

# Bord na Móna

## Blackwater Bog

# Cutaway Bog Decommissioning and Rehabilitation Plan 2022

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

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

*This licence condition requires Bord na Móna agree with the EPA the measures that will provide for rehabilitation, i.e. stabilisation of Blackwater 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 Blackwater Bog.*

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

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

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

*Any consideration of any other future after-uses for Blackwater Bog, such as amenity, 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						
<b>Document Name:</b>	Blackwater Bog Cutaway Bog Decommissioning and Rehabilitation Plan 2022					
<b>Document File Path:</b>						
<b>Document Status:</b>	Draft					
<b>This document comprises:</b>	<b>DCS</b>	<b>TOC</b>	<b>Text (Body)</b>	<b>References</b>	<b>Maps</b>	<b>No. of Appendices</b>
	1	1	48	4	0	12
<b>Rev.</b>	<b>0.1</b>	<b>Author(s):</b>		<b>Checked By:</b>		<b>Approved By:</b>
<b>Name(s):</b>	JOS		MMC		MMC	
<b>Date:</b>	04/02/2022		25/02/2022		25/02/2022	
<b>Rev.</b>	<b>1</b>	<b>Author(s):</b>		<b>Checked By:</b>		<b>Approved By:</b>
<b>Name(s):</b>	CC		JOS		MMC	
<b>Date:</b>	03/03/22		12/04/2022		18/04/2022	
<b>Rev.</b>	<b>1.1</b>	<b>Author(s):</b>		<b>Checked By:</b>		<b>Approved By:</b>
<b>Name(s):</b>						
<b>Date:</b>						

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## NON-TECHNICAL SUMMARY

- Industrial peat harvesting is now completely finished at Blackwater Bog.
- Bord na Móna is currently planning to rehabilitate **a portion** of Blackwater Bog, located in west Co. Offaly, approximately 1 km north-east of Shannonbridge, under the PCAS Scheme. Part of the western extent of Blackwater is located adjacent to the River Shannon.
- This is happening as Bord na Móna are obliged to carry out peatland rehabilitation via an IPC License issued by the Environmental Protection Agency. In addition, the Government has agreed to support peatland rehabilitation via the establishment of the Peatland Climate Action Scheme (PCAS). This is funded via the Government and by Bord na Móna.
- The key objective of peatland rehabilitation is environmental stabilisation. This means developing habitats and vegetation back onto the bare peat, and minimising effects to downstream waterbodies. Blackwater was drained in the past to allow peat production. Better results for water quality improvements, climate action, the reduction of carbon emissions and biodiversity are achieved when the remaining peat is re-wetted. This means drain-blocking and other measures to raise water levels to the surface of the bog and to encourage the natural colonisation of vegetation.
- In general, soggy ground conditions are preferred. This means the remaining peat is wet and that plants that prefer wetter conditions, like Bog Cotton and Reeds will thrive.
- Many Bord na Móna bogs cannot be restored to raised bog, as so much peat has been removed and the environmental conditions have been modified. However other natural habitats will develop like shallow wetlands with Reedbeds, fen peatland and Birch woodland, and in time a naturalised peatland can be restored.
- Re-wetting peat is also better for climate action. This reduces carbon emissions as re-wetting the remaining peat reduces carbon losses such as the production of Carbon Dioxide, the main Greenhouse Gas. The site is expected to still be a reduced carbon source for some time, but eventually the carbon sink function can re-establish as peat-forming conditions are restored. This will take some time.
- The development of a range of habitats in Blackwater 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 peatland habitats.
- The drainage and development of Blackwater for industrial peat production began in 1950s. Industrial peat production completely ceased in 2020.
- Much of the bog is already establishing a range of pioneer wetland, fen peatland and scrub habitats. There are still some bare peat areas.
- Parts of Blackwater bog have already naturally re-wetted. Measures proposed for Blackwater Bog include drain blocking and additional measures required to raise water levels to the surface of the peat (changing levels of pipes for example) across vegetated and unvegetated areas where hydrological conditions can be improved. Some fertiliser will be spread on headlands and other areas (a small part of the overall area) to encourage vegetation growth.
- Bord na Móna plan to carry out this work on part of the site in 2022-2024.
- 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.

- It will take some time for fully developed habitats to fully develop at Blackwater Bog, and for a peatland ecosystem to develop. However, it is expected that most of the bare peat areas will be developing pioneer habitats after 5-10 years.
- This is a peatland rehabilitation plan. This plan does not plan future after-use or development. Bord na Móna continually reviews its land-bank to consider future commercial or industrial developments, such as renewable energy. Any other proposed development will be planned in adherence to relevant planning guidelines and will consider the rehabilitation and the condition of the bog.
- Bord na Móna are currently developing a renewable energy project called Blackwater Solar Farm ([Home | Blackwater Solar Farm](#)), using solar photovoltaic panel arrays to produce electricity. This proposed project is in the pre-planning stage, but the area being considered for development has informed the constraints (see drawing number BNM-DR-23-14-05: Enhanced Rehab Measures and BNM-DR-23-14-20: Standard Rehab Measures). The proposed renewable energy project is expected to use only part of Blackwater Bog. The proposed solar farm development study area is 1079 hectares.
- In advance of this proposed planning submission, it is planned to rehabilitate **part** of Blackwater Bog in 2022 - 2024. The remaining area will be rehabilitated after the proposed renewable energy construction is complete, or at a later date. It is expected that Bord na Móna will revise and update this rehabilitation plan for Blackwater when this renewable energy project has been considered by the planning process, and other areas can be considered for peatland rehabilitation.
- Peatland rehabilitation of these bogs will bring a range of benefits to the local community via improvements to the local landscape and is also important for supporting national policies and strategies in relation to reduction of carbon emissions from these peatlands, supporting biodiversity and improvements to water quality.

## SUMMARY

**Name of bog:** Blackwater Bog      **Total Area:** 2314ha      **Rehabilitation area (FY23 PCAS extent):** 562ha

### Site description:

- Blackwater bog was drained and developed for industrial peat production in the 1950's. Peat production ceased in 2020. The peat was harvested for fuel peat to be used in West Offaly Power in Shannonbridge, Offaly.
- Blackwater Bog is considered a shallow peat cutaway bog with some small pockets of deep peat remaining.
- This bog has pumped bog drainage. Some of the pumps which facilitated former peat extraction are now switched off. Several pumps are still operational.
- Blackwater bog is an older production bog and there is extensive development of pioneer cutaway vegetation communities and wetlands across the former production area, with some areas of bare peat also remaining.
- Coillte have developed a portion of the bog for Commercial plantation forestry, this is outside the area proposed for FY23 PCAS.
- Some of the cutaway has been developed for forestry and has been used for BOGFOR forestry trials, this is also outside the area proposed for FY23 PCAS.
- An ash repository site is present at Blackwater Bog, and is managed by ESB.
- Blackwater Bog is located in close proximity to several designated conservation sites. The EU Designated site Fin Lough Offaly SAC lies within the north-western part of Blackwater. River Shannon Callows SAC and Middle Shannon Callows SPA occur adjacent to the western boundary.

### Rehabilitation goals and outcomes

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

This is defined as:

- Meeting conditions of the IPC licence.
- Stabilisation or improvement in water quality parameters (e.g. suspended solids).
- Environmental stabilisation.
- Optimising hydrological conditions for the further development of mainly open water habitats, fen, Reed Swamp and wet woodland on shallow cutaway peats, along with management of existing habitats.
- Rehabilitation will support the National Policies on Climate Action and GHG mitigation by maintaining and enhancing the current residual peat storage capacity of the bog (locking the carbon into the ground). It is expected that the bog will have reduced emissions (reduced source) as it develops naturally functioning peatland habitats. It will also support Ireland's commitments towards Water Framework Directive and the National River Basin Management Plan 2018-2021.
- Optimising hydrological conditions for the protection of exposed archaeological structures, their retention in situ and preservation into the future.

### Scope of rehabilitation

The principal scope of this rehabilitation plan is defined by:



- The area of Blackwater Bog.
- EPA IPC Licence - Ref. P0502-01. As part of Condition 10.2 of this license, a rehabilitation plan must be prepared for permanent rehabilitation of the boglands within the licensed area. The key objective of 'rehabilitation', as required by this licence, is achieved by the environmental stabilisation of the bog.
- The Scheme (PCAS) includes enhanced measures which are designed to exceed/meet the standard stabilisation requirements as defined by the IPC Licence and to enhance the ecosystem services of Blackwater Bog, in particular, optimising climate action benefits.
- The key goals and outcomes of rehabilitation at this bog outlined above.
- To minimise potential impacts on neighbouring land, boundary drains around Blackwater Bog will be left unblocked, as blocking boundary drains could affect adjacent land.
- Some remnant raised bog around the margins are still utilised for private sod peat cutting.
- Proposed land-use. Bord na Móna are currently developing a renewable energy project called Blackwater Solar Farm. This proposed project is in the pre-planning stage. In advance of this proposed planning submission, it is planned to rehabilitate part of Blackwater Bog in 2022- 2024. The remaining area will be rehabilitated after the proposed renewable energy construction is complete, or at a later date. Bord na Móna remain committed to rehabilitating all of Blackwater Bog and meeting conditions of the IPC License for this bog.

#### **Criteria for successful rehabilitation:**

The Criteria for successful rehabilitation to meet Condition 10 of the IPC Licence have been defined as:

- Rewetting of residual peat in the former area of industrial peat production to slow water movement across the site to retain silt, encouraging development of vegetation cover via natural colonisation, and reducing the area of bare exposed peat through the creation of open water habitats, fen, Reed swamp and wet woodland (IPC Licence validation). The target will be the delivery of measures and this will be measured by an aerial survey after rehabilitation is completed. (IPC Licence validation).
- Stabilising/improving potential emissions to water (e.g. suspended solids). This will be measured via water quality monitoring (suspended solids and ammonia) for at least 2 years after the rehabilitation has been completed. (IPC Licence validation).
- Reducing pressure from peat production on the local river catchment (WFD) (IPC Licence validation). This will be measured by the EPA WFD monitoring programme.
- Optimising the extent of suitable hydrological conditions for climate action (climate action verification). This will be measured by an aerial survey after rehabilitation has been completed.
- Reduction in carbon emissions (climate action verification). Baseline monitoring will be carried after rehabilitation is completed (during the scheme). It is proposed that sites can be monitored against this baseline in the future.
- Setting the site on a trajectory towards establishment of a mosaic of compatible habitats including open water, fen, Reed-Swamp, wet woodland, heath, scrub and birch woodland, where conditions are suitable, and eventually towards a reduced carbon source. Some areas will naturally be dry and develop birch woodland and other drier habitats. It will take some time for stable naturally functioning habitats to fully develop at Blackwater Bog.
- Improvement in biodiversity and ecosystem services (climate action verification).

### Summary of measures:

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

- Planning actions, including developing a detailed site plan and carrying out a hydrology and drainage appraisal.
- Carry out an ecological appraisal of the potential impacts of the planned rehabilitation.
- Carry out proposed measures, which will include a combination of hydrological management, drain blocking, peat field re-profiling and fertiliser applications (targeting bare peat sections of headlands, high fields and other areas).
- Silt ponds will continue to be maintained during the rehabilitation and decommissioning phase.
- Evaluate success of short-term rehabilitation measures outlined above and remediate, where necessary.
- Decommissioning of silt-ponds will be assessed and carried out, where required.

### Timeframe:

- 2021-2022: Short-term planning actions.
- 2022 - 2023: Short-term practical actions.
- 2023-2025: Any Long-term practical actions; Evaluate success of short-term rehabilitation measures outlined above and remediate, where necessary.
- 2025: Decommission silt-ponds, if necessary.

### Budget and Costing

- The rehabilitation plan outlined in this document is predicated on the understanding that it is the Minister's intention to support, via the Climate Action Fund and Ireland's National Recovery and Resilience Plan, Bord na Móna in developing a package of measures, 'the Scheme', for enhanced decommissioning, rehabilitation and restoration of cutaway peatlands referred to as, the Peatlands Climate Action Scheme'. *However, only the additional costs associated with the additional and enhanced rehabilitation, i.e., measures which go beyond the existing standard mandatory decommissioning and rehabilitation requirements arising from Condition 10 will be eligible for support.*
- In relation to the pre-existing Condition 10 IPC Licence requirement to carry out what can be termed the 'standard' decommissioning and rehabilitation, Bord na Móna maintains a provision on its balance sheet to pay for these future costs 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.

### Monitoring, after-care and maintenance

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

- Quarterly monitoring assessments of the site to determine the general status of the site, assess the condition of the rehabilitation work, assess 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, if needed.

- **Water quality monitoring** will be established. Monitoring of key water quality parameters for 2 years after rehabilitation will include: ammonia, phosphorous, suspended solids (silt) and pH.
- Where other uses are proposed for the site, these will be assessed by Bord na Móna in consultation with interested parties. Other after-uses can be proposed for licensed areas and must go through the required assessment and planning procedures.

#### **Additional Monitoring:**

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

#### **Validation and IPC Licence surrender**

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

- The planned rehabilitation has been completed.
- Water quality monitoring demonstrates that water quality indicators are stabilising/improving.
- The site has been environmentally stabilised.

## 1. INTRODUCTION

Bord na Móna operates under IPC Licence issued and administered by the EPA to extract peat within the Blackwater bog group (Ref. P0502-01). As part of Condition 10.2 of this licence, a rehabilitation plan must be prepared for permanent rehabilitation of the boglands within the licensed area. Blackwater bog is part of the Blackwater bog group (see Appendix II for details of the bog areas within the Blackwater Bog Group) and is located in Co. Offaly.

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 VI).
- 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.

It is proposed by Government that Bord na Móna carry out a Peatlands Enhanced Decommissioning, Rehabilitation and Restoration Scheme on its peatlands. Note this proposal is also known colloquially as the 'Peatlands Climate Action Scheme' (PCAS). The additional costs of the Scheme will be supported by Government through the Climate Action Fund, and Ireland's National Recovery and Resilience Plan administered by the Department of Environment, Climate and Communications (DECC), while the National Parks and Wildlife Service (NPWS) will act as the Scheme regulator. Bord na Móna have previously identified a footprint of 33,000 ha as peatlands suitable for this scheme. This Scheme will significantly go beyond what is required to meet rehabilitation and decommissioning obligations (Appendix VII and IX) under existing EPA IPC licence conditions. Improvements supported by the Scheme will ensure that environmental stabilisation is achieved (meaning IPC obligations are met), and importantly, significant additional benefits, particularly relating to climate action and other ecosystem services, will also be delivered. The Scheme commenced in 2021.

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

It is expected that the Scheme (PCAS) will have benefits accruing from biodiversity provision, water quality and storage attenuation as well as increased carbon storage, reduced carbon emissions and acceleration towards carbon sequestration. The Scheme will also facilitate monitoring of carbon fluxes (greenhouse gases and fluvial carbon) in selected areas (in addition to other established research programmes), to monitor changes in where the interventions will accelerate the trajectory towards a naturally functioning peatland ecosystem.

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

- more intensive management of water levels through pump management, drain-blocking and cell bunding,
- re-profiling that will deliver suitable conditions for development of wetlands, fens and bog habitats,
- targeted fertiliser applications,
- seeding of targeted vegetation, and
- proactive inoculation of suitable peatland areas with *Sphagnum*.

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

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

An extent of Blackwater Bog is proposed to be part of this Scheme (PCAS), which commenced in 2021 and this rehabilitation plan outlines the approach to be taken. Activities are proposed for 2022.

### 1.1 Constraints and Limitations

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

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

It also seeks to outline measures to optimise climate action and other ecosystem services benefits, mainly through hydrological management.

This document covers the area of **Blackwater Bog**.

Industrial peat extraction at Blackwater Bog permanently ceased in 2020, having commenced in the 1950's. Blackwater bog is an older production bog and there has been extensive development of pioneer cutaway vegetation communities and wetlands across the former production area where sub-sections have been cutaway over the years. Some areas were in peat extraction until recently and still have bare peat.

It is anticipated that the combination of active enhanced rehabilitation measures and natural colonisation will quickly accelerate environmental stabilisation. Nevertheless, it will still take some time (30-50 years) for naturally functioning wetland and peatland ecosystems to fully re-establish.

Parts of Blackwater Bog (partly 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 Blackwater 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.

Bord na Móna are proposing to develop a renewable energy project (solar farm) at Blackwater Bog. This project is in pre-planning. The proposed development area of the solar farm has been mapped as a constraint. In advance of this development, it is proposed to rehabilitate a substantial part of Blackwater Bog in 2022 that is not constrained (see *Figure: BNM-DR-23-14-05: Enhanced Rehab Measures*). The remaining viable areas will be rehabilitated until after the proposed renewable energy construction is complete, or at a later date. It is expected that Bord na Móna will revise and update the rehabilitation plan for Blackwater when this renewable energy project has been considered by the planning process.

Other constraints within the Blackwater Bog boundary include four plots of Coillte plantation forestry. In addition, Bord na Móna operate an Ash Repository Facility for ESB for the waste ash generated from the power station in Shannonbridge (West Offaly Power). This facility is owned by the ESB. ESB have applied for planning permission (as of March 2022) for the development of an Integrated Constructed Wetland for the treatment and management of leachate derived from the Ash Disposal Facility. The ash site and the proposed constructed wetlands are located outside of the rehabilitation footprint.

Bord na Móna remain fully committed to rehabilitating the whole bog and meeting the conditions of the IPC Licence. Any consideration of any other future after-uses for **Blackwater** Bog, such as renewable energy (other than the previously noted solar farm), 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.

Rehabilitation in other areas of the bog may also be constrained due to other property issues, archaeological features or issues such as rights of way, which may similarly constrain PCAS activities.

## 2. METHODOLOGY

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

The ecological information and site information collected during the Bord na Móna ecological baseline survey in 2009, with additional confirmatory site visits (covering the period 2010 to 2021 inclusive) and monitoring and desktop analysis forms the basis for the development of the rehabilitation plan for the bog, along with:

- Experience of 40 years of research on the after-use development and rehabilitation of the Bord na Móna cutaway bogs (Clarke, 2010; Bord na Móna, 2016);
- Significant international engagement during this period with other counties in relation to best-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 LIDAR data;
- Previous research studies on site;
- Hydrological modelling; and
- The development of a Methodology Paper (draft) outlining the Scheme (PCAS). This rehabilitation includes enhanced measures defined in the Methodology Paper which are designed to exceed the standard stabilisation requirements as defined by the IPC Licence and to enhance the ecosystem services of Blackwater Bog, in particular, optimising climate action benefits.

### 2.1 Desk Study

The desk study involved collecting all relevant environmental and ecological data for the study area. The development of the rehabilitation plan also takes account of research, experience and engagement with other peatland restoration and rehabilitation projects and peatland research including Irish, UK, European and International best-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.
- 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.
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Additional on-line resources were also incorporated into the desk study, including:

- Blackwater Integrated Pollution Control Licence;
- Blackwater Annual Environmental Reports;
- Review of the National Biodiversity Data Centre (NBDC) webmapper;
- Inland Fisheries Ireland (IFI) Reports;
- Environmental Protection Agency database ([www.epa.ie](http://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](http://www.birdwatchireland.ie));
- Geological Survey of Ireland - National Draft Bedrock Aquifer map;
- Geological Survey of Ireland - Groundwater Database ([www.gsi.ie](http://www.gsi.ie));
- Historic Environment Viewer at <https://webgis.archaeology.ie/historicenvironment/>
- National Parks & Wildlife Services Public Map Viewer ([www.npws.ie](http://www.npws.ie));
- Water Framework Directive catchments.ie/maps/ Map Viewer ([www.catchments.ie](http://www.catchments.ie));



- OPW Indicative Flood Maps ([www.floodmaps.ie](http://www.floodmaps.ie));
- CFRAM Preliminary Flood Risk Assessment (PFRA) maps ([www.cfram.ie](http://www.cfram.ie));
- River Basin Management Plan for Ireland 2018 – 2021;
- Bord na Móna Annual Report 2020.
- 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, Blackwater Bog was surveyed in December 2009. Additional ecological walk-over surveys and visits have taken place at Blackwater Bog between 2011-2021 (with a final confirmatory survey taking place in February 2022 of the proposed 2022 PCAS extent). 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 (2010), while mosses and liverworts nomenclature follows identification keys published by the British Bryological Society (2010). A more detailed Bord na Móna classification system was 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 site visit was used to categorise any changes in habitats overlapping the currently proposed PCAS extent at Blackwater Bog in February 2022.

A detailed ecological survey report for the entirety of Blackwater Bog is contained in Appendix III.

### 3. SITE DESCRIPTION

Blackwater Bog is located approximately 1 km north-east of Shannonbridge in Co. Offaly (Grid reference: N 02634 27356). It is part of the Blackwater group of bogs (Blackwater sub-group).

The bog is accessed to the north via the R444 Shannonbridge to Clonmacnoise public road which lies outside the western/north-western boundary of the site, and via local roads off the R357 Shannonbridge to Cloghan road, to the south of the bog.

The rehabilitation area consists of three discrete parcels of land within the wider Blackwater Bog boundary, with a total footprint of 562 ha. These rehabilitation parcels include:

- Tullaghbeg: An area of 121.3 ha of land in the northern part of the site, which lies adjacent to the boundary of Fin Lough (Offaly) SAC.
- Clondelara-Blackwater: an area of 170 ha of land located in the southern part of the site, with its eastern boundary formed by the Gowlan River, and its western boundary extending to the main access road.
- Derrylahan-Blackwater: an area of 270.9 ha lies east of the Gowlan River, extending to the eastern boundary of the site, where the River Blackwater is located

Blackwater Bog is considered a shallow peat cutaway bog with some small pockets of deep peat remaining. The bog is an older production bog and there is extensive development of pioneer cutaway vegetation communities and wetlands across the former production area where peat has been cutaway.

The main landscape feature in this area is the River Shannon and its associated riparian zone and floodplain, which lies west of the western leg of Blackwater Bog. The surrounding landscape comprises of a mosaic of low-lying agricultural land (pasture) interspersed with other raised bogs, many of which have also been managed by Bord na Móna for peat production. Belmont Bog is located immediately adjacent to Blackwater to the west, with Ballaghurt immediately adjacent to the north-east and Bloomhill to the north. Kilmacshane and Garryduff bogs area located south-west of Blackwater Bog, on the opposite bank of the River Shannon. These bogs are also part of the Blackwater bog group.

Blackwater Bog partially overlaps Fin Lough (Offaly) SAC (NPWS Site Code: 000576).

This bog is has pumped bogdrainage. Pumping of the site was critical to sustaining the industrial peat production areas. Seven pumps were previously in operation at Blackwater. Three of these pumps are still operational and four are no longer operational/decommissioned.

See Figure *BNM-DR-23-14-01: Blackwater Bog: Bog Site Location*, included in the accompanying Mapbook<sup>1</sup>, which illustrates the location of Blackwater Bog in context to the surrounding area.

A small part of the greater Blackwater site, outside the current extent proposed for rehabilitation, has already been rehabilitated/stabilised with the development of conifer forestry and various forestry trials. In addition, several wetland areas were created around 2000 including Blackwater Lake and a rewetted area adjacent to Fin Lough SAC, which acted as a buffer.

Blackwater Bog formerly hosted the Clonmacnoise and West Offaly Railway. This was a tourist amenity with a rail engine and carriage transporting visitors around a loop of Blackwater Bog and included various interpretation of local heritage and the heritage of the bog. This tourist amenity is now closed.

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<sup>1</sup> Cutaway Bog Decommissioning and Rehabilitation Plan – Blackwater Bog Map Book

### 3.1 Status and Situation

#### 3.1.1 Site history

Blackwater bog was drained and developed for industrial peat production in the 1950's. Peat production ceased in 2020. The peat was harvested for fuel peat to be used in West Offaly Power in Shannonbridge, Offaly.

#### 3.1.2 Current land-use

- Industrial peat production has now permanently ceased at Blackwater Bog.
- A Bord na Móna workshop and grounds is located in the south of the bog, removed from the currently proposed PCAS extent.
- Ash Repository Facility: Bord na Móna operate an Ash Repository Facility for ESB for the waste ash generated from the power station in Shannonbridge (West Offaly Power). This facility is owned by the ESB. It is licensed by the IPC licences of both ESB (P0611-01) and Bord na Móna (Ref. IPC Licence 502). The ash disposal facility located on the site is likely to be in operation up to 2023 and is similarly outside the lands where rehabilitation is proposed. The drainage of this site requires some pumping of discharges, licenced by the IPC licence.
- ESB have applied for planning permission (as of March 2022) for the development of an Integrated Constructed Wetland for the treatment and management of leachate derived from the Ash Disposal Facility. It is proposed that leachate will be treated through a multi-cell constructed wetland. Leachate entering the Integrated Constructed Wetland will flow sequentially through the treatment cells and discharge to an existing surface water drain on-site, ahead of final discharge to the Gowlan River via an existing licenced discharge location. The treated leachate from the ICW will be substantially reduced in volume, particularly during drier periods and the quality of any discharge will comply with the existing EPA IE licence prior to discharge to the Gowlan River. This proposed development will be located within the Ash facility boundary and is outside the lands where rehabilitation is proposed.
- There are two rehabilitated constructed wetlands within Blackwater Bog that are maturing and developing into semi-natural habitats (89.4 ha).
- Parts of Blackwater Bog, along the southern margins (partly within the areas owned and under the control of Bord na Móna) are currently being used by domestic turf cutters to harvest peat.
- Some of the cutaway has been developed for forestry and has been used for Coillte/Bord na Móna BOGFOR forestry research trials (44.32 ha), these lands do not overlap the currently proposed PCAS extent.
- Clonmacnoise-Blackwater Railway. This former tourist amenity, which operated in the 1990s, is now closed.
- The EU Designated site Fin Lough Offaly SAC lies partially within the north-western part of Blackwater bog, although this designated area was never developed for peat extraction.

#### 3.1.3 Future Landuse

- Bord na Móna are proposing to develop a solar farm at Blackwater Bog. The proposed footprint of the solar farm has been mapped as a constraint for this rehabilitation plan. In advance of this development, it is proposed to rehabilitate areas within Blackwater Bog that are not currently constrained in 2022-2024

(see *Figure: BNM-DR-23-14-05: Enhanced Rehab Measures*). The peatland rehabilitation will **either** be in association with a potential renewable energy project, with peatland rehabilitation integrated into the proposed project, **or** will be completed in the absence of any proposed renewable energy project. It is expected that Bord na Móna will revise and update the rehabilitation plan for Blackwater when this renewable energy project planning application process is completed.

- There are several different proposals and feasibility studies ongoing for amenity development (e.g. greenways) on Blackwater Bog. Bord na Móna are reviewing each of these various proposals from local communities, private groups, the local authority and Fáilte Ireland.

### 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 Blackwater Bog, jobs would have included those to facilitate harvesting for fuel peat to be used in West Offaly Power in Shannonbridge.

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

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

## 3.2 Geology and Peat Depths

### 3.2.1 Sub-soil geology

The sub-soil geology of the entire Blackwater bog is hereby described.

The underlying geology<sup>2</sup> of the south-eastern section of Blackwater comprises Waulsortian Limestones (Massive unbedded lime-mudstone), whilst the geology of the mid-section of the bog comprises Ballysteen Formation (dark

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<sup>2</sup> <https://www.gsi.ie/en-ie/data-and-maps/Pages/Bedrock.aspx>

muddy limestone & shale) and the western and north-western margins the underlying geology comprises Navan beds (dark limestone, mudstone and sandstone).

The underlying soils and sub-soils are classed as 'Raised Bog Cutover Peat'. The lowest lying areas are underlain by marl and lacustrine clay (below c. 37mOD), while there are several ridges of more elevated material (rising to >46mOD). This has been interpreted as glacial till due to the presence of clayey material encountered during coring and based on comparable features present in the surrounding area.

### 3.2.2 Peat type and depths

Blackwater bog is a shallow peat bog (peat depths 0-1 m), with some small pockets of deep peat remaining (>2m). The northern rehab area is predominantly shallow peat (0-5m) on the former peat production area, with more deep peat along the margins. Rehabilitation areas in the eastern part of the site are predominantly shallow, with some small pockets of residual deep "*Sphagnum*" peat, (> 2 metres) close to the eastern margin.

## 3.3 Key Biodiversity Features of Interest

Blackwater Bog is now recolonising with Pioneer Vegetation forming a mosaic with Bare Peat and Wetland habitats.

### 3.3.1 Current habitats

The most common habitats<sup>3</sup> present within the currently proposed rehabilitation areas include:

- Open Water (FL) with Emergent Wetland Communities (poor fen) and Reedbeds.
- Recolonising Cutover (PB4) comprising pioneer Poor Fen (PF2) with Bog Cotton and Bottle Sedge-dominated Poor Fen vegetation.
- Reedbeds (FS1)
- Cutover Bog (PB4) – areas of bare peat.
- Dry heather-dominated communities on Cutaway Bog (PB4) have developed in drier more elevated land, mainly in mosaic with Birch Scrub (WS1).
- Birch Woodland (WN7) occurs in some small patches around the margins.
- Scrub (WS1) (around margins, mainly dominated by Birch, Gorse and Willow).
- Raised Bog (PB1), remnant sections of raised bog occur in the northern area of Blackwater at Tullaghbeg-Fin Lough.
- Watercourses and Riparian zones including the Gowlan River, Derryhask stream and Drainage Ditches (FW4).

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<sup>3</sup> Codes refer to Fossitt (2000), *A Guide to Habitats in Ireland*, The Heritage Council 2000, we note that habitat categories presented are not exhaustive and are meant to indicate the primary habitats of importance which are present. Equivalent Fossitt codes to the habitat descriptions are provided here but we note the referenced figure displays the general BNM habitat layer.

The rehabilitation area consists of three discrete parcels of land within the wider Blackwater boundary. The main habitats in these parcels of land are described below.

### **Tullaghbeg**

The rehabilitation area includes 121.3 ha of land in the northern part of Blackwater and lies adjacent to Fin Lough (Offaly) SAC. The Gowlan River flows along the north and east side and demarcates the boundary. Wetland habitats have developed in the south-east corner of this parcel of land, dominated by pioneer Reedbeds and Open Water. Extensive areas of Bare Peat remain. The former production area along the northern margin had now revegetated with Pioneer Poor Fen vegetation.

The adjacent Fin Lough area (the SAC) contains a mosaic of Rich Fen (PF1), Raised bog (PB1), Reedbeds (FS1), Scrub (WS1) and some Wet Grassland (GS4) around an infilling Limestone Lake (FL3). Fringe habitats around the margins include raised Bog Remnants (PB1, PB4) Scrub developing on high bog (WS1), Bracken (HP1) and Birch Woodland (WN7).

### **Derrylahan-Blackwater**

This area comprises 270.9 ha and is bounded on the south west by the Gowlan River and the north east by the Derryhask stream. This section extends to the boundary of Blackwater Bog where the Blackwater River forms the demarcation between Blackwater and the adjacent Belmont Bog (rehabilitated in 2021).

The majority of this area is re-vegetating with a mixture of Open Water, Pioneer Poor Fen, Reedbeds And Birch Scrub, although some areas of Bare Peat still remain. A significant portion of this section is quite wet and Wetland habitats have developed at either end of this parcel of land, dominated by Reedbeds and Open Water. It is subject to annual flooding or high water levels during the winter months, due to its proximity to the corridor of the Blackwater River.

### **Clondelara-Blackwater**

This rehabilitation area consists of 170 ha of land and is the most westerly parcel of land proposed for rehabilitation. The Gowlan River flows to its east whilst to the west is the main access road into the centre of Blackwater and the ash deposition facility.

The majority of this section was in active peat production until relatively recently and is now starting to revegetate with Pioneer Poor Fen and Scrub communities, with a large area of open water and extensive Reedbeds forming adjacent to the Gowlan River. Drier areas occur within the southern part of this section with Bare Peat, Pioneer Poor Fen and Scrub communities. Bodies of more permanent water would be subject to increased inundation during the winter period.

See Drawing number BNM-DR-23-14-17 titled **Blackwater Bog: Current Habitat Map**, included in the accompanying Mapbook, which illustrates the habitats at Blackwater Bog.





*Wetland, Poor Fen and Reedbed habitat in the north-eastern part of Blackwater (Derrylahan-Blackwater section)*



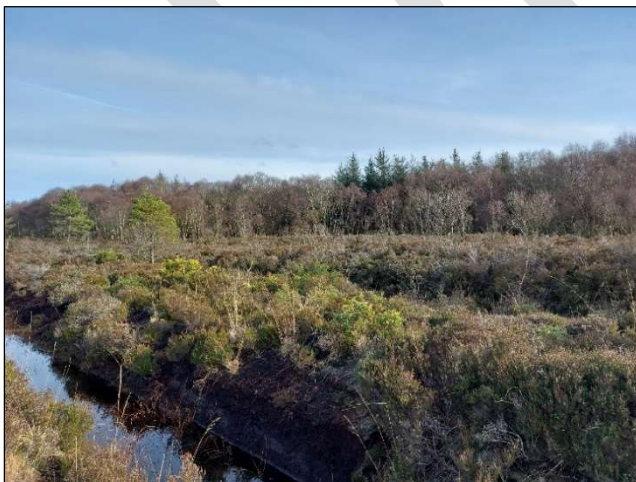
*Wetland, fringed by Reedbed habitat in the south-western part of Blackwater (Clondelara-Blackwater)*



*Bare peat and Poor Fen habitat in the north-eastern part of Blackwater (Derrylahan-Blackwater section)*



*Bare peat and Poor Fen habitat in the south-western part of Blackwater (Clondelara-Blackwater)*



*Dry heather dominated vegetation and Birch Woodland along marginal land in the north-eastern part of Blackwater (Derrylahan-Blackwater section)*



*Dry Heather dominated vegetation and Birch Woodland occurs in drier more elevated areas in the central north-eastern part of Blackwater (Derrylahan-Blackwater section)*

### 3.3.2 Species of conservation interest

A number of species of conservation concern utilize the habitats available at Blackwater Bog. The following is a summary of the records of these species available within both BnM records (covering the whole of Blackwater Bog) and those of the National Biodiversity Centre.

A review of available Biodiversity records from the National Biodiversity Data Centre (hereafter NBDC) of flora and fauna recorded within a polygon including Blackwater Bog found records for several terrestrial mammal species, including records for Badger (*Meles meles*), Eurasian Pygmy Shrew (*Sorex minutus*), Eurasian Red Squirrel (*Sciurus vulgaris*), European Otter (*Lutra lutra*), Pine Marten (*Martes martes*), Red Deer (*Cervus elaphus*), West European Hedgehog (*Erinaceus europaeus*), Irish Hare (*Lepus timidus subsp. hibernicus*) and Irish Stoat (*Mustela erminea subsp. hibernica*).

A number of bat species have also been recorded on or within 5 km of Blackwater bog including Common Pipistrelle (*Pipistrellus pipistrellus sensu lato*), Soprano Pipistrelle (*Pipistrellus pygmaeus*) Daubenton's Bat (*Myotis daubentonii*).

The rehabilitation footprint within Blackwater Bog intersects one 10 km square (N02), which has records of 70 species of birds (2007-2011 Bird Atlas period), 358 species of flowering plant, 27 species of moss, 1 amphibian species, 19 butterfly species, 67 moth species and 77 mollusc species.

Recent NBDC records (2018-2020) for lepidopteran species of conservation interest at Blackwater bog and within 2 km of the bog boundary include the near threatened species Dingy Skipper (*Erynnis tages*), Grayling (*Hipparchia semele*), Small Heath (*Coenonympha pamphilus*), endangered species Wall (*Lasiommata megera*) and the Annex II protected species Marsh Fritillary (*Euphydryas aurinia*). The presence of the rare snail, *Vertigo geyeri*, a species listed on Annex II of the E.U. Habitats Directive, at Fin Lough is of considerable conservation significance.

Numerous bird species are known to use the cutover bogs in Ireland's midlands as breeding grounds, wintering grounds or both. Blackwater contains several semi-natural wetland habitats and a substantial part of the bog as a whole can be subject to inundation during winter periods (although this can vary inter-annually). Based on previous BNM commissioned surveys these areas have the potential to attract substantial amounts of Whooper Swans (*Cygnus cygnus*) (Annex I Birds Directive species) and waterfowl during the winter months. As recently as 2015, Blackwater supported a nationally important population of non-breeding Teal (*Anas crecca*)(i.e. >340) and smaller numbers of Mallard (*Anas platyrhynchos*), Wigeon (*Anas penelope*) and Pintail (*Anas acuta*), and was considered a potential sub-site of the Mid Shannon Callows SPA (in the Whooper Swan context) based on the occurrence of internationally important numbers of this species on at least one occasion (BES 2015<sup>4</sup>). Two areas within Blackwater Bog (outside the current proposed rehabilitation extent) were previously counted as 'Blackwater Railway Lakes' as part of the Irish Wetland Bird Survey (IWeBS) and published reporting describes the occurrence of nationally important numbers of Teal and Pintail, along with occasionally nationally important numbers of Whooper Swan (Crowe *et al.* 2005).

Foraging Hen Harrier (*Circus cyaneus*) are regularly recorded at Blackwater during the winter or non-breeding period and are known to roost at one location outside the currently proposed rehabilitation extent. Individuals may also be recorded foraging occasionally during the breeding period.

Blackwater (as a whole) is a notable location for breeding waders. Surveys carried out in 1997 recorded 25 pairs of Lapwing (*Vanellus vanellus*), 17 pairs of Ringed Plover (*Charadrius hiaticula*), 6 pairs of Common Sandpiper

<sup>4</sup> BES (2015) BORD NA MONA WINTER BIRD SURVEY, 2014-2015 BLACKWATER BOG GROUP DRAFT REPORT OCTOBER 2015. Unpublished report.



(*Actitis hypoleucos*), 5 pairs of Redshank (*Tringa totanus*) and 2 pairs of Common Snipe (*Gallinago gallinago*) (Cooney, 1997). A follow up survey carried out in 1998, recorded 55 breeding pairs of waders, which included 29 pairs of Lapwing, 5 pairs of Common Snipe, 5 pairs of Redshank, 12 pairs of Ringed Plover and 4 pairs of Common Sandpiper (Cooney, 1998). About half of the breeding wader pairs were located around the artificial lakes, with the remainder found in low lying areas to the north-east, that had numerous shallow pools. During breeding wader surveys carried out at Blackwater in 2014 (Copland & Gallagher, 2014) the following breeding pairs were recorded: 3 pairs of Lapwing, 1 pair of Redshank, 1 pair of Ringed Plover, 1 pair of Common Sandpiper and 1 pair of Common Snipe. Whilst breeding numbers of some wader species have likely decreased due to habitat succession, it is still considered that suitable habitats across Blackwater Bog are used by breeding waders.

Multiple signs of terrestrial mammal species have been recorded on or in close proximity to the bog during BNM ecology surveys including Deer, Badger, Hare, Red Fox, Pine Marten and Squirrel. Otter signs have been recorded at the wetlands within the site. The Annex II species (EU Habitats Directive) Whorl Snail (*Vertigo geyeri*), was recorded in 1998 (Moorkens 1998), in the northern part of Fin Lough SAC.

### 3.3.3 Invasive species

Invasive alien species known to occur at Blackwater Bog (or desktop review suggests presence is likely), and for which reasonably foreseeable source impact pathways for dispersal may result from the proposed PCAS are described here.

There are NBDC records and BNM records for Pitcherplant (*Sarracenia purpurea*) from marginal habitat close to the western boundary of Blackwater, however there are no records for this species within the footprint of the proposed rehab areas.

No aquatic invasive species are described in available EPA documentation<sup>5</sup> in respect of WFD Cycle 2 sub-catchment reporting.

A broad range of common garden escapes are occasionally present around the margins of Bord na Móna bogs, and although spatial overlap with the PCAS is expected to be limited, these are, where necessary, to be treated in line with best practice during PCAS activities.

## 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 5 km radius at minimum) to Blackwater Bog. In addition, there are a number of nationally designated sites (NHAs and pNHAs) in proximity to the site.

Fin Lough (Offaly) SAC (site code: 000576) lies within the Bord na Móna site boundary and is immediately adjacent to the rehabilitation area in the northern part of the site. The qualifying interests of this SAC are Alkaline fens [7230] and Geyer's Whorl Snail (*Vertigo geyeri*) [1013]. This site is also designed as a pNHA.

Mongan Bog SAC (site code: 000580) lies 240m north of the Blackwater Bog boundary (657 m north of nearest rehabilitation area). The qualifying interests of this SAC are Active raised bogs [7110], Degraded raised bogs still

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<sup>5</sup> [https://catchments.ie/wp-content/files/subcatchmentassessments/07\\_6%20Blackwater\[Longwood\]\\_SC\\_010%20Subcatchment%20Assessment%20WFD%20Cycle%202.pdf](https://catchments.ie/wp-content/files/subcatchmentassessments/07_6%20Blackwater[Longwood]_SC_010%20Subcatchment%20Assessment%20WFD%20Cycle%202.pdf)

capable of natural regeneration [7120] and Depressions on peat substrates of the *Rhynchosporion* [7150]. Mongan Bog SPA (site code: 004017) overlaps the boundary of this SAC and is designated for Greenland White-fronted Goose (*Anser albifrons flavirostris*) [A395]. This site is also designated as a pNHA.

Pilgrim's Road Esker SAC (site code: 001776) lies 1.4 km north west of Blackwater Bog and is designated for Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (\* important orchid sites) [6210]. This site is also designated as a pNHA.

Moyclare Bog SAC (site code: 000581) lies 3.4 km south-east of Blackwater Bog and is designated for Active raised bogs [7110], Degraded raised bogs still capable of natural regeneration [7120] and Depressions on peat substrates of the *Rhynchosporion* [7150]. This site is also designated as a pNHA.

River Shannon Callows SAC (site code: 000261) lies 500m west of the boundary of Blackwater Bog (2.5 km from the closest rehabilitation area). This SAC is designated for *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) [6410], Lowland hay meadows (*Alopecurus pratensis*, *Sanguisorba officinalis*) [6510], Limestone pavements\* [8240], Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae)\* [91E0] and Otter (*Lutra lutra*) [1355].

Middle Shannon Callows SPA (site code: 004096) overlaps this SAC boundary and is designated for Black-tailed Godwit (*Limosa limosa*) [A156], Golden Plover (*Pluvialis apricaria*) [A140], Black-headed Gull (*Chroicocephalus ridibundus*) [A179], Wigeon (*Anas penelope*) [A050], Whooper Swan (*Cygnus cygnus*) [A038], Corncrake (*Crex crex*) [A122], Lapwing (*Vanellus vanellus*) [A142] and Wetlands [A999]. The River Shannon Callows is also designated as a pNHA.

The River Suck Callows SPA (site code: 004097) lies 1.1 km west of Blackwater Bog (approximately 4 km west of the nearest rehabilitation area), and is designated for Whooper Swan (*Cygnus cygnus*) [A038], Wigeon (*Anas penelope*) [A050], Golden Plover (*Pluvialis apricaria*) [A140], Lapwing (*Vanellus vanellus*) [A142], Greenland White-fronted Goose (*Anser albifrons flavirostris*) [A395] and Wetland and Waterbirds [A999]. This site is also designated as an NHA.

In addition, there are a number of other nationally designated sites (NHAs and pNHAs) in proximity to the site. Lough Nanag Esker pNHA (site code: 000910) lies outside the western boundary of the site. Clonfinlough Esker pNHA (Site code: 000892) lies 815 m north east. Clorhane Wood pNHA (site code: 000894) is located approximately 325 m west of the Blackwater Bog boundary. Clonllyn Glebe Bog pNHA (site code: 001830) is located approximately 3 km north-east of Blackwater Bog.

#### 3.4.1 Other Nature Conservation Designations

The Ramsar Convention entered into force in Ireland on 15<sup>th</sup> March 1985. Ireland currently has 45 sites/wetlands designated as Wetlands of International Importance (Ramsar Sites). These cover a surface area of 66,994ha. The closest Ramsar Site to Blackwater is Mongan Bog, Co. Offaly, which lies 240m north of the Blackwater Bog boundary (657m north of nearest rehabilitation area). This site is designated for its raised bog habitat and is also internationally important for wintering populations of Greenland White-fronted Goose (*Anser albifrons flavirostris*). This site is also designated as SAC and SPA.

### 3.5 Hydrology and Hydrogeology

Blackwater forms part of the Lower Shannon Catchment (Catchment ID : 25B) as defined by the EPA under the Water Framework Directive (WFD) and is primarily situated within the Shannon[Lower]\_SC\_030 sub-catchment,

with a small portion of the bog falling within the SHANNON (Upper)\_130 sub-catchment. It is surrounded by flat agricultural land and additional bog land areas. The Bog is situated just over 1 km to the North-East of Shannonbridge, between the Shannon River to the West and Belmont Rd to the East. The bog contains several drainage pathways and discharge locations, with the majority of the bog discharging to the Shannon River to the West of the Bog. The nearest Water Framework Directive gauging monitoring points in the area are located south of the bog where the water status was recorded as good in 2017 (Q=4, Station Name: Blackwater Br).

There are several rivers within and around the margins that drain the site. The Gowlan River (EPA code: 26G04), flows around the northern and north-eastern site boundary, and through the central part of the site in a south-easterly direction. This watercourse flows along the boundary of all three rehabilitation parcels within Blackwater Bog. The Derryhask stream (EPA code: 25D99) flows through the eastern section of the site. Both the Derryhask and the Gowlan watercourses discharge to the Blackwater (Shannonbridge) River (EPA code: 25B27), which flows in a south-westerly direction along the eastern boundary of Blackwater. This watercourse is a tributary of the River Shannon (lower) (EPA code: 25S01).

Regional hydrological data suggest that Blackwater receives average precipitation of 890mm/yr (1981-2010), with an estimated evapotranspiration rate of c. 505mm/yr, leaving an average effective precipitation of 385mm/yr. Assuming no recharge to groundwater and no groundwater contribution to discharge from the bog, the available precipitation that may become runoff (assuming no change in storage) is 385mm/yr, which equates to an annual runoff rate of c. 3,850m<sup>3</sup>/ha.

GSI data suggests that Blackwater Bog is underlain by several geological formations, the main bedrock units being the Ballysteen formation and Waulsortian Limestones which underlie the majority of the site. In addition, the Navan Beds underlie a small section of the bog towards the north-east and the Lucan Formation underlies a small portion to the south-east. All of these bedrock units are classified as Locally Important Aquifers (Bedrock which is Moderately Productive only in Local Zones). There are several bedrock faults trending through Blackwater Bog and the surrounding areas. Geological Survey of Ireland (GSI) mapping identifies several karst features (Springs and superficial solution features) within close proximity to the bog, with the nearest feature being located c. 250m from the North-western boundary of the bog. No data exists concerning depth to bedrock whilst the closest bedrock outcrop occurs 0.8 km to the east of the bog.

Locally important aquifers are capable of supplying locally important abstractions (e.g. smaller public water supplies, group schemes), or good yields (100-400 m<sup>3</sup>/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.

Quaternary Sediment maps show an overview of Blackwater underlain by peat, yet surrounded by inorganic deposits, including till derived from limestone which occurs to the south-east and south-west of the bog and gravels derived from limestone which occur to the north-east, north and north-west. There are a number of eskers towards the north of the bog.

While Groundwater Vulnerability is typically used to indicate the susceptibility to groundwater pollution, it can provide a useful proxy indication of likely groundwater flow rates in the surrounding area. Groundwater vulnerability is generally high in the areas surrounding the bog; however, a number of extreme vulnerability areas can be identified in the surrounding area, typically associated with gravel deposits or bedrock outcrop.

Blackwater Bog has a pumped drainage regime. Hydrological modelling (BNM-DR-23-14-09 titled **Blackwater Bog: Depression analysis**) indicates that parts of the bog are 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. Note that pumping is ongoing (three operational pumps) and is likely to continue to support potential future land-use.

Blackwater Bog has four outfall points and associated silt pond infrastructure. Blackwater bog has two treated surface water outlets to the Blackwater River, and one to the Shannon Lower and one direct to Shannon Upper, all via a silt pond network.

### 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 Blackwater 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.

Blackwater bog has two treated surface water outlets to the Blackwater River (E\_SH\_25B270200 BLACKWATER (SHANNONBRIDGE)\_020, and one to the Shannon Lower (IE\_SH\_25S012000 SHANNON (LOWER)\_010 and one direct to Shannon Upper (IE\_SH\_26S021920 SHANNON (Upper)\_130), all via a silt pond network.

The Blackwater River or receiving Shannon Upper/Lower are not indicated as being under pressure from peat or peat extraction in the third cycle River Basin Management Plan, currently under preparation.

Details of silt ponds, associated surface water emission points and those being monitored and sampled as part of the PCAS scheme are detailed on the accompanying structures map along with water quality map, see Drawing number BNM-DR-23-14-02 titled **Blackwater Bog: Structures and Sampling**, along with Drawing number BNM-DR-23-14-WQ01 titled **Blackwater Bog: Water Quality Map** included in the accompanying Mapbook, which illustrate the various drainage and water quality infrastructure present at Blackwater 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 National Parks & Wildlife Service, Environmental Protection Agency and Local Authority Water Program, amongst a range of stakeholders.

The main emission limit value associated with this bog is 35mg/l suspended solids, with trigger levels for ammonia of 3.7 mg/l and COD 100mg/l. Initial monthly ammonia concentrations from November 2020 to October 2021 have a range of 0.021 to 0.213 mg/l with an average of 0.128 mg/l. Results for suspended solids for the same period indicate a range of >2 to 33mg/l with an average of 3.31mg/l.

From an analysis of any monitoring over the past 6 years of the IPC licence environmental monitoring of some of the discharges from this bog, indicate that results were under the ELV for SS and Ammonia and broadly under the trigger levels for COD (see Table 3.1.).

Bog	SW	Monitoring	pH	SS mg/l	TS mg/l	Ammonia mg/l	TP mg/l	COD mg/l	Colour
Blackwater Bog	SW-74	Q2 21	7.4	3	172	0.176	<0.05	44	191
Blackwater Bog	SW-75	Q2 21	7.5	2	337	0.126	<0.05	45	184
Blackwater Bog	SW-76	Q2 21	7.5	7	245	0.179	<0.05	70	347
Blackwater Bog	SW-80	Q2 21	7.5	7	304	0.127	<0.05	44	182
Blackwater Bog	SW-74	Q1 19	7.7	<5	384	0.56	<0.05	48	94
Blackwater Bog	SW-75	Q1 19	7.8	<5	414	0.2	<0.05	36	68
Blackwater Bog	SW-76	Q1 19	7.7	<5	266	0.03	0.05	70	202
Blackwater Bog	SW-78	Q4 19	6.5	7	128	0.432	<0.05	79	497
Blackwater Bog	SW-79	Q4 19	7	4	198	2.36	<0.05	66	327
Blackwater Bog	SW-80	Q1 19	7.8	<5	416	0.09	<0.05	36	72
Blackwater Bog	SW-83	Q4 19	6	4	148	1.09	<0.05	106	594
Blackwater Bog	SW-78	Q3 18	7.6	5	326	5.1	0.05	72	164
Blackwater Bog	SW-79	Q3 18	7.7	5	470	0.11	0.05	26	50
Blackwater Bog	SW-83	Q3 18	7.2	5	248	1.5	0.05	107	282
Blackwater Bog	SW-81	Q4 18	7.9	5	226	0.72	0.05	50	134
Blackwater Bog	SW-82	Q4 18	7.4	5	206	2.5	0.05	81	250
Blackwater Bog	SW-84	Q4 18	6.6	5	270	3.4	0.05	85	283
Blackwater Bog	SW-86	Q4 18	7.5	36	210	1.1	0.08	113	152
Blackwater Bog	SW-74	Q2 15	7.8	5	374	1.3	0.05	51	85
Blackwater Bog	SW-77	Q2 15	8	6	372	0.36	0.05	20	60
Blackwater Bog	SW-78	Q2 15	7.7	5	328	0.49	0.05	49	108
Blackwater Bog	SW-80	Q3 15	8.1	5	362	0.02	0.05	43	69
Blackwater Bog	SW-81	Q3 15	8.1	5	410	0.16	0.05	23	99
Blackwater Bog	SW-82	Q3 15	8	9	272	0.29	0.05	57	175
Blackwater Bog	SW-83	Q3 15	7.4	5	226	1.6	0.05	120	5
Blackwater Bog	SW-84	Q3 15	7.7	5	354	0.21	0.05	66	206
Blackwater Bog	SW-86	Q3 15	7.8	5	342	0.19	0.05	60	178

**Table 3.1: Decommissioning and Rehabilitation Programme Water Quality Monitoring.**

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

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

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

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

This is necessary to ensure that there is alignment with the WFD monitoring programme and that where possible, the monitoring programme will enable any improvements in water quality or establishing trends to be quantified

against any available WFD monitoring data. It will also enable the periodic sharing of data which will inform the monitoring reports, success criteria and enable LAWPRO under the Water Framework Directive to track any changes in pressures and be aware of changes in water chemistry.

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

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

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

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 recolonising with pioneer vegetation, but areas of bare peat still remain. 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) 2018-2021 (DHPCLG, 2017) is the key national plan for Ireland to achieve the objectives of the Water Framework Directive (WFD). The NRBMP outlines how key actions such as the Bord na Móna peatland rehabilitation is expected to have a positive impact on water quality and help the NRBMP deliver its objectives in relation to the WFD.

Water will still discharge from designated emission points when rehabilitation at Blackwater Bog has been completed. This discharge will have improving water quality and there will be increased wetland attenuation, meaning slower release of water. This is expected to have a positive impact on status of the key water body receptors; the Blackwater (Shannonbridge) River (EPA code: 25B27); the River Shannon (lower) (EPA code: 25S01) and the Shannon Upper (EPA code: 26S02) and is expected to support the future status of the waterbody as being of Good Status.

### 3.7 Fugitive Emissions to air

None.

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



### 3.8 Carbon emissions

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

The EPA-funded CarbonRestore Project (Renou-Wilson *et al.* 2012) found that rewetting of drained peatlands can lead to restoration of functional peatland, such as the return of typical plant and animal species, which in turn may lead to the restoration of peat-formation and the C-sink function. The EPA NEROS project carried out GHG flux research at Moyarwood Bog and found that Moyarwood Bog was overall a Carbon sink (sink for CO<sub>2</sub> and a source for Methane) 6 years after bog restoration was carried out (Renou-Wilson *et al.* 2018).

The Reedflux Project – funded by Bord na Móna and EPA (Wilson *et al.* 2016) examined GHG fluxes at Blackwater Bog over a 5-year period. This study found that re-wetting created a carbon sink for CO<sub>2</sub> and a source for Methane. Overall, re-wetting at Blackwater reduced the global warming potential of the cutaway compared to an adjacent drained area. Rewetted sites may be more sensitive to interannual changes in weather conditions than their more resilient intact counterparts and may switch from an annual CO<sub>2</sub> sink to a source if triggered by slightly drier conditions.

It is expected that Blackwater 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 site is expected to develop fen and wetland vegetation that has potential to develop as a reduced GHG source when there are optimal hydrological conditions. There is limited potential for short-term development of *Sphagnum*-rich vegetation. Birch woodland is expected to develop on the drier mounds and peripheral headlands. Only a small part of the site has the potential to develop *Sphagnum*-rich peat-forming vegetation.

### 3.9 Current ecological rating

(Following NRA (2009) Evaluation Criteria and applicable to Blackwater Bog as a whole including lands outside the currently proposed PCAS extent).

Bare peat and other intensively managed areas are assessed as **local importance (lower value)**. Marginal habitats including woodland, scrub, pioneer cutaway habitats may act as a refuge, ecological corridors for wildlife or foraging habitat for wintering Hen Harrier are deemed to be **locally important (higher value)**. Mosaics of open water, pioneering fen and other habitat which support breeding waders are **locally important (higher value)** but some locations due to aggregations or presence of rare breeding species may be **Nationally** or **Internationally** important. Waterbodies which act as refugium's for Whooper Swan and other wintering wildfowl during the non-breeding period are evaluated as of **National Importance** but it is noted these are dependent on numbers which occur and may frequently reach **International Importance**. Habitats which host roosting Hen Harrier during the non-breeding period are **Internationally Important**.

Sections of the site (including Fin Lough in the northern part of the site) have been designated as part of nature conservation sites (River Shannon Callows and Fin Lough SACs, Lough Nanag pNHA). These areas contain habitats of particular ecological value (Raised Bog, Alkaline Fen) that are of **International Importance**. These areas are outside the footprint of the current rehabilitation areas.

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## 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 Blackwater group bogs including Blackwater 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,
- Ongoing consultation with Coillte regarding forestry management (forestry leased to Coillte),
- Bird surveys and monitoring carried out by Birdwatch Ireland for Bord na Móna,
- Development of future amenity (local community, private groups, Offaly County Council and Failte Ireland),
- Midlands & East Regional WFD Operational Committee (River Basin Management Plans),
- Archaeological Liaison Committee (National Museum of Ireland & Dept of Culture Heritage and the Gaeltacht),
- Consultation between Bord na Móna and stakeholders as part of the proposed Blackwater Solar Farm is part of a different process and is not listed here ([Home | Blackwater Solar Farm](#)).

To inform the current Plan, both national and local stakeholders, including neighbours whose land adjoins Blackwater 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 Blackwater Bog.

All correspondence received will be acknowledged and evaluated against the rehabilitation work proposed here, and the final draft of the Blackwater 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.
- 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 **climate action benefits as part of PCAS**.
- Optimising hydrological conditions for the development of Wetland habitats such as Reed Swamp, Fen and Wet Woodland on shallow cutaway peat, and eventually naturally functioning Wetland and Peatland habitats.
- Optimising hydrological conditions for the protection of exposed archaeological structures, their retention in situ and preservation into the future.
- Part of Blackwater and the now proposed rehabilitation areas has already vegetated and is stabilising.
- Integrating rehabilitation measures with existing conifer forestry BOGFOR trials. It is not proposed to change or affect any conifer or commercial forestry via this scheme. The future forestry management of these areas will be defined by Coillte.
- Supporting future renewable energy land-use planning. Integrating rehabilitation measures with planned amenity infrastructure on site. It is not proposed to carry out any rehabilitation actions to change or negatively affect any infrastructure.
- Integrating rehabilitation measures with future potential amenity projects. It is expected that any future amenity projects will be integrated with the emerging cutaway landscape and future potential land-use.
- The main goal and outcome of this plan is the successful rehabilitation (environmental stabilisation) of peatlands used for industrial peat production at the bog in a manner that is acceptable to both external stakeholders and to Bord na Móna and which optimise climate action and other ecosystem service benefits.

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

- It will take some time for stable naturally functioning habitats to fully develop at Blackwater Bog. This will happen over a longer timeframe than the implementation of this rehabilitation plan. A significant part of the site has already largely vegetated and stabilising.
- 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. PCAS is expected to deliver significant contributions to Ireland's climate action.
- It is not expected that the site has the potential to develop active raised bog (ARB) analogous to the priority EU Habitats Directive Annex I habitat within the foreseeable future (c.50 years). 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, as part of the Scheme, 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 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 contributory sources of impacts (private peat extraction and Bord na Móna). Reducing pressures due to former peat extraction activities at Blackwater 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. Bloomhill and Bunahinly-Kilgarvin) in 2022. There are expected to be cumulative water quality and other ecosystem service benefits to receiving water bodies such as the the Blackwater (Shannonbridge) River (EPA code: 25B27); the River Shannon (lower) (EPA code: 25S01) and the Shannon Upper (EPA code: 26S02).
- Current and future land-use at Boora Bog. Rehabilitation will focus on re-wetting that can be integrated into the current and potential future land-uses including renewable energy, amenity, and conifer forestry.
- Re-wetting in general will benefit the future preservation of most known and unknown archaeological features. An Archaeological Impact Assessment (AIA) is to be carried out under the PCAS scheme.

## 6. SCOPE OF REHABILITATION

The principal scope of this enhanced rehabilitation plan is to rehabilitate the bog or the currently proposed rehabilitation extent. This is defined by:

- The area of Blackwater Bog/or area proposed currently for rehabilitation.
- EPA IPC Licence Ref. P0502-01. As part of Condition 10.2 of this licence, a rehabilitation plan must be prepared for permanent rehabilitation of the boglands within the licensed area. Blackwater bog is part of the Blackwater Bog group.
- The Scheme is designed to exceed the stabilisation requirements as defined by the IPC Licence. This scheme is designed to enhance the ecosystem services of Blackwater Bog, in particular, optimising **climate action benefits**. The proposed interventions will mean that environmental stabilization is achieved (meaning IPC obligations are met) and, in addition, significant other ecosystem service benefits particularly for climate action will be accrued.
- The local environmental conditions of Blackwater Bog mean that wetland creation and the development of Open Water, Fen, Reed Swamp and Wet Woodland as the most suitable rehabilitation approach for this site, including those areas currently proposed. Blackwater Bog lies in the floodplain of the River Shannon and has a pumped drainage regime and a significant area is likely to eventually develop as Wetland habitats, particularly Reed Swamp. There is only a small portion of residual deep peat.
- 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 Blackwater Bog as **environmental stabilisation and optimising residual peat re-wetting, and setting the site on a trajectory towards the development of wetlands/Reed Swamp and fen on shallow more alkaline peat and other subsoils, and integrating rehabilitation with current land-uses and potential future land-uses..**
- Proposed land-use. Bord na Móna are currently developing a renewable energy project called Blackwater Solar Farm. This proposed project is in the pre-planning stage. It is planned to integrate rehabilitation with the future proposed development.
- Rehabilitation of Blackwater Bog will support multiple national strategies of climate action, biodiversity action and other key environmental strategies such as the Water Framework Directive.
- The time frame for the delivery of the planned rehabilitation will be undertaken according to available resources and appropriate constraints.
- Current land-uses. It is not proposed to carry out any intensive rehabilitation actions to change or negatively affect existing infrastructure or existing land-uses.

### 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 (open water, Reed Swamp, Fen, Wet Woodland, and Birch Woodland). Industrial peat extraction at Blackwater bog commenced in the 1950s and finished in 2020. As a result, peat depths are shallow for the most part (i.e. <1m). In addition, this bog is a wet bog, lying in the floodplain of the River Shannon and Wetland habitats

are developing already. These are local factors that will influence the future trajectory of this bog, which need to be considered as part of the wider rehabilitation work.

- Remaining peat depths are generally shallow for the majority of the site, with small pockets of deep peat remaining (greater than 2 metres).
- **Seasonal constraints.** Ground conditions, weather and seasonal inundation may affect the scheduling and scope of rehabilitation measures. At Blackwater Bog, the majority of the bog has been cutaway. There are local factors that will influence the future trajectory of this site which need to be considered as part of the wider rehabilitation work. Blackwater Bog is considered a 'wet bog', with a history of seasonal inundation. This bog is a pumped bog, and four of the original seven pumps are no longer operational.
- **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.
- **Archaeology.** There are no known archaeological features present at Blackwater Bog. The discovery of monuments or archaeological objects during peatland rehabilitation may potentially constrain the rehabilitation measures proposed for a particular area. While the rehabilitation will optimise hydrological conditions for the protection of exposed archaeological structures, their retention in situ and preservation into the future, any new archaeology may require rehabilitation measures will be reviewed and adapted. If this occurs, rehabilitation measures will be reviewed and adapted. An Archaeological Impact Assessment (Appendix XII) will be carried out to mitigate against any impact on found archaeology at Blackwater 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 should be avoided and reported to Bord na Móna Archaeological Liaison Officer and the National Museum of Ireland.
- **Turbary.** Parts of blackwater along the south-eastern boundary (partly within the areas owned and under the control of Bord na Móna) are currently being used by domestic turf cutters to harvest peat. However, there is no active turbary in the footprint of the rehabilitation areas.
- **Public Rights of Way.** A public right of way exists along the access road in the south of the site at Blackwater Bog, in the townlands of Leitra/Curraghmore. 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.
- **Existing landuse.** Bord na Móna operate an Ash Repository Facility for ESB for the waste ash generated from the power station in Shannonbridge (West Offaly Power). ESB have applied for planning permission (March 2022) for the development of an Integrated Constructed Wetland for the treatment and management of leachate derived from the Ash Disposal Facility. The ash site and the proposed constructed wetland are located outside of the rehabilitation footprint. Other key land-uses are conifer forestry.
- **Future land-use.** Bord na Móna are proposing to develop a solar farm at Blackwater Bog. The proposed footprint of the solar farm has been mapped as a constraint. In advance of this development, it is proposed to rehabilitate part of Blackwater Bog in 2022 that is not constrained (see *Figure: BNM-DR-23-*

14-05: *Enhanced Rehab Measures*). The remaining area will be rehabilitated after the proposed renewable energy construction is complete, or at a later date. Bord na Móna remain committed to rehabilitating all of Blackwater Bog and to meeting IPC Licence conditions for this bog. Phasing rehabilitation in the way has the potential to support additional climate action measures (integrating renewable energy). It is expected that Bord na Móna will revise and update rehabilitation plan for Blackwater when this renewable energy review project has been considered by the planning process.

- **Designated sites.** Fin Lough (Offaly) SAC is located within the Blackwater Bog site boundary and is located adjacent to the rehabilitation area in the northern part of the site. No rehabilitation work will take place in the SAC.

## 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:

- Constrained areas, including the area under consideration for a solar renewable energy, the ash repository facility, and plots of Coillte forestry plantation.
- The longer-term development of stable naturally functioning habitats to fully develop at Blackwater 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 Blackwater Bog.
- The longer-term management of this site, potentially as a nature conservation site, or for amenity, or for other uses in the future.
- Land leased to Coillte. This rehabilitation plan does not cover conifer forestry management on lands leased by Coillte.
- BOGFOR trials. It is not proposed to carry out any rehabilitation measures that would affect these areas. These areas are considered rehabilitated through land-use.
- BnM Blackwater Offices. It is not intended to carry out measures in this area.

## 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 enhanced 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 suspended solids run-off).

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

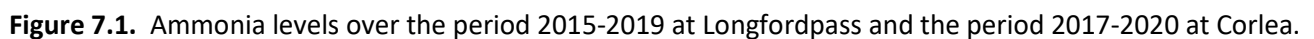
### 7.1. Criteria for successful rehabilitation to meet EPA IPC licence conditions:

- Rewetting of residual peat in the former area of industrial peat production to offset potential 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.

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





**Additional criteria for successful rehabilitation to optimise climate action and other ecosystem service benefits:**

- Optimising the extent of suitable hydrological conditions to optimise climate action and other ecosystem service benefits (optimising and maximising residual peat re-wetting). This will be measured by an aerial survey after rehabilitation has been completed.
- Accelerating the trajectory of the bog towards becoming a reduced carbon source. This will be measured through habitat mapping and the development of cutaway bog condition assessment. This cutaway bog condition assessment will include assessment of environmental and ecological indicators such as vegetation cover, vegetation communities, presence of key species, *Sphagnum* cover, bare peat cover and water levels. Baseline monitoring will be carried after rehabilitation is completed (during the scheme). It is proposed that sites can be monitored against this baseline in the future.
- Reduction in carbon emissions. This will be estimated via a combination of habitat condition assessment and application of appropriate carbon emission factors derived from other sites. Baseline monitoring (habitat condition) will be carried after rehabilitation is completed (during the scheme). It is proposed that sites can be monitored against this baseline in the future.
- Setting the site on a trajectory towards establishment of a mosaic of compatible habitats including open water, Fen, Reed Swamp, Scrub, and Birch Woodland, where conditions are suitable. Some of these habitats have already in part established as pioneer vegetation/wetlands. It will take some time for stable naturally functioning habitats to fully develop at Blackwater Bog. This will be demonstrated and measured via aerial photography, habitat mapping and cutaway/habitat condition assessment. Baseline monitoring will be carried after rehabilitation is completed (during the scheme). It is proposed that sites can be monitored against this baseline in the future.
- Improvement in biodiversity and ecosystem services. This will be demonstrated by metrics outlined in Section 9.1 that can be used to measure changes in ecosystem services (e.g. water quality parameters, development of pioneer habitats, breeding bird monitoring). This will be measured by collecting a range of scientific data that can then quickly be adapted and into metrics that can be used to measure changes in various ecosystem services. Baseline monitoring will be carried after rehabilitation is completed (during the scheme). It is proposed that sites can be monitored against this baseline in the future.

**Table 7.1. Summary of Success criteria, targets, how various success criteria will be measured and expected timeframes.**

Criteria type	Criteria	Target	Measured by	Expected Timeframe
IPC validation	Rewetting in the former area of industrial peat production	Delivery of rehabilitation measures  Reduction in bare peat.	Aerial photography after rehabilitation has been completed – to demonstrate measures (drain-blocking)  Establishment of a baseline for future monitoring of bare peat, vegetation establishment and habitat condition.	2022-2025
IPC validation	Key water quality parameters  Ammonia, Phosphorous, Suspended solids, 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	2021-2024
IPC validation	Reducing pressure from peat production 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

Criteria type	Criteria	Target	Measured by	Expected Timeframe
Climate action verification	Optimising the extent of suitable hydrological conditions to optimise climate action	Optimal extent of suitable hydrological conditions	Aerial photography and Habitat mapping to map extent of suitable hydrological conditions.  Baseline monitoring to be carried out during the scheme when rehabilitation is complete. Sites can be re-monitored in the future and compared against this baseline.	2022-2025
Climate action verification	Reduction in carbon emissions.	Reduction in carbon emissions	Carbon emissions – estimated using a bog condition assessment and appropriate carbon emission factors.	2022-2025
Climate action verification	Setting the site on a trajectory towards establishment of a mosaic of compatible habitats	Establishment of compatible cutaway habitats	Habitat map, Cutaway bog condition map  Baseline monitoring to be carried out during the scheme when rehabilitation is complete. Sites can be re-monitored in the future and compared against this baseline.	2022-2025
Climate action verification	Biodiversity and ecosystem services.  Habitat establishment  Presence of key species – <i>Sphagnum</i>	Improvement in biodiversity and ecosystem services.	Metrics that relate to selected biodiversity and ecosystem services  Presence of key species – <i>Sphagnum</i> – Walkover survey	2022-2025

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

Baseline monitoring to be carried out during the scheme when rehabilitation is complete. Sites can be re-monitored in the future and compared against this baseline.

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

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

- **Funding to pay for resources required to deliver the planned rehabilitation (Bord na Móna and external).** Bord na Móna maintains a provision on its balance sheet to pay for these future costs when industrial peat extraction ceases. Bord na Móna is fully committed to meeting its obligations relating to rehabilitation and decommissioning under the Integrated Pollution Control Licence. It is expected that additional costs of enhanced rehabilitation will be supported by Government through the Climate Action Fund and Ireland's National Recovery and Resilience Plan.
- **Bord na Móna to have sufficient resources (staff and training) to deliver the planned rehabilitation with required associated skills and competencies.**
- **Bord na Móna to have sufficient resources (suitable machinery) and staff to maintain this machinery.**
- **Weather conditions to be within normal limits over the rehabilitation plan timeframe.** Long periods of wet weather have the capacity to significantly affect ground conditions and constrain the delivery of rehabilitation. The potential impact of wet weather on ground conditions can be reduced by appropriate planning and management. Bord na Móna have significant experience of managing these issues through 70 years of working in these peatland environments.
- **Rehabilitation measures to be effective.** The rehabilitation measures proposed in this plan are based on 40 years of Bord na Móna experience of peatland management and best practice applied internationally in peatland management. Measures proposed in this plan have already been shown to be effective 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 degraded bog takes time. It may take 30-50 years for active raised bog vegetation to re-develop on suitable cutaway that was previously bare peat. However, Bord na Móna experience has demonstrated the effectiveness of these type of measures for re-wetting bog and creating carbon sinks (Renou-Wilson et al. 2018).
- Rehabilitation measures have been designed to accelerate and work with natural colonisation and other natural processes. Bord na Móna experience of rehabilitation has shown that re-wetting improves conditions for natural colonisation and that natural colonisation is accelerated where the environmental conditions are most suitable. Rehabilitation measures have been designed to modify the conditions of areas within sites where conditions are less suitable for natural colonisation (modifying hydrology, topography, nutrient status or availability of potential seed sources).
- **Monitoring to be robust and effective.** Rehabilitation Monitoring will be established to validate the success of rehabilitation as required by Condition 10 of the IPC Licence and to verify the benefits of the proposed enhanced measures to optimise climate action. This will focus on collecting a range of scientific data that can then quickly be adapted into metrics that can be used to measure changes in various ecosystem services.

## 8. REHABILITATION ACTIONS AND TIME FRAME

Peatland rehabilitation requires detailed planning and the use of data from desktop surveys and field surveys. This data in association with topographical and hydrological modelling will be important in planning the future peatland landscapes and planning the use of the most appropriate rehabilitation methodologies to maximise climate action benefits. Hydrological modelling indicates those areas that are likely to re-wet when drains are blocked, based on the current topography, and areas where water levels may have to be modified, where needed. Enhanced rehabilitation measures will look to optimise hydrological conditions for re-wetting peat in other areas. This planning is also essential for matching the most sustainable rehabilitation methodology to the most suitable cutaway environment to maximise the benefits of the resource outlay (maximising cost/benefit).

A number of illustrative figures have been produced to inform rehab planning and design, including aerial photography, peat depths, lidar surface maps, and depression analysis modelling; these are included in the accompanying mapbook as the drawings referenced below:

BNM-DR-23-14-22 titled **Blackwater Bog: Aerial Imagery 2020**

BNM-DR-23-14-04 titled **Blackwater Bog: Peat Depths**

BNM-DR-23-14-03 titled **Blackwater Bog: LiDAR Map**

BNM-DR-23-14-09 titled **Blackwater Bog: Depression Analysis**

The rehabilitation actions themselves will be a combination of PCAS measures to re-wet peat. The distribution of these measures is provisionally outlined in drawing titled **BNM-DR-23-14-05 Blackwater Bog: Rehabilitation Measures** in the accompanying Mapbook (note that the actual distribution of these measures may be subject to change in response to stakeholder consultation and refinement of the enhanced rehabilitation measures.)

These enhanced measures for Blackwater bog will include (see Table 8.1):

- Re-assessment of the pumping regime and removing pumps if this desired and has no significant external impact or impact to internal constraints. Initial hydrological modelling a large part of the site has the potential to develop as cutaway wetland habitats with some permanent deeper water.
- **The current pumping will be continued** to maintain conditions to support potential future land-uses. 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, where possible, at outfalls, by adjusting piped drainage and by the creation of overflow channels. More sustainable permanent gravity drainage solutions will be examined. Some targeted bunding may be required. It is expected that a natural seasonal regime of water fluctuation will develop, with water-levels fluctuating in association with levels in the adjacent local rivers. Wetland measures will include a combination of intensive drain blocking (max 7/100 m), modifying outfall heights and managing overflows with overflow pipes, and construction of larger berms where required.
- Deep peat measures including intensive drain blocking (max 7/100 m), field re-profiling, creation of berms, modifying outfall heights and managing overflows and drainage channels.
- Regular drain blocking (3/100) on dry cutaway along with the blocking of outfalls and management of water levels.
- 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.

- Some small bog remnants around the margins of the bog will be targeted for drain-blocking.
- 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 enhanced rehabilitation measures at Blackwater Bog.** Note that the types of rehab and areas of rehab may change in response to stakeholder consultation and refinement of the enhanced rehabilitation measures.

Type	Code	Enhanced Rehabilitation Measure	Extent (Ha)
Wetland	WLT2	Modifying outfalls and managing water levels with overflow pipes + Targeted blocking of outfalls within a site	110.2
Wetland	WLT3	Modifying outfalls and managing water levels with overflow pipes + Targeted blocking of outfalls within a site + constructing larger berms to re-wet cutaway + transplanting Reeds and other rhizomes	13
Wetland	WLT4	More intensive drain blocking (max 7/100 m), + modifying outfalls and managing overflows + transplanting Reeds and other rhizomes	174.48
Deep Peat	DPT2	More intensive drain blocking (max 7/100 m) + modifying outfalls and managing overflows	2.11
Deep Peat	DPT 4	Berms and field re-profiling (45x60m cell), modifying outfalls and managing overflows & drainage channels for excess water & <i>Sphagnum</i> inoculation	23.58
Dry Cutaway	DCT2	Regular drain blocking (3/100m) + modifying outfalls and managing water levels with overflow pipes + targeted fertiliser treatment	166.09
Marginal land	MLT1	No work required	30.39
Marginal land	MLT1	Targeted drain blocking	3.25
Drainage	Drainage	Silt Ponds	6.11
Constraint	Constraint	Other Constraints, including the ash disposal facility, Coillte forestry and the solar farm development (The proposed solar farm development study area is 1079 hectares).	1752.65
Additional Land	Additional Land	Targeted drain blocking	31.89
Total			2313.74

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

- Seek formal approval of the enhanced plan, noting the alternative standard plan should funding from the Scheme not materialise, from the EPA.
- Agree an *ex ante* budget of eligible costs (based on the approved enhanced plan) with the Scheme regulator.
- Develop a detailed site plan with engineering drawings outlining how the various rehabilitation methodologies (The Scheme PCAS) will be applied to Blackwater Bog. This will take account of peat depths, topography, drainage, hydrological modelling and internal constrained areas (see map for an indicative view of the application of different rehabilitation methodologies).
- 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 archaeological disturbance, where possible.
- An assessment of pumping requirements to complete decommissioning is to be carried out.
- A review of issues that may constrain rehabilitation such as known rights of way, the planned solar farm, and existing land agreements is to be carried out
- A review of remaining milled peat stocks is to be carried out. There are peat stocks remaining on the bog in general however only a single stockpile overlaps the currently proposed rehabilitation areas.
- 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 in accordance with the phasing and timeframe of the rehabilitation plan.
- Track implementation and enforcement of the relevant IPC Licence conditions, the mitigation measures (AA) and other environmental control measures during the implantation of the rehabilitation plan.

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

- Carry out proposed measures as per the detailed site plan. This will include a combination of drain blocking, and fertiliser applications targeting bare peat areas of headlands, high fields and other areas (where required) in addition to management prescriptions. All rehabilitation will be carried out with regard to best practice environmental control measures (Appendix IV).
- Monitor the success of rehabilitation measures in relation to developing suitable hydrological conditions.
- Carry out the proposed monitoring, as outlined.
- While natural colonisation is expected to commence almost immediately once peat production ceases, Phase 2 actions will be carried out in targeted areas to accelerate re-vegetation and colonisation of target species. Phase 2 actions may include seeding of targeted vegetation.



- 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.
- Submit an *ex post* report to the Scheme regulator to verify the eligible measures to be carried out in year 1 of the Scheme, and an *ex ante* estimate for year 2 of the Scheme; and so on for each year of the Scheme.

### 8.3 Long-term (>3 years)

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

### 8.4 Timeframe

- **2021-2022:** Short-term planning actions.
- **2022 -2023:** Short-term practical actions.
- **2023-2025:** Long term practical actions. Evaluate success of short-term rehabilitation measures outlined above and remediate where necessary.
- **2025:** Decommission silt-ponds, if necessary.

### 8.5 Budget and costing

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

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

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

At this time, a 'standard' rehabilitation provision (sufficient to discharge the requirement of Condition 10 in the licence) has been allocated to the site based on the area of different cutaway types across the site (See Appendix I).

## 9. AFTERCARE AND MAINTENANCE

### 9.1 Programme for monitoring, aftercare and maintenance

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

- There will be **initial quarterly monitoring assessments** of the site to determine the general status of the site, the condition of the silt ponds, assess the condition of the rehabilitation work, monitoring of any potential impacts on neighbours land, general land security, boundary management, dumping and littering.
- The number of these site visits will reduce after 2 years to bi-annually and then after 5 years to annual visits.
- 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.
- In order to assist in monitoring surface water quality from this bog, it is planned to increase the existing licence monitoring requirements to sampling for the same parameters to every month during the scheduled activities and for a period up to two years. post rehabilitation, depending on the period required to confirm that the main two parameters, suspended solids and ammonia are remaining compliant with the licence emission and trigger limit values and there is an improving trajectory in these two parameters i.e. reduction in concentration.
- Enhanced water quality monitoring will aim to include up to 70% of a bogs drainage catchments.
- Monitoring results will be maintained, trended and reported on each year as part of the requirement to report on Condition 10.1 of the IPC Licence on Bog Rehabilitation in the Annual Environmental Report, which will be available in April each year at [www.epa.ie](http://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. The original (licence) requirement was for a quarterly sampling regime, but this has been increased to a monthly regime to appropriately track the changing water chemistry that will occur as part of this enhanced rehabilitation. In addition, DOC will be included as a parameter to try and identify any changes in carbon in the surface water.
- If, after two years, key 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.

Additional monitoring measures are also proposed to monitor ecosystem service benefits that have been derived by enhanced rehabilitation. 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.

## 9.2 Rehabilitation plan validation and licence surrender – report as required under condition 10.4

**IPC Licence 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 Licence 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.
- The site has been environmentally stabilised.

## 10. REFERENCES

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

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

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

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

### Scope of rehabilitation

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

- The three identified rehabilitation areas in Blackwater Bog.
- EPA IPC Licence - Ref. P0502-01. As part of Condition 10.2 of this licence, a rehabilitation plan must be prepared for permanent rehabilitation of the boglands within the licensed area. Blackwater Bog is part of the Blackwater Bog Group.
- The current condition of Blackwater Bog. This bog has a pumped drainage regime.
- The key objective of rehabilitation, as defined by this licence, is **environmental stabilisation** of the bog.
- To minimise potential impacts on neighbouring land. Boundary drains around Blackwater Bog will be left unblocked as blocking boundary drains could affect adjacent land.
- Current land-use (conifer forestry trials, ash repository facility).
- Future potential land-use (Blackwater Solar Farm).

### Rehabilitation goals and outcomes

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

- Carrying out drain blocking to re-wet peat and slow runoff.
- Stabilising potential emissions from the site (e.g. suspended solids).
- Environmental stabilisation.

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

### Criteria for successful rehabilitation:

- Rewetting of residual peat and shallow cutaway in the former area of industrial peat production to offset potential silt run off and to encourage development of vegetation cover via natural colonisation and reducing the area of bare exposed peat.
- That there is a stabilising/improving concentration of suspended solids and ammonia associated with the measures undertaken to stabilise the peat surface by the blocking of the internal drainage system and the maximised rewetting of the peat surface. This will be demonstrated by developing a stable or downward trajectory of water quality indicators (suspended solids and ammonia) towards what would be typical of a re-wetted cutaway bog. This will be measured via water quality monitoring (suspended solids and ammonia).
- That the main water body associated with surface water from this bog continues to be excluded in the EPA's list of peat pressure water bodies as reported in the River Basin Management Plans. Where the water body has been identified as under pressure from peat extraction, that the intervening EPA monitoring programme associated with its Programme of Measures for this water body shows positive improvements in water quality impacts that were attributable to the original peat extraction activity.

### **Rehabilitation targets**

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

### **Rehabilitation measures:**

- Blocking field drains in drier sections of the former industrial production area to create regular peat blockages (three blockages per 100 m) along each field drain.
- Re-alignment of piped drainage; and management of water levels to create/enhance existing re-wetting.
- No measures are planned for the majority of surrounding marginal peatland habitats.
- Silt ponds will continue to be maintained during the rehabilitation and decommissioning phase.
- Evaluate success of short-term rehabilitation measures and enhance where necessary.
- Decommissioning of silt-ponds will be assessed and carried out, where required.

### **Timeframe:**

- 2022-2023. 1<sup>st</sup> phase of rehabilitation. Field drain blocking.
- 2024. 2<sup>nd</sup> phase. Further realignment of piped drainage and other re-wetting measures dependent on success of 1<sup>st</sup> phase re-wetting, as determined by ongoing monitoring of water levels and re-vegetation.
- Other enhancement measures such as fertiliser treatment will be carried out, if needed. These will be determined by ongoing monitoring.
- 2024-2026. Evaluate success of short-term rehabilitation measures outlined above and remediate where necessary.

- 2024-2026. Decommission silt-ponds, if necessary.

**Table AP-1: Standard Rehabilitation measures and target area.**

Type	Code	Description	Area (Ha)
Deep peat	DPT1	Regular drain blocking (3/100 m) + modifying outfall heights and managing water levels with overflow pipes	25.7
Dry cutaway	DCT1	Modifying outfall heights and managing water levels with overflow pipes	166.1
Wetland	WLT1	Turn off or reduce pumping to re-wet cutaway + modifying outfall heights and managing water levels with overflow pipes	297.6
Marginal Land	MLT1	No work required	65.6
Other	Silt Pond	Silt ponds	6.1
Other	Constraint	Including Rights of Ways, Ash Disposal Facility, Coillte Forestry, and solar farm constrained areas	1752.7
<b>Total</b>			<b>2313.8</b>

See Drawing number BNM-DR-23-14-20 titled **Blackwater Bog: Standard Rehab Measures** included in the accompanying Mapbook which illustrates the standard rehab measures to be applied.

#### **Monitoring, after-care and maintenance**

- There will be initial quarterly monitoring assessments of the site to determine the general status of the site, the condition of the silt-ponds, assess the condition of the rehabilitation work, assess 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.
- Water quality monitoring will be established.
- Monitoring results will be maintained, trended and reported on each year as part of the requirement to report on Condition 10.1 of the IPC Licence on Bog Rehabilitation in the Annual Environmental Report, which will be available in April each year at [www.epa.ie](http://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.
- Where other uses are proposed for the site, these will be assessed by Bord na Móna in consultation with interested parties. Other after-uses can be proposed for licensed areas and must go through the required assessment and planning procedures.

**Validation and IPC Licence surrender**

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

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

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## APPENDIX II: BOG GROUP CONTEXT

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

Industrial peat extraction in the Blackwater Bog Group has permanently ceased on all sites. Remaining milled peat stocks were supplied to Shannonbridge (WOP) and Lanesborough (LRP) in 2020. Both power stations ceased using peat by the end of 2020. Decommissioning and rehabilitation for the Blackwater Bog Group as part of the PCAS project started in 2021.

A number (6) of bogs were initially drained but have never been used for industrial peat production (three former development bogs (Kellysgrove, Tirrur-Derrymore and Newtown-Loughgore), Clonboley, Killeglan and Derrydoo-Woodlough). The latter three bogs are classed as restored raised bogs, still contain active bog habitat (that qualifies as the Annex I EU Habitats Directive habitat) and now form the core of the Bord na Móna Raised Bog Restoration Project due to their high biodiversity value and bog restoration potential. NPWS have identified the Clonboley bog cluster as having high ecological value within the recent assessment of raised bog SACs, NHAs and non-designated sites (NPWS 2014<sup>6</sup>). Several of these sites have been restored during the period 2011-2020.

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

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

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<sup>6</sup> <http://www.npws.ie/peatlandsturf-cutting/nationalraisedbogsacmanagementplan/>

A breakdown of the component bog areas for the Blackwater Bog Group IPC Licence Ref. PO502-01 is outlined in Tables Ap-2a – Ap2c.

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

Bog Name	Area (ha)	Stage of development	Land-Use and History	Peat Production Cessation	Rehab Plan Status
Attymon	336	Cutover Bog  Industrial peat production commenced at Attymon Bog in 1941 and ceased in 2019. Attymon is a deep peat cutover bog.	Attymon Bog formerly supplied fuel sod peat.  Coillte have developed a portion of the former production area for conifer forestry.  Some rehabilitation was carried out in 2019/2020.	2109	Finalised 2018
Cloonkeen	252	Cutover Bog  Industrial peat production commenced at Cloonkeen Bog in 1953 and ceased in 2019. Cloonkeen Bog is a deep peat cutover bog.	Cloonkeen Bog formerly supplied fuel sod peat.  Coillte have developed a portion of the former production area for conifer forestry.  Some rehabilitation was carried out in 2019/2020.	2019	Finalised 2018
Derrydoo-Woodlough	452	Development Bog  Derrydoo-Woodlough Bog was drained in the 1980s in anticipation of industrial peat production. No industrial peat harvesting ever took place.	Bog restoration was carried out in 2013-2014  Rehabilitation (bog restoration) now complete.	N/A	Finalised 2012
Tirrur-Derrymore	422	Development Bog  This bog was drained in the 1980s in anticipation of industrial peat production. No industrial peat harvesting ever took place.	This bog has significant raised bog restoration potential.  Section leased to NPWS as a SAC turf-cutting relocation site.	N/A	Updated 2020
Newtown-Loughgore	448	Development Bog  This bog was drained in the 1980s in anticipation of industrial peat production. No industrial peat harvesting ever took place.	Some sod turf production  Bog restoration was carried out in 2019-2020  Rehabilitation (bog restoration) nearly complete.	2020	Finalised 2012
Killeglan	581	Development Bog  This bog was drained in the 1980s in anticipation of industrial peat production. No industrial peat harvesting ever took place.	Bog restoration was carried out in 2013-2014  Rehabilitation (raised bog restoration) complete	N/A	Finalised 2016
Cloonboley 1	675	Development Bog  This bog was drained in the 1980s in anticipation of industrial peat production. No industrial peat harvesting ever took place on the main section.	A small sub-section has been used for sod turf production.  Bog restoration was carried out in 2013-2014  Rehabilitation (raised bog restoration) complete across the majority of the site	2020	Finalised 2014
Cloonboley2	203	Development Bog  This bog was drained in the 1980s in anticipation of industrial peat	Bog restoration was carried out in 2013-2014  Rehabilitation (raised bog restoration) complete	N/A	Finalised 2016

Bog Name	Area (ha)	Stage of development	Land-Use and History	Peat Production Cessation	Rehab Plan Status
		production. No industrial peat harvesting ever took place.			

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

Bog Name	Area (ha)	Stage of development	Land-Use and History	Peat Production Cessation	Rehab Plan Status
Ballaghurt	597	Cutaway Bog  Industrial peat production commenced at Ballaghurt Bog in 1981. The majority of the site is cutaway with some residual deeper peat	Ballaghurt Bog formerly supplied a range of commercial functions including horticultural peat and fuel peat.  Pioneer cutaway vegetation communities are naturally developing on some cutaway areas.	2020	Draft 2017
Belmont	316	Cutaway Bog  Industrial peat production commenced at Belmont Bog during the 1950's. The majority of the site is cutaway.	There are some areas of pioneer cutaway vegetation communities naturally colonising cutaway sections.  Coilte have developed a portion of the bog for forestry.	2020	Finalised 2021
Blackwater	2,303	Cutaway Bog  Industrial peat production commenced at Blackwater Bog during the 1950's. The majority of the site is cutaway.	Blackwater Bog formerly supplied milled horticultural peat and fuel peat.  There is extensive development of emergent cutaway vegetation communities across the former production area.  The site has been used for experimental forestry (BOGFOR) and other conifer plantations.  Part of the site was rehabilitated with lake and wetland creation.  An ash facility took ash from Shannonbridge Power station	2020	To be finalised 2022
Bloomhill	883	Cutover Bog  Industrial peat production commenced at Bloomhill Bog during 1981. The majority of the site still has relatively deep residual peat.	Bloomhill Bog formerly supplied milled horticultural peat and fuel peat.  Much of the former peat production area is bare peat.	2020	To be finalised 2022
Bunahinly-Kilgarvan	389	Cutover Bog  Industrial peat production commenced at Bunahinly-Kilgarvan Bog during the 1990's. Residual Deep peat remains on these bogs.	Bunahinly-Kilgarvan formerly supplied milled horticultural peat and fuel peat.  Much of the former production area is bare peat.  Part of Bunahinly has been re-wetted.	2020	Finalised 2022
Glebe	132	Cutover Bog  Industrial peat production commenced at Glebe Bog during	Glebe Bog formerly supplied milled; horticultural peat and fuel peat.  Glebe bog is still listed as a pNHA.	2020	Draft 2017



Bog Name	Area (ha)	Stage of development	Land-Use and History	Peat Production Cessation	Rehab Plan Status
		the 1990's. Residual deep peat remains on these bogs.	Much of the former production area is bare peat.		
Clooniff	523	Cutover & cutaway Bog  Industrial peat production commenced at Clooniff Bog during the 1970's. A mosaic of variable peat depths remains on this bog.	Clooniff Bog formerly milled fuel peat.  Much of the former production area is bare peat or wetland.  Some emergent vegetation communities are naturally colonising cutaway areas. Reduced pumping has created a large wetland in one area.	2020	Finalised 2021
Cornafulla	460	Cutover Bog  Industrial peat production commenced at Cornafulla Bog in 1987. This bog still retains relatively deep residual peat.	Cornafulla Bog formerly supplied milled horticultural peat and fuel peat.  Much of the former production area or cutaway is bare peat.	2020	Draft 2017
Cornaveagh	492	Cutover Bog  Industrial peat production commenced at Cornaveagh Bog in 1970's and ceased in 2020. This bog still retains relatively deep residual peat.	Cornaveagh Bog formerly supplied milled horticultural peat and fuel peat.  Much of the former production area footprint or cutaway is bare peat.	2020	Draft 2017
Culliaghmore	442	Cutover Bog  Industrial peat production commenced at Culliaghmore Bog in 1960's and ceased in 2020. Much of this bog is cutaway, with some pockets of deeper residual peat.	Culliaghmore Bog formerly supplied milled horticultural peat and fuel peat.  Much of the former production area footprint or cutaway is bare peat.  Some pioneer cutaway vegetation communities are naturally colonising cutaway areas.	2020	Draft 2017
Garryduff	970	Cutaway Bog  Industrial peat production commenced at Garryduff Bog in 1960's. The majority of this bog is cutaway.	Much of the former production area footprint or cutaway is bare peat.  Extensive natural development of pioneer cutaway vegetation communities is present on cutaway areas.	2020	Finalised 2021
Kellysgrove	201	Development Bog  Kellysgrove Bog was drained in the 1980s in anticipation of industrial peat production. No peat harvesting ever took place.	The site retains degraded raised bog vegetation.  Kellysgrove Bog retains significant raised bog restoration potential.  A way-marked walking trail is positioned along the old Ballinasloe Canal.	2020	Finalised 2021
Kilmacshane	1,294	Cutaway Bog  Industrial peat production commenced at Kilmacshane Bog in 1960's. The majority of this bog is cutaway with some pockets of deeper peat remaining.	Kilmacshane Bog formerly supplied milled horticultural peat and fuel peat.  Some pioneer cutaway vegetation communities are naturally colonising cutaway areas and water levels have risen as pumping reduced, creating wetlands.	2014	Finalised 2021
Lismanny	449	Cutaway Bog  Industrial peat production commenced at Lismanny Bog in 1960's. The majority of this bog is cutaway with some pockets of deeper peat remaining.	Lismanny Bog formerly supplied milled horticultural peat and fuel peat.  Much of the former production area footprint is bare peat. Some pioneer cutaway vegetation communities are naturally colonising cutaway areas.	2020	Draft 2020

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

Bog Name	Area (ha)	Stage of development	Land-Use and History	Peat Production Cessation	Rehab Plan Status
Derryfadda	610	Cutover bog Industrial peat production commenced at Derryfadda Bog in 1980's. This bog still retains residual deep peat.	Derryfadda Bog formerly supplied milled horticultural peat and fuel peat.  Much of the former production area is bare peat.  Some pioneer cutaway vegetation communities are naturally colonising cutaway areas.	2020	To be finalised 2022
Boughill	415	Cutover bog Industrial peat production commenced at Boughill Bog in 2008. This bog still retains residual deep peat.	Boughill Bog formerly supplied milled horticultural peat and fuel peat.  Much of the former production area footprint or cutaway is bare peat.	2020	Draft 2017
Castlegar	517	Cutover bog Industrial peat production commenced at Castlegar Bog in 2001. This bog still retains residual deep peat.	Castlegar Bog formerly supplied milled horticultural peat and fuel peat.  Much of the former production area is bare peat.  The adjacent Annaghbeg Bog NHA is an intact undrained raised bog	2019	Finalised 2021
Gowla	650	Cutover bog Industrial peat production by BnM commenced at Gowla Bog in 1970's. Development for sugar production was in place at Gowla since the 1950's. This bog still retains residual deep peat.	Gowla Bog formerly supplied milled horticultural peat and fuel peat.  Much of the former production area footprint is bare peat.	2020	Draft 2017

See Drawing number BNM-DR-23-14-24 titled **Blackwater Bog Group**, included in the accompanying Mapbook which illustrates the location of Blackwater Bog and the Blackwater Bog Group in context to the surrounding area.

## APPENDIX III: ECOLOGICAL SURVEY REPORT

### Ecological Survey Report

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

<b>Bog Name:</b>	<u>Blackwater</u>	<b>Area (ha):</b>	2338ha
<b>Works Name:</b>	Blackwater	<b>County:</b>	Offaly
<b>Recorder(s):</b>	MMC & DF	<b>Survey Date(s):</b>	7-10 December 2009 5/07/2010

### Habitats present (in order of dominance)

The most common habitats present on the industrial site include:

- Bare peat (BP). The majority of the site in active production or is production-related cutaway. Areas mapped as BP can contain some minor recolonisation along the drains with pioneer Poor fen communities (pJeff, pEang), Scrub (eBir) and Reedbeds (pPhrag, pTyph) most common. (Codes refer BnM classification of pioneer habitats of industrial cutaway and production bog).
- Areas considered as production-related cutaway are re-colonising with some vegetation cover. Pioneer Poor fen communities (pJeff, pEang, PTrig), Birch scrub (eBir) and dry grassland (gCal) are most common habitats found. Some depressions contain small amounts of open water and Poor Fen. Reedbeds also appear in various places in conjunction with the above habitats.
- Reedbeds are more extensive in low-lying areas along the River Gowlan. Some of this bog is cutaway (that is out of production).
- There are two constructed wetlands on the site. The southern wetland contains a significant area of open water and is surrounded by reedbeds and pioneer poor fen communities. The northern wetland is dominated by Reedbeds (pPhrag) and pioneer poor fen communities (pRos, pEang) with much less open water. There are also some high fields with dry heath dominated by Heather (dHeath) and Birch scrub (eBir). There is a small area of Wet Willow-dominated woodland (WN6) with Reedbeds within the northern wetland that was never developed.
- There are several BOGFOR forestry plots on the site that contain a mixture of conifer forestry (WD4) and immature broad-leaved woodland (WS2). Several mounds contain more mature conifer forestry (WD4). (Codes refer to Heritage Council habitat classification, Fossitt 2000).
- A small, abandoned quarry associated with an esker is present on the fringes of the western site boundary. This area contains some dry calcareous grassland (GS1) along with exposed esker gravel and till (ED1), revegetating ground (ED3), scrub (WS1) and Bracken (HD1).
- The Gowlan River (FW2) flows through the site. This river is canalised, and riparian development is poor.
- The site contains an area used for disposal of ash produced by West Offaly Power (ED5). Some compartments are already filled and have been landscaped while other compartments are open.

- Two areas west of the Shannonbridge-Clonmacnoise Road contain some Raised bog (PB1) along with cutover bog (PB4) and fringe habitats (WS1) such as scrub and wet grassland (GS4). There is also a minor amount of conifer plantation and Birch woodland associated with these sections.
- The Fin Lough area contains a mosaic of Rich Fen (PF1), Raised bog (PB1), Reedbeds (FS1), Scrub (WS1) and some wet grassland (GS4) around a Limestone Lake (FL3).
- Fringe habitats around the margins of the site include raised bog remnants (PB1, PB4) scrub developing on high bog (WS1), Bracken (HP1) and Birch woodland (WN7).

### Description of site

Blackwater is located in west Offaly adjacent to Shannonbridge and the west side of the site is located within 1 km of the River Shannon. The main section is a relatively large site that is sub-divided into smaller sections by the local topography and by railways and tracks on the site. This bog is a pumped bog with the water table significantly lower than the surrounding area. The Blackwater Works is located at the southern end of the site and there is one main track that runs in a NE-SW direction towards ash waste facility. A railway also runs along this track and there are other branch railways on either side that divide the rest of the site into several main blocks. The other main topographical features are a mineral island containing farmland at Leitra Townland, which is excluded from the site, and the Gowlan River, which flows N-S through the central part of the site and also around the NE boundary.

The vast majority of Blackwater is in active production with Bare Peat being the dominant habitat or is considered production-related cutaway with some recolonising vegetation. Other main land-uses include the area zoned for the ash waste facility (storage of ash produced by West Offaly Power), several BOGFOR experimental forestry plots and two constructed wetlands. There is a small area adjacent to Gowlan River that is considered cutaway and is out of production. Several sections of the site have not been industrialised and still retain some of their semi-natural characteristics. Some of these sections with NPWS nature conservation designations. The main site has been divided into a series of sub-sections for ease of description (see Habitat Map).

The Blackwater property also includes two smaller areas (Clonliff and Creevagh) located west of the Shannonbridge-Clonmacnoise Road (R444). Both these areas have never been used for industrial peat production. Both areas are located close to the River Shannon.

### Cloniffeen-Curraghmore

This sub-section encompasses the south-west area, south-west of the mineral farmland at Leitra. This section is further divided into two main sections by a railway and a smaller mineral island. Nearly all of this area is in active peat production and is dominated by bare peat, although there are some sections that are revegetating. The main vegetation types include a mosaic of Poor Fen (pJeff), dry grassland (gCal) and scrub (eBir) that is re-colonising over a low ridge in the southern section. This whole area is somewhat higher than the rest of the site. Minor communities include patches of Common Reed (pPhrag), Reedmace appearing in the drains (pThyph) and small patches of disturbed/pioneer vegetation (DisCF). The highest part of the ridge that underlies the cutaway in the southern section is developing some Dry Heath with Heather.

The other main features of this area include several small patches of high raised bog (PB1) and other associated fringe habitats (cutover bog - PB4) around the fringes of the site that remain uncut or undeveloped. Some of these sections of high bog have been drained intensively so their capacity for regeneration is quite poor. One

section of high bog was undeveloped but was a relatively small remnant. Some conifer forestry has also been planted around the edges of the mineral island (adjacent to the railway link to West Offaly Power), and this section also contains some grassland (GA1, GS4), scrub (WS1) and broad-leaved woodland plantation (WD1). A linear section of conifer woodland is located along the north western boundary of this section, evidence of Squirrel activity in this section was evident.

### Leitra-Creevagh

This sub-section encompasses a central area located to the west of the ash site and running between two railways to the western boundary. This block is somewhat higher compared to the rest of the site. A significant area is considered production-related cutaway and is beginning to re-colonise with vegetation. The topography of this block is quite variable with several mounds, ridges and depressions that affect the type of recolonisation. The higher ground generally has a mosaic of Poor fen (pJeff) dry grassland (gCal), Birch scrub (eBir) and disturbed/pioneer vegetation (DisCF). Some of the higher ground has exposed glacial till. Some of the mounds are also developing Dry Heath dominated by Heather towards the west side. Mounds are being colonised by conifers in places. Several of the mounds are used for collecting fossil bog timber. The depressions are somewhat wetter and also contain Poor fen (pJeff, pEang) and Birch scrub as the main vegetation types. Some Reedbeds are also developing in place within the depressions (pPhrag) in association with minor areas of open water (OW).

This area contains a constructed wetland along the east side and adjacent to the track with a significant area of open water and Reedbeds (pPhrag). This area contained extensive areas of reedbed with *Typha latifolia* and *Phragmites australis*, both along the margins of the open water and as reedbed islands amongst the open water. Other habitats found alongside open water consisted of gCal, DisCF, eBir and eGor. A bird watching hide was located beside the lake and swallows had nested in this hide in the previous nesting season. Birds observed using the lake were Little Grebe, Grey Heron, Mute swan, Moorhen and Snipe. Robin, Blackbird and Chaffinch were observed in close proximity to this area.

This area also contains several BOGFOR forestry plots. Several large blocks were planted with various single-species tree crops including Sitka Spruce, Japanese Larch, Lodgepole Pine, and Birch in the 1990's. The development of these plantations overall has been poor although some species have done better than others. The plantations have reached the post-thicket stage but some sections have failed. Several mineral islands within this area were also planted with conifers in the 1970's and are relatively mature. These conifers seem to have done well in comparison with forestry planted on the cutaway bog areas. The canopy of these stands is relatively dense and the ground cover is dominated by leaf litter and moss cover.

Other features of interest include some high bog and associated fringe habitats along the western edge of this section that have remained undeveloped. Lough Nanag is found in one of these areas along the western boundary, although it is likely to have been impacted by the adjacent development of the production bog. This small area is within a NPWS conservation area (pNHA). Further north along this boundary there is a small borrow pit where gravel was extracted from an esker. This quarry is now abandoned and is revegetating. The flora of this area offers a diverse contrast with the majority of the site.

To the south of Lough Nanag an educational area complete with board walk is located. This section formed an important part of the bog rail tours in the past and contains species such as *Calluna vulgaris*, *Erica tetralix*, *Molinia caerulea*, *Trichophorum cespitosum* and *Rhynchospora alba* along with *Sphagnum* sp. A wooden walkway allowed easy access for the general public to this section of the bog. The invasive exotic Pitcher plant (*Sarracenia*

*purpurea*) is found in this section. A section of raised bog to the north of the board walk area has been excavated in order to show off the peat profile with a steel stairway leading down to the bottom of the excavation. A section of raised bog in this area had been drained but did not appear to have been harvested, it did not contain any boardwalk.

### **Lough Nanag**

This relatively small area is located along the western boundary of the site and is designated as a pNHA. The original lake basin has infilled and the area now contains a range of wetland habitats including raised bog (Heather-dominated) (PB1), cutover bog (PB4), Birch woodland (WN7), Birch and Willow-dominated Scrub (WS1), transitional raised bog vegetation dominated by Purple Moor-grass and Bog Myrtle (PB1), some shallow open water with aquatic and emergent bog vegetation, Reedbeds (FS1) and some Rich Fen (PF1). The NHA survey also notes that the site contains some notable transitions between bog vegetation in the basin and dry calcareous grassland vegetation along the base of the eskers. Some of the shallow open water and surrounding habitat was quaking and could be considered a transition mire (PF3). Bottle Sedge and other Sedges were prominent in the vegetation as was Bog Cotton and the open water contained Bog Bean.

### **Tullaghbeg**

This sub-section takes in the north-west section of the main site (north of railway branch) including the portion of Bord na Moña property within Fin Lough. The Fin Lough section has been designated as part of a NPWS nature conservation site (cSAC). A mosaic of wetland habitats including Alkaline Fen (EU Habitats Directive Annex I habitat), Reedbeds and transitional habitats has developed around a small lake in this area. The Gowlan River flows along the north and east side of the section. The majority of this sub-section is in active production and is bare peat, some of which was wet at the time of the survey.

One of the main features in this section is the wetland that was constructed on cutaway adjacent to Fin Lough (bunded area visited 5/07/2010 - see habitat descriptions section). This wetland is about 15 years old and is developing into a diverse mosaic of wetland and dryland habitats. Reedbeds (pPhrag) are a prominent habitat and these are interspersed with stands dominated by Poor fen communities, Bog Cotton (pEang) and Bottle Sedge (pRos). There is a small amount of open water. There are also some fields that are still relatively unvegetated and dominated by bare peat. Several higher fields are developing Dry Heath (dHeath) dominated by Heather and Birch scrub (eBir). This area also contains a small section of wet Willow-dominated woodland (WN6) and Reedbeds (FS1) that probably was never developed. This wetland is notable for the appearance of rich fen indicators such as Saw Sedge (*Cladium mariscus*) and Black Bog-rush (*Schoenus nigricans*).

Adjacent to this wetland and the railway line that divides this section, there is a large area of production-related cutaway that was temporarily wet at the time of the survey. This open water was attracting a significant number of wildfowl. The drier sections were re-vegetating and contained a mosaic of Poor fen communities (pJeff, pEang, pTrig), Birch scrub (eBir) and Reedbeds (pPhrag).

There is also some remnant high raised bog (PB1) around the margins of this section. These remnants are relatively dry and in poor condition. Some have been drained but remain undeveloped. Some have been cut for sod peat (PB4). Gorse and Birch scrub is spreading over parts of these remnants while high bog along the western boundary is being colonised by conifers.

**Clondelara-Blackwater**

This sub-section is located in the SE section of the main site and is bounded by the Gowlan River to the north and the main track to the east. The majority of this section is in active production and is bare peat. A smaller area is considered production related cutaway and is re-vegetating with a mosaic of bare peat and Poor fen communities. This sub-section also includes some cutaway out of production that is dominated by Reedbeds (pPhrag). Some of this section (north-east corner) adjacent to the Gowlan River had high water-levels and was attracting large numbers of wildfowl and Whooper Swans.

This sub-section also contains a block of BOGFOR plantation with a mixture of conifer and broad-leaved tree species in individual blocks. One feature of interest is a small area of high bog (PB4) south of the railway that has been drained but remains undeveloped. This section is dominated by Heather and is quite dry and in poor condition. There are indications that the surface vegetation was removed in the past but has now re-colonised.

**Derrylahan-Blackwater**

This sub-section takes in the eastern central section of the main site and runs from the ash facility to the River Blackwater between the northern railway and the River Gowlan. The majority of this section is considered to be in active production although a significant portion was re-vegetating with a mixture of Poor Fen, Reedbeds and Birch scrub. A large part of the area zoned for the ash facility that has remained undeveloped has also developed Birch scrub in parts (eBir, oBir). A significant portion of the southern part was quite wet. This southern part adjacent to the Gowlan River also takes in a small area of cutaway out of production that is dominated by Reedbeds and open water. At the time of the site visit the south end of this section had high water levels to the extent that some railway lines were submerged and other railway lines had been damaged by the water.

Numerous small mineral islands are dotted along the middle part of this section, these islands have been used as places in which to store piles of fossil timber. The northern section from the ash facility to the Blackwater River is mostly bare peat and is in active industrial peat production.

**Derryhask-Blackwater**

This sub-section takes in the NE section of the main site and takes in all the land north of the northern railway branch (to Belmont). It is divided into two main sections by a railway that links to an adjacent site (Balaghurt/Glebe). The eastern section is still in production although there is some recolonisation. A mosaic of habitats is developing in this area in association with the underlying topography, as a ridge runs through this section. Drier Poor fen and grassland communities are developing in conjunction with Birch scrub, particularly along the drains. Some individual fields have more vegetation developed with Poor fen and Birch scrub being most prominent. There is some minor development of open water and Reedbeds in some depressions.

The area SW of the railway is mainly considered to be production related cutaway. This area is re-colonising with a mosaic of wetland and dryland communities reflecting the underlying topography. Several raised areas and mounds have a mosaic of Birch scrub and communities typical of drier conditions, such as dry grassland (gCal), disturbed/pioneer vegetation (DisCF) and Poor Fen (pJeff, pTrig). Wetlands are developing in the depressions with Poor fen (pEang, pRos, pJeff) and Reedbeds (pPhrag). A large part of this area adjacent to the Blackwater River was quite wet at the time of the survey.



### Forestry and potential forestry on site

Four BOFOR experimental plots were planted on the site in the late 1990's. These plots contain a range of species and species mixes including broad-leaved and conifer species. The plots contain various-sized blocks of single/mixed species plantations. Larch, Lodgepole Pine, Norway Spruce, Sitka Spruce Oak and Birch were all planted. Various different trials looked at different cultivation techniques and the growth of different species and varieties in different conditions. Growth and development of these plots varies from species to species and from plot to plot. Larch was the best developed of all species in the south-east plot with max heights of 8 m. Some conifer plots had failed and were dominated by naturally regenerating Birch. Signs of Deer were prominent on some of the plots and had caused damage to some conifers and Birch.

Several mineral 'islands' or mounds on the site were also planted with conifers, but were older than the BOFOR plots and were planted in the 1970's. These islands were planted with mainly Sitka Spruce and some Lawson Cypress, Norway Spruce and Lodgepole Pine. The conifer plantations were reasonably well-developed and had typically poorly developed ground cover dominated by leaf litter and a poor woodland structure.

There is some potential for development of forestry on some of the drier ridges and mounds around the site, particularly towards the western half of the site (see map). A Native Woodland Scheme or a conifer plantation (afforestation) grant could be used to fund the establishment of woodlands in these areas.

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

#### Fin Lough cSAC and pNHA (NPWS site code 000576)

This SAC is centred around Fin Lough located at the northern end of the site. This lake is a shallow limestone based lake surrounded by wetland habitats including Alkaline Fen (EU Annex I habitat). The site contains a notable transition from fen to raised bog habitat. A rare snail (*Vertigo geyeri*) has also been recorded on this site. Water levels and the area of open water have decreased significantly, leading to a large part of the former lake basin being infilled with Reedbeds. The drop in water levels has been related to industrial peat production in Blackwater.

Bord na Móna owns a large section of the cSAC including part of the lake and fen, although this was never in industrial peat production. (It should be noted that the ownership map attached to the NPWS Management Plan for this site shows the Bord na Móna land holding to be much smaller compared to BnM boundaries as indicated by the GIS data loader). Part of this hydrological unit (outside the cSAC) was likely to have extended into the Blackwater industrial peat production area and was destroyed. However, some of this territory is currently being restored and is part of a constructed wetland.

#### River Shannon Callows cSAC & pNHA (NPWS site code 000216)

This large designated area extends between Athlone and Portumna. The designated area partially includes the two isolated parts of the Blackwater site that are located west of the Shannonbridge to Clonmacnoise road. Both these areas are located close to the river are low-lying and are dominated by intact raised bog (PB1) with

surrounding cutover bog, scrub, transitional zones and wet grassland. There has been no industrial peat production in either section.

Both sections of raised bog have relatively intact sections that are notable for their intact transitional zones including lagg zones. The southern section was relatively dry and *Sphagnum* cover was quite low (inactive raised bog). Pine were spreading over the bog. There was a relatively intact transition from wet grassland to raised bog dominated by Heather, through a zone with no obvious face-bank indicating old cutover bog, (although there may have been some cutting in the past).

The Middle River Shannon Callows SPA (NPWS site code 004096) partially overlaps with the above designation.

#### **Lough Nanag Esker pNHA (NPWS site code 000910)**

This designated area is located adjacent to the west side of the main site. It mainly consists of a series of esker ridges that contain some rare plant species and species-rich grassland, as well as a small lake called Lough Nanag that is surrounded by some bog habitats. The Lough Nanag basin is located within the Bord na Moña property. This lake basin has partially infilled and contains open water, scrub, Reedbeds and wet grassland along with a small portion of remnant raised bog. The basin is located adjacent to industrial peat production and this activity is likely to have affected water levels in the lake (or the lake may have been drained.). The pNHA designation extends northwards and adjacent to another part of the Bord na Moña property which is an old disused gravel pit, now re-vegetating.

#### **Adjacent habitats and land-use**

A range of different habitats and land-use occurs around this large site.

Scrub, remnant high bog and cutover habitats are typically found immediately adjacent to the industrial cutaway. Some of this land may be grazed by livestock and is fenced off.

Small sections around the margins of site have been planted with conifers. Coillte also own a large plantation to the east of the site and adjacent to Belmont bog. Another large area has been recently planted with conifers adjacent to the north of the site and between Blackwater and Balaghurt/Glebe.

Wet grassland (GS4) is also a prominent habitat around the margins of the site and is generally grazed by livestock. Some grassland has been improved (GA1). There is also some dry grassland associated with the eskers to the west and north of the site that is also improved to various degrees and grazed by livestock.

Fin Lough cSAC contains a range of wetland habitats including Reedbeds (FS1), Raised bog (PB1) and rich alkaline fen (PF2). This area is grazed by cattle during the summer.

#### **Watercourses (major water features on/off site)**

There are several significant water features on and around the site.

- Fin Lough (a small lake and associated habitats designated as cSAC at the northern end of the site whose hydrology may have been compromised by industrial peat production in the adjacent bog.)

- Lough Nanag (a small lough at the western side of the site that has been significantly affected by adjacent industrial peat production).
- River Blackwater (a river that flows along the east side of the site and is a tributary of the Shannon).
- River Gowlan (a river that flows around the north-west part of the site draining Lough Nanag, then turns south-east through the centre of site linking to the River Blackwater and is largely channelised). The riparian development along the majority of this river is poor with a deep main channel surrounded by tall embankments. Part of the river along the north-west boundary near Lough Nanag is likely to be piped.
- The Black River (a small stream in the north-east section of the site that is a tributary of the Blackwater River). This river was piped in the past.

## **Fauna biodiversity**

### **Birds**

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

- A Hen Harrier was noted on two occasions hunting over the site.
- A Marsh Harrier was noted hunting on the site in May 2010.
- A Cuckoo was observed on the site in May 2010.
- A Kestrel was also noted on the site on several occasions.
- A possible Merlin was noted over the northern end of the site near Fin Lough.
- Wildfowl were using two main areas of temporary open water, adjacent to the northern constructed wetland and along the Gowlan River. Mallard, Tufted Duck and Teal were noted with a max count of 400 birds between the two sections. Groups of Mallard were noted at several other locations around the site including 9 using some poor fen in a water-logged depression and 6 using northern the constructed wetland.
- Whooper Swans have been recorded using the site. A max count estimated that up to 200 birds were on one of the temporary Open Water areas. Whooper Swans (75) were also noted on the other temporary open water area so in total up to 300 birds may have been using the site. There was significant Whooper traffic to and from the Shannon callows area each day and total numbers fluctuated. Fieldwork was carried out at time when much of the Shannon callows were flooded. Waterfowl were observed roosting on sites with temporary open water at Blackwater. This could account for some of the high number of birds using these sites. Birds were generally roosting but some feeding was noted in some of the pools.
- Little Grebe and Moorhen were noted using the lake towards the centre of the site.
- Several pairs of Mute Swan were also noted on the site with one pair noted on the constructed wetland south of the Ash site.
- A group of Lapwing (16) were noted in one wet section along the Gowlan River, while 12 Lapwing were observed close to the lake.
- At least 3 Grey heron were observed on the site.
- Snipe were routinely flushed from most sections of the site, although higher densities were noted in some sections such as the constructed wetland adjacent to Fin Lough. In total about 124 individual or small groups of 2-3 birds were flushed from the site over the 4 days.

- Other more common birds were noted on the site each day. These included Blackbird, Starling, Grey Crow, Rook, Meadow Pipit, Blue Tit, Reed Bunting, Thrush, Goldfinch, Wren, Redpoll and Stonechat.

**5/07/2010**

Birds using the constructed wetland adjacent to Fin Lough include:

- Skylark
- Meadow Pipit
- Reed Bunting
- Sedge Warbler
- Mallard

#### **Mammals**

- Signs of Deer (most likely Fallow Deer) were noted at several locations around the site including within the BOGFOR plots where they have been causing some damage.
- Rabbit were also quite common on some of the drier sections of site and several Hares were also observed during fieldwork. Grazing by Rabbits/Hares was widespread throughout the site.
- Signs of Badger foraging and footprints were also noted in several sections of the site including around the wetland near Fin Lough, the production-related area in the north-east section that is re-vegetating the margins of the site and around some of the conifer plantations on the mineral islands
- Signs of Otter (Annex I species) were noted adjacent to the constructed wetland near Fin Lough. Fish remains were present on the side of this wetland (scales) at several locations. An Otter scat was also noted along a drain adjacent to the western boundary of the site.
- Pine Martin scats were deposited along the western boundary of the site.
- Squirrels (Red or Grey) are present at least along the margins of the site.
- 

#### **Fish/aquatic environment**

- Remains of a large fish were noted adjacent to the wetland near Fin Lough. A large fish was also noted in the shallows of this wetland.
- Swan Mussel are present in the silt ponds to the north of the lake.

#### **Other**

5/07/2010

- Large White Butterfly
- Large Heath Butterfly
- Damselflies

<p><b>Fungal biodiversity</b></p> <p>Winter Chanterelle (<i>Chantharellus tubaeformis</i>) (amongst conifer plantation on the margins of the site), <i>Laccaria proxima</i> (Scurfy Deceiver) <i>Mycena sp</i> and <i>Lichenomphalia umbellifera</i> (Heath Navel).</p>
<p><b>References</b></p> <p>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).</p> <p>Crowe, O., McElwaine, J.G., Boland, H. &amp; Enlander, I.J. 2015. Whooper <i>Cygnus cygnus</i> and Bewick's <i>C. columbianus bewickii</i> Swans in Ireland: results of the International Swan Census, January 2015. 2015. Irish Birds 10: 151-158.</p> <p>Crowe, O. &amp; Holt, C. 2013. Estimates of waterbird numbers wintering in Ireland, 2006/07-2010/11. Irish Birds 9: 545-552.</p> <p>European Commission (2013). Interpretation manual of European Union Habitats. European Commission DG Environment Nature ENV B.3.</p> <p>Fossitt, J. (2000). A guide to habitats in Ireland. Kilkenny. The Heritage Council.</p> <p>NRA (2009). Guidelines for Assessment of Ecological Impacts of National Road Schemes (Revision 2). National Roads Authority.</p> <p>Wetlands International. 2015. Waterbird Population Estimates. Assessed 17 October 2015: <a href="http://wpe.wetlands.org">wpe.wetlands.org</a>.</p>
<p><b>HABITAT DESCRIPTIONS</b></p> <p>(See Habitats Description Document for detailed description of each vegetation community not described in this section.)</p>
<p><b>HABITAT DESCRIPTIONS</b></p>
<p><b>Bunded area adjacent to Fin Lough</b></p> <p>This constructed wetland is located adjacent to Fin Lough SAC rich fen area. The wetland is developing and contains a range of habitats including pioneer areas with typical pioneer cutaway vegetation types such as pRos and pPhrag, and more established vegetation communities that are similar to those within the fen. The two most established communities include a small area of wet Willow woodland (WN6) that was never exploited for peat and a band of vegetation along the northern boundary that is largely dominated by Black Bog-rush and is quite diverse in places. The wet Willow woodland area has developed in a former part of the fen area that was probably drained to some extent.</p> <p>The Black Bog-rush dominated vegetation is more extensive than previously thought. It is distributed mainly along the northern side of the bunded area. This vegetation type has probably developed from a pioneer cutaway community but seems to be longer established than other parts of the wetland. There may also have</p>

been remnants of the former fen vegetation present around the wet Willow woodland area. Black Bog-rush is dominant with frequent Purple Moor-grass in places and other species present include Devil's-Bit, Round-leaved Sundew, Tormentil, Cross-leaved Heath, Hare's-tail Bog-Cotton, Common Reed, Birch, Eared Willow, Common Bog Cotton, Common Yellow Sedge, Long-stalked Yellow Sedge, Common Sedge, Bottle Sedge, Glaucous Sedge, Catsear, Marsh thistle, Soft Rush, Creeping Bent, Sweet Vernal-grass, Heather, Yellow Rattle, Smooth Mouse-ear, Common Spotted Orchid (*Dactylorhiza fuchsii*), Bog Myrtle, Bog Asphodel and Slender St Johns-wort. This vegetation type seemed to be developing in a particular zone within the wetland that is probably related to water levels.

Black Bog-rush is also scattered occasionally through-out the constructed wetland. Several clumps of Saw Sedge were also noted within the wetland but only one was relatively large (5 m diameter). Lesser Tussock Sedge (*Carex diandra*) was noted in some drains towards the north-eastern part of the wetland. Stoneworts were also noted in some drains.

A narrow band of vegetation along the eastern boundary contains typical rich fen species including some brown mosses such as *Scorpidium scorpioides* and *Campylium stellatum*. This vegetation type has frequent Purple Moorgrass, Black Bog-rush and Common Yellow Sedge. Other species present include Flea Sedge, Star Sedge, Birch, Saw Sedge (several stems), Common Spotted Orchid and Common Sedge.

The remaining wetland is a mosaic of poor fen communities (pRos, minor pJeff) and stands of Common Reed. Some of this vegetation was quite well-developed while in other sections, particularly to the west, the vegetation was at a pioneer stage and there was a significant amount of bare peat associated with the poor fen. Some the ground was very quaking although there was no standing water. Other small sections had some minor standing water. Other species found in this area included Yorkshire Fog, Mint, Marsh Pennywort, Marsh Lousewort, Lesser Spearwort, Milkwort, Royal Fern, Lesser Butterfly Orchid, Knapweed, Ragwort, Marsh Cinquefoil, Water Horsetail, Cuckoo Flower, Marsh Arrowgrass, Floating Sweetgrass, Bullrush, Reedmace, Bog Bean, Hairy Willowherb, Marsh Forget-me-not, Common Horsetail, Marsh Bedstraw, Maretail, Star Sedge, Bladderwort, Multi-flowered Wood-rush, Marsh Valerian, Knotted Pearlwort, *Calliergonella cuspidata*, Fissidens sp.

There are also some development of dry heath and scrub on higher fields. These areas were vegetated with Heather and also contained some Pine and Sitka Spruce along with the more common Birch and Willow. Other species noted included Bramble, Broad Buckler Fern, Hard Fern, Male Fern and Clubmoss was also noted.

## APPENDIX IV. 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 bowers. Only dedicated trained and competent personnel will carry out refuelling operations.
- Mobile storage such as fuel bowers will be bunded to 110% capacity to prevent spills. Tanks for bowers 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 V. 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:

- Any areas of high bog will be subject to a confirmatory survey to establish presence or absence, where relevant, of invasive species within close proximity to activity locations.
- 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<sup>7</sup> will be adhered with throughout all rehabilitation measures and activities.

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<sup>7</sup> <https://www.biodiversityireland.ie/projects/invasive-species/crayfish-plague/>



## APPENDIX VI. POLICY AND REGULATORY FRAMEWORK

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

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

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

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

### 1 EPA IPC Licence

Bord na Móna operates under IPC Licence issued and administered by the EPA to extract peat within the Blackwater bog group (Ref. PO-502-01). As part of Condition 10.2 of this licence, a rehabilitation plan must be prepared for permanent rehabilitation of the boglands within the licensed area. The bog is part of the Blackwater group (and within the Blackwater sub-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 33,000ha. This scheme will significantly go beyond what is required to meet rehabilitation and decommissioning obligations under existing EPA IPC licence conditions. Interventions and measures supported by the Scheme will ensure that environmental stabilisation is achieved (meaning IPC obligations are met), and importantly, significant additional benefits, particularly relating to climate action and

other ecosystem services, will also be delivered. However, only the additional costs associated with the additional and enhanced rehabilitation, i.e., those activities which go beyond the existing decommissioning and rehabilitation requirements arising from Condition 10 will be eligible for support under the Scheme.

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

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

### **3 National Climate Policy**

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

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

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

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

### **4 National Peatlands Strategy**

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

The strategy recognises that Ireland's peatlands will continue to contribute to a wide variety of human needs and to be put to many uses. It aims to ensure that Ireland's peatlands are sustainably managed so that their benefits can be enjoyed responsibly. It aims to inform appropriate regulatory systems to facilitate good decision making in support of responsible use. It also aims to inform the provision of appropriate incentives, financial supports and disincentives where required. The strategy attempts to strike an appropriate balance between different needs, including local stakeholders like turf-cutters and semi-state bodies such as Bord na Móna.

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

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

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

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

## **5 National River Basin Management Plan 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 draft NWBMP 2022-2027 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 draft 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 National Biodiversity Action Plan 2016-2021**

The National Biodiversity Action Plan 2016-2022 has a vision that biodiversity and ecosystems in Ireland are conserved and restored, delivering benefits essential for all sectors of society and that Ireland contributes to efforts to halt the loss of biodiversity and the degradation of ecosystems in the EU and globally. Ireland's 2<sup>nd</sup> National Biodiversity Action Plan outlines the main policies, strategies, actions and targets in relation to biodiversity. This plan has several Bord na Móna specific objectives and actions including implementing the BnM Biodiversity Action Plan 2016-2021 and overlaps with both the National Peatlands Strategy and the National Raised Bog Special Areas of Conservation Management Plan 2017-2022.

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

## **7 National conservation designations**

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

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

The National Raised Bog Special Area of Conservation Management Plan 2017-2022 sets out a roadmap for the long-term management, restoration and conservation of protected raised bogs in Ireland. The Plan strikes an appropriate balance between the need to conserve and restore Ireland's raised bog network as part of Ireland's commitments towards the EU Habitats Directive, and the needs of stakeholders and gives recognition to the important role that communities have to play in the conservation and restoration of raised bogs. The National Raised Bog Special Areas of Conservation (SACs) Management Plan 2017-2022 is part of the measures being implemented in response to the on-going infringement action against Ireland in relation to the implementation of the EU Habitats Directive, with regard to the regulation of turf cutting on the Special Areas of Conservation (SACs). The then Minister for Arts, Heritage and the Gaeltacht, also published a Review of Raised Bog Natural Heritage Area Network in 2014.

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

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

## **9 All-Ireland Pollinator Plan 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.

## **10 Land-use planning policies**

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

## 11 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.

## 12 Bord na Móna Biodiversity Action Plan 2016-2021

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

One example of a key CBD target is:

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

The EU's 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 policies.



### 13 Bord na Móna commitments

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

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

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

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

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

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

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

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

## APPENDIX VII. DECOMMISSIONING

### 1. Condition 10 Decommissioning

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

*10.1 Following 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	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 required
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.

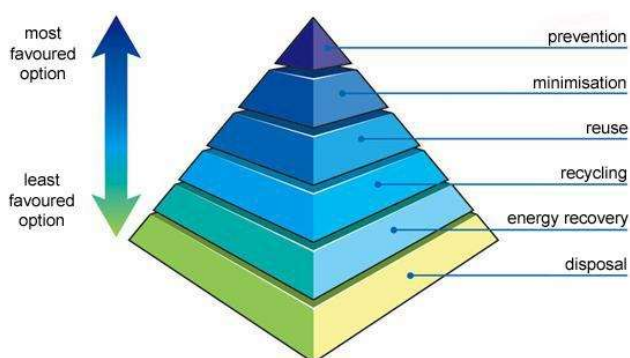
7.3.5 The tonnages and EWC Code for the waste materials listed in *Schedule 2(i) Hazardous Wastes for Disposal/Recovery* and *Schedule 2(ii) Other Wastes for Disposal/Recovery* sent off-site for disposal/recovery.

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 be 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 an EPA Exit Audit (EA) and the eventual partial or full surrender of the licence.

## 2. Enhanced Decommissioning.

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

Item	Enhanced Decommissioning Type	Prosperous Decommissioning Plan
1	Removal of Railway Lines	Removal of Railway Lines
2	Decommissioning Bridges and Underpasses	Where Applicable
3	Decommissioning Railway Level Crossing	Where Applicable
4	Restricting Access (bogs and silt ponds)	Restricting Access to Bog
5	Removal of High Voltage Power Lines	Where Applicable

## APPENDIX VIII. GLOSSARY

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

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

**Dry cutaway bog:** Cutaway bog is categorised as dry cutaway where it is not practical or feasible to re-wet these areas completely. It is inevitable that some areas of cutaway will remain relatively dry due to the heterogeneous 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 heterogeneous 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 is a relatively steep slope that inhibits re-wetting. The majority of dry cutaway will develop towards grassland, heath, scrub and dry woodland habitats.

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

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

**Environmental 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). The Scheme will consider potential rehabilitation and restoration actions (e.g. drain blocking) within marginal land zones, where appropriate.

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

**Restoration:** Ecological restoration is 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 have 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 is reduced or stopped. The water chemistry of wetland cutaway frequently is strongly influenced by the more alkaline sub-soils that have been exposed during peat production. This means that pioneer vegetation is more typical of fen and wetland, rather than raised bog. Wetland cutaway will have a broad range of hydrological conditions depending on the local topography. In some cases, these wetlands may form deep water (> 0.5 m) whilst other areas may have the water table at or just below the surface of the ground.

## APPENDIX IX. EXTRACTIVE WASTE MANAGEMENT PLAN

### (Minimisation, treatment, recovery and disposal)

#### Objective:

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

#### Scope:

This plan covers IPPC Licence's Ref P0502-01, Blackwater Group of Bogs located in County Offaly.

#### 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 Blackwater 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 or is 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 than 2-3 metres.

##### 1.2 Power Station screenings:

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

##### 1.3 Bog Timbers:

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

#### 2.0 P0502-01 IPPC Licence Extractive Waste Conditions

##### 2.1 Condition 7.5 Extractive Waste Management

The licensee shall draw up a Waste Management Plan (to be known as an Extractive Waste Management Plan) for the minimisation, treatment, recovery and disposal of extractive waste. This Plan shall meet the requirements of regulation 5 of the Waste Management (Management of Waste from the Extractive Industries) Regulations, 2009. The Plan shall be submitted for agreement by the Agency by the 31<sup>st</sup> 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 our 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	Classification	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 Blackwater 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 their 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 Blackwater IPC Licence P0502-01.



## APPENDIX X. MITIGATION MEASURES FOR THE APPLICATION OF FERTILISER

- Any fertiliser used will be Rock Phosphate and will not be applied in the following conditions:
  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 <sup>3</sup> 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 <sup>3</sup> 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 XI. CONSULTATION SUMMARIES**

### **Table APX -1 Consultees contacted**

### **Table APX -2 Response summary from Consultees contacted**

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## APPENDIX XII. ARCHAEOLOGY

### Role of the Archaeological Liaison Officer

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




Code of Practice

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# Code of Practice

5. To arrange for the delivery or collection of the stray find, as directed by the Duty Officer of the National Museum of Ireland.
6. To complete the Report of Discovery of Archaeological Object(s) in Bogs (Appendix V), as directed by the Duty Officer of the National Museum of Ireland.
7. To maintain a file of all stray finds and associated documentation and provide copies to the Project Archaeologist.
8. To provide assistance, where required, to the Department during archaeological surveys.
9. To provide assistance, where required, to Bord na Móna's Consultant Archaeologists, during investigation and mitigation of monuments.
10. To report to the Bord na Móna members on the Archaeology Management Liaison Committee any planned developments or new activities on cutaway peatland areas within his/her group of bogs.



	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			