). The depth of the bog at each level point was determined by a Swedish type tube borer coupled in lengths of 1m. The leading tube was provided with a special rotating head which enabled a 0.5m sample from any particular depth to be carried to the surface;
- Midland virgin bogs, such as the Application Site, varied in depth from 10 foot (approx. 3m) to over 40 foot (approx. 12m) – the bulk of the soundings lying in the range 15 foot (approx. 4.5m) to 25 foot (approx. 7.5m); and,
- Apart from the survey of the bog deposit a detailed survey of all the minor streams and minor rivers carrying waters from the bog to main rivers was also carried out.

Once the detailed survey work was completed, and the site deemed suitable for peat extraction, drainage works across the bogs were initiated. The development of the drainage for the site was carried out in stages using a range of machinery. Midland virgin bogs, of which the Application Site were typical, would have had a moisture content of over 94% and varied from 96-97% near the surface to 90% at the bog floor. The stages of drain development are outlined below:

- Initial opening of drains:
  - Drains were first opened by a plough pulled by a Bord na Móna tractor at a slow speed (approximately½ to 1 mile per hour (0.8km/h – 1.6km/h)); and,
  - The drain depth at the plough stage was 20″ (0.51m). Drains had a trapezoidal section with a top width of approximately 30″ (0.76m) and a bottom width of 12″ (0.3m) bottom width.

- Deepening of drains:
  - Following their initial opening, drains were deepened by rotating disc machines operating at speeds of 200-600 yards per hour (approx. 180-550m/hour);
  - Rotating disc machines could deepen the drains to a maximum depth of approximately 60″ (approximately 1.5m), with a bottom width of approximately 12″ (approximately 0.3m); and
  - Whether further deepening of drains was required depended on the purpose of the drain was achieved by smaller-type bucket excavators and peat cutting machinery, by drag lines specially tracked to Bord na Móna's design, by several other excavator types, or by hand where it was desired that the drain should conform to certain maximum dimensions.

Arterial drainage works were not always adequate to achieve the levels of drainage required to allow the extraction of peat deposit to the bog floor. Pumping of whole bog areas or certain portions of bog areas arose where gravity drainage was impossible or achievable only at prohibitive cost. In these instances, the pumps favoured were the Archimedean screw type or the Axial flow type electrically powered, and electrode controlled.

Once drained, the upper acrotelm layer (which comprises the biologically active component of the bog) was removed to facilitate peat extraction and the drying of peat. The acrotelm is one of two distinct layers in undisturbed peat bogs. It overlies the catotelm. The boundary between the two layers is defined by the transition from peat containing living plants (acrotelm) to peat containing dead plant material (catotelm).

The machinery involved in drainage work on the Application Site is described in Section 4.4.2.

4.4.2 Drainage and Bog Preparation Machinery

4.4.2.1 Dragline/Shovel Excavator: Types 287 CU. Metres and 478 CU. Metres

These machines excavated the main outfalls for the bog drainage system in the early development stages and maintained main outfalls during the extraction life of the bog. While these excavators were generally of conventional design and were suitable to be mounted with dragline attachments, back and front acting shovels, and pile driving attachments, they were used mainly with the dragline attachment. The machines were powered by a diesel engine. All drives were mechanical with friction clutches and brake control of winches and turntables, while the track drives and steering were controlled by a claw clutch and brake arrangement.

In 1958, a new underframe for the dragline was designed to minimise surface pressure and eat compaction, thereby eliminating the need for the use of timber mats. The increased mobility and reliability of the machine resulting from the new underframe allowed the machines to move rapidly over the bog to do relatively small jobs which would earlier have been done by hand owing to the slowness and difficulty of moving the dragline over timber mats. Additionally, the elimination of the timber mats meant that groundsmen were no longer required to move the timber mats. This meant that draglines could be operated by the driver only, with no support staff required. The 287-model excavator had caterpillar-type tracks with timber sleepers, which provide the necessary bearing area for operation on bog, without using mats. The 478-model excavator, while equipped with caterpillar track chains, was not fitted with track sleepers but was supported on timber mats where necessary. When excavating bog these machines were fitted with a special dragline bucket of light design with a capacity of 750L. Plate 4-1 below is an image of this type of machinery operating on a Bord na Móna bog.

Plate 4-1: Dragline/Shovel Excavator (source: https://www.bordnamonalivinghistory.ie/equipment-detail/draglineshovel-excavator/)

4.4.2.2 Drainage Machine Type – Klassmann

The Klassmann drainage machine was designed and developed for operation on sod moss extraction bogs. The machine was supplied with a variety of attachments to suit specific duties. For Bord na Móna's applications it was fitted with a slit drainer, a drain cleaner and a levelling screw. The tractor was of light construction with the chassis fabricated from folded steel sections supported on two tracks each comprising two chains carrying steel swamp shoes, running on end sprockets and frictionless bearing mounted intermediate support rollers. The power unit was an air-cooled diesel engine and the transmission consisted of an over-centre single plate clutch, vee belt drive, specially designed four speed gearbox, and chain drives which powered both tracks and the power take off (PTO) for attachments. Additional sprockets were supplied to give a variety of forward speeds to suit specific attachments. Steering was assisted by coil clutch and brake bands. The machine was fitted with a hydraulic system to control the transmission of power to the various attachments. All controls were centralised in an enclosed cab.

The slit drainage attachment was used to open initial drains in virgin bog. It comprised a cutting boom of small buckets carried on special chains and sprockets. The content of the buckets was discharged mechanically into a vane-type spinner which threw the spoil clear of the drain. The drain cleaner attachment was similar to the slit drainer, but cut a wider drain and was used to deepen and maintain drains after the first sod cut was made. The screw leveller attachment was used for the preparation of fields on moss peat bogs to remove the vegetation and level the surface to facilitate the performance of cutting machines and the stability of the sod walls formed by these machines. The attachment had the ability to camber surfaces if required.

4.4.2.3 Drainage Machine Type – M.P. Field Slitter

This machine was developed to cut slit drains in milled peat fields to accelerate drainage in the poorer quality areas. The drains cut to a definite pattern comprising three longitudinal slits, one central and one on either side, with cross drains giving exit to the ditches at regular intervals. The machine comprised a tractor on full tracks with a chain saw cutting attachment similar to the chain saw machine. The tractor had a special transmission to give the correct forward travel speeds in second, and third gear. The modification involved the replacement of the gearbox primary gear train and the differential crown wheel and pinion, in addition to the insertion of a special reduction gearbox. The tracks comprised flat metal cleats carried on two chains and run on the standard tractor tyre wheels with an additional jockey wheel. The attachment was carried at the rear of the tractor, pivoted on the centre of a standard power-take-off bevel box output shaft and is raised and lowered about this pivot by a hydraulic ram operated from the driving position. The cutting element was a standard transmission chain with cutting teeth secured to it by welding, running over top driving sprocket and a bottom driven sprocket whose shaft carries a cutting impeller on either side outside the support bearings. These impellers, in conjunction with the cutting chain, excavated a tunnel of rectangular section at the bottom of the slit drain cut by the chain only. The machine had a cab with toughened glass windows, allowing good vision for manoeuvring and observing the behaviour of the attachment. Plate 4-2 below is an image of this type of machinery operating on a Bord na Móna bog.

Plate 4-2: Drainage Machine Type – M.P. Field Slitter (source: https://www.bordnamonalivinghistory.ie/equipment-detail/drainage-machine/)

4.4.2.4 Ditching Attachment/Ditcher

The purpose of this attachment was to cut the drains separating the peat fields in development bogs and deepen existing drains in bogs subject to peat extraction. The attachment consisted of a rotating cutting disc set at an angle to the line of travel, carried on an arm from the tractor unit. The arm and disc were controlled and supported by wire ropes and a hydraulic ram passing over a mast on the tractor unit and anchored to a projecting ballast box on the other side of the tractor unit. The disc was driven by the tractor main gearbox PTO shaft via a bevel gear reduction box and universal propeller shaft. On other machines a chain drive reduction was inserted between the bevel gearbox and universal propeller shaft to achieve a slower disc speed. The disc had cutting blades and a stationary shield which deflected the flying spoil away from the machine and spread it evenly over the adjacent field.

Plate 4-3: Ditching Attachment/Ditcher

4.4.2.5 Drain Cutting Attachment – Cross Drain

The purpose of this attachment was to cut small drains in milled peat fields from the centre of the field to the ditches separating the fields. The attachment consisted of a cutting boom which was mounted on the rear of the H.D. Tractor Type II on radius arms, controlled for height and level by hydraulic rams. To cut the drain, the tractor stopped, and the cutting boom started, trimmed for level if necessary and lowered into the bog, discharging the spoil to the centre of the field. The boom was of light construction using standard steel sections. The chain was carried on sprockets at the ends of the boom while it ran in a guide with the aid of welded-on cleats along the bottom horizontal portion of the boom. The drive is taken from the P.T.O. shaft of the tractor main gearbox via chain drivers and universal jointed propeller shaft. Plate 4-4 below is an image of this type of machinery operating on a Bord na Móna bog.

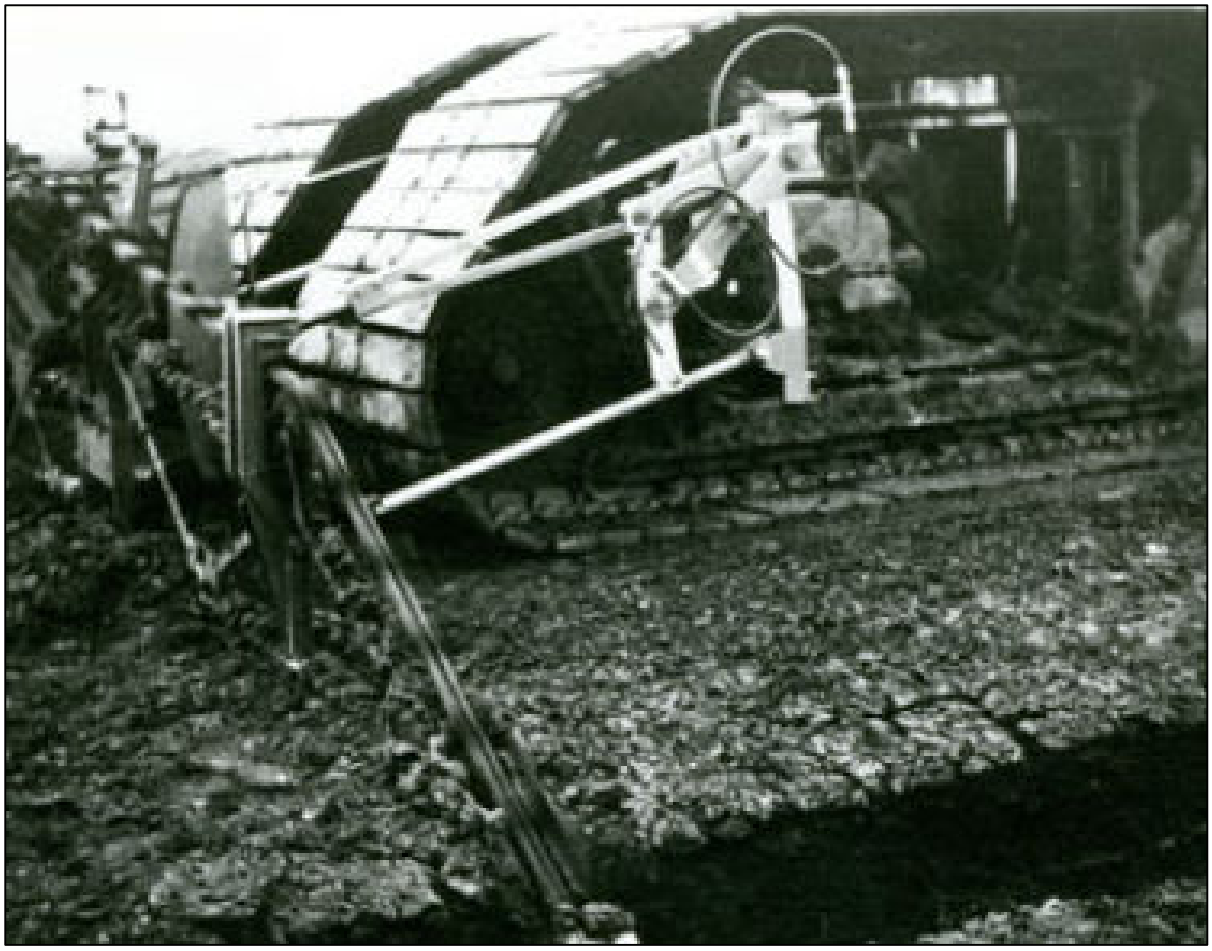

Plate 4-4: Drain Cutting Attachment – Cross Drain (source: https://www.bordnamonalivinghistory.ie/equipment-detail/drain-cutting-attachment-cross-drain/)

4.4.2.6 Drain Cleaner – Screw

This attachment was used to remove slurry from the bottom of milled peat field ditches and dispose of it by spreading it on the adjacent field. The attachment was a screw elevator with radial blades fitted at the top to eject the spoil through an outlet in the casing in a predetermined direction. The attachment was mounted on a cantilevered bracket from the tractor on a pivot arrangement so that the screw casing could be lifted and lowered as required by winch rope. In the working position the screw elevator is lowered into the ditch and scooped the slurry from the bottom of the ditch as the tractor advances. As the tractor progresses along the ditch or drain it accumulates the slurry; the screw elevated it into the discharge chamber and the radial blades ejected it through the outlet onto the peat field. Plate 4-5 below is an image of this type of machinery operating on a Bord na Móna bog.

Plate 4-5: Drain Cleaner Screw (source: https://www.bordnamonalivinghistory.ie/equipment-detail/drain-cleaner-screw/)

4.4.2.7 Stripping Machine Type – I & II

The purpose of this machine was to cut away the top layer of bog from the section which was to be cut. This layer varied in depth from 305 mm to 762 mm and was deposited at the bottom of the face bank prior to reuse on the adjacent spread grounds. The machine had a lightly constructed main frame mounted on caterpillar type tracks and the spiral cutting/conveyor unit was carried in an off-set position at the rear. The spiral cutter/conveyor unit was pivoted to the main frame and suspended on an overhung mast on which it was raised or lowered as required. A separate trimming control, in the form of a hydraulic ram, was fitted at the cutting end.

The Type I machine was powered by diesel engine and transmission of standard manufacture incorporating a differential brake/gear steering arrangement as used on levelling machine. There were 8 forward speeds and 4 reverse speeds available through gearbox and change sprockets.

The Type II machine was powered by a diesel engine driving through an over-centre type clutch, a 'V' rope drive special worm and spur gear reduction box, and chain drives. The machine was steered by coil clutches on the track final drives. There were 6 forward speeds available using change sprockets. Plate 4-10 is an image of this type of machinery operating on a Bord na Móna bog. Plate 4-6 below is an image of this type of machinery operating on a Bord na Móna bog.

Plate 4-6: Stripping Machine (source: https://www.bordnamonalivinghistory.ie/equipment-detail/stripping-machine/)

4.4.2.8 Levelling Machine Type – Scraper

The purpose of this machine was to prepare the surface of the high bog and cutaway for the efficient operation of all other machines, by levelling it. The machine consisted of a large tractor unit carrying a leveller boom in front. As the machine advanced on its long tracks, the boom cut away the high areas, losing the spoil in the hollows. The tractor unit had a rigid main frame supported on caterpillar type power driven tracks and was powered by diesel engine and gear transmission of standard manufacture. The boom had a light framework made up of standard steel sections, around which was driven two conveyor-type chains running on sprockets at each end and in guides along the bottom and top. Across these two chains, arms were fitted, projecting beyond the front of the boom. The projecting portion of the arm had a cutting knife and scraper palm. The boom was controlled for height and level by hydraulic rams. Plate 4-7 below is an image of this type of machinery operating on a Bord na Móna bog.

Plate 4-7: Levelling Machine Type – Scraper (source: https://www.bordnamonalivinghistory.ie/equipment-detail/levelling-machine/)

4.4.3 Peat Extraction Process

Two distinct peat products were extracted at the Application Site: sod peat and milled peat. The methods by which these products were extracted varied, and each process is described in detail in the sections below. A description of the machinery used for peat extraction at the Application Site is provided in Section 4.4.4.

4.4.3.1 Sod Peat Extraction

Sod peat was extracted at the Application Site from 1952 to 1984.

Sod peat, also sometimes referred to as 'machine turf' or 'turf', was extracted utilising technologies which were initially developed between 1910 and 1920. Once the drainage was installed and the bog sufficiently dry for machinery, the surface was prepared using levelling and stripping machines such as those described in Section 4.4.2. Sod peat extraction was subsequently carried out by a range of different bagger/sod peat excavator machines. The German word for both excavator and dredger is '*Bagger*' and this was the word adopted in Ireland for machines which mixed the peat from different depths of the bog and then macerated it. Baggers are shown in Plates 4-20 and 4-21.

In the case of sod peat extraction, large open drainage ditches known as "trenches" were opened at widths of approximately every 240 metres across the entire width of the extraction area.

These trenches served as the beginning of the face bank from which sod peat was ultimately extracted. Baggers cut a trench with a width of 2 meters and a depth of 3 to 4 meters. A chain of buckets on the bagger was then inserted into the trench which extracted peat from all strata of peat in the trench. The extracted peat was then deposited into a macerator which pulped and mixed it. Maceration improved the quality of the sods of peat produced, as by thoroughly mixing peat from each strata of the bagger trench, the density and uniformity of the sod was increased. The macerated peat pulp was then extruded through a narrow double mouthpiece which formed it into two rows of continuous sods each of approximately 5 inches (approx. 13cm) wide x 3 ¾ inches (approx. 9.5cm) high. As they were extruded, the rows of peat were deposited on to a continuously moving chain of spreader plates, which when the spreader arm was fully loaded, tripped automatically and deposited the rows of turf onto the bog surface. Trailing discs then cut the rows into 15 inch (approx. 38cm) long sods. The standard length of the spread arm was 54 metres. The bagger/sod peat excavator machine spread the sod peat on the large area between the trenches which allowed sufficient room to dry the sod peat.

After about two weeks on the surface of the bog, the sods were turned by a sod turning machine to allow the other side of the sod to dry. When the sods were fully dried, the density and uniform texture resulting from the maceration process made them very impervious to rewetting. The dried sod peat was then collected from the surface of the bog using a sod collector. This machine was used to collect the sod peat from the sod rows into stockpiles which were often referred to as 'ricks'. A permanent 3 ft. gauge railway serviced all bog areas and facilitated connectivity to the various works centres, workshops, and fuel depots across the Bord na Móna landbank. When it was decided to move a stockpile, a temporary railway track was laid alongside from the permanent railway line. On completion of loading, the temporary track was lifted and re-laid along another stockpile as required. Please see Figure 4-1 for a Flow Chart of the Sod Peat Extraction Process produced by Bord na Móna.

Typically, sod peat fields were between 800 to 2,000 yards long (approx. 700m to 1,800m) discharging normally to the end of the large drainage trenches. Small, piped outfalls were installed perpendicular to the drains where needed to drain low areas that formed along the sod peat field. The pipes used were either concrete or clay pipes with a small diameter of between 150mm to 300mm.

These bogs utilised pumps where levels did not allow for gravity drainage. As the sod peat machine (bagger) was electrically powered a power supply for the pumps was easily obtained from the existing internal distribution network.

The large drainage trenches were continuously developed and have a width of between 3 to 8 metres typically and a depth of around 2-5 metres. They were maintained using mechanical excavators or draglines and were continuously deepened as sod peat was extracted from the bog to lower the drainage level.

4.4.3.2 Milled Peat Extraction

Milled Peat product was extracted at the Application Site from 1964. From 1984 to 2019 milled peat was the only form of peat extracted, and this was transported exclusively to the nearby Lanesboro Power Station and later Lough Ree Power Stations via the bog railway. The methods by which milled peat was extracted are described in detail below.

In the case of milled peat extraction, parallel open drains were cut at 50 ft. (approx. 15.2m) centres which divided the peat extraction area into fields 45 ft. (13.7m) wide. Typically, the field drains were from 800 to 2,000 yards (approx. 700 to 1,800m) long, discharging at either end into piped outfalls which ran at 90° to the open drains and which themselves discharged into the

nearest natural outfall. Beyond the piped outfall was left a headland or turning ground 70 to 100 ft. (21 to 30m) wide which ran parallel to the piped outfall to enable extraction machines to turn from one field into another. When fully developed, the open field drains had a depth of approx. 4′ 6" (approx. 1.4m) and a top width of approx. 5′ 0" (approx. 1.52m). The field drains were excavated and initially maintained by machines called disc ditchers. The disc ditcher consisted of a cutting disc. which was mounted on an arm offset from a tractor unit. Tractors were powered by a diesel engine, and they were mounted with timber and swamp shoes and front rollers.

Milled peat extraction requires good solar/wind drying conditions and so commenced any time from mid-April onwards, and usually ran until mid-August, once suitable drying conditions prevailed. Following drainage, there were four stages to the extraction of milled peat outlined as follows:

- **Milling** - During the milling process, the top 10-15mm of the surface of each field was broken into peat crumbs by powered milling drums towed behind agricultural tractors (Plate 4-9). This layer of crumbed or milled peat/moss is called a crop and would have had a moisture content of about 80% when milled;
- **Harrowing** - After milling, the peat crop was dried. To assist in this drying, the loose peat was harrowed, or turned over. The harrow consisted of a series of spoons which were towed behind an agricultural tractor (Plate 4-9). The spoons on the harrow were fitted with special base plates which prevented the scraping of wet particles from below the milled peat layer. Harrowing was usually required 2 to 5 times per peat crop, depending drying conditions, the water table level in the peat extraction fields, the initial moisture content of the peat at milling, and peat quality. If rain interrupted the drying process, more harrowing may have been needed.
- **Ridging** - When the milled material was dried to a moisture content of between 45% and 55%, it was gathered into ridges in the centre of each peat extraction field. The ridger consisted of a pair of blades towed in an open V behind an agricultural tractor. The open V blades rest on the bog and channel the loose crop into a triangular ridge in the centre of each peat extraction field. (Plate 4-10 and 4-11);
- **Harvesting** - Harvesting was the final stage of the extraction process. Each individual ridge was lifted mechanically, by a machine called a harvester, transferred and dropped on top of the adjoining field's ridge, until five ridges had been accumulated into a single large ridge. This large ridge formed the final lift into the peat storage stockpile (Plate 4-12 and 4-13).

Typically, every 11th field was used to stockpile the peat from the output of five fields either side; this is referred to as the 'Peco' method and the peat in these stockpiles was removed by rail. The Peco method was used on the Application Site. Weather permitting, the miller followed the harvester and the production cycle recommenced in the emptied fields. The extraction-stockpiling cycle is referred to as a 'harvest' and each group of eleven fields generally produced 12 No. harvests per year. When the extraction season was over, the stockpiles were covered to keep the peat dry unless the peat was scheduled for immediate transportation from the site. Peat was stored in these stockpiles (up to 25 m wide, 10-15 m high) until required for use.

Once stockpiles of milled peat were established, they were rolled and covered with polythene sheeting. The purpose of the polythene covering was to keep stock dry, to protect it against wind erosion, and to inhibit spontaneous combustion in certain types of peat by the exclusion of as much air as possible. A reel of polythene sheeting would be mounted on a single bale spike-type

attachment on an excavator. The excavator would drive alongside the stockpile, and the polythene would be unrolled across it. There were generally 8 no. workers on the ground outside the excavator to undertake the work of unrolling the polythene and laying it across the stockpile (4 no. workers each side of the stockpile). Once the polythene sheet was laid in place, a layer of high-moisture-content milled peat was distributed over the polythene to fix it in place. This was done in three passes along a stockpile by a milled peat harvester; on the first pass, a milled peat harvester which was fitted with a split cowl at the end of the jib distributed an even layer of peat across the top and sides of the stockpile (the split cowl allowed for both faces of the surface of the stockpile to be covered in the one pass). The second and third passes of the milled peat harvester facilitated the deposition of peat along the bottom edges of the stockpile, effectively anchoring the polythene sheeting to the ground, preventing the lifting of the edges in the wind. (see Plate 4-14 and 4-15 below).

When it was decided to move a milled peat stockpile, the polythene sheet covering the stockpile was removed. A trained staff member would walk along the apex of the milled peat stockpile and bisect the polythene sheet at the peak of the apex with a blade. Starting at the end of the stockpile, one side of the bisected polythene sheet was fed into the eye of an implement known as a polywrapper, which was mounted on the three-point linkage of a tractor. The eye of the polywrapper was attached to a pendulous swivel arm, which, as the tractor moved forward, oscillated from left to right to ensure that the polythene being collected was being dispensed evenly across a metal shaft on the polywrapper. This ensured an even spool of polythene was collected. Once the spool was at capacity, one side of the polywrapper was opened, which allowed the metal shaft to be removed and replaced with a plastic one. The entire spool was then removed, and sent for appropriate disposal/recycling. The metal shaft was reinserted into the polywrapper, the side closed, and the process began again until the stockpile was fully uncovered and all polythene collected.

A permanent 3 ft. gauge railway serviced all bog areas and facilitated connectivity to the various works centres, workshops, and fuel depots across the Bord na Móna landbank. As in the case of sod peat stockpiles, when it was decided to move a stockpile of milled peat, a temporary railway track was laid alongside from the permanent railway line. On completion of loading, the temporary track was lifted and re-laid along another stockpile as required.

Please see Figure 4-1 for a Flow Chart of the Sod and Milled Peat Extraction Process, produced by Bord na Móna.

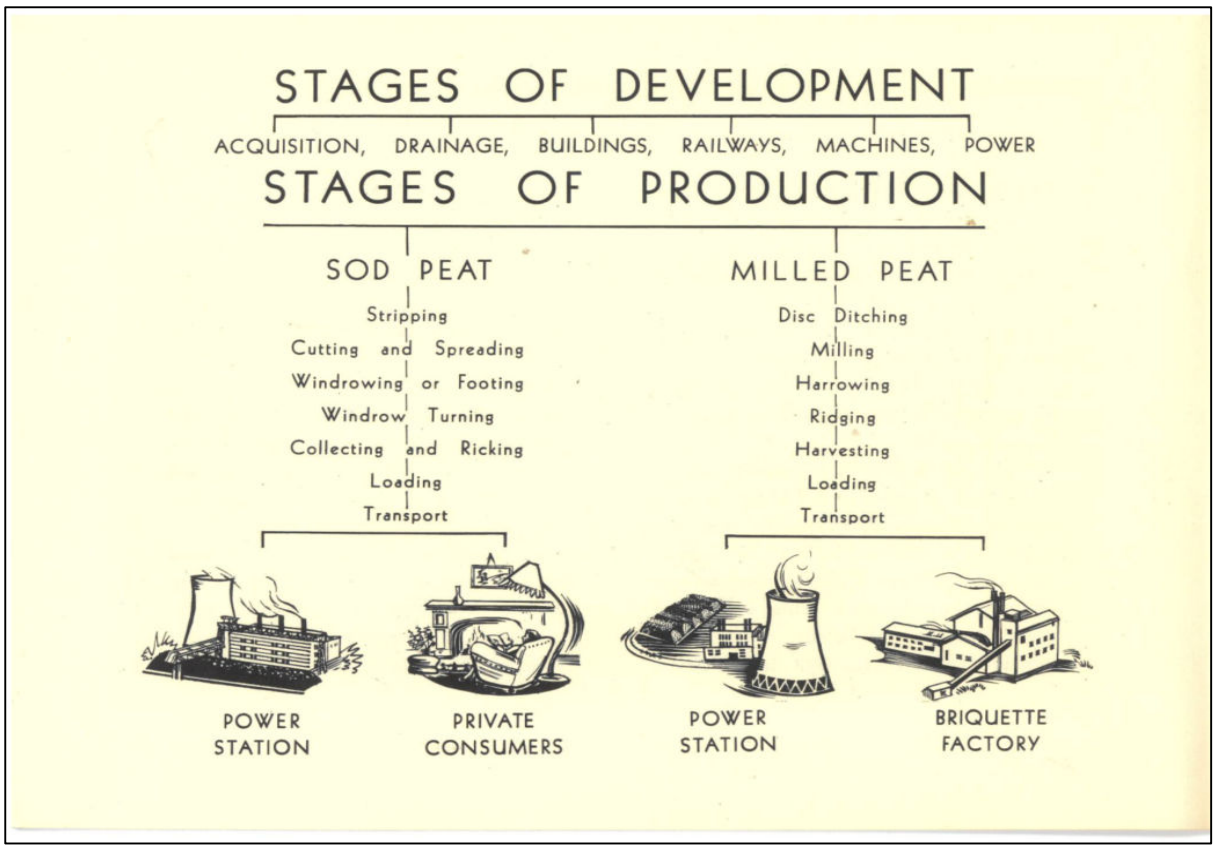

Figure 4-1: Flow chart of the sod and milled peat extraction process produced by Bord na Móna in 1954-

Plate 4-8: Milling process (source: Bord na Móna)

Plate 4-9: Harrowing process (source: Bord na Móna)

Plate 4-10: Ridging process (source: Bord na Móna)

Plate 4-11: Ridging process (source: Bord na Móna)

Plate 4-12: Harvesting - Peco Method (source: Bord na Móna)

Plate 4-13: Harvesting – Peco method (source: Bord na Móna)

Plate 4-14:Polythene covering of stockpiles

Plate 4-15: Process of Stock Protection, showing a layer of milled peat being spread over polythene sheeting to anchor the sheeting in place (source: Bord na Móna)

4.4.4 Peat Extraction Machinery

The following machinery was used in the extraction process once the bogs had been cleared of vegetation and drains inserted. The type of machinery used at any given time would vary depending on machine availability, bog conditions, the type of peat being extracted (i.e. milled or sod) and operator preference.

4.4.4.1 Tractors

A variety of tractors have been used throughout the history of peat extraction activities and all ancillary works on the Application Site. As with all machinery used during peat extraction activities and all ancillary work, the choice of tractor used for any given activity would have been based on availability, bog conditions, and activity type (which would dictate the mechanical requirements of the tractor in terms of power output, drivetrain, weight, wheelbase dimensions, tyre type, PTO specifications, hydraulic requirements etc.). Throughout the decades as improvements in tractor design were made, newer more powerful and efficient tractors were employed on the Application Site. A non-exhaustive overview of the types of tractors used is provided below.

H.D. Tractor II

The H.D. Tractor II was a half-track tractor specially designed for harvesting and ditching operations in the Peco system of milled peat. The machine consisted of a robust main frame

supported on caterpillar type tracks, which are exceptionally high to accommodate the attachments within them, and on large steering rollers in front. The tractor was powered by a diesel engine fitted with automotive-type clutch. The transmission consisted of a main gearbox, an auxiliary gearbox, a worm drive bevel gear differential unit and a spur gear reduction final drive contained within the back axle casting. The tracks comprised a special cast steel link type chain, with swamp shoes or sleepers bolted on, which ran on track rollers suitably spaced on the track frame. The driving sprockets were built up from steel plate discs with steel rollers between, to register with the track chain. The idler sprocket had the steel disc, with distance pieces, allowing the track link driving spuds to pass between them. Both the driver and idler sprockets were fitted with wear resisting cast steel pads where the track link driving spuds make contact with the sprocket plates. The front rollers were steel rimmed with spokes from a central cast hub. A circumferential steel angle section was fitted to obtain steering adhesion. The rollers were mounted on a swinging axle. The steering was manual through a wormbox, operating winding drums with wire ropes to the axle. The driver's platform was spacious, located at a high level over the main gearbox. For ditching operations, a protective cab was fitted over this platform to protect the driver from ditching spray and the elements. On some tractors on ditching operation, a simple hydraulic steering system was fitted. Plate 4-16 is an image of this type of machinery operating on a Bord na Móna bog.

Plate 4-16: H.D. Tractor II (source: https://www.bordnamonalivinghistory.ie/equipment-detail/h-d-tractor-ii-2/)

LHT Tractor II

This tractor was designed to operate miller and ridger attachments in accordance with the Peco system of winning milled peat. This machine consisted of a simple main frame with caterpillar-type tracks and front steering rollers. It was powered by a diesel engine fitted with an automotive type clutch. The transmission was a special speed change gearbox with P.T.O. shaft, and a worm-driven bevel gear differential unit housed in a conventional back axle. The half shafts from the differential unit are coupled to the track drive sprockets direct.

The main frame accommodated either of two engines, the size depending on the attachment to be used with the tractor. Steering was manual by hand wheel through a worm reduction gearbox, draglink and track rod. The front axle swung in the vertical plane to avoid undue distortion of the tractor frame. The front rollers were fitted with a circumferential ring of steel angle section to obtain steering adhesion. Plate 4-17 is an image of this type of machinery operating on a Bord na Móna bog.

Plate 4-17: LHT Tractor II (source: https://www.bordnamonalivinghistory.ie/equipment-detail/lht-tractor/)

LHT Tractor III

This tractor, fitted with attachment, was used for ridging the milled peat into the centre of the field. The tractor was the half-track type with front steering rollers. The main frame was fabricated from standard steel angle and channel sections. The tracks were single chain cast link type with timber swamp shoes bolted on and runs on cast sprockets and intermediate

supporting rollers. The front steering rollers were spoked with fabricated steel rims and cast-iron hub and were mounted on stub axles on a pivoted axle beam which swings in the vertical plane. Steering was affected manually through a worm reduction gearbox, drag link and track rod. The tractor was powered by a water-cooled diesel engine fitted with automotive type clutch. The transmission consisted of a speed step-up primary gearbox of special design, a standard agricultural tractor changes speed gearbox and differential assembly with a chain reduction final drive between the standard transmission unit half shaft and the track sprockets. Since this tractor was used only for ridging operations during daylight hours no electric generator was fitted and the engine was hand started. A hydraulic pump assembly was incorporated in the standard agricultural transmission unit, and this was used to actuate the attachment hydraulic system.

Ridger Tractor (LHT IV)

A tractor specially designed to perform the milled peat ridging operation at more than twice the speed of the L.H.T. II & III by covering the full width of the field in one pass. The chassis was fabricated from standard rolled steel sections mounted on half-tracks which incorporate manganese track links and sprockets with intermediate support rollers. Timber swamp shoes were bolted to the track links. The power unit was a diesel engine with automotive type clutch and it drove through a heavy-duty automotive type gear box and cardan shaft – the differential unit of a standard heavy duty truck back axle with epicyclic gear reduction between half shaft and wheel hubs. The track sprockets were bolted directly to the axle hubs. The tractor was carried on front rollers of generous proportions carried on stub axles and steering is powered by hydraulics. The engine was fitted with two hydraulic pumps, one for power steering and the other for the attachment hydraulic system. The attachment consisted of double blades similar to the single ridger attachment, one blade on either side of the tractor converging at the rear. The blades were supported by sturdy spars which radiated from the tractor chassis. Adjustment of the sole-plate of the blade relative to these spars was provided. The attachment was lifted and lowered hydraulically through a multi-guy rope system over the top of a central mast on the tractor. Plate 4-18 is an image of this type of machinery operating on a Bord na Móna bog.

Plate 4-18: Ridger Tractor (source: https://www.bordnamonalivinghistory.ie/equipment-detail/ridger-tractor/)

Massey Ferguson 35

The Massey Ferguson (MF) 35 would have been used from the 1960s and 1970s. It has a rated engine power of approximately 37 horsepower (hp). The MF 35 was available in both 2WD and 4WD configurations. The tractor is powered by a diesel engine. It is commonly equipped with a 6-speed or 12-speed gearbox, depending on the model and design. It has a hydraulic system with a variable capacity. The tractor's weight is approximately 1,500kg.

Ford TW15

The Ford TW15 was used from the 1980s. It has a rated engine power of approximately 140hp, with a PTO output of approximately 120hp. The TW15 was available in both 2WD and 4WD configurations. The tractor is powered by a diesel engine. It has a hydraulic system with a variable capacity. The tractor's weight is approximately 5,000kg.

Landini 5830

The Landini 5830 was used from the 1980s. It has a rated engine power of approximately 50hp, with a PTO output of approximately 42hp. The 5830 was available in both 2WD and 4WD configurations. The tractor is powered by a diesel engine. It has a hydraulic system with a variable capacity. The tractor's weight is approximately 2,500kg.

Ford F4630

The Ford F4630 was used from the 1990s. It has a rated engine power of approximately 60hp, with a PTO output of approximately 56hp. The F4630 was available in both 2WD and 4WD configurations. The tractor is powered by a diesel engine. It has a hydraulic system with a variable capacity. The tractor's weight is between 2,350kg and 2,750kg, depending on the drivetrain.

New Holland TL70/TL70a

The New Holland TL70 was used from the late 1990s. It has a rated engine power of approximately 65hp, with a PTO output of approximately 56hp. The TL70 was available in both 2WD and 4WD configurations. The tractor is powered by a diesel engine. It has a hydraulic system with a variable capacity. The tractor's weight is between 2,700kg and 3,200kg, depending on the drivetrain and cab specifications.

The New Holland TL70a was a variation of the TL70 which was used from the early 2000s. It had a higher rated engine power than the TL70, of approximately 70hp. Powered by a diesel engine, it weighed between 3,550kg and 3,850kg, depending on the drivetrain.

New Holland TM150

The New Holland TM150 was used from the late 1990s/early 2000s. It has a rated engine power of approximately 150hp, with a PTO output of approximately 120hp. The TM150 was available in both 2WD and 4WD configurations. The tractor is powered by a diesel engine. It has a hydraulic system with a variable capacity. The tractor's weight is between 4,750kg and 5,250kg, depending on the drivetrain.

New Holland TM165

The New Holland TM165 was used from the late 1990s/early 2000s. It has a rated engine power of approximately 165hp, with a PTO output of approximately 135hp. The TM165 was available in both 2WD and 4WD configurations. The tractor is powered by a diesel engine. It has a hydraulic system with a variable capacity. The tractor's weight is between 5,000kg and 5,500kg, depending on the drivetrain.

New Holland TM140

The New Holland TM140 was used from the early 2000s. It has a rated engine power of approximately 140hp, with a PTO output of approximately 115hp. The TM140 was available in both 2WD and 4WD configurations. The tractor is powered by a diesel engine. It has a hydraulic system with a variable capacity. The tractor's weight is between 5,150kg and 5,410kg, depending on the drivetrain.

John Deere 5070M

The John Deere 5070M was used from approximately 2010. It has a rated engine power of approximately 70hp, with an independent PTO. The 5070M was available in both 2WD and 4WD configurations. The tractor is powered by a diesel engine. It has a hydraulic system with a variable capacity. The tractor's weight is approximately 3,700kg.

4.4.4.2 Sod Peat Machinery

Windrow Machine

The purpose of the machine was to pick up the partly dried sods from the spread ground and form them into windrows to accelerate drying. The machine consisted of a tractor unit propelling large diameter spiked drums in front of it and carrying chain/bar conveyors extending from the pick-up drums to the rear of the tractor unit. The tractor unit was supported on caterpillar-type, power driven tracks and steered by coil clutch and brake arrangement. The power unit was an air-cooled diesel engine. The pick-up drums were independently supported and free to follow the bog surface. As they passed over the spread, the spikes penetrated the sods and lifted them to the level of the conveyors, where fingers forced them off the spikes and carried them away by the conveyors. The sods were discharged at the rear of the machine in windrow form, ½ metres apart.

Sod Turning Machine

This machine does the same work as the Single Turning Machine but had greater output. The elevator mechanism was the same as the single machine and the components were interchangeable. These elevator units were located in front of the tractor tracks, and they discharged either into a cross conveyor, rubber belt type, or two return conveyors, rubber belt type, positioned over the tracks. The cross conveyor was reversible and moveable to either side of the machine. The tractor unit consisted of a strong main frame mounted on caterpillar-type tracks suitable for high idle travel speeds. It was powered by a standard diesel engine and transmission gearbox which is fitted with a proprietary clutch and brake steering equipment. A standard hydraulic pump was also built into this transmission and is used to operate the hydraulic lift of the elevators for idle travel. A special chain reduction drive was inserted between the half shaft of the standard tractor transmission and the track drive sprocket. The drive to the elevators and conveyors were taken off from the standard power take-off shaft of the transmission unit. Plate 4-19 is an image of this type of machinery operating on a Bord na Móna bog

Plate 4-19: Sod turning machine (source: https://www.bordnamonalivinghistory.ie/equipment-detail/sod-turning-machine/)

Sod Peat Bagger/Excavator

The purpose of the machine, and the various versions of it, was to excavate, macerate and spread turf for the extraction of sod peat. This is necessary as the high spread ground area diminishes to the point where it will not take a full spread. The machine consists of a sturdy main frame, supported on power driven caterpillar tracks, which carries the various units and their transmission drives, and to which is attached a spreader arm. The turf is excavated by a multi-bucket type digger boom which is retractable to facilitate operation at varying depths, and is pivoted on the main machine so that it can be stowed for idle travel. The boom cuts a face bank at 600 to the horizontal. The turf is discharged from boom buckets into a scraper conveyor, and in turn, into a screw conveyor and twin-screw macerator. The macerator extrudes the turf onto the spreader plate chain which carries the extrusion for a distance of 54 metres, when it is discharged to the bog surface. Cutting discs trailing behind the spreader arm, marks the extrusion into sods as the machine advances. The machine is powered by electricity, and friction clutches are fitted to all motor drives for starting up. All unit drives are protected by shear pins. The machine is fitted with lights for night work and equipped with a short-wave radio transmitting /receiving set. Plate 4-20 and Plate 4-21 is an image of this type of machinery operating on a Bord na Móna bog.

Plate 4-20: Sod Peat Bagger/Excavator (source: https://www.bordnamonalivinghistory.ie/equipment-detail/sod-peat-baggerexcavator/)

Plate 4-21: Sod Peat Bagger/Excavator (source: https://www.bordnamonalivinghistory.ie/equipment-detail/sod-peat-baggerexcavator/Peat Extraction Volumes/)

Cutaway Boom Attachment

The attachment comprised a short boom complete with a catchment conveyor overhung from the main machine by wishbone frames.

The boom had a lightweight framework fabricated in square hollow steel sections, within which the motor, gearbox, and chain drive, common to the original boom, were housed. The boom supporting wishbones were fabricated in square hollow steel sections of generous proportions, the pivots of which were arranged to maintain the same angle of the boom relative to the bank for various depths of cut. The upper wishbone frame was supported on a hydraulic ram from the side of the main machine, which was operated by a valve from the driver's cab, providing convenient control of cutting depths and lift for idle travel. The pivots of the lower wishbone frame were carried on arms from the main machine and were hydraulically adjustable to alter the slope of the bank cut.

The catchment conveyor, supported from the boom frame, was a rubber/canvas conveyor belt running on conventional driver, end roller, and troughing idlers. The section of the belt receiving the turf from the buckets was supported on a series of slides of self-lubricating nylon to prevent deflection of the belt and ensure more efficient sealing. The conveyor had an independent motor/gearbox drive. The catchment conveyor discharged into the original scraper conveyor of the main machine. The attachment could be readily fitted to or removed from the machine by five pins. Plate 4-22 is an image of this type of machinery operating on a Bord na Móna bog.

Plate 4-22: Boom Attachment (source: https://www.bordnamonalivinghistory.ie/equipment-detail/cutaway-boom-attachment/)

Chain Saw Excavator

A machine of compact, sturdy construction with a high output for its size was used in Bord na Móna primarily for drainage with turf extraction as a secondary feature. The tractor unit was powered by a diesel engine, had proprietary transmission gearboxes, and final chain drive to caterpillar-type tracks.

The excavator, macerator, and spreading equipment were carried on the rear of the tractor unit, while a guide roller was carried on the front. All this equipment was lifted and lowered by hydraulics. The turf was excavated by a high-speed chain sword carrying cast steel teeth and discharged by centrifugal force at the upper sprocket into a screw/conveyor/macerator unit. This unit extruded the turf through a fan-tail spout, with an adjustable outlet, onto the spread ground. A series of cutting discs and a marking frame divided the layer of turf into the required sod size.

After the first cut was made, using the clutch and brake steering on the tractor unit, the front guide roller could be lowered into the excavation made to steer the machine for subsequent cuts.

A pair of loaded rollers were trailed behind the cutting sword to close the top of the excavation just made, preparing the spread ground for the next run of the machine. In this way, all available bog could be covered with spread turf, leaving only nominal spaces between the extrusions. Plate 4-23 is an image of this type of machinery operating on a Bord na Móna bog.

Plate 4-23: Chain Saw Excavator (source: https://www.bordnamonalivinghistory.ie/equipment-detail/chain-saw-excavator/)

Fóidín Machine

The fóidín machine originated from an experiment, the 'short cycle harvesting project' conducted at Oweninny bog Co. Mayo in 1965. The aim of the experiment was to produce fast drying peat sods from the surface of milled peat fields that were easy to crush in power stations, this led to the development of the fóidín machine in 1966. It came in two sections: the towing unit, which cut the peat, and the towed unit, which would macerate, extrude and spread the sods. Each of these sections was powered by its own diesel engine. It was steered by coil clutch and all other controls were operable from a cab which overlooked the working parts of the machine. The collection and stockpiling of the sods could be carried out with a combination of existing sod and milled peat machinery, modified in some cases. Fóidín extraction was suspended in most areas in 1972 and was abruptly terminated in 1973 due to several reasons, mainly that the yield from the fóidín system was small and insignificant compared to that of milled peat, complications arose burning crushed sods at ESB stations due to the higher calorific content of fóidín peat, and the cost of extraction was high relative to other peat extraction methods. Out of the 25 fóidín machines owned by Bord na Móna, one was sold to the Finnish State Fuel Supply Department, four were retained, and 20 sold as scrap.

Plate 4-24: Fóidín Machine (source: https://www.bordnamonalivinghistory.ie/equipment-detail/loading-machine/)

Sod Peat Loading Machine

The purpose of this machine was to load sod peat from bog ricks into railway wagons on one side of the rick only. The machine consisted of a lightly constructed mainframe mounted on caterpillar-type power driven tracks and carried a short scraper elevator in front, extending over the width of the tracks, and a low level cross conveyor which elevated as it projected from the side of the machine. These loading machines were either diesel- or electric-powered and would be fitted with either a diesel engine or electric motor as required. Plate 4-25 is an image of this type of machinery operating on a Bord na Móna bog.

Plate 4-25: Sod Peat Loading Machine (source: https://www.bordnamonalivinghistory.ie/equipment-detail/loading-machine/)

4.4.4.3 Milled Peat Machinery

Miller Attachments

Miller attachments were used to break the surface of the bog into fine, milled crumbs which were left on the surface of the bog to be dried by the wind and sun. Milling attachments initially comprised single or triple units. Both single and triple units worked in the same way, with the difference between the two being the number of milling drums, and thus the output (which was approximately 2.25 times higher with the triple unit). Miller attachments were mounted on the rear of tractors and drew power from the tractor's PTO. The single and triple miller attachments were later replaced by an offset miller attachment known as a 'Type – I'.

Single Miller Attachment

Single miller attachments consisted of a simple but strong tubular steel frame, the main members of which extended to, and were pivoted, at the mid-position of the tractor tracks. Rigidly mounted on the underside of the frame was a pin-type milling drum which was driven from the tractor PTO shaft through a bevel gearbox and chain drive. The single miller attachment was supported by a ground roller, through springs, located immediately in front of the milling drum and by a depth control castor a few feet behind the milling drum. For idle travel, the single miller attachment was lifted by hydraulic ram so that the pin milling drum is clear of the bog surface. This attachment, by virtue of the sprung main supporting roller, caused the

milling drum to cut deeper on the hills and shallower in the hollows, thus having a levelling effect on the bog surface. The drive to the milling drum is protected by a tension bolt safety device. Plate 4-26 is an image of this type of machinery operating on a Bord na Móna bog.

Plate 4-26: Single miller attachment (source: https://www.bordnamonalivinghistory.ie/equipment-detail/miller-attachment/)

Triple Miller Attachment

As mentioned above, the triple miller attachment operated in much the same way as the single miller attachment, but with a higher output.

The triple miller attachment consisted of units similar to the single attachment, ganged together. The front centre unit was attached to the tractor drawbar, while the two side rear units were drawn by brackets from the side of the front centre unit frame. These brackets were pivoted, and the level of the front of the side unit frame was controlled by roller castors running on the bog surface. The drives to the three milling drums were by universal jointed propeller shafts with splined slip sleeves, two bevel gearboxes and final chain drives. The milling drum speed was lower than the single unit, but in all other respects the behaviour of the individual units is the same as the single miller attachment. For idle travel the units were lifted on hydraulic rams incorporated in the rear castor roller assemblies. Depth of cut was also adjusted by these rams from the driving seat. The drive to each of the three units was protected by a tension bolt safety device. Plate 4-27 is an image of this type of machinery operating on a Bord na Móna bog.

Plate 4-27: Boom Attachment (source: https://www.bordnamonalivinghistory.ie/equipment-detail/cutaway-boom-attachment/) Triple miller attachment (source: https://www.bordnamonalivinghistory.ie/equipment-detail/miller-attachment/)

Offset Miller Attachment (Type-I)

This attachment was used to form a bevel on the edges of milled peat fields, to assist surface drainage. The attachment was a miller drum, projecting from the rear of the tractor unit on a casing arm which is pivoted at a central position on the rear of the tractor main frame, and extended to carry a ballast weight. The drive was taken from the tractor PTO shaft, through a bevel gearbox which formed the pivot assembly of the arm and a universally jointed propeller shaft extended to the actual milling drum. The milling drum was set backwards as it extended from the tractor so that the spoil was thrown back towards the centre of the milled peat field, where it could be harvested. A supporting trolley fixed to a projecting bracket at the centre of the tractor track and supported on a roller behind the drum, carried the drum arm on an adjustable suspension. The trolley, complete with extension arm and drum could be lifted by a winch rope passing over a mast frame mounted on the tractor. For bogs in early development a bladed drum was used, while a pin drum was used on extraction bogs. Plate 4-28 is an image of this type of machinery operating on a Bord na Móna bog.

Plate 4-28: Offset (Type-I) Miller attachment (source: https://www.bordnamonalivinghistory.ie/equipment-detail/miller-attachment/)

Harrow

The attachment was made up of four spoon frames, each supported on two twin rollers, and towed by a common frame, which was also supported on rollers and hitched to the tractor. The spoon frames were made of steel tubes and were triangular in shape, with two spars projecting at 45 degrees from the base of the triangle at the rear, each to carry a bank of spoons. The spoon was a curved plate, the base of which was a straight line, set at an angle to the line of travel, and while the front was curved back from its base, the rear was curved forward. The actual spoon was welded to an arm made of spring steel, which was pin jointed to the 45-degree spar to allow movement in the vertical plane. These spoons were pitched to ensure that all the peat was turned.

The four spoon frames were each free to follow the bog surface on their supporting rollers but were connected to each other by a pin-jointed link to facilitate turning. The supporting rollers of the towing frame were located in line with the towing points of the rear frames and were free to move laterally to facilitate turning.

Plate 4-29 is an image of this type of machinery operating on a Bord na Móna bog.

Plate 4-29: Harrow (source: https://www.bordnamonalivinghistory.ie/equipment-detail/harrow/)

Harvester

The purpose of this machine was to harvest milled peat from the bog fields in the same way as the Type II harvester attachment on the HD Tractor.

The tractor was a full track unit comprising a lightly constructed mainframe mounted on caterpillar-type tracks; on one side of the tracks returned at a high level to accept the harvesting attachment. The track chain was the cast link type running on cast sprockets and intermediate rollers. It was powered by a diesel engine, and the transmission consisted of a primary gearbox of special design, with a PTO shaft, and increased the transmission RPM through a standard automobile change-speed gearbox and a standard agricultural tractor transmission unit. The final drive reduction between the rear transmission half shaft and track sprocket was by a special spur gear reduction box.

The tractor was steered by a clutch and brake system of proprietary manufacture, which was built into the rear transmission unit. A driver's cab of generous proportions was fitted, with sliding doors and safety glass panels all around. Some of these cabs were of fiberglass construction, and others were of steel. The attachment consisted of a single or double spiral unit and a single belt conveyor, articulated at two points.

The spiral unit was a steel sheet casing suitably stiffened with standard steel sections, capable of housing one or two spirals. The front and rear of the casing were open. The peat ridge was

allowed to enter on the front side as the machine advanced, while the rear opening was blanked off by a trailing board, which was raised and lowered in guides as required, and when in the lowered position, was free to move in these guides as the surface of the bog demanded. The spiral or spirals were supported in this rigid casing by a bearing at each end of the shaft. The revolving spiral or spirals conveyed the peat along the bog surface and trailing board and up a sloping plate of the casing, discharging it onto the belt conveyor.

The spiral unit was supported on two inner and two outer rollers, each pair arranged so that each roller was free to follow the surface of the bog while carrying its share of the load.

The drive to the spiral or spirals was by a double universally jointed propeller shaft, and the casing was pin-jointed to a structural frame, which in turn was pin-jointed to the tractor unit, allowing complete flexibility of the spiral unit to follow the contour of the bog.

The belt conveyor was partly constructed on the structural framework connecting the spiral unit and tractor unit, including the conveyor drive pulley, and partly on the tractor unit, and the remainder formed the jib, projecting from the machine. While flat carrying idlers were used for the receiving end of the belt, flexible shaft type troughing idlers were used over the articulated portion, and conventional type troughing idlers on the jib. At the discharge end of the jib, a moveable deflector was fitted to control the trajectory of the peat.

The attachment was carried on the tractor unit, and a mast on the tractor unit was braced back to the spiral casing by a wire rope, while a multiple rope system actuated by a hydraulic ram on the mast was passed over the top of the mast and connected to the projecting conveyor jib. The top of the mast was also controlled relative to the tractor unit by a wire rope and hydraulic ram.

The driver of the machine could raise or lower the jib and the trailing boards and raise the spiral casing completely off the bog surface by hydraulics, and control the jib deflector by a simple rope winch. Plate 4-30 is an image of this type of machinery operating on a Bord na Móna bog.

Plate 4-30: Harvester (source: https://www.bordnamonalivinghistory.ie/equipment-detail/harvester/)

Milled Peat Loading Machine

The purpose of this machine was to load milled peat from peat stockpiles into railway wagons. The machine consisted of a tractor unit carrying a ground spiral on the front, extending either side of the bottom shaft was a bucket elevator which sloped back over the tractor unit. As the buckets overtopped the top sprockets of the elevator, they discharged onto a rubber belt conveyor which discharged into the railway wagons. Plate 4-31 is an image of this type of machinery operating on a Bord na Móna bog.

Plate 4-31: Milled Peat Loading Machine (source: https://www.bordnamonalivinghistory.ie/equipment-detail/loading-machine/)

Polywrapper

As described in Section 4.4.3.2 above, a polywrapper was used in the uncovering of milled peat stockpiles. The polywrapper was mounted on the three-point linkage of a tractor (see Plates 4-32 and 4-33 below). The eye of the polywrapper was attached to a pendulous swivel arm, which, as the tractor moved forward, oscillated from left to right to ensure that the polythene being collected was being dispensed evenly across a metal shaft on the polywrapper. This ensured an even spool of polythene was collected. Once the spool was at capacity, one side of the polywrapper was opened (see Plate 4-33 below), which allowed the metal shaft to be removed and replaced with a plastic one. The entire spool was then removed and sent for appropriate disposal/recycling. The metal shaft was reinserted into the polywrapper, the side closed, and the process began again until the stockpile was fully uncovered, and all the polythene collected.

Plate 4-32: Polywrapper

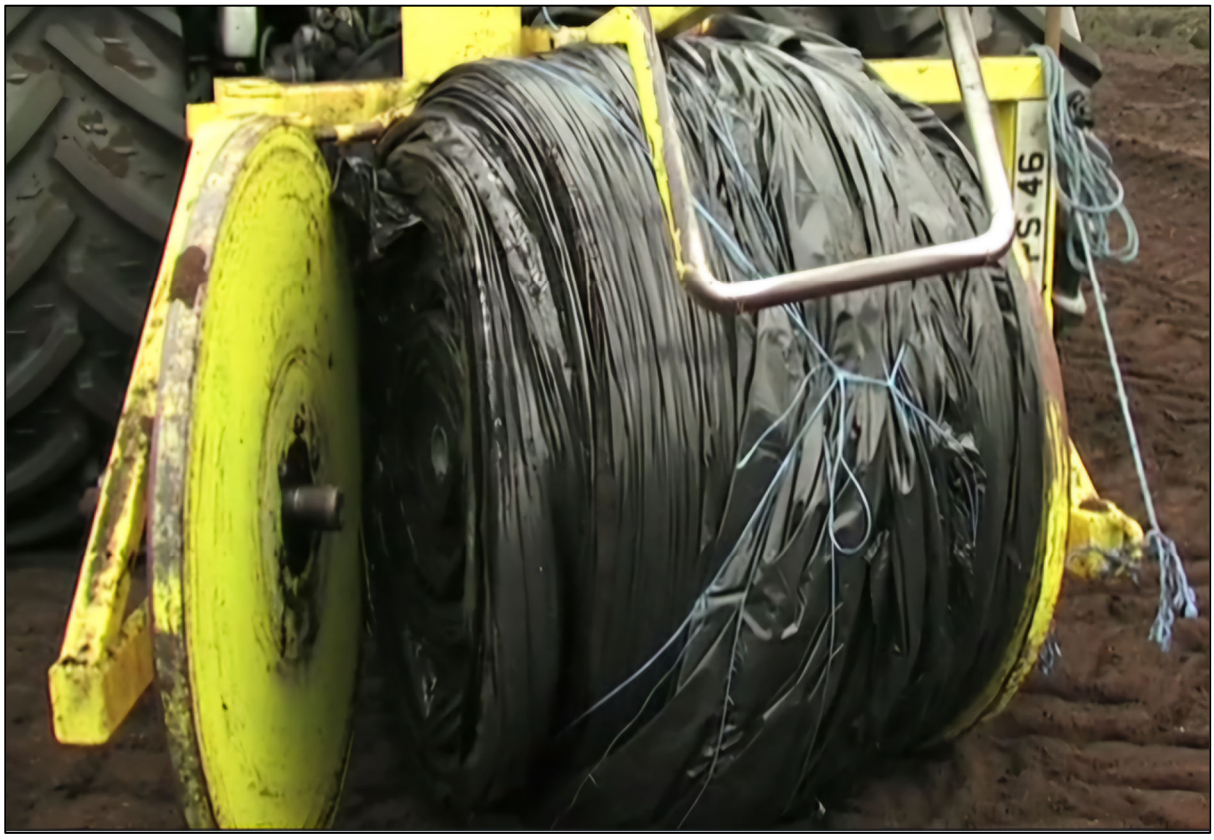

Plate 4-33: Polywrapper with the frame opened to allow access to the collected bale of polythene

4.4.5 Ancillary Structures and Infrastructure

There are a number of ancillary structures and features associated with peat extraction activities and ancillary works at the Application Site. These include:

- Workshops;
- Works offices;
- Welfare Facilities;
- Mobile fuel tanks;
- Fixed fuel tanks;
- Local holding areas;
- Peat loading facility;
- Tiphead; and
- Railway infrastructure.

With the exception of railway infrastructure, and 1 no. machine storage area (located in Lough Bannow bog), the remaining ancillary infrastructure is located outside of the Application Site boundary and as such substitute consent is not being sought in respect of this ancillary infrastructure. Nonetheless, in order to provide as detailed a description as possible of the Project, all of the ancillary infrastructure is described below.

4.4.5.1 Workshops

Mountdillon Works, (also referred to as 'the Works'), provided a central location for support services to the Application Site and other adjacent bogs within the Mountdillon Bog Group, and includes workshops, offices and welfare facilities such as toilets and a canteen. The Works are located along the N63, approximately 3.8 km east of Lanesborough.

Staff parking is provided at Mountdillon Works and it remains the central location for management of the activities within the Application Site. The workshops and offices at Mountdillon Works were originally constructed prior to the enactment of the *Planning and Development Act 1963* (i.e. 1st of October 1964) as described in Section 4.1 and Chapter 1 of this rEIAR and are not included as part of this Substitute Consent application.

Originally, the central Works site for the Mountdillon Bog Group was located at Mountdillon Bog in Co. Roscommon, northwest of the Application Site and across the Shannon River. These works are also referred to as 'Mountdillon Works', owing to their siting at Mountdillon Bog. The now-central Mountdillon Works site, which is adjacent to the Application Site in Co. Longford, became the central works site for the Mountdillon Bog Group when it was constructed in the early 1960s. The original Mountdillon Works located at Mountdillon Bog in Co. Roscommon is still present at that location today, and is still used as a smaller satellite works location for machinery repair and material storage for the bog units within the Mountdillon Bog Group to the west of the Shannon River. For clarity, reference to 'Mountdillon Works' or 'the Works' throughout this rEIAR refers exclusively to Mountdillon Works located adjacent to the Application Site in Co. Longford, as indicated in Figure 4.2, unless otherwise stated. Other smaller workshops and storage yards which were convenient for the workers on the bogs are also located across the Application Site. The workshops were mainly used to carry out repairs and maintenance on machinery which was brought in from the extraction areas.

In 1956, a railway bridge was constructed spanning the River Shannon to the north of Lanesborough, and west of Derryaroge Bog. This railway crossing facilitated rail connectivity between all of the bogs within the Mountdillon Bog Group, as well as connectivity to Mountdillon Works.

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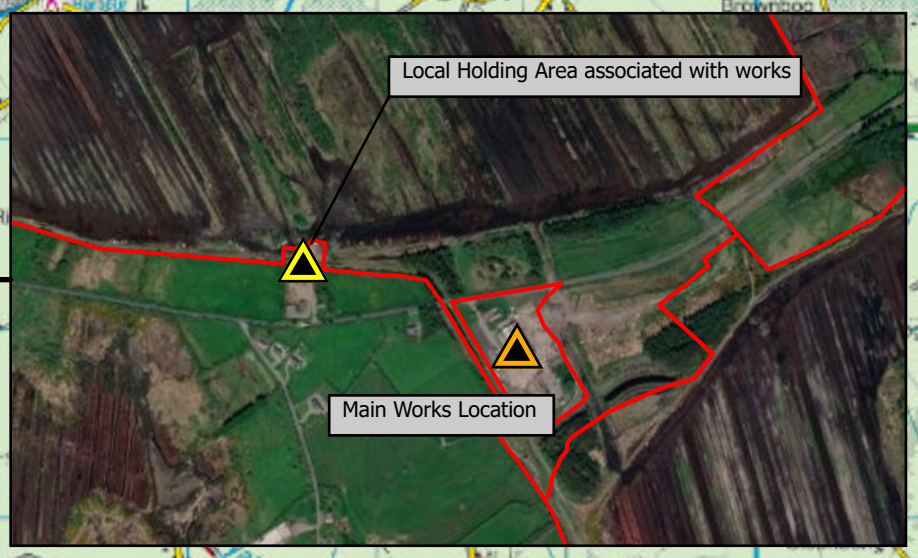
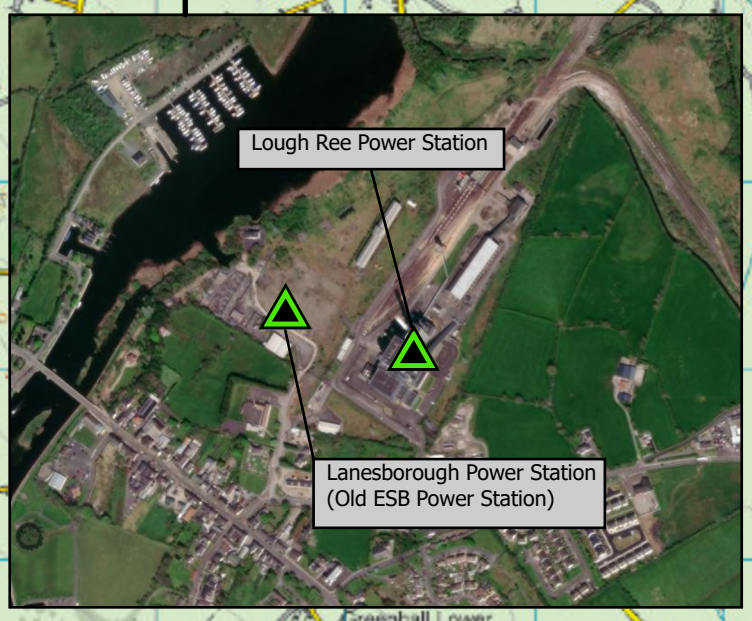
Killashee

Lanesborough





Legend

- Application Boundary
- Power Stations Locations
- Mountdillon Works
- Local Holding Areas

Bord na Móna

Figure 4.2: **Location of Mountdillon works within the Application Site**

DRWG No.	Scale:	Drawn by:	Date:
BNM-PG-24-21-30	**1:40,000**	**AK**	**24/03/2025**

During the Peat Extraction Phase, the majority of workers at the Application Site would arrive to Mountdillon Works prior to mobilising machinery stored at the Works site and navigating to the required location within the Application Site. Machinery was parked at the Works or at the local holding areas in Derryaroge, Derryadd, or Lough Bannow when not in use, and refuelling of machinery was carried out from dedicated refuelling areas at fixed fuel tanks located in the yards, although in some circumstances where machinery could not be tracked back to the Works buildings, refuelling was also carried out on the bogs at the Application Site at designated areas, away from drains or rivers. Concrete bunds and oil interceptors were provided at the Works to prevent release of fuels to the ground or surface water bodies. All tanks and drums were, and continue to be, stored in bunded areas at the Works. These standard practices were in place prior to the implementation of the IPC Licence in 2000. The workshops were mainly used to carry out repairs and maintenance on machinery which was brought in from the extraction areas.

A machine and wheel wash facility are also located at Mountdillon Works. Machine washings generated due to the cleaning of various plant machinery (using a power steam wash system when machinery left the bogs) at wash bays drained into the adjacent peatlands drainage system.

4.4.5.2 Works Offices

The offices at Mountdillon Works provided an administration centre for the Application Site and other bogs within the Mountdillon Bog Group. Permanent administration staff were employed throughout the Peat Extraction Phase from the time of construction of these buildings in the early 1960s. The office buildings also provided welfare facilities such as toilets and a canteen to serve employees and staff at Mountdillon Works buildings and within the Application Site.

4.4.5.3 Welfare Facilities

Welfare facilities were also provided across the Application Site. These typically took the form of small buildings and temporary structures to provide workers on peat extraction fields a clean area to take lunch/tea breaks and provide welfare facilities. While facilities were available at the Mountdillon Works offices, these smaller outposts were situated across the Application Site to provide easier access to workers further away from the central works buildings. Any remaining welfare facilities will be decommissioned as required as part of the IPC Licence decommissioning plans.

Plate 4-34 illustrations the former welfare facility at Derryaroge Bog.

Plate 4-34: Former Welfare Facility at Derryaroge Bog, north of Mountdillon Works (source: Bord na Móna)

4.4.5.4 Fuel Storage

Fuel was, and still is, stored within above bunded ground tanks at Mountdillon Works in compliance with IPC Licence Condition 9 (Plate 4-35). The fuel tanks are bunded to contain any

potential fuel spills or leaks. Refuelling procedures were upgraded to standard bunding specifications to comply with IPC Licence requirements in 2000 (refer to Section 4.7.6 for details).

The filling of tanks from the fuel supplier took place at the main fixed tanks at Mountdillon Works. Refuelling of vehicles and machinery was carried out at the Mountdillon Works, or at the local holding areas in Derryaroge, Derryadd, or Lough Bannow, but in some circumstances where machinery could not be tracked back to the Works buildings or local holding areas, refuelling was also carried out on the bogs at designated areas, away from drains or rivers, in compliance with IPC Licence Condition 9.1.13. Service trains/railcars with a fuel dispensing unit, travelled from the Works to the designated bog area to refuel the machine in question. The service trains/railcars, as shown in Plate 4-36 and Plate 4-37 were filled from the main tanks at Mountdillon Works and travelled by rail to refill the plant machinery on the bog.

This occurred at a frequency of up to three times a week during peak times during the Peat Extraction Phase. This frequency was significantly reduced outside of the peat extraction season (i.e. October to March). The practice of bunding at the Works and for mobile refuelling units was introduced in the 1970s.

Plate 4-35: Existing fuel storage tanks with bunding at Mountdillon Works

Plate 4-36: Decommissioned mobile fuel tank (rail cart) on Derryaroge Bog within the Application Site (source: Bord na Móna)

Plate 4-37: Decommissioned service train south of Mountdillon Works (source: Bord na Móna)

4.4.5.5 Local Holding Areas

There are 3 no, local holding areas associated with peat extraction at the Application Site, located at Derryaroge, Derryadd, and Lough Bannow bogs. The Lough Bannow machine storage

area is the only one within the Application Site. The location of the local holding areas is presented in Figure 4-3 below.

Local holding areas were areas in which peat extraction machinery was parked at the end of the working day. Given the size of the Application Site, it wasn't necessarily sensical to track machinery back to Mountdillon Works each evening, and back to the active areas of peat extraction in the morning, as this would require significant time, given the speed of the machines, and result in unnecessary fuel use. As such, informal local holding areas were established by workers on the bog. These areas were proximate to road networks to allow staff easy and safe access without tracking over bog, and essentially comprised flat areas which were suitable for machines to park on.

4.4.5.6 Peat Loading Facility

A peat loading facility is provided within the Mountdillon Works yard since 2021. Following the closure of Lough Ree Power Station in December 2020, all remaining peat stockpiles at the Application Site were transported via rail from the Application Site to the Mountdillon Works peat loading facility for weighing and loading into heavy goods vehicles (HGVs). HGV movements were via the N63 west and Cloonfore/Clonfower Road (L1163) southwest, and later via the N3 west and the R392 southeast. The stockpiles of milled peat were then transported to either Edenderry Power Station for electricity generation, or to Derrinlough Briquette Factory for the manufacture of solid fuel products. Prior to the closure of Lough Ree Power Station, all deliveries of peat from the Application Site to the Lough Ree Power Station in Lanesborough went directly from stockpiles on the Application Site via rail carriages. An aerial image of the peat loading facility within Mountdillon works is provided in Figure 4-3.

Figure 4-3: Mountdillon Works peat loading facility (source: Google Maps)

4.4.5.7 Tipheads

Tipheads were specific types of infrastructure which facilitated the loading of sod peat into trucks and trailers. There is one tiphead directly adjacent to the Application Site in south Derryaroge, across the N63 from the Mountdillon Works (see Figure 4.4 below). The tiphead at Derryaroge was used up until sod peat sales finished in 1984.

N

Legend

- Derryaroge Tip Head
- Application Boundary

Bord na Móna

Figure 4.4: **Derryarogue Tip Head Location**

DRWG No.	Scale:	Drawn by:	Date:
BNM-PG-24-21-24	**1:20,000**	**AK**	**24/03/2025**

4.4.5.8 Railway Infrastructure

Peat extraction areas were served by a network of permanent and temporary narrow-gauge rail tracks (approximately 1m in width and with track lengths of approximately 9m), the majority of which were constructed in the 1950s and 1960s. During the early years of peat extraction activities and ancillary works, the lifting and laying of rail was done by hand before equipment was designed for that purpose.

The railway was the only means of transporting peat from the Application Site to either the power station (Lanesboro Power Station from 1958 to 2004 and Lough Ree Power Station from 2004 to 2020), the tiphead for sale to the public (sod peat only between 1952 and 1984), or peat loading facility for export to Edenderry Power Station or Derrinlough Briquette Factory (post-December 2020). In the case of the Application Site, from 1984 to 2019 milled peat was the only form of peat extracted, and this was transported via bog railway to Lanesboro Power Station, and following the closure of Lanesboro Power Station in 2004, to the Lough Ree Power Station at the same site.

The total length of permanent track laid within the Mountdillon Bog Group was approximately 113km. Approximately 37km of this permanent track was located within the Application Site boundary and facilitated the movement of extracted peat within the Application Site from the 1960s until November 2022 when stockpile removal finished. In addition, temporary track was also laid across the Application Site as required. When it was decided to sell a stockpile, a temporary railway track was laid alongside the stockpile to connect to the permanent railway line and allow for ease of transport from the Application Site to the power station, or in later years to the centralised peat loading facility at Mountdillon Works. On completion of removal of a stockpile, the temporary track was lifted and re-laid along another stockpile.

The gauge of the track used was 36-inches (0.91m). The rail, in general, weighs 30lbs (13.6kg) or 35lbs (15.6kg) per yard, mounted on steel sleepers, 6-foot (1.8m) in length and 2.5-foot (0.76m) apart to which the rail is attached by steel clips. In certain positions, notably on lines external to the bogs, rail track of 45lbs to 60lbs (20kg to 27kg) per yard on creosoted pine or redwood sleepers was used. The length of a standard section of temporary track was 30-foot (9.2m) and the weight was approximately 1200lbs (544kg), when complete. The section was lifted and laid by a Bord na Móna tractors with special lifting equipment or by a dragline. The standard turnout also had a length of 30-foot (9.2m) and was in two sections for ease of movement.

Permanent rail bed construction on the bog surface depended primarily on good drainage. The rail bed was formed of dry milled peat or of mould and sods placed in position by machine to a depth of 2 to 3-foot (0.6 to 0.9m) and well rolled/compacted. Subsequently, the beds of permanent lines were ballasted, preferably with 9-inch (0.22m) depth of sand or fine gravel. Several level crossings were installed around the Application Site. The gates at level crossings were of single leaf with spans varying from 25 to 40-foot (7.6 to 12.1m). Light mesh was suspended from a hollow top boom of steel. Standard discs and warning lamps complete the level crossing gates.

The railway wagons were pulled by diesel powered locomotives, examples of which are shown in Plate 4-38.

Plate 4-38: Example of railway locomotive and wagons hauling milled peat to the power plant (source: Bord na Móna)

It should also be noted that the nearby Derraghan Ash Disposal Facility (ADF) is an EPA Licenced ash repository (Licence No. P0610-03) which is located to the west of Derryadd Bog and was used for disposal of ash from Lanesboro power station from 2002 until it's closure in 2004 and LRPS from 2004 until its closure in 2020. Derraghan ADF and the LRPS, while both ESB sites, relied upon Bord na Móna rail infrastructure to transport ash from the power station via rail carts, through the Application Site, and on towards Derraghan bog to the west of Derryadd Bog. The rail wagons pulled by Bord na Móna trains were covered with a lid to ensure that no spillage of ash or dust occurred (see Plate 4-39 below).

Plate 4-39: Example of railway locomotives pulling ash wagons

The network of railway lines also connected to the yard at the Mountdillon Works where maintenance was carried out on the locomotives and wagons as required.

A map of the railway network at the Application Site is presented in Figure 4-5 below.

Killashee

Lanesborough

Legend

- Application Boundary
- County Boundaries

Railway Network

- Railway Network

Bord na Móna

Figure 4.5: **Railway Network at the Application Site**

DRWG No.	Scale:	Drawn by:	Date:
BNM-PG-24-21-31	1:40,000	AK	25/03/2025

4.4.5.9 Railway Equipment

Extracted peat was transported from stockpiles on the Application Site via a series of permanent and temporary railway tracks. The equipment which facilitated the installation and maintenance of the railway tracks, as well as the equipment used to transport peat on the railway lines, are described below.

Rail Shifter

A rail shifter was an attachment fitted on to tractors which was used to lift temporary railway tracks in sections and build them onto bolster bogies for transport to a new area. The rail lifter consisted of a lightly constructed main frame supported on two bogies and an overhead lattice work beam supported from the main frame to allow the passage of the rail sections through the machine. When six sections were built on the bolster bogies, they were hauled away by a locomotive. Plate 4-40 is an image of this type of machinery operating on a Bord na Móna bog.

Plate 4-40: Rail Shifter (source: https://www.bordnamonalivinghistory.ie/equipment-detail/rail-shifter/)

Rail Moving Attachment

The purpose of the rail moving attachment was to lift and lay temporary railway track along sod peat ricks and milled peat piles. The attachment was fitted to a tractor and consisted of an A-frame jib pivoted on a bracket secured to the track frame of the tractor and braced back at the top by wire rope to a projected ballast box on the other side of the tractor. A short jib was used for sod peat operations while a longer and a longer jib was used for milled peat operations. Plate 4-41 is an image of this type of machinery operating on a Bord na Móna bog.

Plate 4-41: Rail Moving Attachment to lift and lay temporary railway track, along sod peat ricks and milled peat piles. (source: https://www.bordnamonalivinghistory.ie/equipment-detail/rail-moving-attachment/)

Locomotive 80HP (Wagonmaster)

The locomotive hauled peat from the stockpiles across the Application Site to their required end destination (i.e. Lanesboro Power Station, and later Lough Ree Power Station, the tiphead for public sale up to 1984, or to Mountdillon Works following the closure of Lough Ree Power Station in December 2020). The locomotive was powered by a water-cooled diesel engine driving through a fluid coupling, automotive type clutch, standard automobile change speed gearbox, a special reversing bevel/spur reduction gearbox and drive and coupling rods to the wheels. The main frame was fabricated steel plate. The axles ran in self-aligning double row roller bearings in cast steel housings sliding in horn guides with manganese steel wearing faces. A cab of generous size was included, with a tumbling-type seat to facilitate driving in both directions. The clutch control pedal was duplicated for the two driving positions. The braking system was mechanical hand operated. The locomotive was fitted with beam lighting, electric windscreen wipers and driving mirrors for both directions of travel. Plate 4-42 is an image of this type of machinery operating on a Bord na Móna bog.

Plate 4-42:Locomotive with wagons (source: https://www.bordnamonalivinghistory.ie/equipment-detail/diesel-locomotive/)

Wagons

Wagons had a capacity of 16 cubic metres and were designed with two diamond bogies for sod and milled peat haulage. One bogie of each wagon was free to float 152mm in any direction to prevent derailment on uneven temporary track. The diamond bogie with its centre springs gave great flexibility and prevented axle failures. The wagon bearings were taper roller bearings which were grease-packed and fitted in the wheel hubs, if wheel hubs were fitted..

The use of aluminium to fabricate the sides and floor of milled peat wagons reduced the unladen weight of the wagon when compared to heavier materials such as wood and steel, and therefore facilitated a greater payload (i.e. a greater amount of peat) to be transported per train. Furthermore, the use of aluminium resulted in considerable reduction in the maintenance and painting costs.

Rail Car

Rail cars were used by the Manager or authorised members of their staff, to make inspections and for tours of the bog. Rail cars were equipped with first-aid equipment and also worked as a bog ambulance if needed. Rail cars were fitted with a water-cooled petrol engine, the power from which was transferred through an automotive clutch to a gearbox, and then transferred to each axle via a chain drive. Beam lights and electric windscreen wipers were fitted at each end of the rail car and a short-wave radio transmitting and receiving set enabled the occupants to keep contact with the Works and the larger machines that were fitted with radio units on the bog. Plate 4-43 is an image of this type of machinery operating on a Bord na Móna bog.

Plate 4-43: Rail Car (source: https://www.bordnamonalivinghistory.ie/equipment-detail/rail-car/)

4.4.6 Site Services

Water consumption across the Application Site is primarily at the Mountdillon Works for domestic use. The water supply at Mountdillon Works is from the Lanesborough Public Water Scheme (PWS) which is supplied from two groundwater boreholes; one located at Lisreevagh to the west, and one located to the northwest next to the former Lanesborough Power Station (LBPS).

Wastewater from the welfare facilities at the Mountdillon Works is, discharged to an on-site septic tank with the effluent discharged to a percolation system through peat before penetrating to ground. The septic tank is inspected and de-sludged annually by a licenced waste permit holder to ensure the treatment system is working optimally.

Electricity supply to Mountdillon Works buildings and workshops, and also to the drainage pump stations, are powered by mains electricity from the national grid connected to overhead electrical power lines, within the Application Site. There are existing 110kV and 38kV overhead power lines which cross the Application Site to the south of the Mountdillon Works and at the northern end of Derryaroge Bog.

Compressed air (oxygen and acetylene) are used mainly at the Mountdillon Works for welding and cutting purposes to maintain plant and equipment.

In addition to the above, other materials consumed as part of the peat extraction activities and all ancillary works would have been polythene sheeting for covering stockpiled peat, timber and steel for the rail lines, gravel for the rail beds etc.

4.5 1949 TO 1988 – INITIAL DEVELOPMENT & PEAT EXTRACTION (PRE-EIA DIRECTIVE)

4.5.1 Site Description 1949 (Pre-Extraction)

Prior to the commencement of drainage, which first occurred on the Application Site in 1949, the Application Site was covered by an active raised bog, with the surface being wet, acidic and deficient in plant nutrients, with open Sphagnum-dominated vegetation. Raised bogs are accumulations of deep acid peat where peat can range from 3-12m deep. The "raised bog" name is derived from the elevated dome which develops as the bog grows due to the accumulation of peat. The topography across the site prior to the onset of peat extraction activities is estimated to be 39 – 62 mOD. These estimations have been deduced from the 6inch OSI maps where point data is available.

Water in a raised bog is continuously circulating, and pre-development, the Application Site would have been nutrient-poor and waterlogged on the surface. The principal supply of water to the Application Site would have been from rainfall. Water would have been lost from the Application Site from surface water runoff particularly during the winter months when the storage capacity of the bog would have been fulfilled due to higher levels of seasonal precipitation. Water may also have been lost through the lower levels of the peat deposits, especially where the bog is underlain by gravels or sands without underlying low permeability lacustrine deposits (i.e., clay layer). The pre-development water table at the Application Site was likely very stable with only minor fluctuations and remaining within a few centimetres of the bog's surface.

The primary land-use change associated with the peat extraction activities and all ancillary works occurs during the initial drainage of the bog in advance of peat extraction. Constructed drainage ditches drain the upper surface of the bog by lowering the local peat water table. After the Application Site was drained, vegetation was removed from the bog surface, leaving only bare peat fields between the drains. Around this time and in the years that followed, ancillary features were also constructed including railway lines, workshops, welfare facilities and peat loading facilities.

During the Peat Extraction Phase of the project, only minimal land use change occurred which predominantly related to minor annual topographic changes caused by ongoing peat extraction activities and all ancillary works. While peat extraction activities and all ancillary works were ongoing it was not possible to rehabilitate the underlying peatland.

4.5.2 Drainage and Peat Extraction

The timing of the installation of drainage and initiation of peat extraction varied across the Application Site. Derryaroge Bog was the first bog to commence clearance and drainage in 1949 and would have experienced a relatively abrupt change in land cover with the commencement of peat extraction in 1952. Sod peat extraction commenced in Derryaroge in 1952, which, according to annual reports from the time, assisted with the overall drainage of the bog by removing the acrotelm (see Section 4.4.1 above for description on process of removal of acrotelm/top layer of bog). Clearance and drainage works on Derryadd and Lough Bannow Bogs commenced in 1960.

The earliest aerial imagery available (1973) confirms that that time, drainage to facilitate peat extraction was already inserted at Derryaroge, Derryadd and Lough Bannow bogs. Figure 4-9 below presents the extent of peat extraction at the Application Site in 1973, which has been

deduced from the earliest available aerial imagery for the Application Site (i.e. 1973). All aerial imagery available for the Application Site is included in Appendix 4.5.

The primary and greatest land-use change associated with the peat extraction activities and all ancillary works on the Application Site occurred during the initial drainage and vegetation removal of the bogs in advance of peat extraction activities and all ancillary works. This impact would have predominantly occurred in advance of 1988 at the Application Site. A photographic accompaniment illustrating the types of activities described below can be found in Appendix 4-18 *Bord na Móna: Peat Development in Ireland 1954*.

Table 4-1: Operational History of the Application Site (source: Bord na Móna Annual Reports)

Bog Unit	Commencement of Site Preparation Works (vegetation clearance and drainage insertion)	Extraction Commenced	Extraction Ceased
Derryaroge Bog	1949	1952	July 2019
Derryadd Bog	1960	1964	July 2019
Lough Bannow Bog	1960	1964	July 2019

Table 4-2 describes the general activities within the Application Site over a calendar year during each of the four quarters from 1952, when peat extraction commenced, to June 1988. Some drain maintenance was carried out during the full year, but it was mainly restricted to outside the peat extraction season. Fuel handling and refuelling would have increased significantly during the peat extraction season due the increased activity of the peat extraction machinery.

Table 4-2: Annual peat extraction activities at the Application Site 1952 – July 1988

Calendar Quarter	Activities
January to March	Drain/Machinery/Pump/Silt Pond maintenance, Stockpile removal, peat transportation
April to June	Peat extraction, Stockpile development/removal, peat transportation
July to September	Peat extraction, Stockpile development/protection/removal, peat transportation
October to December	Drain/Machinery/Pump/Silt Pond maintenance, Stockpile removal, peat transportation

4.5.3 Drainage Design

As part of the development of the Application Site for peat extraction, parallel surface water drains as per the methodology outlined in Sections 4.4.3.1 and 4.4.3.2 were created by machine excavators at specific intervals, depending on whether milled or sod peat was being extracted. The strips of bog between these drains were retained to form peat extraction 'fields'. By 1988 drainage channels, silt ponds, outfalls and pumps were extant at the Application Site. Appendix 4.19 contains the Planning Drawing Pack which shows the detailed drainage across the Application Site.

4.5.3.1 Derryaroge Bog

Drainage works first commenced in Derryaroge Bog by 1949 according to Bord na Móna Annual Reports from that time. The earliest available aerial imagery dating from 1973 shows both milled and sod peat drainage inserted at Derryaroge Bog. In 1988, there were 11 no. pumps, 6 no. silt ponds, and 10 no. surface water emission points installed on Derryaroge Bog.

4.5.3.2 Derryadd Bog

Bord na Móna Annual Reports indicate that Derryadd Bog was first drained in 1960, and aerial imagery from 1973 shows that drainage at Derryadd Bog consisted of milled peat drainage, . By 1988, there were at least 3 no., and up to 6 no. pumps installed at Derryadd Bog. The uncertainty around the number of pumps in situ as of 1988 is a result of the uncertainty of the date of installation of 3 no. pumps which are present on the bog. For the purposes of this rEIAR, it is assumed that these pumps were in place at the 1988 baseline. As of 1988, there were 2 no. silt ponds installed at Derryadd Bog, and 5 no. surface water emission points in place.

4.5.3.3 Lough Bannow Bog

Bord na Móna Annual Reports indicate that similarly to Derryadd Bog, Lough Bannow Bog was first drained in 1960, with the aerial imagery from 1973 showing that the drainage at Lough Bannow Bog consisted of milled peat drainage. There are 3 no. pumps located at Lough Bannow Bog. The date of installation of these pumps is not known. For the purposes of this rEIAR, it is assumed that these 3 no. pumps were in place at the 1988 baseline. There are 4 no. surface water emission points in place on Lough Bannow bog, all of which were in place pre-1988. At present, there are 5 no. silt ponds located on Lough Bannow Bog, 3 no. of which were installed between 1988 and 1995. The installation date of the remaining 2 no. silt ponds is unknown. For the purposes of this rEIAR, it is assumed that the installation dates of the 2 no unknown silt ponds was pre-1988, and as such, they were in place at the 1988 baseline.
The extent of the drainage network in place in Derryaroge, Derryadd and Lough Bannow Bogs and timelines of installation associated with same are outlined in Figures 4.6, 4.7 and 4.8 respectively.

N

EO-7
IO-7
EO-3
IO-3
EO-5
IO-8
IO-2
IO-1
EO-2
IO-6
IO-5
EO-1
IO-4
EO-6
IO-10

Legend

- Application Boundary
- Pre - 1988 Discharge Points
- P05_09 Drain

Pump Sites

- 1988 - 1995
- Decommissioned
- Not Known
- pre - 1988

Silt Ponds

- 1988 - 1995
- Pre - 1988
- Not Known

Derryadd Enhanced Drainage

- Decommissioned
- Not Known (Post-1995)
- Pre-1988 Upgraded Post-1995
- Pre-1988 Main Drainage Channels (Including rehabilitation area)

Bord na Móna

Figure 4-6:

Derryarogue Bog Drainage Network

DRWG No.	Scale:	Drawn by:	Date:
BNM-PG-24-21-26	1:19,000	AK	24/03/2025

N

IO-1 IO-2 IO-3 IO-4 IO-5 IO-31 EO-6 IO-10 IO-40 EO-6 IO-11 IO-11 EO-2 IO-11 EO-10 IO-16 EO-10 IO-15 EO-8 EO-9 IO-14 IO-14 IO-12 EO-7 EO-7 IO-12 IO-12 IO-23 EO-10 IO-30 IO-13 IO-13 IO-18 IO-13 IO-13 EO-8 EO-12 IO-22

Legend

- Application Boundary
- Pre - 1988 Discharge Points
- P05_09 Drain

Pump Sites

- Not Known
- pre - 1988

Silt Ponds

- 1988 - 1995
- Pre - 1988
- Not Known

Derryadd Enhanced Drainage

- Decommissioned
- Not Known (Post-1995)
- Pre-1988 Upgraded Pre-1995
- Pre-1988 Upgraded Post-1995
- Pre-1988 Main Drainage Channels (Including rehabilitation area)

Bord na Móna

Figure 4.7:

Derryadd Bog Drainage Network

DRWG No.	Scale:	Drawn by:	Date:
BNM-PG-24-21-27	1:18,000	AK	24/03/2025

N

IO-15
EO-8
EO-9
IO-14
IO-14
EO-13
IO-23
EO-10
IO-13
IO-13
IO-30
EO-10
IO-13
IO-13
IO-26
EO-12
IO-24
IO-24
IO-24
IO-22
IO-25
IO-36
IO-26
IO-27
IO-27
IO-25
IO-27
IO-28
IO-28
IO-29
IO-29
IO-29
EO-14

Legend

Application Boundary

Pre - 1988 Discharge Points

Pump Sites

Not Known

Silt Ponds

1988 - 1995

Not Known

Derryadd Enhanced Drainage

Decommissioned

Not Known (Post-1995)

Pre-1988 Upgraded Pre-1995

Pre-1988 Upgraded Post-1995

Pre-1988 Main Drainage Channels (Including rehabilitation area)

Bord na Móna

Figure 4.8:

Lough Bannow Bog Drainage Network

DRWG No.	Scale:	Drawn by:	Date:
BNM-PG-24-21-28	1:17,000	AK	24/03/2025

Tailte Éireann

4.5.4 Peat Extraction Pre-1988

4.5.4.1 Background

As discussed in Chapter 5 - Planning Policy, the decision to commence peat extraction at the Application Site was closely linked to the decision of the Electricity Supply Board (ESB) to construct the 20MW sod peat-fired Lanesboro Power Station, located in Lanesborough, west of the Application Site. This initial 20MW installation, which was known as Unit 1 of Lanesboro Power Station, was planned and constructed on the basis of an agreement between ESB and Bord na Móna that the station would be fuelled with peat supplied exclusively by Bord na Móna, which was to be extracted from bogs in the surrounding area, including the Application Site. The sod peat-fired Unit 1 of Lanesboro Power Station was commissioned in 1958. Subsequently, a 40MW Unit 2 and 45MW Unit 3 of Lanesboro Power Station were commissioned in 1966 and 1983 respectively. Rather than sod peat, Unit 2 and Unit 3 were fired by milled peat, also supplied by Bord na Móna. Unit 1 of Lanesboro Power Station was closed in 1983, with Unit 2 and Unit 3 continuing to operate until 2004 and 2003 respectively. Lough Ree Power Station, a 100MW generating unit, was commissioned in 2004, and ultimately replaced the Lanesboro Power Station. Lanesboro Power Station was demolished in 2007.

4.5.4.2 Sod Peat Extraction 1952 to 1984

As noted in Section 4.5.2, peat extraction began at the Application Site in Derryaroge Bog in 1952 in the form of sod peat. Derryaroge Bog was the only bog within the Application Site which was subject to sod peat extraction. Before Lanesboro Power Station was commissioned in 1958, sod peat was extracted for domestic sale and to supply the Dublin market via trucks. Sod peat from Derryaroge Bog supplied Unit 1 of the LPS, from its opening in 1958, to its closure in 1983. The processes and machinery associated with sod peat extraction are described in Section 4.4.3.1.

Sod peat from the Application Site was also brought by rail to the tiphead in Derryaroge for sale to the public. In total, there were three tip heads located within the Mountdillon Bog Group; at Mountdillon Bog, Derraghan Bog, and Derryaroge Bog, all of which are located outside of the Application Site. Sod peat extracted from the Application Site which was transported off site via tiphead went exclusively through the tiphead at Derryaroge Bog. The tipheads at Mountdillon and Derraghan bogs closed in the 1970s, with the tiphead at Derryaroge remaining operational into the 1980s.

Sod peat extraction at Derryaroge Bog ceased in 1984 following the closure of LPS Unit 1. Following the cessation of sod peat extraction in Derryaroge Bog, the areas of sod peat extraction were converted to milled peat extraction (i.e. the drainage infrastructure was amended to facilitate milled peat extraction) to allow peat from Derryaroge Bog to continue to supply Lanesboro Power Station.

4.5.4.3 Milled Peat Extraction 1964 to 1988

Milled peat extraction commenced at the Application Site in 1964. From 1966, milled peat from the Application Site was sent to Lanesboro Power Station to supply the newly-commissioned milled peat-fired Unit 2 and Unit 3 of the power station. The processes and machinery associated with milled peat extraction are described in Section 4.4.3.2.

During the period from 1964 to 1988 milled peat was the predominant form of peat extraction ongoing throughout the Application Site. Milled peat was the only form of peat extraction

undertaken on Derryadd and Lough Bannow bogs. From 1984 onwards, following the cessation of sod peat extraction in Derryaroge Bog, milled peat extraction was the only form of peat extraction at the Application Site. Figure 4-9 shows a map of the peat extraction areas at the Application Site in 1973, illustrating areas that were in active extraction and areas where peat extraction had not yet commenced.

Appendix 4.5 includes available aerial imagery from 1973, 1995, 2004, and 2019. Labels are added to the imagery to identify the three bogs within the Application Site as well as neighbouring bogs.

Milled peat was transferred from the stockpiles into railway wagons by a loading machine or excavator and transported by rail to the power station at Lanesborough exclusively during this time period.

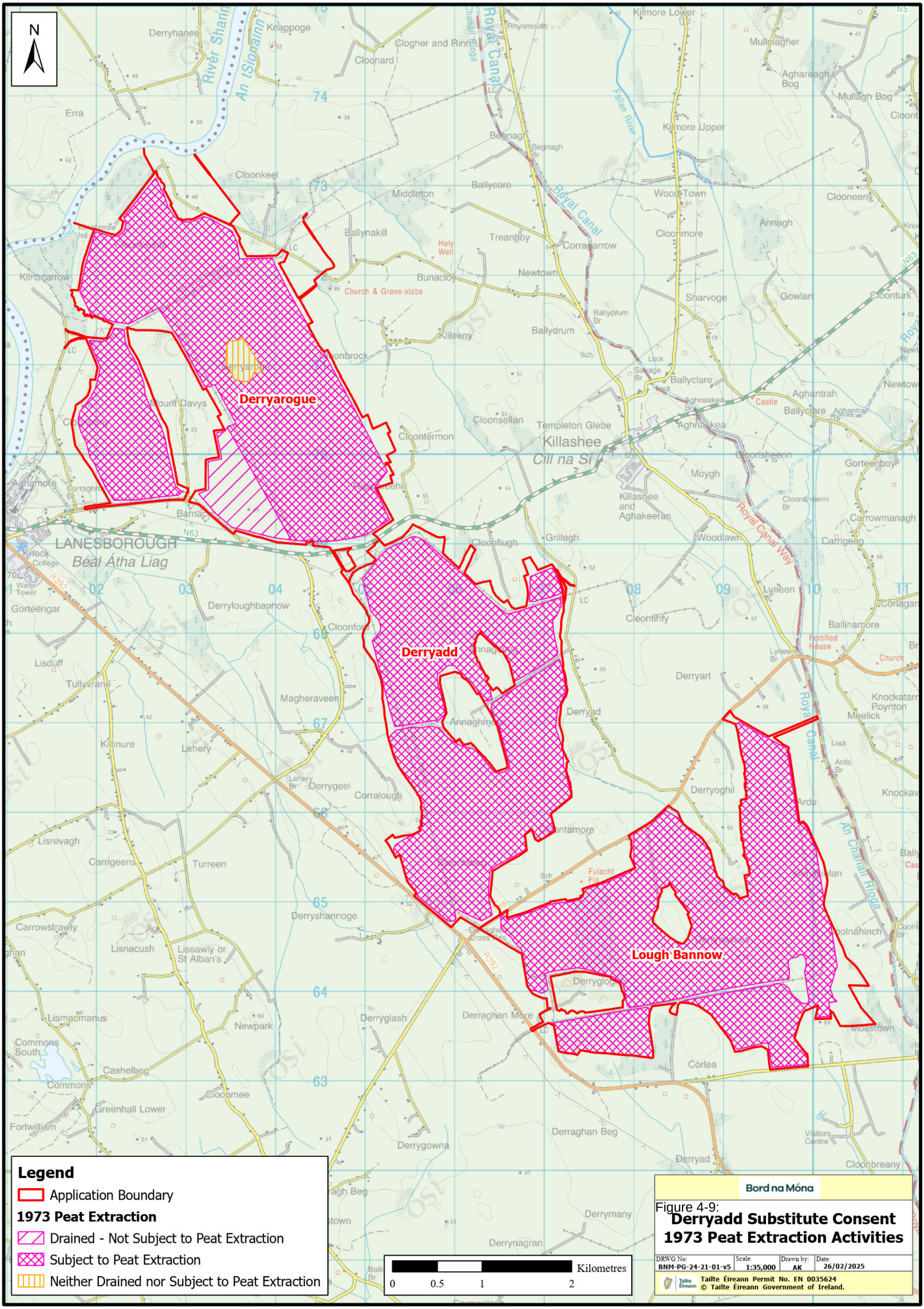

N
Derryhanee
Knappoge
River Shannon
An tSionainn
Clogher and Rinn
Cloonard
Chanail Rioga
Royal Canal
Rhynmouth
Kilmore Lower
Mullolagher
Aghareagh Bog
Mullagh Bog
Erra
74
Begnagh
Begnagh Br
Fallan River
Kilmore Upper
Cloonkeel
73
Ballycore
Middleton
Royal Canal
Wood Town
Clooneeny
Annagh
Cloonmore
Ballynakill
Holy Well
Treanboy
Corragarrow
Kilnacarrow
Bunacloy
Newtown
Church & Grave-slabs
Sharvoge
Gowlan
Cloonturk
N63
Ballydrum Br
Killeeny
Ballydrum
Sch
Lock
Savage Br
Ballyclare
Aghantrah
Castle
Aghnaskea
Mount Davys
Cloonsellan
Templeton Glebe
Killashee
Cill na Si
Cloontermon
Cloonsheerin
Gorteenboy
Moygh
Killashee and Aghakeeran
Cloonsheerin Br
Carrowmanagh
Barnacor
N63
LANESBOROUGH
Béal Átha Liag
Grillagh
Woodlawn
Carrigeen
Royal Canal Way
Knock College
Water Tower
R392
02
03
04
05
06
07
08
09
10
11
Lyneen
Corlagan
Gorteengar
Derryloughbannow
Cloonfiugh
Cloonfinfy
Ballinamore
Fortified House
Church
Lisduff
Tullyvrane
Derryart
Derryadd
Annaghmore
Derryad
Knockatarry
Poynton
Meelick
Magheraveen
67
Killinure
Lehery
Lehery Br
Derrygeel
Corralough
Derryoghil
Ards
Ards Br
Knockav
Lisrevagh
Carrigeens
Turreen
Derryshannoge
Carrowstrawly
Lisnacush
Lissawly or St Alban's
Lough Bannow
Derryglogh
Derraghan More
Derryglash
Lismacmanus
Newpark
Commons South
Cashelbeg
Commons
Cloonmee
Greenhall Lower
Fortwilliam
Corlea
Derraghan Beg
Derrygowna
Derrymany
Derrynagran
Visitors Centre
Cloonbreany
Legend
Application Boundary
1973 Peat Extraction
Drained - Not Subject to Peat Extraction
Subject to Peat Extraction
Neither Drained nor Subject to Peat Extraction
Kilometres
0
0.5
1
2
Bord na Móna
Derryadd Substitute Consent
1973 Peat Extraction Activities
DRWG No: BNM-PG-24-21-01-v5
Scale: 1:35,000
Drawn by: AK
Date: 26/02/2025
Tailte Éireann Permit No. EN 0035624
© Tailte Éireann Government of Ireland.

Figure 4-9:

4.5.4.4 Peat Extraction Volumes 1952 - 1988

It is estimated that approximately 60,000 tonnes of sod peat were extracted annually from Derryaroge Bog between 1952 and 1984, which would have been predominantly delivered to Unit 1 of the LPS between 1958 and 1984. Smaller volumes of sod peat were transported by rail to the tiphead at Derryaroge Bog, north of the Mountdillon Works, for public sale.

It is estimated that approximately 329,000 tonnes of milled peat was produced annually at the Application Site between 1964 and July 1988, with deliveries of stockpiled peat to the LPS (Unit 2 and 3) occurring from 1966 onwards. While Unit 2 of LPS opened in 1966, milled peat extraction started earlier in 1964 to ensure that there was sufficient supply in stockpiles in the event of future bad harvests due to weather.

It is estimated that between the commencement of peat extraction at the Application Site in 1952 and July 1988, approximately 9,998,326 tonnes of peat was extracted (1,920,000 tonnes of sod peat from 1952 – 1984 and 8,078,326 tonnes of milled peat from 1964 – July 1988).

4.5.5 Control Measures pre-1988

With the exception of silt control (which from 1974 was subject to a formal management program as discussed in Section 4.5.6.9 below), formal documentation outlining dedicated measures referred to as control measures practised on site from 1948 - July 1988 are not available. However, based on personal communication with a retired Bord na Móna manager, the following measures below were enacted at the Application Site as part of daily, monthly, and annual bog management and operations and were outlined in the IPC Licence application submitted to the EPA in 1999.

4.5.5.1 Peat Extraction Machinery – Maintenance Programmes and Storage

- All peat extraction machinery listed in Section 4.4.4 were stored either at the Mountdillon Works, or at machine storage locations in Derryaroge, Derryadd, or Lough Bannow bogs at the end of the workday;
- All machinery was regularly inspected, serviced and maintained;
- All machinery was regularly cleaned via power steam wash system at a wash bay which drained into a fuel/oil interceptor unit and associated gravel soak pit. The interceptor unit facilitated the removal of any oil/grease components. This was done to minimise dust and particle release; and,
- A self-contained machine parts washer was located in the workshop at the Mountdillon Works.

4.5.5.2 Refuelling Facilities

- Refuelling and maintenance of all vehicles were undertaken at the Mountdillon Works, or at machine storage locations in Derryaroge, Derryadd, or Lough Bannow bogs. When machinery required refuelling on the Application Site, it was carried out by a mobile (rail or tractor-transported) fuelling unit which travelled out from the Mountdillon Works to the bogs where the machinery was located. Refuelling procedures were upgraded to standard bunding specifications to comply with IPC Licence requirements in 2000 (refer to Section 4.4.5.4 for details).

The following emergency action procedure was implemented at the Application Site prior to IPC Licencing (i.e., pre-2000):

1. When a spill occurred, the General Manager was immediately informed of the incident;

2. The spill was required to be assessed by the General Manager for potential risk to the health and safety of employees and the potential environmental consequences;
3. If there was a risk of explosion, all personnel were required to be evacuated from the area;
4. The spill was sourced, isolated and contained with polystyrene booms or dry peat (moisture content of 10%);
5. All efforts were made to prevent the spill from entering a storm drain or nearest outfall;
6. Once the spill had been contained, a suitable absorbent (e.g., dry peat) was to be used to soak the spillage;
7. All possible ignition sources such as electoral equipment, naked lights, machinery were removed from the area. Any combustibles in the spill area were removed;
8. Follow up action measures taken includes the implementation of appropriate remedial work to prevent such a spillage recurring in the future; and,
9. In the event of a significant spillage, the General Manager was required to notify the local authority.

4.5.5.3 Fire Safety

With respect to Fire Safety, the following emergency action procedure was implemented at the Application Site prior to IPC Licencing (i.e., pre-2000):

- Annual training provided for bog fires crew and factory personnel and all general staff was provided with a minimum of two hours training in fire prevention;
- All fire exits were designated. These doors were required to be fitted with push-bar mechanisms only and lighted from independent sources. They were required to be unobstructed inside and outside at all times, and open outwards;
- Each canteen/office were required to be equipped with a fire blanket and fire extinguisher;
- There were required to be at least one fire point at all office premises;
- Petrol and other oils were required to be stored in designated oil stores;
- Batteries were not charged in working areas unless suitable protection was provided;
- Training was provided for oxygen cylinder storage and use;
- Fire Wagons: Designated rail wagons were provided for fire prevention which contained: hoses, shovels, fire beaters, baskets, buckets, breathing apparatus, first aid kit, drums of foam and foam making machine, extinguishers etc.
- Stockpiles were covered with polythene film gauge sheets and secured in position by spreading an even layer of high moisture content milled peat. This prevented spontaneous combustion of certain peat types by excluding air as much as possible; and,
- Fire Safety Audits were undertaken at six monthly intervals along with random audits. Yearly assessments were undertaken of all audits completed.

4.5.5.4 Dust Management at Bog Boundaries and Headlands

Dust emissions were higher from the milled peat extraction process than the sod peat extraction process. Tree cover along the fringes of bogs minimised the amount of dust that would travel off-site. In 1976 Bord na Móna established a policy to preserve the vegetation and tree cover on all bog fringes and on any mineral islands[4]. In addition, the following measures were undertaken at a minimum to minimise dust emissions and later expanded under IPC Licence:

[4] Brown Gold 'A History of Bord na Móna and the Irish Peat Industry', 2010 Clarke, Donal, Chapter 10 Pg 206

- Stockpiles were compacted on either side by large rollers drawn by tractors;
- Stockpiles were covered with polythene film gauge sheets and secured in position by spreading an even layer of high moisture content milled peat;
- Peat extraction during windy weather was to be avoided;
- The headlands were to be kept clean and loose peat removed;
- Drivers were required to drive slow along dusty headlands; and,
- All road crossing points were to be maintained clean.

4.5.5.5 Internal Rail Network Maintenance

Railway tracks and railway locomotives underwent continuous inspection and maintenance to prevent derailments, fires, accidents and fuel leaks. The locomotives were fitted with beam lighting, electric windscreen wipers and driving mirrors for both directions of travel.

4.5.5.6 Surface Water Management

Surface water run-off from the Mountdillon Works and hard standing areas drained via onsite surface water drainage systems, which were installed as part of the construction of buildings and hardstand areas over the decades, into the adjacent peatland surface water drainage network.

All machinery was regularly inspected and serviced. All machinery was regularly cleaned via power steam wash system at a wash bay which drained into an interceptor unit and associated gravel soak pit. There are 2 interceptor units which facilitated the removal of any oil/grease components. This was done to minimise dust and particle release.

Formal silt control measures adopted in 1974 are outlined in Section 4.5.6.9 below.

4.5.5.7 Maintenance Programme for Internal Drains

The internal drains were cleaned on a regular basis in suitable weather, mainly prior to and post the peat extraction season (i.e. between October and March). This was necessary to remove sludge from the bottom of drains and dispose of it by spreading it on the adjacent field. Drain maintenance was carried out using ditchers. These works were programmed to ensure that the drains servicing the peat extraction areas were fit for purpose. Drain maintenance was carried out mainly prior to and post the peat extraction season (i.e. between October and March).

4.5.5.8 Maintenance of Onsite Surface Water Pumps

The following procedure was followed with respect to ensuring that the onsite pumps were maintained in good working order:

- Visual inspection of pumps daily;
- Operational check of pumps biweekly; and,
- Service of pumps monthly.

4.5.5.9 Silt Management

As part of the Third Development Programme in the 1970s, Bord na Móna decided in 1974 to control all effluent by means of specially designed and constructed silt ponds, thereby trapping more than 90% of the suspended solids present in the drainage water. A silt committee was set up in October 1975 to study the feasibility of removing silt from the bog effluents. Recommendations of an interim report prepared by the committee in 1975/1976 were as follows:

1. *Provision of silt ponds should be a basic feature of new bog development for milled peat and their construction should be planned for all outlet systems.*
2. *Ideally, silt ponds should be located in cutaway bog.*
3. *Sufficient area should be acquired at the initial stage to provide for silt ponds.*
4. *In production bogs, existing large catchments should be broken up into manageable proportions and ponds constructed to accord with local topography.*
5. *Revision of drainage techniques should be considered such as arranging flatter gradients in external and internal outfalls and extending their width and length in the lower reaches to encourage settlement of silt.*
6. *Initial drainage effluent should be allowed to spill over face banks (where practicable) until adequate silt ponds have been provided. This should be applied to all new bog development immediately. Similarly, growth and vegetation should not be removed from external outfalls until interference with drainage and/or complaints force us* [Bord na Móna] *to act.*
7. *It is recommended that catchments to be protected by silt ponds should not be greater than 500 acres.*
8. *Ponds should be designed for maximum run-off of 1 cubic foot per minute per acre and run-off controlled by provision of small diameter culverts, weirs or sluices.*
9. *For milled peat, 50 square foot of pond per acre of catchment. For 500 acres, 45-foot wide x 555-foot long x 7-foot deep, i.e., 6-foot maximum of silt and 1 foot minimum of water.*
10. *Ponds should be provided in pairs each sufficient for the catchment protected.*
11. *Ponds should be cleaned out at regular intervals as required but at least four times a year using dragline or Hymac retained permanently for this purpose. Investigations to be made into the suitability of pumping units.*
12. *Second parallel pond should be used during excessively large water flow (storm water).*
13. *The problem of discharging into the Clodiagh River at Monettia* [County Offaly] *has become difficult in view of ESBs requirement that the entire river be kept free of silt. Silt ponds will be essential and provision should be made in their layout to allow for further extension of the ponds if decantation needs to be improved further.*

A copy of a memo sent to Mountdillon Works from the Bord na Móna Production Manager in March 1976 setting out the recommendations of the silt committee is included in Appendix 4.9. It is understood that this memo was sent to the Managers of all Bord na Móna Works sites including Mountdillon Works as the memo directs that *"At all milled peat bogs in production, works should carry out surveys and select sites for silt ponds as recommended"*. It is therefore assumed that Mountdillon works would have commenced the selection of sites for the establishment of silt ponds at the bogs around this time. Further Bord na Móna records show that silt pond measures were introduced across all Bord na Móna bogs in the early to mid-1980's in response to the 1977 *Water Pollution Act*. A number of silt ponds were installed at the Application Site pre-1988 to reduce sediment discharge from the extraction works. Silt ponds were installed to trap and reduce the emission of suspended solids to surface water bodies originating from activities associated with peat extraction, such as suspended peat particles generated from the extraction fields and collected in the bog drainage network as well as run-off from workshop areas.

Silt ponds were designed and constructed, primarily, with a width of 8m, however, in some cases, silt ponds of up to 12m in width were constructed. The larger silt ponds up to 12m wide are only provided in areas where access is available to both sides of the silt ponds for cleaning. The length of the silt pond varies depending on the capacity required (i.e., the length is proportional to the area of catchment being drained). The silt pond design, as submitted to the EPA with the IPC Licence Application in 1999, is shown in Figure 4-10. In some locations, baffles (i.e., obstructing panels or vanes) have been installed within the ponds to reduce the energy in the flow and

elongate the pond thereby increasing residence time and aiding settlement. Silt ponds are generally excavated to a depth of 1.5m below the pipe invert level, however in some locations, due to restricted space, the silt pond depth is greater than this. Low-velocity flow through the silt pond is generally controlled by inlet and outlet pipes at the silt ponds or upstream of the silt pond. These pipes control the velocity of the flow into and out of the silt ponds so that the velocity within the silt pond itself is less than 0.1 m/sec. This slow flow through the pond allows suspended sediment (mainly peat) particles to fall out of suspension and build up on the base of the pond, thereby reducing the sediment loading of the outflow from the pond. The principle behind the design of the silt ponds is an application of Stoke's Law. Stokes' Law describes how small solid particles move through a viscous fluid, stating that the drag force on these particles is directly proportional to their size, velocity, and the fluid's viscosity. The silt ponds are cleaned twice a year and are all located hydraulically upgradient of discharge/outfall points to the adjacent surface watercourse. Access to the silt ponds is via headlands and machine passes which were created to facilitate vehicle movements within the site.

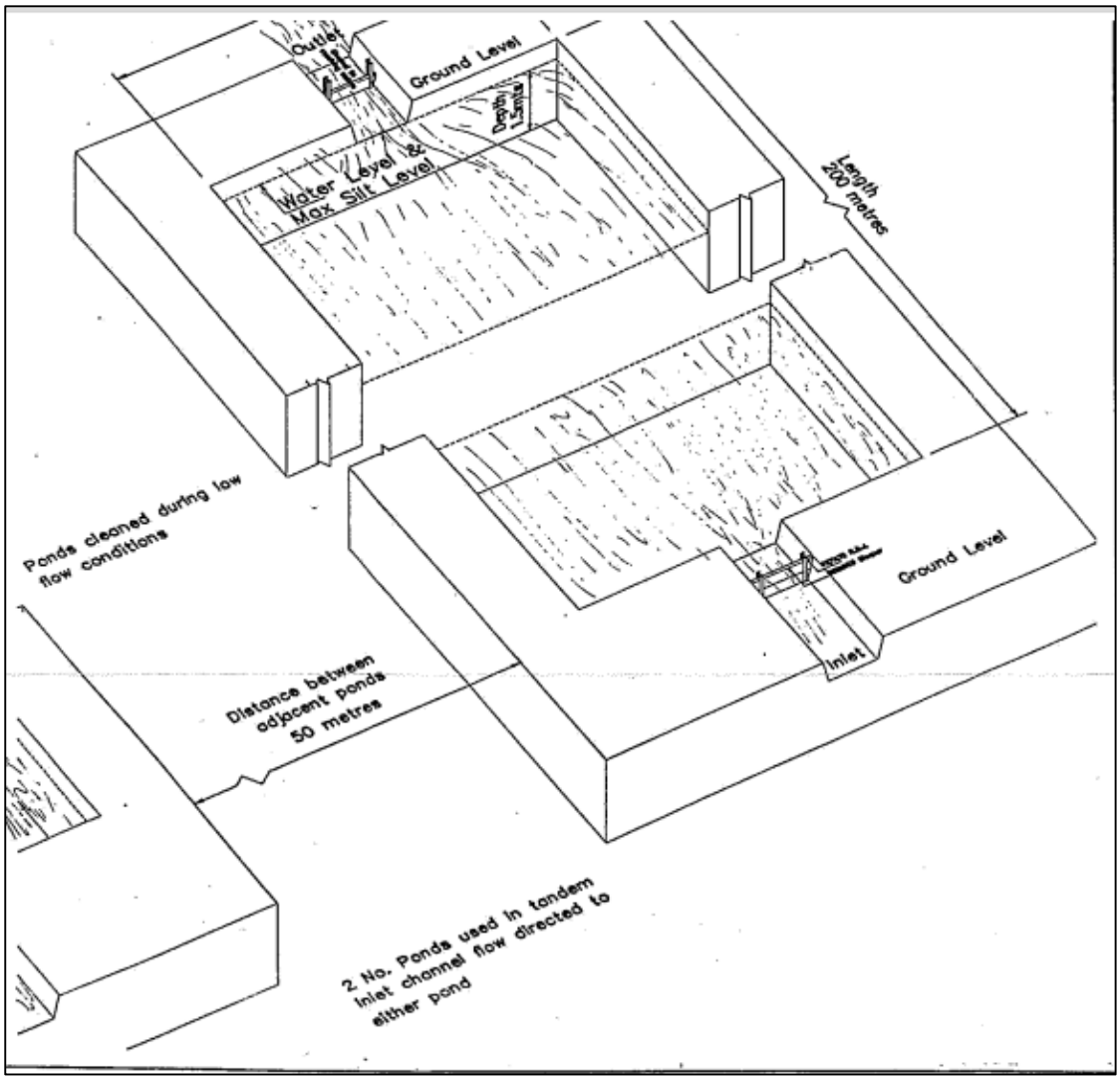


Figure 4-10: – Silt pond design implemented at the Mountdillon Bog Group (Source: Bord na Móna IPC Licence Application submitted to the EPA in 1999)

*Other records of Silt Committee meetings (April 1984 included in Appendix 4.10), attended by the Manager from the Mountdillon Bog Group, set out acceptable standards of effluent and note that a decision from ABP on a licence for effluent from the Littleton Briquette Factory in County Tipperary set an upper limit of 100 mg/l for suspended solids. The records note "*Although the

legalities regarding obligation to treat bog effluent and briquette factory effluent may be dissimilar the waste involved is similar. It would, therefore, seem reasonable to assume that a target value of 100mg/l in the case of bog effluent would satisfy potential complainants whose complaints are based on genuine dissatisfaction with the present standard of our [Bord na Móna] *effluents".*

These records are evidence of early control measures implemented across the Bord na Móna landbank, including the Application Site, to control sediment levels in effluent.

4.5.5.10 Waste Management

The following measures were carried out with respect to management of waste:

- Waste oils and brake fluids drained from machinery during servicing were collected in drums and emptied to a designated waste oil storage tank;
- Waste oil storage tank contents were transported off-site by a licenced waste disposal contractor;
- Oil and fuel filters were changed at vehicle service intervals;
- Spent filters were collected and disposed of by a licensed waste disposal contractor;
- Used batteries were collected by licensed battery collection contractor;
- Off-washings form the self-contained machine parts washer were collected within a sludge tank at the workshops;
- Ash from the onsite boiler was stored in a skip onsite and collected by a licenced waste contractor and taken to a landfill for disposal;
- Waste polythene removed from stockpiles was collected at the roadside by a plastic recycling company; and
- Workshop waste and general refuse from canteens/offices were historically burned on site or disposed of into waste disposal areas at the workshops. This practise changed to the use of skips which were then collected by licenced waste contractors.

4.5.5.11 Archaeological Disturbance

As part of peat extraction training, all employees hired to ork on the bogs were required to read and adhere to the recommendations set out in the Department of Education publication entitled, *Ancient Objects in Irish Bogs and Farmlands: A Guide for Finders* (1942).

Workers were required to stop all works and report to the Bog Manager if archaeological finds were encountered. If materials thought to be of archaeological interest were encountered, the Bog Manager was required to report the findings to the Garda Síochána within seven days. The Gardai would then contact the Commissioner of Public Works. A record of archaeological finds and observations within the Application Site can be found in Section 13.3. of Chapter 13: Cultural Heritage of this rEIAR.

4.6 JULY 1988 - REIAR BASELINE

As described in in Chapter 1 and Section 4.1, the application for substitute consent, and therefore this rEIAR, covers the period from July 1988, the timeframe for when the EIA Directive was required to be transposed into Irish Law, to present day.

As described in in Chapter 1 and Section 4.1, the application for substitute consent, and therefore this rEIAR, covers the period from July 1988, the timeframe for when the EIA Directive was required to be transposed into Irish Law, to present day. As such, the baseline against which the environmental effects of the development required to be assessed has therefore been identified as being the position as of July 1988 (being the earlier of the transposition dates of the relevant Directives. The activities carried out as of July 1988, combined with the activities from July 1988 onwards, form the Project. The remedial impact assessments are presented in the subsequent specialist chapters.

4.6.1 Site and Activity Description – 1988 rEIAR Baseline

By 1988, the land use at the Application Site was well established as industrial peat extraction. All bogs were fully drained and milled peat extraction was the only form of peat extraction taking place across the Application Site in 1988. As outlined in Section 4.4.3.1, sod peat extraction, which had been taking place exclusively in Derryaroge Bog, ended in 1984. Following the cessation of sod peat extraction, works to convert the drainage infrastructure from sod peat drainage (as described in Section 4.4.3.1) to milled peat drainage (as described in Section 4.4.3.2) commenced. It is not clear from records or aerial imagery when milled peat extraction commenced in the former sod peat extraction areas of Derryaroge, but aerial imagery indicates that by 1995, milled peat drainage had replaced sod peat drainage, with milled peat extraction underway by that time. For the purposes of this rEIAR, it is assumed that areas of sod peat drainage in Derryaroge Bog had been fully converted to milled peat drainage by 1988, with milled peat extraction underway at the time. In 1988, milled peat extracted from the Application Site was transferred via rail to Unit 2 and 3 of the Lanesboro Power Station for Station for electricity generation. The main entrance points to the Application Site were located at the Mountdillon Works off the N63 in the north of Derryadd bog, in the south of Derryaroge bog on the N63, and at the south of Lough Bannow via a local access road. Mountdillon Works, which comprised a canteen, storage sheds and maintenance buildings, is still in situ at present day. The following ancillary infrastructure was established at the site by July 1988:

- Railway infrastructure (all bogs within the Application Site);
- Internal machine passes/tracks (all bogs within the Application Site);
- Silt ponds and drains (all bogs within the Application Site); and
- Pumping stations (all bogs within the Application Site).

Figure 4-11 shows the extent of peat extraction across the Application Site in 1988.

Drain deepening and maintenance would have continued at the Application Site in 1988. As stated in Section 4.5.3, drainage channels were in place prior to 1988 as well as a number of silt ponds, outfalls, and pumps.

The total tonnage of peat extracted at the Application Site between July and December 1988 was 176,747 tonnes. The estimated topography of the Application Site in as of July 1988 is based on an average depth of milled peat extraction of 0.1m per year over a 31-year period, which has been worked back from the 2019 topography. As milled peat was the only form of peat extracted at the Application Site from 1984 onwards, this approach is considered to be the most robust in determining the topography in 1988.

4.6.2 1988 Peat Extraction Activities

Table 4-3 below describes the general activities within the Application Site during each of the four quarters of the calendar year in 1988. Some drain maintenance was carried out during the full year, but it was mainly restricted to outside the peat extraction season (i.e. from October to March). Fuel handling and refuelling would have increased significantly during the peat extraction season due the activity of the peat extraction machinery. Rail network maintenance continued in 1988 with temporary rail tracks added and removed alongside peat stockpiles as required.

Peat extraction activities at the Application Site took place between 08:00 and 21:00 during the summer months, with transportation of the peat between the hours of 06:00 and 11:00. Office hours and workshop hours remained as 08:00 to 16:30 all year round.

Table 4-3: – 1988 Peat Extraction Activities

Calendar Quarter	Activities
January to March	Drain/Machinery/Pump/Silt Pond maintenance, Stockpile removal, peat transportation
April to June	Peat extraction, Stockpile development/removal, peat transportation
July to September	Peat extraction, Stockpile development/protection/removal, peat transportation
October to December	Drain/Machinery/Pump/Silt Pond maintenance, Stockpile removal, peat transportation

There are no detailed records for peat extraction volumes for 1988, therefore data for the years 1992 to 2001 (refer to Section 4.7.2 and Table 4-4 therein) have been selected as a representative sample from which an average value has been calculated to represent peat extraction volumes in 1988. This calculated average volume was then halved as the baseline year began in July 1988. Based on this methodology, it is estimated that approximately 176,747 tonnes of milled peat would have been extracted from the Application Site between July and December 1988.

4.7 PEAT EXTRACTION PHASE 1988 – 2019 (DRAINAGE, PEAT EXTRACTION & ASSOCIATED ACTIVITIES)

As demonstrated above, by 1988 peat extraction was well established at the Application Site. Drainage was installed in all bogs and railway infrastructure was laid on all bogs as required.

4.7.1 Drainage Design

During the Peat Extraction Phase, the deepening and maintenance of drainage channels continued beyond 1988, up until the cessation of peat extraction in 2019. As the areas subject to peat extraction from 1988 to 2019 reduced in their extent (refer to Figures 4-11 to 4-14) and the depth of peat available was subsequently reducing, the extent and number of drains requiring deepening and maintenance reduced accordingly.

Machinery used for drainage works would have been largely the same as that described in Section 4.4.2 with ever-improving engine efficiency in tractors and excavators.

Drainage construction methodologies are described in Sections 4.4.2, 4.4.3.1 and 4.4.3.2.

Derryaroge Bog

In 1988 milled peat extraction was continuing in northern and western sections of Derryaroge Bog. As previously discussed, Derryaroge Bog was the only bog unit within the Application Site which was subject to sod peat extraction. Sod peat extraction ceased in 1984, and works to convert the drainage infrastructure from sod peat drainage (as described in Section 4.4.3.1) to milled peat drainage (as described in Section 4.4.3.2) commenced. It is not clear from records or aerial imagery when milled peat extraction commenced in the former sod peat extraction areas of Derryaroge, but aerial imagery indicates that by 1995, milled peat drainage had replaced sod peat drainage in Derryaroge, with milled peat extraction underway by that time. For the purposes of this rEIAR, it is assumed that areas of sod peat drainage in Derryaroge Bog had been fully converted to milled peat drainage, with milled peat extraction underway in those areas by 1988. By 2004, only the northern and western side of Derryaroge remained subject to peat extraction. At the point of the cessation of peat extraction 2019, only a part of the southern extent of the bog was subject to peat extraction. By the end of the Peat Extraction Phase in 2019, 12 no. pumps (with 4 no. decommissioned), 9 no. silt ponds and 10 no. surface water emission points were in place, all of which remain in situ today. Of the 12 no. pumps, 11 no. were installed pre-1988 (4 no. of these are now decommissioned), with 1 no. pump installed between 1988 and 1995. Of the 9 no. silt ponds installed at Derryaroge Bog, 6 no. were installed pre-1988, and 3 no. installed between 1988 and 1995. All 10 no. surface water emission points were in place pre-1988.

Derryadd Bog

Drainage was fully inserted in Derryadd Bog by 1988, with the full extent of the drained area subject to milled peat extraction. Between 1995 and 2004, peat extraction ceased in some areas in the centre of the bog and revegetation began to occur. At the point of the cessation of peat extraction in 2019, peat extraction was occurring near the east and west boundaries, with extraction also occurring a in portion of northeast corner of Derryadd bog. There are 6 no. pumps located in Derryadd Bog; at least 3 no. of which were installed and operational pre-1988, with the installation of the remaining 3 no. pumps unknown. There are 5 no. silt ponds, 2 no. of which were installed pre-1988, with the remaining 3 no. installed between 1988 and 1995. There are 5 no. surface water emission points, all of which were in place pre-1988.

Lough Bannow Bog

Drainage was fully inserted in Lough Bannow bog by 1988, with the full extent of the drained area subject to milled peat extraction. By 1995, peat extraction had ceased on the western side of the bog, and by 2004, extraction had also ceased on the eastern side of the bog. The areas subject to peat extraction gradually reduced in Lough Bannow bog between 2004 and 2019, and at the point of the cessation of peat extraction in 2019, only areas on the northeastern southern boundaries were subject to peat extraction. There are 3 no. pumps on Lough Bannow Bog; the installation dates of these pumps are unknown. There are 5 no. silt ponds, 3 no. of which were installed between 1988 and 1995. The installation date of the remaining 2 no. silt ponds is unknown. There are 4 no. surface water emission points in place on Lough Bannow bog, all of which were in place pre-1988.

Silt Ponds

Upgrades to silt ponds were undertaken at the Application Site following a 1990 survey undertaken by Bord na Móna which involved a daily sampling and analysis programme at

different locations in the Bord na Móna landholdings (including the Mountdillon Bog Group) over a full calendar year to determine the quantity of silt within the run-off from bogs. The study (a copy of which is included in Appendix 4.7) determined that an average of 50m^3 of sludge per hectare (20m^3 per acre) was typically discharged. Following this, the silt ponds were designed to cater for the settling of sufficient amounts of silt providing the ponds were de-sludged at least twice per annum. A second pond was installed adjacent to the first to facilitate de-sludging (i.e., used as a backup when the first pond reached silt storage capacity and underwent de-sludging).

Condition 6 of the IPC Licence (which is included in Appendix 4.1) details the requirements for Bord na Móna to implement a programme to ensure all drainage water from all boglands is discharged via an appropriately designed silt pond treatment arrangement, that an operational procedure for de-silting was prepared and that de-silting is carried out twice per year. The silt arising from the de-silting operations was either stockpiled a distance from drains and the silt pond or placed back out onto the extraction fields. Up until the cessation of peat extraction, this material would then have been incorporated into the subsequent harvests.

4.7.2 Peat Extraction

Milled peat extraction, under the same processes described in Section 4.4.3.2, continued at the Application Site from 1988 until July 2019, at which point peat extraction permanently ceased across the Application Site. Improvements and modernisation of machinery occurred between 1988 and 2019 which increased the efficiency and speed of operations over this time period. There were significant developments in diesel-powered engines which would have resulted in the use of more fuel-efficient tractors on the Application Sites with significantly cleaner exhaust emissions compared to the baseline year of 1988 or pre-1988.

During the latter part of the 1988 to 2019 assessment period (i.e., from late 1990s/2000 onwards), peat extraction gradually slowed down and then ceased permanently in July 2019 across the Application Site, with a corresponding reduction in fuel handling/refuelling, machinery maintenance and stockpile development.

Peat extraction maps for the years 1995, 2004, and 2019 are presented in Figures 4-12, Figure 4-13 and Figure 4-14 and illustrate the extent of extraction activity at the Application Site over time, including at the point of the cessation of peat extraction in 2019. Corresponding aerial images for the years 1995, 2004, and 2019 are included in Appendix 4.5.

N

Derryarogue

Derryadd

Lough Bannow

Legend

Application Boundary

1988 Peat Extraction

Subject to Peat Extraction

Neither Drained nor Subject to Peat Extraction

Kilometres

0 0.5 1 2

Bord na Móna

Figure 4-11:

Derryadd Substitute Consent
1988 Peat Extraction Activities

DRWG No:	Scale:	Drawn by:	Date:
BNM-PG-24-21-02-v5	1:35,000	AK	26/02/2025

Figure 4-12:

Derryadd Substitute Consent
1995 Peat Extraction Activities

Bord na Móna

DRWG No:	Scale:	Drawn by:	Date:
BNM-PG-24-21-03-v5	1:35,000	AK	26/02/2025

Legend

- Application Boundary

1995 Peat Extraction

- Drained - Not Subject to Peat Extraction
- Subject to Peat Extraction
- Neither Drained nor Subject to Peat Extraction

Kilometres
0 0.5 1 2

Derryarogue
Derryadd
Lough Bannow

N

Derryarogue

Derryadd

Lough Bannow

Legend

Application Boundary

2004 Peat Extraction

Drained - Not Subject to Peat Extraction

Subject to Peat Extraction

Neither Drained nor Subject to Peat Extraction

0 0.5 1 2 Kilometres

Bord na Móna

Figure 4-13:

Derryadd Substitute Consent
2004 Peat Extraction Activities

DRWG No:	Scale:	Drawn by:	Date:
BNM-PG-24-21-04-v5	1:35,000	AK	26/02/2025

N

Derryarogue

Derryadd

Lough Bannow

Legend

Application Boundary

2019 Peat Extraction

Drained - Not Subject to Peat Extraction

Subject to Peat Extraction

Neither Drained nor Subject to Peat Extraction

0 0.5 1 2 Kilometres

Bord na Móna

Figure 4-14:

Derryadd Substitute Consent
2019 Peat Extraction Activities

DRWG No:	Scale:	Drawn by:	Date:
BNM-PG-24-21-23	1:35,000	AK	27/02/2025

4.7.3 Peat Extraction Volumes July 1988 to 2019

The volumes of peat extracted at the Application Site varied from year to year and were influenced by weather conditions. The annual extraction quantities for the period from 1988 to 2019 are set out in Figure 4.15 and Table 4-4. There are no detailed records for peat extraction volumes between 1988 and 1991, therefore data for 10-year period between 1992 and 2001 have been selected as a representative sample from which an average value has been calculated to represent peat extraction volumes in the 1988 to 1991 period. Figure 4-16 shows the locations of existing silt ponds within and adjacent to the Application Site.

Between July 1988 and July 2019, an average of 288,215 tonnes of peat were extracted each year, with a total of approximately 9,222,879 tonnes extracted between July 1988 and the cessation of peat extraction in July 2019. There was a closing stock of milled peat recorded for the 2019 season of 84,008 tonnes at the point of the cessation of peat extraction. This closing stock was subsequently systematically transferred by rail to Lough Ree Power Station until the power station ceased operations in December 2020. Following the closure of Lough Ree Power Station, stockpiles were removed to Edenderry Power Station and Derrinlough Briquette Factory. During the Peat Extraction Phase, Bord na Móna implemented a stockpiling system whereby the aim was to have three years supply stockpiled at any time to ensure there was a supply available to the power stations in years of poor harvest due to weather conditions. The peat extraction volumes therefore do not directly relate to deliveries of peat to the power station over that extraction year.

From the recorded volumes in Table 4-4, the most productive extraction year was 1993 with 645,731 tonnes extracted this season. The least productive extraction year was 2002 with 124,952 tonnes. The year of 2019 doesn't represent a full extraction year as peat extraction ceased early in July 2019.

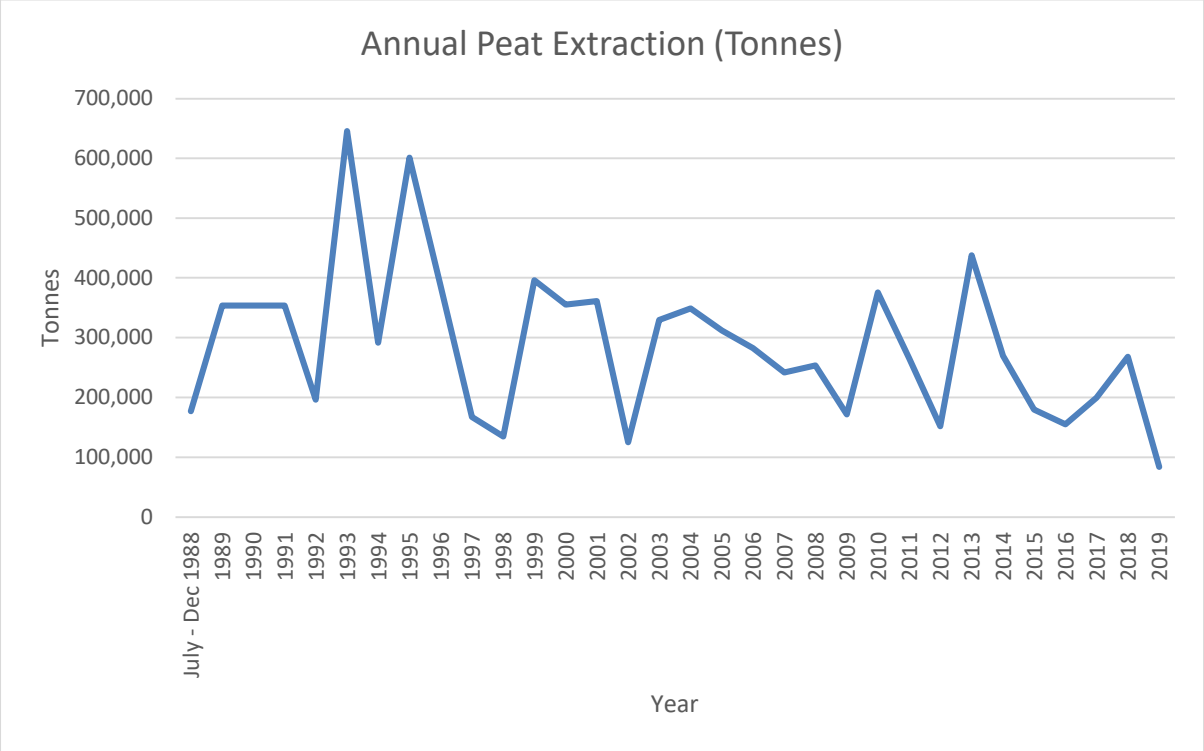


Figure 4-15: Annual Peat Extraction Volumes July 1988 – July 2019

Table 4-4: Annual peat extraction quantities for the period 1988 to 2019

Year	Annual Extraction (Tonnes)
July – December 1988*	176,747**
1989	353,493**
1990	353,493**
1991	353,493**
1992	196,266
1993	645,731
1994	291,430
1995	600,739
1996	386,862
1997	167,239
1998	134,561
1999	395,820
2000	355,023
2001	361,257
2002	124,952
2003	329,375
2004	348,936
2005	312,112
2006	282,405
2007	241,904
2008	253,686
2009	171,506
2010	375,757
2011	265,415
2012	151,635
2013	437,822
2014	269,654
2015	179,391
2016	154,839
2017	199,266
2018	268,062
January - July 2019	84,008***
Total	**9,222,879**

**1988 Baseline peat extraction figures are for months July – December 1988 when Baseline period began as per Section 4.1.*

***Based on average peat extraction volumes at the Application Site in the 10-year period between 1992 and 2001 in the absence of accurate data.*

****Peat extraction at the Application Site came to an end midway through this year leading to a lower annual extraction volume compared to previous years.*

N

SW40 DR49 SW37 DR46 P05-15 SW38 DR47 SW47 SW42 DR51 P05-12 DR45 P05-19 P05-18 SW35 EO-2 DR44 IO-3 DR53 IO-1 IO-2 P05-13 EO-1 CB55 SW46 SW44 DR48 EO-1 IO-1 DR53A P05-11 IO-3 IO-2 IO-1 IO-6 EO-2 EO-2 P05-21 IO-5 IO-6 P05-20 IO-4 IO-6 IO-5 EO-2 P05-22 IO-3 P05-14 P05-16 P05-17 IO-2 IO-3 IO-4 IO-5 IO-1 EO-6 P05-08 IO-31 EO-2 SW69 DD79 SW68 DD77/78 IO-11 IO-11 P05-09 IO-1 EO-10 SW70 DD80 IO-16 EO-10 IO-15 EO-8 P05-53 EO-9 EO-9 IO-14 IO-14 EO-7 IO-12 DD82 P05-10 IO-12 EO-13 SW76 P05-02 LW86 IO-23 SW75 P05-03 LW85 IO-13 IO-13 P05-06 EO-10 IO-13 IO-13 DD83 P05-07 SW73 EO-8 EO-12 SW74 LW84 IO-22 IO-26 LW85A IO-24 IO-24 IO-24 IO-25 IO-26 IO-26 IO-25 IO-27 IO-27 IO-28 IO-28 IO-29 IO-29 IO-29 LW88 P05-04 SW78

Legend

- Substitute Consent Boundary
- Internal/External Outfall
- Pump Sites
- Silt Ponds
- Discharge Points

Bord na Móna

Figure 4-16:

Drainage System

DRWG No.	Scale:	Drawn by:	Date:
BNM-PG-24-21-29	1:35,000	AK	24/03/2025

4.7.4 Ancillary Activities 1988 to 2019

As outlined in Section 4.4.5 there were various ancillary structures and features associated with peat extraction activities at the Application Site.

The Mountdillon Works served as the central location for support services, including workshops, offices, and welfare facilities. These facilities were primarily used for the maintenance and repair of machinery associated with peat extraction and ancillary activities. The offices at Mountdillon Works provided administrative and welfare facilities, serving employees and staff on-site. The Works also played a central role in the administration of activities within the Application Site. As outlined in Section 4.4.5.1, the workshops and offices at the Mountdillon Works were built before the implementation of the Planning and Development Act (1963), which came into effect on October 1st 1964, and these structures are not part of this substitute consent application.

Welfare facilities, known as Tea Centres, were scattered across the Application Site. These facilities provided workers with a clean area for taking breaks and welfare services.

As outlined in Section 4.4.5.4, fuel for machinery was, and still is, stored in above-ground tanks with bunding to prevent fuel spills or leaks. These tanks are located at the Mountdillon Works, and refuelling procedures were upgraded to comply with licensing requirements in 2000. The Mountdillon Works yard included a peat loading facility, described in Section 4.4.5.5, with a weighbridge for accurate recording of peat tonnages and deliveries.

Described in Section 4.4.5.7 above, during the Peat Extraction Phase, a 36-inch gauge railway system was the exclusive means of transporting milled peat from the bogs of the Application Site to the nearby Lanesboro Power Station up to 2004, and to Lough Ree Power Station from 2004 to 2020. The steel rails, with a weight of 30lbs to 35lbs per yard, were mounted on steel sleepers, with some areas using heavier rails on creosoted pine or redwood sleepers. Approximately 37km of permanent track existed within the Application Site during these period, and temporary tracks were laid as needed to transport peat from stockpiles to the power station or the central peat loading facility at Mountdillon Works. These temporary tracks were typically 30-foot sections, laid and lifted using special equipment. The construction of permanent rail beds depended on proper drainage, and various level crossings were installed. Diesel locomotives were used to pull peat-filled wagons, which were equipped with lids to prevent the release of dust during transportation.

4.7.5 Control Measures 1988 to 2000

Post-1988, but prior to the implementation of the IPC Licence at the Application Site in 2000, the environmental management measures set out in Section 4.5.6, remained in place across the Application Site. In addition, as evidenced in the 1991 Harkins Report (see Appendix 4.7), silt control measures in the form of silt ponds were in place prior to 1988, with Bord na Móna carrying out further studies and surveys throughout the 1980s and 1990s to improve silt pond design and use such that suspended solids emissions in surface run-off were reduced.

4.7.5.1 Archaeological Code of Practice

Bord na Móna has a long history of co-operation with the National Museum of Ireland, the National Monuments Service and the relevant governmental departments overseeing heritage at the time, in relation to the cultural and archaeological importance of wetlands as well as the potential for, and handling of, archaeology discovered in bogs. After the discovery and subsequent preservation of trackways at Corlea Bog, Co. Longford by Bord na Móna employees in the 1980s, a new programme for peatland archaeology was established. Since 1991 an annual programme of archaeological survey, initially funded by the National Monuments Service, has been conducted in Bord na Móna Bogs, with the results being forwarded for inclusion in the Sites and Monuments Record.

Since 1998, Bord na Móna has a statutory duty under the Turf Development Act 1998 (Section 56) to afford appropriate protection for the environment and the archaeological heritage.

> Section 56.- *The Company and each subsidiary shall ensure that its activities are so conducted as to afford appropriate protection for the environment and the archaeological heritage.*

The 1998 Act was in accord with the development of an *Agreed Principles for the Protection of Wetlands Archaeology in Bord na Móna Bogs* (1998) between the Minister for Arts, Heritage and the Gaeltacht, the National Museum of Ireland and Bord na Móna. The Agreed Principles set out 10 standards within which archaeology in the Bord na Móna peatlands were managed. Five Archaeological Liaison Officers were spread across the Bord nan Móna Bog Groups and received training on how to deal with and report finds. Since 1998, all archaeological surveys were funded by Bord na Móna. The surveys have been accompanied by an annual programme of selective archaeological excavation and paleo-environmental analysis. By 2013, 64,000 of the ca. 80,000-hectare land holdings of Bord na Móna had been subject to archaeological survey.[5]

A Code of Practice between the Department of Arts, Heritage and the Gaeltacht, the National Museum of Ireland and Bord na Móna was established in 2012.[6] This Code superseded the Agreed Principles. The Code provided a framework within existing legislation, policy and practice to enable Bord na Móna to progress with peat extraction activities and all ancillary works and simultaneously ensure archaeological control measures is in place. The measures Bord na Móna are responsible for are listed below:

Bord na Móna will

1. *Engage a Project Archaeologist*
2. *Maintain the network of Archaeological Liaison Officers.*
3. *Disseminate a set of Archaeological Protection Procedures*
4. *Ensure that any monuments or archaeological objects discovered during peat extraction are protected in an appropriate manner by following the Archaeological Protection Procedures.*

[5] Department of the Arts, Heritage and the Gaeltacht 2013 Review of Archaeological Survey and Mitigation Policy relating to Bord na Móna Peatlands since 1990. https://www.archaeology.ie/sites/default/files/media/pdf/bnm-peatland-review-final-report-20-06-2013.pdf

[6] 2012 Code of Practice between the Department of Arts, Heritage and the Gaeltacht, the National Museum of Ireland

and Bord na Mónahttps://www.archaeology.ie/sites/default/files/media/publications/cop-bord-na-mona-en.pdf

5. *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.*
6. *Ensure that any archaeological objects discovered on Bord na Móna lands are reported immediately to the Duty Officer of the National Museum of Ireland.*
7. *Prioritise monuments for investigation taking account of monument vulnerability, contractual obligations and peat production targets.*
8. *Prepare tenders for archaeological mitigation of impacts on monuments, to include excavation and recording, in consultation with the Project Archaeologist and the Minister.*
9. *Engage professional Consultant Archaeologists to carry out mitigation of monuments, including the required palaeo-environmental assessment and post-excavation studies.*
10. *Provide the necessary finance to fulfil the post-excavation requirements of the Minister and the Director including the conservation of archaeological objects and the provision of scientific analyses and dating, as well as the production of reports on all archaeological work, to a standard which will meet the approval of the Minister.*

4.7.6 Control Measures 2000 to Present Day (Post-IPC Licence)

Bord na Móna was granted an IPC Licence (Reg. No. P0504-01) for the Mountdillon Bog Group (within which the Application Site is located) in May 2000. Following the grant of the IPC Licence, the control measures listed in Section 4.7.5 have been updated and expanded. A copy of the IPC Licence is provided in Appendix 4-1. The IPC Licence application is publicly available and can be viewed on request at EPA Headquarters PO Box 3000 Johnstown Castle Estate County Wexford Y35 W821.

Following the grant of the IPC Licence in 2000, Bord na Móna staff underwent an EPA IPC Licence Compliance training programme, which resulted in the development of an environmental management system. This system addresses emissions to water and air, noise, vibration and odour emissions, waste management, use of natural resources, visual effects and the natural environment and ecosystem.

The conditions of the IPC Licence are intended for the protection of the environment and apply from the time of grant of the IPC Licence. The EPA has undertaken Technical Amendments of the IPC Licence for the purpose of aligning the conditions of the IPC Licence to the objectives of national and European environmental protection legislation enacted over the lifetime of the IPC Licence. In September 2012, the IPC Licence was subject to a Technical Amendment for the purpose of aligning with the European Communities Environmental Objectives (Surface Water) Regulations, 2009 and it now contains an objective to 'maintain' or 'restore' the water surface water quality to the defined 'Good Status'. With the implementation of conditions listed in the IPC Licence, the potential environmental effects of peat extraction activities and all ancillary works on water quality (such as the release of elevated concentrations of suspended sediments, and by association on aquatic ecosystems and protected species), have and continue to reduce through the implementation of IPC Licence conditions. Please see Chapter 9 Hydrology and Hydrogeology of this rEIAR and the Annual Environmental Reports (AER) included as Appendix 4-4 for details.

The IPC Licence is subject to 14. no conditions pertaining to the ongoing monitoring and maintenance to ensure any emissions from site activities will comply with and not contravene, any of the requirements of Section 83(3) of the Environmental Protection Agency Act, 1992 outlined below:

(3) The Agency shall not grant a licence or revised licence for an activity unless it is satisfied that—

> *(a) any emissions from the activity will not result in the contravention of any relevant air quality standard specified under section 50 of the Air Pollution Act, 1987, and will comply with any relevant emission limit value specified under section 51 of the Air Pollution Act, 1987,*
>
> *(b) any emissions from the activity will comply with, or will not result in the contravention of, any relevant quality standard for waters, trade effluents and sewage effluents and standards in relation to treatment of such effluents prescribed under section 26 of the Local Government (Water Pollution) Act, 1977,*
>
> *(c) any emissions from the activity or any premises, plant, methods, processes, operating procedures or other factors which affect such emissions will comply with, or will not result in the contravention of, any relevant standard including any standard for an environmental medium prescribed under regulations made under the European Communities Act, 1972, or under any other enactment,*
>
> *(d) any noise from the activity will comply with, or will not result in the contravention of, any regulations under section 106,*
>
> *(e) any emissions from the activity will not cause significant environmental pollution, and*
>
> *(f) the best available technology not entailing excessive costs will be used to prevent or eliminate or, where that is not practicable, to limit, abate or reduce an emission from the activity,*

and, where appropriate, the Agency shall attach conditions relating to the matters specified in the foregoing paragraphs to the licence or revised licence.

Conditions 1 to 4 of the IPC Licence outline the Scope, Management, Interpretation and Notification procedures required by the Applicant, respectively. Conditions 11 to 14 detail the Monitoring (equipment use), Recording and Reporting, Emergency Response and Financial Provisions duties of the Applicant. Conditions 5 to 10 pertain to environmental monitoring and management:

- Condition 5 Emissions to Atmosphere
- Condition 6 Emissions to Water
- Condition 7 Waste Management
- Condition 8 Noise
- Condition 9 Water Protection
- Condition 10 Cutaway Bog Rehabilitation

In compliance with Condition 5, the Applicant must undertake annual tests on boiler combustion efficiency and dust monitoring. Please see Chapter 10: Air Quality for further details. Condition 6 ensures the Applicant establishes a surface water discharge monitoring programme which is reviewed annually, and a report submitted to the EPA quarterly. The Applicant is also required to submit water sample results annually, implement and maintain silt ponds. Condition 9 pertains to the 'Water Protection' and outlines the daily, weekly, monthly, quarterly, and annual inspections Bord na Móna must carry out to provide for the protection of surface and groundwater. There are currently silt pond inspections and maintenance including quarterly grab sampling ongoing at the application site. Please see Chapter 9 Hydrology and Hydrogeology for further details. Condition 7 compels the Applicant to correctly dispose of

waste to licenced facilities. Please see Chapter 14 Material Assets for details. Condition 8 ensures that any on site activities do not give rise to noise exceedances at noise sensitive locations. Please see Chapter 11 Noise and Vibration for further details. Condition 10 pertains to site decommissioning followed by peatland rehabilitation and is detailed in Section 4.9 below which details the Remedial Phase, and Chapter 7 Biodiversity. It is the intention of the of the Applicant to continue implementing and practising the monitoring measures as listed in the Licence after the site is decommissioned, where applicable.

4.7.6.1 Standard Operation Procedures

To facilitate the production of AERs, Bord na Móna produced an *Environmental and Operational Procedures for Protection of Surface Water* document which comprises a suite of Standard Operation Procedures (SOPs) which have the overall aim of promoting and maintaining environmental integrity throughout all Bord na Móna activities. The document includes SOPs for drainage planning and implementation, silt pond and outfall maintenance, waste management, peat extraction methods, and general bog housekeeping. The SOPs also set out emergency preparedness and response procedures, how to deal with complains, effective communication with Bord na Móna operatives, the local community and local authorities. Please see Appendix 4-13 Environmental and Operational Procedures for Protection of Surface Water for details.

4.8 CURRENT PHASE (JULY 2019 TO PRESENT DAY)

4.8.1 Decommissioning Process

In January 2021, Bord na Móna formally announced that peat extraction across all bogs within its landholding had ceased, although peat extraction at the Application Site had ceased prior to this in July 2019. The Application Site still operates under the requirements of IPC Licence P0504-01, and any decommissioning works undertaken with respect to peat extraction activities and all ancillary works are in accordance with Condition 10 of the IPC Licence, which states that that:

"10.1: Following termination 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."

In compliance with Condition 10.1 of the IPC Licence, it is a requirement of the licensee to decommission the Application Site by removing/disposing/recovering buildings, equipment, waste etc. from the Application Site. The main criteria pertaining to successfully complying with this condition is ensuring that the Application Site is not causing or likely to cause environmental pollution and the site of the activity is in a satisfactory state such that licenced lands can be deemed suitable for surrender of the IPC License 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 extraction operation at the Application 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, stockpile covering, pumps, septic tanks and fuel tanks. Ongoing

decommissioning at the Application Site included removal of peat stockpiles which was completed in November 2022, as well as decommissioning of other infrastructure, which is to follow at a later date, outlined in Table 4-5. As outlined in Section 4.4.5.7, approximately 37km of permanent rail track was located within the Application Site boundary. To date 1km of permanent rail has been decommissioned and removed in the south of Lough Bannow Bog. The remaining 36km of rail track will be decommissioned as part of the overall decommissioning programme for the IPC Licence. Decommissioning activities are detailed for each of the three bogs within the Application Site in Appendix 4.3.

Table 4-5: – Future decommissioning items for Application Site

Item	Description	Application Site Decommissioning Plan
1	Clean-up of remaining or unconsolidated waste or materials located in Bogs, Yards, Buildings and Offices	Relevant to All Bogs
2	Clean silt ponds	Relevant to All Bogs
3	Decommission peat stockpiles	Completed November 2022
4	Decommission or remove buildings and compounds	Relevant to All Bogs
5	Decommission fuel tanks and associated facilities	Relevant to Derryadd Bog
6	Decommission and removal of septic tanks	Relevant to Derryadd Bog
7	Decommissioning and removal of a number of existing bog pumps where suitable/necessary	Relevant to All Bogs

In relation to waste management, Condition 7 of the IPC Licence requires these now defined waste items to be disposed of or recovered as follows:

"Condition 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.

Condition 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.

Condition 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.*
- *Condition 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 IPC Licence, waste items are and will continue to be removed for recycling or disposal, using external contractors with the required waste collection permits, approved under Condition 7.2, and waste records are and will continue to be maintained as required under Condition 7.3.

Where possible, Bord na Móna will target preferred waste treatment methods from the waste hierarchy to identify waste that can reused or recycled in lieu of recovery or disposal.

The validation of the success of compliance with Condition 10.1 of the IPC Licence is carried out through an Independent Closure Audit (ICA) which is followed by an EPA Exit Audit (EA) and the eventual partial or full surrender of the IPC Licence.

4.8.2 Peatland Climate Action Scheme

The Peatland Climate Action Scheme (PCAS) is a programme of enhanced peatland rehabilitation measures with the primary aim of optimising climate action benefits of rewetting former industrial peat extraction areas by creating soggy peatland conditions that will allow compatible peatland habitats to redevelop. These measures are separate to those defined by the IPC Licence. This programme has been developed to optimise ecosystem service benefits of peatland rehabilitation and restoration, particularly carbon storage and reducing carbon emissions. In addition, this will also benefit biodiversity and water (water quality and catchment management), as well as providing space for local communities and people to enjoy the outdoors. The scheme is supported by Government through Ireland's National Recovery and Resilience Plan administered by the Department of Environment, Climate and Communications (DECC). Please see https://www.bnmpcas.ie/ for details. The National Parks and Wildlife Service (NPWS) acts as the Scheme regulator and there is ongoing engagement with the EPA. This scheme is in addition to the IPC Licence requirements and therefore does not form part of this substitute consent application and is being applied at specific locations across the Bord na Móna landbank that are identified as suitable for the prescribed enhancement measures, e.g., north and western sections of Derryaroge bog where PCAS is currently underway.

The scope of the rehabilitation measures for the sections of Derryaroge that are currently active under the PCAS Programme include the following, which are directly taken from Section 8 of the Derryaroge Cutaway Bog and Decommissioning and Rehabilitation Plan 2023 (included in Appendix 4-3, which is also publicly accessible on the Bord na Móna PCAS website[7]):

Derryaroge North and West:

- *Re-assessment of the pumping regime and removing pumps if this desired and has no significant external impact. A significant part of the site has already developed a mosaic of wetland habitats with deeper water. Hydrological modelling will look to optimise water levels. 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 flooding regime will develop, with water levels fluctuating in association with levels in*

[7] https://www.bnmpcas.ie/wp-content/uploads/sites/18/2023/06/Derryarogue-Final-Rehab-Plan-2023-v12.pdf

the adjacent River Shannon Less intensive measures (targeted drain-blocking) will be used in areas where habitats have already established.

- *Intensive drain blocking and construction of berms in shallow peat areas/modelled depressions to create/promote the spread of wetland habitats*
- *Regular drain blocking (3/100) on dry cutaway along with the blocking of outfalls and management of water levels,*
- *Re-alignment of piped drainage*
- *Deep Peat measures including field re-profiling, resulting in bunded areas suitable for Sphagnum inoculation, on deeper peat*
- *Targeted fertiliser applications to accelerate vegetation establishment on areas of bare peat on headlands and high fields, and within certain areas of dry cutaway. Areas where vegetation has established do not need fertiliser application*
- *Initial hydrological modelling indicates that a small part of the site will develop a mosaic of wetland habitats with the potential for some 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 small 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.*

These rehabilitation measures are ongoing on the relevant lands within Derryaroge Bog. Details of monitoring associated with the enhanced peatland rehabilitation measures associated with PCAS are outlined in Section 4.9.2.2 below.

4.9 REMEDIAL PHASE

4.9.1 Peatland Rehabilitation Plans

Following the conclusion of the decommissioning activities, Bord na Móna are required under Condition 10.2 of the IPC Licence to prepare (to the satisfaction of the EPA) and implement, a Cutaway Bog Rehabilitation Plan. Condition 10.2 of the Licence states:

"Condition 10.2: Cutaway Bog Rehabilitation Plan:

- *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.*
- *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.*

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

- *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).*
- *10.3.2: The criteria which define the successful rehabilitation of the activity or part thereof, which ensures minimum impact to the environment.*
- *10.3.3: A programme to achieve the stated criteria.*
- *10.3.4: Where relevant, a test programme to demonstrate the successful implementation of the rehabilitation plan.*
- *10.3.5: A programme for aftercare and maintenance.*

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.

Reason: To make provision for the proper closure of the activity ensuring protection of the environment."

Bord na Móna has produced a draft Cutaway Bog Decommissioning and Rehabilitation Plan for each of the three bogs within the Application Site (i.e., Derryaroge Bog, Derryadd Bog, and Lough Bannow Bog). Please see Appendix 4-3 for details. Bord na Móna has finalised the rehabilitation plan for part of Derryaroge Bog (see Derryaroge Cutaway Bog and Decommissioning and Rehabilitation Plan 2023, included in Appendix 4-3) and this area is currently being rehabilitated. It is the intention of Bord na Móna to rehabilitate the bogs in a phased approach under the requirements of the IPC Licence.

Decommissioning and rehabilitation plans have been developed from a combination of the following:

- 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[8]);
- Significant international engagement during this period with other countries in relation to best-practice 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);
- Ongoing consultation and engagement with internal and external stakeholders regarding rehabilitation, biodiversity and other general issues over the years about the Mountdillon Bog Group;
- Geographical Information System (GIS) Mapping;
- Bord na Móna drainage surveys;
- Bog topography and LIDAR data;
- Previous research studies on site; and,
- Hydrological modelling.

The current plans also take cognisance of the EPA Guidance on the Process of Preparing and Implementing a Bog Rehabilitation Plan (2020). Each plan contains within a detailed ecological report and GIS mapping pack. The key objective of Bord na Móna peatland rehabilitation is environmental stabilisation. The rehabilitation of the bogs will support biodiversity e.g., plants, insects, bird and mammals, and the formation of wetland peatland and woodland habitats. In addition, peatland rehabilitation will bring a range of benefits to the local community via improvements in the local landscape and it is also complying with national policies and strategies regarding the reduction of carbon emissions, supporting biodiversity and enhancing water quality. It is anticipated it will take up to 30 years for naturally functioning wetland and peatland ecosystems to fully re-establish.

To inform the final rehabilitation plan for each bog, both national and local stakeholders, including neighbours whose land adjoins the relevant bog units and local representatives of national bodies (such as Regional National Parks and Wildlife Service staff) and relevant offices in County Councils (such as the Heritage or Environmental Offices) will be contacted. Any identified local interest groups will be sought and informed of the opportunity to engage with

[8] *Bord na Móna. 2016. Bord na Móna Biodiversity Action Plan 2016-2021. Brosna Press, Ferbane.* *http://www.bordnamona.ie/wp-content/uploads/2016/04/Biodiversity-Action-Plan-2016-2021.pdf*

this rehabilitation plan, and when identified invited to submit their comments or observations in relation to the proposed rehabilitation. All correspondence received will be acknowledged and evaluated against the rehabilitation work proposed and the final draft of plans will contain a review of the consultation.

Prior to the submission of the draft Cutaway Bog Decommissioning and Rehabilitation Plans to the EPA for agreement, a baseline ecology survey will be carried out to determine the status of natural colonisation, the potential for targeted revegetation and/or rewetting and the future development at the Application Site to ensure stabilisation of the future cutaway. Draft Cutaway Bog Decommissioning and Rehabilitation Plans for each bog which outline the proposed rehabilitation for the Application Site have been prepared and are detailed below. A timeline for the stages of the measures included in the Cutaway Bog Decommissioning and Rehabilitation Plans is provided in Table 4.6 below. Further details can be found in the Cutaway Bog Decommissioning and Rehabilitation Plans provided in Appendix 4-3.

Table 4-6: Timeline for Cutaway Bog Decommissioning and Rehabilitation Plan Actions

	Derryaroge (2023 Plan)	Derryadd (2025 (Draft) Plan)	Derryaroge (2025 (Draft) Plan)	Lough Bannow (2025 (Draft) Plan)
Completed and Ongoing	A significant part of the site has already re-vegetating, with significant cover of pioneer vegetation developing a mosaic of typical cutaway peatland and wetland habitats. Natural re-colonisation of the cutaway so far has been quite effective. Bare peat areas within the cutaway parts of the site are shrinking as vegetation develops and consolidates.	Part of the site has already re-vegetated, with pioneer vegetation maturing and developing a mosaic of typical cutaway peatland habitats with Birch woodland predominating. Bare peat areas within the older cutaway areas are reducing. Natural re-colonisation of the cutaway so far has been quite effective. Other parts of the site (younger cutaway) are naturally colonising for more than 10 years and are developing a mosaic of cutaway habitats. Natural re-colonisation of the cutaway so far has been quite effective.	A significant part of the site has already re-vegetating, with significant cover of pioneer vegetation developing a mosaic of typical cutaway peatland and wetland habitats. Natural re-colonisation of the cutaway so far has been quite effective. Bare peat areas within the cutaway parts of the site are shrinking as vegetation develops and consolidates.	• A significant part of the site has already re-vegetated, with pioneer vegetation maturing and developing a mosaic of typical cutaway peatland habitats with Birch woodland predominating. Bare peat areas within the older cutaway areas are reducing. Small wetlands are already developing. Natural re-colonisation of the cutaway so far has been quite effective. Other parts of the site (younger cutaway) are naturally colonising for more than 10 years and are developing a mosaic of cutaway habitats. • A portion of the cutaway has already been developed as a conifer plantation by Coillte. This will be subject to ongoing forestry management. • Bog restoration was carried out in the remnant raised bog zone around Lough Bawn pNHA in 2017 (15 ha). An area of bog previously drained by Bord na Móna but never developed was re-wetted using peat dams to block the drains.

	Derryaroge (2023 Plan)	Derryadd (2025 (Draft) Plan)	Derryaroge (2025 (Draft) Plan)	Lough Bannow (2025 (Draft) Plan)
				This improved the condition of the buffer zone around Lough Bawn pNHA.
Short-term Planning Actions (0-1 Years)	• Develop a detailed site plan with engineering drawings outlining how the various rehabilitation methodologies (The Scheme PCAS) will be applied to Derryaroge Bog. This will take account of peat depths, topography, drainage, and hydrological modelling. • A drainage management assessment of the proposed enhanced rehabilitation measures will be carried out and any issues identified resolved and the rehabilitation plan adapted. • A review of known archaeology and an archaeological impact appraisal of the proposed rehabilitation will be carried out. The results of this assessment will be incorporated into the rehabilitation plan to minimise known	• Seek formal approval of the rehabilitation plan from the EPA. • Develop a detailed site plan outlining how the various rehabilitation methods will be applied. This will take account of peat depths, topography, drainage and hydrological modelling (see rehabilitation map for an indicative view of the application of different rehabilitation methodologies). • A drainage management assessment of the proposed rehabilitation measures will be carried out and any issues identified resolved and the rehabilitation plan adapted. • A review of known archaeology and an archaeological impact appraisal of the proposed rehabilitation will be carried out. The results of this assessment will be incorporated into the rehabilitation plan to minimise known archaeological disturbance, where possible. • A review of issues that may constrain rehabilitation such as known rights of way, turbary and existing land agreements is to be carried out. • A review of remaining milled peat stocks is to be carried out. • An ecological appraisal of the potential impacts of the planned rehabilitation on the presence of sensitive ground-nesting bird breeding species (e.g. breeding waders) is to be carried out. The scheduling of rehabilitation operations will be adapted, where required. • Ensure all activities comply with the environmental protection requirements of the IPC Licence. • Carry out Appropriate Assessment (AA) of the Rehabilitation Plan. Incorporate any required mitigation measures from the AA (if required) in the plan for the delivery of rehabilitation and decommissioning across the site. • 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.		

	Derryaroge (2023 Plan)	Derryadd (2025 (Draft) Plan)	Derryaroge (2025 (Draft) Plan)	Lough Bannow (2025 (Draft) Plan)
	archaeological disturbance, where possible. • A review of issues that may constrain rehabilitation such as known rights of way, turbary and existing land agreements is to be carried out. • A review of remaining milled peat stocks is to be carried out. • An ecological appraisal of the potential impacts of the planned rehabilitation on the presence of sensitive ground-nesting bird breeding species (e.g. breeding waders) is to be carried out. The scheduling of rehabilitation operations will be adapted, where required. • Ensure all activities comply with the environmental protection requirements of the IPC Licence. • Carry out Appropriate Assessment of the Rehabilitation Plan. • Track implementation and enforcement of the relevant IPC Licence conditions, the mitigation measures (AA) and other environmental			

	Derryaroge (2023 Plan)	Derryadd (2025 (Draft) Plan)	Derryaroge (2025 (Draft) Plan)	Lough Bannow (2025 (Draft) Plan)
	control measures during the implantation of the rehabilitation plan.			
Short-term Practical Actions (0-2 Years)	• Carry out proposed measures as per the detailed site plan. This will include a combination of bunding and drain blocking on deep peat, and fertiliser application targeting bare peat areas of headlands, high fields and other areas (where required) in addition to wetland creation and management prescriptions. • All rehabilitation will be carried out with regard to best practice environmental control measures. • Monitor the success of rehabilitation measures in relation to developing suitable hydrological conditions. • Carry out the proposed monitoring, as outlined. • While natural colonisation is expected to commence almost immediately once peat production ceases, • Rehabilitiation measures in Derryaroge West and North are ongoing (2024-)	• Carry out proposed measures as per the detailed site plan. All rehabilitation will be carried out with regard to best practice environmental control measures. • Monitor the success of rehabilitation measures in relation to developing suitable hydrological conditions. • Carry out the proposed monitoring. • Silt ponds will be monitored during this period and there will be continued maintenance and cleaning to prevent potential suspended solids run-off from the site during the rehabilitation phase.		

	Derryaroge (2023 Plan)	Derryadd (2025 (Draft) Plan)	Derryaroge (2025 (Draft) Plan)	Lough Bannow (2025 (Draft) Plan)
	• Silt ponds will be monitored during this period and there will be continued maintenance and cleaning to prevent potential 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.			
Long-term Actions (>3 Years)	• Evaluate success of short-term rehabilitation measures outlined above and remediate where necessary. • Delivery of a monitoring, aftercare and maintenance programme. • Decommissioning of silt-ponds will be assessed and carried out, where required. • Reporting to the EPA will continue until the IPC License is surrendered.			

4.9.2 Description of Proposed Rehabilitation Measures

Some rehabilitation works have commenced on the Application Site already in the form of natural revegetation and re-colonisation (as described in the Cutaway Bog Decommissioning and Rehabilitation Plans (Appendix 4.3)) and in Table 4-7 above. Further rehabilitation work will commence immediately following the full decommissioning of the Application Site. The Cutaway Bog Decommissioning and Rehabilitation Plans included provides a description of the three bogs and their ecology. It also provides a framework and outline the typical works that will be undertaken to achieve the aims of successful rehabilitation (the criteria for which are defined in the plan) and a timescale for when the various elements of the plan will likely be implemented.

The details necessary to achieve the aims set out in the Cutaway Bog Decommissioning and Rehabilitation Plans (and shown on the potential Future Habitats Map) will include the exact locations of the drains to be blocked and any bunds to be constructed etc. These details are based on the existing habitats present and the topography of the Application Site. This level of detail will only be available once the rehabilitation plan is finalised. The remedial measures to be undertaken will follow proven and standard procedures that have been successfully applied by Bord na Móna and are known to be effective as detailed below.

4.9.2.1 Drain Blocking

Drains will be blocked using a number of methods depending on the size and type of drain. These methods will include the following:

- Peat dams within small drainage channels on the cutover bog;
- Removal or blocking of drainage pipes, or modification of drainage levels, where required.

These methods are fully described in the Irish Wildlife Manual, *Best Practice in Raised Bog Restoration in Ireland* (Mackin et al, 2017).

4.9.2.2 Monitoring

As per the Cutaway Bog Decommissioning and Rehabilitation Plans, a programme of monitoring, aftercare and maintenance will be implemented to validate the efficacy of the rehabilitation measures in achieving environmental stabilisation. Monitoring will initially involve 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, and then after 5 years to annual visits. Monitoring visits will also consider any requirements for further 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. This will be used to verify completion of rehabilitation measures. The extent of bare peat will be assessed using this baseline data, and habitat maps will be updated, if needed. It is proposed that sites can be monitored against this baseline in the future.

Water quality monitoring at the bog will be established. 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 IPC 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.

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, and COD and DOC. This monthly sampling regime on a selected number of silt ponds will be carried out over a two-year cycle.

If, after two years, key criteria for successful rehabilitation are being achieved and key targets are being met, then the water quality monitoring will be reviewed, with consideration of potential ongoing 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 criteria for successful rehabilitation have not been achieved and key targets have not been met, then the rehabilitation measures and status of the site will be evaluated and enhanced, where required. This evaluation may indicate no requirement for additional enhancement of rehabilitation measures but may demonstrate that more time is required before key criteria for rehabilitation has been achieved. Monitoring of water quality will then also continue for another period to be defined.

Additional monitoring measures are also proposed to monitor ecosystem service benefits that have been derived by enhanced rehabilitation in the areas subject to the PCAS scheme in the north and west of Derryaroge Bog. These proposed monitoring measures will be funded by the proposed Climate Action Fund 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. 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.

4.10 POTENTIAL FUTURE LAND USE

4.10.1 Proposed Derryadd Wind Farm

The Application Site is an important natural asset and has the potential to play a strategic role in meeting national climate action targets, which have become all the more significant in light of the Climate Action and Low Carbon Development (Amendment) Act 2021, the Climate Action Plan 2024, the Climate Change Performance Index 2024, and the Change Advisory Council's Annual Report 2024. These reports provide an updated assessment of both global climate change and climate change in the context of Ireland and identify the increasingly discernible impacts climate change is having on both the environment and society. In line with the Applicant's vision to assist in achieving a climate neutral Ireland by 2050, it is intended to utilise the Application Site for both peatland remediation and wind energy infrastructure and to facilitate environmental stabilisation of the Application Site and the optimisation of climate action benefits.

The overall permanent footprint of the proposed wind farm will be less than 4% of the total area of the Application Site, and therefore does not impact or change the overall goals and outcomes of the proposed rehabilitation plans. As such, it is the intention of the Applicant to integrate the peatland rehabilitation measures with the proposed future wind farm. The key objectives of environmental stabilisation and re-wetting of the cutaway areas will occur between and surrounding the proposed windfarm infrastructure. This has proven successful during construction of Mountlucas and Cloncreen Wind Farms.

The Cutaway Bog Decommissioning and Rehabilitation Plans, which will accompany the planning application for the proposed wind farm, detail how the Application Site will be rehabilitated alongside the construction and operation of the proposed wind farm, should the proposed wind farm development be consented. Further details of this proposed wind farm development can be obtained at the project website (https://www.derryaddwindfarm.ie/). A separate planning application for the proposed Derryadd Wind Farm will be submitted directly to An Bord Pleanála through the Strategic Infrastructure Development planning process. As mentioned, the wind farm footprint comprises approximately 4% of the total area of the Application Site and the wind farm application includes proposals to rehabilitation the site to support peatland, wetland and woodland habitats. The 132 MW windfarm development, if constructed, will generate 404,712 MWh of renewable energy annually, based on a 35% capacity factor. This has the potential to reduce Ireland's CO_2 emissions by 4.5% of the 2030 Electricity Sector carbon budget. This figure takes into account the carbon emissions related to the construction of the windfarm development including the removal of peat for the development construction. The generation of renewable electricity will be beneficial in terms of meeting national targets and the objectives of CAP24.'

Both the remedial measures and the proposed Derryadd Wind Farm are cumulatively assessed with the future remedial measures that will be carried at the Substitute Consent Application Site.

4.10.2 Ongoing and Future Enhanced Rehabilitation Measures (PCAS)

As part of Condition 10 of the IPC Licence, decommissioning and rehabilitation will be carried out as standard remedial measures associated with peat extraction activities and all ancillary works at the Application Site as described in Sections 4.8 and 4.9 above. In line with Bord na Móna's accelerated decarbonisation strategy, and the availability of government funding, the company has also committed to ambitious enhanced peatland decommissioning, rehabilitation and restoration measures, targeting circa 33,000 ha in over 80 no. Bord na Móna bogs.

This strategy has been developed to optimise ecosystem service benefits of peatland rehabilitation and restoration, particularly carbon storage and reducing carbon emissions. In addition, this will also benefit biodiversity and water (water quality and catchment management), as well as providing space for local communities and people to enjoy the outdoors.

PCAS measures are ongoing within areas to the north and west of Derryaroge Bog (refer to the 2023 Derryaroge Bog Cutaway Bog Decommissioning and Rehabilitation Plan included in Appendix 4.3). Sites are considered for inclusion within the PCAS on a year-by-year basis and the inclusion of Derryaroge, Derryadd and Lough Bannow Bogs are subject to ongoing review. In the event that future PCAS plans are not implemented or prepared, the Application Site will be rehabilitated in line with the Cutaway Bog Decommissioning and Rehabilitation Plans outlined in Section 4.9.1 above and included in Appendix 4.3.

Both the enhanced rehabilitation measures (PCAS) and the proposed wind farm are cumulatively assessed in this rEIAR with the future remedial measures (described in Section 4.9) that will be carried out at the Application Site as part of the IPC Licence requirements under Condition 10 of the Licence.

4.11 REFERENCES

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Appendix 2 Bord na Móna Ecological Survey Reports

Appendix 2a DERRYAROGE

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. The report outlines potential options for biodiversity management after industrial peat production has ceased, (if this is the proposed main land-use for the site).

Bog Name:	**Derryarogue**	**Area (ha):**	925 ha
Works Name:	Mount Dillon	**County:**	Longford
Recorder(s):	MMC & DF	**Survey Date(s):**	3rd September 2012
Photos:	Photos taken – see L:\AI_Data\Boora\Ecology Team\Photos\Derryarogue		

Review status: checked by CF ☺ discussed with TE ☐ discussed with Works manager ☐

Remaining work:

Peat production programme and outlook

Large sections of the site contain less than 1.1m of peat remaining and even larger sections of the site are no longer in peat production. The site is expected to remain in peat production until 2027.

Key biodiversity features of interest

- The site contains some establishing pioneer cutaway habitats at various developmental stages. Some of these areas are flooded to various extents and contain developing wetlands.
- The establishing cutaway habitats are attracting other typical wildlife, including signs of Otter around the silt pond complex to the west of the site.
- The production bog is surrounded by some typical marginal habitats of high local value including intact raised bog (PB1) and bog woodland (WN7).
- The River Shannon flows close to the western edge of the bog. The Shannon is an important wildlife corridor along which species can move from one area to another.

Ecological rating

The majority of the site can be rated as having a **low-high local ecological value (E-D).** Bare peat and other intensively managed areas are assessed as having a low local ecological value (E) (although some bare peat areas attract breeding waders). Pioneer cutaway habitats have a moderate local value (D) and act as a refuge for wildlife.

Habitats present (in order of dominance)

The most common habitats present at this site include:

- Bare peat (Codes refer BnM classification of pioneer habitats of production bog. See Appendix I).
- Pioneer Soft Rush-dominated poor fen (pJeff) with less frequent Bog Cotton (pEang) or Bottle Sedge (pRos) -dominated poor fen.
- Willow-dominated scrub (eWill) (in mosaic with pJeff) (in those areas that are flooded regularly)
- Open water (OW) (permanent) and Temporary open water (TOW)

- Birch-dominated scrub (eBir, oBir) (on drier higher ground that is not flooded))
- Pioneer dry heath (dHeath) (mainly in mosaic with Birch scrub)
- Dry pioneer Purple Moorgrass-dominated grassland (gMol)
- Access routes (Acc)
- Riparian zones (Rip) (with drains and associated habitats such as scrub and bog woodland)
- Silt ponds (Silt) with Gorse/Birch scrub and Purple Moorgrass-dominated grassland (gMol)

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

- Raised bog (PB1) (Codes refer to Heritage Council habitat classification, Fossitt 2000), See Appendix I.)
- Cutover Bog (PB4)
- Scrub (WS1)
- Wet (callows-type) grassland (GS4)
- Bog woodland (WN7)
- Dense Bracken (HD1)
- Improved grassland (GA1) around the boundary where the GIS boundary extends into adjacent fields

Description of site

Derryarogue Bog is located approximately three kilometres to the east of Lanesborough in County Longford. This bog is located within two main section, a western (smaller) section and an eastern section in which the majority of the site is located. A mineral island is located on the site and this area was previously surveyed and is described in the Derryarogue Springs ecological survey (G:\Ecology Team\management plans\Mount Dillon\Derryarogue). A long section of rail line to the west of the site connects the Roscommon Bogs with the Power Station in Lanesborough. A rail bridge across the River Shannon is also part of the site.

Mount Dillon works area is located in the south of the site, while the N63 Longford to Roscommon Road travels along much of the southern boundary of the site.

The peat that is harvested from Derryarogue is used as fuel peat in the adjacent Lough Ree Power Station. Large areas of Derryarogue are still in active peat production; however large areas of the site are cutaway and have developed a range of cutaway habitats. Numerous power lines cross the site and are in place to power to the pumps that are scattered across the site. Derryarogue Bog has been in peat production since 1964.

The northern section of the site is separated from the rest of the site by a rail line that crosses the site in an east west direction. Production is still active in the area, however a range of pioneer habitats have developed in areas that have not been in peat production for a number of years. Habitats that have developed on the older cutaway habitats include closed Birch scrub that was primarily made up of Birch and Willow with Oak and Pine becoming established also. These habitats are at least twenty years old and were located on higher ground. Younger pioneer habitats include gCal, pTrig, eBir and pPhrag. Large areas of exposed gravel are also common across this section of the site. A grey clay type sub-soil is located under this section of the site and it is clearly visible in the field drains. The western side of this section appears to be lower lying than the rest of the section and many of the field drains contained pioneer reed-beds (pPhrag). A flood defence berm was constructed in 2011 along the south western edge of this section in order to prevent flood water from the River Shannon entering the site.

The main section of the site is very varied in terms of habitats that are located there. This area also contains the mineral Island that is dealt with in a separate report. Large areas within this section appear to be cutaway despite the land-use map showing only small areas being out of production. Gravel protrudes from the ground in various locations even in some of the areas that are still in peat production. Pioneer habitats include Birch scrub (eBir, oBir and cBir). The centre of this section of the site appears to be considerably lower than the surrounding areas, surprisingly areas of open water are rare; however this is likely to be a result of the constant pumping of the site.

Two areas of wetland are developing within this section of the site and are mainly comprised of small areas of open water, and a mix of species such as Reed-mace, Soft Rush, Club Rush, Bulbous Rush, Marsh Arrow Grass and Mint. Charaphytes were also present to the open water. These areas appeared to have been

developing for a number of years and although they are small they were becoming diverse and provided habitat for Mallard and Snipe. These wetland areas had a quaking feel to them and it would be expected that they would expand across the site once the pumps were turned off.

Other habitats on the site include dry heath (on elevated areas), scrub and areas of pioneer poor fen. A large area of bare peat was located at the western edge of this section and peat production was on going in this area. Peat production in the majority of the section however was confined to individual fields that were scattered throughout.

The eastern section of the site was largely in peat production; however areas of cutaway of varying ages were also present. The areas of cutaway were becoming colonised with pioneer poor fen and scrub. The areas of scrub along the eastern edge were quite well developed and were approaching mature bog woodland.

During the spring of 2012 a honey project was started on the site. Ten bee hives were located on the mineral island. These hives are managed by *Hyland Honey*.

Forestry and potential forestry on site

There are some small patches of conifer plantation located along the southern boundary of the site adjacent to the main Mount Dillon works area. These plantations are generally small and were planted originally as shelter belts approximately 40 years ago. The main species are Sitka Spruce and Lodge-pole Pine. These areas have never received any management work and could be clear felled at this stage.

Some sections of the site may be suitable for forestry in the future depending on the site conditions when peat production ceases.

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

None

Lough Bannow pNHA (site code – 000449) is located less than 0.5km from the south of the site.

Adjacent habitats and land-use

Adjacent habitats include wet grassland (GS4), improved agricultural grassland (GA1), raised bog (PB1), scrub (WS1), bog woodland (WD7), conifer plantation along with active and inactive cutover bog (PB4).

Watercourses (major water features on/off site)

- The Templeton Glebe River flows along the north eastern boundary of the site before joining with the River Shannon.
- Another tributary of the River Shannon flows alongside the north western boundary of the site.
- The River Shannon is located less than 0.5km from the site.

Peat type and sub-soils

Gravel underlies the majority of the site. A grey coloured sub soil underlies the peat at the northern end of the site.

Fauna biodiversity

Birds

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

- Grasshopper Warbler
- Whitethroat
- Buzzard
- Other more common species include Grew Crow, Black Bird, Robin, Wood Pigeon, Swallow, Pied Wagtail, Pheasant,

Mammals

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

- Pine Marten
- Fox
- Badger
- Hare

Other species

Butterflies include – Brimstone, Speckled Wood, Peacock, Painted Lady, Small Tortshell

Stickleback in drains.

Honey Bees.

Fungal biodiversity

none

Activities on the site

Activities on the site include:

- A Longford Town resident uses the site to exercise his 14 dogs. These dogs are not controlled on the site and are chasing Hares and other wildlife. They may also pose a risk to people on the bog.
- Shooting
- Domestic turf cutting along the edges of the site.
- A flood defence berm has been constructed in the north western corner of the site.
- A honey project started in 2012 has installed ten bee hives on the mineral island at the centre of the site.

Future issues for biodiversity management and/or rehabilitation

Potential issues for biodiversity management and or rehabilitation once production has ceased include:

- Uncontrolled dogs on the site.
- Old plastic has been dumped at various locations around the site.
- Large sections of the site will be liable to flood once production ceases on the site. These areas will

develop a mosaic of wetland habitats such as open water and reedbed. The remaining deeper peat areas are likely to develop wet heath (HH3).

- Sections of remnant raised bog located along the boundaries of Derryrogue are in varying conditions. Some areas are relatively large and have not been ditched; however these sections are still drying out. There may be issues with ownership in some of the larger sections.
- Boundary issues. The current GIS boundary of the property includes small areas that are obviously managed by other land-owners around the margins of the bog, such as small portions of fields that are managed as farmland.
-

Potential management options for Biodiversity and/or rehabilitation

There are several potential management options for this site after industrial peat-cutting has ceased, some of which can be applied to different sections that have different potentials to enhance their biodiversity value. These suggested options do not preclude other land-uses of the site in the future.

- Drain blocking and installing berms could be used to trap more water in the lower lying sections of the site.
- Berms could be used to create areas of open water alongside areas where the water levels are controlled in order to allow the development of wet grassland. This management practice could be used to create suitable breeding wader habitat similar to Drinagh cutaway bog in Co Offaly (McCorry *et al*. 2012).
- Natural regeneration of habitats is probably the most suitable option for re-colonisation of cutaway bog when peat production ceases.
- The small areas of raised bog within the BnM boundary are too small to have potential for restoration of raised bog functions. Some abandoned sections could, however, be retained for biodiversity with no active management required. They offer some potential as a reserve for raised bog species including mosses that may be able to colonise some parts of the cutaway in the future.
- The mineral island along with some other raised sections that also contain mineral soil will be suitable for the development of Oak Ash Hazel woodland. Tree planting will speed up this process.
- The water courses along the boundaries of the site could be re-profiled in order to create more natural habitats.
- Butterfly diversity appears to be high on the site (further surveys needed). In some of the drier sections of the site wildflower meadows could be developed to encourage butterfly diversity.
- This site has a high amenity value as it contains a bridge across the Shannon. This bridge is solely used for transporting peat at present but could be used to allow recreational users to cross the Shannon.

Potential future natural habitats on the site

This section attempts to predict the development of natural habitats on the site, assuming there is no intervention or changes in land-use. This prediction is based on research and methods used to predict the natural vegetation of Ireland (Cross 2006). Cross (2006) predicted that cutaway bog is likely to develop a mosaic of Birch forest, alder and ash-alder carr, fen and heath in the future. There is no time-line given for the development of these habitats, although it could be expected that the development of natural climax habitats could take hundreds of years. The complexity is the result of small scale variations in the substrate and other environmental factors such as drainage and ground-water influence.

- The remnant sections of raised bog along the edges of the site are likely to remain as degraded raised bog (PB1).
- The overall majority of the site is likely to develop a wetland mosaic (mixture of open water, fen and wet woodland).
- The mineral island and some other raised areas are located on mineral soil. These areas will be likely to

develop Oak Ash Hazel woodland.

- Some remnant areas of high bog (PB1) unused by private sod-peat cutters could be expected to remain open as dry Heather-dominated habitats, with some sections developing bog woodland (WN7) and dry heath mosaics.
- Cutover bog (PB4) is likely to develop bog woodland (WN7) in the long-term, depending on land-use.

References

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HABITAT DESCRIPTIONS

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

HABITAT DESCRIPTIONS

Appendix I. Codes used for habitat classification.

Bord na Mońa habitat classification scheme

	General	Vegetation community [1]	BnM habitat code	Equivalent Heritage Council codes [2]
Pioneer habitats of industrial cutaway	Peatland	Bare peat (0-50% cover)	BP	ED2
		Embryonic bog community (containing *Sphagnum* and Bog Cotton)	PBa	PB
		Embryonic bog community (Calluno-Sphagnion)	PBb	PB
	Flush and Fen	Pioneer *Campylopus*-dominated community	pCamp	PF2
		Pioneer *Juncus effusus*-dominated community (Soft Rush)	pJeff	PF2
		Pioneer *Eriophorum angustifolium*-dominated community (Bog Cotton)	pEang	PF2
		Pioneer *Juncus bulbosus*-dominated community (Bulbous Rush)	pJbulb	PF2
		Pioneer *Triglochin palustris*-dominated community (Marsh Arrowgrass)	pTrig	PF2
		Pioneer Caricion davallianae-Community with *Cladium* (rich fen)	pCladium	PF1
		pioneer *Schoenus nigricans* community (rich fen)	pSchon	PF1
		pioneer *Carex viridula*/brown moss community (rich fen)	pVir	PF1
	Emergent communities	Pioneer *Carex rostrata*-dominated community (Bottle Sedge)	pRos	PF2/FS1
		Pioneer *Phragmites australis*-dominated community (Common Reed)	pPhrag	FS1
		Pioneer *Typha latifolia*-dominated community (Reedmace)	pTyp	FS1
		Pioneer *Schoenoplectus lacustris*-dominated community (Bulrush)	pSch	FS1
	Open water	Charaphyte-dominated community	pChar	FL2
		Permanent pools and lakes	OW	FL2
		Temporary open water	tOW	
	Woodland and scrub	Emergent *Betula*/*Salix*-dominated community (A) (Birch/Willow)	eBir	WS1
		Open *Betula*/*Salix*-dominated community (B) (Birch/Willow)	oBir	WS1
		Closed *Betula*/*Salix*-scrub community (C) (Birch/Willow)	cBir	WS1
		Ulex europaeus-dominated community (Gorse)	eGor	WS1
		Betula/*Salix*-dominated woodland (Birch/Willow)	BirWD	WN7
	Heathland	Pioneer dry *Calluna vulgaris*-dominated community (Heather)	dHeath	HH1
		Dense *Pteridium aquilinum* (Bracken)	dPter	HD1
	Grassland	Pioneer dry calcareous and neutral grasssland (Centaureo-Cynosuretum)	gCal	GS1
		Dactylis-Anthoxanthum-dominated community (Cocksfoot-Sweet Vernalgrass)	gCo-An	GS2
		Anthoxanthum-Holcus-Equisetum community (Sweet Vernalgrass-Yorkshire Fog-Horsetail)	gAn-H-Eq	GS
		Molinia caerulea-dominated community (dry) (Purple Moorgrass)	gMol	GS4
		Marsh (Meadowsweet and other tall herbs) (Filipendulion ulmariae)	Mar	GM1
	Disturbed	*Tussilago farfara*-dominated community (vegetation > 50%) (Colt's Foot)	DisCF	ED3
		Epilobium-dominated community (vegetation > 50%) (Willowherb spp.)	DisWil	ED3
	General	Riparian areas (streams or drain with associated edge habitats (e.g. FW2/4 + WS1, GS2 etc)	Rip	FW2 +
		Silt Ponds (artificial ponds with associated bank habitats (e.g. FL8 + WS1, GS2, ED2, ED3)	Silt	FL8 +
		Access (tracks or railways with associated edge habitats (e.g. BL3 + gCal, gMol, eGor etc)	Acc	BL3 +
		Works areas (predominately built land but can include landscaped and brownfield habitats (e.g. GA2, WS3, WD4, ED2, ED3)	Works	BL3 +

[1] These are generally pioneer habitats of bare peat and the communities can contain a significant proportion of bare peat. Some habitats are more developed than others. They frequently occur in mosaic with each other.
[2] Not all these communities are equivalent to habitat classes used by The Heritage Council habitat classification scheme (Fossitt 2000) as some are quite rudimentary and undeveloped.

Heritage Council habitat classification scheme (Fossitt 2000)

	General	Habitat	Heritage Council code
Semi-natural and modified habitats	Peatlands	Raised Bog	PB1
		Lowland Blanket bog	PB3
		Cutover Bog	PB4
		Rich fen and flush	PF1
		Poor fen and flush	PF2
		Transition mire and quaking bog	PF3
	Woodland and scrub	Oak-Birch-Holly woodland	WN1
		Oak-Ash-Hazel woodland	WN2
		Wet Pendunulate Oak-Ash woodland	WN4
		Riparian Woodland	WN5
		Wet Willow-Alder-Ash woodland	WN6
		Bog woodland	WN7
		Mixed broad-leaved woodland	WD1
		Mixed broad-leaved/conifer woodland	WD2
		Conifer plantation	WD4
		Scrub (Gorse)	WS1
		Emergent Betula-dominated community	WS1
		Closed Betula scrub community	WS1
		Recently-planted woodland	WS2
		Ornamental scrub	WS3
		Short-rotation coppice	WS4
		Recently-felled woodland	WS5
	Linear woodland	Hedgerow	WL1
		Treeline	WL2
	Grasslands and Marsh	Improved grassland	GA1
		Amenity grassland	GA2
		Dry calcareous and neutral grassland	GS1
		Dry meadows and grassy verges	GS2
		Dry-humid acid grassland	GS3
		Wet grassland	GS4
		Freshwater Marsh	GM1
	Heath and Bracken	Dry Heath	HH1
		Dry calcareous Heath	HH2
		Wet Heath	HH3
		Dense Bracken	HD1
	Disturbed ground	Exposed sand, gravel or till	ED1
		Spoil and bare ground	ED2
		Recolonising bare ground	ED3
		Active quarry	ED4
	Freshwater	Acid Oligotrophic lakes	FL2
		Mesotrophic lakes	FW4
		Artificial ponds (slit ponds)	FL8
		Depositing rivers	FW2
		Canals	FW3
		Drains	FW4
	Cultivated and Built land	Stonewalls and other stonework	BL1
		Earth Banks	BL2
		Buildings and artificial surfaces	BL3
		Arable crops	BC1
		Horticulture	BC2
		Tilled land	BC3

Appendix 2b DERRYADD

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. The report outlines potential options for biodiversity management after industrial peat production has ceased, (if this is the proposed main land-use for the site).

Bog Name:	**Derryadd**	**Area (ha):**	655 ha
Works Name:	Mount Dillon	**County:**	Longford
Recorder(s):	MMC & DF	**Survey Date(s):**	26th and 27th July 2012
Photos:	Photos taken – see L:\AI_Data\Boora\Ecology Team\Photos\Derryadd		

Review status: checked by CF ☺ discussed with TE ☐ discussed with Works manager ☐

Remaining work:

Peat production programme and outlook

Derryadd Bog is expected to be in peat production until 2030.

Key biodiversity features of interest

- The majority of the bog is currently in active peat production, however a significant area of cutaway has developed into calcareous grassland and scrub.
- The margins of the BnM property include some remnant habitats including raised bog (PB1) and bog woodland (WN7) that acts as a refuge for local wildlife.

Ecological rating

The majority of the site can be rated as having **(E) low local ecological value** as it is dominated by bare peat production bog.

Some parts of the site have a higher value (**National value -B**) as they attract species of conservation significance such as Otter.

Habitats present (in order of dominance)

The most common habitats present at this site include:

- Bare peat (BP) (Codes refer BnM classification of pioneer habitats of production bog. See Appendix I).
- Pioneer dry heath communities (dHeath)
- Scrub (eBir, OBir and CBir).
- Silt Ponds (Silt) with associated habitats such as scrub, Bracken, rank grassland (GS2), dry calcareous grassland (gCal) and typical pioneer communities of disturbed areas (disTuss).

The most common habitats present around the margins at this site include:

- Bog woodland (WN7) (Codes refer to Heritage Council habitat classification, Fossitt 2000), See Appendix I.)

- Scrub (WS1) (Gorse scrub and Birch scrub developing of dry high bog around margins)
- Raised bog (PB1)
- Cutover bog (PB4) (several small fragments)
- Wet grassland (GS4).

Description of site

Derryadd Bog is located approximately 4km to the East of Lanesborough in County Longford. This site is located within one main block. Two mineral islands (Annaghmore and Annaghbeg) are located within the site, these areas are not within the ownership of BnM and are managed as grazing land for domestic animals. A minor road connects the mineral islands with a public road that adjoins the eastern edge of the site. Derryarogue Bog is located immediately to the north of the site (separated by the Longford to Roscommon road). A rail link connects the site with Derryarogue to the north and Lough Bannow to the south. The majority of the site is in active peat production. The peat is used as fuel peat in Lough Ree Power in Lanesborough. Derryadd Bog has been in full peat production since the early 1960's and contains two pumps (south western corner of the site and along the northern boundary).

A relatively large area in the centre of the site has been cutaway for a number of years. This area of cutaway is located on a ridge that extends to the north and south of the mineral islands at the centre of the site. These areas are dry and have colonised by a mixture of calcareous grassland (gCal) and scrub (eBir, oBir and cBir). The scrub is well developed in places and is comprised mainly of Birch, however a proportion of Pine (Scot's Pine and Lodge-pole Pine) along with smaller amounts of Hazel and Ash have also become established. These areas are located on gravel and are dry.

Smaller areas of cutaway have developed across the site; these areas appear to be young and are mainly comprised of pioneer poor fen habitats.

Extensive drainage work was ongoing in the south western corner of the site at the time of the ecological survey.

A watercourse flows through the southern section of the site. This watercourse is a tributary of the River Shannon and has been canalised.

Other habitats along the margins of the site include bog woodland, wet grassland, dry heath and cutover bog. Overall, large areas of the site contain less than 2m of peat and contain exposed marl and gravel; however some small areas of the bog, in the south western corner of the site, are young in terms of peat production and still contain some "red" or "Sphagnum" peat. Two pumps are situated on the site and are used to prevent flooding.

Forestry and potential forestry on site

There are two small blocks of Conifer plantation on the site and these are comprised of 50 year old Sitka Spruce and Lodge-Pole Pine. Although these areas are in poor condition for their age it may prove financially viable to clear fell these areas. Timber extraction would be relatively easy as they are located directly behind the works area to the north of the site.

Other areas of the site may be considered for planting in the future as there are some elevated areas that are dry and may prove to be suitable for planting.

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

None

Lough Bannow pNHA (site code – 000449) is located 0.6km to the west of the site.

Adjacent habitats and land-use

Adjacent habitats include lowland depositing river (FW2), wet grassland (GS4), improved agricultural grassland

(GA1), cutaway bog (PB4), Conifer plantation and raised bog (PB1).

Watercourses (major water features on/off site)

- Tributaries of the River Shannon flow along the eastern and western boundaries of the site.
- A tributary of the River Shannon flows through the southern section of Derryadd.

Peat type and sub-soils

The majority of Derryadd contains between 1 to 2m of peat, however large areas of the site contain less than 1m of peat and are approaching the end of peat production. The remaining peat on the site appears to be fen peat. The site is underlain with a mix of gravel and marl.

Fauna biodiversity

Birds

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

- Heron
- Mallard (4)
- Kestrel
- Skylark (6)
- Willow Warbler (3)
- Grasshopper Warbler
- Other more common species include Wood Pigeon, Meadow pipit, Robin, Blackbird, Grey Crow, Magpie
- Some BnM employees are actively releasing Pheasant onto the site.

Mammals

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

- Otter
- Badger
- Pine Marten
- Squirrel (Red or Grey)
- Hare

Other species

Frog

Butterflies –

Green-veined White, Small Copper, Small Heath, Large White, Meadow Brown

Fungal biodiversity

Wax Cap, Shaggy Ink Cap.

Activities on the site

Activities on the site include:

- Pheasants are released every year by BnM staff members.
- Shooting

Future issues for biodiversity management and/or rehabilitation

Potential issues for biodiversity management and or rehabilitation once production has ceased include:

- Large sections of the site will be liable to flood once production ceases on the site. These areas will develop a mosaic of wetland habitats such as open water and reedbed.
- Sections of remnant raised bog located along the boundaries of Derryadd are in varying conditions. Overall these areas are small and are drying out. There may be issues with ownership in some of the larger sections.
- Boundary issues. The current GIS boundary of the property includes small areas that are obviously managed by other land-owners around the margins of the bog, such as small portions of fields that are managed as farmland.

Potential management options for Biodiversity and/or rehabilitation

There are several potential management options for this site after industrial peat-cutting has ceased, some of which can be applied to different sections that have different potentials to enhance their biodiversity value. These suggested options do not preclude other land-uses of the site in the future.

- Drain blocking and installing berms could be used to trap more water in the lower lying sections of the site.
- Natural regeneration of habitats is probably the most suitable option for re-colonisation of cutaway bog when peat production ceases.
- The small areas of raised bog within the BnM boundary are too small to have potential for restoration of raised bog functions. Some abandoned sections could, however, be retained for biodiversity with no active management required. They offer some potential as a reserve for raised bog species including mosses that may be able to colonise some parts of the cutaway in the future.
- The water courses along the boundaries of the site could be re-profiled in order to create more natural habitats.
- Butterfly diversity appears to be high on the site (further surveys needed). In some of the drier sections of the site wildflower meadows could be developed to encourage butterfly diversity.

Potential future natural habitats on the site

This section attempts to predict the development of natural habitats on the site, assuming there is no intervention or changes in land-use. This prediction is based on research and methods used to predict the natural vegetation of Ireland (Cross 2006). Cross (2006) predicted that cutaway bog is likely to develop a mosaic of Birch forest, alder and ash-alder carr, fen and heath in the future. There is no time-line given for the development of these habitats, although it could be expected that the development of natural climax habitats could take hundreds of years. The complexity is the result of small scale variations in the substrate and other

environmental factors such as drainage and ground-water influence.

- Large sections of the site are likely to develop a wetland mosaic (mixture of open water, fen and wet woodland).
- Bog woodland with elements of Oak Ash Hazel woodland are likely to develop on the higher ground towards the centre of the site.
- Bog woodland with Pine are likely to develop along the eastern section of the site; this is probably going to be more extensive along the eastern side of this site than others because the areas to the east will be relatively dry and there already is high frequency of pine establishment on the cutaway to date.
- Dry species poor bog woodland (WN7) is likely to develop along the edges of the site.
- Some remnant areas of high bog (PB1) unused by private sod-peat cutters could be expected to remain open as dry Heather-dominated habitats, with some sections developing bog woodland (WN7) and dry heath mosaics.
- Cutover bog (PB4) is likely to develop bog woodland (WN7) in the long-term, depending on land-use.

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 I. Codes used for habitat classification.

Bord na Mońa habitat classification scheme

	General	Vegetation community [1]	BnM habitat code	Equivalent Heritage Council codes [2]
Pioneer habitats of industrial cutaway	Peatland	Bare peat (0-50% cover)	BP	ED2
		Embryonic bog community (containing *Sphagnum* and Bog Cotton)	PBa	PB
		Embryonic bog community (Calluno-Sphagnion)	PBb	PB
	Flush and Fen	Pioneer *Campylopus*-dominated community	pCamp	PF2
		Pioneer *Juncus effusus*-dominated community (Soft Rush)	pJeff	PF2
		Pioneer *Eriophorum angustifolium*-dominated community (Bog Cotton)	pEang	PF2
		Pioneer *Juncus bulbosus*-dominated community (Bulbous Rush)	pJbulb	PF2
		Pioneer *Triglochin palustris*-dominated community (Marsh Arrowgrass)	pTrig	PF2
		Pioneer Caricion davallianae-Community with *Cladium* (rich fen)	pCladium	PF1
		pioneer *Schoenus nigricans* community (rich fen)	pSchon	PF1
		pioneer *Carex viridula*/brown moss community (rich fen)	pVir	PF1
	Emergent communities	Pioneer *Carex rostrata*-dominated community (Bottle Sedge)	pRos	PF2/FS1
		Pioneer *Phragmites australis*-dominated community (Common Reed)	pPhrag	FS1
		Pioneer *Typha latifolia*-dominated community (Reedmace)	pTyp	FS1
		Pioneer *Schoenoplectus lacustris*-dominated community (Bulrush)	pSch	FS1
	Open water	Charaphyte-dominated community	pChar	FL2
		Permanent pools and lakes	OW	FL2
		Temporary open water	tOW	
	Woodland and scrub	Emergent *Betula*/*Salix*-dominated community (A) (Birch/Willow)	eBir	WS1
		Open *Betula*/*Salix*-dominated community (B) (Birch/Willow)	oBir	WS1
		Closed *Betula*/*Salix*-scrub community (C) (Birch/Willow)	cBir	WS1
		Ulex europaeus-dominated community (Gorse)	eGor	WS1
		Betula/*Salix*-dominated woodland (Birch/Willow)	BirWD	WN7
	Heathland	Pioneer dry *Calluna vulgaris*-dominated community (Heather)	dHeath	HH1
		Dense *Pteridium aquilinum* (Bracken)	dPter	HD1
	Grassland	Pioneer dry calcareous and neutral grasssland (Centaureo-Cynosuretum)	gCal	GS1
		Dactylis-Anthoxanthum-dominated community (Cocksfoot-Sweet Vernalgrass)	gCo-An	GS2
		Anthoxanthum-Holcus-Equisetum community (Sweet Vernalgrass-Yorkshire Fog-Horsetail)	gAn-H-Eq	GS
		Molinia caerulea-dominated community (dry) (Purple Moorgrass)	gMol	GS4
		Marsh (Meadowsweet and other tall herbs) (Filipendulion ulmariae)	Mar	GM1
	Disturbed	*Tussilago farfara*-dominated community (vegetation > 50%) (Colt's Foot)	DisCF	ED3
		Epilobium-dominated community (vegetation > 50%) (Willowherb spp.)	DisWil	ED3
	General	Riparian areas (streams or drain with associated edge habitats (e.g. FW2/4 + WS1, GS2 etc)	Rip	FW2 +
		Silt Ponds (artificial ponds with associated bank habitats (e.g. FL8 + WS1, GS2, ED2, ED3)	Silt	FL8 +
		Access (tracks or railways with associated edge habitats (e.g. BL3 + gCal, gMol, eGor etc)	Acc	BL3 +
		Works areas (predominately built land but can include landscaped and brownfield habitats (e.g. GA2, WS3, WD4, ED2, ED3)	Works	BL3 +

[1] These are generally pioneer habitats of bare peat and the communities can contain a significant proportion of bare peat. Some habitats are more developed than others. They frequently occur in mosaic with each other.
[2] Not all these communities are equivalent to habitat classes used by The Heritage Council habitat classification scheme (Fossitt 2000) as some are quite rudimentary and undeveloped.

Heritage Council habitat classification scheme (Fossitt 2000)

	General	Habitat	Heritage Council code
Semi-natural and modified habitats	Peatlands	Raised Bog	PB1
		Lowland Blanket bog	PB3
		Cutover Bog	PB4
		Rich fen and flush	PF1
		Poor fen and flush	PF2
		Transition mire and quaking bog	PF3
	Woodland and scrub	Oak-Birch-Holly woodland	WN1
		Oak-Ash-Hazel woodland	WN2
		Wet Pendunulate Oak-Ash woodland	WN4
		Riparian Woodland	WN5
		Wet Willow-Alder-Ash woodland	WN6
		Bog woodland	WN7
		Mixed broad-leaved woodland	WD1
		Mixed broad-leaved/conifer woodland	WD2
		Conifer plantation	WD4
		Scrub (Gorse)	WS1
		Emergent Betula-dominated community	WS1
		Closed Betula scrub community	WS1
		Recently-planted woodland	WS2
		Ornamental scrub	WS3
		Short-rotation coppice	WS4
		Recently-felled woodland	WS5
	Linear woodland	Hedgerow	WL1
		Treeline	WL2
	Grasslands and Marsh	Improved grassland	GA1
		Amenity grassland	GA2
		Dry calcareous and neutral grassland	GS1
		Dry meadows and grassy verges	GS2
		Dry-humid acid grassland	GS3
		Wet grassland	GS4
		Freshwater Marsh	GM1
	Heath and Bracken	Dry Heath	HH1
		Dry calcareous Heath	HH2
		Wet Heath	HH3
		Dense Bracken	HD1
	Disturbed ground	Exposed sand, gravel or till	ED1
		Spoil and bare ground	ED2
		Recolonising bare ground	ED3
		Active quarry	ED4
	Freshwater	Acid Oligotrophic lakes	FL2
		Mesotrophic lakes	FW4
		Artificial ponds (slit ponds)	FL8
		Depositing rivers	FW2
		Canals	FW3
		Drains	FW4
	Cultivated and Built land	Stonewalls and other stonework	BL1
		Earth Banks	BL2
		Buildings and artificial surfaces	BL3
		Arable crops	BC1
		Horticulture	BC2
		Tilled land	BC3

Appendix 2c LOUGH BANNOW

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. The report outlines potential options for biodiversity management after industrial peat production has ceased, (if this is the proposed main land-use for the site).

Bog Name:	**Lough Bannow**	**Area (ha):**	746ha
Works Name:	Mount Dillon	**County:**	Longford
Recorder(s):	DF	**Survey Date(s):**	27th and 29th July 2010
Photos:	Photos taken – see L:\AI_Data\Boora\Ecology Team\Photos\Lough Bannow		

Review status: checked by CF ☺ discussed with TE ☐ discussed with Works manager ☐

Remaining work:

Dr. Judith Keleman (waiting for reply)

JP Reilly is a source of local knowledge on Lough Bawn and can be contacted through Patsy Cox.

Peat production programme and outlook

Due to the presence of many gravel ridges and areas of exposed fossil timber, peat production on this site is not estimated to go beyond the next five years (Patsy Cox).

Key biodiversity features of interest

- Calcareous springs (or depressions collecting tufa-rich groundwater). If classified as tufa-forming (active springs), they qualify as the Annex I habitat 'Petrifying springs with tufa formation (Cratoneurion) (7220)'.
- Lough Bawn, which contains Transition Mire and Quaking bog (PF3) qualifies as an Annex I EU Habitats Directive habitat-'transition mires and quaking bogs' -7140. (Lough Bawn pNHA 001819)
- Extensive bog woodland (WN7) (Annex I habitat) along the western sedges of the transition mire (Lough Bawn site) qualifies as the Annex I habitat 'bog woodland' -91D0.
- Pioneer dry calcareous grassland developing on cutaway.
- Oak Ash Hazel woodland (WN2) in the north east section of the site.
- Areas of Birch (oBir and cBir) dominated scrub that are becoming species rich and likely to develop into Oak-Ash-Hazel woodland (WN2) in the future.
- Otters are using the drains in the north eastern section of the site and are likely to be using the drainage system that is connected to the Royal Canal.
- Pine Marten are present on the site at numerous locations

Habitats present (in order of dominance)

The most common habitats present at this site include:

- Poor fen (pEang, pJeff, pTyp, pPhrag and pTrig)
- Bare peat (BP)
- gCal

- DisCf
- pCamp
- Rip - riparian areas (streams/drains with fringing habitats)
- Birch dominated scrub (ebir, oBir and cBir) (Codes refer BnM classification of pioneer habitats of production bog. See Appendix I).
- Exposed gravel
- dHeath
- Temporary open water (tow)
- Conifer plantation (WD4)
- Transition mire and quaking bog (PF3)
- Bog woodland (WN7)
- Raised bog (PB1) remnant
- Oak-Ash-Hazel woodland (WN2)
- Possible calcareous springs (FP1)
- Dense Bracken (HD1)
- Wet grassland (GS4) along the fringes of the bog

Description of site

Lough Bannow Bog is situated approximately seven kilometres south east of Lanesborough, Co. Longford along the R392 Road. The R398 public road runs along the north of the site while a secondary road (Keenagh road) runs along part of the southern section of the road. The Royal Canal passes within 500 metres of eastern edge of the site. Two large mineral islands are located within the site boundaries but are not under BnM ownership. This site has been harvested for milled peat since the late 1960's and the general outlook for peat production on this bog will be for another five years on selected areas of the site, areas of the site that will not be further harvested for peat are located throughout the site and are at various stages of development in terms of revegetation. A large section of failed conifer plantation is located on the site. Overall this site varies greatly from areas that are re-vegetating rapidly since they came out of production to areas that are currently under production (Bare peat). Topographically, the site undulates and has regular small hills of gravel that are exposed between areas of low lying peat, the latter areas being still in production. A rail line crosses the site in an east west direction, dissecting the site into a much larger northern section and a smaller southern section.

Over all the majority of the site is still zoned as production but as the peat resource on this site becomes exhausted small hills and ridges of gravel are being exposed, these hills and ridges are becoming revegetated with Dry grassland mosaic (DisCf, gCal and gAn-H-Eq). Areas between these hills are either still in production or are revegetating with plant species that are indicative of poor fen habitats such as pEang, pTyp and pJeff. Birch scrub is also becoming established on many of the habitats that have been out of production for longer periods of time, particularly the drier areas.

A conifer plantation was planted in 1995 and is comprised of Sitka and Norway spruce. Some sections of this plantation had trees of medium quality and were in need of thinning and fertilisation, however the majority of the area was extremely poor, with dead or dying trees throughout. The most logical reason for the widespread loss of trees in this plantation was the presence of Heather throughout these areas. Heather is extremely well suited to savaging nitrogen from poor soils and will deprive trees such as Sitka Spruce of nitrogen, causing then to go into check followed by eventual death. Birch and Scots Pine had become established in areas of the plantation and appeared to be doing much better than the spruce.

Immediately to the east of the conifer plantation a large area of the site was largely revegetated with a mixture of cBir, oBir, dHeath, BP and pEang. Much of the cBir was dense and was developing into bog woodland. Other areas beyond the cBir were younger and were a mosaic of wet and dry habitats (depending on the topography of the site), intermixed with areas of bare peat. To the south east of the conifer plantation a row of three small hills were at different levels of development, mainly Birch scrub, but the notable feature of these areas was the

presence of Oak and Hazel.

A large mineral island is located within the site boundaries in the centre of the site. This “Island” is connected to the public road that runs close to the northern boundary of the site via a small track. This area is not owned by BnM and is managed as agricultural grassland. To the south of the mineral island the site is a mixture of pioneer habitats including DisCf, BP, eBir, pJeff and gCal. To the south of the revegetating areas the site is still in production.

The central-eastern part of the site is largely a mixture of dry grassland mosaics and wet grassland mosaics (gCal, DisCf, eBir, oBir, pJeff, pEang, pPhrag, pTyp), with areas of bare peat scattered throughout, some of the areas of bare peat were large but some areas were much smaller and were comprised of a couple of short fields between gravel ridges.

A small works area is located along the railway line close to the eastern end of the line. This works area is comprised of a large tea centre with large amounts of machinery stored around it. Immediately to the north of the works area an area of scrub (cBir) that was developing some of the components of Oak Ash Hazel woodland. This woodland is young and is still developing with Birch, Oak, Rowan, Holly, Hawthorn, Hazel, Guelder Rose, Bramble, Raspberry, Herb-Robert, Meadow-sweet, Honey-suckle, Tufted Sedge, Purple Moor-grass and Male Fern. Paths through this are of the site were in regular use by BnM machinery and relatively large areas of Meadow-sweet dominated wet grassland was located along the access routes. A large rectangular shaped area had been excavated in this area and was filled with water resulting in the presence of an artificial pond. This pond did not contain many macrophytes apart from Reedmace, Floating Sweet Grass with some Water Crow’s-foot also. The wet grassland areas contained Meadow Sweet, Knapweed, Willow, Plantain, Vetch, Sweet Vernal-grass, Devil’s Bit-Scabious, Hogweed, Horsetails, Red Clover and Creeping Bent Grass. A small wet hollow was also located close to this area and further investigations may be needed in order to determine if this is an actual spring. Although this spot was damp with no standing or flowing water at the time of the ecological survey it did contain tufa which may indicate the presence of springs in this area.

Moving north from this area towards the north eastern corner of the site, the bog again comprises a mosaic of habitats including pJeff, pEang, eBir, gCal, pEqus and DisCf, the largest single habitat consists of a large area of pJeff and oBir along the western edge of the north east corner of the site. An old, disused, railway line is located close to the eastern edge of the site and has been colonised with gMol, dHeath and eGor, several old railway carriages are still located on the track.

The north eastern corner of the site also contains two small mineral islands that contain Birch, Oak, Blackthorn, Ash and Hazel along with Male fern, Bramble, Lords and Ladies, Hogweed, Harts Tongue Fern, Honeysuckle, Wood Anemone and Herb Robert. Sections of these mounds contain large mature Oak (older than 100 years).

Moving westwards from the mire onto sections of cutover, the site again becomes a mosaic of habitats, mainly pJeff, oBir and bare peat before encountering a mineral island. This mineral island is similar to the one that has already been described to the north of the railway line.

Moving west a large area of bare peat is located before the site again becomes a mosaic of pioneer poor fen and pioneer grassland habitats.

The south west corner of the site is mainly bare peat with pTrig, pRos and pTyp becoming established along the drains, this area is marked on the 2nd edition OSI 6 inch map as a small lake called Lough Anpastia. This lake no longer exists and there is no evidence of it ever having been present on the ground. A pump was in operation close to this area.

This site is dry because of constant pumping and at least three pumps are located on the site. Some of the drains in the east of the site have been excavated down to limestone bedrock, Otter spraint were found in one of these drains in the northern section of the site, this drainage ditch is connected to the nearby Royal Canal.

<u>Lough Bawn pNHA 001819</u>

This area is located along the eastern edge of the site. It is bordered by remnant raised bog to the south, west and north while an area of woodland on mineral soil borders Lough Bawn to the east. The south eastern corner of the site is bordered by conifer plantation, part of which was clear felled in the past few years and replanted. The majority of the Lough is in Bord na Mona ownership with a small section owned by Coillte.

The sections of raised bog that surround part of the Lough were in moderate to poor condition overall and the most westerly sections had been ditched many years ago. The ditched sections were dominated by Heather; however the most southerly section of raised bog were in some what better condition with a more varied flora.

Lough Bawn is fringed with woodland through out. This woodland varies from wet bog woodland (WN7) to dry Oak Ash Hazel woodland (WN2) along its eastern side. The woodland that fringes the Lough to the west, north and south is bog woodland (WN7) that varies from sparse cover to denser cover; these sections of bog woodland were quaking and had a high cover of Sphagnum moss in general. These sections of woodland are classed as Annex I habitats (91D0) and are considered to be a rare habitat in Ireland with an estimated nation wide land cover of 150ha approximately (NPWS - Bog woodland (91D0) Conservation Status Assessment report).

The areas of bog woodland ranged to thick, dense areas of woodland to areas that had a lesser density of trees. The main tree species were Birch and Scot's Pine along with Alder, Eared Willow and some gorse. There was extensive evidence that the water levels fluctuate throughout these areas, with some areas being permanently water logged with a quaking feel throughout. Species within the areas of bog woodland included Bog Myrtle, Devil's-bit Scabious, Bog Bean, Honeysuckle, Soft Rush, Sphagnum palustre, Ivy, Bramble, Sweet Vernal Grass, Heather, Star Sedge, Wood Horsetail, Grey Willow, Holly, Broad Buckler Fern, Cow wheat, mint, Water Horsetail, Hogweed, Calliergon sp., Ragged Robin, Lesser Spearwort, Lousewort, *Aulacomnium palustre*, Spotted Marsh Orchid, Marsh Bedstraw. Yorkshire Fog, Heath Wood-Rush and *Epilobium obscurum*.

A section of mature Oak-Ash-Hazel (WN2) is located on the eastern side of Lough Bawn, this woodland was relatively dry and was located on mineral soil. Species here included Birch, Scot's Pine, Ash, Alder, Willow, Hazel, herb Robert, Spindle, Enchanter's nightshade, Ivy, Honeysuckle, Wood False Broome, Hypnum sp., Bramble, Viola sp., Blackthorn, Rowan, Wavy hair Grass, Meadow Sweet, Wood horsetail, Wild strawberry, Holly, hawthorn, Blackthorn, Gorse, Glaucous Sedge, Sycamore, Bush Vetch, Cock's foot, Beech, Rough meadow Grass, Spear Thistle, Wood dock, Wood Sanicle, wood Sedge, Primrose, Lady Fern, Sorrell, Male Fern, Hart's Tongue Fern, Yew, Wytch Elm, *Polytrichum commune*, Yellow rattle, Cep, Bay Bolete, Common Puffball and Trooping Funnel Cap.

A section to the east of this woodland has been fenced off and is grazed, the grazed area ran along the entire eastern edge of the woodland.

The Coillte owned woodland to the south east of Lough Bawn is a mixture of recently felled conifer plantation and mature plantation with sitka Spruce, Norway Spruce and Lodgepole Pine, the edge of these sections were a mixture of species such as Oak, Birch and Hazel with some Yew also.

Lough Bawn had been a lake up until 1964 when drainage of the lake begun, after this initial drainage the water levels shrink until the lake was mostly terristrailized by the late 1960's. This area is classed as transition mire and quaking bog (PF3) according to Fossitt, 2000.

At present the lough has filled in with very small amounts of open water remaining and the entire area has a quaking feel to it. The Lough is covered with a mat of vegetation containing hummocks of vegetation interspersed with shallow water. The Lough is dominated with mosses and sedges and individual trees have spread across the surface of the Lough. Plant species in the area of the lough include Purple Moor Grass, Eared Willow, Birch, Bog Asphodel, Bog Bean, Devil's-bit Scabious, Star Sedge, Purple Loosestrife, Greater Tussock Sedge, Bottle Sedge, Sphagnum palustre (tussock forming) S. subnitens, Heather, Lesser tussock Sedge, Marsh cinquefoil, *Aulacomnium palustre* (tussock forming), marsh Pennywort, Round-leaved Sundew, Wild Angelica, Marsh Thistle, Ragged Robin, Reedmace, Alder, Mint, Water Horsetail, Creeping Bent-grass, Eriophorum angustifolium and Lousewort. *Usnea* sp. lichen was growing on the branches of many of the trees.

One of the BnM employees on the site reported the presence of springs at locations around the site.

There are records of Black Headed Gull, Snipe and Lapwing using this site.

Old BnM plastic has been dumped in one section of the site.

Forestry and potential forestry on site

A conifer plantation is located in the north of the site. This plantation is mainly Sitka Spruce with some Norway Spruce, these trees are in poor condition with the majority of the trees in check or dying. However, there are some areas within the plantation where there has been moderate tree growth and these areas could be thinned and fertilised. The best approach for this plantation is to employ a shelter-wood silvicultural system. This would entail felling and clearing areas along the eastern edge of the plantation and thus leaving taller trees to the south east where the taller trees would provide shelter from the prevailing winds. The sections of spruce that have failed all had a thick ground layer of Heather. Heather will out-compete spruce in terms of obtaining nitrogen from poor soils and this is one of the likely reasons for the failure of the plantation. In a shelter-wood silvicultural system the cleared areas would be replanted immediately with Scot's Pine which would be vastly more suited to the ground conditions that are present on this site.

Numerous small mineral islands are located around the site, some of these areas are already developing Oak-Ash-Hazel (WN2) woodland, in the future it would be envisioned that this habitat would expand across the site in time. An old section of Oak-Ash-Hazel woodland is located in the north east of the site and some of the trees are estimated to be older than 100 years.

A band of bog woodland (WN7) encircles most of the transition mire area in the south east of the site. This woodland is mainly Scot's Pine and Birch and qualifies as the Annex I habitat "bog woodland (91D0)" and is considered to be a priority habitat.

Coillte own the section of woodland to the south east of Lough Bawn. This forested area consists of recently felled conifer plantation with some mature conifer woodland to the east.

There is the potential to enter the woodland to the east of Lough Bawn into the Native Woodland Scheme under Element I of the scheme. Some of the higher mounds could also be used to develop areas of native woodland depending on future hydrological changes.

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

Lough Bawn is situated in the south eastern corner of the site and was formally a lake until the late 1960's. The lake dried out after intensive drainage works and is now classified as a 'Transition mire and quaking bog' pNHA 001819.

Adjacent habitats and land-use

Adjacent habitats include improved agricultural grassland (GA1), wet grassland (GS4), conifer plantation (WD4), raised bog (PB1), recently planted woodland (WS2) and cutover bog (PB4). The Royal Canal (FW3) is located approximately 0.5km to the east of the site.

Watercourses (major water features on/off site)

- The Bilberry River begins at the southern boundary of the site, this river flows southwards before flowing into Lough Ree
- A tributary of the Bilberry River begins in the south western corner of the site.
- A tributary of the River Shannon starts in the north of the site before flowing northwards.
- All of the watercourses are part of the Shannon catchment.
- The Royal Canal flows within 0.5km of the eastern edge of the site.

Peat type and sub-soils

As the peat resource becomes exhausted gravel ridges and hills are exposed, these hills are composed of

Limestone gravel.

Fauna biodiversity

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

- Raven (2)
- Sky Lark
- Sand marten
- Common Gull
- Snipe (3)
- Swans are reported to be using the flooded areas during the winter.
- Other more common species include Meadow Pipits, Swallow, Dunnock, Blackbird, Chaffinch, Wood Pigeon, Pheasant and Magpie.

Mammals

- Otter spraint found in a drainage ditch in the north east of the site, this drain is connected to the nearby Royal Canal.
- Pine Marten
- Badger
- Fox
- Hare
- Rabbit

Invertebrates

- Silver-washed Fritillary Butterfly
- Peacock Butterfly
- Green-veined White Butterfly
- Large Heath Butterfly
- Large White Butterfly
- Small Heath Butterfly
- Small Copper Butterfly
- Painted Lady Butterfly

Fish

- Stickleback in the drains

Fungal biodiversity

The Oak-Ash-Hazel woodland along the eastern boundary of the site is rich in fungal diversity with Ceps, Bay Bolete, Razor Strop and Trooping Funnel Cap observed.

Activities on the site

Activities on the site include:

- Peat production is still carried out at various locations around the site however as time goes by more

and more areas are coming out of production and are becoming re-vegetated.

- Most of the site is pumped to prevent water logging, when production is finished it is assumed that these pumps will be turned off resulting in many areas developing areas of open water between dry gravel hills and ridges.
- Some old railway carriages have been abandoned on the site
- Cattle have been grazing sections of woodland along the eastern boundary of the site.
- Some old BnM plastic has been discarded on sections of the bog.

Future issues for biodiversity management

Potential issues for biodiversity management once production has ceased include:

- Once production has ceased it is assumed that the water pumps will be turned off, this will result is the site becoming a mosaic of dry and wet habitats. Natural basins on the site will quickly develop wetland habitats interspersed with higher, drier habitats.
- Natural regeneration appears to be capable of establishing vegetation on this site quite quickly

Potential management options for Biodiversity

There are several potential management options for this site after industrial peat-cutting has ceased, some of which can be applied to different sections that have different potentials to enhance their biodiversity value. These suggested options do not preclude other land-uses of the site in the future.

- Bunds could be constructed on the site such as the north east corner and the south west corner in order to create wetlands. This would also re-develop a wetland on the area that was once occupied by Lough Anpastia.
- In the area of the conifer plantation the dying spruce could be replaced with Scot's Pine. This species would be better suited to conditions on the site while also proving beneficial to nature conservation. This area could be managed jointly with Coillte as a biodiversity area.
- Lough Bawn area managed as a key nature conservation site. There is potential for this area to be part of a LIFE project with development bog sites (Largest bog woodland Annex I habitat on BnM property). Works to be carried out in this area could include drain blocking.
- Development of excavated trenches as ponds.
- Development of woodlands on the drier mounds under the Native Woodland Scheme.

Potential future natural habitats on the site

This section attempts to predict the development of natural habitats on the site, assuming there is no intervention or changes in land-use. This prediction is based on research and methods used to predict the natural vegetation of Ireland (Cross 2006). Cross (2006) predicted that cutaway bog is likely to develop a mosaic of Birch forest, alder and ash-alder carr, fen and heath in the future. There is no time-line given for the development of these habitats, although it could be expected that the development of natural climax habitats could take hundreds of years. The complexity is the result of small scale variations in the substrate and other environmental factors such as drainage and ground-water influence.

- Wetlands will develop once the water pumps cease, the extent of these wetlands will depend on the level of water after the pumping stops.
- Woodlands will develop in the drier areas such as on top of the gravel mounds, these woodlands are likely to be a mixture of Oak-Ash-Hazel (WN2) woodland and Bog woodland (WN7).
- The areas of wet grassland along the western edge of the site are likely to become wet woodland if

grazing does not occur.

- Lough Bawn, depending on future hydrological developments may continue to dry out or become wetter with the development of a larger area of open water.
- Potential rich fen may develop where springs are present.

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 I. Codes used for habitat classification.

Bord na Mońa habitat classification scheme

	General	Habitat [1]	BnM habitat code	Equivalent Heritage Council codes [2]
Pioneer habitats of industrial cutaway	Peatland	Bare peat (0-50% cover)	BP	ED2
		Embryonic bog community (containing *Sphagnum* and Bog Cotton)	PBa	PB
		Embryonic bog community (Calluno-Sphagnion)	PBb	PB
	Flush and Fen	Pioneer *Campylopus*-dominated community	pCamp	PF2
		Pioneer *Juncus effusus*-dominated community (Soft Rush)	pJeff	PF2
		Pioneer *Eriophorum angustifolium*-dominated community (Bog Cotton)	pEang	PF2
		Pioneer *Juncus bulbosus*-dominated community (Bulbous Rush)	pJbulb	PF2
		Pioneer *Triglochin palustris*-dominated community (Marsh Arrowgrass)	pTrig	PF2
		Pioneer Caricion davallianae-Community with *Cladium* (rich fen)	pCladium	PF1
	Emergent communities	Pioneer *Carex rostrata*-dominated community (Bottle Sedge)	pRos	FS1
		Pioneer *Phragmites australis*-dominated community (Common Reed)	pPhrag	FS1
		Pioneer *Typha latifolia*-dominated community (Reedmace)	pTyp	FS1
		Pioneer *Schoenoplectus lacustris*-dominated community (Bulrush)	pSch	FS1
	Open water	Charaphyte-dominated community	pChar	FL2
		Permanent pools and lakes	OW	FL2
		Temporary open water	tOW	
	Woodland and scrub	Emergent *Betula*/*Salix*-dominated community (A) (Birch/Willow)	eBir	WS1
		Open *Betula*/*Salix*-dominated community (B) (Birch/Willow)	oBir	WS1
		Closed *Betula*/*Salix*-scrub community (C) (Birch/Willow)	cBir	WS1
		Ulex europaeus-dominated community (Gorse)	eGor	WS1
		Betula/*Salix*-dominated woodland (Birch/Willow)	BirWD	WN7
	Heathland	Pioneer dry *Calluna vulgaris*-dominated community (Heather)	dHeath	HH1
		Dense *Pteridium aquilinum* (Bracken)	dPter	HD1
	Grassland	Pioneer dry calcareous and neutral grasssland (Centaureo-Cynosuretum)	gCal	GS1
		Dactylis-*Anthoxanthum*-dominated community (Cocksfoot-Sweet Vernalgrass)	gCo-An	GS2
		Anthoxanthum-*Holcus*-*Equisetum* community (Sweet Vernalgrass-Yorkshire Fog-Horsetail)	gAn-H-Eq	GS
		Molinia caerulea-dominated community (dry) (Purple Moorgrass)	gMol	GS4
		Marsh (Meadowsweet and other tall herbs) (Filipendulion ulmariae)	Mar	GM1
	Disturbed	*Tussilago farfara*-dominated community (vegetation > 50%) (Colt's Foot)	DisCF	ED3
		Epilobium-dominated community (vegetation > 50%) (Willowherb spp.)	DisWil	ED3
	General	Riparian areas (streams or drain with associated edge habitats (e.g. FW2/4 + WS1, GS2 etc)	Rip	FW2 +
		Silt Ponds (artificial ponds with associated bank habitats (e.g. FL8 + WS1, GS2, ED2, ED3)	Silt	FL8 +
		Access (tracks or railways with associated edge habitats (e.g. BL3 + gCal, gMol, eGor etc)	Acc	BL3 +
		Works areas (predominately built land but can include landscaped and brownfield habitats (e.g. GA2, WS3, WD4, ED2, ED3)	Works	BL3 +

[1] These are generally pioneer habitats of bare peat and the communities can contain a significant proportion of bare peat. Some habitats are more developed than others. They frequently occur in mosaic with each other.
[2] Not all these communities are equivalent to habitat classes used by The Heritage Council habitat classification scheme (Fossitt 2000) as some are quite rudimentary and undeveloped.

Heritage Council habitat classification scheme (Fossitt 2000)

	General	Habitat	Heritage Council code
Semi-natural and modified habitats	Peatlands	Raised Bog	PB1
		Lowland Blanket bog	PB3
		Cutover Bog	PB4
		Rich fen and flush	PF1
		Poor fen and flush	PF2
		Transition mire and quaking bog	PF3
	Woodland and scrub	Oak-Birch-Holly woodland	WN1
		Oak-Ash-Hazel woodland	WN2
		Wet Pendunulate Oak-Ash woodland	WN4
		Riparian Woodland	WN5
		Wet Willow-Alder-Ash woodland	WN6
		Bog woodland	WN7
		Mixed broad-leaved woodland	WD1
		Mixed broad-leaved/conifer woodland	WD2
		Conifer plantation	WD4
		Scrub (Gorse)	WS1
		Emergent Betula-dominated community	WS1
		Closed Betula scrub community	WS1
		Recently-planted woodland	WS2
		Ornamental scrub	WS3
		Short-rotation coppice	WS4
		Recently-felled woodland	WS5
	Linear woodland	Hedgerow	WL1
		Treeline	WL2
	Grasslands and Marsh	Improved grassland	GA1
		Amenity grassland	GA2
		Dry calcareous and neutral grassland	GS1
		Dry meadows and grassy verges	GS2
		Dry-humid acid grassland	GS3
		Wet grassland	GS4
		Freshwater Marsh	GM1
	Heath and Bracken	Dry Heath	HH1
		Dry calcareous Heath	HH2
		Wet Heath	HH3
		Dense Bracken	HD1
	Disturbed ground	Exposed sand, gravel or till	ED1
		Spoil and bare ground	ED2
		Recolonising bare ground	ED3
		Active quarry	ED4
	Freshwater	Acid Oligotrophic lakes	FL2
		Mesotrophic lakes	FW4
		Artificial ponds (slit ponds)	FL8
		Depositing rivers	FW2
		Canals	FW3
		Drains	FW4
	Cultivated and Built land	Stonewalls and other stonework	BL1
		Earth Banks	BL2
		Buildings and artificial surfaces	BL3
		Arable crops	BC1
		Horticulture	BC2
		Tilled land	BC3

Appendix 3 Bord na Móna Cutaway Bog Decommissioning and Rehabilitation Plans

Appendix 3a DERRYAROGE 2023 FINAL

Bord na Móna

Derryarogue Bog
Rehab Plan
GIS Map Book
2023

MAKING COMPLEX EASY

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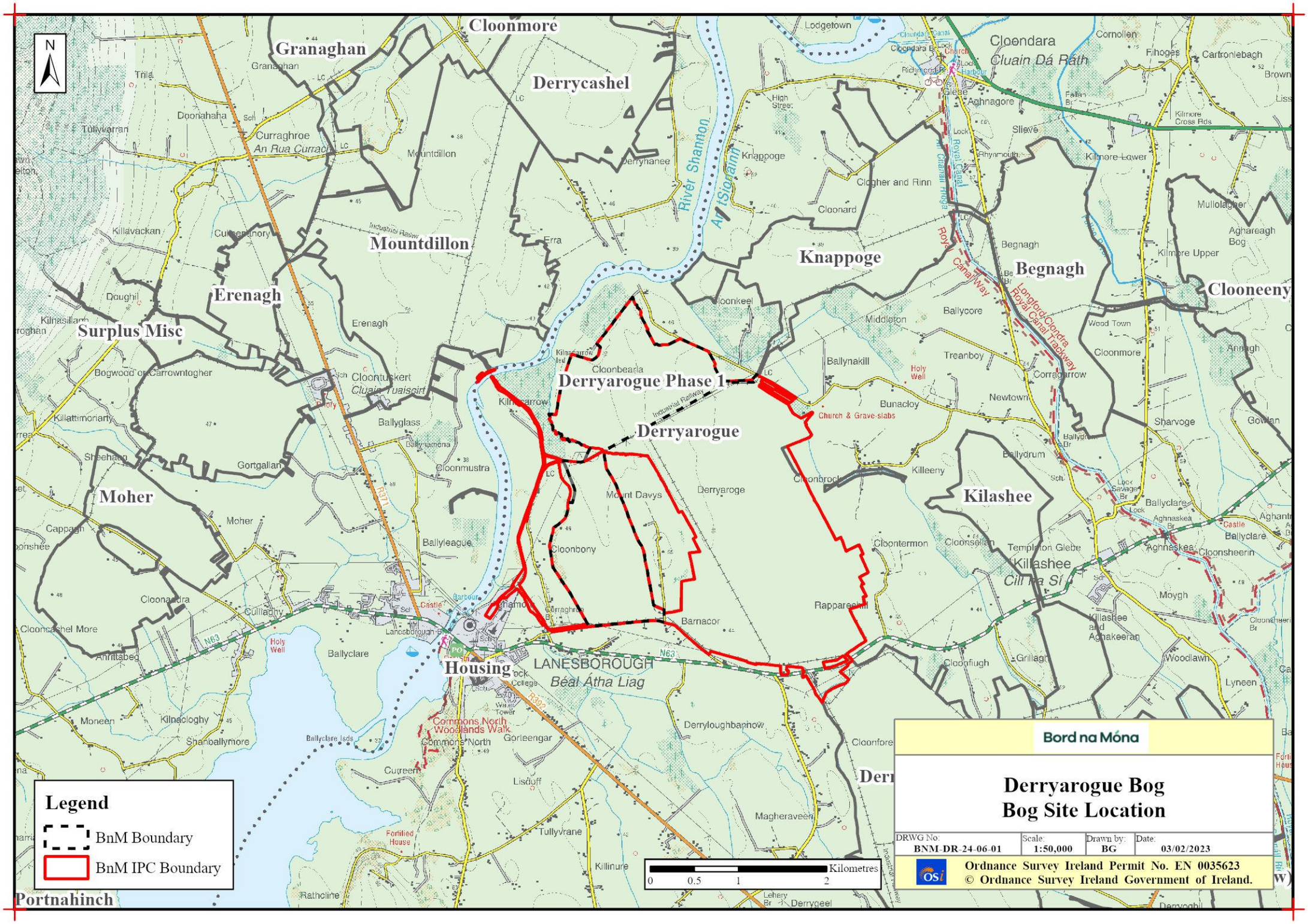

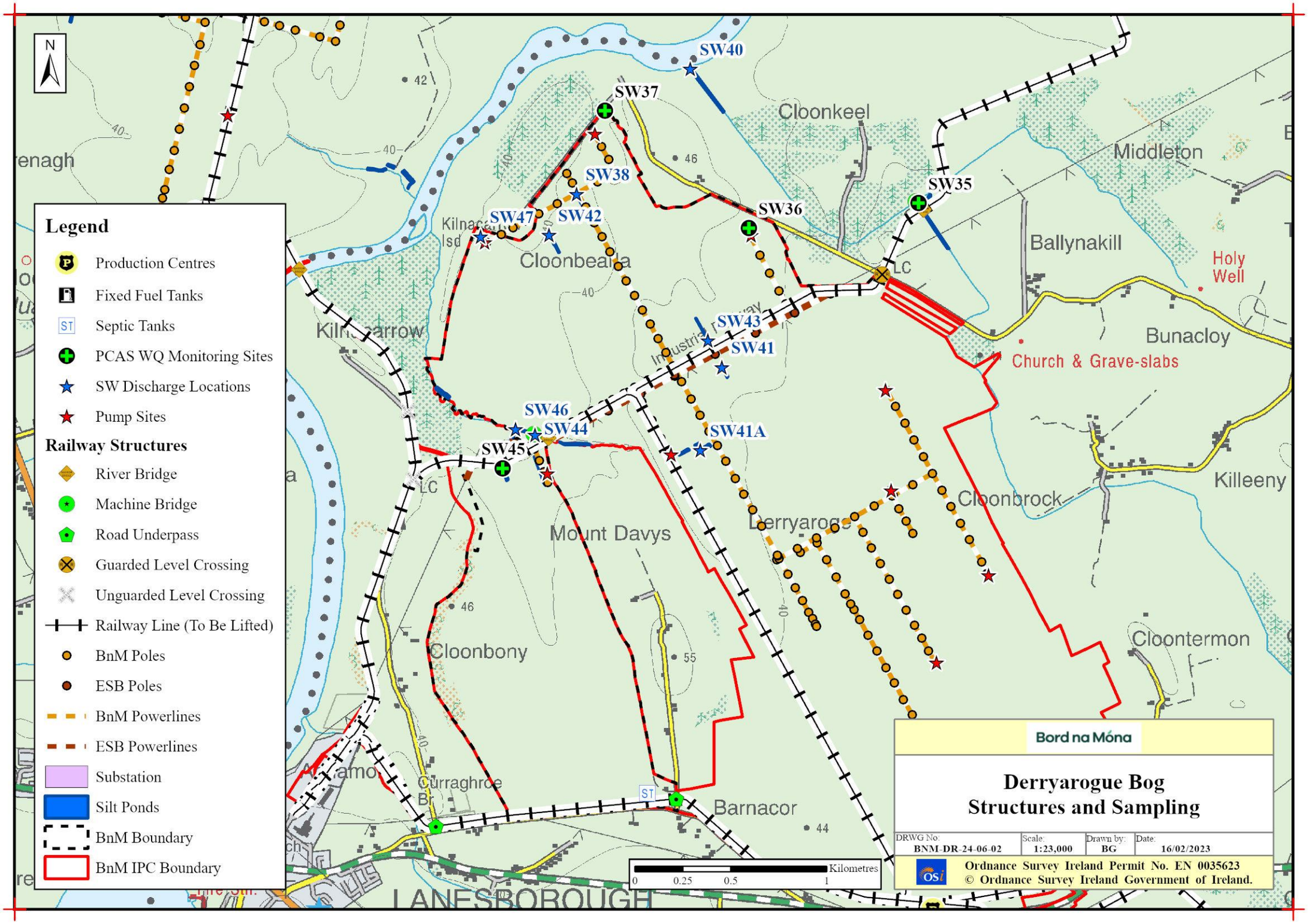
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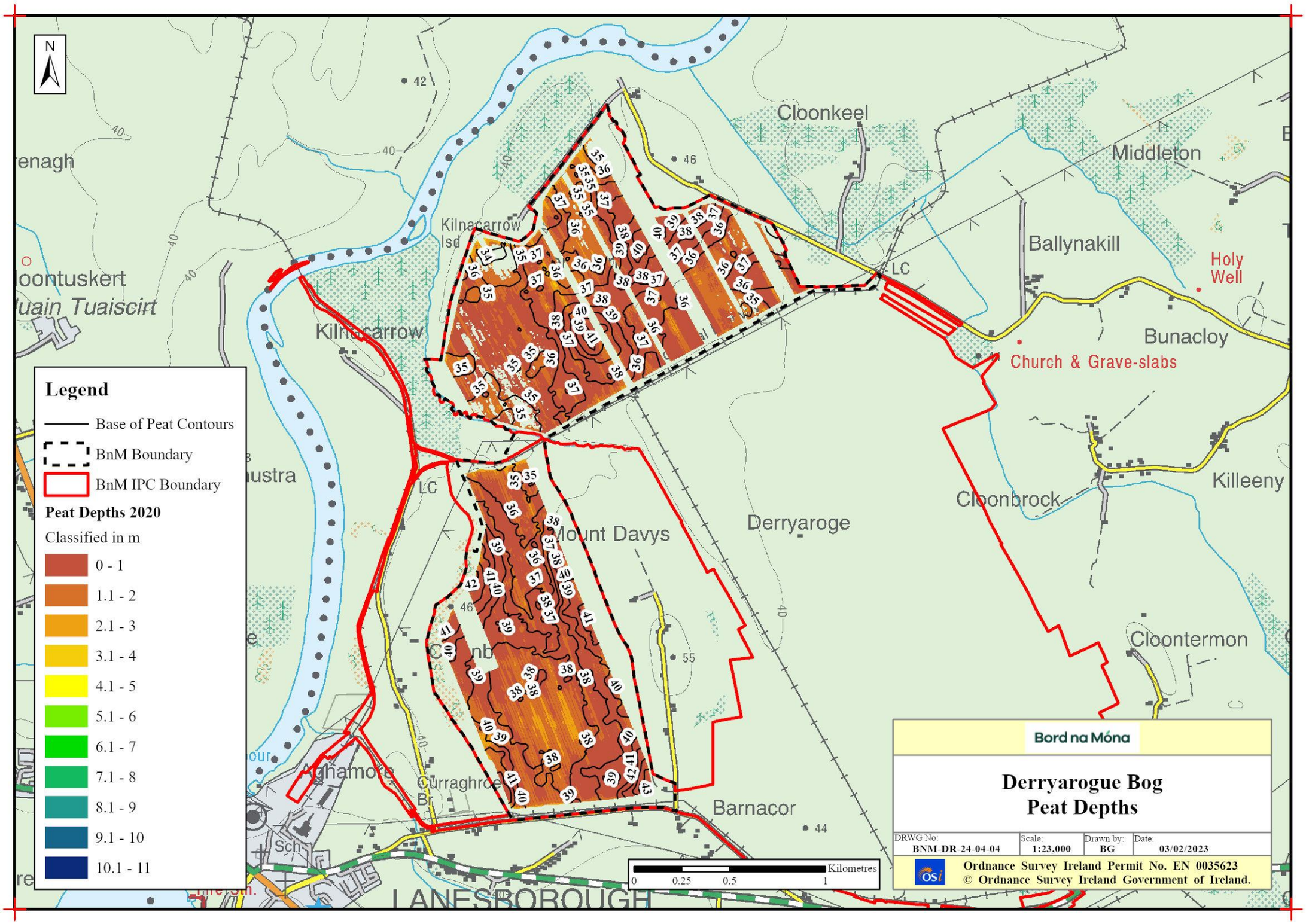

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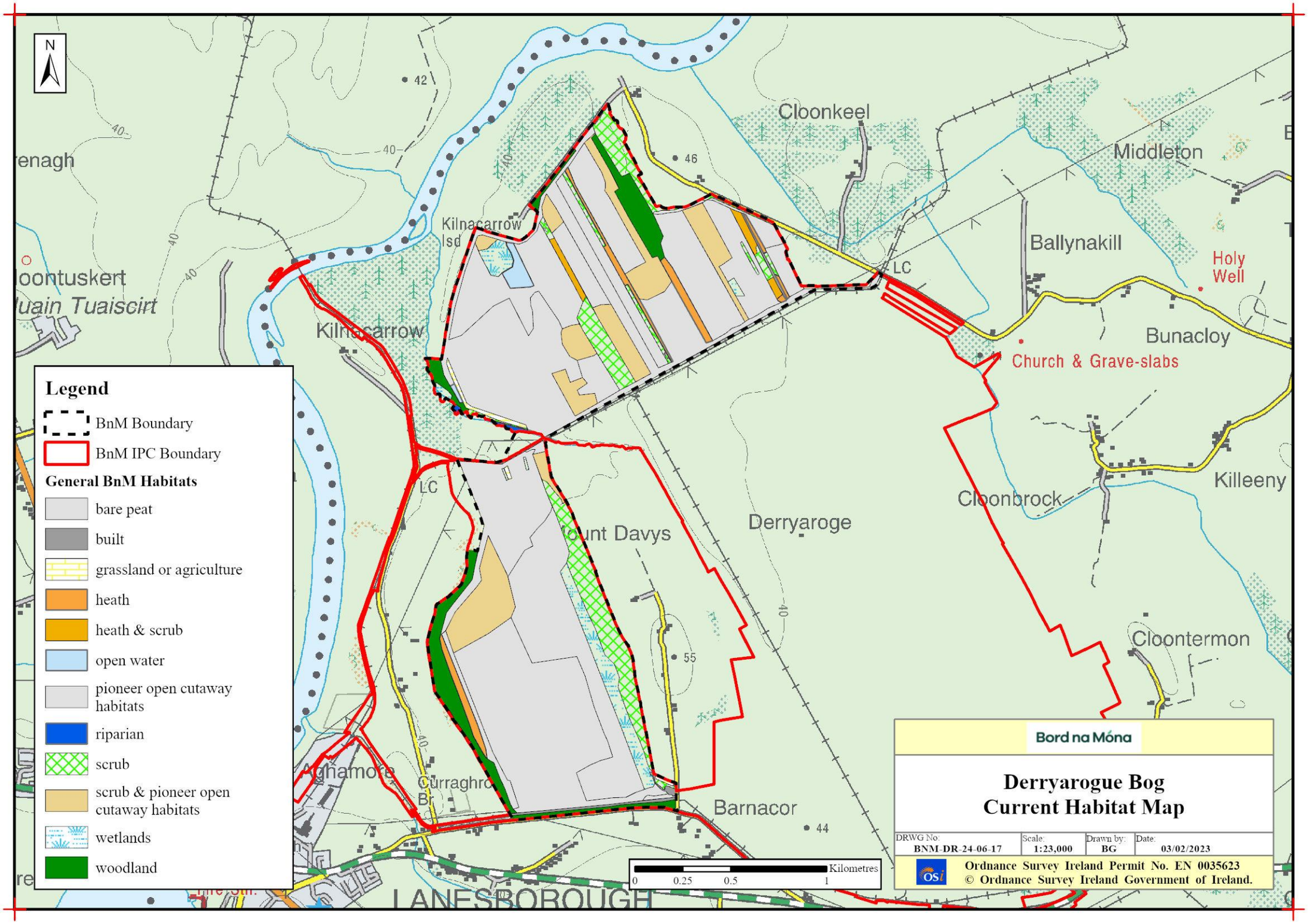

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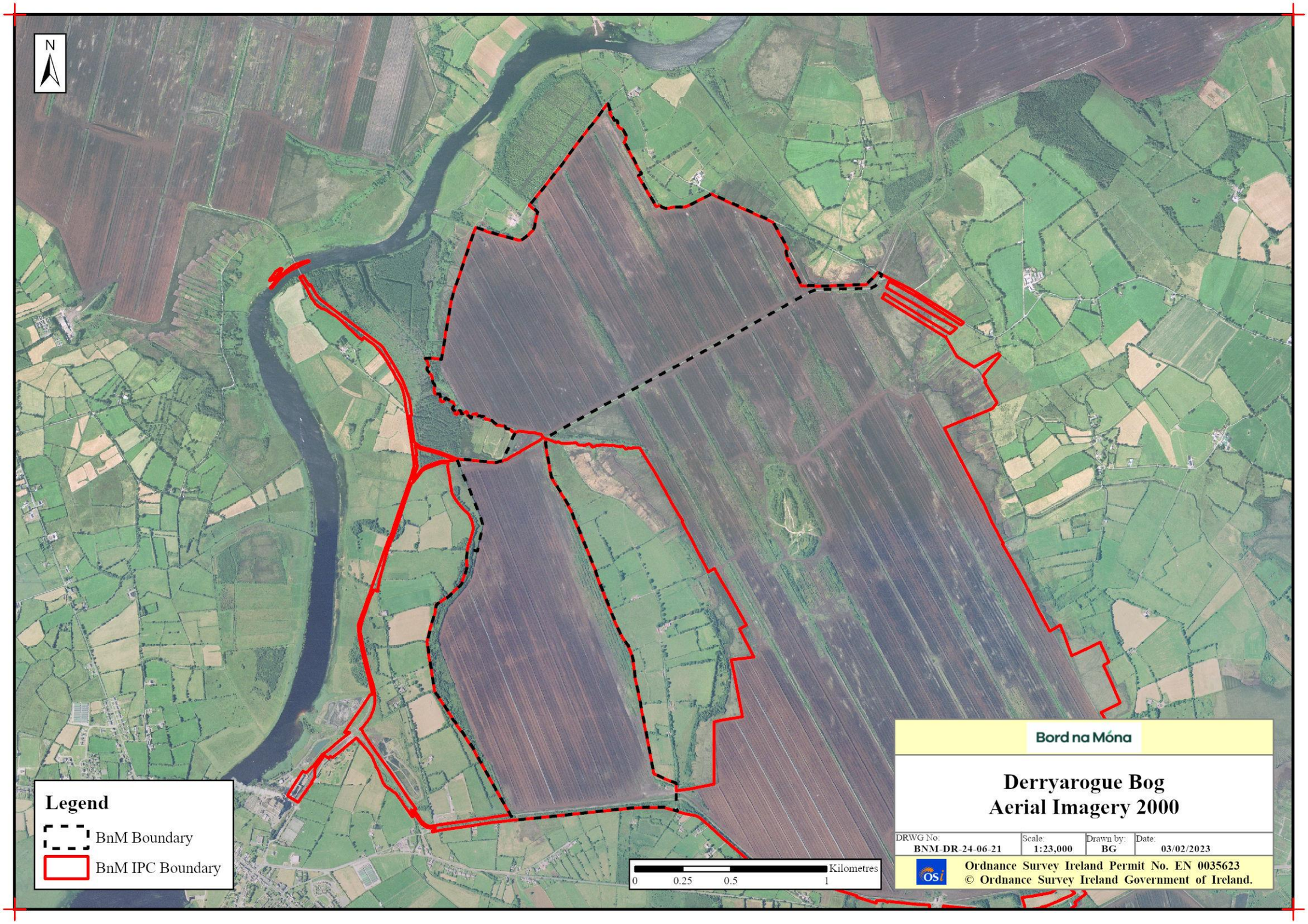

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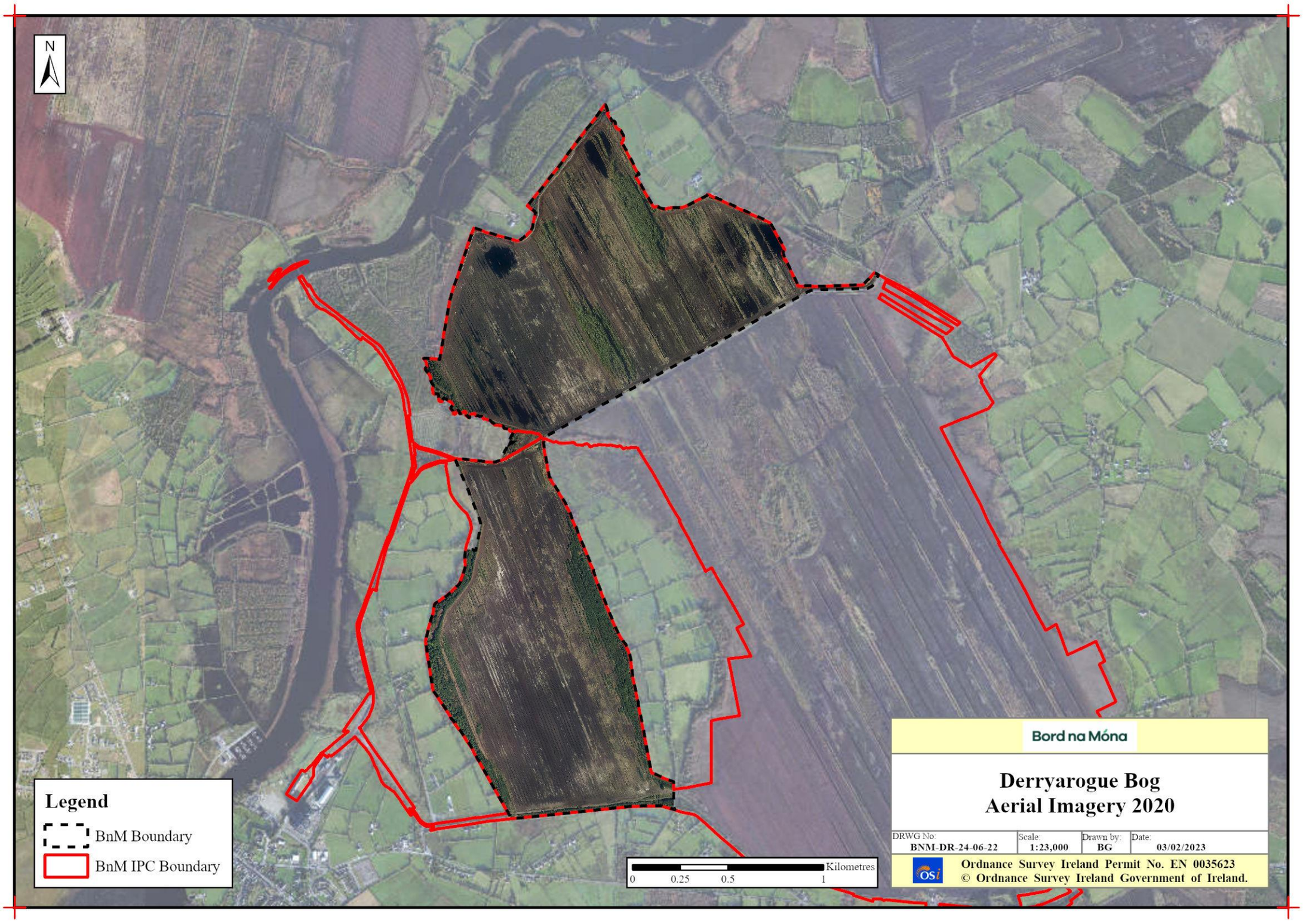

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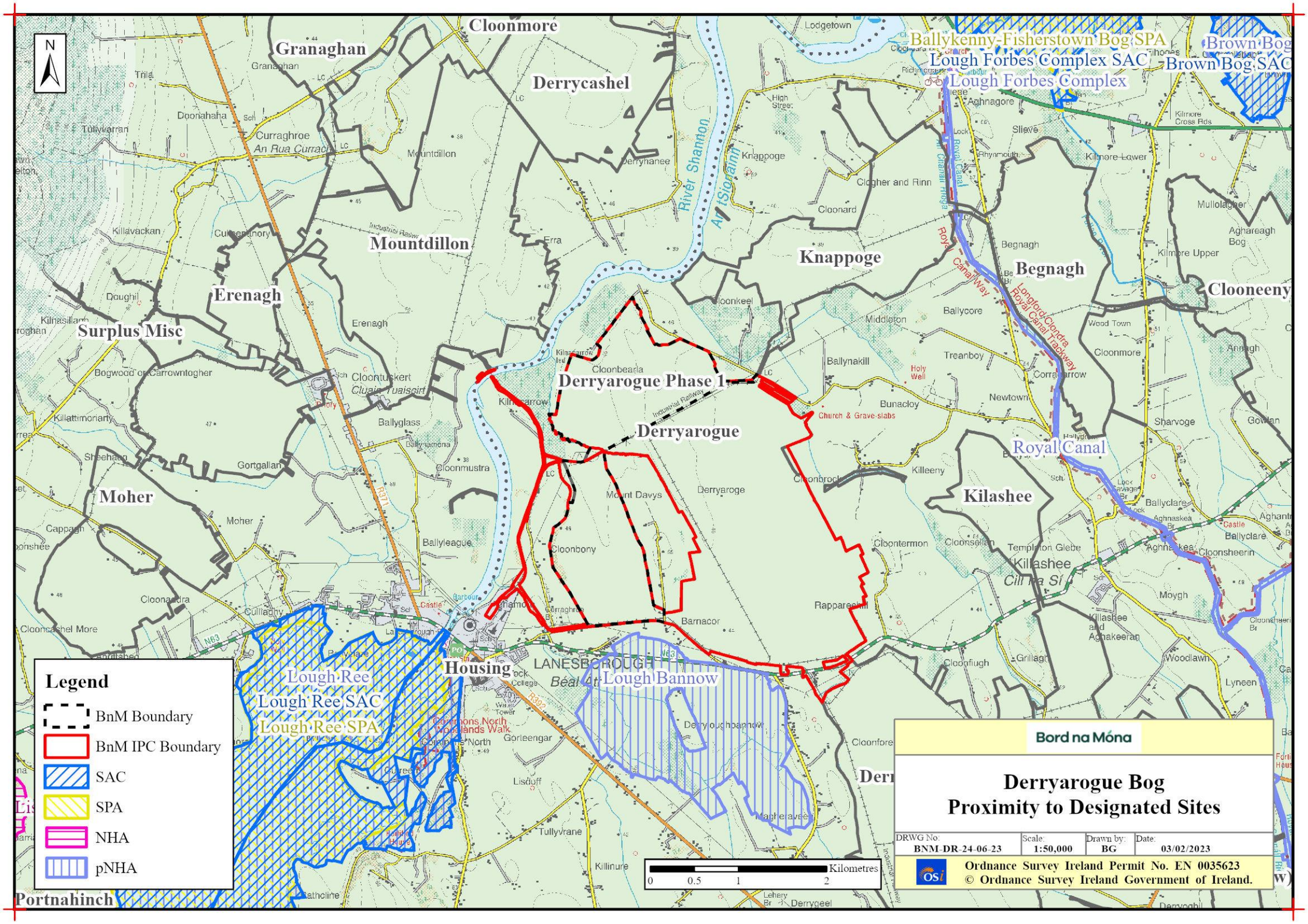

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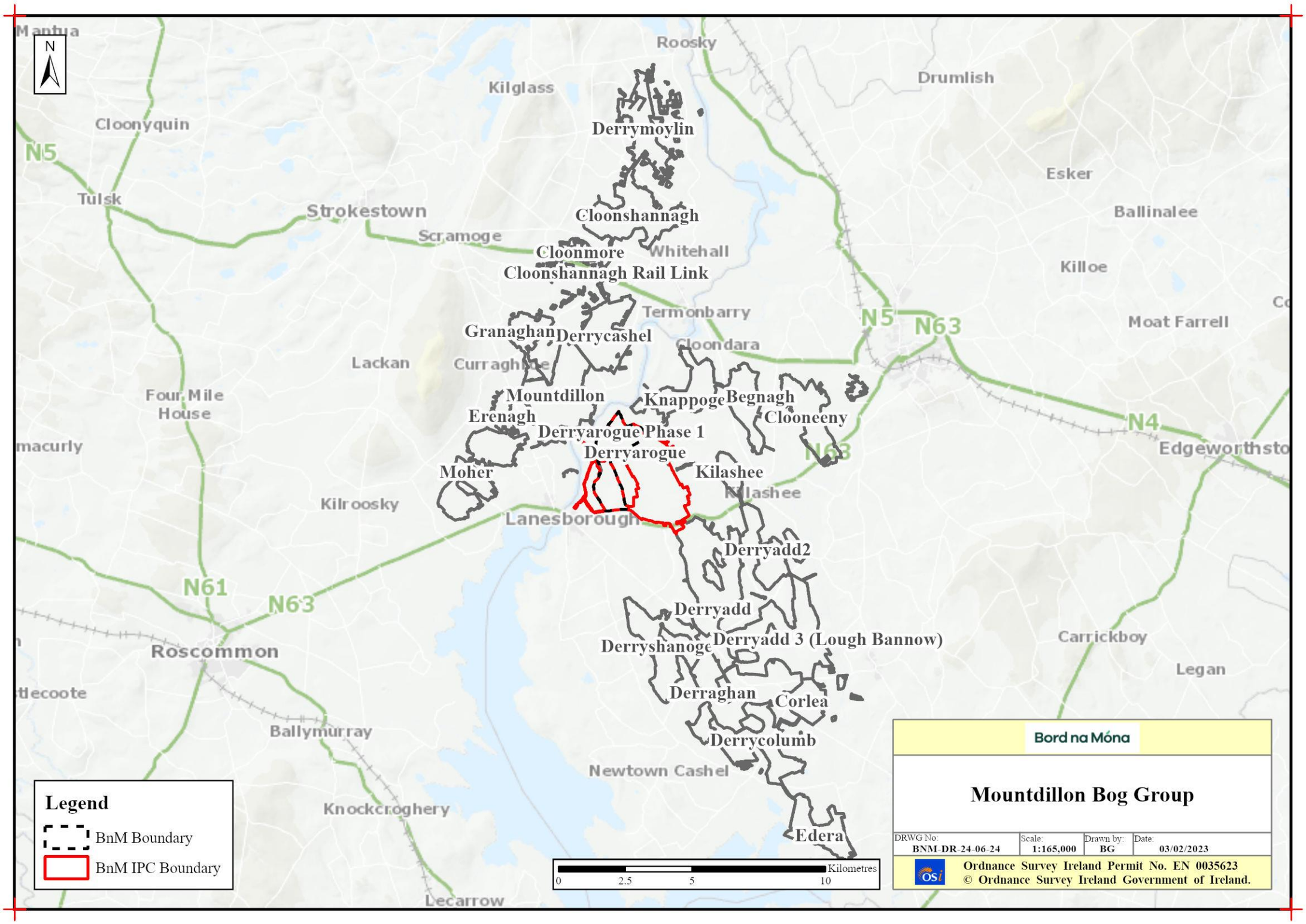

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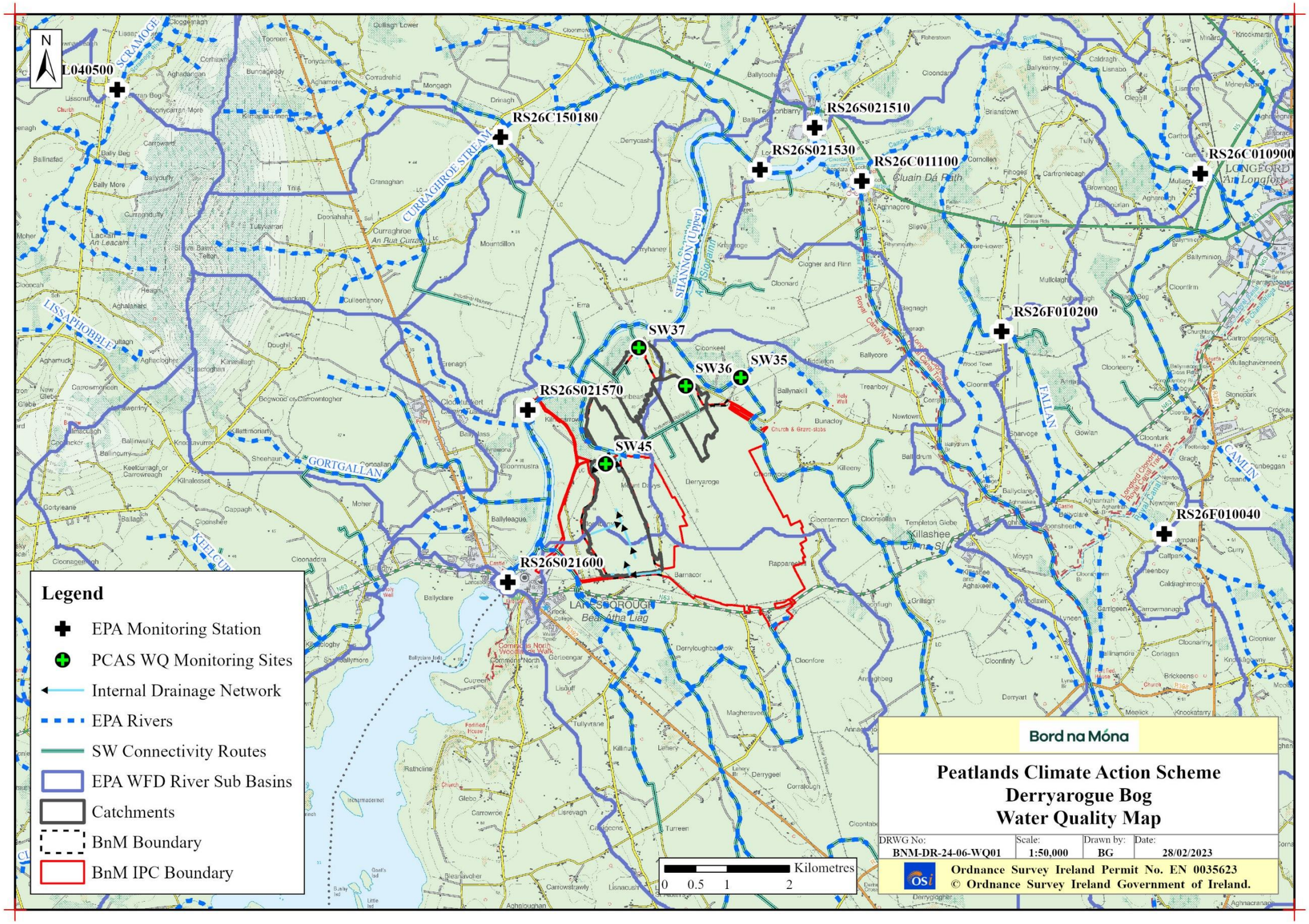

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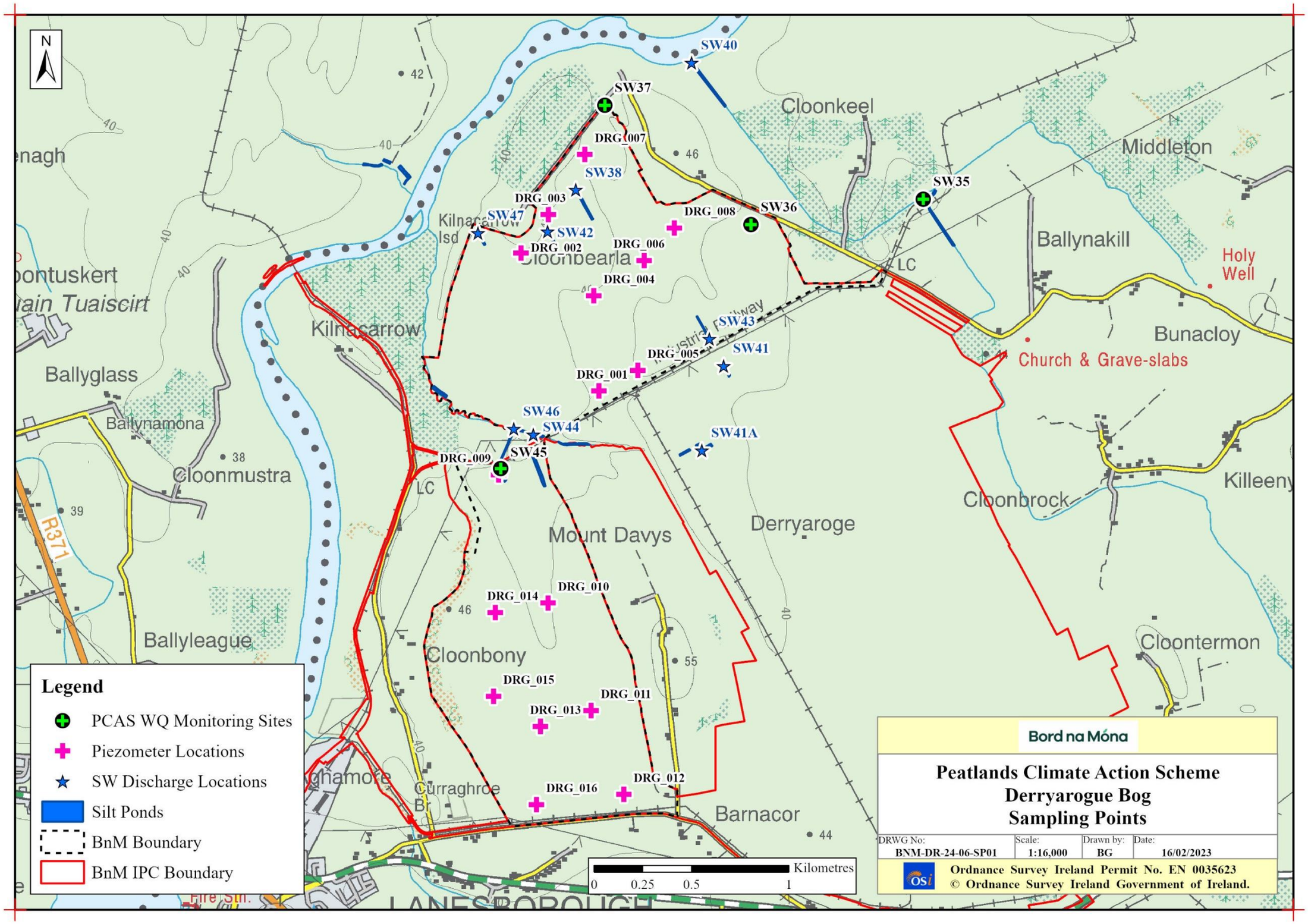

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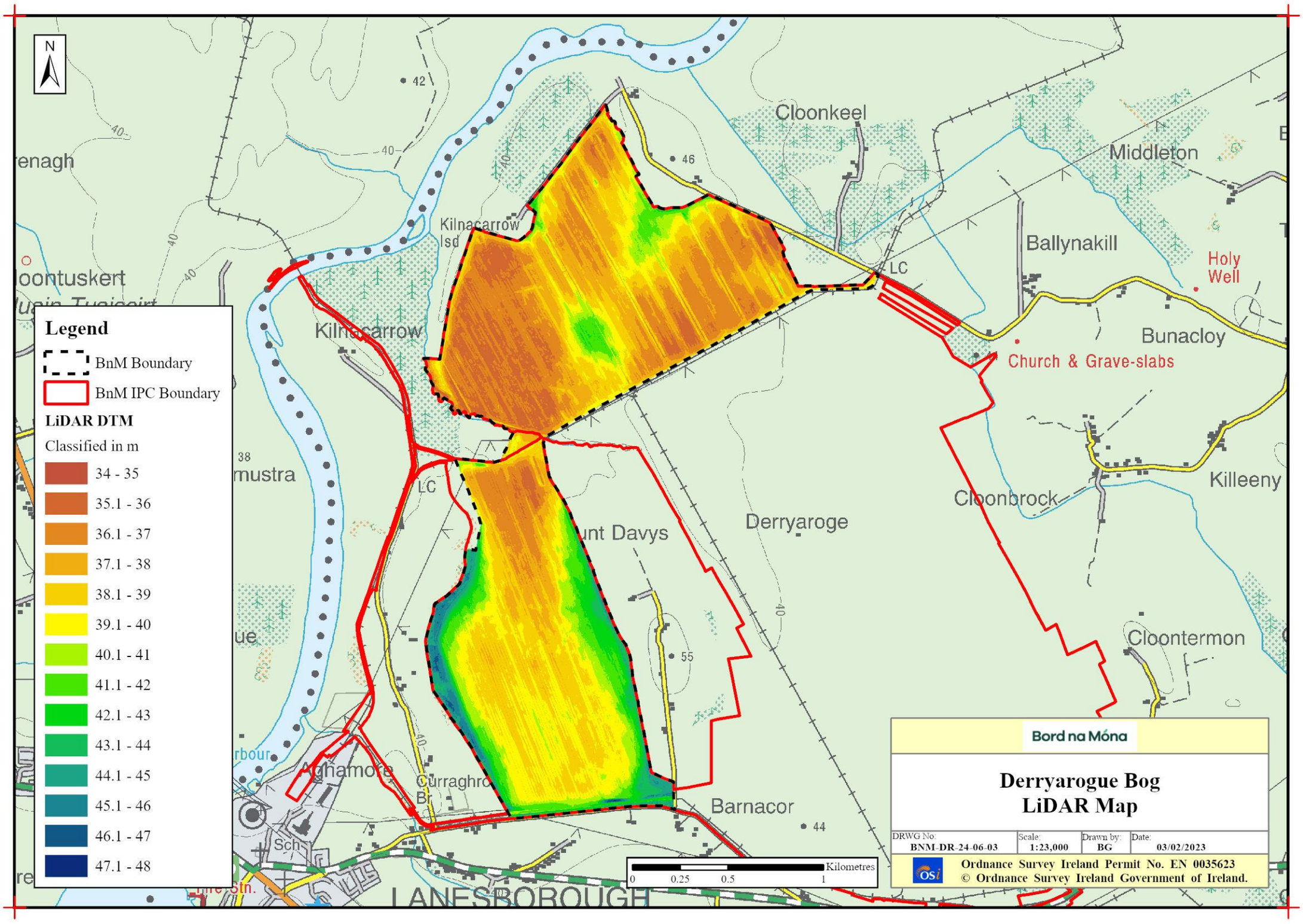

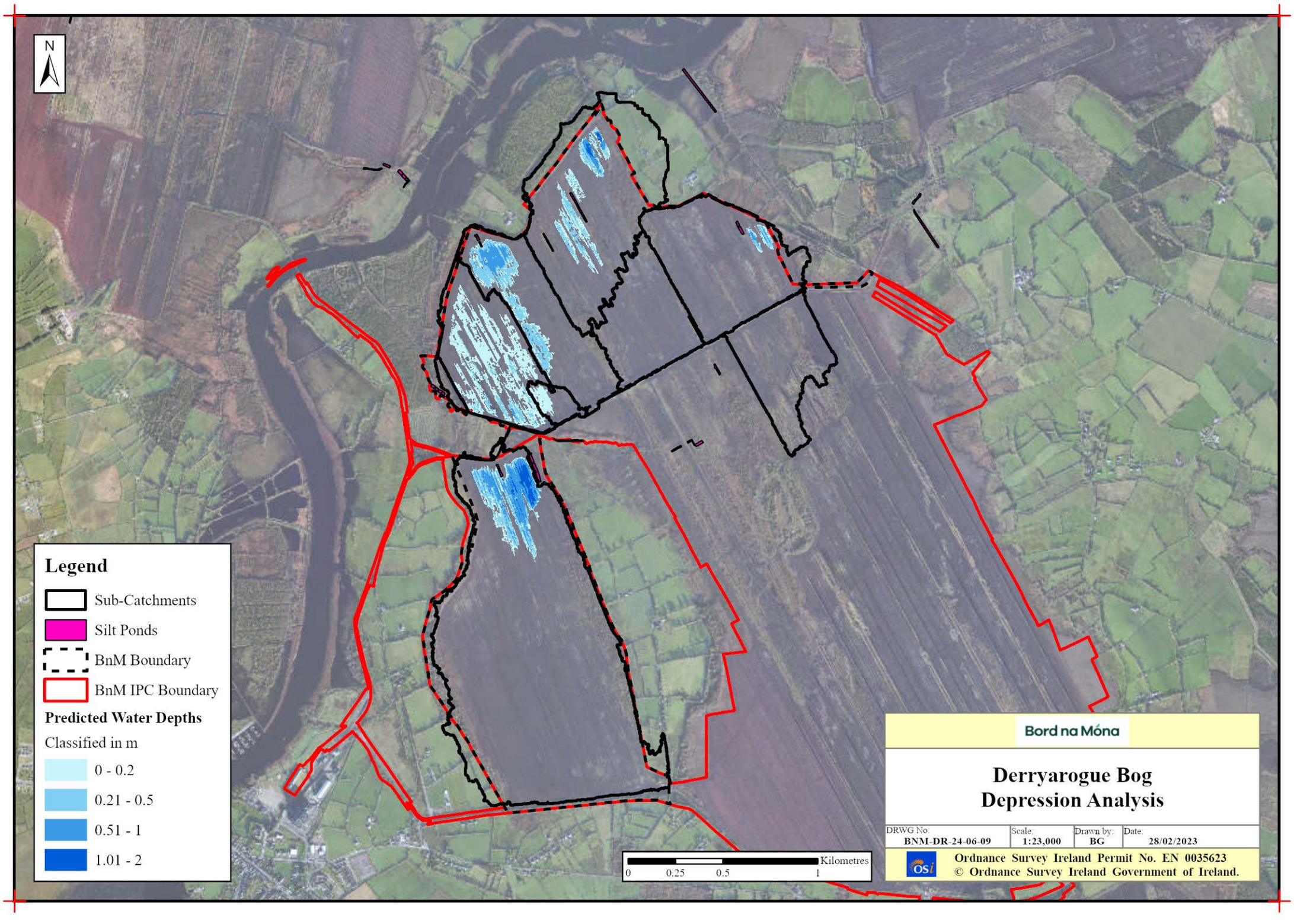
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BNM-DR-24-06-13: General Drainage Map

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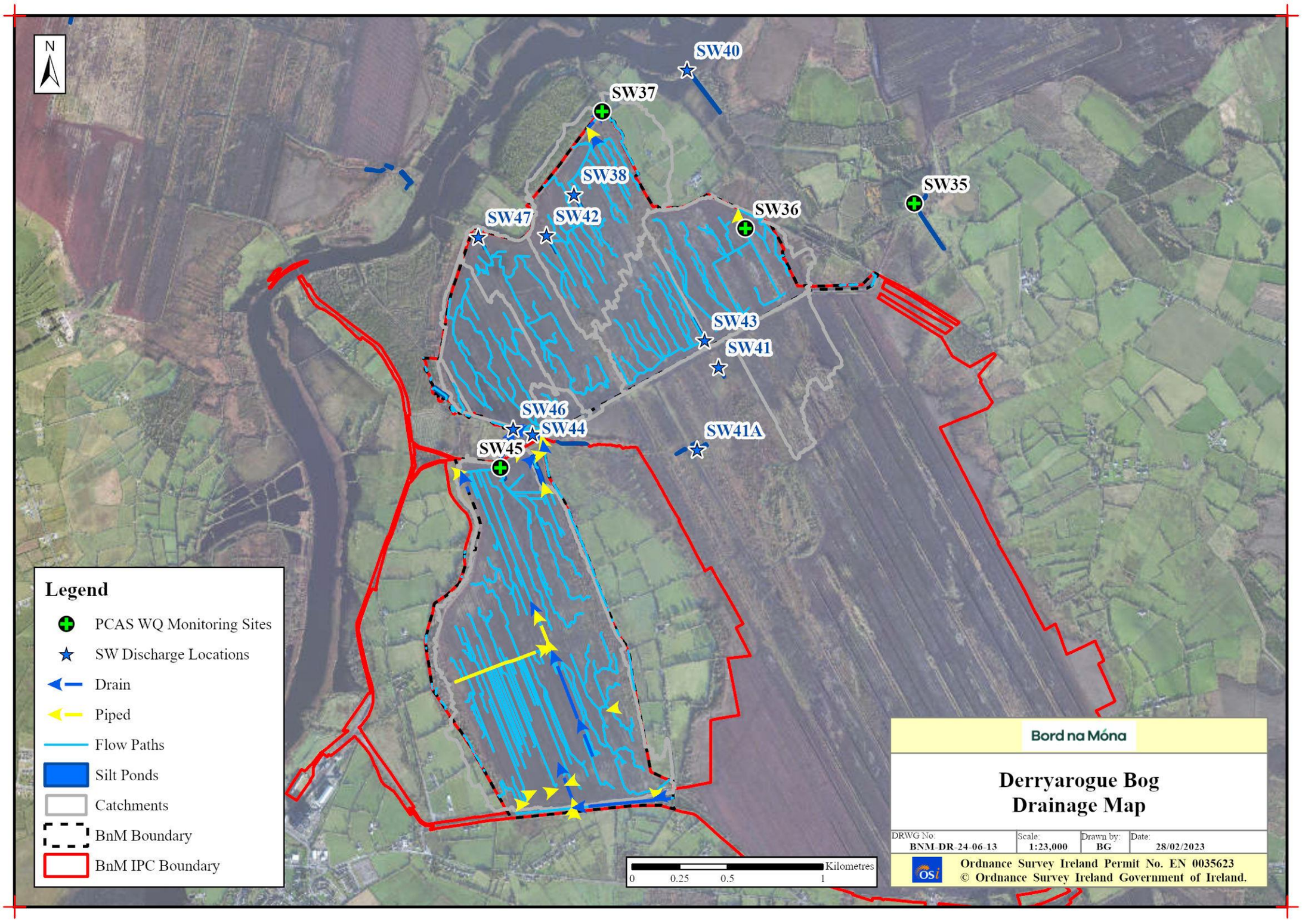

Rehabilitation Maps

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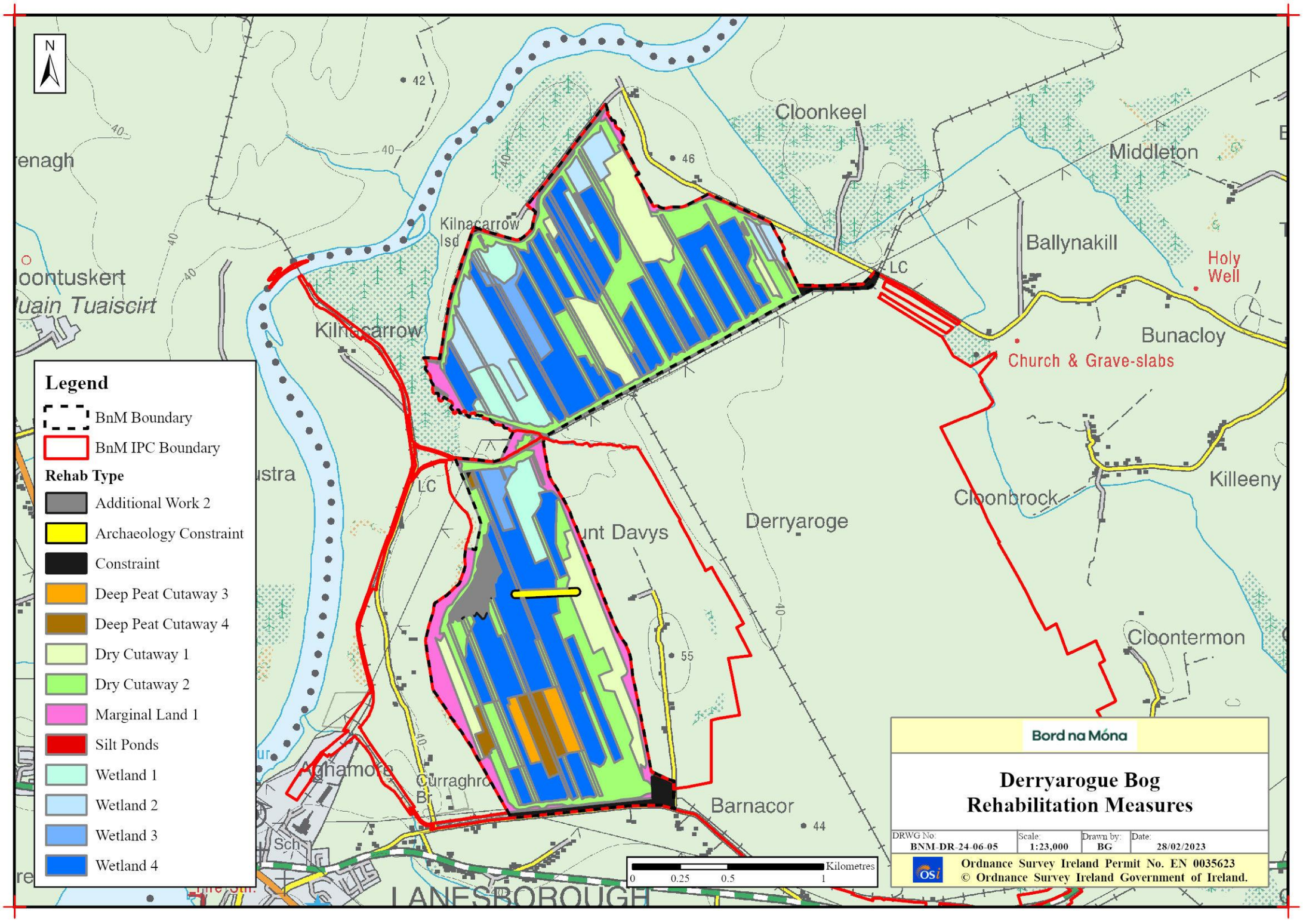

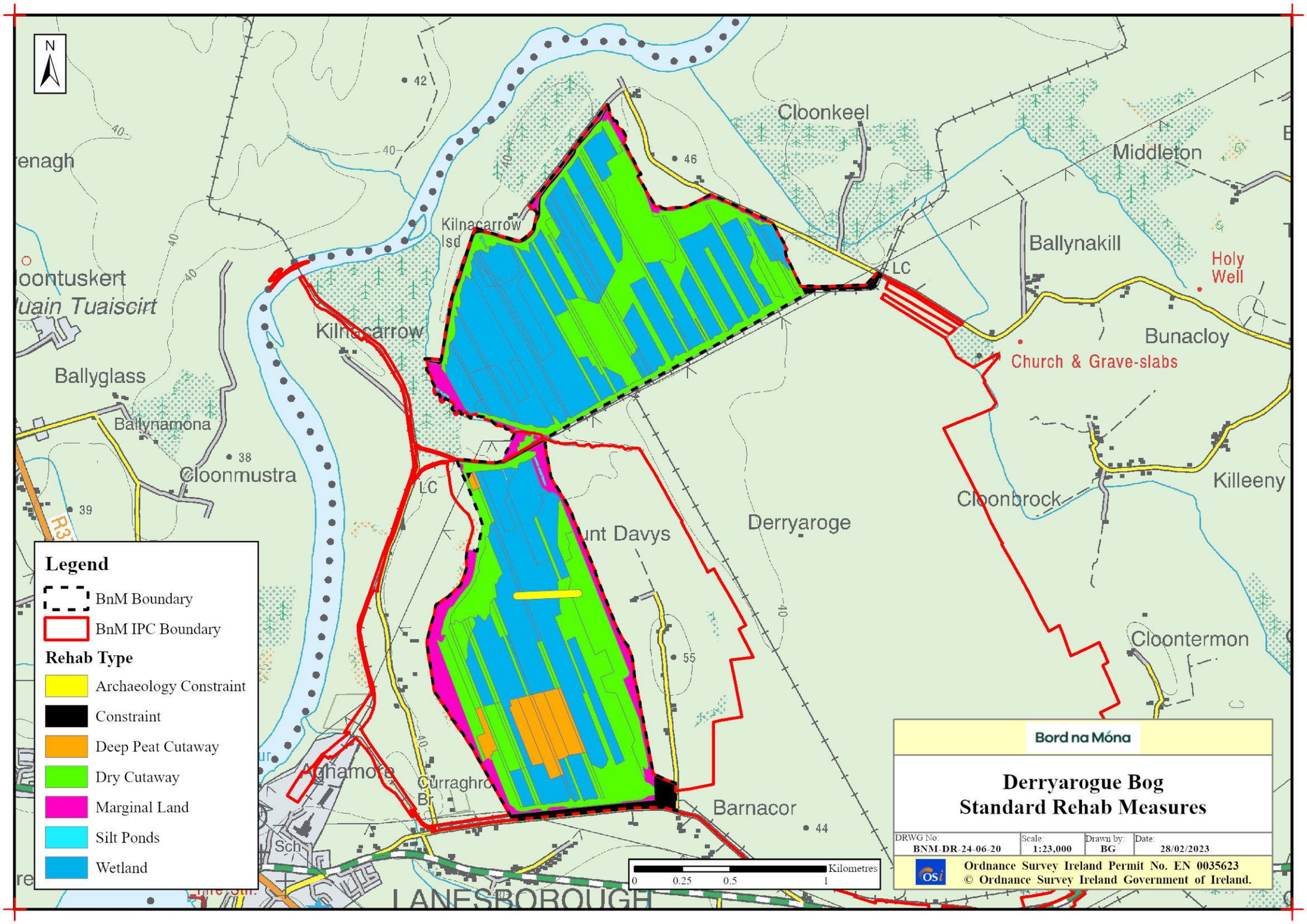
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Appendix 3a, b and c 2025 DRAFT PLANs

Bord na Móna

Derryadd Bog

Draft Cutaway Bog Decommissioning and Rehabilitation Plan

2025

This document seeks to address the requirements of Condition 10.2 of IPC License Ref. P0504-01:

> "*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 Derryadd 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 fully ceased at Derryadd Bog.

Bord na Móna have defined the key rehabilitation outcome at Derryadd Bog as environmental stabilisation.

*This rehabilitation plan has been updated but not fully finalised. As such it remains a **draft** rehabilitation plan until it is fully finalised. Bord na Móna expect to finalise these rehabilitation plans in the future as part of its overall peatland rehabilitation programme.*

Any consideration of any other future after-uses for Derryadd Bog, 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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Non-technical summary

- Bord na Móna is updating the draft rehabilitation plan for Derryadd Bog, located approximately 4km east of Lanesborough in Co. Longford.
- This rehabilitation plan has been prepared by Bord na Móna as part of obligations to carry out peatland rehabilitation via an IPC License issued by the Environmental Protection Agency.
- Derryadd Bog has been in full industrial peat production since the early 1960's and supplied Lough Ree Power Station in Lanesborough up until its closure in 2020. This bog has a pumped drainage regime.
- Industrial peat harvesting has now ceased at Derryadd Bog.
- A relatively large area of dry cutaway located to the north and south of the farmland at the centre of the site have developed as calcareous grassland and Birch scrub/woodland, the remainder of the cutaway is dominated by bare peat. Small wetland features are developing.
- The key objective of peatland rehabilitation is environmental stabilisation. This means developing vegetation and promoting re-establishment of more typical cutaway peatland communities such as Birch woodland, Reedbeds, fen habitat and *Sphagnum*-rich embryonic bog communities.
- Rehab measures will include drain-blocking and other measures to raise water levels to the surface of the bog, thus encouraging the development of naturally functioning cutaway peatland habitats.
- These rehabilitation measures will be planned by a team consisting of expert ecologists and engineers. It is a guiding principle of Bord na Móna rehabilitation planning that no actions or activities will be undertaken that would negatively impact on adjacent land. No boundary drains will be blocked. Water will still leave the bog via the existing outlets.
- Peatland rehabilitation of this bog 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.
- Drain blocking at Derryadd will result in improved water quality, climate benefits with the reduction of carbon emissions and enhanced biodiversity when the residual peat is re-wetted.
- Many Bord na Móna bogs cannot be restored back to raised bog, as the majority of peat has been removed and the environmental conditions have been modified. However other natural habitats will develop, like poor fen and *Sphagnum* rich embryonic bog communities (on deeper peat); and wetlands with Reedbeds and Birch woodland on shallower peat. In time a naturalised peatland can be developed.
- It will take some time for vegetation and habitats to fully develop at Derryadd, and a peatland ecosystem to be restored. However, it is expected that most of the remaining bare peat will be developing pioneer habitats after 5-10 years.
- The development of a range of habitats at Derryadd 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.
- This peatland rehabilitation plan does not consider future after-use or development. Bord na Móna continually reviews its land-bank to consider future commercial or industrial developments. Any other proposed development will be planned in adherence to relevant planning guidelines and will consider the rehabilitation and the condition of the bog.

1. INTRODUCTION

Bord na Móna operates under IPC Licence issued and administered by the EPA to extract peat within the Mountdillon bog group (Ref. P0504-01). 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. Derryadd Bog is part of the Mountdillon bog group (see Appendix I for details of the bog areas within the Mountdillon bog group). Derryadd Bog is located in Co. Longford, approximately 4km east of Lanesborough.

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 (Appendix V).
- 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 measures.
- Budget and Costings.
- Associated aftercare, maintenance, and monitoring.

Note: This plan should be read in conjunction with the accompanying Map book.

Bord na Móna announced the complete cessation of industrial peat production across its estate in January 2021.

This **draft** rehabilitation plan outlines the proposed approach to be taken for IPC compliance in respect of Derryadd Bog and how the site will be rehabilitated. Bord na Móna is fully committed to meeting its obligations relating to rehabilitation and decommissioning under the Integrated Pollution Control Licence.

It has been proposed by the Government that Bord na Móna carry out a Peatlands Enhanced Decommissioning, Rehabilitation and Restoration Scheme on its peatlands. This proposal is also known colloquially as the 'Peatlands Climate Action Scheme' (PCAS). The additional costs of the scheme will be supported by the 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. The Peatlands Climate Action Scheme is expected to operate between 2021-2025. Over 13,000 ha of cutaway peatlands have been rehabilitated as part of this scheme to date, across multiple Bord na Móna peatlands. Enhanced rehabilitation measures that have been proposed as part of PCAS are **NOT** proposed as part of this draft Derryadd rehabilitation plan at this stage (2025). The potential implementation of enhanced rehabilitation measures at Derryadd Bog will be dependent on the selection of Derryadd as a site to be included in PCAS in the future.

1.1 Constraints and Limitations

This document seeks to address the requirements of Condition 10.2 of IPC License Ref. P0504-01:

> "*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 document covers the area of **Derryadd Bog**. Parts of Derryadd Bog (around the perimeter of the site) are currently being used by domestic turf cutters for intensive private sod peat production. These areas are ecologically and hydrologically linked to the area owned by Bord na Móna where rehabilitation is planned. It is beyond the scope of this rehabilitation plan to address turf cutting issues on Derryadd Bog that are outside of the control of Bord na Móna. Nevertheless, Bord na Móna are aware of such issues which may constrain the proposed rehabilitation actions, and this rehabilitation plan considered potential impacts of these on the delivery of the stated objectives.

Rehabilitation in other areas of the bog may also be constrained due to other property issues or issues such as rights of way.

2. METHODOLOGY

This rehabilitation plan was developed with a combination of desktop and field surveys, consultations with internal and external stakeholders. The development of this rehabilitation plan considered recently published guidance issued by the EPA '*Guidance on the Process of Preparing and Implementing a Bog Rehabilitation Plan*' (EPA, 2020).

The ecological information and general bog information collected during the Bord na Móna ecological baseline surveys, additional site visits (covering the period 2012 to 2023 inclusive), monitoring and desktop analysis, forms the basis for the development of this 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-practice 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 peat depth data;
- Hydrological modelling;

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 practice guidance (full citations are in the references section):

- Anderson *et al*. (2017). An overview of the progress and challenges of peatland restoration in Western Europe.
- Barry, T.A. et al (1973). A survey of cutover peats and underlying mineral soils. Soil Survey Bulletin No. 30. Dublin, Bord na Móna and An Foras Taluntais.
- Bonn *et al*. (2017). Peatland restoration and ecosystem services- science, policy and practice.
- Carroll *et al*. (2009). *Sphagnum* in the Peak District. Current Status and Potential for Restoration. Moors for the Future Report No 16.
- Clark & Rieley (2010). Strategy for responsible peatland management.
- Eades *et al*. (2003). The Wetland Restoration Manual.
- Farrell & Doyle (2003). Rehabilitation of Industrial Cutaway Atlantic Blanket Bog, NW Mayo, Ireland.
- Feehan, J. (2004). A long-lived wilderness. The future of the north midlands peatland network. Department of Environmental Resource Management, UCD.
- Foss, P.J., Crushell, P. & Gallagher, M.C. (2017) Title: Counties Longford &Roscommon Wetland Study. Report prepared for Longford and Roscommon County Councils.
- Gann *et al*. (2019). International Principles and Standards for the practice of Ecological Restoration.
- Hinde *et al*. (2010). *Sphagnum* re-introduction project: A report on research into the re-introduction of *Sphagnum* mosses to degraded moorland. Moors for the Future Research Report 18.

- Joosten & Clarke (2002). Wise Use of mires and peatlands – Background and Principles including a framework for Decision-making.
- Lindsay (2010). Peatbogs and Carbon: A Critical Synthesis to Inform Policy Development in Oceanic Peat Bog Conservation and Restoration in the Context of Climate Change.
- Mackin *et al*. (2017). Best practice in raised bog restoration in Ireland. Irish Wildlife Manuals, No. 99. National Parks and Wildlife Service,
- McBride *et al*. (2011). The Fen Management Handbook (2011), Scottish Natural Heritage.
- McDonagh (1996). Drain blocking by machines on Raised Bogs. Unpublished report for National Parks and Wildlife Service.
- NPWS (2017a). National Raised Bog Special Areas of Conservation management plan. Department of Arts, Heritage and the Gaeltacht.
- Pschenyckyj *et al.,* (2021), Optimising Water Quality Returns from Peatland Management while Delivering Co-Benefits for Climate and Biodiversity. An Fóram Uisce.
- Quinty & Rochefort (2003). Peatland Restoration Guide, second edition. Canadian *Sphagnum* Peat Moss Association and New Brunswick Department of Natural Resources and Energy.
- Regan*, et al.* (2020). Ecohydrology, Greenhouse Gas Dynamics and Restoration Guidelines for Degraded Raised Bogs. EPA Research Report. Prepared for the Environmental Protection Agency by Trinity College Dublin.
- Renou-Wilson *et al*. (2011). BOGLAND - Sustainable Management of Peatlands in Ireland. STRIVE Report No 75 prepared for the Environmental Protection Agency.
- Schouten (2002). Conservation and Restoration of Raised Bogs: Geological, Hydrological and Ecological Studies. Dúchas - The Heritage Service of the Department of the Environment and Local Government, Ireland.
- Thom (2019). Conserving Bogs – Management Handbook.
- Wheeler & Shaw (1995). Restoration of Damaged Peatlands – with Particular Reference to Lowland Raised Bogs Affected by Peat Extraction.
- Wittram *et al*. (2015). A Practitioners Guide to Sphagnum Reintroduction. Moors for the Future Partnership.

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

- Mountdillon bog group Integrated Pollution Control Licence;
- Mountdillon bog group 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);
- Historic Environment Viewer at https://webgis.archaeology.ie/historicenvironment/
- 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 2022 – 2027;
- Bord na Móna Annual Report 2024.
- 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 are 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. As part of this exercise, Derryadd Bog was surveyed in July of 2012. Additional ecological walk-over surveys and visits have taken place at Derryadd Bog between 2014-2019. Habitat maps have been updated, where required. This rehabilitation plan is informed by the original baseline survey as well as subsequent confirmatory site walk-over surveys and visits, and updates to baseline data.

Habitat mapping followed best practice 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 (2019), while mosses and liverworts nomenclature follows identification keys published by the British Bryological Society (2010). A more detailed Bord na Móna classification system was previously 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).

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

3. SITE DESCRIPTION

Derryadd Bog is located approximately 4km to the east of Lanesborough in County Longford (Grid reference: ITM 205880; 267866). Two areas of farmland and mineral soil (areas that were not covered in peat) (Annaghmore and Annaghbeg) are located within the bog. These areas are not within the ownership of Bord na Móna and are managed for agriculture (livestock grazing). A minor road connects the mineral islands with a public road that adjoins the eastern edge of the site. Derryarogue Bog is located immediately to the north of the site (separated by the N63 Longford to Roscommon road). An industrial rail link connects the site with Derryarogue to the north and Lough Bannow to the south. Derryadd has a pumped drainage regime, with six pumps (one to the south, east and north and three along the western boundary).

Derryadd Bog was in full industrial peat production since the early 1960's and much of the site was in active industrial peat production in 2019. Industrial peat extraction in Derryadd Bog ceased in 2020. Much of Derryadd Bog is now cutaway and the majority of the original raised bog has now been removed.

See Drawing number BNM-ECO-23-27-01 titled *Derryadd Bog: Bog Site Location*, included in the accompanying Mapbook[1] , which illustrates the location of Derryadd Bog in context to the surrounding area.

3.1 Status and Situation

3.1.1 Site history

Industrial peat production commenced at Derryadd in the 1960's and ceased in 2020. Parts of the site have become cutaway and ceased peat extraction on a phased basis between 1990-2020. These areas have been developing cutaway habitats since then. Derryadd Bog formerly supplied fuel peat for Lough Ree Power Station in Lanesborough. This power station has now stopped electricity generation.

3.1.2 Current land-use

A relatively large area in the centre of the site has been cutaway for a number of years. This area has developed as calcareous grassland and Birch-dominated scrub at various successional stages. In recent years some areas of Derryadd Bog have developed pioneer wetlands with pioneer wetland communities including Reedbeds. A watercourse flows through the southern section of the site. This watercourse is a tributary of the River Shannon and has been canalised.

Several BnM former industrial railways occur at the site..

There are some areas of active turbary outside the margins of the site. These are mapped in the accompanying Mapbook.

There was ongoing hydrological management via pumping to support the former industrial peat production and its infrastructure. Pumping is ongoing during the decommissioning phase.

[1] Cutaway Bog Decommissioning and Rehabilitation Plan – Derryadd Bog Map Book

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.

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In respect of Derryadd Bog, jobs included in the above study would have included those to facilitate peat extraction for the supply of fuel peat for Lough Ree Power.

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.

3.2 Geology and Peat Depths

3.2.1 Sub-soil geology

The underlying geology[2] of Derryadd Bog is comprised completely of Visean Limestones (undifferentiated).

3.2.2 *Peat type and depths*

Much of Derryadd Bog is now cutaway and the majority of the original raised bog has now been removed. In some places there are exposed sub-soils. In general, between 0.5-1.5 of residual fen or minerotrophic peat remains. This will have a significant influence on the development of future pioneer habitats. There are also some

[2] https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=de7012a99d2748ea9106e7ee1b6ab8d5&scale=0

isolated pockets with residual peat of deeper than 2 m. This may have the potential to develop embryonic *Sphagnum*-rich peat-forming communities if optimum hydrological conditions can be developed.

3.3 Key Biodiversity Features of Interest

The majority of Derryadd Bog comprises a mosaic of bare peat along with post-production cutaway habitats including birch scrub at various successional stages, wetlands and associated pioneer wetland habitats and calcareous grasslands. Part of the centre of the site has been cutaway for a number of years and has developed relatively mature dry cutaway habitats (mostly Birch woodland). Habitats of biodiversity interest are therefore largely confined to older cutaway and the marginal habitats fringing the former production area.

The different cutaway habitats developing across the site reflects the underlying and varying environmental conditions. Environmental factors such as hydrology, residual peat depths and topography all have a significant influence on the future development of cutaway habitats and proposed rehabilitation. Hydrology tends to have the most significant influence on the development of future cutaway habitats. All sites have hydrological gradients from wet to dry habitats. Shallow residual peat usually means there are stronger fen influences on the pioneer cutaway development as fen peat is the residual peat type and ground-water has a stronger influence.

A detailed ecological report is provided in Appendix II.

3.3.1 Current habitats

The most common vegetation communities/habitats[3] present include:

- Bare peat (community 'Bare peat (0-50% cover)'or BP) (PB4)
- Pioneer dry heath communities (community 'Dry *Calluna* community' or dHeath) (PB4)
- Scrub (Emergent *Betula/Salix*-dominated community (A) (Birch/Willow), Open *Betula/Salix*-dominated community (B) (Birch/Willow), Closed Betula/Salix-scrub community (C) (Birch/Willow) or eBir, OBir and CBir) (WS1).
- Silt Ponds (Silt) with associated habitats such as scrub, Bracken, rank grassland (GS2), dry calcareous grassland (gCal) and typical pioneer communities of disturbed areas (disTuss).

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

- Birch woodland (WN7)
- Scrub (WS1) (Gorse scrub and Birch scrub developing of dry high bog around margins)
- Raised bog (PB1)
- Cutover bog (PB4) (several small fragments)
- Wet grassland (GS4).

A relatively large area in the centre of the site has been classed as cutaway for a number of years. This area of cutaway is located on a ridge that extends to the north and south of the mineral islands at the centre of the site.

[3] Categories in brackets refer to the current BnM classification system for vegetation communities, along with an equivalent Heritage Council habitat classification or Fossitt Code, where relevant.

These areas are dry and have colonised by a mixture of calcareous grassland (gCal) and scrub (eBir, oBir and cBir). The scrub is well developed in places and is comprised mainly of Birch, however a proportion of Pine (Scot's Pine and Lodge-pole Pine) along with smaller amounts of Hazel and Ash have also become established. These areas are located on gravel and are dry.

In recent years sections of the site have developed pioneer wetlands with pioneer wetland communities including Reed beds. These areas are used by wintering birds such as Whooper Swan and breeding species including Ringed Plover and Lapwing. The drier sections of the site have also developed areas of Birch-dominated scrub.

A watercourse flows through the southern section of the site. This watercourse is a tributary of the River Shannon and has been canalised.

Other habitats along the margins of the site include bog woodland (birch dominated) (WN7), wet grassland (GS4) and cutover bog (PB4). Overall, large areas of the site contain less than 2m of peat and contain exposed marl and gravel; however some small areas of the bog, in the south-western corner of the site still contain some "red" or "*Sphagnum*" peat. Six pumps are situated on the site and are used to maintain drainage across the site.

See Appendix II for more detail on site, habitats and local features.

See Drawing number BNM-ECO-23-27-17 titled ***Derryadd Bog: Current Habitat Map***, included in the accompanying Mapbook, which illustrates the habitats at Derryadd Bog.

3.3.2 Species of conservation interest

A number of species of conservation concern have been recorded at Derryadd Bog. The following is a summary of the records of these species available within both BnM records and those of the National Biodiversity Data Centre (NBDC). Multiple mammal species have been recorded on or within 1 Km of the bog including Irish Hare (*Lepus timidus subsp. hibernicus)*, Eurasian Badger (*Meles meles),* Pine Marten (*Martes martes*) and European Otter (*Lutra lutra*).

The butterfly species Green-veined White (*Pieris napi*), Small Copper (*Lycaena phlaeas*), Small Heath (*Coenonympha pamphilus*), Large White (*Pieris brassicae*) and Meadow Brown (*Maniola jurtina*) have all been recorded during Bord na Mona surveys.

Numerous bird species are known to use the cutover bogs in Ireland's midlands as breeding grounds, wintering grounds or both. Heron (*Ardea cinerea*), Mallard (*Anas plathrhynchos*), Kestrel (*Falco tinnunculus*), Skylark (*Alauda arvensis*), Willow Warbler (*Phylloscopus trochilus*), Grasshopper Warbler (*Locustella naevia*), Wood Pigeon (*Columba palumbus*), Meadow Pipit (*Anthus pratensis*), Robin (*Erithacus rubecula*), Blackbird (*Turdus merula*), Hooded Crow (*Corvus cornix*), Magpie (*Pica pica*) have all been recorded during BNM ecology surveys.

NBDC records for red-listed[4] bird species of conservation concern recorded in the 10km square (N06) which Derryadd intersects include; Buzzard (*Buteo buteo*), Barn Owl (*Tyto alba*), Bewick's Swan (*Cygnus columbianus subsp. bewickii*), Black-headed Gull (*Larus ridibundus*), Common Redshank (*Tringa totanus*), Curlew (*Numenius arquata*), Golden Plover (*Pluvialis apricaria*), Herring Gull (*Larus argentatus*), Lapwing (*Vanellus vanellus*), Northern Pintail (*Anas acuta*), Northern Shoveler (*Anas clypeata*), Red Grouse (*Lagopus lagopus*) and Yellowhammer (*Emberiza citrinella*).

[4] Gilbert G, Stanbury A and Lewis L (2021), "Birds of Conservation Concern in Ireland 2020 –2026". Irish Birds 9: 523—544

A review of the Ornithology Chapter for the previously proposed Derryadd Wind Farm Ecological Impact Assessment Report (EIAR)[3] (Planning Ref. No. ABP-303592-19) was also undertaken. The below paragraphs provide a summary of the bird species of conservation concern recorded during surveys to inform the above was undertaken. A full list of bird species recorded within and adjacent to the bog, in the wider study area, is provided in the EIAR.

Three Amber Listed (BoCCI) species, including Black-headed Gull, Lesser-black-backed gull and Mallard were recorded within the boundary of Derryadd East during dedicated bird surveys for the proposed development. In addition, Whooper Swan have also been recorded flying over the site during dedicated winter bird vantage point surveys (2021/2022).

Surveys in the wider study area, outside the boundary of Derryadd bog also recorded additional Red Listed (BoCCI) species including Curlew, Redshank, Herring Gull, Grey Wagtail, Lapwing and Wigeon. The results of the breeding bird surveys (2015, 2016 and 2017) undertaken in the wider study area also recorded several additional Red List species (BoCCI), including; Woodcock, Curlew, Lapwing and Quail. A number of species recorded during the winter months in the study area are listed on Annex I of the EU Birds Directive, namely; Golden Plover, Greenland White-fronted Goose, Hen Harrier, Kingfisher, Merlin and Peregrine Falcon. Golden Plover, Hen Harrier, Merlin and Peregrine Falcon were also recorded during breeding season surveys along with Common Tern and Little Egret. Habitat is limited for many of these species at Derryadd however.

It should be noted that much of the wildfowl, wader and gull observations recorded as part of the ornithological study were associated with the River Shannon and associated wet grasslands to the north of the area.

3.3.3 Invasive species

NBDC holds records for the high impact invasive species Japanese Knotweed (*Fallopia japonica*), and Rhododendron (*Rhododendron ponticum*), recorded in marginal scrub habitat along the northern boundary.

A broad range of common garden escapes are also occasionally present around the margins of Bord na Móna bogs. Although spatial overlap with the rehabilitation work is expected to be limited, these are, where necessary, to be treated in line with best practice during rehabilitation.

3.4 Statutory Nature Conservation Designations

There are no European Sites, Special Areas of Conservation (SAC) or Special Protection Areas (SPA), located within or adjacent to Derryadd Bog. The nearest EU Designated sites to Derryadd Bog are as follows:

- Mount Jessop SAC (Site Code: 002202) – 5.4 km east of Derryadd
- Lough Forbes Complex SAC (site code: 001818) – 6.4 km to the north east of Derryadd
- Ballykenny-Fisherstown Bog SPA (site code: 004101) – 6.4 km to the north east of Derryadd
- Brown Bog (site code: 002346) – 7 km to the north of Derryadd
- Lough Ree SAC (Site Code: 000440) – 4.1 km to the west of Derryadd
- Lough Ree SPA (Site Code: 004064) – 4.3 km to the west of Derryadd
- Fortwilliam Turlough SAC (site code: 000448) – 4.1 km to the south-west of Derryadd

[3] Tobin, 2019, Derryadd Wind Farm Environmental Impact Assessment Report (EIAR), Volume II, EIAR Main Report.

A number of non-statutory designated sites also occur in the wider area around Derryadd Bog. Lough Ree pNHA (NPWS Site Code: 002103), occurs approximately 4.3 km to the west of Derryadd. Mount Jessop NHA (NPWS Site Code: 001450), occurs approximately 5.4 km to the east of Derryadd Bog. Forthill Bog NHA (NPWS Site Code: 001448), occurs approximately 5 km to the south of Derryadd Bog. Lisnanarriagh Bog NHA (NPWS Site Code: 002072), occurs approximately 9.5 km to the west of Derryadd.

See drawing *BNM-ECO-23-27-23: Derryadd Bog Proximity to Designated Sites* in the accompanying map book.

3.4.1 Other Nature Conservation Designations

The Ramsar Convention entered into force in Ireland on 15th March 1985. Ireland currently has 45 sites/wetlands designated as Wetlands of International Importance (Ramsar Sites). These cover a surface area of 66,994ha. There are no Ramsar sites located in proximity to Derryadd Bog.

3.5 Hydrology and Hydrogeology

Derryadd bog forms part of the Upper Shannon Catchment (Catchment ID: 26C) as defined by the EPA under the Water Framework Directive (WFD). The bog lies completely within the Shannon [Upper]_SC_80 sub-catchment.

There are several rivers and streams within the site and around the margins that drain the site. The Ballynakill_26 River (EPA code: 26B22) runs along the eastern boundary in a northerly eventually discharging to the River Shannon [Upper] (EPA code: 26S02) downstream. The Derrygeel (EPA code: 26B22) watercourse arises within the southern section of the site and flows west. The Rappareehill (EPA code: 26R40) arises adjacent to the north west corner of the site and flows south then west. Both watercourses join the Lough Bannow Stream (EPA code: 26L12) which flows into the Shannon [Upper] (EPA code: 26S02).

The bog has field drains running in a general north to south orientation. Derryadd Bog has a pumped drainage system and there are six sets of pumps at the bog to facilitate drainage from several discharge points for the former peat production and support of infrastructure.

GSI data indicates that the majority of Derryadd Bog lies within a regionally important aquifer – Karstified (conduit). The south west section of the site lies within a locally important aquifer - bedrock which is moderately productive only in local zones. An aquifer is an underground body of water-bearing rock or unconsolidated materials (gravel or sand) from which groundwater can be extracted in useful amounts. GSIs Aquifer classes are divided into three main groups based on their resource potential, and further subdivided based on the type of openings through which groundwater flows. There are nine aquifer categories in total. Locally important aquifers are capable of supplying locally important abstractions (e.g. smaller public water supplies, group schemes), or good yields (100-400 m3/d). This data gives an indication of sub-surface deposits (bedrock and unconsolidated materials) in terms of their groundwater resource potential and dominant groundwater flow type.

Regionally important aquifers are those in which the network of fractures, fissures and joints, through which groundwater flows, is well connected and widely dispersed, resulting in a relatively even distribution of highly permeable zones. There is good aquifer storage and groundwater flow paths can be up to several kilometres in length. There is likely to be substantial groundwater discharge to surface waters (‘baseflow’) and large (>2,000 m3/d), dependable springs may be associated with these aquifers.

The majority of Derryadd Bog is located in an area mapped by GSI as of low groundwater vulnerability (GSI Map viewer), with the two mineral islands to the centre mapped as moderate groundwater vulnerability. 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. These data indicate there is generally low risk of any groundwater contamination occurring at this site.

Quaternary sediment maps show that Derryadd Bog is generally underlain by visean limestones (undifferentiated). The two mineral islands to the centre of the site are underlain by till derived from limestones. This combination of sediment is common in the wider context surrounding the site.

3.6 Emissions to surface-water and watercourses

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. Industrial peat production has now permanently ceased at Derryadd Bog.

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. Silt pond decommissioning will be considered when sites are deemed to be on a trajectory of environmental stability and peatland rehabilitation has been completed.

Derryadd Bog has 3 treated surface water outlets to the Upper Shannon (26C) catchment. Rappareehill (26R40) River flows from the north west corner of the site along the western boundary before turning west and joining Lough Bannow Stream (26L12). Derrygeel (26D77) River flows from the south west of the site also joining Lough Bannow Stream. Ballynakill_26 (26B2) River flows along the eastern boundary and north into the River Shannon (Upper (100) (26S02). All three outlets are directed to the River Shannon (Upper)_100 (26S02). This river is listed as being under pressure from peat extraction in the 2nd cycle of the River Basin Management Plan for Ireland and is indicated as remaining so in the third cycle.

Details of silt ponds, associated surface water emission points and monitoring and sampling locations are detailed in Drawing numbers BNM-ECO-23-27-02 titled *Derryadd Bog: Structures and Sampling*, along with Drawing number BNM-ECO-23-27-WQ01 titled *Derryadd Bog: Water Quality Map* and BNM-ECO-23-27-SP01 titled *Sampling Points* included in the accompanying Mapbook, which illustrate the various drainage and water quality infrastructure present at Derryadd Bog.

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 Environmental Protection Agency.

Decommissioning and Rehabilitation Programme Water Quality Monitoring.

Rehabilitation of cutaway peatland is closely linked with control of emissions. One of the criteria for successful rehabilitation is stabilisation through re-vegetation, which will stabilise all substrates and in turn remove the need

for further silt control measures. This site is already largely vegetated. Re-wetted peat also aids the primary objective of stabilizing peat, as when peat is re-wetted it is not vulnerable to wind erosion. Re-wetted peat and the development of wet peatland habitats can also act as sinks for silt and mobile peat, and increases additional retention time for solids, and the peatland vegetation can quickly stabilise this material within blocked drains on site (by acting like constructed wetlands).

Water quality of water discharges from restored peatlands normally improves as a result of bog restoration measures and the restoration of natural peatland processes (Bonn *et al*., 20017). Bog restoration 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) (DHLGH 2024) 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 peatland 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 Derryadd has been completed. This discharge will have improved 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 watercourse receptors and the Shannon [Upper]_SC_080 sub catchment and will support the future status of the watercourses achieving Good Status.

Decommissioning and Rehabilitation Programme Water Quality Monitoring

Water quality monitoring will be established. 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 additional rehabilitation.

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 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.

3.7 Fugitive Emissions to air

Rehabilitation of the drained peatland will seek to re-wet the dry peat where possible. Collectively re-wetting and re-vegetating will minimise any risk of emission to air from dust.

3.8 Carbon emissions

Irish peatlands are a huge carbon store, containing more than 75% of the national soil organic carbon (Renou-Wilson et al. 2012). Peatland drainage and extraction transforms a natural peatland which acts as a modest carbon sink (taking in 0.1 to 1.1 t of carbon as CO2-C /ha/yr) into a cutaway ecosystem which is a large source of

carbon dioxide (releasing 1.3 to 2.2 t of carbon as CO2-C /ha/yr) based on Tier 1 Emission factors (Evans et al. 2017). Renou-Wilson et al. (2018) reported losses of between 0.81 – 1.51 CO2-C /ha/yr from drained peatlands located in Ireland.

Re-wetting of dry peatlands will increase methane emissions (Gunther et al. 2020) as a consequence of the anoxic conditions within the peat body that provide a suitable environment for the microbial breakdown of plant litter and root exudates. Tanneberger et al. (2021) describes how peatland management has to choose between CO2 emissions from drained peatlands or increased methane (CH_4) emissions from rewetted industrial peatlands. However, when radiative effects and atmospheric lifetimes of both GHG gases are considered and modelled, postponing rewetting increases the longterm warming effect of continued CO_2 emissions (Gunther et al. 2020). This means the increase in methane due to rewetting of dry peatlands is still negated by the CO_2 emissions reductions. Further, Wilson et al. (2022) confirmed the benefit of rapid rewetting to achieve strong carbon reductions and potentially altering the warming dynamics from warming to cooling depending upon the climate scenario.

It is expected that Derryadd Bog will become a reduced carbon source following rehabilitation. The potential of any cutaway site to develop as a 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 majority of the bog will develop as birch woodland on drier areas and peripheral headlands. Large wetlands are expected to develop on shallow peat with open water, reed swamp and fen habitats with alkaline peatland emission factors. Part of this bog is expected to develop regenerating wet deep peat vegetation on deep peat areas.

3.9 Current ecological rating

(Following NRA (2009) Evaluation Criteria)

The majority of Derryadd Bog can be rated as **Local Importance; lower value to Local Importance; higher value.** Bare peat in the former production area of Derryadd Bog is assessed as **local importance (lower value)**.

The revegetated former production area dominated by birch scrub/woodland that runs north-south through the centre of the site and marginal habitats including woodland, scrub, pioneer cutaway habitats, fen, calcareous grassland, remnant raised bog, and wetlands may act as a refuge and as ecological corridors for wildlife and are therefore deemed to be **locally important (higher value)**.

4. CONSULTATION

4.1 Consultation to date

Consultation seeks 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.

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

- General consultation with range of stakeholders at annual Bord na Móna Biodiversity Action Plan review days 2010-2018.
- Longford Wetland Wilderness (general proposal led by Longford County Council and other stakeholders. This has had several iterations. See Lough Ree and Mid Shannon, Spirit Level 2017. A feasibility study for Longford County Council).
- Feehan, J. (2004) A Long-Lived Wilderness; the future of the north midlands peatland network UCD/NWWPC.
- Lauder, A. & O'Toole L. (2017). Concept development for a landscape-scale Wetland Wilderness Park in the Mid Shannon Region. A report funded by the Heritage Council's Heritage Grant Scheme.
- Foss, P.J., Crushell, P. & Gallagher, M.C. (2017). Counties Longford &Roscommon Wetland Study. Report prepared for Longford and Roscommon County Councils.
- Archaeological Liaison Committee (National Museum of Ireland & Dept of Culture Heritage and the Gaeltacht).
- 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.).
- Greenway development at Derryadd (Longford County Council).

To inform the current Plan, both national and local stakeholders, including neighbours whose land adjoins Derryadd Bog and local representatives of national bodies (such as Regional National Parks and Wildlife Service staff) and relevant offices in County Councils (such as the Heritage or Environmental Offices) will be contacted. Any identified local interest groups will be sought and informed of the opportunity to engage with this rehabilitation plan, and when identified invited to submit their comments or observations in relation to the proposed rehabilitation at Derryadd Bog.

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

4.2 Issues raised by Consultees

N/A Yet as consultation has not commenced.

4.3 Bord na Móna response to issues raised during consultation

N/A Yet as consultation has not commenced.

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.
- Environmental stabilisation of the former peat production areas and mitigation of potential silt run-off.
- Stabilisation or reduction in water quality parameters of water discharging from the site (e.g. suspended solids).
- Reducing pressure on receiving waterbodies 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 the protection of exposed archaeological structures, their retention in situ and preservation into the future.
- The main goal and outcome of this plan is the successful rehabilitation (environmental stabilisation and restoration) of a peatland originally drained for industrial peat production, but not brought into production, in a manner that is acceptable to both external stakeholders and to Bord na Móna.

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

- Natural colonisation will form the basis for the environmental stabilisation of the bare peat areas. Re-wetting of the cutaway, where possible, is a general rehabilitation strategy. The main target will be to maintain water-levels close to the peat surface, and to avoid the creation of large-water bodies, where possible. However, this is dependent on the topography of the cutaway bog and the final drainage regime. Re-wetting and water levels close to the peat surface accelerates the re-vegetation processes, the development of vegetation cover and therefore environmental stabilisation. There is already significant potential for the creation of wet cutaway habitats at this cutaway bog due to the local topography (localised basins).
- It will take some time for stable naturally functioning habitats to fully develop at Derryadd Bog. This will happen over a longer timeframe 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.
- 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). Furthermore, only a small proportion of the bog has potential to develop *Sphagnum*-rich habitats in this timeframe. Nevertheless, re-wetting across the entire bog, will improve habitat conditions of the whole bog. 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). Reducing pressures due to former peat extraction activities at Derryadd Bog will contribute to stabilising or improving water quality status of receiving water bodies in general. Ultimately, improving the WFD status of the receiving waterbody will depend on reducing pressure from a range of different sources, including peatlands in general (private and Bord na Móna).

- Bord na Móna are also planning rehabilitation measures in some nearby bogs (e.g. Derryadd East, Derryshannoge) starting in 2023, and rehabilitation has taken place in several surrounding bogs in 2021/2022, including Begnagh, Clooneeny, Knappoge, Derrycashel and Derraghan bogs. There are expected to be cumulative water quality and other ecosystem service benefits to receiving water bodies from rehabilitating more than one bog in the same catchment.
- Re-wetting in general will benefit the future preservation of most known and unknown archaeological features.

6. SCOPE OF REHABILITATION

The principal scope of this rehabilitation plan is the environmental stabilisation of the bog. This is defined by:

- The area of Derryadd Bog.
- EPA IPC Licence - Ref. P0504-01. 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. Derryadd bog is part of the Mountdillon bog group.
- The local environmental conditions of Derryadd Bog mean that drain blocking and hydrological management to re-wet peat where possible is the most suitable rehabilitation approach for this site. Derryadd Bog while largely comprising shallower peat does retain pockets of residual deep peat in places.
- The key goals and outcomes of rehabilitation set by Bord na Móna. Bord na Móna have defined the key goal and outcome of rehabilitation at Derryadd Bog as **environmental stabilisation** and **optimising residual peat re-wetting,** to enhance the development of compatible habitats.
- The cutaway is already developing a mosaic of woodland, grassland, wetland and cutaway peatland habitats. A significant portion of this cutaway has largely stabilised. Rehabilitation is proposed to enhance residual peat re-wetting in these areas while taking account of existing habitats, future infrastructure and land-uses (e.g. amenity).
- Rehabilitation of Derryadd Bog will support multiple national strategies of climate action, biodiversity action and other key environmental strategies such was the Water Framework Directive.
- The time frame for the delivery of the planned rehabilitation will be undertaken according to available resources and appropriate constraints.
- It is not proposed to carry out rehabilitation on all marginal or peripheral cutover bog zones. Generally, these bog remnants are narrow, or are subject to turbary, and do not have positive bog restoration prospects.

6.1 Key constraints

- **Bog conditions.** Rehabilitation outcomes of sites are constrained by the environmental characteristics of these particular areas. Drain blocking can be widespread in scale with each field drain being blocked (e.g. Kellysgrove) or more localised with targeted drain-blocking (e.g. Mountlucas Wind Farm) and both can be very effective. This can be used in conjunction with local topographical features like natural hollows to manage water levels or with other typical features of cutaway peatlands like high peat fields, which act as berms to hold water to some extent.
- The majority of this bog has been cutaway. Derryadd bog has a pumped drainage regime, which will need to be considered as part of the wider rehabilitation. A mosaic of wetland habitats are the most compatible habitat that can be developed in response to re-wetting and reducing or stopping pumping.
- **Surrounding landscape and neighbours.** Another key constraint is the interaction between the Bord na Móna sites and the surrounding landscape. Care has to 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.
- **Turbary.** There is one isolated area (constraint), along the western margin that is subject to active turbary.
- **Archaeology**. There are archaeological features present at Derryadd Bog, which may constrain rehabilitation activities. The discovery of monuments or archaeological objects during peatland

rehabilitation may potentially constrain the rehabilitation measures proposed for a particular area. The rehabilitation will optimise hydrological conditions for the protection of exposed archaeological structures, their retention in situ and preservation into the future. Any newly discovered archaeology may require rehabilitation measures to be reviewed and adapted. An Archaeological Impact Assessment (see Appendix X) will be carried out to mitigate against any impact on archaeology that may be found at Derryadd Bog. In the worst-case scenario works affecting the surface and sub-surface of the bog might disturb previously unknown archaeological deposits or artefacts without preservation by record taking place. Should any previously unknown archaeological material be uncovered during the rehabilitation works, it will be avoided and reported to the Bord na Móna Archaeological Liaison Officer and the National Museum of Ireland.

- **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. Two Rights of Way exist at or around the margin of Derryadd Bog.
- **Proposed amenity development**. Longford County Council lodged a Part 8 Planning Application in 2021 named 'No. 88 Mid Shannon Wilderness Park trackways' which includes greenway or amenity walking/cycling tracks towards the southern and northern boundaries of Derryadd Bog. This proposed amenity does not affect the planned rehabilitation.

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 drain blocking and other ground activities.

6.3 Key Exclusions

The scope of this rehabilitation plan does not cover:

- The longer-term development of stable naturally functioning habitats to fully develop at Derryadd Bog. The plan covers the short-term rehabilitation **actions** and **an additional monitoring and after-care programme** to monitor the rehabilitation and to respond to any needs.
- This plan is not intended to be an after-use or future land-use plan for Derryadd Bog.
- The longer-term management of this site, potentially as a nature conservation site, or for amenity, or for other uses in the future.

7. CRITERIA FOR SUCCESSFUL REHABILITATION

This section outlines what criteria will be used to indicate successful rehabilitation and what critical success factors are needed to achieve successful rehabilitation. All criteria used to indicate successful rehabilitation will be measured to validate the achievement of the rehabilitation goals and outcomes and validate the completion of the rehabilitation.

The key objective of this rehabilitation plan is **environmental stabilisation** and the stabilisation of any emissions from the site that related to the former industrial drainage 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 a naturally functioning raised bog ecosystem; and
- mitigation of key emissions (e.g. potential suspended solids run-off).

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

- Rewetting of residual peat in the area originally drained for industrial peat production to offset potential run off of suspended solids and to encourage and accelerate development of vegetation cover via natural colonisation. See Table 7.1 for 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.

With regard to predicting and estimating likely trends that might materialize 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 (Figure 7.1).

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

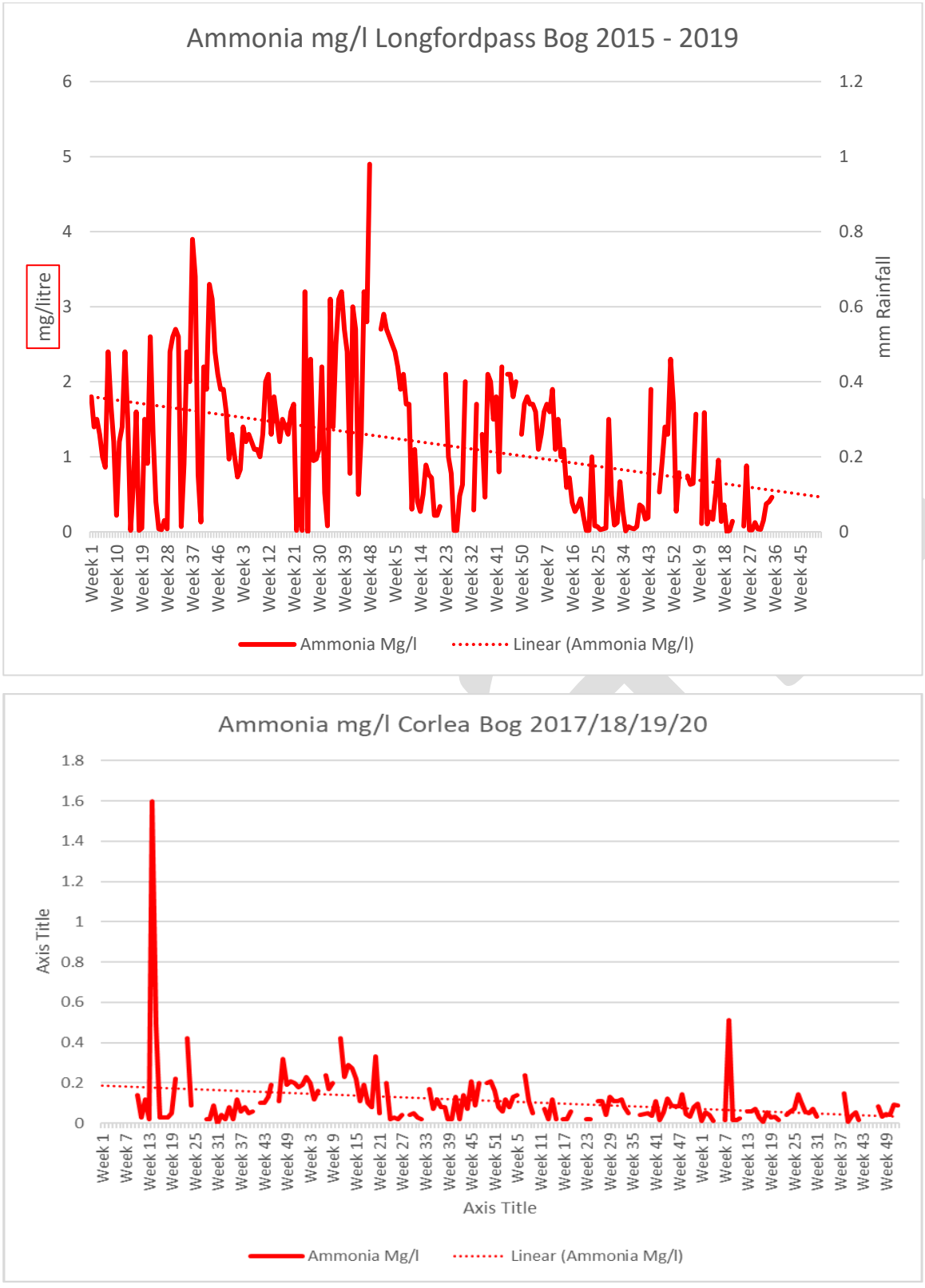

Figure 7.1. Ammonia levels over the period 2015-2019/2020 at Longfordpass and Corlea.

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 Timeframe
IPC validation	Rewetting in the former area of industrial drainage.	Delivery of rehabilitation measures Restoration of hydrological regime.	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.	3 years
IPC validation	Key water quality parameters Ammonia, Phosphorous, Suspended solids, pH and conductivity	Reduction or stabilisation of key water quality parameters associated with this bog	Water quality monitoring for a period after rehabilitation has been completed	2 years
IPC validation	Reducing pressure from drainage on the local water body catchment (WFD)	Where this section of the water body (that this bog drains to) has not been identified as under pressure from peat extraction, that the intervening EPA monitoring programme associated with its Programme of Measures for this water body, confirms that its classification remains at not being at risk from peat extraction associated with activities at this bog.	EPA WFD monitoring programme	WFD schedule

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).** 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.
- **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 practice 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 and restoration 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. 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 restoration and rehabilitation requires detailed planning and the use of data from desktop surveys and field surveys. This data in association with topographical and hydrological modelling will be important in planning the future peatland landscapes and planning the use of the most appropriate rehabilitation methodologies based on environmental characteristic. Hydrological modelling indicates those areas that are likely to re-wet when drains are blocked, based on the current topography. This planning is 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).

A number of illustrative figures have been produced to inform Rehab Planning and Design, including Aerial Photography, Peat Depths and LiDAR Surface Maps, these are included in the accompanying Mapbook as the drawings referenced below:

BNM-ECO-23-27-21 titled ***Derryadd Bog: Aerial Imagery2020***

BNM-ECO-23-27-04 titled ***Derryadd Bog: Peat Depths***

BNM-ECO-23-27-03 titled ***Derryadd Bog: LiDAR Map***

The restoration and rehabilitation measures are provisionally outlined in drawing titled BNM-ECO-23-27-20 ***Derryadd Bog: Standard Rehabilitation Measures*** in the accompanying Mapbook.

These rehabilitation measures for Derryadd Bog will include (see Table 8.1):

- Re-assessment of the pumping regime and removing pumps or reducing pumping if this is desired and has no significant external impact or impacts on proposed future land-uses. Initial hydrological modelling indicates that a part of the site will develop a mosaic of wetland habitats with some permanent deeper water if pumps are decommissioned or pumping is reduced. 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, where possible. More sustainable permanent gravity drainage solutions will be examined. Some pumping may have to be retained. 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 of surrounding rivers.
- A widespread drain-blocking programme and hydrological management will be implemented across the cutaway, where possible. In general, field drains will be blocked where possible to re-wet cutaway and re-wet to the optimum water-level. More intensive measures will be targeted towards the bare peat.
- Less intensive measures (targeted drain-blocking) will be used in areas where habitats have already established.
- Hydrological Measures will include drain blocking (3/100 m), modifying outfalls and managing water levels with overflow pipes.
- 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 silt run-off, 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).

Table 8.1: Types of and areas for rehabilitation measures at Derryadd Bog. Note that the types of rehab and areas of rehab may change in response to stakeholder consultation and refinement of the rehabilitation measures.

Type	Code	Description	Area (Ha)
Deep peat cutover bog	DPT1	Regular drain blocking (3/100 m) + modifying outfalls and managing water levels with overflow pipes	62.5
Dry cutaway	DCT1	Modifying outfalls and managing water levels with overflow pipes	303.2
Wetland cutaway	WLT1	Turn off or reduce pumping to re-wet cutaway + modifying outfalls and managing water levels with overflow pipes	213.6
Marginal land	MLT1	No work required	71.1
Silt Pond	Silt Pond	Silt Pond	0.8
Constraint	Constraint	Constraint	3
Total Area			**654.2**

8.1 Completed and Ongoing

- Part of the site has already re-vegetated, with pioneer vegetation maturing and developing a mosaic of typical cutaway peatland habitats with Birch woodland predominating. Bare peat areas within the older cutaway areas are reducing. Natural re-colonisation of the cutaway so far has been quite effective. Other parts of the site (younger cutaway) are naturally colonising for more than 10 years and are developing a mosaic of cutaway habitats. Natural re-colonisation of the cutaway so far has been quite effective.

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

- Seek formal approval of the rehabilitation plan from the EPA.
- Develop a detailed site plan outlining how the various rehabilitation methods will be applied to Derryadd Bog. This will take account of peat depths, topography, drainage and hydrological modelling (see rehabilitation map for an indicative view of the application of different rehabilitation methodologies).
- A drainage management assessment of the proposed rehabilitation measures will be carried out and any issues identified resolved and the rehabilitation plan adapted.
- A review of known archaeology and an archaeological impact appraisal of the proposed rehabilitation will be carried out. The results of this assessment will be incorporated into the rehabilitation plan to minimise known archaeological disturbance, where possible.
- A review of issues that may constrain rehabilitation such as known rights of way, turbary and existing land agreements is to be carried out.
- An ecological appraisal of the potential impacts of the planned rehabilitation on the presence of sensitive ground-nesting bird breeding species (e.g. breeding waders) is to be carried out. The scheduling of rehabilitation operations will be adapted, where required.
- Ensure all activities comply with the environmental protection requirements of the IPC Licence.
- Carry out Appropriate Assessment (AA) of the Rehabilitation Plan. Incorporate any required mitigation measures from the AA (if required) in the plan for the delivery of rehabilitation and decommissioning across the site.

- 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.

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

- Carry out proposed measures as per the detailed site plan. This will include intensive drain blocking and targeted hydrological management prescriptions in the cutaway. All rehabilitation will be carried out with regard to best practice environmental control measures (Appendix III).
- Monitor the success of rehabilitation measures in relation to developing suitable hydrological conditions.
- Carry out the proposed monitoring, as outlined in section 9.
- Silt ponds will be monitored during this period and there will be continued maintenance and cleaning to prevent potential suspended solids run-off from the site during the rehabilitation phase.

8.4 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 9 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.

8.5 Timeframe (when finalised)

- **Year 1**: Short-term planning actions.
- **Year 1-3**: Short-term practical actions.
- **Year 1-3**: Long term practical actions. Evaluate success of short-term rehabilitation measures outlined above and remediate where necessary.
- **> Year 3**: Decommission silt-ponds, if necessary

8.6 Budget and costing

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 2022). 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 different cutaway types across the site.

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.
- These monitoring visits will also consider any requirements for further 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. This will be used to verify completion of rehabilitation measures. The extent of bare peat will be assessed using this baseline data, and habitat maps will be updated, if needed. It is proposed that sites can be monitored against this baseline in the future.
- **Water quality monitoring** at the bog will be established. 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.
- Monitoring results will be maintained, trended 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, and COD.
- This monthly sampling regime on a selected number of silt ponds will be carried out over a two-year cycle.
- If, after two years, key criteria for successful rehabilitation are being achieved and key targets are being met, then the water quality monitoring will be reviewed, with consideration of potential ongoing 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 criteria for successful rehabilitation have **not** been achieved and key targets have **not** been met, then the rehabilitation measures and status of the site will be evaluated and enhanced, where required. This evaluation may indicate no requirement for additional enhancement of rehabilitation measures but may demonstrate that more time is required before key criteria for 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 that are compatible the provision of biodiversity and ecosystem services, 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.

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. BOG GROUP CONTEXT

The Mount Dillon Bog Group IPC Licensed area is made up of two sub-groups (Lough Ree (the Mount Dillon Energy Peat Group) and Mostrim) and have been in industrial peat production for several decades. There are 28 defined sites covering a total area of 11,322 ha. Of the 28 sites, 23 mainly straddle the River Shannon within counties Roscommon and Longford, with five sites partially in County Westmeath to the east. Each bog area further comprises a range of habitats from bare milled peat former peat extraction areas to re-colonising cutaway to workshops areas and transport infrastructure. Industrial peat extraction from these sites mainly supplied ESB power stations at Lanesborough (LRP) or for horticultural peat products.

Industrial peat extraction in the Mount Dillon Bog Group ceased in 2019. Remaining milled peat stocks were utilised in Lanesborough (LRP) until the power station ceased electricity generation at the end of 2020. Remaining peat stocks have been transferred to other customers (Edenderry Power Station, Derrinlough Brickette Factory) between 2021-2023. Intensive decommissioning and rehabilitation for the Mount Dillon Bog Group started in 2020/2021.

One bog site, Cloonmore, was never used for industrial peat production and several bogs in the Mostrim group were drained but never fully developed and still retain typical high bog characteristics. These include Clonwhelan, Glenlough and a section of Mostrim. These sites have been zoned for biodiversity and a high bog drain blocking will be used to re-wet the high bog and encourage restoration of the raised bog habitat. Several sites (Glenlough, Mostrim, Clonwhelan and Clynan) were assessed by consultants for NPWS as part of the review of the raised bog Natural Heritage Area network (NPWS 2014).

The rehabilitation plan for the Mount Dillon Bog Group encompasses all areas involved in industrial peat production including former industrial peat production areas and associated facilities. It also includes rehabilitation measures for those bogs that were initially drained but not fully developed.

A breakdown of the component bog areas for the Mount Dillon Bog Group IPC License Ref. PO-504-01-01 is outlined in Table Ap-2.

Industrial peat production history varies across the Mount Dillon bog group, so there is a wide range of peat depths at present. Bogs close to Lanesborough tend to have shallower peat depths or have been cutaway, while some bogs on the periphery of the group tend to have deeper residual peat reserves. Several sites such as Mount Dillion and Derrycashel have been mostly cutaway to the fen peat layers or in some cases to expose the underlying gravel/sub-soil. Several bogs in the Mostrim group have only been partially developed or have had no industrial peat production, and have relatively deep peat depths remaining.

Table Ap-2: Mount Dillon Bog Group names, area and indicative status (Mount Dillon Energy Peat sub-group)

Bog Name	Area (ha)	Stage of development	Land-Use and History	Peat Production Cessation	Rehab Plan Status
Begnagh	265	Cutover Bog Industrial peat production commenced at Begnagh Bog in 1977 and ceased in 2020. Deep peat reserves remain on much of the former production area.	Begnagh Bog formerly supplied a range of commercial functions including; fuel peat for Lough Ree Power Some areas of cutaway on site are developing pioneer cutaway vegetation communities.	2020	Finalised 2022 Rehab started in 2022

Bog Name	Area (ha)	Stage of development	Land-Use and History	Peat Production Cessation	Rehab Plan Status
		Begnagh is considered a deep peat cutover bog.			
Clooneeny	358	Cutover Bog Industrial peat production commenced at Clooneeny Bog in 1985 and ceased in 2020. Deep peat reserves remain on much of the former production area. Clooneeny is considered a deep peat cutover bog.	Clooneeny Bog formerly supplied a range of commercial functions including; horticultural peat and fuel peat for Lough Ree Power Most of the former production area on site is bare peat. Some areas of cutaway on site are developing pioneer cutaway vegetation communities.	2020	Finalised 2022 Rehab started in 2022
Cloonmore	102	N/A	Never developed for industrial peat production; scattered plots.	N/A	N/A
Cloonshannagh	494	Cutover Bog Industrial peat production commenced at Cloonshannagh Bog in 1985 and ceased in 2020. Deep peat reserves remain across the former production area. Cloonshannagh is considered a deep peat cutover bog.	Cloonshannagh Bog formerly supplied a range of commercial functions including; horticultural peat and fuel peat for Lough Ree Power Restoration work has been carried out on a 38ha section of high bog within Cloonshannagh Bog. Some of the former production area on site is developing pioneer cutaway vegetation communities, the remainder of the site is bare peat.	2020	Finalised 2024 Rehab to start 2025
Cloonshannagh Rail Link	28	Cloonshannagh rail link is a link between sites.	N/A	N/A	N/A
Corlea	163	Cutaway Bog Industrial peat production commenced at Corlea Bog in 1960 and ceased in 2018. Long-term peat extraction has reduced peat reserves on this bog. Corlea is considered a shallow peat cutaway bog.	The former production area at Corlea has already extensively colonised. Pioneer wetland and scrub development has occurred over much of the site. Some wetland and rehabilitation management was undertaken between 2016-2018. Part of site leased to local community development group to develop amenity walkway in association with Longford County Council.	2018	Finalised in 2023 Rehab started in 2023
Derraghan	289	Cutover Bog Industrial peat production commenced at Derraghan Bog in the 1940's and ceased in 2020. Most of the former production area has shallow peat reserves. Some pockets of deep peat remain. Derraghan is considered a shallow peat cutover bog.	Derraghan Bog formerly supplied a range of commercial functions including; fuel peat for Lough Ree Power Much of the former production area at Derraghan has been out of production for some time. These areas have already extensively colonised with pioneer wetland and scrub vegetation communities.	2020	Finalised 2021 Rehab commenced 2022
Derryadd	653	Cutover Bog Industrial peat production commenced at Derryadd Bog in 1960 and ceased in 2020. Long-term peat extraction has reduced peat reserves on this bog. Most of the former production area has shallow peat reserves. Some pockets of deep peat remain. Derryadd is considered a shallow peat cutover bog.	Much of the former production area at Derryadd has been out of production for some time. These areas have already extensively colonised with pioneer wetland and scrub vegetation communities	2020	Draft plan Updated 2025
Derryadd2 (Derryadd East)	328	Cutover Bog Industrial peat production commenced at Derryadd 2 Bog in 1960 and ceased in 2020. Long-term peat extraction has reduced	Much of the former production area at Derryadd 2 has been out of peat production for some time. These areas have already extensively colonised with pioneer wetland and scrub vegetation communities	2020	Finalised 2023 Rehab started 2023

Bog Name	Area (ha)	Stage of development	Land-Use and History	Peat Production Cessation	Rehab Plan Status
		peat reserves on this bog. Most of the former production area has shallow peat reserves. Some pockets of deep peat remain. Derryadd 2 is considered a shallow peat cutover bog.			
Derryarogue	895	Cutover Bog Industrial peat production commenced at Derryarogue Bog in 1941 and ceased in 2020. Long-term peat extraction has reduced peat reserves on this bog. Most of the former production area has shallow peat reserves. Some pockets of deep peat remain. Derryarogue is considered a shallow peat cutover bog.	Much of the former production area at Derryarogue has been out of production for some time. These areas have already extensively colonised with pioneer wetland, cutaway and scrub vegetation communities. Part of Derryarogue will be rehabilitated as part of PCAS in 2023 An amenity walkway through part of Derryarogue..	2020	Derryarogue West Finalised in 2023 Rehab started in 2023 Derryarogue Draft updated 2025 (remainder of site)
Derrycashel	388	Cutover Bog Industrial peat production commenced at Derrycashel Bog in 1951 and ceased in 2018. Long-term peat extraction has reduced peat reserves on this bog. Most of the former production area has shallow peat reserves. Some pockets of deep peat remain. Derrycashel is considered a shallow peat cutover bog.	Derrycashel Bog formerly supplied a range of commercial functions including; fuel peat for Lough Ree Power Much of the former production area at Derryarogue has been out of production for some time. These areas have already extensively colonised with pioneer wetland and scrub vegetation communities. Some wetland and rehabilitation management was undertaken (c.60ha) between 2014-2015.	2018	Finalised 2021 Rehab started in 2021
Derrycolumb	454	Cutover Bog Industrial peat production commenced at Derrycolumb Bog in the 1980's and ceased in 2019. Most of the former production area still has deep peat reserves. Derrycolumb is considered a deep peat cutover bog.	Derrycolumb Bog formerly supplied a range of commercial functions including; fuel peat for Lough Ree Power Much of the former production area at Derrycolumb has been out of production for some time. These areas have already extensively colonised with pioneer wetland and scrub vegetation communities.	2018	Finalised 2021 Rehab started in 2021
Derrymoylin	356	Cutover Bog Industrial peat production commenced at Derrymoylin Bog in 1985 and ceased in 2020. Long-term peat extraction has reduced peat reserves on this bog. Derrymoylin is considered a shallow peat cutover bog.	Derrymoylin Bog formerly supplied a range of commercial functions including; fuel peat for Lough Ree Power. Most of the former production area on site is bare peat.	2020	Finalised 2025. Rehab to start in 2025
Derryshannoge	452	Cutover Bog Industrial peat production commenced at Derryshannoge Bog in 1985 and ceased in 2020. Deep peat reserves remain across most of the site. Derryshannoge is considered a deep peat cutover bog.	Derryshannoge Bog formerly supplied a range of commercial functions including; fuel peat for Lough Ree Power. Much of the former production area at Derryshannoge has been out of production for some time. These areas have already extensively colonised with pioneer cutaway and scrub vegetation communities.	2020	Finalised in 2023 Rehab started in 2023

Bog Name	Area (ha)	Stage of development	Land-Use and History	Peat Production Cessation	Rehab Plan Status
Edera	281	Cutover Bog Development for industrial peat production commenced at Edera Bog in 1990's. Active extraction from Edera began in 2003 and ceased in 2018. Edera is considered a deep peat cutover bog.	Edera Bog formerly supplied a range of commercial functions including; fuel peat for Lough Ree Power. The majority of Edera Bog former production area is bare peat.	2020	Finalised 2021 Rehab started in 2021
Erenagh	93	Cutover Bog Development for industrial peat production commenced at Erenagh Bog in 1970's. Erenagh is considered a deep peat cutover bog.	Erenagh Bog formerly supplied a range of commercial functions including; fuel peat for Lough Ree Power. Much of the former production area at Erenagh has been out of production for some time. These areas have already extensively colonised with pioneer cutaway and scrub vegetation communities.	2020	Draft 2024
Granaghan	212	Cutover Bog Development for industrial peat production commenced at Granaghan Bog in 1980's. Long-term peat extraction has reduced peat reserves on this bog but deep peat reserves remain on site. Granaghan is considered a deep peat cutover bog.	Granaghan Bog formerly supplied a range of commercial functions including; horticultural peat and fuel peat for Lough Ree Power. The majority of Granaghan Bog former production area is bare peat.	2020	Finalised in 2024. Rehab to start in 2025.
Killashee	110	Cutover Bog Development for industrial peat production commenced at Killashee and Derryadd East bogs in 1985. Killashee is considered a deep peat cutover bog.	Killashee and Derryadd East bogs formerly supplied a range of commercial functions including; horticultural peat and fuel peat for Lough Ree Power. The majority of Killashee and Derryadd East bogs former production area is bare peat. Some areas have colonised with pioneer cutaway and scrub vegetation communities.	2020	Finalised in 2023
Knappoge	313	Cutaway Bog Peat Production at Knappoge bog commenced in 1963, and finished in 2018. Peat depths on the former production area are generally shallow. There are some pockets of deeper peat. Knappoge is considered a shallow peat cutaway bog.	Knappoge Bog formerly supplied a range of commercial functions including; fuel peat for Lough Ree Power. The majority of Knappoge Bog former production area is bare peat. Some areas have colonised with pioneer cutaway and scrub vegetation communities.	2018	Draft 2021 Rehab started in 2022
Lough Bannow	739	Cutaway Bog Peat Production at Lough Bannow bog commenced in the 1960'S, and finished in 2020. Peat depths on the former production area are generally shallow. There are some pockets of deeper peat. Lough Bannow is considered a shallow peat cutaway bog.	Much of the former production area at Lough Bannow has been out of production for some time. These areas have already extensively colonised with pioneer cutaway and scrub vegetation communities. A small (35ha) conifer plantation was established in 1980's.	2020	Draft updated in 2025
Moher	483	Cutover Bog Peat Production at Moher bog commenced in the 1960'S, and finished in 2020. Peat depths on the former production area remain relatively deep. Moher is considered a deep peat cutover bog.	Moher Bog formerly supplied a range of commercial functions including; fuel peat for Lough Ree Power. Much of the former production area at Moher has been out of production for some time. These areas have already extensively colonised with pioneer cutaway and scrub vegetation communities.	2020	Draft 2021

Bog Name	Area (ha)	Stage of development	Land-Use and History	Peat Production Cessation	Rehab Plan Status
Mount Dillon	592	Cutaway Bog Peat Production at Mount Dillon bog commenced in the 1940'S, and finished in 2020. Peat depths on the former production largely shallow and the peat is considered cutaway. Some deep peat remains on the west of the site. Mount Dillon is considered a shallow peat cutaway bog.	Mount Dillon Bog formerly supplied a range of commercial functions including; fuel peat for Lough Ree Power. Much of the former production area at Mount Dillon has been out of production for some time. These areas have already extensively colonised with pioneer cutaway, wetland and scrub vegetation communities.	2020	To be updated in 2025.

See Drawing number BNM-DR-23-27-24 titled **Mount Dillon Bog Group**, included in the accompanying Mapbook which illustrates the location of Derryadd bog and the Mount Dillon Bog Group in context to the surrounding area.

APPENDIX II. 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:	**Derryadd**	**Area (ha):**	657ha
Works Name:	Mount Dillon	**County:**	Longford
Recorder(s):	BnM Ecology Section	**Survey/ monitoring Date(s):**	26th and 27th July 2012 Cutaway habitats re-surveyed in 2017 *A range of additional ecological surveys were carried out 2014-2019 to inform the EIAR for the proposed Derryadd Wind Farm. These baseline surveys have also informed this rehabilitation plan.*

Habitats present (in order of dominance)

The most common habitats present at this site include:

- Bare peat (BP) (Codes refer BnM classification of pioneer habitats of production bog. See Appendix II).
- Pioneer dry heath communities (dHeath)
- Scrub (eBir, OBir and CBir).
- Silt Ponds (Silt) with associated habitats such as scrub, Bracken, rank grassland (GS2), dry calcareous grassland (gCal) and typical pioneer communities of disturbed areas (disTuss).

The most common habitats present around the margins at this site include:

- Birch woodland (WN7) (Codes refer to Heritage Council habitat classification, Fossitt 2000), See Appendix II)
- Scrub (WS1) (Gorse scrub and Birch scrub developing of dry high bog around margins)
- Raised bog (PB1)
- Cutover bog (PB4) (several small fragments)
- Wet grassland (GS4).

Description of site

Derryadd Bog is located approximately 4km to the East of Lanesborough in County Longford. This site is located within one main block. Two mineral islands (Annaghmore and Annaghbeg) are located within the site, these areas are not within the ownership of Bord na Móna and are managed as grazing land for domestic animals. A minor road connects the mineral islands with a public road that adjoins the eastern edge of the site. Derryarogue Bog is located immediately to the north of the site (separated by the N63 Longford to Roscommon road). An industrial rail link connects the site with Derryarogue to the north and Lough Bannow to the south. The peat was used as fuel peat in Lough Ree Power Station in Lanesborough. Derryadd Bog was in full industrial peat production since the early 1960's and contains six pumps. Industrial peat extraction has now ceased.

A relatively large area in the centre of the site has been classed as cutaway for a number of years. This area of cutaway is located on a ridge that extends to the north and south of the mineral islands at the centre of the site. These areas are dry and have colonised by a mixture of calcareous grassland (gCal) and scrub (eBir, oBir and cBir). The scrub is well developed in places and is comprised mainly of Birch, however a proportion of Pine (Scot's Pine and Lodge-pole Pine) along with smaller amounts of Hazel and Ash have also become established. These areas are located on gravel and are dry.

Smaller areas of cutaway have developed across the site; these areas mainly comprise of pioneer poor fen habitats.

A watercourse flows through the southern section of the site. This watercourse is a tributary of the River Shannon and has been canalised.

Other habitats along the margins of the site include Birch woodland, wet grassland, dry heath and cutover bog. Overall, large areas of the site contain less than 2m of peat and contain exposed marl and gravel; however some small areas of the bog, in the south western corner of the sitef still contain some "red" or "Sphagnum" peat..

Adjacent habitats and land-use

Adjacent habitats include lowland depositing river (FW2), wet grassland (GS4), improved agricultural grassland (GA1), cutaway bog (PB4), Conifer plantation and raised bog (PB1).

Watercourses (major water features on/off site)

- Tributaries of the River Shannon flow along the eastern and western boundaries of the site.
- A tributary of the River Shannon flows through the southern section of Derryadd Bog.

Peat type and sub-soils

The majority of Derryadd Bog contains between 1 to 2m of peat, however large areas of the site contain less than 1m of peat. The remaining peat on the site appears to be fen peat. The site is underlain with a mix of gravel and marl.

Fauna biodiversity (2012)

Birds

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

- Heron
- Mallard (4)
- Kestrel
- Skylark (6)
- Willow Warbler (3)
- Grasshopper Warbler
- Other more common species include Wood Pigeon, Meadow pipit, Robin, Blackbird, Grey Crow, Magpie
-

Mammals

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

- Otter
- Badger
- Pine Marten
- Squirrel (Red or Grey)
- Hare

Other species

Frog

Butterflies –

Green-veined White, Small Copper, Small Heath, Large White, Meadow Brown

References

Cross, J.R. 2006. The Potential Natural Vegetation of Ireland. Biology and Environment: Proceeding of the Royal Irish Academy, Vol. 106B, No. 2, 65-116 (2006).

European Commission (2013). Interpretation manual of European Union Habitats. European Commission DG Environment Nature ENV B.3.

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

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

APPENDIX III. ENVIRONMENTAL CONTROL MEASURES TO BE APPLIED TO BOG REHABILITATION

- Bog restoration/rehabilitation measures will be restricted to within the footprint of the proposed rehabilitation area.
- 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.
- All plant and equipment for use will comply with the Construction Plant and Equipment Permissible Noise Levels Regulations (SI 359/1996).
- The proposed activities will be restricted to daylight hours and there will be no requirement for artificial lighting.
- Silt ponds will be inspected and maintained as per the IPC Licence.
- During periods of heavy precipitation and run-off, activities will be halted.
- Measures will be carried out using a suitably sized machine and, in all circumstances,, excavation depths and volumes will be minimised where possible.
- All machines will be regularly checked and maintained prior to arrival at the site to prevent hydrocarbon leakage.
- Hoses and valves will be checked regularly for signs of wear and will be closed and securely locked when not in use.
- Fuelling and lubrication of equipment shall only be carried out in designated areas away from surface water drainage features and ecologically sensitive areas.
- Waste oils and hydraulic fluids will be collected in leak-proof containers and removed from the site for disposal or re-cycling.
- Vehicles will never be left unattended during refuelling.
- No direct discharges to waters will be made. No washings from vehicles, plant or equipment will be carried out on site.
- All plant refuelling will take place using mobile fuel bowsers. Only dedicated trained and competent personnel will carry out refuelling operations.
- 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.
- Potential impacts caused by spillages etc. during rehabilitation will be reduced by keeping spill kits and other appropriate equipment on-site.
- 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 IV. BIOSECURITY

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. 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 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 washing vehicles prior to entering the area.

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 Practice measures around the prevention and spread of Crayfish plague[5] will be adhered with throughout all rehabilitation measures and activities.

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

APPENDIX V. 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. P0-504-01). 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.

3 National and EU Climate and Biodiversity 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.

Peatlands rehabilitation and restoration is referenced in Section 17.3.3 of the Land Use, Land Use Change, Forestry and Marine Chapter of the National Climate Action Plan 2021 as follows:

"The rehabilitation of degraded peatlands to a condition in which they regain their ability to deliver specific ecosystem services has considerable potential for initial mitigation gains, and future carbon sequestration. Additional benefits of peatland restoration include positive socio-economic outcomes for the Midlands, increased natural capital, enriched biodiversity, improved water quality, and flood attenuation."

The scheme is included as Action 33 in the Climate Action Plan 2021 Annex of Actions - Deliver the Enhanced Decommissioning, Rehabilitation and Restoration (EDRR) Scheme for Bord na Mona Peatlands.

EDRRS is also referenced in the Climate Action Plan 2021 as a measure to deliver a Just Transition in the Midlands.

International research and scientific understanding of peatlands is now reflected in key Irish national policy and strategy documents such as the National Raised Bog Special Areas of Conservation (SACs) Management Plan 2017 - 2022 (Department of Arts, Heritage and the Gaeltacht 2017), The National Peatland Strategy (Department of Arts, Heritage and the Gaeltacht 2015), The National Biodiversity Action Plan (National Parks and Wildlife Service 2017), The River Basin Management Plan for Ireland 2018-2021 (Department of Housing, Planning and Local Government 2018), and the Biodiversity – Climate Change Sectoral Action Plan (Department of Arts, Heritage and the Gaeltacht 2019). Each of the national plans, which are also complemented with the recently published EU Green Deal communication on Biodiversity Strategy for 2030 (COM 2020) have overlapping

objectives and actions that focus on the restoration of peatlands damaged by turf-cutting, drainage and other impacts, as well as the re-wetting of Bord na Móna industrial peat extraction bogs.

While not specifically identified as a restoration implementor, EDRRS objectives are in line with those of the United Nations Decade on Ecosystem Restoration 2021-2030 of Preventing, Halting and Reversing the Degradation of Ecosystems worldwide.

EDRRS is also in line with the EU Commission proposal for a Nature Restoration Law which will apply legally binding targets for nature restoration in different eco-systems to every Member State. The aim is to cover at least 20% of the EU's land and sea areas by 2030 with nature restoration measures and eventually extend these to all ecosystems in need of restoration by 2050.

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 Draft National River Basin Management Plan 2022-2027 (Water Framework Directive)

The National River Basin Management Plan (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 2018-2021 outlined 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) was part of the WFD (2018-2021) programme of measures. The NRBMP 2018-2021 takes account of the fact that Bord na Móna was 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 2018-2021 rehabilitation target was 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 was expected to have a positive impact on water quality and will help the NRBMP 2018-2021 deliver its objectives in relation to the Water Framework Directive and is one of the five key principle actions.

The NWBMP 2022-2027 (DHLGH 2024) describes how the number of waterbodies impacted by peat, industry and forestry have decreased by 10, 10 and 5 waterbodies, respectively since the second cycle. Impacts on water quality and river habitat arising from peat and peat extraction and associated drainage include the release of ammonium and fine-grained suspended sediments, and physical alteration of aquatic habitats. Drainage of peatlands also results in changes to the hydromorphological condition of rivers.

The NWBMP 2022-2027 outlines how maintaining and restoring Irish bogs will lead to a decrease in waterborne carbon leaching to levels comparable with intact bogs as well as reducing losses of peat silt and ammonia. Vegetation on the surface of the peat can also slow the flow of water over the land surface. Based on the EPA's most recent reports, peat extraction and drainage is impacting on 106 water bodies across the country, with peat the single pressure on 28 of these water bodies. However, compared to the data in the second-cycle plan, the number of water bodies impacted by peat has decreased.

The cessation of industrial peat extraction by Bord na Móna in 2021 was 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. This is now being supported by the results and conclusions of the draft NWBMP 2022-2027.

6 4th National Biodiversity Action Plan 2023-2030

Ireland's 4th National Biodiversity Action Plan (NBAP) sets the national biodiversity agenda for the period 2023-2030 and aims to deliver the transformative changes required to the ways in which we value and protect nature. The 4th NBAP has been developed with the support, advice and input of the interdepartmental Biodiversity Working Group and the independent Biodiversity Forum. Ireland's 2nd National Biodiversity Conference was held to gather insights and recommendations for the development of the NBAP and a public consultation process was held to provide further opportunities to engage with the Plan.

The 4th NBAP strives for a "whole of government, whole of society" approach to the governance and conservation of biodiversity. The aim is to ensure that every citizen, community, business, local authority, semi-state and state agency has an awareness of biodiversity and its importance, and of the implications of its loss, while also understanding how they can act to address the biodiversity emergency as part of a renewed national effort to "act for nature".

The delivery of rehabilitation via PCAS is expected to significantly contribute in the future to actions and targets of the 4th National Biodiversity Action Plan 2023-2030, particularly in relation to peatland restoration, nature restoration and creation of new habitats such as wetlands and woodlands.

7 EU Nature Restoration Law

The EU Nature Restoration Law is a key element of the EU Biodiversity Strategy, which sets binding targets to restore degraded ecosystems, in particular those with the most potential to capture and store carbon and to prevent and reduce the impact of natural disasters. The regulation combines an overarching restoration objective for the long-term recovery of nature in the EU's land and sea areas with binding restoration targets for specific habitats and species. These measures should cover at least 20% of the EU's land and sea areas by 2030, and ultimately all ecosystems in need of restoration by 2050.

This regulation has now been adapted and it is expected that all Member States will be required to produce a National Restoration Plan within two years of adoption. This will be led by the National Parks and Wildlife Service and will comprise a broad and deep public participation process, informed by robust ecological and socio-economic impact assessments. Bord na Móna are working with NPWS to identify bog restoration and other re-wetted cutaway sites that can contribute towards Irelands targets for the Nature Restoration Law.

8 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.

9 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.

10 All-Ireland Pollinator Plan 2021-2025

The All-Ireland Pollinator Plan 2021-2025 outlines key objectives and actions to protect and support pollinating insects and the habitats they rely on. A Bord na Móna specific action in this plan includes 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.

11 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.

12 National Archaeology Code of Practice

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 Practice relating to management of any archaeological finds that may arise during cutaway peatland rehabilitation and decommissioning.

13 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.

14 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.

15 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 VI. 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 termination 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 license 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	Derryadd Decommissioning Plan
1	Clean-up of remaining or unconsolidated waste or materials located in Bogs, Yards, Buildings and Offices	Where relevant
2	Cleaning Silt Ponds	Cleaning Silt Ponds
3	Decommissioning Peat Stockpiles	Where relevant
4	Decommissioning or Removal of Buildings and Compounds	Where relevant
5	Decommissioning Fuel Tanks and associated facilities	Where relevant
6	Decommissioning and Removal of Bog Pump Sites	Where relevant
7	Decommissioning or Removal of Septic Tanks	Where required

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.

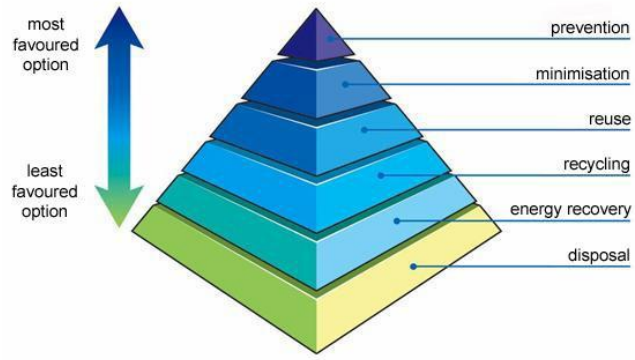
7.3.5 The tonnages and EWC Code for the waste materials listed in *Schedule 2(i) Hazardous Wastes for Disposal/Recovery* and *Schedule 2(ii) Other Wastes for Disposal/Recovery* sent off-site for disposal/recovery.

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.

APPENDIX VII. 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 embryonic *Sphagnum*-rich plant communities in these conditions if the peat can be re-wetted. This brings the opportunity of re-developing embryonic *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 cannot 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.

Environmental stabilisation: 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 Licence. 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 stabilisation.

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).

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.

APPENDIX VIII. 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 P0504-01, Mountdillon Group of Bogs located in Co. Longford.

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 the Mountdillion bog group 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:
Lough Ree Power Station screens the peat from the bogs 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 P0504-01 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' December 2012. 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:

- Secure the stability of the waste
- Put in place measures to prevent pollution of soil, surface water and ground water.
- 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:

- 10.1 Following termination 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.
- 10.1.2 Implement the agreed cutaway bog rehabilitation plan (refer Condition 10.2).

10.2 Cutaway Bog Rehabilitation Plan:

- 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.
- 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:

- 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).
- 10.3.2 The criteria which define the successful rehabilitation of the activity or part thereof, which ensures minimum impact to the environment.
- 10.3.3 A programme to achieve the stated criteria.
- 10.3.4 Where relevant, a test programme to demonstrate the successful implementation of the rehabilitation plan.
- 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 Mountdillion 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.

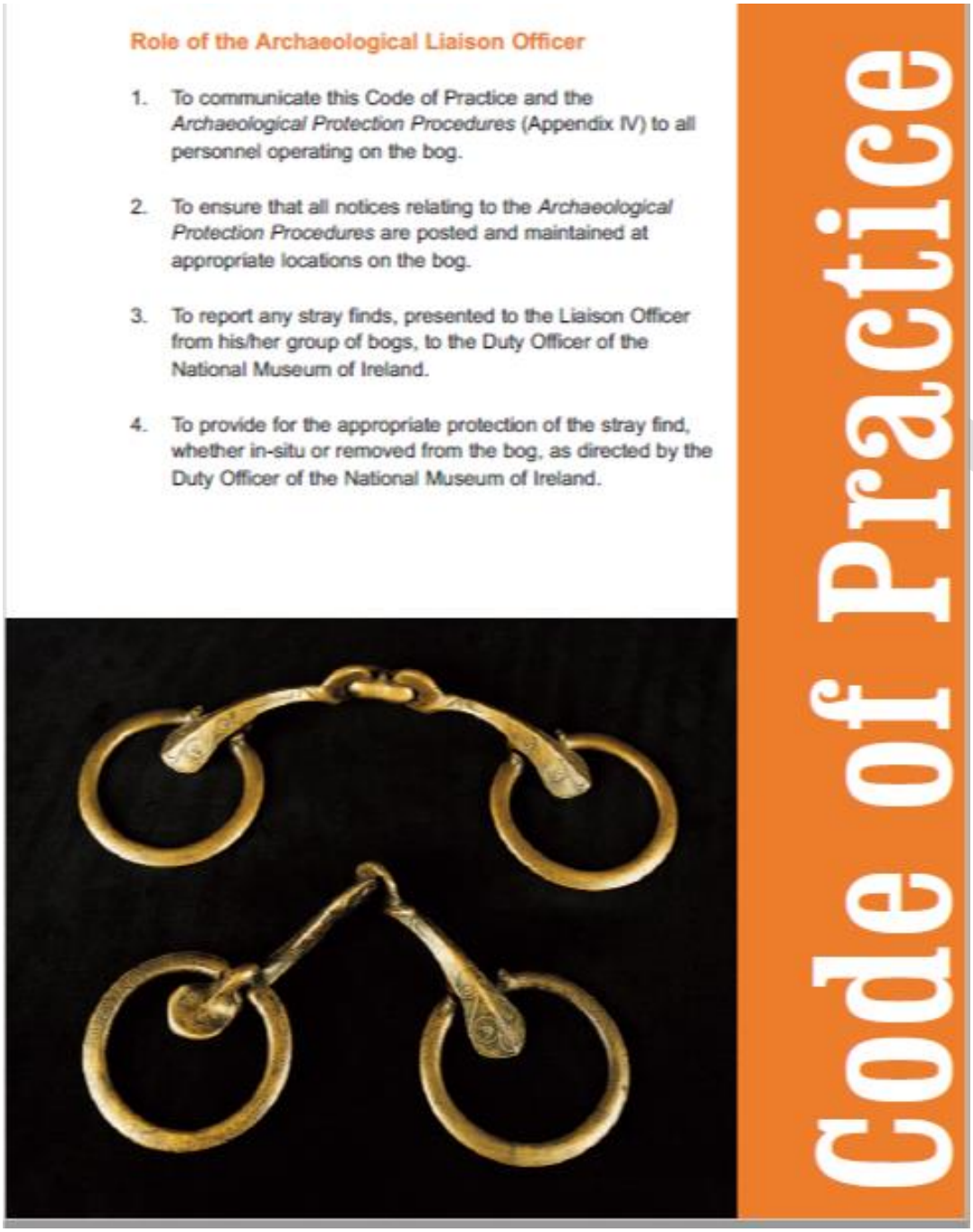
Review.
This plan will be reviewed every five years, the first review to take place in September 2017. This review will entail an inspection of these waste facilities to ensure their placing, management, maintenance and stability comply with the requirements of the Extractive Waste Management requirements and condition 7.5, 7.6 and 7.7 of the Mountdillion IPPC Licence P0504-01.

APPENDIX IX. MITIGATION MEASURES FOR THE APPLICATION OF FERTILISER

- Any fertiliser used will be Rock Phosphate and will not be applied in the following conditions:
    1. The land is waterlogged;
    2. The land is flooded, or it is likely to flood;
    3. The land is frozen, or covered with snow;
    4. Heavy rain is forecast within 48 hours (forecasts will be checked from Met Éireann).
    5. 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.
- No fertiliser will be spread on land within 2 metres of a surface watercourse.
- 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*

APPENDIX X. ARCHAEOLOGY



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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:**

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			
2			

Bord na Móna

Derryarogue Bog

Draft Cutaway Bog Decommissioning and Rehabilitation Plan

2025

This document seeks to address the requirements of Condition 10.2 of IPC License Ref. P0504-01:

> "*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 Derryarogue 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 fully ceased at Derryarogue Bog.

Bord na Móna have defined the key rehabilitation outcome at Derryarogue Bog as environmental stabilisation.

*The rehabilitation plan for the **overall Derryarogue Bog** has been updated but not fully finalised. As such it remains a **draft** rehabilitation plan until it is fully finalised. A rehabilitation plan **for part of Derryarogue** Bog has been fully finalised in 2023 and rehabilitation as part of the Peatland Climate Action Scheme started in late 2023. Bord na Móna expect to finalise these rehabilitation plans in the future as part of its overall peatland rehabilitation programme.*

Any consideration of any other future after-uses for Derryarogue Bog 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.

Document Control Sheet	
Document Name:	Derryarogue Bog - Cutaway Bog Decommissioning and Rehabilitation Plan 2025
Document File Path:	Q:\Ecology Team\EPA draft rehab plans 2017 word docs\Mountdillon ref.504 (Lough Ree) \Derryarogue
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This document comprises:	DCS	TOC	Text (Body)	References	Maps	No. of Appendices
	1	1	29	4	0	12

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Date:	10/05/2023	13/06/2023	23/06/2023

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Name(s):		MMC	MMC
Date:		8/01/2025	8/01/2025

Table of Contents

Non-technical summary

- Bord na Móna is updating the draft rehabilitation plan for Derryarogue Bog, located in Co. Longford.
- Derryarogue Bog is located approximately 2.5 km north-east of Lanesborough.
- Derryarogue Bog has a pumped drainage regime, with five pumps in the rehabilitation footprint.
- Industrial peat harvesting is now finished at Derryarogue Bog.
- A mosaic of habitats has established across Derryarogue Bog as industrial peat extraction stopped in phases over the past 20 years. There is a mosaic of both wet and dry cutaway habitats present including wetlands and Birch scrub and woodland. There is also some bare peat remaining.
- This rehabilitation plan has been prepared as Bord na Móna as part of obligations to carry out peatland rehabilitation via an IPC License issued by the Environmental Protection Agency.
- This rehabilitation plan excludes Derryarogue **West** (Cloonbony) and Derryarogue North (Cloonbearla) which is part of Derryarogue Bog proposed for rehabilitation separately, under the Peatland Climate Action Scheme (see 2023 Bogs - BNM Peatlands Climate Action Scheme (bnmpcas.ie)).
- The key objective of peatland rehabilitation is environmental stabilisation. This means developing vegetation and promoting re-establishment of more typical cutaway peatland communities such as Birch woodland, Reedbeds, fen habitat and *Sphagnum*-rich embryonic bog communities.
- Rehab measures will include drain-blocking and other measures to raise water levels to the surface of the bog, thus encouraging the development of naturally functioning cutaway peatland habitats.
- These rehabilitation measures will be planned by a team consisting of expert ecologists, hydrologists and engineers. It is a guiding principle of Bord na Móna rehabilitation planning that no actions or activities will be undertaken that would negatively impact on adjacent land. No boundary drains will be blocked. Water will still leave the bog via the existing outlets.
- Peatland rehabilitation of this bog 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.
- Drain blocking at Derryarogue will result in improved water quality, climate benefits with the reduction of carbon emissions and enhanced biodiversity when the residual peat is re-wetted.
- Many Bord na Móna bogs cannot be restored back to raised bog, as the majority of peat has been removed and the environmental conditions have been modified. However other natural habitats will develop, like poor fen and *Sphagnum* rich embryonic bog communities (on deeper peat); and wetlands with Reedbeds and Birch woodland on shallower peat. In time a naturalised peatland can be developed.
- It will take some time for vegetation and habitats to fully develop at Derryarogue, and a peatland ecosystem to be restored. However, it is expected that most of the remaining bare peat will be developing pioneer habitats after 5-10 years.
- The development of a range of habitats at Derryarogue 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.
- Longford County Council and Bord na Móna have developed a greenway or amenity walking/cycling track along the northern headland at Derryarogue Bog. This links two local access roads and to Knappoge Bog.

This greenway and amenity track forms part of a wider proposal led by Longford County Council to develop a project called the Mid-Shannon Wilderness Park, which would develop amenity across BnM cutaway bogs.

- This is a peatland rehabilitation plan. This plan does not consider future after-use or development. Bord na Móna continually reviews its land-bank to consider future commercial or industrial developments. Any other proposed development will be planned in adherence to relevant planning guidelines and will consider the rehabilitation and the condition of the bog.

1. INTRODUCTION

Bord na Móna operates under IPC Licence issued and administered by the EPA to extract peat within the Mount Dillon Bog Group (Ref. P0504-01), of which Derryarogue Bog is a part (see Appendix I for details of the bog areas within this Group). 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. Derryarogue Bog is located in Co. Longford.

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 (Appendix V).
- 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 measures.
- Budget and Costings.
- Associated aftercare, maintenance, and monitoring.

Note: This plan should be read in conjunction with the accompanying Map book.

Bord na Móna have announced the complete cessation of industrial peat production across its estate (January 2021).

This **draft** rehabilitation plan outlines the proposed approach to be taken for IPC compliance in respect of Derryarogue Bog, and how the site will be rehabilitated. Bord na Móna is fully committed to meeting its obligations relating to rehabilitation and decommissioning under the Integrated Pollution Control Licence.

It has been 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. The Peatlands Climate Action Scheme is expected to operate between 2021-2025. Over 13,000 ha of cutaway peatlands have already been rehabilitated as part of this scheme to date, across multiple Bord na Móna peatlands. Enhanced rehabilitation measures have started as part of the PCAS project at Derryarogue West (Cloonbony) and Derryarogue North (Cloonbearla). PCAS measures are **NOT** proposed as part of this draft Derryarogue rehabilitation plan, which applies specifically to the remaining area of the Derryarogue Bog at this stage (2025). The potential implementation of enhanced rehabilitation measures across the rest of Derryarogue will be dependent on the selection of the remaining site to be included in PCAS in the future.

1.1 Constraints and Limitations

This document seeks to address the requirements of Condition 10.2 of IPC License Ref. P0504-01:

> "*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 document specifically covers the area of **Derryarogue Bog** shown outlined by a black dashed line in the site location map (drawing number BNM-DR-23-27-01).

Industrial peat extraction at Derryarogue Bog permanently ceased in 2019, having commenced in 1952. Currently the cutaway area comprises a mosaic of pioneering cutaway habitats, scrub, wetland/open water, Birch woodland and bare peat, in addition to marginal[1] habitats.

Some of the high bog remnants (within the areas owned and under the control of Bord na Móna) are currently being used by domestic turf cutters to harvest peat. These areas are ecologically and hydrologically linked to the area owned by Bord na Móna where rehabilitation is planned. It is beyond the scope of this rehabilitation plan to address turf cutting issues on Derryarogue Bog. Nevertheless, Bord na Móna are aware of such issues which may constrain the proposed rehabilitation actions, and this rehabilitation plan considered potential impacts of these on the delivery of the stated objectives.

There are known rights of way around the margins of Derryarogue Bog. 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.

Longford County Council lodged a Part 8 Planning Application in 2021 named 'No. 88 Mid Shannon Wilderness Park trackways' which includes greenway or amenity walking/cycling tracks along the headland at the northern end of Derryarogue Bog. This amenity has been constructed. This amenity does not affect the planned rehabilitation.

A wayleave agreement (relating to a third-party grid connection) is also in place in respect of the rail line corridor that forms the southern boundary of the Derryarogue Bog. This will be unaffected by the measures currently proposed.

Rehabilitation in other areas of the bog may also be constrained due to other property issues or archaeological features. There are known archaeological features present at Derryarogue Bog, which may constrain rehabilitation activities.

[1] 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.

2. METHODOLOGY

This rehabilitation plan was developed with a combination of desktop and field surveys, consultations with internal and external stakeholders. 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 surveys, additional confirmatory site visits (covering the period 2012 to 2023 inclusive) and monitoring and desktop analysis, forms the basis for the development of this 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-practice 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 peat depth data;
- Hydrological modelling;

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 practice guidance (full citations are in the References Section):

- Anderson *et al*. (2017). An overview of the progress and challenges of peatland restoration in Western Europe.
- Barry, T.A. et al (1973). A survey of cutover peats and underlying mineral soils. Soil Survey Bulletin No. 30. Dublin, Bord na Móna and An Foras Taluntais.
- Bonn *et al*. (2017). Peatland restoration and ecosystem services- science, policy and practice.
- Carroll *et al*. (2009). *Sphagnum* in the Peak District. Current Status and Potential for Restoration. Moors for the Future Report No 16.
- Clark & Rieley (2010). Strategy for responsible peatland management.
- Eades *et al*. (2003). The Wetland Restoration Manual.
- Farrell & Doyle (2003). Rehabilitation of Industrial Cutaway Atlantic Blanket Bog, NW Mayo, Ireland.
- Feehan, J. (2004). A long-lived wilderness. The future of the north midlands peatland network. Department of Environmental Resource Management, UCD.
- Foss, P.J., Crushell, P. & Gallagher, M.C. (2017) Title: Counties Longford &Roscommon Wetland Study. Report prepared for Longford and Roscommon County Councils.
- Gann *et al*. (2019). International Principles and Standards for the practice of Ecological Restoration.
- Hinde *et al*. (2010). *Sphagnum* re-introduction project: A report on research into the re-introduction of *Sphagnum* mosses to degraded moorland. Moors for the Future Research Report 18.

- Joosten & Clarke (2002). Wise Use of mires and peatlands – Background and Principles including a framework for Decision-making.
- Lindsay (2010). Peatbogs and Carbon: A Critical Synthesis to Inform Policy Development in Oceanic Peat Bog Conservation and Restoration in the Context of Climate Change.
- Mackin *et al*. (2017). Best practice in raised bog restoration in Ireland. Irish Wildlife Manuals, No. 99. National Parks and Wildlife Service,
- McBride *et al*. (2011). The Fen Management Handbook (2011), Scottish Natural Heritage.
- McDonagh (1996). Drain blocking by machines on Raised Bogs. Unpublished report for National Parks and Wildlife Service.
- NPWS (2017a). National Raised Bog Special Areas of Conservation management plan. Department of Arts, Heritage and the Gaeltacht.
- Pschenyckyj et al., 2021, Optimising Water Quality Returns from Peatland Management while Delivering Co-Benefits for Climate and Biodiversity. An Fóram Uisce.
- Quinty & Rochefort (2003). Peatland Restoration Guide, second edition. Canadian *Sphagnum* Peat Moss Association and New Brunswick Department of Natural Resources and Energy.
- Regan*, et. al.* (2020). Ecohydrology, Greenhouse Gas Dynamics and Restoration Guidelines for Degraded Raised Bogs. EPA Research Report. Prepared for the Environmental Protection Agency by Trinity College Dublin.
- Renou-Wilson *et al*. (2011). BOGLAND - Sustainable Management of Peatlands in Ireland. STRIVE Report No 75 prepared for the Environmental Protection Agency.
- Schouten (2002). Conservation and Restoration of Raised Bogs: Geological, Hydrological and Ecological Studies. Dúchas - The Heritage Service of the Department of the Environment and Local Government, Ireland;
- Thom (2019). Conserving Bogs – Management Handbook.
- Wheeler & Shaw (1995). Restoration of Damaged Peatlands – with Particular Reference to Lowland Raised Bogs Affected by Peat Extraction.
- Wittram *et al*. (2015). A Practitioners Guide to Sphagnum Reintroduction. Moors for the Future Partnership.

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

- Mountdillon Integrated Pollution Control Licence;
- Mountdillon 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);
- Historic Environment Viewer at https://webgis.archaeology.ie/historicenvironment/
- 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 2022-2027
- Bord na Móna Annual Report 2024.
- 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 are 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. As part of this exercise, Derryarogue Bog was surveyed in 2012. Habitat maps were updated in 2017. A survey also took place in February of 2023, in advance of the preparation of this rehabilitation plan. Habitat maps have been updated, where required. This rehabilitation plan is informed by the original baseline survey as well as subsequent confirmatory site walk-over surveys and visits, and updates to baseline data.

Habitat mapping followed best practice 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 (2019), while mosses and liverworts nomenclature follows identification keys published by the British Bryological Society (2010). A more detailed Bord na Móna classification system was previously 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 survey report for Derryarogue Bog is contained in Appendix II.

3. SITE DESCRIPTION

Derryarogue Bog is located approximately three kilometres to the east of Lanesborough in County Longford. The extent of Derryarogue Bog that is subject to this standard rehabilitation plan is located within the main eastern section of the Derryarogue site. Derryarogue Bog is part of the Mountdillon group (Lough Ree sub-group) of bogs. The River Shannon flows close to the western and northern boundaries of the wider Derryarogue Bog site.

The surrounding landscape is dominated by a mosaic of farmland, largely consisting of improved grassland, and other bogs, many owned and managed by Bord na Móna. A long section of rail line to the west of the site connects the Roscommon Bogs of the Mountdillon Bog Group to the ESB Power Station in Lanesborough. The N63 Longford to Roscommon Road is located to the south of Derryarogue bog, with access to the bog provided via local roads off the N63.

A tributary of the River Shannon flows close to the north-western edge of the bog (Kilnacarrow EPA code: 26K64). The Ballynakill_26 (EPA code: 26B22) flows along the north eastern boundary of the site before joining with the River Shannon.

Derryarogue Bog was in industrial peat production since the 1950's therefore, much of the harvestable peat resource has been removed. Industrial peat extraction has now ceased. The majority of the site has shallow residual peat. Gravel and other sub-soils are exposed in places across the site. Sections of Derryarogue that have come out of peat extraction in the past 20 years have been developing pioneer cutaway habitats (wetlands, Birch scrub and woodland). This has led to a patchy heterogeneous mosaic of pioneer habitats that reflect the former peat production history and the underlying environmental conditions. Derryarogue Bog has a pumped drainage regime with five pumps within the lands subject to the current Plan.

Derryarogue **West** (Cloonbony Bog and a northern section - Cloonbearla), separated from the main bog via a headland and industrial bog railway, are being rehabilitated under PCAS and subject to a separate rehabilitation plan 2023 Bogs - BNM Peatlands Climate Action Scheme (bnmpcas.ie). See Drawing number BNM-DR-23-27-01: Bog Site Location, included in the accompanying Mapbook[2] , which illustrates the location of Derryarogue Bog in context to the surrounding area.

3.1 Status and Situation

3.1.1 Site history

Derryarogue Bog was used to supply the adjacent Lanesborough and subsequently Lough Ree ESB Power Station. Derryarogue Bog was in industrial peat extraction from 1952 to 2019. Much of the site was cutaway at various stages prior to 2019 with industrial peat extraction reducing on a phased basis, therefore cutaway habitats have been developing across the site for some time.

Numerous power lines cross the site and are in place to power the surface water drainage pumps that are located across the bog.

[2] Cutaway Bog Decommissioning and Rehabilitation Plan – Derryarogue Bog Map Book

3.1.2 Current land-use

Longford County Council and Bord na Móna have developed a greenway or amenity walking/cycling track along the headland at the northern end of Derryarogue Bog.

Several BnM industrial railways occur at the site. It is anticipated that this railway will be decommissioned when peat stocks are finally removed from neighbouring bogs.

Only a small area of remnant raised bog occurs along the margins of the Derryarogue. This bog remnant has been subject to drainage, associated with domestic turf cutting and the remaining peat is almost exhausted in this area.

There was ongoing hydrological management via pumping to support the former industrial peat production and its infrastructure. Pumping is ongoing during the decommissioning phase.

3.1.3. Socio-Economic conditions

Bord na Móna has historically been a vital employer for the rural communities in the Irish Midlands. 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 in these areas 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. These job numbers have now declined with the cessation of peat extraction.

In respect of Derryarogue 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 Lanesborough and subsequently Lough Ree power stations.

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

Employment numbers have now declined following the cessation of peat extraction at this bog.

3.2 Geology and Peat Depths

3.2.1 Sub-soil geology

The underlying geology[3] at Derryarogue Bog comprises Visean Limestones (undifferentiated). Quaternary sediment maps indicate that Derryarogue is primarily underlain by peat, with till derived chiefly from Limestone. The site is underlain with a mix of limestone till and marl/lacustrine clay sub-soils.

3.2.2 *Peat type and depths*

Much of Derryarogue Bog is now cutaway and the majority of the original raised bog has now been removed, with exposed sub-soils in places. Derryarogue is considered to be a shallow peat cutover bog, and in general between 0.5m - 1.5m of residual fen or minerotrophic peat remains. There are also some small isolated pockets with residual peat of deeper than 2 m in the south-west of the site (Barnacor).

3.3 Key Biodiversity Features of Interest

The different cutaway habitats developing across the site reflects the underlying and varying environmental conditions. Environmental factors such as hydrology, residual peat depths and topography all have a significant influence on the future development of cutaway habitats and proposed rehabilitation. Hydrology tends to have the most significant influence on the development of future cutaway habitats. All sites have hydrological gradients from wet to dry habitats. Shallow residual peat usually means there are stronger fen influences on the pioneer cutaway development as fen peat is the residual peat type and ground-water has a stronger influence.

The majority of Derryarogue Bog comprises a mosaic of bare peat along with cutaway habitats. Some of these areas contain developing wetlands. The establishing cutaway habitats are attracting other typical wildlife, including signs of Otter around the silt pond complex to the west of the site. The former production bog is surrounded by some typical marginal habitats of high local value including intact raised bog (PB1) and Birch woodland (WN7). The River Shannon flows close to the western edge of the bog. The Shannon is an important wildlife corridor along which species can move from one area to another. During winter, parts of the site flood, occasionally attracting Whooper Swans in to roost, with flocks of up to 100 birds recorded (Tobin, 2019). Waders (Lapwing, Ringed Plover, Woodcock and Snipe) are likely to breed in small numbers on site. Lapwing and Ring Plover have bred in the past at the north end of Derryarogue Bog and Ringed Plover have breed in the past in the central section. Marsh Fritillary have been recorded on site and are likely to breed due to the presence of suitable habitat containing the larval foodplant (Devil's Bit Scabious *Succisia pratensis*).

Derryarogue Mineral Island is a feature of high ecological value due to the presence of calcareous grassland (GS1), scrub and woodland (WS1/WN2), Rich fen and flush (PF1) and calcareous springs (FP1). (The rich fen and flush habitat had previously been classified as wet calcareous grassland – Appendix II). A recent survey (Fitzgerald 2023) has found that both the rich fen and flush and calcareous springs are of Annex I Habitat quality. Rich fen and flush (PF1) corresponds with Alkaline fen (7230) due to its species assemblage and abundance of indicator species. The calcareous springs correspond with the priority EU Annex I Habitat (*7220) Petrifying springs with tufa formation (Cratoneurion). The presence of two Annex I habitats means this area has **National** ecological importance, given the scarcity and conservation status of these particular habitats.

[3] https://www.gsi.ie/en-ie/data-and-maps/Pages/Bedrock.aspx

3.3.1 Current habitats

The most common habitats[4] present in the former production areas at Derryarogue include:

- Bare peat (0-50% cover) (BP)
- Pioneer *Juncus effusus* poor fen community (pJeff) with less frequent pioneer *Eriophorum angustifolium* (pEang) or *Carex rostrata* community (pRos) dominated poor fen.
- Willow-dominated scrub (in mosaic with *Juncus effusus* poor fen community) (in those areas that are flooded regularly)
- Permanent pools and lakes (OW) and temporary open water (TOW)
- Emergent *Betula*-dominated community (A) (eBir) and open *Betula*-dominated community (B) (oBir) (on drier higher ground that is not flooded)
- Dry *Calluna* community (dHeath) (mainly in mosaic with Birch scrub)
- Dry pioneer *Molinia caerulea* dominated grassland community (gMol)
- Access routes (Acc)
- Riparian zones (Rip) (with drains and associated habitats such as scrub and Birch woodland)
- Silt ponds (Silt) with *Ulex*-dominated scrub community/Birch scrub and *Molinia caerulea* dominated grassland community (gMol)

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

- Raised bog (PB1)
- Cutover Bog (PB4)
- Scrub (WS1)
- Wet (callows-type) grassland (GS4)
- Birch woodland (WN7)
- Dense Bracken (HD1)
- Improved grassland (GA1) where boundary extends into adjacent fields

See Drawing number BNM-ECO-23-27-17 titled **Derryarogue Bog: Current Habitat Map**, included in the accompanying Mapbook, which illustrates the habitats at Derryarogue Bog.

3.3.2 Species of conservation interest

A number of species of conservation concern utilize the habitats available at Derryarogue Bog. The following is a summary of the records of these species available within both BnM records and those of the National Biodiversity Data Centre.

- Multiple mammal species have been recorded on or in close proximity to the bog including Badger (*Meles meles*), Red Fox (*Vulpes vulpes*), West European Hedgehog (*Erinaceus europaeus*), Pine Marten (*Martes martes*), Irish Stoat (*Mustela erminea subsp. hibernica*), Irish Hare (*Lepus timidus subsp. hibernicus*), European Rabbit (*Oryctolagus cuniculus*), European Otter (*Lutra lutra*), Eurasian Red Squirrel (*Sciurus*

[4] Codes refer BnM classification of pioneer habitats of production bog

vulgaris), Eurasian Pygmy Shrew (*Sorex minutus*), and the invasive species American Mink (*Mustela vison*) and Eastern Grey Squirrel (*Sciurus carolinensis*).

- Marsh Fritillary (*Euphydryas aurinia*) butterfly has been recorded on Derryarogue Bog. This species is using calcareous grassland (GS1) in Derryarogue Island – a mineral island within Derryarogue Bog.
- Five Red Listed (BoCCI) bird species were recorded within the boundary of Derryarogue. These species include; Snipe, Golden Plover, Woodcock, Meadow Pipit and Kestrel. Eight Amber List species (BoCCI) were recorded, including; Black-headed Gull, Lesser Black-backed Gull, Ringed plover, Common Gull, Short Eared Owl, Cormorant, Mallard and Mute Swan. A number of additional Green listed target species recorded included Peregrine Falcon, Buzzard, Sparrowhawk, Little Egret and Grey Heron. Three of these species are also listed on Annex I of the EU Birds Directive, namely; Golden Plover, Peregrine Falcon and Little Egret.
- Records from the wider area outside the boundary of Derryarogue bog also recorded additional Red Listed (BoCCI) species including Curlew, Redshank, Herring gull, Grey wagtail, Lapwing and Wigeon. The results of the breeding bird surveys (2015, 2016 and 2017) also recorded several additional Red List species (BoCCI), including; Woodcock, Curlew, Lapwing and Quail. A number of species recorded during the winter months from the wider area are listed on Annex I of the EU Birds Directive, namely; Golden Plover, Greenland White-fronted goose, Hen Harrier, Kingfisher, Merlin and Peregrine Falcon. Golden Plover, Hen Harrier, Merlin and Peregrine Falcon were also recorded during breeding season surveys along with Common Tern and Little Egret.

It should be noted that much of the wildfowl, wader and gull observations recorded as part of the ornithological study were associated with the River Shannon and associated wet grasslands to the north of the area.

BNM Ecology Survey Records

During the most recent ecological survey in February 2023 the following bird species of conservation interest were recorded at Derryarogue; red listed species Snipe (*Gallinago gallinago*), Golden Plover (*Pluvialis apricaria*), Lapwing (*Vanellus vanellus*), and Woodcock (*Scolopax rusticola*). In addition, Annex I species Hen Harrier (*Circus cyaneus*), Whooper Swan (*Cygnus cygnus*) Little Egret (*Egretta garzetta*) was also recorded utilising the bog.

3.3.3 Invasive species

The invasive species American Mink (*Mustela vison*) has previously been recorded from Derryarogue Bog. There are no other BNM records for high impact invasive species recorded from the bog.

A broad range of common garden escapes are occasionally present around the margins of Bord na Móna bogs, and although spatial overlap with the proposed rehabilitation is expected to be limited, these are, where necessary, to be treated in line with best practice during rehabilitation activities.

3.4 Statutory Nature Conservation Designations

There are a number of European Sites in close proximity (i.e. within a 5km radius at minimum) to Derryarogue Bog.

Lough Ree SAC (site code: 000440) lies approximately 2.3 km south-west of Derryarogue Bog. The qualifying interests of Lough Ree SAC include Natural eutrophic lakes with *Magnopotamion or Hydrocharition* - type

vegetation [3150] Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (* important orchid sites) [6210], Active raised bogs [7110], Degraded raised bogs still capable of natural regeneration [7120], Alkaline fens [7230], Limestone pavements [8240], Bog woodland [91D0], Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae*) [91E0] and *Lutra lutra* (Otter) [1355].

Lough Ree SPA (Site code: 004064) lies approximately 2.5 km south-west of Derryarogue Bog and overlaps Lough Ree SAC. This SPA is designated for a variety of waterfowl and waders and wetland habitat [A999]. Lough Ree is also designed at a pNHA (site code: 000440).

Lough Forbes Complex SAC (site code: 001818) lies approximately 4.6 km north-east of Derryarogue Bog. This EU site is designated for Natural eutrophic lakes [3150], Active raised bogs [7110], Degraded raised bogs still capable of natural regeneration [7120], Depressions on peat substrates of the *Rhynchosporion* [7150] and Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) [91E0].

Ballykenny-Fisherstown Bog SPA (site code: 004101) lies approximately 4.6 km north-east of Derryarogue Bog and overlaps Lough Forbes Complex SAC. This SPA is designated for Greenland White-fronted Goose (*Anser albifrons flavirostris*) [A395].

A number of NHA's (Natural Heritage Areas) and pNHA's (Proposed Natural Heritage Areas) also occur within 5km of Derryarogue Bog including:

- Lough Bannow pNHA (Site code: 000449) lies approximately 90 m south
- Lough Ree pNHA (site code: 000440) lies approximately2.4 km south-west
- Royal Canal pNHA (site code: 002103) lies approximately 2.7 km east
- Lough Forbes Complex pNHA (site code: 001818) lies approximately 4.4 km north-east

3.4.1 Other Nature Conservation Designations

The Ramsar Convention entered into force in Ireland on 15th March 1985. Ireland currently has 45 sites/wetlands designated as Wetlands of International Importance (Ramsar Sites). These cover a surface area of 66,994ha.

There are no Ramsar sites in close proximity to Derryarogue Bog.

3.5 Hydrology and Hydrogeology

Derryarogue Bog lies in the Shannon (Upper) catchment (Catchment ID: 26C), the Shannon (Upper) sub-catchment (Catchment ID: 26C), as defined by the EPA under the Water Framework Directive (WFD).

There are several drains/channelised streams around the margins of the site that drain the site. Ballynakill (EPA Code: 26B22) flows northerly along the eastern bog boundary. The Kilnacarrow Stream (EPA Code: 26K64), flows in a northerly direction along the north-western boundary of the bog.

Derryarogue Bog has a pumped drainage regime. There are five pumps located on site. These facilitate drainage from several discharge points for the former peat production and support of infrastructure. Pumping is ongoing during this decommissioning phase.

Hydrological modelling indicates that parts of the bog are in a natural basin with significant potential for re-wetting, with the assumption that all drains would be blocked. It is likely that a portion of the basins in target areas will re-wet with deeper water, creating a mosaic of wetland habitats, when drains are blocked.

GSI data indicates that Derryarogue Bog is primarily underlain by visean limestones (undifferentiated), which is classified as a regionally important aquifer - karstified (conduit).

Geological Survey of Ireland (GSI) mapping identifies several karst features (enclosed depressions) approximately 1km east of the bog. No data exists concerning depth to bedrock, however, there is a small area of bedrock in close proximity to the bog.

An aquifer is an underground body of water-bearing rock or unconsolidated materials (gravel or sand) from which groundwater can be extracted in useful amounts. GSIs Aquifer classes are divided into three main groups based on their resource potential, and further subdivided based on the type of openings through which groundwater flows. There are nine aquifer categories in total. Locally important aquifers are capable of supplying locally important abstractions (e.g. smaller public water supplies, group schemes), or good yields (100-400 m3/d). This data gives an indication of sub-surface deposits (bedrock and unconsolidated materials) in terms of their groundwater resource potential and dominant groundwater flow type.

Regionally important aquifers are those in which the network of fractures, fissures and joints, through which groundwater flows, is well connected and widely dispersed, resulting in a relatively even distribution of highly permeable zones. There is good aquifer storage and groundwater flow paths can be up to several kilometres in length. There is likely to be substantial groundwater discharge to surface waters ('baseflow') and large (>2,000 m3/d), dependable springs may be associated with these aquifers.

The entirety of the bog is located in an area mapped by GSI as of low groundwater vulnerability (GSI Mapviewer). Groundwater vulnerability for the area surrounding Derryarogue Bog is generally of low/moderate vulnerability. 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. These data indicate there is generally low risk of any groundwater contamination occurring at this site. 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 watercourses

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. Industrial peat production has now permanently ceased at Derryarogue Bog.

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. Silt pond decommissioning will be considered when sites are deemed to be on a trajectory of environmental stability and peatland rehabilitation has been completed.

Derryarogue Bog has three main surface water discharge locations from previously active peat extraction catchments, which discharge to the Kilnacarrow River (IE_SH_26S021600)and the Ballynakill River (IE_SH_26B220790) both of which flow to the River Shannon. The River Shannon was listed as being under pressure from peat extraction in the 2nd cycle of the River Basin Management Plan for Ireland and is indicated as remaining so in the third cycle which is currently in preparation.

Details of silt ponds and associated surface water emission are detailed on the accompanying structures map along with water quality map. See Drawing number BNM-ECO-23-27-02 Structures and Sampling, along with Drawing number BNM-ECO-23-27-WQ01: Water Quality Map included in the accompanying Mapbook, which illustrate the various drainage and water quality infrastructure present at Derryarogue Bog.

Decommissioning and Rehabilitation Programme Water Quality Monitoring.

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 Environmental Protection Agency.

Rehabilitation of cutaway peatland is closely linked with control of emissions. One of the criteria for successful rehabilitation is stabilisation through re-vegetation, which will stabilise all substrates and in turn remove the need for further silt control measures. This site is already largely vegetated. Re-wetted peat also aids the primary objective of stabilizing peat, as when peat is re-wetted it is not vulnerable to wind erosion. Re-wetted peat and the development of wet peatland habitats can also act as sinks for silt and mobile peat, and increases additional retention time for solids, and the peatland vegetation can quickly stabilise this material within blocked drains on site (by acting like constructed wetlands).

Water quality of water discharges from restored peatlands normally improves as a result of bog restoration measures and the restoration of natural peatland processes (Bonn *et al*., 20017). Bog restoration 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) (DHLGH, 2024) 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 peatland 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 Derryarogue has been completed. This discharge will have improved 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 waterbody receptors, the River Shannon (IE_SH_26S021600 SHANNON (Upper)_100) and Ballynakill River (IE_SH_26B220790 BALLYNAKILL_010), and will support the future status of the waterbodies achieving Good Status.

Water quality monitoring will be established. 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 additional rehabilitation.

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 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.

3.7 Fugitive Emissions to air

There will be no fugitive emissions to air associated with the proposed rehabilitation of Derryarogue Bog.

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

Irish peatlands are a huge carbon store, containing more than 75% of the national soil organic carbon (Renou-Wilson et al. 2012). Peatland drainage and extraction transforms a natural peatland which acts as a modest carbon sink (taking in 0.1 to 1.1 t of carbon as CO2-C /ha/yr) into a cutaway ecosystem which is a large source of carbon dioxide (releasing 1.3 to 2.2 t of carbon as CO2-C /ha/yr) based on Tier 1 Emission factors (Evans et al. 2017). Renou-Wilson et al. (2018) reported losses of between 0.81 – 1.51 CO2-C /ha/yr from drained peatlands located in Ireland.

Re-wetting of dry peatlands will increase methane emissions (Gunther et al. 2020) as a consequence of the anoxic conditions within the peat body that provide a suitable environment for the microbial breakdown of plant litter and root exudates. Tanneberger et al. (2021) describes how peatland management has to choose between CO2 emissions from drained peatlands or increased methane (CH4) emissions from rewetted industrial peatlands. However, when radiative effects and atmospheric lifetimes of both GHG gases are considered and modelled, postponing rewetting increases the longterm warming effect of continued CO2 emissions (Gunther et al. 2020). This means the increase in methane due to rewetting of dry peatlands is still negated by the CO2 emissions reductions. Further, Wilson et al. (2022) confirmed the benefit of rapid rewetting to achieve strong carbon reductions and potentially altering the warming dynamics from warming to cooling depending upon the climate scenario.

It is expected that Derryarogue Bog will become a reduced carbon source following rehabilitation. The potential of any cutaway site to develop as a 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. Much of this bog is expected to develop wetland habitats on shallow peat with open water, reed swamp and fen habitats with alkaline peatland emission factors. A small area will develop as regenerating wet deep peat vegetation on deep peat areas. Birch woodland is expected to develop on the drier mounds and along peripheral headlands.

3.9 Current ecological rating

(Following NRA (2009) Evaluation Criteria)

The majority of Derryarogue Bog can be rated as **Local Importance; lower value to Local Importance; higher value.** Bare peat and other intensively managed areas are assessed as **local importance (lower value)**. Marginal habitats including wetland, woodland, scrub, pioneer cutaway habitats and bog remnant may act as a refuge and as ecological corridors for wildlife and are therefore deemed to be **locally important (higher value)**.

The area known as Derryarogue Mineral Island is rated as having **National Importance**, due to the presence of Annex I habitats and species.

4. CONSULTATION

4.1 Consultation to date

Consultation seeks 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.

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

- General consultation with range of stakeholders at annual Bord na Móna Biodiversity Action Plan review days 2010-2018.
- Longford Wetland Wilderness (general proposal led by Longford County Council and other stakeholders. This has had several iterations. See Lough Ree and Mid Shannon, Spirit Level 2017. A feasibility study for Longford County Council).
- Feehan, J. (2004) A Long-Lived Wilderness; the future of the north midlands peatland network UCD/NWWPC.
- Lauder, A. & O'Toole L. (2017). Concept development for a landscape-scale Wetland Wilderness Park in the Mid Shannon Region. A report funded by the Heritage Council's Heritage Grant Scheme.
- Foss, P.J., Crushell, P. & Gallagher, M.C. (2017). Counties Longford &Roscommon Wetland Study. Report prepared for Longford and Roscommon County Councils.
- Archaeological Liaison Committee (National Museum of Ireland & Dept of Culture Heritage and the Gaeltacht).
- 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.).
- Greenway development at Derryarogue (Longford County Council).
- Consultation for the preparation of Derryarogue **West** Rehabilitation Plan 2023(PCAS) 2023 Bogs - BNM Peatlands Climate Action Scheme (bnmpcas.ie).

To inform the current Plan, both national and local stakeholders, including neighbours whose land adjoins Derryarogue Bog and local representatives of national bodies (such as Regional National Parks and Wildlife Service staff) and relevant offices in County Councils (such as the Heritage or Environmental Offices) will be contacted. Any identified local interest groups will been sought and informed of the opportunity to engage with this rehabilitation plan, and when identified invited to submit their comments or observations in relation to the proposed rehabilitation at Derryarogue Bog or the programme in general.

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

4.2 Issues raised by Consultees

N/A as yet, as consultation has not commenced.

4.3 Bord na Móna response to issues raised during consultation

N/A as yet, as consultation has not commenced.

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.
- Environmental stabilisation of the former peat production areas and mitigation of potential silt run-off.
- Stabilisation or reduction in water quality parameters of water discharging from the site (e.g. suspended solids).
- Reducing pressure on receiving waterbodies 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 the protection of exposed archaeological structures, their retention in situ and preservation into the future.
- 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.

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

- Natural colonisation will form the basis for the environmental stabilisation of the bare peat areas. Re-wetting of the cutaway, where possible, is a general rehabilitation strategy. The main target will be to maintain water-levels close to the peat surface, and to avoid the creation of large-water bodies, where possible. However, this is dependant on the topography of the cutaway bog and the final drainage regime. Re-wetting and water levels close to the peat surface accelerates the re-vegetation processes, the development of vegetation cover and therefore environmental stabilisation. There is already significant potential for the creation of wet cutaway habitats at Derryarogue Bog due to the local topography (localised basins).
- It will take some time for stable naturally functioning habitats to fully develop at Derryarogue Bog. This will happen over a longer timeframe than the implementation of this rehabilitation plan.
- 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). Furthermore, the majority of the bog is shallow peat and only a small proportion of the bog has potential to develop *Sphagnum*-rich habitats in this timeframe. Nevertheless, re-wetting across the entire bog will improve habitat conditions of the whole bog. Other peatland habitats will develop in a wider mosaic that reflects underlying conditions.
- 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.
- 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 Mona). Reducing pressures due to former peat extraction activities at Derryarogue Bog will contribute to stabilising or improving water quality status of receiving water bodies in general. Ultimately, improving the WFD status of the receiving water body will depend on reducing pressure from a range of different sources, including peatlands in general (private and Bord na Mona).
- Bord na Móna are also planning rehabilitation measures in some nearby bogs (e.g. Derryadd East, Derryshannoge), starting in 2023, and rehabilitation has taken place in several surrounding bogs in 2021/2022, including Begnagh, Clooneeny, Knappoge, Derrycashel and Derraghan bogs. There are expected to be cumulative water quality and other ecosystem service benefits to receiving water bodies from rehabilitating more than one bog in the same catchment.
- Re-wetting in general will benefit the future preservation of most known and unknown archaeological features.

6. SCOPE OF REHABILITATION

The principal scope of this rehabilitation plan is the environmental stabilisation of the bog. This is defined by:

- The area of Derryarogue Bog, excluding Derryarogue **West** (Cloonbony) and Derryarogue North (Cloonbearla).
- EPA IPC Licence - Ref. P0504-01. As part of Condition 10.2 of this license, a rehabilitation plan must be prepared for permanent rehabilitation of the bog lands within the licensed area.
- The local environmental conditions of Derryarogue Bog mean that wetland creation along with some deep peat measures is the most suitable rehabilitation approach for this site. Derryarogue Bog has a pumped drainage regime and has small patches of residual deep peat along with larger areas of shallow cutaway and shallow cutaway areas that are already developing as wetland, heath and Birch scrub.
- Bord na Móna have defined the key goal and outcome of rehabilitation at Derryarogue Bog as **environmental stabilisation and optimising residual peat re-wetting,** to enhance the development of compatible habitats.
- The cutaway is already developing a mosaic of woodland, grassland, wetland and cutaway peatland habitats. A significant portion of this cutaway has largely stabilised. Rehabilitation is proposed to enhance residual peat re-wetting in these areas while taking account of existing habitats, future infrastructure and land-uses (e.g. amenity).
- Rehabilitation of Derryarogue Bog will support multiple national strategies of climate action, biodiversity action and other key environmental strategies such was the Water Framework Directive.
- The time frame for the delivery of the planned rehabilitation will be undertaken according to available resources and appropriate constraints.
- It is not proposed to carry out rehabilitation on all marginal or peripheral cutover bog zones. Generally, these bog remnants are narrow, or are subject to turbary, and do not have positive bog restoration prospects.

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 sites where there has not been significant industrial peat extraction and the peat body is largely intact (deep peat sites that are drained). At other sites, 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, etc.) and there will therefore be different habitat outcomes (wetlands, fen, heathland, grassland and Birch woodland).
- The majority of this bog has been cutaway. Derryarogue bog has a pumped drainage regime, which will need to be considered as part of the wider rehabilitation. A mosaic of wetland habitats are the most compatible habitat that can be developed in response to re-wetting, if pumping ceases or is reduced.
- **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.

- **Archaeology**. There are archaeological features present at Derryarogue Bog, which may constrain rehabilitation activities. The discovery of monuments or archaeological objects during peatland rehabilitation may potentially constrain the rehabilitation measures proposed for a particular area. The rehabilitation will optimise hydrological conditions for the protection of exposed archaeological structures, their retention in situ and preservation into the future. Any newly discovered archaeology may require rehabilitation measures to be reviewed and adapted. A review of known archaeology and an archaeological impact appraisal of the proposed rehabilitation will be carried out. In the worst-case scenario works affecting the surface and sub-surface of the bog might disturb previously unknown archaeological deposits or artefacts without preservation by record taking place. Should any previously unknown archaeological material be uncovered during the rehabilitation works, it will be avoided and reported to the Bord na Móna Archaeological Liaison Officer and the National Museum of Ireland. The results of this assessment will be incorporated into the rehabilitation plan to minimise known archaeological disturbance, where possible.
- **Public Rights of Way**. There are known rights of way at Derryarogue Bog. 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.
- **Turf-cutting.** A small area of remnant of high bog along the eastern margins, will not be subject to rehabilitation measures. This is largely due to turf cutting, and the small area that this parcel of land covers and the limited effectiveness of rehabilitation measures in this area. This area is ecologically and hydrologically linked to the area owned by Bord na Móna where rehabilitation is planned.
- **Proposed amenity development**. Longford County Council lodged a Part 8 Planning Application in 2021 named 'No. 88 Mid Shannon Wilderness Park trackways' which includes greenway or amenity walking/cycling tracks through Derryarogue Bog. This amenity has been constructed. This greenway and amenity track will form part of a wider proposal led by Longford County Council to develop a project called the Mid-Shannon Wilderness Park, which would develop amenity across BnM cutaway bogs.This amenity does not affect the planned rehabilitation.

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 drain blocking and other ground activities.

6.3 Key Exclusions

The scope of this rehabilitation plan does not cover:

- Areas subject to turf cutting are excluded.
- The longer-term development of stable naturally functioning habitats at Derryarogue Bog. The plan covers the short-term rehabilitation **actions** and **an additional monitoring and after-care programme** to monitor the rehabilitation and to respond to any needs.

- This plan is not intended to be an after-use or future land-use plan for Derryarogue Bog. The longer-term management of this site, potentially as a nature conservation site, or for amenity, or for other uses in the future.
- Derryarogue **West** (Cloonbony) and Derryarogue North (Cloonbearla). These areas are part of a separate rehabilitation plan, which is being delivered as part of the Peatland Climate Action Scheme in 2023.

7. CRITERIA FOR SUCCESSFUL REHABILITATION

This section outlines what criteria will be used to indicate successful rehabilitation and what critical success factors are needed to achieve successful rehabilitation. All criteria used to indicate successful rehabilitation will be measured to validate the achievement of the rehabilitation goals and outcomes and validate the completion of the rehabilitation.

The 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. potential run-off of suspended solids).

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 silt run off and to encourage and accelerate development of vegetation cover via natural colonisation and reducing the area of bare exposed peat. See Table 7.1 for 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.

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

Similarly monitoring of surface water ammonia emissions from a Corlea bog in Mountdillon over the past 4 yrs. post cessation of peat extraction with ongoing rehabilitation, indicate downward trends.

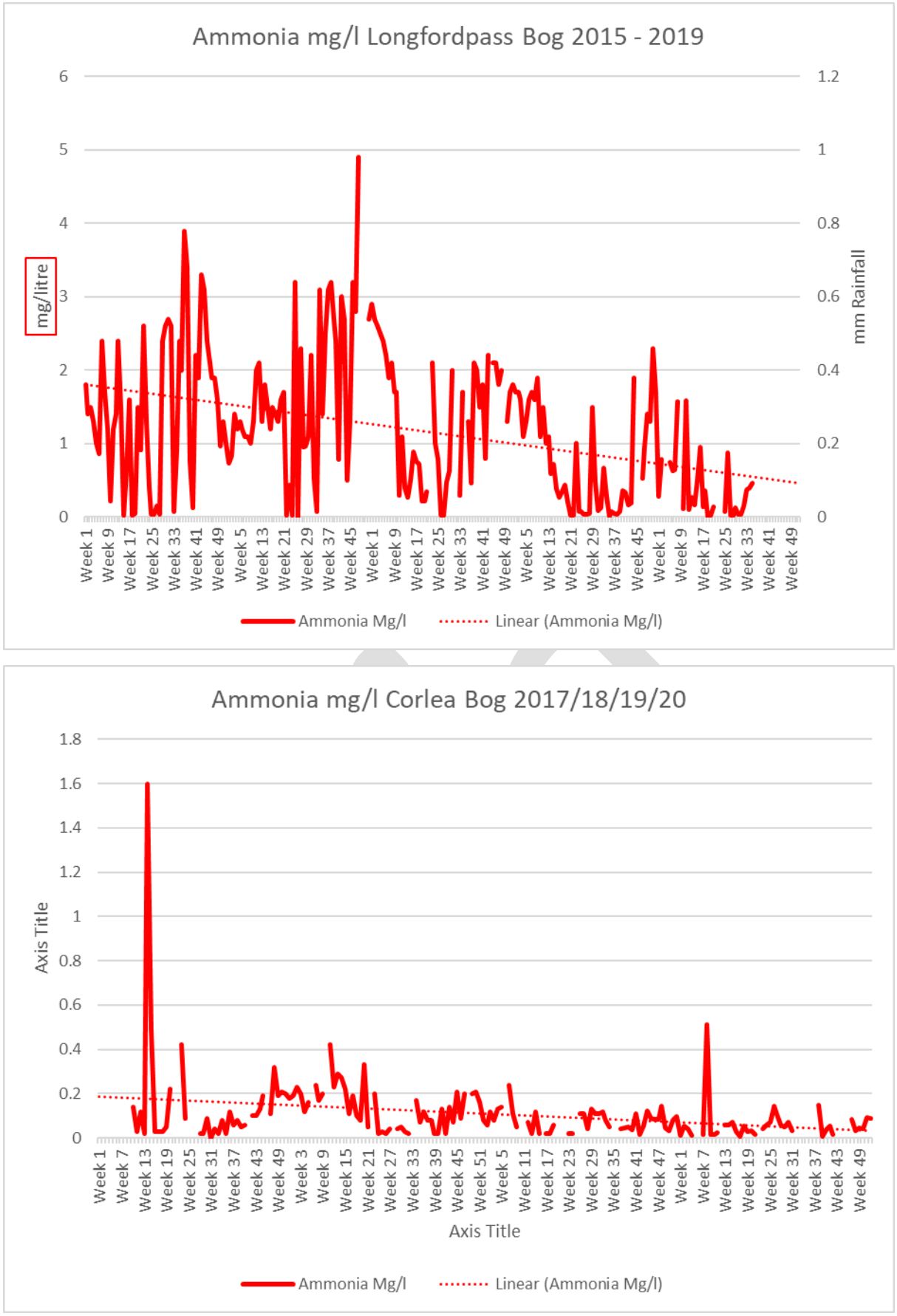

Figure 7.1. Ammonia levels over the period 2015-2019 at Longfordpass and the period 2017-2020 at Corlea.

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 drainage.	Delivery of rehabilitation measures Restoration of hydrological regime.	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.	3 years
IPC validation	Key water quality parameters Ammonia, Phosphorous, Suspended solids, pH and conductivity	Reduction or stabilisation of key water quality parameters associated with this bog	Water quality monitoring for a period after rehabilitation has been completed	2 years
IPC validation	Reducing pressure from drainage on the local water body catchment (WFD)	Where this section of the water body (that this bog drains to) has not been identified as under pressure from peat extraction, that the intervening EPA monitoring programme associated with its Programme of Measures for this water body, confirms that its classification remains at not being at risk from peat extraction associated with activities at this bog.	EPA WFD monitoring programme	WFD schedule

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).** 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.
- **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 practice 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 and restoration 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. 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 restoration and rehabilitation requires detailed planning and the use of data from desktop surveys and field surveys. This data in association with topographical and hydrological modelling will be important in planning the future peatland landscapes and planning the use of the most appropriate rehabilitation methodologies based on environmental characteristic. Hydrological modelling indicates those areas that are likely to re-wet when drains are blocked, based on the current topography. This planning is 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).

A number of illustrative figures have been produced to inform Rehab Planning and Design, including Aerial Photography, Peat Depths and LiDAR Surface Maps, these are included in the accompanying Mapbook as the drawings referenced below:

BNM-ECO-23-27-21 titled **Derryarogue Bog: Aerial Imagery 2020**

BNM-ECO-23-27-04 titled **Derryarogue Bog: Peat Depths**

BNM-ECO-23-27-03 titled **Derryarogue Bog: LiDAR Map**

The restoration and rehabilitation measures are provisionally outlined in drawing titled **BNM-ECO-23-27-20 Derryarogue Bog: Rehabilitation Measures** in the accompanying Mapbook.

These rehabilitation measures for Derryarogue Bog will include (see Table 8.1):

- Re-assessment of the pumping regime and removing pumps or reducing pumping if this is desired and has no significant external impact or impacts on proposed future land-uses. Initial hydrological modelling indicates that a part of the site will develop a mosaic of wetland habitats with some permanent deeper water if pumps are decommissioned, or pumping is reduced. 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, where possible. More sustainable permanent gravity drainage solutions will be examined. Some pumping may have to be retained. 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 of surrounding rivers.
- A widespread drain-blocking programme and hydrological management will be implemented across the cutaway, where possible. In general, field drains will be blocked where possible to re-wet cutaway and re-wet to the optimum water-level. More intensive measures will be targeted towards the bare peat.
- Less intensive measures (targeted drain-blocking) will be used in areas where habitats have already established.
- Hydrological measures will include drain blocking (3/100 m), modifying outfalls and managing water levels with overflow pipes.
- 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 silt run-off, 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).

Table 8.1: Types of and areas for rehabilitation measures at Derryarogue Bog. Note that the types of rehab and areas of rehab may change in response to stakeholder consultation and refinement of the rehabilitation measures.

Type	Code	Description	Area (Ha)
Deep peat cutover bog	DPT1	Regular drain blocking (3/100 m) + modifying outfalls and managing water levels with overflow pipes	37
Dry cutaway	DCT1	Modifying outfalls and managing water levels with overflow pipes	342.9
Wetland cutaway	WLT1	Modifying outfalls and managing water levels with overflow pipes	103.2
Marginal land	MLT1	No work required	61.1
Silt Pond	Silt Pond	Silt Pond	0.5
Constraint	Constraint	Constraint	50.9
Total Area			**595.6**

8.1 Completed and Ongoing

- A significant part of the site has already re-vegetating, with significant cover of pioneer vegetation developing a mosaic of typical cutaway peatland and wetland habitats. Natural re-colonisation of the cutaway so far has been quite effective. Bare peat areas within the cutaway parts of the site are shrinking as vegetation develops and consolidates.

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

- Seek formal approval of the rehabilitation plan from the EPA.
- Develop a detailed site plan outlining how the various rehabilitation methods will be applied to Derryarogue Bog. This will take account of peat depths, topography, drainage and hydrological modelling (see rehabilitation map for an indicative view of the application of different rehabilitation methodologies).
- A drainage management assessment of the proposed rehabilitation measures will be carried out and any issues identified resolved and the rehabilitation plan adapted.
- A review of known archaeology and an archaeological impact appraisal of the proposed rehabilitation will be carried out. The results of this assessment will be incorporated into the rehabilitation plan to minimise known archaeological disturbance, where possible.
- A review of issues that may constrain rehabilitation such as known rights of way, turbary and existing land agreements is to be carried out.
- A review of remaining milled peat stocks is to be carried out.
- An ecological appraisal of the potential impacts of the planned rehabilitation on the presence of sensitive ground-nesting bird breeding species (e.g. breeding waders) is to be carried out. The scheduling of rehabilitation operations will be adapted, where required.
- Ensure all activities comply with the environmental protection requirements of the IPC Licence.

- Carry out Appropriate Assessment (AA) of the Rehabilitation Plan. Incorporate any required mitigation measures from the AA (if required) in the plan for the delivery of rehabilitation and decommissioning across the site.
- 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.

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

- Carry out proposed measures as per the detailed site plan. All rehabilitation will be carried out with regard to best practice environmental control measures (Appendix III).
- Monitor the success of rehabilitation measures in relation to developing suitable hydrological conditions.
- Carry out the proposed monitoring, as outlined in section 9.
- Silt ponds will be monitored during this period and there will be continued maintenance and cleaning to prevent potential suspended solids run-off from the site during the rehabilitation phase.

8.4 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 9 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.

8.5 Timeframe (when finalised)

- **Year 1**: Short-term planning actions.
- **Year 1-3**: Short-term practical actions.
- **Year 1-3**: Long term practical actions. Evaluate success of short-term rehabilitation measures outlined above and remediate where necessary.
- **> Year 3**: Decommission silt-ponds, if necessary

8.6 Budget and costing

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 different cutaway types across the site.

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.
- These monitoring visits will also consider any requirements for further 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. This will be used to verify completion of rehabilitation measures. The extent of bare peat will be assessed using this baseline data, and habitat maps will be updated, if needed. It is proposed that sites can be monitored against this baseline in the future.
- **Water quality monitoring** at the bog will be established. 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.
- Monitoring results will be maintained, trended 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, and COD.
- This monthly sampling regime on a selected number of silt ponds will be carried out over a two-year cycle.
- If, after two years, key criteria for successful rehabilitation are being achieved and key targets are being met, then the water quality monitoring will be reviewed, with consideration of potential ongoing 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 criteria for successful rehabilitation have **not** been achieved and key targets have **not** been met, then the rehabilitation measures and status of the site will be evaluated and enhanced, where required. This evaluation may indicate no requirement for additional enhancement of rehabilitation measures but may demonstrate that more time is required before key criteria for 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 that are compatible the provision of biodiversity and ecosystem services, 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.

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: BOG GROUP CONTEXT

The Mount Dillon Bog Group IPC Licensed area is made up of two sub-groups (Lough Ree (the Mount Dillon Energy Peat Group) and Mostrim) and have been in industrial peat production for several decades. There are 28 defined sites covering a total area of 11,322 ha. Of the 28 sites, 23 mainly straddle the River Shannon within counties Roscommon and Longford, with five sites partially in County Westmeath to the east. Each bog area further comprises a range of habitats from bare milled peat former peat extraction areas to re-colonising cutaway to workshops areas and transport infrastructure. Industrial peat extraction from these sites mainly supplied ESB power stations at Lanesborough (LRP) or for horticultural peat products.

Industrial peat extraction in the Mount Dillon Bog Group ceased in 2019. Remaining milled peat stocks were utilised in Lanesborough (LRP) until the power station ceased electricity generation at the end of 2020. Remaining peat stocks have been transferred to other customers (Edenderry Power Station, Derrinlough Brickette Factory) between 2021-2023. Intensive decommissioning and rehabilitation for the Mount Dillon Bog Group started in 2020/2021.

One bog site, Cloonmore, was never used for industrial peat production and several bogs in the Mostrim group were drained but never fully developed and still retain typical high bog characteristics. These include Clonwhelan, Glenlough and a section of Mostrim. These sites have been zoned for biodiversity and a high bog drain blocking will be used to re-wet the high bog and encourage restoration of the raised bog habitat. Several sites (Glenlough, Mostrim, Clonwhelan and Clynan) were assessed by consultants for NPWS as part of the review of the raised bog Natural Heritage Area network (NPWS 2014).

The rehabilitation plan for the Mount Dillon Bog Group encompasses all areas involved in industrial peat production including former industrial peat production areas and associated facilities. It also includes rehabilitation measures for those bogs that were initially drained but not fully developed.

A breakdown of the component bog areas for the Mount Dillon Bog Group IPC License Ref. PO-504-01-01 is outlined in Table Ap-2.

Industrial peat production history varies across the Mount Dillon bog group, so there is a wide range of peat depths at present. Bogs close to Lanesborough tend to have shallower peat depths or have been cutaway, while some bogs on the periphery of the group tend to have deeper residual peat reserves. Several sites such as Mount Dillion and Derrycashel have been mostly cutaway to the fen peat layers or in some cases to expose the underlying gravel/sub-soil. Several bogs in the Mostrim group have only been partially developed or have had no industrial peat production, and have relatively deep peat depths remaining.

Table Ap-2: Mount Dillon Bog Group names, area and indicative status (Mount Dillon Energy Peat sub-group)

Bog Name	Area (ha)	Stage of development	Land-Use and History	Peat Production Cessation	Rehab Plan Status
Begnagh	265	Cutover Bog Industrial peat production commenced at Begnagh Bog in 1977 and ceased in 2020. Deep peat reserves remain on much of the former production area.	Begnagh Bog formerly supplied a range of commercial functions including; fuel peat for Lough Ree Power Some areas of cutaway on site are developing pioneer cutaway vegetation communities.	2020	Finalised 2022 Rehab started in 2022

Bog Name	Area (ha)	Stage of development	Land-Use and History	Peat Production Cessation	Rehab Plan Status
		Begnagh is considered a deep peat cutover bog.			
Clooneeny	358	Cutover Bog Industrial peat production commenced at Clooneeny Bog in 1985 and ceased in 2020. Deep peat reserves remain on much of the former production area. Clooneeny is considered a deep peat cutover bog.	Clooneeny Bog formerly supplied a range of commercial functions including; horticultural peat and fuel peat for Lough Ree Power Most of the former production area on site is bare peat. Some areas of cutaway on site are developing pioneer cutaway vegetation communities.	2020	Finalised 2022 Rehab started in 2022
Cloonmore	102	N/A	Never developed for industrial peat production; scattered plots.	N/A	N/A
Cloonshannagh	494	Cutover Bog Industrial peat production commenced at Cloonshannagh Bog in 1985 and ceased in 2020. Deep peat reserves remain across the former production area. Cloonshannagh is considered a deep peat cutover bog.	Cloonshannagh Bog formerly supplied a range of commercial functions including; horticultural peat and fuel peat for Lough Ree Power Restoration work has been carried out on a 38ha section of high bog within Cloonshannagh Bog. Some of the former production area on site is developing pioneer cutaway vegetation communities, the remainder of the site is bare peat.	2020	Finalised 2024 Rehab to start 2025
Cloonshannagh Rail Link	28	Cloonshannagh rail link is a link between sites.	N/A	N/A	N/A
Corlea	163	Cutaway Bog Industrial peat production commenced at Corlea Bog in 1960 and ceased in 2018. Long-term peat extraction has reduced peat reserves on this bog. Corlea is considered a shallow peat cutaway bog.	The former production area at Corlea has already extensively colonised. Pioneer wetland and scrub development has occurred over much of the site. Some wetland and rehabilitation management was undertaken between 2016-2018. Part of site leased to local community development group to develop amenity walkway in association with Longford County Council.	2018	Finalised in 2023 Rehab started in 2023
Derraghan	289	Cutover Bog Industrial peat production commenced at Derraghan Bog in the 1940's and ceased in 2020. Most of the former production area has shallow peat reserves. Some pockets of deep peat remain. Derraghan is considered a shallow peat cutover bog.	Derraghan Bog formerly supplied a range of commercial functions including; fuel peat for Lough Ree Power Much of the former production area at Derraghan has been out of production for some time. These areas have already extensively colonised with pioneer wetland and scrub vegetation communities.	2020	Finalised 2021 Rehab commenced 2022
Derryadd	653	Cutover Bog Industrial peat production commenced at Derryadd Bog in 1960 and ceased in 2020. Long-term peat extraction has reduced peat reserves on this bog. Most of the former production area has shallow peat reserves. Some pockets of deep peat remain. Derryadd is considered a shallow peat cutover bog.	Much of the former production area at Derryadd has been out of production for some time. These areas have already extensively colonised with pioneer wetland and scrub vegetation communities	2020	Draft plan Updated 2025
Derryadd2 (Derryadd East)	328	Cutover Bog Industrial peat production commenced at Derryadd 2 Bog in 1960 and ceased in 2020. Long-term peat extraction has reduced	Much of the former production area at Derryadd 2 has been out of peat production for some time. These areas have already	2020	Finalised 2023 Rehab started 2023

Bog Name	Area (ha)	Stage of development	Land-Use and History	Peat Production Cessation	Rehab Plan Status
		peat reserves on this bog. Most of the former production area has shallow peat reserves. Some pockets of deep peat remain. Derryadd 2 is considered a shallow peat cutover bog.	extensively colonised with pioneer wetland and scrub vegetation communities		
Derryarogue	895	Cutover Bog Industrial peat production commenced at Derryarogue Bog in 1941 and ceased in 2020. Long-term peat extraction has reduced peat reserves on this bog. Most of the former production area has shallow peat reserves. Some pockets of deep peat remain. Derryarogue is considered a shallow peat cutover bog.	Much of the former production area at Derryarogue has been out of production for some time. These areas have already extensively colonised with pioneer wetland, cutaway and scrub vegetation communities. Part of Derryarogue will be rehabilitated as part of PCAS in 2023 An amenity walkway through part of Derryarogue..	2020	Derryarogue West Finalised in 2023 Rehab started in 2023 Derryarogue Draft updated 2025 (remainder of site)
Derrycashel	388	Cutover Bog Industrial peat production commenced at Derrycashel Bog in 1951 and ceased in 2018. Long-term peat extraction has reduced peat reserves on this bog. Most of the former production area has shallow peat reserves. Some pockets of deep peat remain. Derrycashel is considered a shallow peat cutover bog.	Derrycashel Bog formerly supplied a range of commercial functions including; fuel peat for Lough Ree Power Much of the former production area at Derryarogue has been out of production for some time. These areas have already extensively colonised with pioneer wetland and scrub vegetation communities. Some wetland and rehabilitation management was undertaken (c.60ha) between 2014-2015.	2018	Finalised 2021 Rehab started in 2021
Derrycolumb	454	Cutover Bog Industrial peat production commenced at Derrycolumb Bog in the 1980's and ceased in 2019. Most of the former production area still has deep peat reserves. Derrycolumb is considered a deep peat cutover bog.	Derrycolumb Bog formerly supplied a range of commercial functions including; fuel peat for Lough Ree Power Much of the former production area at Derrycolumb has been out of production for some time. These areas have already extensively colonised with pioneer wetland and scrub vegetation communities.	2018	Finalised 2021 Rehab started in 2021
Derrymoylin	356	Cutover Bog Industrial peat production commenced at Derrymoylin Bog in 1985 and ceased in 2020. Long-term peat extraction has reduced peat reserves on this bog. Derrymoylin is considered a shallow peat cutover bog.	Derrymoylin Bog formerly supplied a range of commercial functions including; fuel peat for Lough Ree Power. Most of the former production area on site is bare peat.	2020	Finalised 2025. Rehab to start in 2025
Derryshannoge	452	Cutover Bog Industrial peat production commenced at Derryshannoge Bog in 1985 and ceased in 2020. Deep peat reserves remain across most of the site. Derryshannoge is considered a deep peat cutover bog.	Derryshannoge Bog formerly supplied a range of commercial functions including; fuel peat for Lough Ree Power. Much of the former production area at Derryshannoge has been out of production for some time. These areas have already extensively colonised with pioneer cutaway and scrub vegetation communities.	2020	Finalised in 2023 Rehab started in 2023

Bog Name	Area (ha)	Stage of development	Land-Use and History	Peat Production Cessation	Rehab Plan Status
Edera	281	Cutover Bog Development for industrial peat production commenced at Edera Bog in 1990's. Active extraction from Edera began in 2003 and ceased in 2018. Edera is considered a deep peat cutover bog.	Edera Bog formerly supplied a range of commercial functions including; fuel peat for Lough Ree Power. The majority of Edera Bog former production area is bare peat.	2020	Finalised 2021 Rehab started in 2021
Erenagh	93	Cutover Bog Development for industrial peat production commenced at Erenagh Bog in 1970's. Erenagh is considered a deep peat cutover bog.	Erenagh Bog formerly supplied a range of commercial functions including; fuel peat for Lough Ree Power. Much of the former production area at Erenagh has been out of production for some time. These areas have already extensively colonised with pioneer cutaway and scrub vegetation communities.	2020	Draft 2024
Granaghan	212	Cutover Bog Development for industrial peat production commenced at Granaghan Bog in 1980's. Long-term peat extraction has reduced peat reserves on this bog but deep peat reserves remain on site. Granaghan is considered a deep peat cutover bog.	Granaghan Bog formerly supplied a range of commercial functions including; horticultural peat and fuel peat for Lough Ree Power. The majority of Granaghan Bog former production area is bare peat.	2020	Finalised in 2024. Rehab to start in 2025.
Killashee	110	Cutover Bog Development for industrial peat production commenced at Killashee and Derryadd East bogs in 1985. Killashee is considered a deep peat cutover bog.	Killashee and Derryadd East bogs formerly supplied a range of commercial functions including; horticultural peat and fuel peat for Lough Ree Power. The majority of Killashee and Derryadd East bogs former production area is bare peat. Some areas have colonised with pioneer cutaway and scrub vegetation communities.	2020	Finalised in 2023
Knappoge	313	Cutaway Bog Peat Production at Knappoge bog commenced in 1963, and finished in 2018. Peat depths on the former production area are generally shallow. There are some pockets of deeper peat. Knappoge is considered a shallow peat cutaway bog.	Knappoge Bog formerly supplied a range of commercial functions including; fuel peat for Lough Ree Power. The majority of Knappoge Bog former production area is bare peat. Some areas have colonised with pioneer cutaway and scrub vegetation communities.	2018	Draft 2021 Rehab started in 2022
Lough Bannow	739	Cutaway Bog Peat Production at Lough Bannow bog commenced in the 1960'S, and finished in 2020. Peat depths on the former production area are generally shallow. There are some pockets of deeper peat. Lough Bannow is considered a shallow peat cutaway bog.	Much of the former production area at Lough Bannow has been out of production for some time. These areas have already extensively colonised with pioneer cutaway and scrub vegetation communities. A small (35ha) conifer plantation was established in 1980's.	2020	Draft updated in 2025
Moher	483	Cutover Bog Peat Production at Moher bog commenced in the 1960'S, and finished in 2020. Peat depths on the former production area remain relatively deep. Moher is considered a deep peat cutover bog.	Moher Bog formerly supplied a range of commercial functions including; fuel peat for Lough Ree Power. Much of the former production area at Moher has been out of production for some time. These areas have already extensively colonised	2020	Draft 2021

Bog Name	Area (ha)	Stage of development	Land-Use and History	Peat Production Cessation	Rehab Plan Status
			with pioneer cutaway and scrub vegetation communities.		
Mount Dillon	592	Cutaway Bog Peat Production at Mount Dillon bog commenced in the 1940'S, and finished in 2020. Peat depths on the former production largely shallow and the peat is considered cutaway. Some deep peat remains on the west of the site. Mount Dillon is considered a shallow peat cutaway bog.	Mount Dillon Bog formerly supplied a range of commercial functions including; fuel peat for Lough Ree Power. Much of the former production area at Mount Dillon has been out of production for some time. These areas have already extensively colonised with pioneer cutaway, wetland and scrub vegetation communities.	2020	To be updated in 2025.

See Drawing number BNM-ECO-23-27-24 titled **Mount Dillon Bog Group**, included in the accompanying Mapbook which illustrates the location of Derryarogue bog and the Mount Dillon Bog Group in context to the surrounding area.

APPENDIX II: ECOLOGICAL SURVEY REPORT

Note: this report covers the whole of Derryarogue Bog. There may be references to receptors or habitats not present within the lands subject to the current Plan. See Section 3.3. for Biodiversity features of Interest within the footprint of the current Plan.

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:	**Derryarogue**	**Area (ha):**	458ha
Works Name:	Mount Dillon	**County:**	Longford
Recorder(s):	BnM Ecology Section	**Survey/ monitoring Date(s):**	11th October 2012 A range of additional ecological surveys were carried out 2014-2019. These baseline surveys have also informed this rehabilitation plan.

Habitats present (in order of dominance)

The most common habitats present at this site include:

- Bare peat (Codes refer BnM classification of pioneer habitats of production bog)
- Pioneer Soft Rush-dominated poor fen (pJeff) with less frequent Bog Cotton (pEang) or Bottle Sedge (pRos) -dominated poor fen.
- Willow-dominated scrub (eWill) (in mosaic with pJeff) (in those areas that are flooded regularly)
- Open water (OW) (permanent) and Temporary open water (TOW)
- Birch-dominated scrub (eBir, oBir) (on drier higher ground that is not flooded))
- Pioneer dry heath (dHeath) (mainly in mosaic with Birch scrub)
- Dry pioneer Purple Moorgrass-dominated grassland (gMol)
- Access routes (Acc)
- Riparian zones (Rip) (with drains and associated habitats such as scrub and Birch woodland)
- Silt ponds (Silt) with Gorse/Birch scrub and Purple Moorgrass-dominated grassland (gMol)

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

- Raised bog (PB1) (Codes refer to Heritage Council habitat classification, Fossitt 2000)
- Cutover Bog (PB4)
- Scrub (WS1)
- Wet (callows-type) grassland (GS4)
- Birch woodland (WN7)
- Dense Bracken (HD1)
- Improved grassland (GA1) around the boundary where the GIS boundary extends into adjacent fields

Description of site

Derryarogue Bog is located approximately three kilometres to the east of Lanesborough in County Longford. This bog is located within two main section, a western (smaller) section and an eastern section in which the majority of the site is located. A mineral island is located on the site and this area was previously surveyed and is described in the Derryarogue Mineral Island ecological survey. A long section of rail line to the west of the site connects the Roscommon Bogs with the Power Station in Lanesborough. A rail bridge across the River Shannon is also part of the site.

The peat that was harvested from Derryarogue was used as fuel peat in the adjacent Lough Ree Power Station. Large areas of the site are cutaway and have developed a range of cutaway habitats. Numerous power lines cross the site and are in place to power to the pumps that are scattered across the site.

The northern section of the site is separated from the rest of the site by a rail line that crosses the site in an east west direction. A range of pioneer habitats have developed in areas that were formerly in peat production. Habitats that have developed on the older cutaway habitats include closed Birch scrub that was primarily made up of Birch and Willow with Oak and Pine becoming established also. These habitats are at least twenty years old and were located on higher ground. Younger pioneer habitats include gCal, pTrig, eBir and pPhrag. Large areas of exposed gravel are also common across this section of the site. A grey clay type sub-soil is located under this section of the site and it is clearly visible in the field drains. The western side of this section appears to be lower lying than the rest of the section and many of the field drains contained pioneer reed-beds (pPhrag). A flood defence berm was constructed in 2011 along the south western edge of this section in order to prevent flood water from the River Shannon entering the site.

The main section of the site is very varied in terms of habitats that are located there. This area also contains the mineral Island that is dealt with in a separate report. Large areas within this section are cutaway. Gravel protrudes from the ground in various locations. Pioneer habitats include Birch scrub (eBir, oBir and cBir). The centre of this section of the site appears to be considerably lower than the surrounding areas.

Several areas of wetland are developing within this section of the site and are mainly comprised of small areas of open water, and a mix of species such as Reed-mace, Soft Rush, Club Rush, Bulbous Rush, Marsh Arrow Grass and Mint. Charaphytes were also present to the open water. These areas appeared to have been developing for a number of years and although they are small they were becoming diverse and provided habitat for Mallard and Snipe.

Other habitats on the site include dry heath (on elevated areas), scrub and areas of pioneer poor fen. A large area of bare peat was located at the western edge of this section.

The eastern section of the site was largely in industrial peat production until recently; however areas of cutaway of varying ages were also present. The areas of cutaway were becoming colonised with pioneer poor fen and scrub. The areas of scrub along the eastern edge were quite well developed and were approaching mature Birch woodland.

During the spring of 2012 a honey project was started on the site. Ten bee hives were located on the mineral island. These hives were managed by *Hyland Honey*. This project finished in 2013.

Derryarogue Mineral Island

This site is known as Derryarogue Island and is part of Derryarogue Bog and the Mount Dillon Group of bogs. It is located in Co. Longford to the north-east of Lanesborough and Lough Ree. The River Shannon flows 2 km west of the site. Derryarogue island is a typical 'mineral island' or mound of glacial material and bedrock that protrudes from the surrounding bog (now cutaway and production bog) landscape. There are many examples of these types of small glacial mounds surrounded by bog in this area. The habitats found on these mounds are in contrast to the surrounding bog as they are strongly influenced by the calcareous bedrock and calcareous glacial deposits or sub-soil that underlay the site. Many of these areas are managed as farmland and Derryarogue Island is also mapped as farmland on the 2nd edition OSI 6 inch map, prior to the development of the BnM production bog.

The island is surrounded by typical habitats developing on production and production-related bog. These include bare peat fields of the still-active production bog to the south of the site and the developing Birch scrub and dry heath that surrounds the majority of the remainder of the site. There is also frequent cover of other typical habitats found in the transitional zone between cutaway and mineral soil such as Bracken and several grassland communities (gMol, gDa-An). The main part of the island is dominated by scrub and grassland. These habitats are criss-crossed with travel-paths, where there is exposed soil and some rutting where the ground is wet.

The scrub is dominated by Blackthorn and is thick and impenetrable, although there are frequent young and maturing Ash trees developing within the scrub. Other species present include Hawthorn, Elder, Privet, Rowan, Honeysuckle, Bramble, Ivy, Male Fern

and Soft Shield Fern. The ground cover is generally quite poor and dominated by Ivy. Some of the Blackthorn-scrub transitions to a band of Gorse or to a Bramble thicket. There are also locations around the margins where there is transition to Birch and Willow scrub. Alder is also present on the site towards the southern end where there has been some clearance in the past for electric lines. A small area to the south of the site was classified as woodland as it was dominated by mature Ash. However, this habitat was surrounded by a band of scrub and Brambles, making it difficult to survey.

There are several different grassland communities present on the site. The vegetation types vary according to hydrology and other environmental factors such as soil depth, amount of peat etc. The main grassland type is a dry calcareous grassland community. This is dominated by species such as Glaucous Sedge, Yellow Sedge, Sweet Vernal-grass, Red Fescue and Bird's-foot Trefoil. Other species present include Knapweed, Perennial Rye-grass, Quaking Grass, False Oat-grass, Yorkshire Fog, Dandelion, Long-leaved Plantain, Broad-leaved Plantain, Nettle, Red Clover, Hawkbit sp., Ox-eye Daisy, Primrose, Creeping Thistle, Timothy, Mouse-ear, Yarrow, Wild Carrot, Ladies-Bedstraw, Purging Flax, Yellow-wort, Mouse-ear Hawkweed, Daisy, White Clover, Milkwort, Common Spotted Orchid and Marsh Hellaborine. Several Dog Rose plants appear in this habitat and single Gorse, Blackthorn and some Hawthorn also appear within the grassland.

The dry grassland frequently grades into damper grassland, sometimes over short distances, which is also significantly influenced by the calcareous-rich soils but is likely to be more prevalent of peaty soils. This community contains frequent Yellow Sedge, Carnation Sedge, Star Sedge and Purple Moorgrass. This community contains species including Common Sedge, Green-ribbed Sedge, Flea Sedge, Hard Rush, Compact Rush, Heath Grass, Knotted Pearlwort, Common Sorrel, Marsh Bedstraw, Bog Thistle, Common Century, Common Chickweed, Self Heal, Mash Horsetail, Crested Dogstail, Devil's-Bit, Rough Meadow-grass, Marsh Valerian, Silverweed, Jointed Rush, Marsh Thistle, Creeping Buttercup, Meadowsweet and Curled Dock. *Calliergonella cuspidata* is frequently found within this grassland type as well as extensive low hummocks of some brown moss species such as *Campylium stellatum*. One small area close to the edge of the scrub contained a small patch of Bladder Sedge. Species more typical of drier areas also appear in this community and vice-versa.

There are some areas where the drainage is impeded to a greater extent and these areas contain frequent Soft Rush and Hard Rush. Other species present included Water Plantain, Spike-rush sp., Water Forget-me-not, Bulbous Rush and Floating Sweet-grass. Some of the travel paths contained wet grassland vegetation that was dominated by Rush species.

Small springs or damp hollows are found in the largest open grassland area in the centre of the site and along some of the old travel patches around the margins of the site. Most of these did not have any standing water at the time of the survey (after an exceptionally dry May-June period), although they were all damp. Several others contained, probably from heavy rainfall the previous evening. There was no sign of running water, which could be associated with springs. Calcareous-rich groundwater seepage into these shallow hollows with a high water-table could create the same habitats. The hollows were generally 1-5 m in diameter and > 0.5 m deep. The vegetation cover within the hollows was variable, with some hollows being dominated by exposed whitish mud and others dominated by brown mosses. Typical moss species associated with these hollows included brown mosses such as *Scorpidium scorpoides, Drepanocladus* spp. and *Campylium stellatum, as well as Calliergonella cuspidata*. The majority of the hollows had some development of tufa, generally a calcareous coating on plant material and mosses within the hollow. The tufa was not very well developed. Other species found in these hollows included Yellow Sedge, Silverweed, Marsh Arrowgrass, Lesser Spearwort, Spike-Rush sp., Mint, Jointed Rush, Creeping Bent and Brookweed. The species assemblage varied from hollow to hollow. Several of these hollows seemed to have been created by heavy machinery creating ruts in the travel paths that were subsequently colonised by typical species. The tufa spring indicator moss species, *Palustriella commutata* was searched for but was not recorded.

The meadow type grassland community is a tussocky type of grassland dominated by Cocksfoot, Tufted Hairgrass, Tall Fescue, Yorkshire Fog Purple Moor-grass and Sweet Vernal-grass. This vegetation type occurs on deeper soils and is less diverse than the former two communities. Bramble and Bracken both spread into this grassland type in places. Tussocky Purple Moorgrass and Meadowsweet dominates in one area close to the margins along with Tufted Hairgrass.

There are several places around the main part of the site where there is a little more peat and a dry heath type vegetation develops. This is dominated by Heather and also contains species such as Cross-leaved Heath, Purple Moorgrass, Multi-flowered Woodrush, Tormentil, Slender St John's-wort, and Common Twayblade.

A small area to the south of the site within a small hollow is developing rich fen like vegetation, adjacent to a small area with mature Willow. A small area is dominated by Greater Tussock Sedge and there are also several tussocks of Tufted Sedge. Surrounding vegetation contains Common Bog-cotton, Bottle Sedge, Cuckoo Flower, Water Horsetail, *Calliergonella cuspidata, Scorpidium scorpoides*, *Campylium stellatum,* Birch, Eared Willow, Lesser Spearwort, Common Spotted orchid, Angelica, Purple Moor-grass and

Devil's-Bit. This very small area also has some Reedmace. This area is likely to have a fluctuating water table with the possibility of flooding during the winter.

The margins of the site generally contain transitional type grassland communities that are similar to pioneer cutaway grassland communities. The main community is dominated by Purple Moorgrass (gMol) and this has developed along some of the old travel paths.

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

None

Adjacent habitats and land-use

Adjacent habitats include wet grassland (GS4), improved agricultural grassland (GA1), raised bog (PB1), scrub (WS1), Birch woodland (WD7), conifer plantation along with active and inactive cutover bog (PB4).

Watercourses (major water features on/off site)

- The Derrygeel Stream flows through the site, this stream is a tributary of the Lough Bannow River that in turn flows into the River Shannon above Lanesborough.
- Another tributary of the Derrygeel Stream flows along the western boundary of the site.

Peat type and sub-soils

The site is underlain with a mix of gravel and marl.

Fauna biodiversity

Birds

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

- Mallard (24)
- Raven
- Snipe
- Whooper Swan (6)
- Other more common species included Blackbird, Grey Crow, Meadow Pipit, Pheasant, Robin and Long tailed Tit.

Mammals

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

- Badger
- Fox
- Mink

Other species

Frog

Fish in the watercourses

APPENDIX III. ENVIRONMENTAL CONTROL MEASURES TO BE APPLIED TO BOG REHABILITATION

- Bog restoration/rehabilitation measures will be restricted to within the footprint of the proposed rehabilitation area.
- 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.
- All plant and equipment for use will comply with the Construction Plant and Equipment Permissible Noise Levels Regulations (SI 359/1996).
- The proposed activities will be restricted to daylight hours and there will be no requirement for artificial lighting.
- Silt ponds will be inspected and maintained as per the IPC Licence.
- During periods of heavy precipitation and run-off, activities will be halted.
- Measures will be carried out using a suitably sized machine and, in all circumstances,, excavation depths and volumes will be minimised where possible.
- All machines will be regularly checked and maintained prior to arrival at the site to prevent hydrocarbon leakage.
- Hoses and valves will be checked regularly for signs of wear and will be closed and securely locked when not in use.
- Fuelling and lubrication of equipment shall only be carried out in designated areas away from surface water drainage features and ecologically sensitive areas.
- Waste oils and hydraulic fluids will be collected in leak-proof containers and removed from the site for disposal or re-cycling.
- Vehicles will never be left unattended during refuelling.
- No direct discharges to waters will be made. No washings from vehicles, plant or equipment will be carried out on site.
- All plant refuelling will take place using mobile fuel bowsers. Only dedicated trained and competent personnel will carry out refuelling operations.
- 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.
- Potential impacts caused by spillages etc. during rehabilitation will be reduced by keeping spill kits and other appropriate equipment on-site.
- 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 IV. BIOSECURITY

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. 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 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 washing vehicles prior to entering the area.

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).

In addition to the above, Best Practice measures around the prevention and spread of Crayfish plague[5] will be adhered with throughout all rehabilitation measures and activities.

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

APPENDIX V. 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. P0-504-01). 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.

3 National and EU Climate and Biodiversity 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.

Peatlands rehabilitation and restoration is referenced in Section 17.3.3 of the Land Use, Land Use Change, Forestry and Marine Chapter of the National Climate Action Plan 2021 as follows:

"The rehabilitation of degraded peatlands to a condition in which they regain their ability to deliver specific ecosystem services has considerable potential for initial mitigation gains, and future carbon sequestration. Additional benefits of peatland restoration include positive socio-economic outcomes for the Midlands, increased natural capital, enriched biodiversity, improved water quality, and flood attenuation."

The scheme is included as Action 33 in the Climate Action Plan 2021 Annex of Actions - Deliver the Enhanced Decommissioning, Rehabilitation and Restoration (EDRR) Scheme for Bord na Mona Peatlands.

EDRRS is also referenced in the Climate Action Plan 2021 as a measure to deliver a Just Transition in the Midlands.

International research and scientific understanding of peatlands is now reflected in key Irish national policy and strategy documents such as the National Raised Bog Special Areas of Conservation (SACs) Management Plan 2017 - 2022 (Department of Arts, Heritage and the Gaeltacht 2017), The National Peatland Strategy (Department of Arts, Heritage and the Gaeltacht 2015), The National Biodiversity Action Plan (National Parks and Wildlife Service 2017), The River Basin Management Plan for Ireland (DHLGH 2024) and the Biodiversity – Climate Change Sectoral Action Plan (Department of Arts, Heritage and the Gaeltacht 2019). Each of the national plans, which are also complemented with the recently published EU Green Deal communication on Biodiversity Strategy for 2030 (COM 2020) have overlapping objectives and actions that focus on the restoration of peatlands damaged

by turf-cutting, drainage and other impacts, as well as the re-wetting of Bord na Móna industrial peat extraction bogs.

While not specifically identified as a restoration implementor, EDRRS objectives are in line with those of the United Nations Decade on Ecosystem Restoration 2021-2030 of Preventing, Halting and Reversing the Degradation of Ecosystems worldwide.

EDRRS is also in line with the EU Commission proposal for a Nature Restoration Law which will apply legally binding targets for nature restoration in different eco-systems to every Member State. The aim is to cover at least 20% of the EU's land and sea areas by 2030 with nature restoration measures and eventually extend these to all ecosystems in need of restoration by 2050.

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 Draft National River Basin Management Plan 2022-2027 (Water Framework Directive)

The National River Basin Management Plan (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 2018-2021 outlined 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) was part of the WFD (2018-2021) programme of measures. The NRBMP 2018-2021 takes account of the fact that Bord na Móna was 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 2018-2021 rehabilitation target was 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 was expected to have a positive impact on water quality and will help the NRBMP 2018-2021 deliver its objectives in relation to the Water Framework Directive and is one of the five key principle actions.

The NWBMP 2022-2027 (DHLGH 2024) describes how the number of waterbodies impacted by peat, industry and forestry have decreased by 10, 10 and 5 waterbodies, respectively since the second cycle. Impacts on water quality and river habitat arising from peat and peat extraction and associated drainage include the release of ammonium and fine-grained suspended sediments, and physical alteration of aquatic habitats. Drainage of peatlands also results in changes to the hydromorphological condition of rivers.

The NWBMP 2022-2027 (DHLGH 2024) outlines how maintaining and restoring Irish bogs will lead to a decrease in waterborne carbon leaching to levels comparable with intact bogs as well as reducing losses of peat silt and ammonia. Vegetation on the surface of the peat can also slow the flow of water over the land surface. Based on the EPA's most recent reports, peat extraction and drainage is impacting on 106 water bodies across the country, with peat the single pressure on 28 of these water bodies. However, compared to the data in the second-cycle plan, the number of water bodies impacted by peat has decreased.

The cessation of industrial peat extraction by Bord na Móna in 2021 was 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. This is now being supported by the results and conclusions of the draft NWBMP 2022-2027.

6 4th National Biodiversity Action Plan 2023-2030

Ireland's 4th National Biodiversity Action Plan (NBAP) sets the national biodiversity agenda for the period 2023-2030 and aims to deliver the transformative changes required to the ways in which we value and protect nature. The 4th NBAP has been developed with the support, advice and input of the interdepartmental Biodiversity Working Group and the independent Biodiversity Forum. Ireland's 2nd National Biodiversity Conference was held to gather insights and recommendations for the development of the NBAP and a public consultation process was held to provide further opportunities to engage with the Plan.

The 4th NBAP strives for a "whole of government, whole of society" approach to the governance and conservation of biodiversity. The aim is to ensure that every citizen, community, business, local authority, semi-state and state agency has an awareness of biodiversity and its importance, and of the implications of its loss, while also understanding how they can act to address the biodiversity emergency as part of a renewed national effort to "act for nature".

The delivery of rehabilitation via PCAS is expected to significantly contribute in the future to actions and targets of the 4th National Biodiversity Action Plan 2023-2030, particularly in relation to peatland restoration, nature restoration and creation of new habitats such as wetlands and woodlands.

7 EU Nature Restoration Law

The EU Nature Restoration Law is a key element of the EU Biodiversity Strategy, which sets binding targets to restore degraded ecosystems, in particular those with the most potential to capture and store carbon and to prevent and reduce the impact of natural disasters. The regulation combines an overarching restoration objective for the long-term recovery of nature in the EU's land and sea areas with binding restoration targets for specific habitats and species. These measures should cover at least 20% of the EU's land and sea areas by 2030, and ultimately all ecosystems in need of restoration by 2050.

This regulation has now been adapted and it is expected that all Member States will be required to produce a National Restoration Plan within two years of adoption. This will be led by the National Parks and Wildlife Service and will comprise a broad and deep public participation process, informed by robust ecological and socio-economic impact assessments. Bord na Móna are working with NPWS to identify bog restoration and other re-wetted cutaway sites that can contribute towards Irelands targets for the Nature Restoration Law.

8 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.

9 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.

10 All-Ireland Pollinator Plan 2021-2025

The All-Ireland Pollinator Plan 2021-2025 outlines key objectives and actions to protect and support pollinating insects and the habitats they rely on. A Bord na Móna specific action in this plan includes 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.

11 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.

12 National Archaeology Code of Practice

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 Practice relating to management of any archaeological finds that may arise during cutaway peatland rehabilitation and decommissioning.

13 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.

14 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.

15 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 VI. DECOMMISSIONING

1. Condition 10 Decommissioning

Decommissioning 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 termination 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	Derryarogue 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
4	Decommissioning or Removal of Buildings and Compounds	Decommissioning or Removal of Buildings and Compounds
5	Decommissioning Fuel Tanks and associated facilities	Where relevant
6	Decommissioning and Removal of Bog Pump Sites	Where relevant
7	Decommissioning or Removal of Septic Tanks	Where relevant

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.

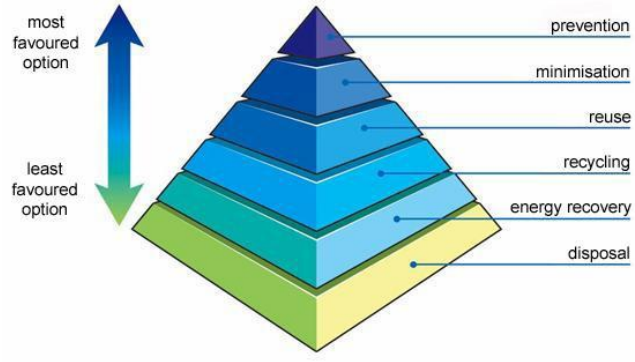
7.3.5 The tonnages and EWC Code for the waste materials listed in *Schedule 2(i) Hazardous Wastes for Disposal/Recovery* and *Schedule 2(ii) Other Wastes for Disposal/Recovery* sent off-site for disposal/recovery.

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.

APPENDIX VII. 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 embryonic *Sphagnum*-rich plant communities in these conditions if the peat can be re-wetted. This brings the opportunity of re-developing embryonic *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 cannot 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.

Environmental stabilisation: 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 Licence. 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 stabilisation.

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).

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 VIII. 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 P0504-01, Mountdillon Group of Bogs located in Co. Longford.

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 the Mountdillion bog group 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:
Lough Ree Power Station screens the peat from the bogs 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 P0504-01 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' December 2012. 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:

- Secure the stability of the waste
- Put in place measures to prevent pollution of soil, surface water and ground water.
- 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,	01 01 02	None	Removed by screen at the	Tractor and trailer.

	reincorporated into low areas, agreed with the Agency, and stabilized under normal natural bog conditions			factory and transported by tractor and trailer to the designated and agreed locations	
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:

- 10.1 Following termination 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.
- 10.1.2 Implement the agreed cutaway bog rehabilitation plan (refer Condition 10.2).

10.2 Cutaway Bog Rehabilitation Plan:

- 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.
- 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:

- 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).
- 10.3.2 The criteria which define the successful rehabilitation of the activity or part thereof, which ensures minimum impact to the environment.
- 10.3.3 A programme to achieve the stated criteria.
- 10.3.4 Where relevant, a test programme to demonstrate the successful implementation of the rehabilitation plan.
- 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 Mountdillion 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 Mountdillion IPPC Licence P0504-01.

APPENDIX IX. MITIGATION MEASURES FOR THE APPLICATION OF FERTILISER

- Any fertiliser used will be Rock Phosphate and will not be applied in the following conditions:
    1. The land is waterlogged;
    2. The land is flooded, or it is likely to flood;
    3. The land is frozen, or covered with snow;
    4. Heavy rain is forecast within 48 hours (forecasts will be checked from Met Éireann).
    5. 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.
- No fertiliser will be spread on land within 2 metres of a surface watercourse.
- 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*

APPENDIX X. 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 ……

3) Records

Revision Index			
Revision	Date	Description of change	Approved
1	13/09/2020	First release	EMcD
2			

Bord na Móna

Lough Bannow Bog

Draft Cutaway Bog Decommissioning and Rehabilitation Plan

2025

This document seeks to address the requirements of Condition 10.2 of IPC License Ref. P0504-01:

> "*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 Lough Bannow 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 fully ceased at Lough Bannow Bog (also known as Derryadd 3).

Bord na Móna have defined the key rehabilitation outcome at Lough Bannow Bog as environmental stabilisation.

*This rehabilitation plan has been updated but not fully finalised. As such it remains a **draft** rehabilitation plan until it is fully finalised. Bord na Móna expect to finalise these rehabilitation plans in the future as part of its overall peatland rehabilitation programme.*

Any consideration of any other future after-uses for Lough Bannow Bog, 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.

Document Control Sheet	
Document Name:	Lough Bannow Bog - Cutaway Bog Decommissioning and Rehabilitation Plan 2024
Document File Path:	Z:\EPA draft rehab plans 2017 word docs\Mountdillon ref.504 (Lough Ree)\Lough Bannow\Lough Bannow Sub Con Rehab
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This document comprises:	DCS	TOC	Text (Body)	References	Maps	No. of Appendices
	1	1	29	4	0	12

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Rev.	1.1	Author(s):	Checked By:	Approved By:
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Rev.	1.1	Author(s):		Approved By:
Name(s):		MMC		MMC
Date:		07/01/2025		07/01/2025

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NON-TECHNICAL SUMMARY

- Bord na Móna is updating the draft rehabilitation plan for Lough Bannow Bog (also known as Derryadd 3), located approximately 7 km south-east of Lanesborough in Co. Longford.
- This rehabilitation plan has been prepared by Bord na Móna as part of obligations to carry out peatland rehabilitation via an IPC License issued by the Environmental Protection Agency.
- Lough Bannow Bog has been in full industrial peat production since the early 1960's and supplied Lough Ree Power Station in Lanesborough up until its closure in 2020. This bog has a pumped drainage regime.
- Industrial peat harvesting is now ceased at Lough Bannow Bog.
- A mosaic of habitats has established across Lough Bannow Bog as industrial peat extraction stopped in phases over the past 20 years. There is a mosaic of both wet and dry cutaway habitats present including wetlands and Birch scrub and woodland. There is also some bare peat remaining.
- The key objective of peatland rehabilitation is environmental stabilisation. This means developing vegetation and promoting re-establishment of more typical cutaway peatland communities such as Birch woodland, Reedbeds, fen habitat and *Sphagnum*-rich embryonic bog communities, where possible.
- Rehab measures will include drain-blocking and other measures to raise water levels to the surface of the bog, thus encouraging the development of naturally functioning cutaway peatland habitats.
- These rehabilitation measures will be planned by a team consisting of expert ecologists and engineers. It is a guiding principle of Bord na Móna rehabilitation planning that no actions or activities will be undertaken that would negatively impact on adjacent land. No boundary drains will be blocked. Water will still leave the bog via the existing outlets.
- Peatland rehabilitation of this bog 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.
- Drain blocking at Lough Bannow Bog will result in improved water quality, climate benefits with the reduction of carbon emissions and enhanced biodiversity when the residual peat is re-wetted.
- Many Bord na Móna bogs cannot be restored back to raised bog, as the majority of peat has been removed and the environmental conditions have been modified. However other natural habitats will develop, like poor fen and *Sphagnum* rich embryonic bog communities (on deeper peat); and wetlands with Reedbeds and Birch woodland on shallower peat. In time a naturalised peatland can be developed.
- It will take some time for vegetation and habitats to fully develop at Lough Bannow Bog, and a peatland ecosystem to be restored. However, it is expected that most of the remaining bare peat will be developing pioneer habitats after 5-10 years.
- A range of cutaway peatland habitats are already starting to develop at Lough Bannow Bog. Woodland and scrub have developed on gravel mounds and in lower-lying areas some small wetland features are developing. More established habitats are present around the margins of the bog.
- Lough Bawn pNHA, overlaps the south-east corner of the site and has been subject to rehabilitation (some drain-blocking) in the past (2017). This area contains two Annex I habitats, bog woodland and transition mire and quaking bog.
- The development of a range of habitats at Lough Bannow 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.

- This peatland rehabilitation plan does not outline future after-use or development. Bord na Móna continually reviews its land-bank to consider future commercial or industrial developments. Any other proposed development will be planned in adherence to relevant planning guidelines and will consider the rehabilitation and the condition of the bog.

1. INTRODUCTION

Bord na Móna operates under IPC Licence issued and administered by the EPA to extract peat within the Mountdillon bog group (Ref. P0504-01). 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. Lough Bannow Bog is part of the Mountdillon bog group (see Appendix I for details of the bog areas within the Mountdillon bog group).

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 (Appendix V).
- 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 measures.
- Budget and Costings.
- Associated aftercare, maintenance, and monitoring.

Note: This plan should be read in conjunction with the accompanying Map book.

Bord na Móna have announced the complete cessation of industrial peat production across its estate (January 2021).

This **draft** rehabilitation plan outlines the proposed approach to be taken for IPC compliance in respect of Lough Bannow Bog and how the site will be rehabilitated. Bord na Móna is fully committed to meeting its obligations relating to rehabilitation and decommissioning under the Integrated Pollution Control Licence.

It has been 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 are supported by Government through 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. The Peatlands Climate Action Scheme is expected to operate between 2021-2026. Over 13,000 ha of cutaway peatlands have already been rehabilitated as part of this scheme to date across multiple Bord na Móna peatlands. Enhanced rehabilitation measures that have been proposed as part of other PCAS projects have **NOT** been proposed as part of this **draft** Lough Bannow rehabilitation plan at this stage (2025). The potential implementation of enhanced rehabilitation measures at Lough Bannow will be dependent on the selection of Lough Barrow as a site to be included in PCAS in the future.

1.1 Constraints and Limitations

This document seeks to address the requirements of Condition 10.2 of IPC License Ref. P0504-01:

> "*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.*"

Parts of Lough Bannow Bog (around the perimeter of the site) are currently being used by domestic turf cutters for intensive private sod peat production. These areas are ecologically and hydrologically linked to the area owned by Bord na Móna where rehabilitation is planned. It is beyond the scope of this rehabilitation plan to address turf cutting issues on Lough Bannow Bog that are outside of the control of Bord na Móna. Nevertheless, Bord na Móna are aware of such issues which may constrain the proposed rehabilitation actions, and this rehabilitation plan considered potential impacts of these on the delivery of the stated objectives.

Rehabilitation in other areas of the bog may also be constrained due to other property issues or issues such as rights of way.

Any consideration of any other future after-uses for Lough Bannow Bog 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. 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 surveys, additional confirmatory site visits (covering the period 2012 to 2022 inclusive) and monitoring and desktop analysis, forms the basis for the development of this 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-practice 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 peat depth data;
- Hydrological modelling;

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 practice guidance (full citations are in the References Section):

- Anderson *et al*. (2017). An overview of the progress and challenges of peatland restoration in Western Europe.
- Barry, T.A. et al (1973). A survey of cutover peats and underlying mineral soils. Soil Survey Bulletin No. 30. Dublin, Bord na Móna and An Foras Taluntais.
- Bonn *et al*. (2017). Peatland restoration and ecosystem services- science, policy and practice.
- Carroll *et al*. (2009). *Sphagnum* in the Peak District. Current Status and Potential for Restoration. Moors for the Future Report No 16.
- Clark & Rieley (2010). Strategy for responsible peatland management.
- Eades *et al*. (2003). The Wetland Restoration Manual.
- Farrell & Doyle (2003). Rehabilitation of Industrial Cutaway Atlantic Blanket Bog, NW Mayo, Ireland.
- Feehan, J. (2004). A long-lived wilderness. The future of the north midlands peatland network. Department of Environmental Resource Management, UCD.
- Foss, P.J., Crushell, P. & Gallagher, M.C. (2017) Title: Counties Longford &Roscommon Wetland Study. Report prepared for Longford and Roscommon County Councils.
- Gann *et al*. (2019). International Principles and Standards for the practice of Ecological Restoration.
- Hinde *et al*. (2010). *Sphagnum* re-introduction project: A report on research into the re-introduction of *Sphagnum* mosses to degraded moorland. Moors for the Future Research Report 18.

- Joosten & Clarke (2002). Wise Use of mires and peatlands – Background and Principles including a framework for Decision-making.
- Lindsay (2010). Peatbogs and Carbon: A Critical Synthesis to Inform Policy Development in Oceanic Peat Bog Conservation and Restoration in the Context of Climate Change.
- Mackin *et al*. (2017). Best practice in raised bog restoration in Ireland. Irish Wildlife Manuals, No. 99. National Parks and Wildlife Service,
- McBride *et al*. (2011). The Fen Management Handbook (2011), Scottish Natural Heritage.
- McDonagh (1996). Drain blocking by machines on Raised Bogs. Unpublished report for National Parks and Wildlife Service.
- NPWS (2017a). National Raised Bog Special Areas of Conservation management plan. Department of Arts, Heritage and the Gaeltacht.
- Pschenyckyj et al., 2021, Optimising Water Quality Returns from Peatland Management while Delivering Co-Benefits for Climate and Biodiversity. An Fóram Uisce.
- Quinty & Rochefort (2003). Peatland Restoration Guide, second edition. Canadian *Sphagnum* Peat Moss Association and New Brunswick Department of Natural Resources and Energy.
- Regan*, et. al.* (2020). Ecohydrology, Greenhouse Gas Dynamics and Restoration Guidelines for Degraded Raised Bogs. EPA Research Report. Prepared for the Environmental Protection Agency by Trinity College Dublin.
- Renou-Wilson *et al*. (2011). BOGLAND - Sustainable Management of Peatlands in Ireland. STRIVE Report No 75 prepared for the Environmental Protection Agency.
- Schouten (2002). Conservation and Restoration of Raised Bogs: Geological, Hydrological and Ecological Studies. Dúchas - The Heritage Service of the Department of the Environment and Local Government, Ireland;
- Thom (2019). Conserving Bogs – Management Handbook.
- Wheeler & Shaw (1995). Restoration of Damaged Peatlands – with Particular Reference to Lowland Raised Bogs Affected by Peat Extraction.
- Wittram *et al*. (2015). A Practitioners Guide to Sphagnum Reintroduction. Moors for the Future Partnership.

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

- Mountdillon bog group Integrated Pollution Control Licence;
- Mountdillon bog group 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);
- Historic Environment Viewer at https://webgis.archaeology.ie/historicenvironment/
- 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 2022-2027;
- Bord na Móna Annual Report 2024.
- 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 are 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. As part of this exercise, Lough Bannow Bog was surveyed in July of 2012. Additional ecological walk-over surveys and visits have taken place at Lough Bannow Bog between 2014-2019. Habitat maps have been updated, where required. This rehabilitation plan is informed by the original baseline survey as well as subsequent confirmatory site walk-over surveys and visits, and updates to baseline data.

Habitat mapping followed best practice 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 (2019), while mosses and liverworts nomenclature follows identification keys published by the British Bryological Society (2010). A more detailed Bord na Móna classification system was previously 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).

A detailed ecological survey report for Lough Bannow Bog is contained in Appendix II.

3. SITE DESCRIPTION

Lough Bannow Bog is situated approximately 7 km south-east of Lanesborough, Co. Longford along the R392 Road. The R398 public road runs along the north of the site while a secondary road (Keenagh road) runs along part of the southern section of the bog. The Royal Canal passes within 500 metres of eastern edge of the site. Two large mineral islands are located within the site boundaries but are not under BnM ownership.

Much of Lough Bannow is now cutaway and the majority of the original raised bog has now been removed. In some places there are exposed sub-soils. Peat depth is in general shallow and between 0.5-1.5 of residual fen or minerotrophic peat remains. Some isolated pockets with residual peat of deeper than 2 m also occur at Lough Bannow. Pioneer cutaway habitats have started to develop across Lough Bannow. In some areas woodland habitats are developing on gravel mounds while small wetlands are developing in low-lying areas.

See Drawing number BNM-ECO-23-27-01 titled ***Lough Bannow Bog: Bog Site Location***, included in the accompanying Mapbook[1] , which illustrates the location of Lough Bannow Bog in context to the surrounding area.

3.1 Status and Situation

3.1.1 Site history

Industrial peat production commenced at Lough Bannow in the 1960's and ceased in 2020. Lough Bannow Bog formerly supplied fuel peat for Lough Ree Power Station in Lanesborough. This power station has now stopped electricity generation.

3.1.2 Current land-use

Overall, this site varies greatly from areas that are re-vegetating rapidly since industrial peat extraction ceased to bare peat areas that were still in industrial peat extraction until relatively recently (2020). The majority of the site is now developing pioneer cutaway peatland habitats and bare peat cover is reducing. Some parts of the site have recently developed pioneer wetlands communities including Reed beds. The drier sections of the site have developed areas of Birch dominated scrub with some woodland.

Topographically, the site undulates and has regular small hills of gravel that are exposed between basins of low-lying peat. A rail line crosses the site in an east-west direction, dissecting the site into a much larger northern section and a smaller southern section.

A conifer plantation was planted by Coillte in 1995 and is comprised of Sitka and Norway spruce. Some sections of this plantation had trees of poor quality and were in need of thinning and fertilisation. In general, the forestry quality was extremely poor, with dead or dying trees throughout. Birch and Scots Pine had become established in areas of the plantation and appeared to be doing much better than the Spruce.

There was hydrological management via pumping to support the former industrial peat production and its infrastructure. Pumping is ongoing during the decommissioning phase. Lough Bannow Bog contains three

[1] Cutaway Bog Decommissioning and Rehabilitation Plan – Lough Bannow Bog Map Book

pumps (one to the south and two along the northern boundary). Some of the drains in the east of the site have been excavated down to limestone bedrock.

There are some areas of active turbary around the margins of the site. These are mapped in the accompanying Mapbook. See Appendix II for more detail on site, habitats and local features.

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 Lough Bannow Bog, jobs included in the above study would have included those to facilitate peat extraction for the supply of fuel peat for Lough Ree Power.

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 industrial peat extraction at this bog.

3.2 Geology and Peat Depths

3.2.1 Sub-soil geology

The underlying geology[2] of Lough Bannow Bog is comprised of Agrillaceous Limestones (Visean), Ballysteen Formation, Moathill Formation and Meath Formation.

3.2.2 *Peat type and depths*

Much of Lough Bannow is now cutaway and the majority of the original raised bog has now been removed. In some places there are exposed sub-soils. In general, there is between 0.5-1.5 of residual fen or minerotrophic peat. This will have a significant influence on the development of future pioneer habitats. There are also some

[2] https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=de7012a99d2748ea9106e7ee1b6ab8d5&scale=0

small isolated pockets with residual peat of deeper than 2 m. This may have the potential to develop embryonic *Sphagnum*-rich peat-forming communities if optimum hydrological conditions can be developed.

3.3 Key Biodiversity Features of Interest

Lough Bannow is one of a cluster of bogs that has developed along the floodplains of the River Shannon. It is susceptible to being partially inundated with water during winter periods. A portion of the former industrial peat production areas lie below the winter flood level of the Shannon.

The different cutaway habitats developing across the site reflects the underlying and varying environmental conditions. Environmental factors such as hydrology, residual peat depths and topography all have a significant influence on the future development of cutaway habitats and proposed rehabilitation. Hydrology tends to have the most significant influence on the development of cutaway habitats. All sites have hydrological gradients from wet to dry habitats. Shallow residual peat usually means there are stronger fen influences on the pioneer cutaway development as fen peat is the residual peat type and ground-water has a stronger influence.

Woodland habitats are developing on some mineral mounds across the site. Some of these are mature and contain mature trees and typical species of Oak-Ash-Hazel Woodland (WN2). Areas of Birch-dominated scrub that are becoming species rich and likely to develop into Oak-Ash-Hazel woodland (WN2) in the future. Small wetlands are developing across the site and these attract some wetland bird species. Pioneer dry calcareous grassland (GS1) developing on cutaway on gravel hills and ridges. This pioneer habitat adds significantly to the overall diversity of the site. Otters are using the drains in the north eastern section of the site and are likely to be using the drainage system that is connected to the Royal Canal. Curlew and Merlin have both considered to be breeding within the vicinity of the site within the (although neither are thought to be actually nesting on-site). Nevertheless, Lough Bannow may be of value to these species for foraging during the breeding season. Larval food webs for Marsh Fritillary have been recorded in Lough Bannow (Tobin, 2019).

The site also contains a former lough called Lough Bawn, which is now a transition mire (PF3). This area is also a pNHA. This area is of high ecological value, is species-rich and contains two Annex I habitats, bog woodland and transition mire and quaking bog. It is part of an intact bog remnant that also includes some raised bog (PB1).

A detailed ecological report is provided in Appendix II.

3.3.1 Current habitats

The most common habitats[3] present in the former production areas at Lough Bannow Bog include:

- Poor fen (pEang, pJeff, pTyp, pPhrag and pTrig)
- Bare peat (0-50% cover) (BP)
- Pioneer dry calcareous and neutral grasssland (*Centaureo-Cynosuretum*) (gCal)
- *Tussilago farfara*-dominated community (vegetation > 50%) (Colt's Foot) (DisCf)
- Pioneer *Campylopus*-dominated community (pCamp)

3 Codes refer BnM classification of pioneer habitats of production bog and Heritage Council habitat classification, Fossitt 2000

- Rip - riparian areas (streams/drains with fringing habitats)
- Birch dominated scrub (ebir, oBir and cBir)
- Exposed gravel
- Pioneer dry Calluna vulgaris-dominated community (Heather) (dHeath)
- Temporary open water (tow)
- Conifer plantation (WD4)
- Transition mire and quaking bog (PF3)
- Birch woodland (WN7)
- Raised bog (PB1) remnant
- Oak-Ash-Hazel woodland (WN2)
- Possible calcareous springs (FP1)
- Dense Bracken (HD1)
- Wet grassland (GS4) along the fringes of the bog

See Drawing number BNM-ECO-23-27-17 titled ***Lough Bannow Bog: Current Habitat Map***, included in the accompanying Mapbook, which illustrates the habitats at Lough Bannow Bog.

3.3.2 Species of conservation interest

A number of species of conservation concern have been recorded at Lough Bannow Bog. The following is a summary of the records of these species available within both BnM records and those of the National Biodiversity Data Centre (NBDC).

Multiple mammal species have been recorded at Lough Bannow Bog including Irish Hare (*Lepus timidus subsp. Hibernicus)*, Eurasian Badger (*Meles meles),* Pine Marten (*Martes martes*) and European Otter (*Lutra lutra*).

Regarding lepidoptera species, there are NBDC/BNM records for the following species at Lough Bannow: Brimstone (*Gonepteryx rhamni*), Common Blue (*Polyommatus icarus*), Green Hairstreak (*Callophrys rubi*), Green-veined White (*Pieris napi*), Large Heath (*Coenonympha tullia*), Large White (*Pieris brassicae*), Orange-tip (*Anthocharis cardamines*), Peacock (*Inachis io*), Silver-washed Fritillary (*Argynnis paphia*), Small Copper (*Lycaena phlaeas*), Painted Lady (*Vanessa cardui*), Small Heath (*Coenonympha pamphilus*) and Speckled Wood (*Pararge aegeria*). Marsh Fritillary (*Euphydryas aurinia*) was recorded at Lough Bannow as part of the surveys carried out for the previous Derryadd Wind Farm application (Planning Ref. No. ABP-303592-19).

Numerous bird species are known to use the cutover bogs in Ireland's midlands as breeding grounds, wintering grounds or both. Raven (*Corvus corax*), Skylark (*Alauda arvensis*), Sand Martin (*Riparia riparia*), Common Gull (*Larus canus*), Snipe (*Gallinago gallinago*), Meadow Pipit (*Anthus pratensis*), Swallow (*Hirundo rustica*), Dunnock (*Prunella modularis*), Blackbird (*Turdus merula*), Chaffinch (*Fringilla coelebs*), Wood Pigeon (*Columba palumbus*), Pheasant (*Phasianus colchicus*) and Magpie (*Pica pica*) have all been recorded during BNM ecology surveys.

NBDC records for red-listed[4] bird species of conservation concern recorded in the 10km squares (N06, N16) which Lough Bannow intersects include; Barn Owl (*Tyto alba*), Bewick's Swan (*Cygnus columbianus subsp. bewickii*), Black-headed Gull (*Larus ridibundus*), Common Redshank (*Tringa totanus*), Corncrake (*Crex crex*), Curlew (*Numenius arquata*), Golden Plover (*Pluvialis apricaria*), Herring Gull (*Larus argentatus*), Lapwing (*Vanellus vanellus*), Northern Pintail (*Anas acuta*), Northern Shoveler (*Anas clypeata*), Red Grouse (*Lagopus lagopus*) and Yellowhammer (*Emberiza citrinella*) and Grey Partridge (*Perdix perdix*).

A review of the Ornithology Chapter for the previously proposed Derryadd Wind Farm Ecological Impact Assessment Report (EIAR)[3] (Planning Ref. No. ABP-303592-19) was also undertaken. The below paragraphs provide a summary of the bird species of conservation concern recorded during surveys (from 2015) to inform the above was undertaken. A full list of bird species recorded within and adjacent to the bog, in the wider study area, is provided in the EIAR.

Surveys in the wind farm study area recorded Red Listed (BoCCI) species including Curlew, Redshank, Herring Gull, Grey Wagtail, Lapwing and Wigeon. The results of the breeding bird surveys (2015, 2016 and 2017) undertaken in the wider wind farm study area also recorded several additional Red List species (BoCCI), including; Woodcock, Curlew, Lapwing and Quail. A number of species recorded during the winter months in the wind farm study area are listed on Annex I of the EU Birds Directive, namely; Golden Plover, Greenland White-fronted Goose, Hen Harrier, Kingfisher, Merlin and Peregrine Falcon. Golden Plover, Hen Harrier, Merlin and Peregrine Falcon were also recorded during breeding season surveys along with Common Tern and Little Egret. Habitat is limited for many of these species at Lough Bannow however.

It should be noted that much of the wildfowl, wader and gull observations recorded as part of the ornithological study were associated with the River Shannon and associated wet grasslands to the north of the site.

3.3.3 Invasive species

There are no NBDC/BNM records for invasive species at Lough Bannow Bog. A broad range of common garden escapes are also occasionally present around the margins of Bord na Móna bogs. Although spatial overlap with the rehabilitation work is expected to be limited, these are, where necessary, to be treated in line with best practice during rehabilitation.

3.4 Statutory Nature Conservation Designations

There are a number of European Sites (SAC's or SPA's) in close proximity (i.e. within a 5km radius at minimum) to Lough Bannow Bog. Lough Bannow Bog has no overlapping EU designated sites. The nearest EU Designated sites to Lough Bannow Bog are as follows:

- Mount Jessop SAC (Site Code: 002202) – 3.4 km east of Lough Bannow
- Lough Forbes Complex SAC (site code: 001818) – 8.2 km to the north east of Lough Bannow
- Ballykenny-Fisherstown Bog SPA (site code: 004101) – 8.2 km to the north east of Lough Bannow
- Brown Bog (site code: 002346) – 8 km to the north of Lough Bannow

[4] Gilbert G, Stanbury A and Lewis L (2021), "Birds of Conservation Concern in Ireland 2020 –2026". Irish Birds 9: 523—544

[3] Tobin, 2019, Derryadd Wind Farm Environmental Impact Assessment Report (EIAR), Volume II, EIAR Main Report.

- Lough Ree SAC (Site Code: 000440) – 4.2 km to the west of Lough Bannow
- Lough Ree SPA (Site Code: 004064) – 4.7 km to the west of Lough Bannow
- Fortwilliam Turlough SAC (site code: 000448) – 4.6 km to the south-west of Lough Bannow

One non-statutory designated site, Lough Bawn pNHA, overlaps the south-east corner of the site and has been subject to rehabilitation in the past. A number of non-statutory designated sites also occur in the wider area around Lough Bannow Bog. Lough Ree pNHA (NPWS Site Code: 002103), occurs approximately 4.2 km to the west of Lough Bannow. Mount Jessop NHA (NPWS Site Code: 001450), occurs approximately 3.4 km to the east of Lough Bannow. Forthill Bog NHA (NPWS Site Code: 001448), occurs approximately 3.8 km to the south of Lough Bannow. Lisnanarriagh Bog NHA (NPWS Site Code: 002072), occurs approximately 10.8 km to the west of Lough Bannow Bog.

See drawing *BNM-ECO-23-27-23:* ***Lough Bannow Bog Proximity to Designated Sites*** in the accompanying map book.

3.4.1 Other Nature Conservation Designations

The Ramsar Convention entered into force in Ireland on 15th March 1985. Ireland currently has 45 sites/wetlands designated as Wetlands of International Importance (Ramsar Sites). These cover a surface area of 66,994ha. There are no Ramsar sites located in proximity to Lough Bannow Bog.

3.5 Hydrology and Hydrogeology

Lough Bannow bog forms part of the Upper Shannon Catchment (Catchment ID: 26C) as defined by the EPA under the Water Framework Directive (WFD). The bog lies within the Shannon [Upper]_SC_80, Shannon [Upper]_SC_60 and Bilberry_SC_10 sub-catchments.

There are several rivers and streams within the site and around the margins that drain the site. The Ballynakill_26 River (EPA code: 26B22) runs along the northern boundary in a northerly direction where it flows into the River Shannon downstream. The Bilberry (26B03) River rises near the south west of the bog and its tributary, the Ledwithstown_26, rises near the south eastern boundary, both flow in a south westerly direction. The Bilberry eventually discharges to Lough Ree, located in the Shannon [Upper]_SC_9 sub-catchment.

The bog has field drains running in a general north to south orientation. Lough Bannow Bog has a pumped drainage system and there are three sets of pumps at the bog to facilitate drainage from several discharge points for the former peat production and support of infrastructure.

GSI data indicates that the majority of Lough Bannow Bog lies within a locally important aquifer – bedrock which is moderately productive only in local zones. An aquifer is an underground body of water-bearing rock or unconsolidated materials (gravel or sand) from which groundwater can be extracted in useful amounts. GSIs Aquifer classes are divided into three main groups based on their resource potential, and further subdivided based on the type of openings through which groundwater flows. There are nine aquifer categories in total. Locally important aquifers are capable of supplying locally important abstractions (e.g. smaller public water supplies, group schemes), or good yields (100-400 m^3/d). This data gives an indication of sub-surface deposits (bedrock and unconsolidated materials) in terms of their groundwater resource potential and dominant groundwater flow type.

Regionally important aquifers are those in which the network of fractures, fissures and joints, through which groundwater flows, is well connected and widely dispersed, resulting in a relatively even distribution of highly permeable zones. There is good aquifer storage and groundwater flow paths can be up to several kilometres in length. There is likely to be substantial groundwater discharge to surface waters ('baseflow') and large (>2,000 m^3/d), dependable springs may be associated with these aquifers.

The majority of Lough Bannow Bog is located in an area mapped by GSI as of low groundwater vulnerability (GSI Map viewer), with the two mineral islands to the centre and west mapped as moderate groundwater vulnerability. 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. These data indicate there is generally low risk of any groundwater contamination occurring at this site.

Quaternary sediment maps show that Lough Bannow Bog is generally underlain by cutover raised peat. The two mineral islands to the centre and west of the site are underlain by till derived from limestones. This combination of sediment is common in the wider context surrounding the site.

3.6 Emissions to surface-water and watercourses

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. Industrial peat production has now permanently ceased at Lough Bannow Bog.

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 phase. Silt pond decommissioning will be considered when sites are deemed to be on a trajectory of environmental stability and peatland rehabilitation has been completed.

Lough Bannow Bog has 5 treated surface water outlets which discharge to the Upper Shannon (26C) and Upper Shannon (26E) catchments. The Derrygeel (26D77) River flows in close proximity to the north-west corner of the site into Lough Bannow Stream (26L12) and subsequently the River Shannon (Upper) (26S02). Two outlets are associated with Ballynakill_26 (26B2) River flow north and into the River Shannon (Upper) (26S02). The fourth outlet is located to the north east and provides hydrological connectivity with the Royal Canal. The fifth outlet is located in the south west and discharges to Bilberry (26B03) River which subsequently joins the Ledwithstown River (26L84) and discharges to Lough Ree. The River Shannon (Upper)_100 (26S02) is listed as being under pressure from peat extraction in the 2nd cycle of the River Basin Management Plan for Ireland and is indicated as remaining so in the third cycle. The Ledwithstown River (26L84) is listed as being under pressure from peat extraction in the 2nd cycle, but not indicated as being so in the third cycle.

Details of silt ponds, associated surface water emission points and monitoring and sampling locations are detailed in Drawing numbers BNM-ECO-23-27-02 titled ***Lough Bannow Bog: Structures and Sampling***, along with Drawing number BNM-ECO-23-27-WQ01 titled ***Lough Bannow Bog: Water Quality Map*** and included in the accompanying Mapbook, which illustrate the various drainage and water quality infrastructure present at Lough Bannow Bog.

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 Environmental Protection Agency.

Decommissioning and Rehabilitation Programme Water Quality Monitoring.

Rehabilitation of cutaway peatland is closely linked with control of emissions. One of the criteria for successful rehabilitation is stabilisation through re-vegetation, which will stabilise all substrates and in turn remove the need for further silt control measures. This site is already largely vegetated. Re-wetted peat also aids the primary objective of stabilizing peat, as when peat is re-wetted it is not vulnerable to wind erosion. Re-wetted peat and the development of wet peatland habitats can also act as sinks for silt and mobile peat, and increases additional retention time for solids, and the peatland vegetation can quickly stabilise this material within blocked drains on site (by acting like constructed wetlands).

Water quality of water discharges from restored peatlands normally improves as a result of bog restoration measures and the restoration of natural peatland processes (Bonn *et al*., 20017). Bog restoration 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) (DHLGH, 2024) 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 peatland 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 Lough Bannow has been completed. This discharge will have improved 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 watercourse receptors and the Shannon[Upper]_SC_080, Shannon [Upper]_SC_60 and Bilberry_SC_10 sub-catchments and will support the future status of the watercourses achieving Good Status.

Decommissioning and Rehabilitation Programme Water Quality Monitoring

Water quality monitoring will be established. 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 additional rehabilitation.

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 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.

3.7 Fugitive Emissions to air

Rehabilitation of the drained peatland will seek to re-wet the dry peat where possible. Collectively re-wetting and re-vegetating will minimise any risk of emission to air from dust.

3.8 Carbon emissions

Irish peatlands are a huge carbon store, containing more than 75% of the national soil organic carbon (Renou-Wilson et al. 2012). Peatland drainage and extraction transforms a natural peatland which acts as a modest carbon sink (taking in 0.1 to 1.1 t of carbon as CO2-C /ha/yr) into a cutaway ecosystem which is a large source of carbon dioxide (releasing 1.3 to 2.2 t of carbon as CO2-C /ha/yr) based on Tier 1 Emission factors (Evans et al. 2017). Renou-Wilson et al. (2018) reported losses of between 0.81 – 1.51 CO2-C /ha/yr from drained peatlands located in Ireland.

Re-wetting of dry peatlands will increase methane emissions (Gunther et al. 2020) as a consequence of the anoxic conditions within the peat body that provide a suitable environment for the microbial breakdown of plant litter and root exudates. Tanneberger et al. (2021) describes how peatland management has to choose between CO_2 emissions from drained peatlands or increased methane (CH_4) emissions from rewetted industrial peatlands. However, when radiative effects and atmospheric lifetimes of both GHG gases are considered and modelled, postponing rewetting increases the longterm warming effect of continued CO2 emissions (Gunther et al. 2020). This means the increase in methane due to rewetting of dry peatlands is still negated by the CO_2 emissions reductions. Further, Wilson et al. (2022) confirmed the benefit of rapid rewetting to achieve strong carbon reductions and potentially altering the warming dynamics from warming to cooling depending upon the climate scenario.

It is expected that Lough Bannow Bog will become a reduced Carbon source following rehabilitation. The potential of any cutaway site to develop as a 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 majority of the cutaway bog will develop as Birch woodland on drier areas and peripheral headlands. Large wetlands are expected to develop on shallow peat with open water, reed swamp and fen habitats with alkaline carbon emission factors. A small part of this bog is expected to develop regenerating wet *Sphagnum*-rich vegetation on deep peat areas.

3.9 Current ecological rating

(Following NRA (2009) Evaluation Criteria)

The majority of Lough Bannow Bog can be rated as **Local Importance; lower value to Local Importance; higher value.** Bare peat in the former industrial production area of Lough Bannow Bog are assessed as **local importance (lower value)**.

The revegetated former peat production areas to the east and west of the site and marginal habitats including woodland, scrub, pioneer cutaway habitats, fen, calcareous grassland, remnant raised bog, and wetlands may

act as a refuge and as ecological corridors for wildlife and are therefore deemed to be **locally important (higher value)**.

Lough Bawn pNHA contains several Annex I habitats and is an area of **National** importance.

4. CONSULTATION

4.1 Consultation to date

Consultation seeks 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.

There has been ongoing consultation about rehabilitation, biodiversity, and other general issues over the years about Mountdillon bog group, including Lough Bannow Bog, with various stakeholders in relation to:

- General consultation with range of stakeholders at annual Bord na Móna Biodiversity Action Plan review days 2010-2018.
- Longford Wetland Wilderness (general proposal led by Longford County Council and other stakeholders. This has had several iterations. See Lough Ree and Mid Shannon, Spirit Level 2017. A feasibility study for Longford County Council).
- Feehan, J. (2004) A Long-Lived Wilderness; the future of the north midlands peatland network UCD/NWWPC.
- Lauder, A. & O'Toole L. (2017). Concept development for a landscape-scale Wetland Wilderness Park in the Mid Shannon Region. A report funded by the Heritage Council's Heritage Grant Scheme.
- Foss, P.J., Crushell, P. & Gallagher, M.C. (2017). Counties Longford &Roscommon Wetland Study. Report prepared for Longford and Roscommon County Councils.
- Archaeological Liaison Committee (National Museum of Ireland & Dept of Culture Heritage and the Gaeltacht).
- 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.).
- Greenway development at Lough Bannow (Longford County Council).

To inform the current Plan, both national and local stakeholders, including neighbours whose land adjoins Lough Bannow Bog and local representatives of national bodies (such as Regional National Parks and Wildlife Service staff) and relevant offices in County Councils (such as the Heritage or Environmental Offices) will be contacted. Any identified local interest groups will be sought and informed of the opportunity to engage with this rehabilitation plan, and when identified invited to submit their comments or observations in relation to the proposed rehabilitation at Lough Bannow Bog.

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

4.2 Issues raised by Consultees

N/A Yet as consultation to finalise this rehabilitation plan has not commenced.

4.3 Bord na Móna response to issues raised during consultation

N/A Yet as consultation has not commenced.

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.
- Environmental stabilisation of the former peat production areas and mitigation of potential silt run-off.
- Stabilisation or reduction in water quality parameters of water discharging from the site (e.g. suspended solids).
- Reducing pressure on receiving waterbodies 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 the protection of exposed archaeological structures, their retention in situ and preservation into the future.
- 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.

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

- Natural colonisation will form the basis for the environmental stabilisation of the bare peat areas. Re-wetting of the cutaway, where possible, is a general rehabilitation strategy. The main target will be to maintain water-levels close to the peat surface, and to avoid the creation of large-water bodies, where possible. However, this is dependent on the topography of the cutaway bog and the final drainage regime. Re-wetting and water levels close to the peat surface accelerates the re-vegetation processes, the development of vegetation cover and therefore environmental stabilisation. There is already significant potential for the creation of wet cutaway habitats at Lough Bannow Bog due to the local topography (localised basins).
- It will take some time for stable naturally functioning habitats to fully develop at Lough Bannow Bog. This will happen over a longer timeframe 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 peatland 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.
- 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). Furthermore, only a small proportion of the bog has potential to develop *Sphagnum*-rich habitats in this timeframe. Nevertheless, re-wetting across the entire bog, will improve habitat conditions of the whole bog. 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). Reducing pressures due to former peat extraction activities at Lough Bannow Bog will contribute to stabilising or improving water quality status of receiving water bodies in general. Ultimately, improving the WFD status of the receiving waterbody will depend on reducing pressure from a range of different sources, including peatlands in general (private and Bord na Móna).

- Re-wetting in general will benefit the future preservation of most known and unknown archaeological features.

6. SCOPE OF REHABILITATION

The principal scope of this rehabilitation plan is the environmental stabilisation of the bog. This is defined by:

- The area of Lough Bannow Bog.
- EPA IPC Licence - Ref. P0504-01. 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. Lough Bannow bog is part of the Mountdillon bog group.
- The local environmental conditions of Lough Bannow Bog mean that drain blocking and hydrological management to re-wet peat where possible is the most suitable rehabilitation approach for this site.
- The key goals and outcomes of rehabilitation set by Bord na Móna. Bord na Móna have defined the key goal and outcome of rehabilitation at Lough Bannow Bog as **environmental stabilisation** and **optimising residual peat re-wetting where possible,** to enhance the development of compatible habitats.
- The cutaway is already developing a mosaic of woodland, grassland, wetland and cutaway peatland habitats. Much of this cutaway has largely stabilised. Rehabilitation is proposed to enhance residual peat re-wetting in these areas while taking account of existing habitats, future infrastructure and land-uses (e.g. amenity).
- Rehabilitation of Lough Bannow Bog will support multiple national strategies of climate action, biodiversity action and other key environmental strategies such was the Water Framework Directive.
- The time frame for the delivery of the planned rehabilitation will be undertaken according to available resources and appropriate constraints.
- It is not proposed to carry out rehabilitation on all marginal or peripheral cutover bog zones. Generally, these bog remnants are narrow, or are subject to turbary, and do not have positive bog restoration prospects.

6.1 Key constraints

- **Bog conditions.** Rehabilitation outcomes of sites are constrained by the environmental characteristics of these particular areas. Drain blocking can be widespread in scale with each field drain being blocked (e.g. Kellysgrove) or more localised with targeted drain-blocking (e.g. Mountlucas Wind Farm) and both can be very effective. This can be used in conjunction with local topographical features like natural hollows to manage water levels or with other typical features of cutaway peatlands like high peat fields, which act as berms to hold water to some extent.
- The majority of this bog has been cutaway. Lough Bannow bog has a pumped drainage regime, which will need to be considered as part of the wider rehabilitation.
- **Coillte.** An area covering approx. 35ha in the western section of the site is owned by Coillte and has been mapped as a constraint. No rehabilitation measures will be carried out within Coillte owned lands and the hydrology of this area will be considered when planning measures in the surrounding area.
- **Surrounding landscape and neighbours.** Another key constraint is the interaction between the Bord na Móna sites and the surrounding landscape. Care has to 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.
- **Turbary.** Some marginal areas of lough Bannow are subject to active turbary/turf cutting.

- **Archaeology**. There are archaeological features present at Lough Bannow Bog, which may constrain rehabilitation activities. The discovery of monuments or archaeological objects during peatland rehabilitation may potentially constrain the rehabilitation measures proposed for a particular area. The rehabilitation will optimise hydrological conditions for the protection of exposed archaeological structures, their retention in situ and preservation into the future. Any newly discovered archaeology may require rehabilitation measures to be reviewed and adapted. An Archaeological Impact Assessment (see Appendix X) will be carried out to mitigate against any impact on archaeology that may be found at Lough Bannow Bog. In the worst-case scenario works affecting the surface and sub-surface of the bog might disturb previously unknown archaeological deposits or artefacts without preservation by record taking place. Should any previously unknown archaeological material be uncovered during the rehabilitation works, it will be avoided and reported to the Bord na Móna Archaeological Liaison Officer and the National Museum of Ireland.
- **Public Rights of Way**. Public rights of way occur in the SW of Lough Bannow. 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. Two Rights of Way exist at or around the margin of Lough Bannow Bog.
- **Amenity development.** Longford County Council lodged a Part 8 Planning Application in 2021 named 'No. 88 Mid Shannon Wilderness Park trackways' which includes greenway or amenity walking/cycling tracks adjacent to Lough Bannow Bog. This proposed greenway and amenity track will form part of a wider proposal led by Longford County Council to develop a project called the Mid-Shannon Wilderness Park, which would develop amenity across BnM cutaway bogs.This amenity does not affect the planned rehabilitation.

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 drain blocking and other ground activities.

6.3 Key Exclusions

The scope of this rehabilitation plan does not cover:

- The longer-term development of stable naturally functioning habitats to fully develop at Lough Bannow Bog. The plan covers the short-term rehabilitation **actions** and **an additional monitoring and after-care programme** to monitor the rehabilitation and to respond to any needs.
- The area leased to and managed by Coillte.
- This plan is not intended to be an after-use or future land-use plan for Lough Bannow Bog.
- The longer-term management of this site, potentially as a nature conservation site, or for amenity, or for other uses in the future.

7. CRITERIA FOR SUCCESSFUL REHABILITATION

This section outlines what criteria will be used to indicate successful rehabilitation and what critical success factors are needed to achieve successful rehabilitation. All criteria used to indicate successful rehabilitation will be measured to validate the achievement of the rehabilitation goals and outcomes and validate the completion of the rehabilitation.

The key objective of this rehabilitation plan is **environmental stabilisation** and the stabilisation of any emissions from the site that related to the former industrial drainage 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 a naturally functioning peatland ecosystem; and
- mitigation of key emissions (e.g. potential suspended solids run-off).

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

- Rewetting of residual peat in the former peat production area to offset potential run off of suspended solids and to encourage and accelerate development of vegetation cover via natural colonisation. See Table 7.1 for 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.

With regard to predicting and estimating likely trends that might materialize 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 (Figure 7.1).

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

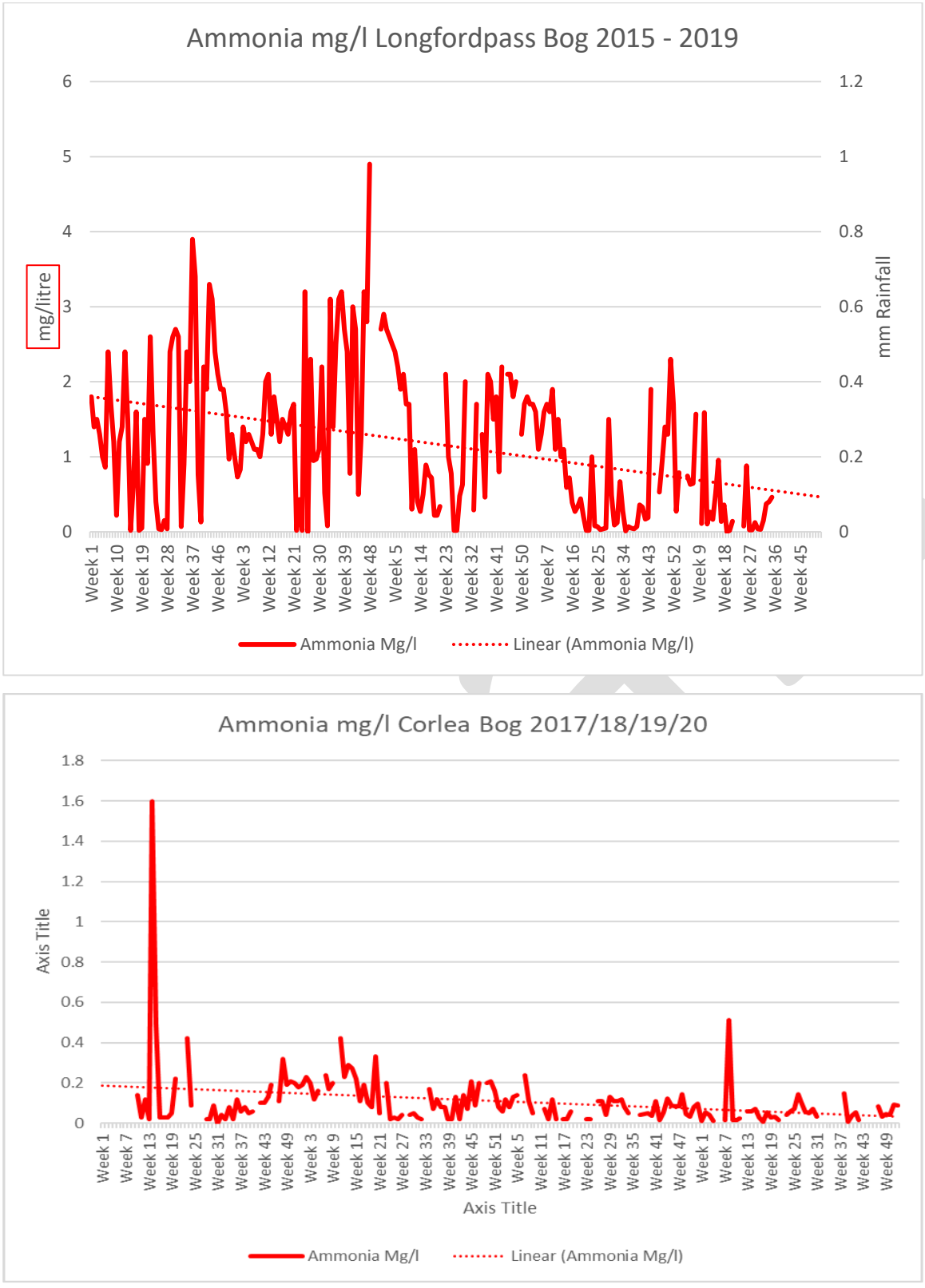

Figure 7.1. Ammonia levels over the period 2015-2019/2020 at Longfordpass and Corlea.

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 drainage.	Delivery of rehabilitation measures Delivery of more favourable hydrological regime.	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.	3 years
IPC validation	Key water quality parameters Ammonia, Phosphorous, Suspended solids, pH and conductivity	Reduction or stabilisation of key water quality parameters associated with this bog	Water quality monitoring for a period after rehabilitation has been completed	2 years
IPC validation	Reducing pressure from drainage on the local water body catchment (WFD)	Where this section of the water body (that this bog drains to) has not been identified as under pressure from peat extraction, that the intervening EPA monitoring programme associated with its Programme of Measures for this water body, confirms that its classification remains at not being at risk from peat extraction associated with activities at this bog.	EPA WFD monitoring programme	WFD schedule

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).** 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.
- **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 practice 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 and restoration 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. 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 restoration and rehabilitation requires detailed planning and the use of data from desktop surveys and field surveys. This data in association with topographical and hydrological modelling will be important in planning the future peatland landscapes and planning the use of the most appropriate rehabilitation methodologies based on environmental characteristic. Hydrological modelling indicates those areas that are likely to re-wet when drains are blocked, based on the current topography. This planning is 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).

A number of illustrative figures have been produced to inform Rehab Planning and Design, including Aerial Photography, Peat Depths and LiDAR Surface Maps, these are included in the accompanying Mapbook as the drawings referenced below:

BNM-ECO-23-27-21 titled ***Lough Bannow Bog: Aerial Imagery2020***

BNM-ECO-23-27-04 titled ***Lough Bannow Bog: Peat Depths***

BNM-ECO-23-27-03 titled ***Lough Bannow Bog: LiDAR Map***

The restoration and rehabilitation measures are provisionally outlined in drawing titled BNM-ECO-23-27-20 ***Lough Bannow Bog: Standard Rehabilitation Measures*** in the accompanying Mapbook.

These rehabilitation measures for Lough Bannow Bog will include (see Table 8.1):

- Re-assessment of the pumping regime and removing pumps or reducing pumping if this is desired and has no significant external impact or impacts on proposed future land-uses. Initial hydrological modelling indicates that a parts of the site will develop a mosaic of wetland habitats with some permanent deeper water if pumps are decommissioned, or pumping is reduced. 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, where possible. More sustainable permanent gravity drainage solutions will be examined. Some pumping may be retained. 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 of surrounding rivers.
- A widespread drain-blocking programme and hydrological management will be implemented across the cutaway, where possible. In general, field drains will be blocked where possible to re-wet cutaway peat and re-wet to the optimum water-level, where possible. More intensive measures will be targeted towards the bare peat.
- Less intensive measures (targeted drain-blocking) will be used in areas where habitats have already established.
- Hydrological management measures will include drain blocking (3/100m), modifying outfalls and managing water levels with overflow pipes.
- 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 silt run-off, 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).

Table 8.1: Types of and areas for rehabilitation measures at Lough Bannow Bog.

Type	Code	Description	Area (Ha)*
Deep peat cutover bog	DPT1	Regular drain blocking (3/100 m) + modifying outfalls and managing water levels with overflow pipes	52.2
Dry cutaway	DCT1	Modifying outfalls and managing water levels with overflow pipes	333.5
Wetland cutaway	WLT1	Turn off or reduce pumping to re-wet cutaway + modifying outfalls and managing water levels with overflow pipes	207.6
Marginal land	MLT1	No work required	108.5
Silt Pond	Silt Pond	Silt Pond	0.5
Constraint	Constraint	Constraint	55
Total Area			**757.2**

**Note that the types of rehab and areas of rehab may change in response to stakeholder consultation and refinement of the rehabilitation measures.*

8.1 Completed and Ongoing

- A significant part of the site has already re-vegetated, with pioneer vegetation maturing and developing a mosaic of typical cutaway peatland habitats with Birch woodland predominating. Bare peat areas within the older cutaway areas are reducing. Small wetlands are already developing. Natural re-colonisation of the cutaway so far has been quite effective. Other parts of the site (younger cutaway) are naturally colonising for more than 10 years and are developing a mosaic of cutaway habitats.
- A portion of the cutaway has already been developed as a conifer plantation by Coillte. This will be subject to ongoing forestry management and is excluded from this rehabilitation plan.
- Bog restoration was carried out in the remnant raised bog zone around Lough Bawn pNHA in 2017 (15 ha). An area of bog previously drained by Bord na Móna but never developed for peat extraction was re-wetted using peat dams to block the drains. This improved the condition of the buffer zone around Lough Bawn pNHA.

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

- Seek formal approval of the rehabilitation plan from the EPA.
- Develop a detailed site plan outlining how the various rehabilitation methods will be applied to Lough Bannow Bog. This will take account of peat depths, topography, drainage and hydrological modelling (see rehabilitation map for an indicative view of the application of different rehabilitation methodologies).
- A drainage management assessment of the proposed rehabilitation measures will be carried out and any issues identified resolved and the rehabilitation plan adapted.
- A review of known archaeology and an archaeological impact appraisal of the proposed rehabilitation will be carried out. The results of this assessment will be incorporated into the rehabilitation plan to minimise known archaeological disturbance, where possible.
- A review of issues that may constrain rehabilitation such as known rights of way, turbary and existing land agreements is to be carried out.

- An ecological appraisal of the potential impacts of the planned rehabilitation on the presence of sensitive ground-nesting bird breeding species (e.g. breeding waders) is to be carried out. The scheduling of rehabilitation operations will be adapted, where required.
- Ensure all activities comply with the environmental protection requirements of the IPC Licence.
- Carry out Appropriate Assessment (AA) of the Rehabilitation Plan. Incorporate any required mitigation measures from the AA, if needed, in the plan for the delivery of rehabilitation and decommissioning across the site.
- 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.

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

- Carry out proposed measures as per the detailed site plan. This will include intensive drain blocking and targeted hydrological management prescriptions in the cutaway. All rehabilitation will be carried out with regard to best practice environmental control measures (Appendix III).
- Monitor the success of rehabilitation measures in relation to developing suitable hydrological conditions.
- Carry out the proposed monitoring, as outlined in section 9.
- Silt ponds will be monitored during this period and there will be continued maintenance and cleaning to prevent potential suspended solids run-off from the site during the rehabilitation phase.

8.4 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 9 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.

8.5 Timeframe (when finalised)

- **Year 1**: Short-term planning actions.
- **Year 1-3**: Short-term practical actions.
- **Year 1-3**: Long term practical actions. Evaluate success of short-term rehabilitation measures outlined above and remediate where necessary.
- **> Year 3**: Decommission silt-ponds, if necessary

8.6 Budget and costing

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, 2024). 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 different cutaway types across the site.

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.
- These monitoring visits will also consider any requirements for further 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. This will be used to verify completion of rehabilitation measures. The extent of bare peat will be assessed using this baseline data, and habitat maps will be updated, if needed. It is proposed that sites can be monitored against this baseline in the future.
- **Water quality monitoring** at the bog will be established. 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.
- Monitoring results will be maintained, trended 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, and COD.
- This monthly sampling regime on a selected number of silt ponds will be carried out over a two-year cycle.
- If, after two years, key criteria for successful rehabilitation are being achieved and key targets are being met, then the water quality monitoring will be reviewed, with consideration of potential ongoing 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 criteria for successful rehabilitation have **not** been achieved and key targets have **not** been met, then the rehabilitation measures and status of the site will be evaluated and enhanced, where required. This evaluation may indicate no requirement for additional enhancement of rehabilitation measures but may demonstrate that more time is required before key criteria for 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 that are compatible the provision of biodiversity and ecosystem services, 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.

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: BOG GROUP CONTEXT

The Mount Dillon Bog Group IPC Licensed area is made up of two sub-groups (Lough Ree (the Mount Dillon Energy Peat Group) and Mostrim) and have been in industrial peat production for several decades. There are 28 defined sites covering a total area of 11,322 ha. Of the 28 sites, 23 mainly straddle the River Shannon within counties Roscommon and Longford, with five sites partially in County Westmeath to the east. Each bog area further comprises a range of habitats from bare milled peat former peat extraction areas to re-colonising cutaway to workshops areas and transport infrastructure. Industrial peat extraction from these sites mainly supplied ESB power stations at Lanesborough (LRP) or for horticultural peat products.

Industrial peat extraction in the Mount Dillon Bog Group ceased in 2019. Remaining milled peat stocks were utilised in Lanesborough (LRP) until the power station ceased electricity generation at the end of 2020. Remaining peat stocks have been transferred to other customers (Edenderry Power Station, Derrinlough Brickette Factory) between 2021-2023. Intensive decommissioning and rehabilitation for the Mount Dillon Bog Group started in 2020/2021.

One bog site, Cloonmore, was never used for industrial peat production and several bogs in the Mostrim group were drained but never fully developed and still retain typical high bog characteristics. These include Clonwhelan, Glenlough and a section of Mostrim. These sites have been zoned for biodiversity and a high bog drain blocking will be used to re-wet the high bog and encourage restoration of the raised bog habitat. Several sites (Glenlough, Mostrim, Clonwhelan and Clynan) were assessed by consultants for NPWS as part of the review of the raised bog Natural Heritage Area network (NPWS 2014).

The rehabilitation plan for the Mount Dillon Bog Group encompasses all areas involved in industrial peat production including former industrial peat production areas and associated facilities. It also includes rehabilitation measures for those bogs that were initially drained but not fully developed.

A breakdown of the component bog areas for the Mount Dillon Bog Group IPC License Ref. PO-504-01-01 is outlined in Table Ap-2.

Industrial peat production history varies across the Mount Dillon bog group, so there is a wide range of peat depths at present. Bogs close to Lanesborough tend to have shallower peat depths or have been cutaway, while some bogs on the periphery of the group tend to have deeper residual peat reserves. Several sites such as Mount Dillion and Derrycashel have been mostly cutaway to the fen peat layers or in some cases to expose the underlying gravel/sub-soil. Several bogs in the Mostrim group have only been partially developed or have had no industrial peat production, and have relatively deep peat depths remaining.

Table Ap-2: Mount Dillon Bog Group names, area and indicative status (Mount Dillon Energy Peat sub-group)

Bog Name	Area (ha)	Stage of development	Land-Use and History	Peat Production Cessation	Rehab Plan Status
Begnagh	265	Cutover Bog Industrial peat production commenced at Begnagh Bog in 1977 and ceased in 2020. Deep peat reserves remain on much of the former production area. Begnagh is considered a deep peat	Begnagh Bog formerly supplied a range of commercial functions including; fuel peat for Lough Ree Power Some areas of cutaway on site are developing pioneer cutaway vegetation communities.	2020	Finalised 2022 Rehab started in 2022

Bog Name	Area (ha)	Stage of development	Land-Use and History	Peat Production Cessation	Rehab Plan Status
		cutover bog.			
Clooneeny	358	Cutover Bog Industrial peat production commenced at Clooneeny Bog in 1985 and ceased in 2020. Deep peat reserves remain on much of the former production area. Clooneeny is considered a deep peat cutover bog.	Clooneeny Bog formerly supplied a range of commercial functions including; horticultural peat and fuel peat for Lough Ree Power Most of the former production area on site is bare peat. Some areas of cutaway on site are developing pioneer cutaway vegetation communities.	2020	Finalised 2022 Rehab started in 2022
Cloonmore	102	N/A	Never developed for industrial peat production; scattered plots.	N/A	N/A
Cloonshannagh	494	Cutover Bog Industrial peat production commenced at Cloonshannagh Bog in 1985 and ceased in 2020. Deep peat reserves remain across the former production area. Cloonshannagh is considered a deep peat cutover bog.	Cloonshannagh Bog formerly supplied a range of commercial functions including; horticultural peat and fuel peat for Lough Ree Power Restoration work has been carried out on a 38ha section of high bog within Cloonshannagh Bog. Some of the former production area on site is developing pioneer cutaway vegetation communities, the remainder of the site is bare peat.	2020	Finalised 2024 Rehab to start 2025
Cloonshannagh Rail Link	28	Cloonshannagh rail link is a link between sites.	N/A	N/A	N/A
Corlea	163	Cutaway Bog Industrial peat production commenced at Corlea Bog in 1960 and ceased in 2018. Long-term peat extraction has reduced peat reserves on this bog. Corlea is considered a shallow peat cutaway bog.	The former production area at Corlea has already extensively colonised. Pioneer wetland and scrub development has occurred over much of the site. Some wetland and rehabilitation management was undertaken between 2016-2018. Part of site leased to local community development group to develop amenity walkway in association with Longford County Council.	2018	Finalised in 2023 Rehab started in 2023
Derraghan	289	Cutover Bog Industrial peat production commenced at Derraghan Bog in the 1940's and ceased in 2020. Most of the former production area has shallow peat reserves. Some pockets of deep peat remain. Derraghan is considered a shallow peat cutover bog.	Derraghan Bog formerly supplied a range of commercial functions including; fuel peat for Lough Ree Power Much of the former production area at Derraghan has been out of production for some time. These areas have already extensively colonised with pioneer wetland and scrub vegetation communities.	2020	Finalised 2021 Rehab commenced 2022
Derryadd	653	Cutover Bog Industrial peat production commenced at Derryadd Bog in 1960 and ceased in 2020. Long-term peat extraction has reduced peat reserves on this bog. Most of the former production area has shallow peat reserves. Some pockets of deep peat remain. Derryadd is considered a shallow peat cutover bog.	Much of the former production area at Derryadd has been out of production for some time. These areas have already extensively colonised with pioneer wetland and scrub vegetation communities	2020	Draft plan Updated 2025
Derryadd2 (Derryadd East)	328	Cutover Bog Industrial peat production commenced at Derryadd 2 Bog in 1960 and ceased in 2020. Long-term peat extraction has reduced	Much of the former production area at Derryadd 2 has been out of peat production for some time. These areas have already extensively colonised with pioneer wetland and scrub vegetation communities	2020	Finalised 2023 Rehab started 2023

Bog Name	Area (ha)	Stage of development	Land-Use and History	Peat Production Cessation	Rehab Plan Status
		peat reserves on this bog. Most of the former production area has shallow peat reserves. Some pockets of deep peat remain. Derryadd 2 is considered a shallow peat cutover bog.			
Derryarogue	895	Cutover Bog Industrial peat production commenced at Derryarogue Bog in 1941 and ceased in 2020. Long-term peat extraction has reduced peat reserves on this bog. Most of the former production area has shallow peat reserves. Some pockets of deep peat remain. Derryarogue is considered a shallow peat cutover bog.	Much of the former production area at Derryarogue has been out of production for some time. These areas have already extensively colonised with pioneer wetland, cutaway and scrub vegetation communities. Part of Derryarogue will be rehabilitated as part of PCAS in 2023 An amenity walkway through part of Derryarogue..	2020	Derryarogue West Finalised in 2023 Rehab started in 2023 Derryarogue Draft updated 2025 (remainder of site)
Derrycashel	388	Cutover Bog Industrial peat production commenced at Derrycashel Bog in 1951 and ceased in 2018. Long-term peat extraction has reduced peat reserves on this bog. Most of the former production area has shallow peat reserves. Some pockets of deep peat remain. Derrycashel is considered a shallow peat cutover bog.	Derrycashel Bog formerly supplied a range of commercial functions including; fuel peat for Lough Ree Power Much of the former production area at Derryarogue has been out of production for some time. These areas have already extensively colonised with pioneer wetland and scrub vegetation communities. Some wetland and rehabilitation management was undertaken (c.60ha) between 2014-2015.	2018	Finalised 2021 Rehab started in 2021
Derrycolumb	454	Cutover Bog Industrial peat production commenced at Derrycolumb Bog in the 1980's and ceased in 2019. Most of the former production area still has deep peat reserves. Derrycolumb is considered a deep peat cutover bog.	Derrycolumb Bog formerly supplied a range of commercial functions including; fuel peat for Lough Ree Power Much of the former production area at Derrycolumb has been out of production for some time. These areas have already extensively colonised with pioneer wetland and scrub vegetation communities.	2018	Finalised 2021 Rehab started in 2021
Derrymoylin	356	Cutover Bog Industrial peat production commenced at Derrymoylin Bog in 1985 and ceased in 2020. Long-term peat extraction has reduced peat reserves on this bog. Derrymoylin is considered a shallow peat cutover bog.	Derrymoylin Bog formerly supplied a range of commercial functions including; fuel peat for Lough Ree Power. Most of the former production area on site is bare peat.	2020	Finalised 2025. Rehab to start in 2025
Derryshannoge	452	Cutover Bog Industrial peat production commenced at Derryshannoge Bog in 1985 and ceased in 2020. Deep peat reserves remain across most of the site. Derryshannoge is considered a deep peat cutover bog.	Derryshannoge Bog formerly supplied a range of commercial functions including; fuel peat for Lough Ree Power. Much of the former production area at Derryshannoge has been out of production for some time. These areas have already extensively colonised with pioneer cutaway and scrub vegetation communities.	2020	Finalised in 2023 Rehab started in 2023

Bog Name	Area (ha)	Stage of development	Land-Use and History	Peat Production Cessation	Rehab Plan Status
Edera	281	Cutover Bog Development for industrial peat production commenced at Edera Bog in 1990's. Active extraction from Edera began in 2003 and ceased in 2018. Edera is considered a deep peat cutover bog.	Edera Bog formerly supplied a range of commercial functions including; fuel peat for Lough Ree Power. The majority of Edera Bog former production area is bare peat.	2020	Finalised 2021 Rehab started in 2021
Erenagh	93	Cutover Bog Development for industrial peat production commenced at Erenagh Bog in 1970's. Erenagh is considered a deep peat cutover bog.	Erenagh Bog formerly supplied a range of commercial functions including; fuel peat for Lough Ree Power. Much of the former production area at Erenagh has been out of production for some time. These areas have already extensively colonised with pioneer cutaway and scrub vegetation communities.	2020	Draft 2024
Granaghan	212	Cutover Bog Development for industrial peat production commenced at Granaghan Bog in 1980's. Long-term peat extraction has reduced peat reserves on this bog but deep peat reserves remain on site. Granaghan is considered a deep peat cutover bog.	Granaghan Bog formerly supplied a range of commercial functions including; horticultural peat and fuel peat for Lough Ree Power. The majority of Granaghan Bog former production area is bare peat.	2020	Finalised in 2024. Rehab to start in 2025.
Killashee	110	Cutover Bog Development for industrial peat production commenced at Killashee and Derryadd East bogs in 1985. Killashee is considered a deep peat cutover bog.	Killashee and Derryadd East bogs formerly supplied a range of commercial functions including; horticultural peat and fuel peat for Lough Ree Power. The majority of Killashee and Derryadd East bogs former production area is bare peat. Some areas have colonised with pioneer cutaway and scrub vegetation communities.	2020	Finalised in 2023
Knappoge	313	Cutaway Bog Peat Production at Knappoge bog commenced in 1963, and finished in 2018. Peat depths on the former production area are generally shallow. There are some pockets of deeper peat. Knappoge is considered a shallow peat cutaway bog.	Knappoge Bog formerly supplied a range of commercial functions including; fuel peat for Lough Ree Power. The majority of Knappoge Bog former production area is bare peat. Some areas have colonised with pioneer cutaway and scrub vegetation communities.	2018	Draft 2021 Rehab started in 2022
Lough Bannow	739	Cutaway Bog Peat Production at Lough Bannow bog commenced in the 1960'S, and finished in 2020. Peat depths on the former production area are generally shallow. There are some pockets of deeper peat. Lough Bannow is considered a shallow peat cutaway bog.	Much of the former production area at Lough Bannow has been out of production for some time. These areas have already extensively colonised with pioneer cutaway and scrub vegetation communities. A small (35ha) conifer plantation was established in 1980's.	2020	Draft updated in 2025
Moher	483	Cutover Bog Peat Production at Moher bog commenced in the 1960'S, and finished in 2020. Peat depths on the former production area remain relatively deep. Moher is considered a deep peat cutover	Moher Bog formerly supplied a range of commercial functions including; fuel peat for Lough Ree Power. Much of the former production area at Moher has been out of production for some time. These areas have already extensively colonised with pioneer cutaway and scrub vegetation	2020	Draft 2021

Bog Name	Area (ha)	Stage of development	Land-Use and History	Peat Production Cessation	Rehab Plan Status
		bog.	communities.		
Mount Dillon	592	Cutaway Bog Peat Production at Mount Dillon bog commenced in the 1940'S, and finished in 2020. Peat depths on the former production largely shallow and the peat is considered cutaway. Some deep peat remains on the west of the site. Mount Dillon is considered a shallow peat cutaway bog.	Mount Dillon Bog formerly supplied a range of commercial functions including; fuel peat for Lough Ree Power. Much of the former production area at Mount Dillon has been out of production for some time. These areas have already extensively colonised with pioneer cutaway, wetland and scrub vegetation communities.	2020	To be updated in 2025.

See Drawing number BNM-DR-23-27-24 titled **Mount Dillon Bog Group**, included in the accompanying Mapbook which illustrates the location of Lough Bannow bog and the Mount Dillon Bog Group in context to the surrounding area.

APPENDIX II: 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:	**Lough Bannow**	**Area (ha):**	743ha
Works Name:	Mount Dillon	**County:**	Longford
Recorder(s):	BnM Ecology Section	**Survey/ monitoring Date(s):**	27th and 29th July 2010 Habitats re-surveyed 2012. *A range of additional ecological surveys were carried out 2014-2019 to inform the EIAR for the proposed Derryadd Wind Farm. These baseline surveys have also informed this rehabilitation plan.*

Habitats present (in order of dominance)

The most common habitats present at this site include:

- Poor fen (pEang, pJeff, pTyp, pPhrag and pTrig)
- Bare peat (BP)
- gCal
- DisCf
- pCamp
- Rip - riparian areas (streams/drains with fringing habitats)
- Birch dominated scrub (ebir, oBir and cBir) (Codes refer BnM classification of pioneer habitats of production bog. See Appendix II).
- Exposed gravel
- dHeath
- Temporary open water (tow)
- Conifer plantation (WD4)
- Transition mire and quaking bog (PF3)
- Birch woodland (WN7)
- Raised bog (PB1) remnant
- Oak-Ash-Hazel woodland (WN2)
- Possible calcareous springs (FP1)
- Dense Bracken (HD1)
- Wet grassland (GS4) along the fringes of the bog

Description of site

Lough Bannow Bog is situated approximately seven kilometres south east of Lanesborough, Co. Longford along the R392 Road. The R398 public road runs along the north of the site while a secondary road (Keenagh road) runs along part of the southern section of the bog. The Royal Canal passes within 500 metres of eastern edge of the site. Two large mineral islands are located within the site boundaries but are not under BnM ownership. This site was harvested for milled peat since the late 1960's. Industrial peat extraction has now ceased. A large section of failed conifer plantation is located on the site. Overall this site varies greatly from areas that are re-vegetating rapidly since they came out of peat extraction to areas that were in peat extraction until recently and are bare peat. Topographically, the site undulates and has regular small hills of gravel that are exposed between areas of low lying peat. A rail line crosses the site in an east west direction, dissecting the site into a much larger northern section and a smaller southern section.

As ridges of gravel are being exposed, these hills and ridges are becoming revegetated with Dry grassland mosaic (DisCf, gCal and gAn-H-Eq). Areas between these hills are either bare peat or are revegetating with plant species that are indicative of poor fen habitats such as pEang, pTyp and pJeff. Birch scrub is also becoming established on many of the habitats that have been out of production for longer periods of time, particularly the drier areas.

A conifer plantation was planted in 1995 and is comprised of Sitka and Norway spruce. Some sections of this plantation had trees of medium quality and were in need of thinning and fertilisation, however the majority of the area was extremely poor, with dead or dying trees throughout. The most logical reason for the widespread loss of trees in this plantation was the presence of Heather throughout these areas. Heather is extremely well suited to salvaging nitrogen from poor soils and will deprive trees such as Sitka Spruce of nitrogen, causing then to go into check followed by eventual death. Birch and Scots Pine had become established in areas of the plantation and appeared to be doing much better than the spruce.

Immediately to the east of the conifer plantation a large area of the site was largely revegetated with a mixture of cBir, oBir, dHeath, BP and pEang. Much of the cBir was dense and was developing into Birch woodland. Other areas beyond the cBir were younger and were a mosaic of wet and dry habitats (depending on the topography of the site), intermixed with areas of bare peat. To the south east of the conifer plantation a row of three small hills were at different levels of development, mainly Birch scrub, but the notable feature of these areas was the presence of Oak and Hazel.

A large mineral island is located within the site boundaries in the centre of the site. This "Island" is connected to the public road that runs close to the northern boundary of the site via a small track. This area is not owned by BnM and is managed as agricultural grassland. To the south of the mineral island the site is a mixture of pioneer habitats including DisCf, BP, eBir, pJeff and gCal.

The central-eastern part of the site is largely a mixture of dry grassland mosaics and wet grassland mosaics (gCal, DisCf, eBir, oBir, pJeff, pEang, pPhrag, pTyp), with areas of bare peat scattered throughout, some of the areas of bare peat were large but some areas were much smaller and were comprised of a couple of short fields between gravel ridges.

A small works area is located along the railway line close to the eastern end of the line. This works area is comprised of a large tea centre with large amounts of machinery stored around it. Immediately to the north of the works area an area of scrub (cBir) that was developing some of the components of Oak Ash Hazel woodland (WN2). This woodland is young and is still developing with Birch, Oak, Rowan, Holly, Hawthorn, Hazel, Guelder Rose, Bramble, Raspberry, Herb-Robert, Meadow-sweet, Honey-suckle, Tufted Sedge, Purple Moor-grass and Male Fern. Paths through this are of the site were in regular use by BnM machinery and relatively large areas of Meadow-sweet dominated wet grassland was located along the access routes. A large rectangular shaped area had been excavated in this area and was filled with water resulting in the presence of an artificial pond. This pond did not contain many macrophytes apart from Reedmace, Floating Sweet Grass with some Water Crow's-foot also. The wet grassland areas contained Meadow Sweet, Knapweed, Willow, Plantain, Vetch, Sweet Vernal-grass, Devil's Bit-Scabious, Hogweed, Horsetails, Red Clover and Creeping Bent Grass. Although this spot was damp with no standing or flowing water at the time of the ecological survey it did contain tufa which may indicate the presence of springs in this area.

Moving north from this area towards the north eastern corner of the site, the bog again comprises a mosaic of habitats including pJeff, pEang, eBir, gCal, pEqus and DisCf, the largest single habitat consists of a large area of pJeff and oBir along the western edge of the north east corner of the site. An old, disused, railway line is located close to the eastern edge of the site and has been colonised with gMol, dHeath and eGor, several old railway carriages are still located on the track.

The north eastern corner of the site also contains two small mineral islands that contain Birch, Oak, Blackthorn, Ash and Hazel along with Male fern, Bramble, Lords and Ladies, Hogweed, Harts Tongue Fern, Honeysuckle, Wood Anemone and Herb Robert. Sections of these mounds contain large mature Oak (older than 100 years).

Moving westwards from the mire onto sections of cutover, the site again becomes a mosaic of habitats, mainly pJeff, oBir and bare peat before encountering a mineral island. This mineral island is similar to the one that has already been described to the north of the railway line.

Moving west a large area of bare peat is located before the site again becomes a mosaic of pioneer poor fen and pioneer grassland habitats.

The south west corner of the site is mainly bare peat with pTrig, pRos and pTyp becoming established along the drains, this area is marked on the 2nd edition OSI 6 inch map as a small lake called Lough Anpastia. This lake no longer exists and there is no evidence of it ever having been present on the ground.

Three pumps are located on the site. Some of the drains in the east of the site have been excavated down to limestone bedrock, Otter spraint were found in one of these drains in the northern section of the site, this drainage ditch is connected to the nearby Royal Canal.

<u>Lough Bawn pNHA 001819</u>

This area is located along the eastern edge of the site. It is bordered by remnant raised bog to the south, west and north while an area of woodland on mineral soil borders Lough Bawn to the east. The south eastern corner of the site is bordered by conifer plantation, part of which was clear felled in the past few years and replanted. The majority of the Lough is in Bord na Mona ownership with a small section owned by Coillte.

The sections of raised bog that surround part of the Lough were in moderate to poor condition overall and the most westerly sections had been ditched many years ago. The ditched sections were dominated by Heather; however the most southerly section of raised bog were in somewhat better condition with a more varied flora.

Lough Bawn is fringed with woodland throughout. This woodland varies from wet bog woodland (WN7) to dry Oak Ash Hazel woodland (WN2) along its eastern side. The woodland that fringes the Lough to the west, north and south is bog woodland (WN7) that varies from sparse cover to denser cover; these sections of bog woodland were quaking and had a high cover of Sphagnum moss in general. These sections of woodland are classed as Annex I bog woodland habitat (91D0) and are considered to be a rare habitat in Ireland with an estimated nationwide land cover of 150ha approximately (NPWS - Bog woodland (91D0) Conservation Status Assessment report).

The areas of bog woodland ranged to thick, dense areas of woodland to areas that had a lesser density of trees. The main tree species were Birch and Scot's Pine along with Alder, Eared Willow and some gorse. There was extensive evidence that the water levels fluctuate throughout these areas, with some areas being permanently waterlogged with a quaking feel throughout. Species within the areas of bog woodland included Bog Myrtle, Devil's-bit Scabious, Bog Bean, Honeysuckle, Soft Rush, *Sphagnum palustre*, Ivy, Bramble, Sweet Vernal Grass, Heather, Star Sedge, Wood Horsetail, Grey Willow, Holly, Broad Buckler Fern, Cow wheat, mint, Water Horsetail, Hogweed, Calliergon sp., Ragged Robin, Lesser Spearwort, Lousewort, *Aulacomnium palustre*, Spotted Marsh Orchid, Marsh Bedstraw. Yorkshire Fog, Heath Wood-Rush and *Epilobium obscurum*.

A section of mature Oak-Ash-Hazel (WN2) is located on the eastern side of Lough Bawn, this woodland was relatively dry and was located on mineral soil. Species here included Birch, Scot's Pine, Ash, Alder, Willow, Hazel, Herb Robert, Spindle, Enchanter's nightshade, Ivy, Honeysuckle, Wood False Broome, Hypnum sp., Bramble, Viola sp., Blackthorn, Rowan, Wavy hair Grass, Meadow Sweet, Wood horsetail, Wild strawberry, Holly, Hawthorn, Blackthorn, Gorse, Glaucous Sedge, Sycamore, Bush Vetch, Cock's foot, Beech, Rough meadow Grass, Spear Thistle, Wood dock, Wood Sanicle, Wood Sedge, Primrose, Lady Fern, Sorrell, Male Fern, Hart's Tongue Fern, Yew, Wych Elm, *Polytrichum commune*, Yellow rattle, Cep, Bay Bolete, Common Puffball and Trooping Funnel Cap.

A section to the east of this woodland has been fenced off and is grazed, the grazed area ran along the entire eastern edge of the woodland.

The Coillte owned woodland to the south east of Lough Bawn is a mixture of recently felled conifer plantation and mature plantation with sitka Spruce, Norway Spruce and Lodgepole Pine, the edge of these sections were a mixture of species such as Oak, Birch and Hazel with some Yew also.

Lough Bawn had been a lake up until 1964 when drainage of the lake begun, after this initial drainage the water levels shrink until the lake was mostly terristrailized by the late 1960's. This area is classed as transition mire and quaking bog (PF3) according to Fossitt, 2000.

At present the lough has filled in with very small amounts of open water remaining and the entire area has a quaking feel to it. The Lough is covered with a mat of vegetation containing hummocks of vegetation interspersed with shallow water. The Lough is dominated with mosses and sedges and individual trees have spread across the surface of the Lough. Plant species in the area of the lough include Purple Moor Grass, Eared Willow, Birch, Bog Asphodel, Bog Bean, Devil's-bit Scabious, Star Sedge, Purple Loosestrife, Greater Tussock Sedge, Bottle Sedge, *Sphagnum palustre* (tussock forming) S. subnitens, Heather, Lesser Tussock Sedge, Marsh cinquefoil, *Aulacomnium palustre* (tussock forming), Marsh Pennywort, Round-leaved Sundew, Wild Angelica, Marsh Thistle, Ragged Robin, Reedmace, Alder, Mint, Water Horsetail, Creeping Bent-grass, *Eriophorum angustifolium* and Lousewort. *Usnea* sp. lichen was growing on the branches of many of the trees.

One of the BnM employees on the site reported the presence of springs at locations around the site.

There are records of Black Headed Gull, Snipe and Lapwing using this site.

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

Lough Bawn is situated in the south eastern corner of the site and was formally a lake until the late 1960's. The lake dried out after intensive drainage works and is now classified as a 'Transition mire and quaking bog' pNHA 001819.

There are two Annex I habitats present on this site, bog woodland (91D0) and transition mire and quaking bog (7140).

Adjacent habitats and land-use

Adjacent habitats include improved agricultural grassland (GA1), wet grassland (GS4), conifer plantation (WD4), raised bog (PB1), recently planted woodland (WS2) and cutover bog (PB4). The Royal Canal (FW3) is located approximately 0.5km to the east of the site.

Watercourses (major water features on/off site)

- The Bilberry River begins at the southern boundary of the site, this river flows southwards before flowing into Lough Ree
- A tributary of the Bilberry River begins in the south western corner of the site.
- A tributary of the River Shannon starts in the north of the site before flowing northwards.
- All of the watercourses are part of the Shannon catchment.
- The Royal Canal flows within 0.5km of the eastern edge of the site.

Peat type and sub-soils

As the peat resource becomes exhausted gravel ridges and hills are exposed, these hills are composed of Limestone gravel.

Fauna biodiversity (2010)

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

- Raven (2)
- Sky Lark
- Sand marten
- Common Gull
- Snipe (3)
- Swans are reported to be using the flooded areas during the winter.
- Other more common species include Meadow Pipits, Swallow, Dunnock, Blackbird, Chaffinch, Wood Pigeon, Pheasant and Magpie.

Mammals

- Otter spraint found in a drainage ditch in the north east of the site, this drain is connected to the nearby Royal Canal.
- Pine Marten
- Badger
- Fox
- Hare
- Rabbit

Invertebrates

- Silver-washed Fritillary Butterfly
- Peacock Butterfly
- Green-veined White Butterfly
- Large Heath Butterfly
- Large White Butterfly
- Small Heath Butterfly
- Small Copper Butterfly
- Painted Lady Butterfly

Fish

- Stickleback in the drains

Fungal biodiversity

The Oak-Ash-Hazel woodland along the eastern boundary of the site is rich in fungal diversity with Ceps, Bay Bolete, Razor Strop and Trooping Funnel Cap observed.

APPENDIX III. ENVIRONMENTAL CONTROL MEASURES TO BE APPLIED TO BOG REHABILITATION

- Bog restoration/rehabilitation measures will be restricted to within the footprint of the proposed rehabilitation area.
- 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.
- All plant and equipment for use will comply with the Construction Plant and Equipment Permissible Noise Levels Regulations (SI 359/1996).
- The proposed activities will be restricted to daylight hours and there will be no requirement for artificial lighting.
- Silt ponds will be inspected and maintained as per the IPC Licence.
- During periods of heavy precipitation and run-off, activities will be halted.
- Measures will be carried out using a suitably sized machine and, in all circumstances,, excavation depths and volumes will be minimised where possible.
- All machines will be regularly checked and maintained prior to arrival at the site to prevent hydrocarbon leakage.
- Hoses and valves will be checked regularly for signs of wear and will be closed and securely locked when not in use.
- Fuelling and lubrication of equipment shall only be carried out in designated areas away from surface water drainage features and ecologically sensitive areas.
- Waste oils and hydraulic fluids will be collected in leak-proof containers and removed from the site for disposal or re-cycling.
- Vehicles will never be left unattended during refuelling.
- No direct discharges to waters will be made. No washings from vehicles, plant or equipment will be carried out on site.
- All plant refuelling will take place using mobile fuel bowsers. Only dedicated trained and competent personnel will carry out refuelling operations.
- 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.
- Potential impacts caused by spillages etc. during rehabilitation will be reduced by keeping spill kits and other appropriate equipment on-site.
- 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 IV. BIOSECURITY

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. 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 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 washing vehicles prior to entering the area.

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 Practice measures around the prevention and spread of Crayfish plague[5] will be adhered with throughout all rehabilitation measures and activities.

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

APPENDIX V. 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. P0-504-01). 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.

3 National and EU Climate and Biodiversity 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.

Peatlands rehabilitation and restoration is referenced in Section 17.3.3 of the Land Use, Land Use Change, Forestry and Marine Chapter of the National Climate Action Plan 2021 as follows:

"The rehabilitation of degraded peatlands to a condition in which they regain their ability to deliver specific ecosystem services has considerable potential for initial mitigation gains, and future carbon sequestration. Additional benefits of peatland restoration include positive socio-economic outcomes for the Midlands, increased natural capital, enriched biodiversity, improved water quality, and flood attenuation."

The scheme is included as Action 33 in the Climate Action Plan 2021 Annex of Actions - Deliver the Enhanced Decommissioning, Rehabilitation and Restoration (EDRR) Scheme for Bord na Mona Peatlands.

EDRRS is also referenced in the Climate Action Plan 2021 as a measure to deliver a Just Transition in the Midlands.

International research and scientific understanding of peatlands is now reflected in key Irish national policy and strategy documents such as the National Raised Bog Special Areas of Conservation (SACs) Management Plan 2017 - 2022 (Department of Arts, Heritage and the Gaeltacht 2017), The National Peatland Strategy (Department of Arts, Heritage and the Gaeltacht 2015), The National Biodiversity Action Plan (National Parks and Wildlife Service 2017), The River Basin Management Plan for Ireland (DHLGH 2024), and the Biodiversity – Climate Change Sectoral Action Plan (Department of Arts, Heritage and the Gaeltacht 2019). Each of the national plans, which are also complemented with the recently published EU Green Deal communication on

Biodiversity Strategy for 2030 (COM 2020) have overlapping objectives and actions that focus on the restoration of peatlands damaged by turf-cutting, drainage and other impacts, as well as the re-wetting of Bord na Móna industrial peat extraction bogs.

While not specifically identified as a restoration implementor, EDRRS objectives are in line with those of the United Nations Decade on Ecosystem Restoration 2021-2030 of Preventing, Halting and Reversing the Degradation of Ecosystems worldwide.

EDRRS is also in line with the EU Commission proposal for a Nature Restoration Law which will apply legally binding targets for nature restoration in different eco-systems to every Member State. The aim is to cover at least 20% of the EU's land and sea areas by 2030 with nature restoration measures and eventually extend these to all ecosystems in need of restoration by 2050.

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 Draft National River Basin Management Plan 2022-2027 (Water Framework Directive)

The National River Basin Management Plan (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 2018-2021 outlined 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) was part of the WFD (2018-2021) programme of measures. The NRBMP 2018-2021 takes account of the fact that Bord na Móna was 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 2018-2021 rehabilitation target was 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 was expected to have a positive impact on water quality and will help the NRBMP 2018-2021 deliver its objectives in relation to the Water Framework Directive and is one of the five key principle actions.

The NWBMP 2022-2027 (DHLGH 2024) describes how the number of waterbodies impacted by peat, industry and forestry have decreased by 10, 10 and 5 waterbodies, respectively since the second cycle. Impacts on water quality and river habitat arising from peat and peat extraction and associated drainage include the release of ammonium and fine-grained suspended sediments, and physical alteration of aquatic habitats. Drainage of peatlands also results in changes to the hydromorphological condition of rivers.

The NWBMP 2022-2027 outlines how maintaining and restoring Irish bogs will lead to a decrease in waterborne carbon leaching to levels comparable with intact bogs as well as reducing losses of peat silt and ammonia. Vegetation on the surface of the peat can also slow the flow of water over the land surface. Based on the EPA's most recent reports, peat extraction and drainage is impacting on 106 water bodies across the country, with peat the single pressure on 28 of these water bodies. However, compared to the data in the second-cycle plan, the number of water bodies impacted by peat has decreased.

The cessation of industrial peat extraction by Bord na Móna in 2021 was 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. This is now being supported by the results and conclusions of the NWBMP 2022-2027.

6 4th National Biodiversity Action Plan 2023-2030

Ireland's 4th National Biodiversity Action Plan (NBAP) sets the national biodiversity agenda for the period 2023-2030 and aims to deliver the transformative changes required to the ways in which we value and protect nature. The 4th NBAP has been developed with the support, advice and input of the interdepartmental Biodiversity Working Group and the independent Biodiversity Forum. Ireland's 2nd National Biodiversity Conference was held to gather insights and recommendations for the development of the NBAP and a public consultation process was held to provide further opportunities to engage with the Plan.

The 4th NBAP strives for a "whole of government, whole of society" approach to the governance and conservation of biodiversity. The aim is to ensure that every citizen, community, business, local authority, semi-state and state agency has an awareness of biodiversity and its importance, and of the implications of its loss, while also understanding how they can act to address the biodiversity emergency as part of a renewed national effort to "act for nature".

The delivery of rehabilitation via PCAS is expected to significantly contribute in the future to actions and targets of the 4th National Biodiversity Action Plan 2023-2030, particularly in relation to peatland restoration, nature restoration and creation of new habitats such as wetlands and woodlands.

7 EU Nature Restoration Law

The EU Nature Restoration Law is a key element of the EU Biodiversity Strategy, which sets binding targets to restore degraded ecosystems, in particular those with the most potential to capture and store carbon and to prevent and reduce the impact of natural disasters. The regulation combines an overarching restoration objective for the long-term recovery of nature in the EU's land and sea areas with binding restoration targets for specific habitats and species. These measures should cover at least 20% of the EU's land and sea areas by 2030, and ultimately all ecosystems in need of restoration by 2050.

This regulation has now been adapted and it is expected that all Member States will be required to produce a National Restoration Plan within two years of adoption. This will be led by the National Parks and Wildlife Service and will comprise a broad and deep public participation process, informed by robust ecological and socio-economic impact assessments. Bord na Móna are working with NPWS to identify bog restoration and other re-wetted cutaway sites that can contribute towards Irelands targets for the Nature Restoration Law.

8 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.

9 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.

10 All-Ireland Pollinator Plan 2021-2025

The All-Ireland Pollinator Plan 2021-2025 outlines key objectives and actions to protect and support pollinating insects and the habitats they rely on. A Bord na Móna specific action in this plan includes 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.

11 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.

12 National Archaeology Code of Practice

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 Practice relating to management of any archaeological finds that may arise during cutaway peatland rehabilitation and decommissioning.

13 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.

14 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.

15 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 VI. 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 termination 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 license 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	Lough Bannow Decommissioning Plan
1	Clean-up of remaining or unconsolidated waste or materials located in Bogs, Yards, Buildings and Offices	Where relevant
2	Cleaning Silt Ponds	Cleaning Silt Ponds
3	Decommissioning Peat Stockpiles	Where relevant
4	Decommissioning or Removal of Buildings and Compounds	Where relevant
5	Decommissioning Fuel Tanks and associated facilities	Where relevant
6	Decommissioning and Removal of Bog Pump Sites	Where relevant
7	Decommissioning or Removal of Septic Tanks	Where required

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.

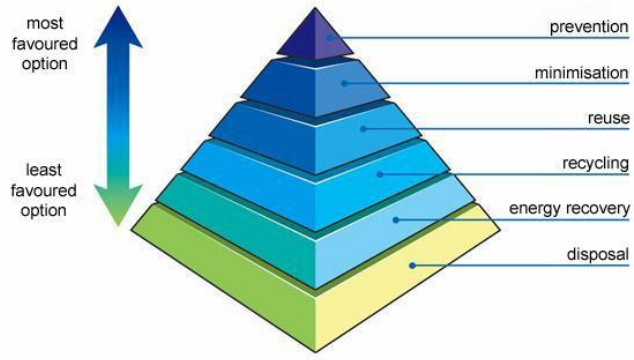
7.3.5 The tonnages and EWC Code for the waste materials listed in *Schedule 2(i) Hazardous Wastes for Disposal/Recovery* and *Schedule 2(ii) Other Wastes for Disposal/Recovery* sent off-site for disposal/recovery.

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.

APPENDIX VII. 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 embryonic *Sphagnum*-rich plant communities in these conditions if the peat can be re-wetted. This brings the opportunity of re-developing embryonic *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 cannot 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.

Environmental stabilisation: 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 Licence. 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 stabilisation.

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).

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.

APPENDIX VIII. 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 P0504-01, Mountdillon Group of Bogs located in Co. Longford.

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 the Mountdillion bog group 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:
Lough Ree Power Station screens the peat from the bogs 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 P0504-01 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' December 2012. 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:

- Secure the stability of the waste
- Put in place measures to prevent pollution of soil, surface water and ground water.
- 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:

- 10.1 Following termination 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.
- 10.1.2 Implement the agreed cutaway bog rehabilitation plan (refer Condition 10.2).

10.2 Cutaway Bog Rehabilitation Plan:

- 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.
- 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:

- 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).
- 10.3.2 The criteria which define the successful rehabilitation of the activity or part thereof, which ensures minimum impact to the environment.
- 10.3.3 A programme to achieve the stated criteria.
- 10.3.4 Where relevant, a test programme to demonstrate the successful implementation of the rehabilitation plan.
- 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 Mountdillion 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.

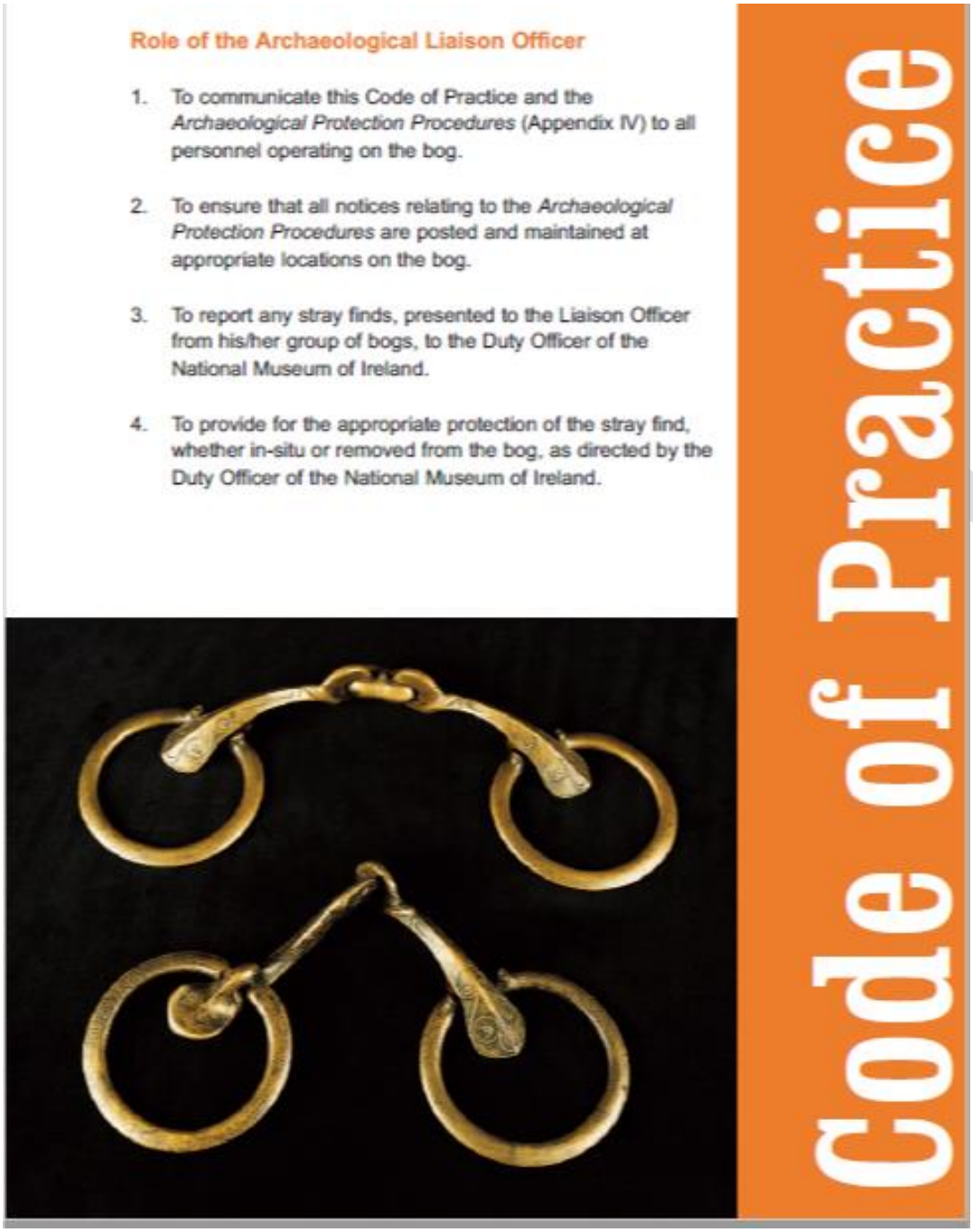
Review.
This plan will be reviewed every five years, the first review to take place in September 2017. This review will entail an inspection of these waste facilities to ensure their placing, management, maintenance and stability comply with the requirements of the Extractive Waste Management requirements and condition 7.5, 7.6 and 7.7 of the Mountdillion IPPC Licence P0504-01.

APPENDIX IX. MITIGATION MEASURES FOR THE APPLICATION OF FERTILISER

- Any fertiliser used will be Rock Phosphate and will not be applied in the following conditions:
    1. The land is waterlogged;
    2. The land is flooded, or it is likely to flood;
    3. The land is frozen, or covered with snow;
    4. Heavy rain is forecast within 48 hours (forecasts will be checked from Met Éireann).
    5. 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.
- No fertiliser will be spread on land within 2 metres of a surface watercourse.
- 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*

APPENDIX X. ARCHAEOLOGY



22

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:**

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			
2			

Appendix 4 Aerial Photographs of the Application Site 1995 -2019

W ← NORTH → E

S

N.18

GSI I IRL 1/300-A-73-4750 M

N 18

KILLASHEE

DERRYAROGE

CLOONFORE

DERRYAD

NORTH

N. 21

GSI 1 IRL 1/300-4-73-4750 M

N 2

DERRYARDGE

KNAPPOGE

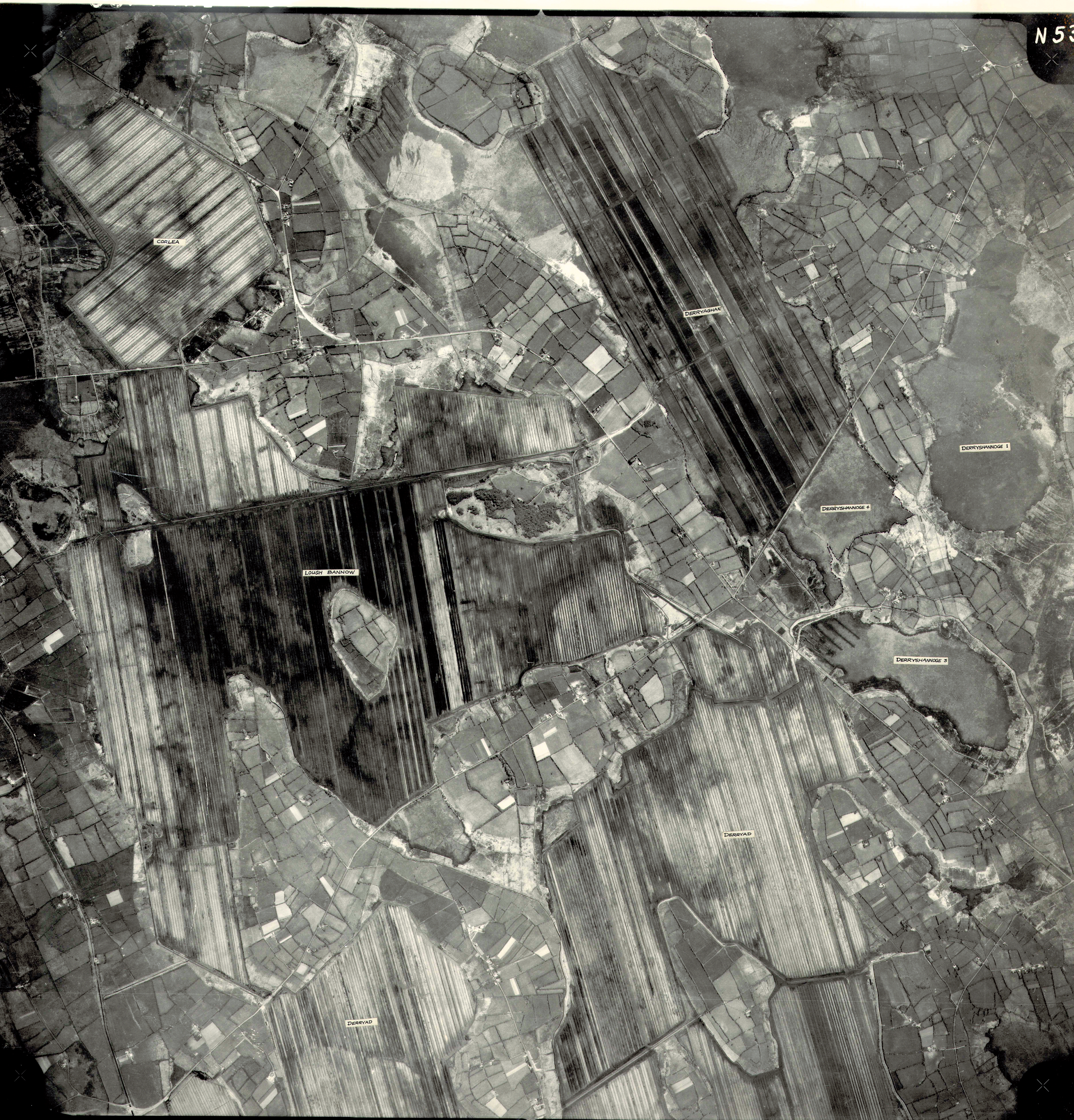
MOUNTDILLON

GRANAGHAN

CLOONMORE

NORTH

N.53


N53
CORLEA
DERRYAGHAN
DERRYSHANNOGE 1
DERRYSHANNOGE 4
DERRYSHANNOGE 3
LOUGH BANNOW
DERRYAD
DERRYAD

NORTH

N.54

N54

CORLEA

DERRYAGHAN

LOUGH BANNOW

DERRYAD

DERRYAD

N

Legend

Application Boundary

0 0.5 1 2 Kilometres

Bord na Móna

Derryadd Substitute Consent 1995 Imagery

DRWG No:	Scale:	Drawn by:	Date:
BNM-PG-22-02-16-v2	1:35,000	AK	29/11/2024

N

Legend

Application Boundary

Kilometres

0 0.5 1 2

Bord na Móna

Derryadd Substitute Consent 2000 Imagery

DRWG No:	Scale:	Drawn by:	Date:
BNM-PG-22-02-17-v2	1:35,000	AK	29/11/2024

N

Legend

Application Boundary

0 0.5 1 2 Kilometres

Bord na Móna

Derryadd Substitute Consent 2004 Imagery

DRWG No:	Scale:	Drawn by:	Date:
BNM-PG-22-02-18-v2	1:35,000	AK	29/11/2024

N

Legend

Application Boundary

Kilometres

0 0.5 1 2

Bord na Móna

Derryadd Substitute Consent 2015 Imagery

DRWG No:	Scale:	Drawn by:	Date:
BNM-PG-22-02-19-v2	1:35,000	AK	29/11/2024

N

Legend

Application Boundary

0 0.5 1 2 Kilometres

Bord na Móna

Derryadd Substitute Consent 2019 Imagery

DRWG No:	Scale:	Drawn by:	Date:
BNM-PG-22-02-21	1:35,000	AK	29/11/2024

Appendix 6 CONSULTATION WITH THE DEVELOPMENT APPLICATION UNIT

Caroline Naughton

From: David OConnor (Housing) <David.OConnor@npws.gov.ie>
Sent: Friday 13 December 2024 09:07
To: Caroline Naughton
Subject: RE: Derryadd Substitute Consent rEIAR Scoping_50924

Good morning Caroline,

The observations that I sent you refer to the Environmental Impact Assessment Report (rEIAR) for Wind Farm; Substitute Consent as per your attachment and not proposed Derryadd Wind Farm Development.

Regards,

David

David O'Connor
Executive Officer

An Roinn Tithíochta, Rialtais Áitiúil agus Oidhreachta
Department of Housing, Local Government and Heritage
Aonad na nIarratas ar Fhorbairt
Development Applications Unit
Oifigí an Rialtais
Government Offices
Bóthar an Bhaile Nua, Loch Garman, Contae Loch Garman, Y35 AP90
Newtown Road, Wexford, County Wexford, Y35 AP90
—

David.oconnor@npws.gov.ie
Manager.DAU@npws.gov.ie

From: Caroline Naughton <caroline.naughton@tobin.ie>
Sent: Thursday 12 December 2024 16:27
To: David OConnor (Housing) <David.OConnor@npws.gov.ie>; Housing Referrals <Referrals@npws.gov.ie>
Subject: Derryadd Substitute Consent rEIAR Scoping_50924

Hi David,

Thank you for your reply.

I just want to clarify that this scoping request is for the Derryadd Substitute Consent Remedial Environmental Impact Assessment Report (rEIAR) and not the proposed Derryadd Wind Farm development, which is a separate consultation.

I have attached the relevant scoping letter sent 250924 in relation to this rEIAR.

A separate consultation was carried out by TOBIN in relation to the Derryadd Windfarm Project in Oct 2024.

Please let me know if you have any queries in relation to this.

Kind regards,

Caroline Naughton
Senior Project Manager

TOBIN
Galway | Dublin | Castlebar | Limerick | Sligo
Telephone: +353 61 976262
Email: caroline.naughton@tobin.ie
Website: http://www.tobin.ie

TOBIN

ENGINEERS IRELAND
CPD ACCREDITED EMPLOYER

2024 Engineering Excellence Awards Winner: Environmental Engineering Project of the Year
2022 Engineers Ireland Awards Winner: CPD Employer of the Year
2022 Association of Consulting Engineers of Ireland Awards Winner: Innovation
2020 Association of Consulting Engineers of Ireland Awards Winner: Project Management
2019 Association of Consulting Engineers of Ireland Awards Winner: Design Excellence (Structures)

From: David OConnor (Housing) <David.OConnor@npws.gov.ie>
Sent: Wednesday 11 December 2024 15:01
To: Caroline Naughton <caroline.naughton@tobin.ie>
Subject: Environmental Impact Assessment Report (rEIAR) Derryadd Wind Farm

Good afternoon Caroline,

Please find attached Archaeological and Nature Conservation observations/recommendations for the above mentioned pre-planning application.

Please acknowledge receipt of the attached letter.
You are requested to send any further communications to this Department's Development Applications Unit (DAU) at: referrals@npws.gov.ie

Kind regards,

David O'Connor
Executive Officer

An Roinn Tithíochta, Rialtais Áitiúil agus Oidhreachta
Department of Housing, Local Government and Heritage
Aonad na nIarratas ar Fhorbairt
Development Applications Unit
Oifigí an Rialtais
Government Offices
Bóthar an Bhaile Nua, Loch Garman, Contae Loch Garman, Y35 AP90
Newtown Road, Wexford, County Wexford, Y35 AP90

David.oconnor@npws.gov.ie
Manager.DAU@npws.gov.ie

An Roinn Tithíochta,
Rialtais Áitiúil agus Oidhreachta
Department of Housing,
Local Government and Heritage

Your Ref: EIAR Scoping Document for the proposed Derryadd Wind Farm
Our Ref: G Pre Planning-LD-BnaM Wind Farm
(Please quote in all related correspondence)

11 December 2024

Tobin Consulting Engineers
Market Square
Castlebar
Co Mayo

Development: Environmental Impact Assessment Report (rEIAR) for Wind Farm. Substitute Consent for historical peat extraction and all associated bog development works

A Chara,
I refer to correspondence received in connection with the above.
Outlined below are heritage-related observations/recommendations of the Department co-ordinated by the Development Applications Unit under the stated heading:

Nature Conservation

The Department notes that the application site occurs within 3km of Lough Ree and the Lough Ree Special Protection Area (SPA). A number of qualifying interests of the Lough Ree SPA such as Whooper swan, Lapwing and Golden Plover are known to occur in the vicinity of the application site. Other important ornithological receptors such as the red listed Curlew and White-tailed Sea Eagle are also known to occur within the vicinity of the wind farm application site. Consequently, the Department wishes to emphasise the importance of establishing the presence or absence of any sensitive bird species that occur within the zone of influence of the proposed wind farm. The Department also wishes the importance of undertaking a robust assessment for any such species that considers the relevant potential impacts, such as collision mortality impacts, displacement impacts and/or disturbance impacts, which the proposed development may cause.

To facilitate the above the Department would like to make the following specific recommendations / observation for the consultant ecologists working on behalf of the applicant;

A Visibility Analysis should be undertaken to inform the location and coverage the of vantage point surveys

The Department considers that a visibility analysis should be undertaken to inform the placement of the vantage point surveys to ensure coverage of the wind farm application site its zone of influence. The area is characterised by large flat areas of cut over bogs in which a mosaic of wetlands, secondary woodland and scrub. Consequently, the department considers that any visibility analysis should be done on the basis of a Digital Surface Model (DSM) rather than a Digital Elevation Model (DEM) i.e. it should include the tree cover. This is necessary to ensure that areas of the site are not obstructed from view during the vantage point surveys. This is particularly important for species such as Golden plover and Lapwing, which are known to occur in the vicinity of the application site.

Collision Risk Modelling / Collision Mortality Impacts should be contextualised appropriately

The Ornithology Chapter of the EIAR should ensure that the correct reference population is used to contextualise any collision impacts predicted by the collision risk modelling for those species recorded within the collision zone of any turbines. In Ireland the methodology outlined in Percival (2003) to determine the significance of any collision mortality impacts is often referred to in EIARs provided with proposed windfarms. Percival (2003) states that 'one issue in this process concerns the precise area or bird population against which the degree of impact should be judged. For protected SPAs this is usually quite straightforward, comprising simply the populations for which that site has been designated' (Percival, 2003). Outside of protected sites Percival (2003) recommends that an analysis be undertaken as to whether a homogenous area of suitable habitat occurs with which a population may be associated and the density that this area may contain. In Scotland NatureScot recommends the use of Natural Heritage Zones (NHZs) which are bio-geographical units that represent areas with similar biogeographic character, similar habitat assemblages, and species populations. Any impact is first contextualised in terms of the populations of these areas before being contextualised nationally. These areas are not synonymous with administrative boundaries areas such as county boundaries. The use of such areas is particularly important when a population is distributed unevenly across the country or has a different distribution during the breeding season and the wintering season. As there is no published equivalent in Ireland to the Natural Heritage Zones (NHZs) used in Scotland efforts should be made by the consultants to create an appropriate reference bio-geographic area and associated population estimate, or make reference to appropriate published figures. Any estimate should be done with reference to scientific literature on the habitat requirements of the species and the population densities they typically hold during the relevant season.

Arbitrary / generic percentage thresholds should not be used to determine the significance of impacts

The Department does not encourage the use of generic percentage thresholds when assessing the significance of the effects of any impacts caused by the proposed wind farm such as collision mortality impacts. Instead the Department recommends that the approach outlined in the guidance provided by the *Institute of Ecology and Environmental Management* (IEEM) which recommends that the ecology of the species, current status and trend be considered. The Department also encourages, where necessary, and where possible, that population modelling should be used to put any potential mortality impacts in context.

Cumulative effects should be considered in an additive manner

The Department considers that the cumulative impacts of windfarms on bird species should be assessed with reference to the Nature Scot document *Assessing the cumulative impacts of onshore wind farms on birds* (2018). Most notably any collision mortality impacts, and/or displacement impacts, should be considered in an additive manner. Consequently any cumulative assessment should make reference to the additive annual collision mortality, or the additive displacement area, on any relevant species within the same bio-geographic area and not simply make reference to the conclusions of the relevant EIARs. This approach is necessary to ensure that a significant cumulative effect does not remain uncharacterised during the EIA process.

The interplay between the rehabilitation works and the proposed wind farm should be considered

The proposed wind farm application site is subject to rehabilitation works being undertaken by *Bord na Mona* as part of their *Integrated Pollution Control* (IPC) licence. Consequently, rehabilitation works may occur before or concurrently with the development or operation of the proposed wind farm. As such the Department recommends that the effects, both positive and negative, that the rehabilitation works may have on the application site be considered in conjunction with the impacts of the proposed wind farm. For example, the application site may become more, or less, suitable for bird species that occur within the wider area. Any potential changes to the use of the application site by bird species over the course of the operation of the wind farm should be considered in any reports provided to inform the Environmental Impact Assessment (EIA) and Appropriate Assessment (AA) processes. The Department also recommends the inclusion of a robust post consent monitoring protocol that takes any such changes into account.

Archaeology

It is noted that the proposed site boundary contains a very high concentration of recorded monument and any proposed development within this environment would require a full and detailed impact assessment report together with a full and detailed field survey. Where recorded archaeological monuments are located the NMS recommended avoidance.
Pending the results of a full and detailed impact assessment report together with a full and detailed field survey. The developer shall be prepared to be advised by the National Monuments Service with regard to any necessary mitigating action (e.g. redesign, preservation in situ) avoidance of all recorded monuments, further assessment such as geophysical survey , test trenching, monitoring and all groundwork and excavation.

You are requested to send any further communications to this Department's Development Applications Unit (DAU) at referrals@npws.gov.ie, where used, or to the following address:

The Manager
Development Applications Unit (DAU)
Government Offices
Newtown Road
Wexford
Y35 AP90

Is mise, le meas

David O'Connor
Development Applications Unit
Administration