Blackwater East Bog

Cutaway Bog Decommissioning and Rehabilitation Plan 2025

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 that BnM (formerly Bord na Móna) agree with the EPA the measures that will provide for rehabilitation, i.e. stabilisation of Blackwater East Bog upon cessation of peat production and complements 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 East 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 Minster. This Scheme will see the Minister support, via the Climate Action Fund and Ireland's National Recovery and Resilience Plan, BnM 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 East 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.

BnM have defined the key rehabilitation outcome at Blackwater East 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 East 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.

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NON-TECHNICAL SUMMARY

- BnM is currently planning to rehabilitate Blackwater East Bog, located in west Co. Offaly, approximately 1 km north-east of Shannonbridge, under the PCAS Scheme.
- Industrial peat harvesting has now completely finished at Blackwater East Bog.
- BnM have already rehabilitated a significant portion of Blackwater Bog, encompassing three discrete parcels of land (554 ha) within the wider Blackwater Bog boundary. This rehabilitation was outlined in a plan for the bog finalised in 2022. This Blackwater East rehabilitation plan (2025) focuses on an area of 419 ha, located in the northeast of Blackwater Bog.
- BnM 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 BnM.
- 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 East Bog was drained in the past to allow peat production. Better results for water quality, 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 BnM 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 area proposed for rehabilitation 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 East 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 East Bog 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 East bog have already naturally re-wetted. Measures proposed for Blackwater East Bog include drain blocking and additional measures required to raise water levels to the surface of the peat across vegetated and unvegetated areas where hydrological conditions can be improved. Some fertiliser will be spread on headlands and other areas to encourage vegetation growth.
- BnM plan to carry out this work in 2025.

- These rehabilitation measures will be planned by a team consisting of expert ecologists, hydrologists and engineers. It is a principle of BnM 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 establish at Blackwater East 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 peatland rehabilitation plan does not plan future after-use or development. BnM 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.
- BnM and ESB are proposing to develop a c160 MW solar farm within Blackwater Bog called Blackwater Solar Farm (Blackwater Solar Farm). This proposed project is in the pre-planning stage. The proposed renewable energy project is expected to use only part of Blackwater Bog. There is no overlap between the area being considered for the solar development and the PCAS footprint of Blackwater East Bog.
- Peatland rehabilitation of Blackwater East 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.

1. INTRODUCTION

BnM (formerly 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 East bog is part of the Blackwater Bog group (see Appendix II) and is located 5km northeast of Shannonbridge and 12km south of Athlone in Co. Offaly.

This Blackwater East rehabilitation plan focuses on an area of 419 ha, located in the northeast of Blackwater Bog. BnM finalised a rehabilitation plan for part of Blackwater Bog in 2022 (https://www.bnmpcas.ie/wp-content/uploads/sites/18/2022/10/Blackwater-Bog-Final-Rehab-Plan-v9.pdf). The 2022 plan focused on three parcels of land covering 554 ha of Blackwater Bog, one located in the north-west, and two in the south-east of the bog, which are contiguous with the 2025 proposed rehabilitation footprint. Rehabilitation is substantially complete in these areas.

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.*"

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 BnM 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. BnM have identified a footprint of 33,000 ha as peatlands suitable for this scheme. This Scheme will significantly go beyond what is required to meet rehabilitation and decommissioning obligations (Appendix VII & IX) under existing EPA IPC licence conditions. Improvements supported by the Scheme will ensure that environmental stabilisation is achieved (meaning IPC obligations are met), and importantly, significant additional benefits, particularly relating to climate action and other ecosystem services, will also be delivered.

Only the costs associated with the additional, enhanced and accelerated rehabilitation, i.e. those measures which go beyond the existing decommissioning and rehabilitation requirements arising from Condition 10, will be

eligible for support under the Scheme. BnM announced the complete cessation of industrial peat production across its estate (January 2021).

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

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

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

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.

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

1.1 Constraints and Limitations

This document covers the area of **Blackwater East Bog** as shown on drawing *BNM-DR-26-14-RP-01 Site Location.*

BnM 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. This facility also includes the development of an Integrated Constructed Wetland for the treatment and management of leachate derived from the Ash Disposal Facility. The Ash Repository Facility has been mapped as a constraint on the rehabilitation plan.

A network of railway lines occur across Blackwater East Bog and have been mapped as constraints on the rehabilitation plan.

BnM and ESB are proposing to develop a c160 MW solar farm within Blackwater Bog called Blackwater Solar Farm (Blackwater Solar Farm). This proposed project is in the pre-planning stage. The proposed renewable energy project is expected to use only part of Blackwater Bog. There is no overlap between the area being considered for the solar development and the PCAS footprint of Blackwater East Bog. It is expected that BnM will revise and update the rehabilitation plan for the remainder of Blackwater when this renewable energy project has been considered by the planning process.

BnM remain fully committed to rehabilitating Blackwater East Bog and meeting the conditions of the IPC Licence. Any consideration of any other future after-uses for Blackwater East 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.

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, '*Guidance on the Process of Preparing and Implementing a Bog Rehabilitation Plan' (EPA, 2020)*.

The ecological information and site information collected during the BnM ecological baseline survey, additional confirmatory site visits (covering the period 2011 to 2025 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 BnM cutaway bogs (Clarke, 2010; BnM, 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
- The development of a Methodology Paper 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 East 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, BnM 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.
- Joosten & Clarke (2002). Wise Use of mires and peatlands – Background and Principles including a framework for Decision-making.
- Lindsay (2010). Peatbogs and Carbon: A Critical Synthesis to Inform Policy Development in Oceanic Peat Bog Conservation and Restoration in the Context of Climate Change.
- Mackin *et al*. (2017). Best practice in raised bog restoration in Ireland. Irish Wildlife Manuals, No. 99. National Parks and Wildlife Service,
- McBride *et al*. (2011). The Fen Management Handbook (2011), Scottish Natural Heritage.
- McDonagh (1996). Drain blocking by machines on Raised Bogs. Unpublished report for National Parks and Wildlife Service.
- NPWS (2017a). National Raised Bog Special Areas of Conservation management plan. Department of Arts, Heritage and the Gaeltacht.
- Pschenyckyj et al., 2021, Optimising Water Quality Returns from Peatland Management while Delivering Co-Benefits for Climate and Biodiversity. An Fóram Uisce.
- Quinty & Rochefort (2003). Peatland Restoration Guide, second edition. Canadian *Sphagnum* Peat Moss Association and New Brunswick Department of Natural Resources and Energy.
- Regan*, et. al.* (2020). Ecohydrology, Greenhouse Gas Dynamics and Restoration Guidelines for Degraded Raised Bogs. EPA Research Report. Prepared for the Environmental Protection Agency by Trinity College Dublin.
- Renou-Wilson *et al*. (2011). BOGLAND - Sustainable Management of Peatlands in Ireland. STRIVE Report No 75 prepared for the Environmental Protection Agency.
- Schouten (2002). Conservation and Restoration of Raised Bogs: Geological, Hydrological and Ecological Studies. Dúchas - The Heritage Service of the Department of the Environment and Local Government, Ireland.
- Thom (2019). Conserving Bogs – Management Handbook.
- Wheeler & Shaw (1995). Restoration of Damaged Peatlands – with Particular Reference to Lowland Raised Bogs Affected by Peat Extraction.
- Wittram *et al*. (2015). A Practitioners Guide to Sphagnum Reintroduction. Moors for the Future Partnership.

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

- 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).
- EPA Guidance on Requests for Alterations to a Licensed Industrial or Waste Activity.
- Birdwatch Ireland online data (including I-WeBS and CBS datasets; www.birdwatchireland.ie).
- Geological Survey of Ireland - National Draft Bedrock Aquifer map.
- Geological Survey of Ireland - Groundwater Database (www.gsi.ie).
- Historic Environment Viewer at https://webgis.archaeology.ie/historicenvironment/
- National Parks & Wildlife Services Public Map Viewer (www.npws.ie).
- Water Framework Directive catchments.ie/maps/ Map Viewer (www.catchments.ie).

- OPW Indicative Flood Maps (www.floodmaps.ie).
- CFRAM Preliminary Flood Risk Assessment (PFRA) maps (www.cfram.ie).
- River Basin Management Plan for Ireland 2022-2027.
- Bord na Móna Annual Report 2024.
- Spatial data in respect of Article 17 reporting, available online at https://www.npws.ie/maps-and-data/habitat-and-species-data/article-17

2.2 Consultation

A number of stakeholders have been identified during the course of BnM'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

BnM carried out a baseline ecological survey of all of its properties in 2009-2012 and developed habitat maps. As part of this exercise, Blackwater East Bog was surveyed in December 2009 and July 2010. Additional ecological walk-over surveys and visits have taken place at Blackwater East Bog in the intervening years. Habitat surveys took place in 2024 and 2025 in advance or preparation of this rehabilitation plan. Habitat maps have been updated, where required. This rehabilitation plan is informed by the original baseline survey as well as subsequent confirmatory site walk-over surveys and visits, and updates to baseline data.

Habitat mapping followed best-practice guidance from Smith *et al.* (2011). Map outputs including all habitat maps and target notes were produced using GIS software application packages (ArcGIS). General marginal habitats and other habitats that had not been modified significantly by industrial peat extraction were classified using Fossitt *et al*. (2000). Plant nomenclature for vascular plants follows Stace (2019), while mosses and liverworts nomenclature follows identification keys published by the British Bryological Society (2010). A more detailed BnM classification system was previously developed for classifying pioneer cutaway habitats as Fossitt categories were deemed not to be detailed enough for cutaway bog (much of cutaway bog could be classified as Cutover Bog - PB4). Much of the pioneer cutaway vegetation is still at an early stage of its development and cannot be assigned to Fossitt Level 3 categories yet.

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

3. SITE DESCRIPTION

Blackwater East Bog is located in County Offaly approximately 5km northeast of Shannonbridge and 12km south of Athlone. It is part of the Blackwater group of bogs (Blackwater sub-group) (Ref. 502-01).

BnM have previously rehabilitated a significant portion of Blackwater Bog in 2022/2023, encompassing three discrete parcels of land within the wider Blackwater Bog boundary. This rehabilitation was outlined in a plan for the bog that was finalised in 2022 (https://www.bnmpcas.ie/wp-content/uploads/sites/18/2022/10/Blackwater-Bog-Final-Rehab-Plan-v9.pdf). The 2022 plan focused on three parcels of land covering 554 ha of Blackwater Bog, one located in the north-west, and two in the south-east of the bog, which are contiguous with the 2025 proposed rehabilitation footprint. Rehabilitation is substantially complete in these areas. This Blackwater East rehabilitation plan (2025) focuses on an area of 419 ha, located in the northeast of Blackwater Bog.

The surrounding landscape is dominated by a mosaic of farmland, largely consisting of improved grassland, along with several areas of coniferous forestry and other raised bogs, including the wider Blackwater Bog immediately to the northwest, west, and southwest, Ballaghurt and Glebe to the northeast, and Belmont to the south, all of which are owned and managed by BnM.

Blackwater Bog is one of a cluster of bogs that has developed along the floodplains of the River Shannon. The Blackwater (Shannonbridge) Stream (EPA Code: 25B27) flows southwest along the southeastern boundary of the bog, discharging into the River Shannon (Lower) (EPA Code: 25S01) to the southwest. The Gowlan (Offaly) Stream (EPA Code: 26G04) flows south from its source along the western boundary of the wider blackwater bog before discharging into the Blackwater Stream to the south of the bog. The Derryhask Stream (EPA Code: 25D99) flows southeast along the southern boundary of the bog from its source, joining the Blackwater Stream at the southern edge of the bog. The Moyclare Stream (EPA Code: 25M74) flows northwest, outside the bog boundary, converging with the Blackwater Stream at the southern boundary of the bog.

Although there are no pumps within the boundary of Blackwater East, the bog is under the influence of the pumping regime of the wider Blackwater Bog.

See Figure *BNM-DR-26-14-RP-01: Blackwater East Bog: Bog Site Location*, included in the accompanying Mapbook[1], which illustrates the location of Blackwater East Bog in context to the surrounding area.

3.1 Status and Situation

3.1.1 Site history

Blackwater East 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.

A significant part of Blackwater Bog has already re-vegetated and is developing a mosaic of pioneer cutaway wetland, Birch scrub and other pioneer cutaway habitats including wetlands and reedbeds.

Some previous rehabilitation was carried out in the southwest of Blackwater East Bog between 2000 and 2005, with the creation of a small bunded wetland. This wetland was used as a silt control measure.

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

3.1.2 Current land-use

Industrial peat production has now permanently ceased at Blackwater East Bog.

BnM 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 BnM (Ref. IPC Licence 502). The Ash facility boundary has been mapped as a constraint on the rehabilitation plan. ESB were granted planning permission (March 2023) 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 has been mapped as a constraint on the rehabilitation plan.

3.1.3. Socio-Economic conditions

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

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

In respect of 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, BnM played a central role in building communities through several initiatives, including development and construction of local housing complexes, education bursaries, support of local sporting clubs, the provision of community gain funds, charity programmes and the provision and building of amenity areas.

Employment numbers have declined following 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).

There are approximately 1400 people working in BnM at present, with approximately 135 roles directly involved in PCAS.

3.2 Geology and Peat Depths

3.2.1 Sub-soil geology

GSI bedrock geology data reveals that Blackwater East is underlain by three different bedrock units: the Ballysteen Formation (dark muddy limestone and shale), Navan Beds Formation (dark limestone, mudstone, sandstone) and Waulsortian Limestone (massive, unbedded lime-mudstone).

These units are separated by multiple faults beneath the site, orientated in northwest-southeast and northeast-southwest directions. The Navan Beds formation extends along the northern boundary as, while most of the southeastern section of the bog is underlain by a single unit of Waulsortian Limestone. The substantial remainder of the bog is underlain by the Ballysteen Formation, which separate the other units by extending from southwest to northeast.

Quaternary sediment mapping indicates that the bog is predominantly cutover raised peat, with extensive areas underlain by till derived from limestone throughout the site (including a significant portion within the site boundary). The regions immediately surrounding the bog feature the same deposits with limestone gravels and eskers occurring further north. Moving downstream along the Blackwater Stream, there are ravels derived from limestone, which transition to alluvium in proximity to and along the banks of the River Shannon.

3.2.2 *Peat type and depths*

Generally, peat depths are shallow across most of Blackwater East Bog (<1.5m); however, there are a small number of pockets of slightly deeper peat, particularly to the south of the site and a section to the southeast where peat depths range from 1.5 - 4m.

Peat depths have been mapped across the bog using GPR and are provided in figure *BNM-DR-26-14-RP-04: Peat depths*.

3.3 Key Biodiversity Features of Interest

Blackwater East Bog is now recolonising with pioneer vegetation forming mosaic habitat along with bare peat, wetlands and scrub.

3.3.1 Current habitats

The most common vegetation communities/habitats[2] present in the former production area within the PCAS rehabilitation extent include:

- Bare peat (0-50% cover) (BP) (plate 3-1, plate 3-3)
- Pioneer poor fen dominated by *Juncus effusus*-dominated community (Soft Rush) (pJeff) and Pioneer *Eriophorum angustifolium*-dominated community (Bog Cotton) (pEang) (plate 3-1, plate 3-4)
- Pioneer *Juncus bulbosus*-dominated community (Bulbous Rush) (pJbulb),
- *Molinia caerulea*-dominated community (dry) (Purple Moorgrass) (gMol),
- Open *Betula/Salix*-dominated community (B) (Birch/Willow) (oBir) (plate 3-1)
- Pioneer dry *Calluna vulgaris*-dominated community (Heather) (dHeath)

[2] Codes refer BnM classification of pioneer habitats of production bog

- Closed *Betula/Salix*-scrub community (C) (Birch/Willow) (cBir) (generally in mosaic with other cutaway habitats) (plate 3-1, plate 3-4)
- Wetlands with open water (OW), pioneer *Phragmites australis*-dominated community (Common Reed) (pPhrag), Pioneer *Typha latifolia*-dominated community (Reedmace) (pTyp) and Pioneer *Carex rostrata*-dominated community (Bottle Sedge) (pRos) (plate 3-2, plate 3-4)

The most common habitats[3] found around the margins include:

- Scrub (WS1)
- Birch woodland (WN7)
- Conifer plantation (WD4)
- Improved grassland (GA1)
- Raised bog (PB1)
- Treeline (WS2)

See Drawing number *BNM-DR-26-14-RP-17: Current Habitat Map*, included in the accompanying Mapbook, which illustrates the habitats at Blackwater Bog East. See below for photographic plates of habitats (taken in March 2025).

[3] Codes refer to Heritage Council habitat classification, Fossitt 2000

Photos of Habitats at Blackwater East Bog (March 2025)

Plate 3-1 Aerial of Blackwater East Bog, looking northeast. The bog is a mix of wetlands, pioneer open habitats and Birch scrub (oBIR, cBir), with some bare peat remaining particularly along highfields and headlands.

Photos of Habitats at Blackwater East Bog (March 2025)

Plate 3-2 Wetlands with open water (OW) have formed in low lying depressions, fringed with pioneer Phragmites australis-dominated community (Common Reed) (pPhrag).

Plate 3-3 Bare peat (0-50% cover) (BP) along bog headland.

Plate 3-4 Pioneer poor fen dominated by Pioneer Eriophorum angustifolium-dominated community (Bog Cotton) (pEang) with Open Betula/Salix-dominated community (B) (Birch/Willow) (oBir) and Wetlands with open water (OW).

Photos of Habitats at Blackwater East Bog (March 2025)

Plate 3-5 Birch Woodland (BirWD) and closed Betula/Salix-scrub community (C) (Birch/Willow) (cBir)

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 Data Centre (NBDC).

- Mammal species have been recorded on or in close proximity to the bog including 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*).
- Lepidopteran species of conservation interest recorded at Blackwater Bog include the near threatened species Dingy Skipper (*Erynnis tages*) and Small Heath (*Coenonympha pamphilus*), and the endangered species Wall (*Lasiommata megera*).

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 wider area of Blackwater Bog can be subject to inundation during winter periods (although this can vary inter-annually). These areas have the potential to attract substantial amounts of waterfowl during the winter months.

- Species recorded include the BOCCI[4] red listed species Lapwing (*Vanellus vanellus*), Golden Plover (*Pluvialis apricaria*), Snipe (*Gallinago gallinago*) and Redshank (*Tringa totanus*). BOCCI amber listed

[4] https://birdwatchireland.ie/app/uploads/2021/04/BOCCI4-leaflet-2-1.pdf

species recorded include Teal (*Anas crecca*), Mute Swan (*Cygnus olor*), Whooper Swan (*Cygnus cygnus*), Greylag Goose (*Anser anser*), Mallard (*Anas platyrhynchos*), Cormorant (*Phalacrocorax carbo*), Wigeon (*Anas penelope*) and Pintail (*Anas acuta*)

- 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 with species recorded including Lapwing (*Vanellus vanellus*), Ringed Plover (*Charadrius hiaticula*), Common Sandpiper (*Actitus hypoleucos*), Redshank (*Tringa totanus*) and Common Snipe (*Gallinago gallinago*).

Peatland rehabilitation may result in positive quality effects on the relative abundance or proportion of species of conservation concern utilising bogs post rehabilitation. This may include Red or Amber listed species of breeding waders along with wintering species including Swans and other wildfowl.[5]

3.3.3 Invasive species

There are records of high impact invasive species American Mink (*Mustela vison*), Fallow Deer (*Dama dama*) and Zebra Mussel (*Dreissena (Dreissena) polymorpha*) from the wider Blackwater Bog. There are no records for invasive plant species within the PCAS rehabilitation extent.

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

3.4 Statutory Nature Conservation Designations

There are several European Sites in proximity (within 5km) to Blackwater East Bog, including:

- Fin Lough (Offaly) SAC (site code: 000576) - 500m northwest
- Mongan Bog SAC (site code: 000580) - 3km north
- Mongan Bog SPA (site code: 004017) - 3km north
- Pilgrim's Road Esker SAC (site code: 001776) - 4.4km north
- Moyclare Bog SAC (site code: 000581) - 4.8km southeast
- River Shannon Calllows SAC (site code: 000216) - 4.8km west
- Middle Shannon Callows SPA (site code: 004096) - 4.8km west
- The River Suck Callows SPA (site code: 004097) - 8.2km west

Several NHA's (Natural Heritage Areas) and pNHA's (Proposed Natural Heritage Areas) occur in proximity (within 5km) of Blackwater East Bog:

- Fin Lough (Offaly) pNHA (site code: 000576) - 500m northwest
- Clonfinlough Esker pNHA (Site code: 000892) - 2.8km north
- Mongan Bog pNHA. (site code: 000580) - 3km north
- Clonlyon Glebe Bog pNHA (site code: 000893) - 3km northeast
- Lough Nanag Esker pNHA (site code: 000910) - 4.2km west
- Pilgrim's Road Esker pNHA (site code: 001776) - 4.4km north

[5] https://www.bnmpcas.ie/wp-content/uploads/sites/18/2023/08/Annual-Monitoring-Report_Final-Rev-A_Redacted.pdf

- Moyclare Bog pNHA (site code: 000581) - 4.8km southeast
- River Shannon Calllows pNHA (site code: 000216) - 4.8km west
- Clorhane Wood pNHA (site code: 000894) - 4.8 km west

3.4.1 Other Nature Conservation Designations

The Ramsar Convention entered into force in Ireland on 15th March 1985. Ireland currently has 45 sites/wetlands designated as Wetlands of International Importance (Ramsar Sites). These cover a surface area of 66,994ha. The closest Ramsar Site to Blackwater is Mongan Bog, Co. Offaly, which lies 3km north of Blackwater East Bog. 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 East forms part of the Lower Shannon Catchment (Catchment ID: 25B) as defined by the EPA under the Water Framework Directive (WFD). The site is entirely situated within the Shannon [Lower]_SC_030 sub-catchment and Blackwater (Shannonbridge)_020 sub-basin, which flows into the River Shannon (Lower) via the Blackwater Stream. The bog contains several drainage pathways and discharge locations, with the entire bog discharging to streams or rivers which eventually flow into the River Shannon.

There are several rivers within and around the margins that drain the site. The Blackwater (Shannonbridge) Stream (EPA Code: 25B27) flows southwest along the southeastern boundary of the bog, discharging into the River Shannon (Lower) (EPA Code: 25S01) to the southwest. The Gowlan (Offaly) Stream (EPA Code: 26G04) flows south from its source along the western boundary of the bog before discharging into the Blackwater Stream to the south of the bog. The Derryhask Stream (EPA Code: 25D99) flows southeast along the southern boundary of the bog from its source, joining the Blackwater Stream at the southern edge of the bog. The Moyclare Stream (EPA Code: 25M74) flows northwest, outside the bog boundary, converging with the Blackwater Stream at the southern boundary of the bog.

Regional hydrological data suggest that Blackwater East receives average precipitation of 888mm/yr (1981-2010), with an estimated annual effective rainfall rate of 457mm/yr based on GSI data. The GSI also estimate an annual average recharge rate of 18-19mm/year for Blackwater East. In areas underlain by lacustrine deposits, this is anticipated to be a reasonable estimate of recharge rate. However, in areas underlain by more permeable glacial material this is likely to be an underestimate, particularly where there are elevated mounds of glacial till combined with shallow peat deposits. A higher recharge rate is expected in areas where shallow peat underlain by glacial till, which would lead to increased losses of water to depth. In these areas an estimated recharge rate of 50-60mm/yr would be considered a reasonable estimate, with a higher recharge rate expected where peat is shallow (<1m). Although significant declines in hydraulic conductivity with depth are commonly reported in raised bogs (e.g., Morris et al., 2022), this is not always the case (e.g., Chason & Siegel, 1986). Findings from other PCAS bogs have demonstrated that hydraulic conductivity (K) of peat in production bogs is highly variable close to the surface but typically declines by several orders of magnitude at depth.

Slug tests, carried out in deep piezometers at Lodge Bog, Clooneeny and Bloomhill, where peat depths varied from 1.7m – 3.75m, suggest that at depth there is a compacted layer of peat which limits vertical infiltration through the peat. This is suspected to be caused, in part, by repeated heavy traffic movements across the production bog combined with the impact of wider drainage causing the peat to subside. Typical K value in the phreatic wells at these were found to be highly variable with K values of up to 1.15×10^{-2} m/day which contrasts

with the K values reported from the deep piezometers at the three bogs which ranged from 1.81 x 10^{-3} m/day to 5.45 x 10^{-4} m/day. Findings have indicated that where peat thickness is less than 1.5m, the efficacy of this confining layer from limiting losses to depth is more limited (since drains will typically have breached this layer).

Analysis of water table responses to rehabilitation measures implemented through PCAS have demonstrated this occurring at several bogs, with the water table successfully brought to within 20cm of the ground surface in areas underlain by glacial deposits where the peat is sufficiently thick (>1.5m). Therefore, while successful rewetting may be feasible in some of the areas underlain by lacustrine deposits where there is sufficient thickness of peat, areas of shallow peat underlain by glacial deposits are anticipated to be extremely challenging to rewet. A recharge rate of 50-100mm/yr is considered to be a more realistic recharge figure for such areas. Based on these estimates of recharge, the available precipitation that may become runoff (assuming no change in storage) ranges from 439mm/year – 357mm/yr. This equates to an annual runoff rate of c. 4,390 – 3,570 m^3/ha/yr which is typical for Midland type bogs.

GSI bedrock geology data reveals that Blackwater East is underlain by three different bedrock units: the Ballysteen Formation (dark muddy limestone and shale), Navan Beds Formation (dark limestone, mudstone, sandstone) and Waulsortian Limestone (massive, unbedded lime-mudstone). These units are separated by multiple faults beneath the site, orientated in northwest-southeast and northeast-southwest directions. The Navan Beds formation extends along the northern boundary as, while most of the southeastern section of the bog is underlain by a single unit of Waulsortian Limestone. The substantial remainder of the bog is underlain by the Ballysteen Formation, which separate the other units by extending from southwest to northeast.

All bedrock units beneath the bog are classified as Locally Important (LI) aquifers as they are moderately productive only in local zones. An aquifer is an underground body of water-bearing rock or unconsolidated materials (gravel or sand) from which groundwater can be extracted in useful amounts. GSIs Aquifer classes are divided into three main groups based on their resource potential and further subdivided based on the type of openings through which groundwater flows. There are nine aquifer categories in total. Locally important aquifers are capable of supplying locally important abstractions (e.g. smaller public water supplies, group schemes), or good yields (100-400 m3/d). This data gives an indication of sub-surface deposits (bedrock and unconsolidated materials) in terms of their groundwater resource potential and dominant groundwater flow type.

Regionally important aquifers are those in which the network of fractures, fissures and joints, through which groundwater flows, is well connected and widely dispersed, resulting in a relatively even distribution of highly permeable zones. There is good aquifer storage and groundwater flow paths can be up to several kilometres in length. There is likely to be substantial groundwater discharge to surface waters ('baseflow') and large (>2,000 m3/d), dependable springs may be associated with these aquifers.

Quaternary sediment mapping indicates that the bog is predominantly cutover raised peat, with extensive areas underlain by till derived from limestone throughout the site (including a significant portion within the site boundary). The regions immediately surrounding the bog feature the same deposits with limestone gravels and eskers occurring further north. Moving downstream along the Blackwater Stream, there are ravels derived from limestone, which transition to alluvium in proximity to and along the banks of the River Shannon.

Groundwater (GW) vulnerability is classified as low across almost all of Blackwater East Bog, with the northwestern corner classified as moderate. However, there is a large area of high-extreme vulnerability outside the boundary of the bog.

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

3.6 Emissions to surface-water and watercourses

Blackwater Bog has 12 treated surface water outlets to the receiving waters. These are the Blackwater River (E_SH_25B270200 BLACKWATER (SHANNONBRIDGE)_020, the Shannon Lower (IE_SH_25S012000 SHANNON (LOWER)_010 and the Shannon Upper (IE_SH_26S021920 SHANNON (Upper)_130).

The Blackwater River (Shannonbridge)_020 has a moderate status and is identified as being at risk. The River Shannon Lower_010 and the Shannon Upper_130 are also classified as having a moderate status, with the WFD risk under review – *Water Framework Directive*.

The locations of silt ponds, associated surface water emission points and those being monitored and sampled as part of the PCAS scheme are detailed on the attached water quality map (*BNM-DR-26-14-RP-13: General Drainage Map*).

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.

Peat extraction was not identified as pressure in the second cycle of the river basin management plan is indicated as remaining so in the third cycle, currently under preparation. 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. From an analysis of any monitoring over the past 3 yrs. of the IPC licence environmental monitoring of some of the discharges from this bog, indicate that results were under the ELV for SS and Ammonia and broadly under the trigger levels for COD. Ammonia averaged 0.64 mg/l with a range of 0.02 to 5.1 mg/l, while suspended solids for the same period indicated a range of <2 to 36mg/l with an average of 6 mg/l.

Table 3-1 Decommissioning and Rehabilitation Programme Water Quality Monitoring.

Bog	SW	Monitoring	pH	SS	TS	Ammonia	TP	COD	Colour
Blackwater Bog	SW-74	Q124	7.40	<2	183.00	0.18	0.05	49.00	175.00
Blackwater Bog	SW-75	Q124	7.60	<2	346.00	0.05	<0.05	44.00	132.00
Blackwater Bog	SW-76	Q124	7.70	<2	302.00	0.05	<0.05	44.00	133.00
Blackwater Bog	SW-80	Q124	7.70	<2	320.00	0.05	<0.05	47.00	133.00
Blackwater Bog	SW-77	Q2 24	7.60	<2	349.00	0.19	<0.05	55.00	180.00
Blackwater Bog	SW-85	Q2 24	7.70	<2	301.00	0.05	<0.05	45.00	76.00
Blackwater Bog	SW-78	Q1 23	7.00	<2	204.00	0.30	<0.05	60.00	369.00
Blackwater Bog	SW-79	Q1 23	7.30	3.00	298.00	0.41	<0.05	50.00	203.00
Blackwater Bog	SW-83	Q1 23	6.70	2.00	154.00	0.44	<0.05	75.00	456.00
Blackwater Bog	SW-74	Q1 22	7.80	<2	377.00	0.13	<0.05	38.00	91.80
Blackwater Bog	SW-75	Q1 22	7.90	3.00	425.00	0.08	<0.05	26.00	79.80
Blackwater Bog	SW-76	Q1 22	7.90	2.00	387.00	0.08	<0.05	27.00	82.50
Blackwater Bog	SW-80	Q1 22	7.90	2.00	434.00	0.13	<0.05	29.00	81.40
Blackwater Bog	SW-74	Q2 21	7.40	3.00	172.00	0.18	<0.05	44.00	191.00
Blackwater Bog	SW-75	Q2 21	7.50	2.00	337.00	0.13	<0.05	45.00	184.00
Blackwater Bog	SW-76	Q2 21	7.50	7.00	245.00	0.18	<0.05	70.00	347.00
Blackwater Bog	SW-80	Q2 21	7.50	7.00	304.00	0.13	<0.05	44.00	182.00
Blackwater Bog	SW-74	Q2 20	7.80	6.00	438.00	0.36	<0.05	28.00	79.70
Blackwater Bog	SW-75	Q2 20	8.00	12.00	457.00	0.10	<0.05	24.00	457.00
Blackwater Bog	SW-76	Q2 20	8.00	3.00	456.00	0.02	<0.05	23.00	57.90
Blackwater Bog	SW-80	Q2 20	8.10	2.00	466.00	0.02	0.08	20.00	57.10
Blackwater Bog	SW-74	Q1 19	7.70	<5	384.00	0.56	<0.05	48.00	94.00
Blackwater Bog	SW-75	Q1 19	7.80	<5	414.00	0.20	<0.05	36.00	68.00
Blackwater Bog	SW-76	Q1 19	7.70	<5	266.00	0.03	0.05	70.00	202.00
Blackwater Bog	SW-77	Q2 19							
Blackwater Bog	SW-78	Q4 19	6.50	7.00	128.00	0.43	<0.05	79.00	497.00
Blackwater Bog	SW-79	Q4 19	7.00	4.00	198.00	2.36	<0.05	66.00	327.00
Blackwater Bog	SW-80	Q1 19	7.80	<5	416.00	0.09	<0.05	36.00	72.00
Blackwater Bog	SW-83	Q4 19	6.00	4.00	148.00	1.09	<0.05	106.00	594.00
Blackwater Bog	SW-85	Q2 19							
Blackwater Bog	SW-78	Q3 18	7.60	5.00	326.00	5.10	0.05	72.00	164.00
Blackwater Bog	SW-79	Q3 18	7.70	5.00	470.00	0.11	0.05	26.00	50.00
Blackwater Bog	SW-83	Q3 18	7.20	5.00	248.00	1.50	0.05	107.00	282.00
Blackwater Bog	SW-81	Q4 18	7.90	5.00	226.00	0.72	0.05	50.00	134.00
Blackwater Bog	SW-82	Q4 18	7.40	5.00	206.00	2.50	0.05	81.00	250.00
Blackwater Bog	SW-84	Q4 18	6.60	5.00	270.00	3.40	0.05	85.00	283.00
Blackwater Bog	SW-86	Q4 18	7.50	36.00	210.00	1.10	0.08	113.00	152.00

The licence obligation of quarterly sampling regime on a selected number of ponds to be sampled over a 3-year cycle would 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 monthly.

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.

Initial monthly results are included in Appendix XIII, for Blackwater East Bog. These results cover the period from November 2020 to December 2024 and are from some of the surface water outlets from sections of bog to be rehabilitated in 2024. Peat extraction ceased in this bog in 2020 and as expected some of the key water quality parameters that can impact water quality from peat extraction activities, remain on a relatively static trajectory, with suspended solids indicating a level trend from all outlets during the period, all well below any limits of concern. During this same period there was a slight downward trend in Ammonia for all emission points, with all other parameters fluctuated slightly, most likely influenced by normal weather patterns, including rainfall.

Monthly ammonia concentrations from emission points for November 2020 to December 2024 had a range of 0.014 to 1.21 mg/l with an average of 0.114 mg/l. Results for suspended solids for the same period indicated a range of <2 to 33mg/l with an average of 3.87 mg/l.

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 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.

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

These results will also be available in April each year as a requirement of the Annual Environmental Report at www.epa.ie.

The parameters to include 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.

Success criteria:

The key water quality success criteria associated with this enhanced rehabilitation are as follows:

- 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.
- 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 any 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.

As the monthly monitoring program at Blackwater East Bog continues in 2025 and during the rehabilitation works planned for 2025, further trending will be produced to verify any ongoing trends.

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

Irish peatlands are a huge carbon store, containing more than 75% of the national soil organic carbon (Renou-Wilson *et al.* 2012). Peatland drainage and extraction transforms a natural peatland which acts as a modest carbon sink (taking in 0.1 to 1.1 t of carbon as CO2-C /ha/yr) into a cutaway ecosystem which is a large source of carbon dioxide (releasing 1.3 to 2.2 t of carbon as CO2-C /ha/yr) based on Tier 1 Emission factors (Evans *et al*. 2017). Renou-Wilson *et al.* (2018) reported losses of between 0.81 – 1.51 CO2-C /ha/yr from drained peatlands located in Ireland.

Re-wetting of dry peatlands will increase methane emissions (Gunther *et al*. 2020) as a consequence of the anoxic conditions within the peat body that provide a suitable environment for the microbial breakdown of plant litter and root exudates. Tanneberger *et al.* (2021) describes how peatland management has to choose between CO2 emissions from drained peatlands or increased methane (CH4) emissions from rewetted industrial peatlands. However, when radiative effects and atmospheric lifetimes of both GHG gases are considered and modelled, postponing rewetting increases the long-term warming effect of continued CO2 emissions (Gunther *et al*. 2020). This means the increase in methane due to rewetting of dry peatlands is still negated by the CO2 emissions reductions. Further, Wilson *et al.* (2022) confirmed the benefit of rapid rewetting to achieve strong carbon reductions and potentially altering the warming dynamics from warming to cooling depending upon the climate scenario.

It is expected that Blackwater East Bog will become a reduced carbon source following rehabilitation. The potential of any cutaway site to develop as a carbon sink in the longer-term depends on the success of the rehabilitation measures, the extent of development of *Sphagnum*-rich or other peat-forming habitats, the balance of carbon fluxes from different cutaway habitats and future climatic conditions. Much of this bog is expected to develop wetland habitats on shallow peat with open water, reed swamp and fen habitats with alkaline emission factors and a smaller proportion will develop as regenerating wet deep peat vegetation on deep peat areas. Birch woodland and heather dominated vegetation is expected to develop on the drier mounds and along peripheral headlands.

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.**

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 BnM over the past 40 years, with particular emphasis on engagement with stakeholders during the 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 bog group, including Blackwater Bog & Blackwater East Bog, with various stakeholders in relation to:

- General consultation with range of stakeholders at annual BnM Biodiversity Action Plan review days 2010-2018.
- Archaeological Liaison Committee (National Museum of Ireland & Dept of Culture Heritage and the Gaeltacht).
- Midlands & East Regional WFD Operational Committee (River Basin Management Plans).
- Sub-committee on Shannon Flooding Work Programme and Measures (OPW, Waterways Ireland, ESB, LA's, Fisheries Ireland, NPWs etc.).
- Archaeological Liaison Committee (National Museum of Ireland & Dept of Culture Heritage and the Gaeltacht).
- Midlands & East Regional WFD Operational Committee (River Basin Management Plans).
- Ongoing consultation with Coillte regarding forestry management (forestry leased to Coillte).
- Bird surveys and monitoring carried out by Birdwatch Ireland for BnM.
- The operation of the waste ash facility (ESB).
- Ongoing feasibility and development of amenity, greenways and cycle tracks (local groups, Offaly Leader, Offaly County Council and Failte Ireland).
- Consultation with Green Offaly regarding a proposed Peatland Biosphere Reserve in Offaly.
- Ongoing consultation and engagement with the National Park's and Wildlife Service regarding the conservation of Fin Lough SAC.
- Consultation between BnM and stakeholders as part of the proposed Blackwater Solar Farm is part of a different process and is not listed here (Blackwater Solar Farm).

To inform the current Plan, both national and local stakeholders, including neighbours whose land adjoins Blackwater East 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 East Bog or the programme in general (see Appendix XI).

All correspondence received will be acknowledged and reviewed and evaluated against the rehabilitation work proposed.

4.2 Issues raised by Consultees

N/A. Not issued to consultees yet.

4.3 BnM response to issues raised during consultation

N/A.

5. REHABILITATION GOALS AND OUTCOMES

The rehabilitation goals and outcomes outline what BnM 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 reed swamp and fen on shallow more alkaline peat and other subsoils, or *Sphagnum*-rich regenerating wet deep peat vegetation communities on deep residual peat.
- Supporting future renewable energy land-use planning. 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 BnM 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 East Bog. This will happen over a longer timeframe than the implementation of this rehabilitation plan. A significant part of the area proposed for rehabilitation has already largely vegetated and stabilised.
- 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 such the development of new habitat to support biodiversity and local attenuation of water flows from the bog.
- WFD status in receiving water bodies can be affected by peatlands and peat extraction but is also affected by other sources such as agriculture. In addition, receiving water bodies that are assessed as At Risk from peatlands and from peat extraction are likely to have several contributary sources of impacts (private peat extraction and BnM). 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 BnM).

- 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.
- BnM and ESB are proposing to develop a c160 MW solar farm within Blackwater Bog called Blackwater Solar Farm (Blackwater Solar Farm). This proposed project is in the pre-planning stage. The proposed renewable energy project is expected to use only part of Blackwater Bog. There is no overlap between the area being considered for the solar development and the PCAS footprint of Blackwater East Bog.

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 East Bog proposed for rehabilitation as part of this phase.
- 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 East 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 East 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 East Bog means that a combination of targeted drain-blocking, wetland outfall management and fertiliser treatment, are the most suitable rehabilitation approach.
- BnM have defined the key goal and outcome of rehabilitation at Blackwater East Bog as environmental stabilisation of the site, optimising climate action benefits, where possible. The re-wetting of residual peat in the cutaway will be optimised, setting the site on a trajectory towards the development of wetlands/Reed Swamp and fen on shallow more alkaline peat and other subsoils, and the development of peat-forming communities on areas of residual deep peat, where possible.
- Rehabilitation of Blackwater East Bog will support multiple national strategies of climate action, biodiversity action and other key environmental strategies such was the Water Framework Directive.
- The time frame for the delivery of the planned rehabilitation will be undertaken according to available resources and appropriate constraints.
- Proposed land-use. BnM and ESB are proposing to develop a c160 MW solar farm within Blackwater Bog called Blackwater Solar Farm (Blackwater Solar Farm). This proposed project is in the pre-planning stage. The proposed renewable energy project is expected to use only part of Blackwater Bog. There is no overlap between the area being considered for the solar development and the PCAS footprint of Blackwater East Bog.

6.1 Key constraints

- **Bog conditions.** Rehabilitation outcomes of sites are constrained by the environmental characteristics of these particular areas. For example, there is potential for raised bog restoration at some 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 bogs, such as Ballybeg/Lanespark/Derryvella, 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 (regenerating *sphagnum*-rich deep peat vegetation, wetlands, fen, heathland, grassland and Birch woodland).
- Industrial peat extraction at Blackwater bog commenced in the 1950s and finished in 2020. As a result, peat depths are generally shallow (i.e. <1.5m). 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 the bog, which need to be considered as part of the wider rehabilitation work.

- **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 the area proposed for rehabilitation 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 BnM 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**. The discovery of monuments or archaeological objects during peatland rehabilitation may potentially constrain the rehabilitation measures proposed for a particular area. The rehabilitation will optimise hydrological conditions for the protection of exposed archaeological structures, their retention in situ and preservation into the future. Any newly discovered archaeology may require rehabilitation measures to be reviewed and adapted. An Archaeological Impact Assessment (Appendix XII) will be carried out to mitigate against any impact on archaeology that may be found at Ballybeg/Lanespark/Derryvella Bog. Should any previously unknown archaeological material be uncovered during the rehabilitation works, it will be avoided and reported to the BnM 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 BnM) 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**. Where a public right of way or similar burden exists on BnM property, consideration will be given to ensuring that these 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 Land Use.** BnM 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. This facility also includes the development of an Integrated Constructed Wetland for the treatment and management of leachate derived from the Ash Disposal Facility. The Ash Repository Facility has been mapped as a constraint on the rehabilitation plan.
- **Future land-use.** BnM and ESB are proposing to develop a c160 MW solar farm within Blackwater Bog called Blackwater Solar Farm (Blackwater Solar Farm). This proposed project is in the pre-planning stage. The proposed renewable energy project is expected to use only part of Blackwater Bog. There is no overlap between the area being considered for the solar development and the PCAS footprint of Blackwater East Bog.

6.2 Key Assumptions

- It is assumed that BnM 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 ash repository facility.
- The longer-term development of stable naturally functioning habitats to fully develop at Blackwater East 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 East Bog.
- The longer-term management of this site, potentially as a nature conservation site, or for amenity, or for other uses in the future.

7. CRITERIA FOR SUCCESSFUL REHABILITATION

This section outlines what criteria will be used to indicate successful rehabilitation and what critical success factors are needed to achieve successful rehabilitation. All criteria used to indicate successful rehabilitation will be measured to validate the achievement of the rehabilitation goals and outcomes and validate the completion of the rehabilitation.

The key objective of this 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 BnM 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, BnM 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 BnM 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 during the rehabilitation works planned for 2025, and data from the 2024/2025 monitoring program is compiled, further trending will be produced to verify any ongoing trends.

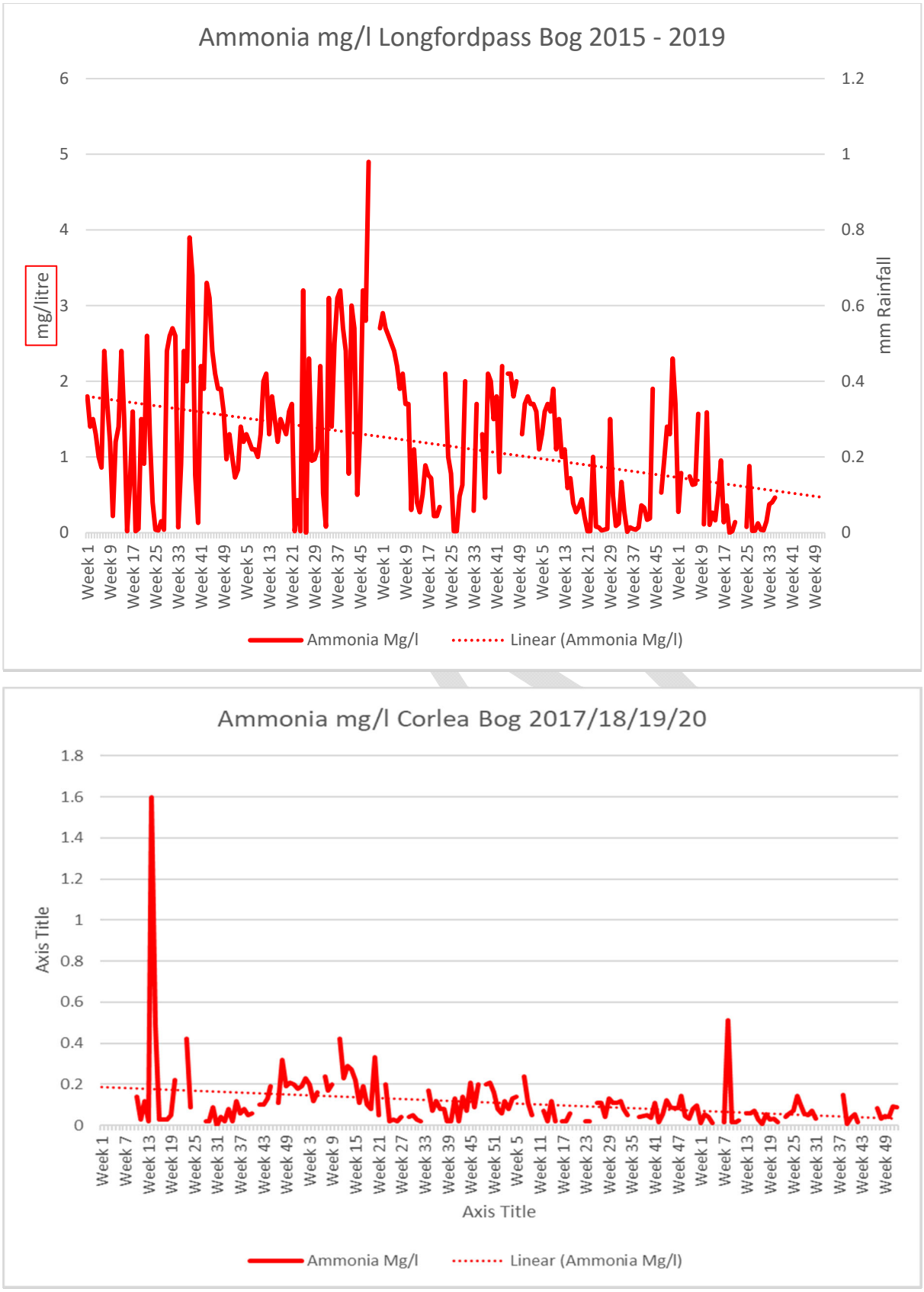

Figure 7.1. Ammonia levels over the period 2015-2019 at Longfordpass and the period 2017-2020 at Corlea.

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/carbon sink. This will be measured through habitat mapping and the development of cutaway bog condition assessment. This cutaway bog condition assessment will include assessment of environmental and ecological indicators such as vegetation cover, vegetation communities, presence of key species, *Sphagnum* cover, bare peat cover and water levels (similar to ecotope mapping). 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 *Sphagnum*-rich regenerating wet deep peat vegetation communities, wetland, fen, reed swamp, heath, scrub, poor fen, 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 the 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.	2025-2027
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	2025-2027
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
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	2025-2027

Criteria type	Criteria	Target	Measured by	Expected Timeframe
			compared against this baseline.	
Climate action verification	Reduction in carbon emissions.	Reduction in carbon emissions	Carbon emissions – estimated using a bog condition assessment and appropriate carbon emission factors.	2025-2027
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.	2025-2027

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 (• BnM and external).** BnM maintains a provision on its balance sheet to pay for these future costs. BnM 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 rehabilitation will be supported by Government through the Climate Action Fund and Ireland's National Recovery and Resilience Plan.
- **BnM to have sufficient resources (staff and training) to deliver the planned rehabilitation with required associated skills and competencies.**
- **BnM 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. BnM 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 BnM experience of peatland management and best practice applied internationally in

peatland management. Measures proposed in this plan have already been shown to be affective at other sites. BnM will apply a flexible and adaptable approach to the more innovative rehabilitation measures proposed in this plan**.** If measures are not initially effective, BnM 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, BnM 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. BnM experience of rehabilitation has shown that re-wetting improves conditions for natural colonisation and that natural colonisation is accelerated where the environmental conditions are most suitable. Rehabilitation measures have been designed to modify the conditions of areas within sites where conditions are less suitable for natural colonisation (modifying hydrology, topography, nutrient status or availability of potential seed sources).
- **Monitoring to be robust and effective.** Rehabilitation Monitoring will be established to validate the success of rehabilitation as required by Condition 10 of the IPC Licence and to verify the benefits of the proposed measures to optimise climate action. This will focus on a collecting a range of scientific data that can then quickly be adapted and into metrics that can be used to measure changes in various ecosystem services.

8. REHABILITATION ACTIONS AND TIME FRAME

Peatland rehabilitation requires detailed planning and the use of data from desktop surveys and field surveys. This data in association with 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-26-14-RP-22: Aerial Imagery 2021

BNM-DR-26-14-RP-04: Peat Depths

BNM-DR-26-14-RP-03: LiDAR Map

BNM-DR-26-14-RP-09: Depression Analysis

The rehabilitation actions themselves will be a combination of PCAS measures to re-wet peat. The distribution of these measures is outlined in drawing titled *BNM-DR-26-14-RP-05: Enhanced 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.)

Proposed Phase 2 rehabilitation measures (Table 8.1) for Blackwater East bog will include:

- Wetland measures will include managing outfalls, managing water levels with overflow pipes and targeted blocking of outfalls within the bogs.
- Initial hydrological modelling indicates low lying parts of the site will develop a mosaic of wetland habitats with the potential for some deeper water. Hydrological management will look to optimise summer water levels to maximise the development of wetland vegetation (by looking to set water depths at < 0.5 m, where possible. Water-levels will be adjusted at outfalls and by adjusting piped drainage.
- Targeted drain blocking (AW2 measures) is proposed in cutover that has now developed woodland and scrub. This will optimise hydrological conditions/rewet the residual peat.
- Dry cutaway measures will include regular drain blocking (3/100m), modifying outfalls and managing water levels with overflow pipes.
- Targeted fertiliser application 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.

Table 8-1 Types of and areas for enhanced rehabilitation measures at Blackwater East Bog.

Type	Code	Enhanced Rehabilitation Measure	Extent (Ha)
Wetland	WLT1	Turn off or reduce pumping to re-wet cutaway + blocking outfalls and managing water levels with overflow pipes	37.6
Wetland	WLT2	Modifying outfalls and managing water levels with overflow pipes + Targeted blocking of outfalls within a site	42.1
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	4.7
Wetland	WLT4	More intensive drain blocking (max 7/100 m), + modifying outfalls and managing overflows + transplanting Reeds and other rhizomes	27.8
Dry Cutaway	DCT1	Modifying outfalls and managing water levels with overflow pipes	8.8
Dry Cutaway	DCT2	Regular drain blocking (3/100m) + modifying outfalls and managing water levels with overflow pipes + targeted fertiliser treatment	71.6
Marginal land	MLT1	No work required	7.7
Drainage	Silt Ponds	Silt Ponds	0.1
Constraint	Constraint	Other constraints, including the ash disposal facility	30.2
Additional Works	Additional Works	Targeted drain blocking	188.7
Total			**419.3**

**Note that the types of rehab and areas of rehab may change in response to stakeholder consultation and refinement of the enhanced rehabilitation measures.*

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 will be applied to Blackwater East Bog. This will take account of peat depths, topography, drainage, and hydrological modelling (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.
- A review of issues that may constrain rehabilitation such as known rights of way and existing land agreements is to be carried out.

- An ecological appraisal of the potential impacts of the planned rehabilitation on the presence of sensitive ground-nesting bird breeding species (e.g. breeding waders) is to be carried out. The scheduling of rehabilitation operations will be adapted, where required.
- Ensure all activities comply with the environmental protection requirements of the IPC Licence.
- Carry out Appropriate Assessment 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 implementation of the rehabilitation plan.

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

- Carry out proposed measures as per the Phase 2 rehabilitation. This will include targeted drain-blocking, along with fertiliser application targeting bare peat areas of headlands, high fields and other areas (where required) and hydrological management. All rehabilitation measures will be carried out with regard to best practice environmental control measures (Appendix IV).
- Monitor the success of rehabilitation measures.
- Carry out the proposed monitoring, as outlined.
- Silt ponds will be monitored during this period and there will be continued maintenance and cleaning to prevent potential run-off of suspended solids from the site during the rehabilitation phase.
- Submit an ex-post report to the Scheme regulator to verify the eligible measures to be carried out in year 1 of the Scheme, and an ex-ante estimate for year 2 of the Scheme; and so on for each year of the Scheme.
- A review of known archaeology and an archaeological impact assessment (AIA), 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.

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

- **2025**: Short-term planning actions.
- **2025-2026**: Short-term delivery actions.
- **2026**: Long term delivery actions. Evaluate success of short-term rehabilitation measures outlined above and remediate where necessary.
- **2028**: Decommission silt-ponds, if necessary.

8.5 Budget and costing

BnM appreciates the Minister's intention to support BnM 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.

BnM 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 BnM Annual Report (Bord na Móna, 2024). BnM 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.
- 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 BnM 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 have 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.

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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, BnM 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**. BnM 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 BnM. 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 rehabilitation areas in Blackwater East 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 East Bog is part of the Blackwater Bog Group.
- The current condition of Blackwater East Bog.
- 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 East Bog will be left unblocked as blocking boundary drains could affect adjacent land.
- Current land-use (ash repository facility).
- Future potential land-use (Blackwater Solar Farm).

Rehabilitation goals and outcomes

The key rehabilitation goal and outcome for Blackwater East 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:

- 2025. 1st phase of rehabilitation. Field drain blocking.
- 2026. 2nd phase. Further realignment of piped drainage and other re-wetting measures dependent on success of 1st phase re-wetting, as determined by ongoing monitoring of water levels and re-vegetation.
- Other enhancement measures such as fertiliser treatment will be carried out, if needed. These will be determined by ongoing monitoring.

- 2027-2028. Evaluate success of short-term rehabilitation measures outlined above and remediate where necessary.
- 2027-2028. Decommission silt-ponds, if necessary.

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

Type	Code	Description	Area (Ha)
Dry cutaway	DCT1	Modifying outfall heights and managing water levels with overflow pipes	80.4
Wetland	WLT1	Turn off or reduce pumping to re-wet cutaway + modifying outfall heights and managing water levels with overflow pipes	112.1
Marginal Land	MLT1	No work required	7.7
Additional Works	AW2	Targeted drain blocking	189.1
Other	Silt Pond	Silt ponds	0.1
Other	Constraint	Including Ash Disposal Facility	29.9
Total			**419.3**

See Drawing number *BNM-DR-26-14-RP-20 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.
- 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 BnM 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.

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 the majority of sites. It is planned to supply remaining milled peat stocks to Shannonbridge (WOP) and Lanesborough (LRP) during 2020. Both power stations will cease 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), Cloonboley, 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 BnM Raised Bog Restoration Project due to their high biodiversity value and bog restoration potential. NPWS have identified the Cloonboley bog cluster as having high ecological value within the recent assessment of raised bog SACs, NHAs and non-designated sites (NPWS 2014[6]). 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.

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

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

Bog Name	Area (ha)	Stage of development	Land-Use and History	Peat Production Cessation	Rehab Plan Status
Attymon	336	Cutover Bog Industrial peat production commenced at Attymon Bog in 1941 and ceased in	Attymon Bog formerly supplied fuel sod peat.	2017	Finalised 2024 Rehab to start 2025

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

Bog Name	Area (ha)	Stage of development	Land-Use and History	Peat Production Cessation	Rehab Plan Status
		2017. Attymon is a deep peat cutover bog.	Coillte have developed a portion of the former production area for conifer forestry. Rehabilitation ongoing		
Cloonkeen	252	Cutover Bog Industrial peat production commenced at Cloonkeen Bog in 1953 and ceased in 2019. Cloonkeen Bog is a deep peat cutover bog.	Cloonkeen Bog formerly supplied fuel sod peat. Coillte have developed a portion of the former production area for conifer forestry. Rehabilitation ongoing	2019	Draft 2024
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 Rehab complete
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	Finalised 2023 Rehab complete
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 2024 Rehab ongoing
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 2023 Rehab ongoing 2025
Cloonboley 1	675	Development Bog This bog was drained in the 1980s in anticipation of industrial peat production. No industrial peat	A small sub-section has been used for sod turf production. Bog restoration was carried out in 2013-2014 Rehabilitation (raised bog restoration) complete	2020	Updated 2024 Rehab ongoing 2025

Bog Name	Area (ha)	Stage of development	Land-Use and History	Peat Production Cessation	Rehab Plan Status
		harvesting ever took place on the main section.			
Cloonboley2	203	Development Bog This bog was drained in the 1980s in anticipation of industrial peat production. No industrial peat harvesting ever took place.	Bog restoration was carried out in 2013-2014 Rehabilitation (raised bog restoration) complete	N/A	Finalised 2013 Rehab complete

Table Ap-2a: 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 Ballaghhurt 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	Finalised 2023 Rehab ongoing
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. Coillte have developed a portion of the bog for forestry.	2020	Finalised 2021 Rehab complete
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	Updated 2022 Rehab ongoing
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. Bloomhill was updated in 2021 and Bloomhill East was constrained at the time. Bloomhill East is being finalised in 2025.	2020	Updated 2025 Rehab to start 2025
Bunahinly-Kilgarvan	389	Cutover Bog Industrial peat production commenced at Bunahinly-	Bunahinly-Kilgarvan formerly supplied milled horticultural peat and fuel peat.	2020	Finalised 2021

Bog Name	Area (ha)	Stage of development	Land-Use and History	Peat Production Cessation	Rehab Plan Status
		Kilgarvan Bog during the 1990's. Residual Deep peat remains on these bogs.	Much of the former production area is bare peat. Part of Bunahinly has been re-wetted.		Rehab ongoing
Glebe	132	Cutover Bog Industrial peat production commenced at Glebe Bog during the 1990's. Residual deep peat remains on these bogs.	Glebe Bog formerly supplied milled, horticultural peat and fuel peat. Glebe bog is still listed as a pNHA. Much of the former production area is bare peat.	2020	Finalised 2022 Rehab ongoing
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 Rehab complete
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

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

Table Ap-2b: 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. Part of the site has been rehabilitiated	2020	Finalised 2022 Rehab ongoing
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. Rehabilitation measures have commenced at Castlegar in 2021.	2019	Finalised 2021 Rehab complete
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	Finalised 2023 Rehab ongoing

See Drawing number *BNM-DR-26-14-RP-24: Blackwater Bog Group*, included in the accompanying Mapbook which illustrates the location of Bloomhill East Bog and the Blackwater Bog Group in context to the surrounding area.

APPENDIX III. ECOLOGICAL SURVEY REPORT

Ecological Survey Report

Note: The original survey report has been edited to include only areas within the PCAS rehabilitation footprint for Blackwater East bog.

Bog Name:	**Blackwater East**	**Area (ha):**	419 ha
Works Name:	Blackwater	**County:**	Offaly
Recorder(s):	MMC & DF	**Survey Date(s):**	7th – 10th December 2009 5th July 2010

Habitats present (in order of dominance)

The most common habitats present include:

- Bare peat (BP).
- 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.
- 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.
- 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. This is managed by the ESB.
- Marginal habitats include raised bog remnants (PB1, PB4) scrub developing on high bog (WS1), Bracken (HD1) and Birch woodland (WN7).

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 was re-vegetating with a mixture of Poor Fen, Reedbeds and Birch scrub. A large part of the area zoned for the ash facility 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 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.

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 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.

Watercourses (major water features on/off site)

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

- 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.
- 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.

05/07/2010

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.
- 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
- 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

- Swan Mussel are present in the silt ponds to the north of the lake.

Other

05/07/2010

- Large White Butterfly
- Large Heath Butterfly

Fungal biodiversity

Winter Chanterelle (*Chantharellus tubaeformis*) (amongst conifer plantation on the margins of the site), *Laccaria proxima* (Scurfy Deceiver) *Mycena sp* and *Lichenomphalia umbellifera* (Heath Navel).

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 bowsers. Only dedicated trained and competent personnel will carry out refuelling operations.
- Mobile storage such as fuel bowsers will be bunded to 110% capacity to prevent spills. Tanks for bowsers and generators shall be double skinned. When not in use, all valves and fuel trigger guns from fuel storage containers will be locked. All pumps using fuel or containing oil will be locally and securely bunded where there is the possibility of discharge to waters.
- Potential impacts caused by spillages etc. during rehabilitation will be reduced by keeping spill kits and other appropriate equipment on-site.
- Site activities will be carried out in accordance with 'best practice'. In order to ensure compliance and implementation of 'best practice', these measures will be communicated to relevant BnM 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 BnM ownership. Rehabilitation and decommissioning in the bog will have due regard to the relevant biosecurity measures outlined below:

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

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

In addition to the above, best practice measures around the prevention and spread of Crayfish plague[7] will be adhered with throughout all rehabilitation measures and activities.

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

APPENDIX VI. POLICY AND REGULATORY FRAMEWORK

BnM 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, BnM 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 BnM 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.

BnM 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 BnM. 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 BnM peatland rehabilitation plan. BnM have also developed and operate various policies and strategies that also inform the development of this rehabilitation plan.

1 EPA IPC Licence

BnM operates under IPC Licence issued and administered by the EPA to extract peat within the Blackwater bog group (Ref. P0-502-01). As part of Condition 10.2 of this license, a rehabilitation plan must be prepared for permanent rehabilitation of the boglands within the licensed area. The bog is part of the Blackwater group. This regulatory requirement is the main driver of the development of this rehabilitation plan.

2 The Peatlands Climate Action Scheme (PCAS)

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

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

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

For the avoidance of doubt, should the Scheme and the associated statutory obligation on BnM not materialise, BnM will not carry out the enhanced decommissioning, rehabilitation and restoration measures described in this plan. BnM 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.

BnM 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 BnM.

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.

BnM is a key stakeholder in the National Peatlands Strategy and the Peatlands Strategy Implementation Group. The strategy recognises the potential for some BnM 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 BnM) for the after-use of cutaway bog.

- BnM 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 BnM is not to open up any undrained new bogs for peat production.
- Lands identified by BnM as having high biodiversity value and/or priority habitats will be reserved for these purposes as the principal future land use.
- Generally, BnM 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 BnM Strategic Framework for the Future Use of Peatlands.

The National Peatlands Strategy highlights the importance and value of developing peatland rehabilitation plans for BnM 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 River Basin Management Plan for Ireland 2022-2027 (DHLGH 2024) 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 2022-2027 outlined how peat extraction can be a potentially significant pressure on various water quality parameters. Peatland rehabilitation of BnM cutaway (in addition to other measures) was part of the WFD (2022-2027) programme of measures. The NRBMP 2022-2027 takes account of the fact that BnM 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 2022-2027 rehabilitation target was superseded by the acceleration of the BnM de-carbonisation programme and the Scheme (PCAS).

The development of site rehabilitation plans and the delivery of peatland rehabilitation by BnM was expected to have a positive impact on water quality and will help the NRBMP 2022-2027 deliver its objectives in relation to the Water Framework Directive and is one of the five key principal actions.

The NRBMP 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 NRBMP 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 BnM 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 NRBMP 2022-2027.

6 4th National Biodiversity Action Plan 2023-2030

Ireland's 4th National Biodiversity Action Plan (NBAP) sets the national biodiversity agenda for the period 2023-2030 and aims to deliver the transformative changes required to the ways in which we value and protect nature. The 4th NBAP has been developed with the support, advice and input of the interdepartmental Biodiversity Working Group and the independent Biodiversity Forum. Ireland's 2nd National Biodiversity Conference was held to gather insights and recommendations for the development of the NBAP and a public consultation process was held to provide further opportunities to engage with the Plan.

The 4th NBAP strives for a "whole of government, whole of society" approach to the governance and conservation of biodiversity. The aim is to ensure that every citizen, community, business, local authority, semi-state and state agency has an awareness of biodiversity and its importance, and of the implications of its loss, while also understanding how they can act to address the biodiversity emergency as part of a renewed national effort to "act for nature".

The delivery of rehabilitation via PCAS is expected to significantly contribute in the future to actions and targets of the 4th National Biodiversity Action Plan 2023-2030, particularly in relation to peatland restoration, nature restoration and creation of new habitats such as wetlands and woodlands.

7 EU Nature Restoration Law

The EU Nature Restoration Law is a key element of the EU Biodiversity Strategy, which sets binding targets to restore degraded ecosystems, in particular those with the most potential to capture and store carbon and to prevent and reduce the impact of natural disasters. The regulation combines an overarching restoration objective for the long-term recovery of nature in the EU's land and sea areas with binding restoration targets for specific habitats and species. These measures should cover at least 20% of the EU's land and sea areas by 2030, and ultimately all ecosystems in need of restoration by 2050.

This regulation has now been adapted and it is expected that all Member States will be required to produce a National Restoration Plan within two years of adoption. This will be led by the National Parks and Wildlife Service and will comprise a broad and deep public participation process, informed by robust ecological and socio-economic impact assessments. BnM are working with NPWS to identify bog restoration and other re-wetted cutaway sites that can contribute towards Irelands targets for the Nature Restoration Law.

8 National conservation designations

BnM 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, pNHAs) and National Nature Reserves). BnM will take account of this network of conservation objectives and their conservation objectives when developing these rehabilitation plans. It is expected that peatland rehabilitation will, in general, benefit the conservation objectives of this network of nature conservation sites.

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

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

BnM 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 BnM 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 BnM 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.

BnM 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. BnM and the National Parks and Wildlife Service continues to engage regarding the ongoing relocation of turf-cutters from protected raised bog sites.

10 All-Ireland Pollinator Plan 2021-2025

The All-Ireland Pollinator Plan 2021-2025 outlines key objectives and actions to protect and support pollinating insects and the habitats they rely on. A BnM specific action in this plan includes the adoption of pollinator-friendly management within the BnM network of sites. One action to help achieve this objective is habitat rehabilitation and restoration, where possible, of pollinator-friendly habitats, including peatland habitats.

11 Land-use planning policies

As BnM 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. BnM 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 BnM: heritage, tourism, biodiversity/conservation, landscape, renewable energy, and economy/enterprise.

12 National Archaeology Code of Practice

BnM 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 BnM, 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 BnM 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 BnM lands are reported immediately to the Duty Officer of the National Museum of Ireland.
- BnM will adhere to the Archaeology Code of Practice relating to management of any archaeological finds that may arise during cutaway peatland rehabilitation and decommissioning.

13 • BnM Biodiversity Action Plan 2016-2021

Rehabilitation of industrial peatlands is a key objective of the BnM Biodiversity Action Plan 2016-2021. This action plan outlines the main objectives and actions around biodiversity on BnM lands. The BnM 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 BnM's responses can be found in the BnM Biodiversity Action Plan (Bord na Móna, 2016). Both policy documents highlight targets such as reducing pressure on biodiversity, promoting sustainability, habitat restoration and benefits of ecosystem services.

One example of a key CBD target is:

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

The EUs headline target for progress by 2020 is to:

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

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

14 BnM commitments

BnM 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.

In line with BnM'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. These initial targets have been achieved.

The company announced the cessation of industrial peat production in 2021 and that it would rehabilitate a target of 33,000 ha between 2021-2026 . Rehabilitation measures will 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 Nature Restoration Law, the Climate Action Plan, the Water Framework Directive, etc.) and rehabilitation guidelines set down by the Environmental Protection Agency. BnM has now transitioned to a Climate Solutions company with a key commercial and development focus being the delivery of renewable energy to support Ireland's Climate Action Plan. In general, BnM will seek to balance and optimise commercial, social, and environmental value of its bogs, and develop integrated land-uses, while taking account of the need for sustainability and their biodiversity value.

These commitments outline the importance of peatland rehabilitation to BnM. 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.

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 BnM 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.

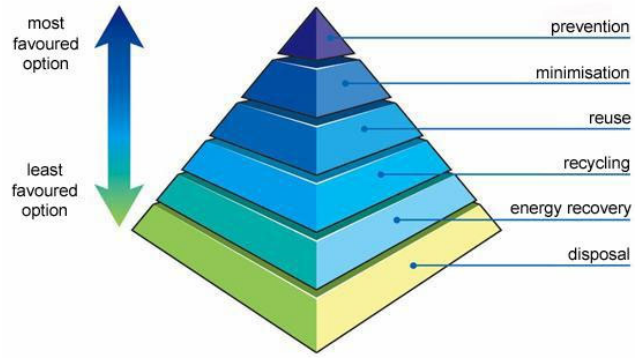
7.3.5 The tonnages and EWC Code for the waste materials listed in *Schedule 2(i) Hazardous Wastes for Disposal/Recovery* and *Schedule 2(ii) Other Wastes for Disposal/Recovery* sent off-site for disposal/recovery.

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, BnM will utilize the appropriate waste hierarchy to identify waste that can reused or recycled ahead of disposal.



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

2. Enhanced Decommissioning.

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

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

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

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 BnM 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 BnM 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, BnM cutaway peatlands cannot be restored back to raised bog in a reasonable timeframe as their environmental conditions has changed so radically (with the removal of the acrotelm – 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 BnM sites have pumped drainage and these sites are likely to develop a mosaic of wetland habitats when pumping in reduced or stopped. The water chemistry of wetland cutaway frequently is strongly influenced by the more alkaline sub-soils that have been exposed during peat production. This means that pioneer vegetation is more typical of fen and wetland, rather than raised bog. Wetland cutaway will have a broad range of hydrological conditions depending on the local topography. In some cases, these wetlands may form deep water (> 0.5 m) whilst other areas may have the water table at or just below the surface of the ground.

APPENDIX IX. EXTRACTIVE WASTE MANAGEMENT PLAN

(Minimisation, treatment, recovery and disposal)

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

Scope:
This plan covers IPPC Licence's Ref P0502-01, 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 that 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 bogs timbers. Schedule 3 (ii) of the IPPC licence permits disposal of these peat screenings back to the bog, where it is levelled and graded into the surrounding peat landscape. These locations have been agreed with the Agency as per condition 7.4 of the IPPC Licence, and as per the attached locations.

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

2.0 P0502-01 IPPC Licence Extractive Waste Conditions

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

2.2 Condition 7.6 Waste Facility
(i) No new waste facility may be developed or an existing waste facility modified unless agreed by the Agency.

(ii) The licensee shall ensure that all existing waste facilities are managed and maintained to ensure their physical stability and to prevent pollution or contamination of soil, air, surface water or groundwater.
(iii) The licensee shall ensure that all new waste facilities are constructed, managed and maintained to ensure their physical stability and to prevent pollution or contamination of soil, air, surface water or groundwater.
(iv) Operational measures shall be continuously employed to prevent damage to waste facilities from personnel, plant or equipment.
(v) The licensee shall establish and maintain a system for regular monitoring and inspection of waste facilities.
(vi) All records of monitoring and inspection of waste facilities, as required under the licence, shall be maintained on-site in order to ensure the appropriate handover of information in the event of a change of operator or relevant personnel.

2.3 Condition 7.7 Excavation Voids

7.7.1 Unless otherwise agreed by the Agency, only extractive waste shall be placed in excavation voids.
7.7.2 When placing extractive waste into excavation voids for rehabilitation and construction purposes, the licensee shall, in accordance with regulation 10 of the Waste Management (Management of Waste from the Extractive Industries) Regulations, 2009, and the Extractive Waste Management Plan:

- Secure the stability of the waste
- Put in place measures to prevent pollution of soil, surface water and ground water.
- Carry out monitoring of the extractive waste and excavation void.

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

3.0 Minimisation.

3.1 Silt Pond excavation material and cleanings.

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

3.2 Power Station Screenings.

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

3.3 Bog Timbers.

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

4.0 Treatment

4.1 Silt Pond excavation material and cleanings.

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

4.2 Power Station Screenings.

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

4.3 Bog Timbers

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

5.0 Recovery

5.1 Silt Pond excavation material and cleanings.

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

5.2 Power Station Screenings.

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

5.3 Bog Timbers

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

6.0 Disposal

6.1 Silt Pond excavation material and cleanings.

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

6.2 Power Station Screenings.

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

6.3 Bog Timbers

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

7.0 Extractive Waste Management Plan

5 (2a) (i)

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

5 (2a) (ii)

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

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

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

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

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

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

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

Classification in accordance Annex II.

Waste Material	Description	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	01 01 02	None	Removed from the bog surface by excavator and transported by tractor	Tractor and Trailer

Waste Material	Description	Classification	Chemical Process treatment	Deposition description	Transport System
	exposure to atmospheric/meteorological conditions.			and trailer to the agreed locations	

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 there placement back to the bog in smaller concentrated designated waste facilities does not constitute a risk to the prevention of water compliance.
The lands under where these materials are deposited are peatlands and are un-effected by the placing of this material.

Review.
This plan will be reviewed every five years, the first review to take place in September 2017. This review will entail an inspection of these waste facilities to ensure their placing, management, maintenance and stability comply with the

requirements of the Extractive Waste Management requirements and condition 7.5, 7.6 and 7.7 of the 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^3 or more of water per day, or serving 500 or more people	200 metres (or as little as 30 metres where a local authority allows)
Any water supply source providing 10m^3 or more of water per day, or serving 50 or more people	100 metres (or as little as 30 metres where a local authority allows)
Any other water supply for human consumption	25 metres (or as little as 30 metres where a local authority allows)
Lake shoreline	20 metres
Exposed cavernous or karstified limestone features (such as swallow holes or collapse features)	15 metres
Any surface watercourse where the slope towards the watercourse exceeds 10%	10 metres
Any other surface waters	5 metres*

APPENDIX XI. CONSULTATION SUMMARIES

N/A

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

22

Code of Practice

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

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

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

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

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

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

BnM	Land & Habitats– Bog Operations **Archaeological Findings**		
Document Approved By:	**Revision Date:**	**Doc No:**	**Revision No:**
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Purpose

The purpose of this procedure is to describe the arrangements in BnM for findings of Archaeological material (Stray Finds).
All objects, sites or monuments, no matter how fragmentary, are important elements of our heritage.

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 manmade 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.

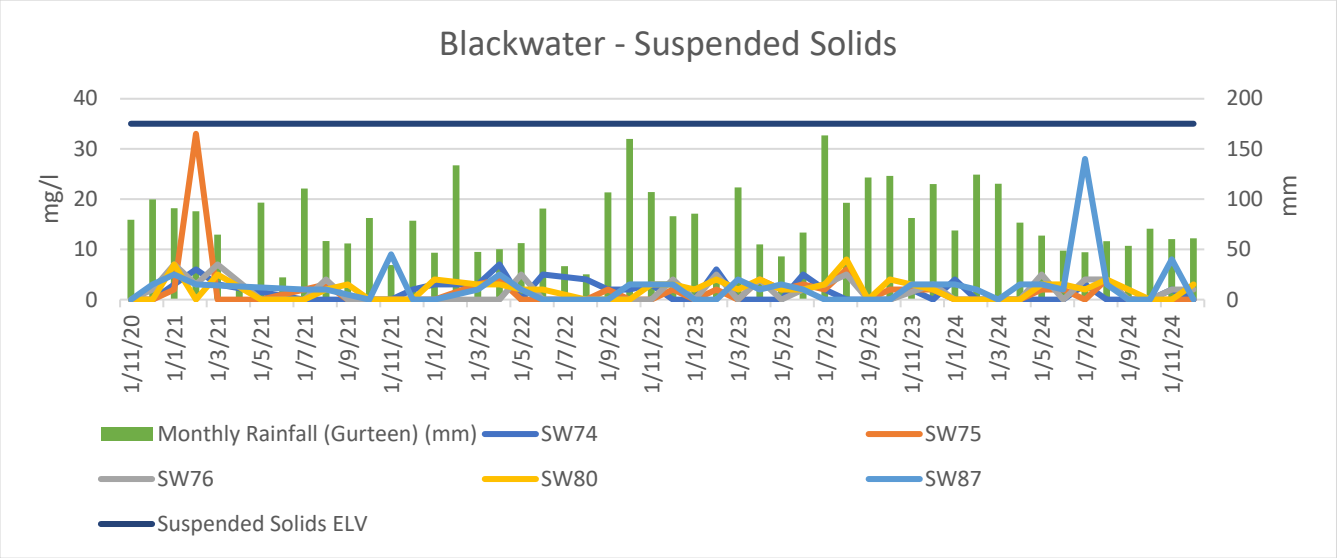
NOTE: Our archaeological heritage is a finite, non-renewable resource. Once a site is destroyed its information is lost forever and we have lost the chance to understand a little more about our past, where we have come from and perhaps the opportunity to learn for the future.

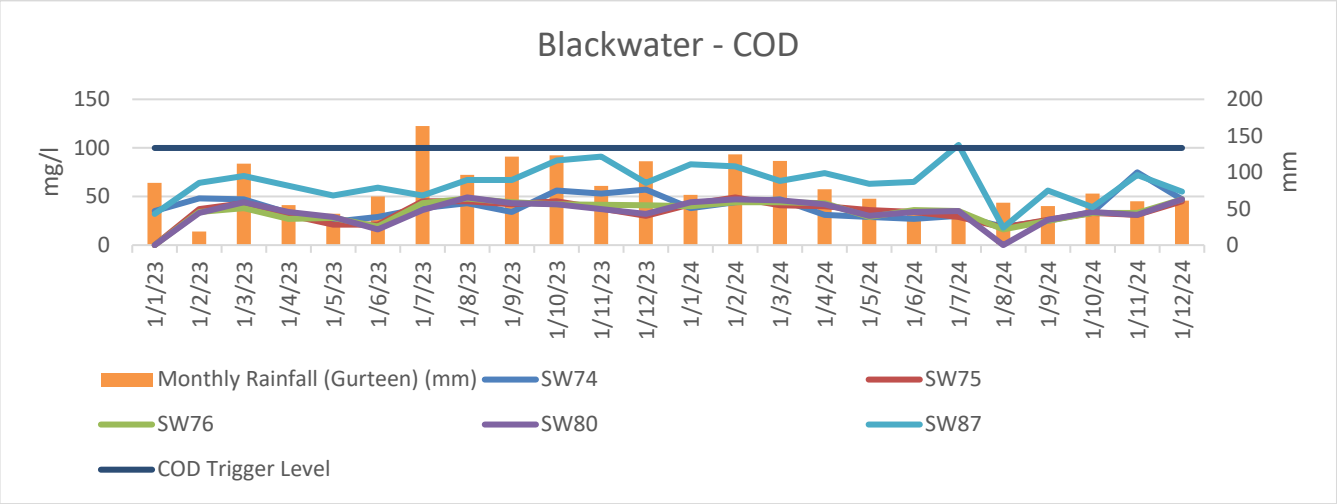
Your Archaeological Liaison Officer is Enda McDonagh.

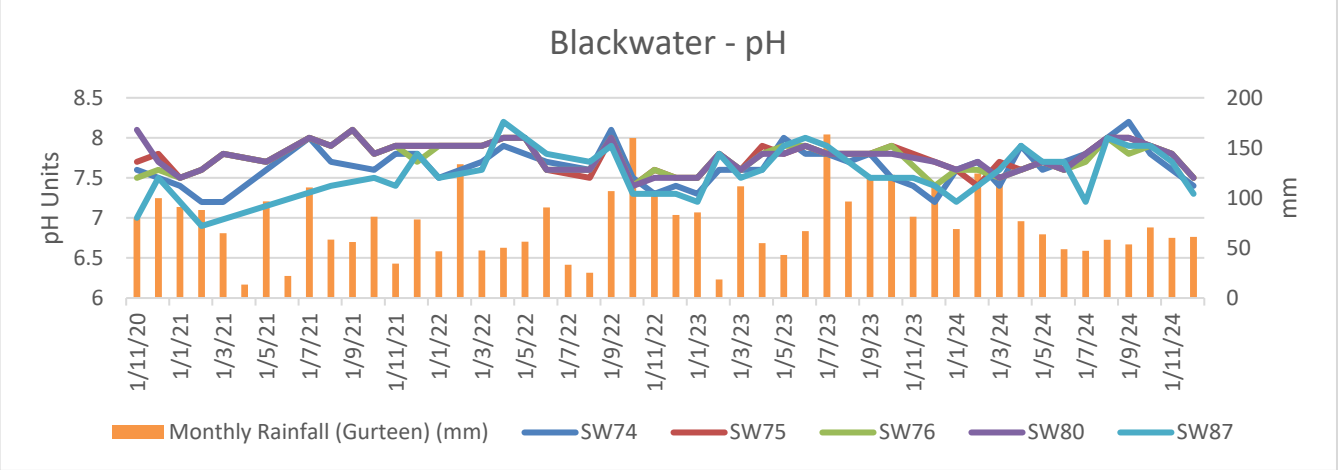
2) Records

Revision Index			
Revision	Date	Description of change	Approved
1	13/19/2020	First release	EMcD
2	13/08/2024	Second release	EMcD

APPENDIX XIII. WATER QUALITY MONITORING RESULTS FOR BLACKWATER EAST BOG






Blackwater - pH
pH Units
mm
8.5
8
7.5
7
6.5
6
200
150
100
50
0
1/11/20
1/1/21
1/3/21
1/5/21
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1/9/21
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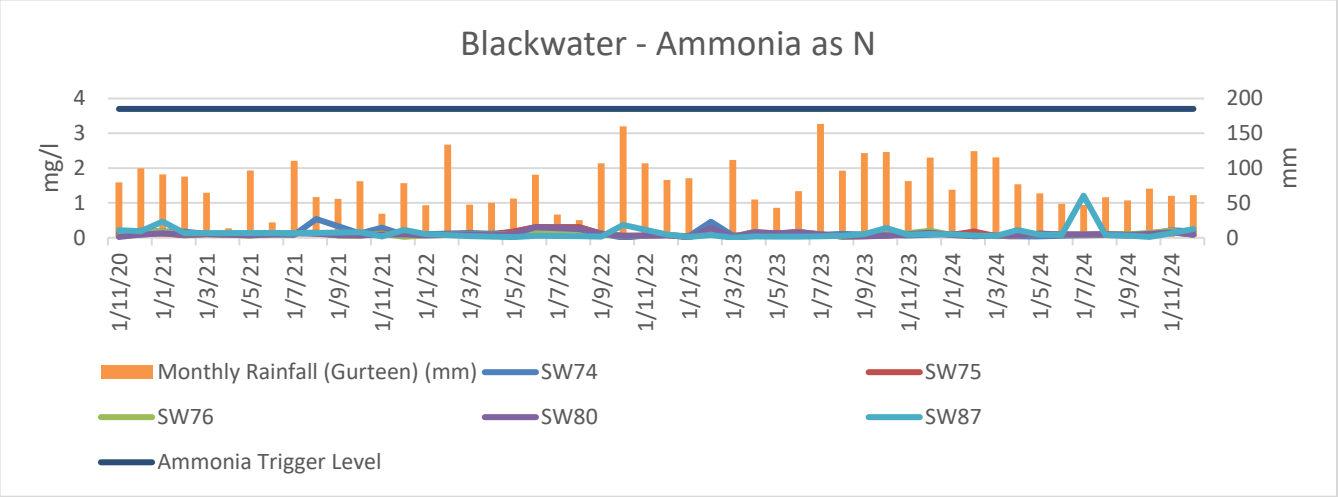
1/11/23
1/1/24
1/3/24
1/5/24
1/7/24
1/9/24
1/11/24
Monthly Rainfall (Gurteen) (mm)
SW74
SW75
SW76
SW80
SW87


Blackwater - Ammonia as N
mg/l
mm
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2
1
0
200
150
100
50
0
1/11/20
1/1/21
1/3/21
1/5/21
1/7/21
1/9/21
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1/7/24
1/9/24
1/11/24
Monthly Rainfall (Gurteen) (mm)
SW74
SW75
SW76
SW80
SW87
Ammonia Trigger Level

PCAS SW Sampling Scheme				Suspended Solids	Suspended Solids	Suspended Solids	Suspended Solids	Suspended Solids	Suspended Solids	Suspended Solids	Suspended Solids	Suspended Solids	Suspended Solids	Suspended Solids	Suspended Solids	Suspended Solids	Suspended Solids	Suspended Solids	Suspended Solids	Suspended Solids	Suspended Solids	Suspended Solids	Suspended Solids	Suspended Solids	Suspended Solids	Suspended Solids	Suspended Solids	Suspended Solids	Suspended Solids	Suspended Solids
Bog Group	Licence No	Bog Name	SW Code GIS	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
				1/11/20	1/12/20	1/1/21	1/2/21	1/3/21	1/4/21	1/5/21	1/6/21	1/7/21	1/8/21	1/9/21	1/10/21	1/11/21	1/12/21	1/1/22	2/2/22	2/3/22	2/4/22	1/5/22	1/6/22	1/7/22	1/8/22	1/9/22	1/10/22	1/11/22	1/12/22		
Blackwater	P0502-01	Blackwater East Bog	SW74	<2	<2	3	6	3				<2	<2		<2	<2	2	3		3	7	<2	5		4	2	2	3	<2		
Blackwater	P0502-01	Blackwater East Bog	SW75	<2	<2	2	33	<2		<2		2	3	<2	<2	<2		<2		3	4	<2	<2		<2	2	<2	<2	2		
Blackwater	P0502-01	Blackwater East Bog	SW76	<2	2	7	3	7		<2		<2	4	<2	<2	<2	<2	<2		<2	<2	5	<2		<2	<2	<2	<2	4		
Blackwater	P0502-01	Blackwater East Bog	SW80	<2	<2	7	<2	5		<2		<2	2	3	<2	<2	<2	4		3	3	2	2		<2	<2	<2	3	3		
Blackwater	P0502-01	Blackwater East Bog	SW87	<2	3	5	3					2	2		<2	9	<2	<2		2	5	2	<2		<2	<2	3		3		
		Monthly Rainfall (Gurteen) (mm)		79.4	99.7	90.9	87.8	64.6	13.4	96.5	22	110.4	58.2	55.8	81.1	34.3	78.4	46.6	133.6	47.4	50.1	56.2	90.5	33.2	25.1	106.7	159.8	106.9	82.9		
		Suspended Solids ELV		35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35		

PCAS SW Sampling Scheme				Colour	Colour	Colour	Colour	Colour	Colour	Colour	Colour	Colour	Colour	Colour	Colour	Colour	Colour	Colour	Colour	Colour	Colour	Colour	Colour	Colour	Colour	Colour	Colour	Colour	Colour	Colour
Bog Group	Licence No	Bog Name	SW Code GIS	mg/l Pt Co	mg/l Pt Co	mg/l Pt Co	mg/l Pt Co	mg/l Pt Co	mg/l Pt Co	mg/l Pt Co	mg/l Pt Co	mg/l Pt Co	mg/l Pt Co	mg/l Pt Co	mg/l Pt Co	mg/l Pt Co	mg/l Pt Co	mg/l Pt Co	mg/l Pt Co	mg/l Pt Co	mg/l Pt Co	mg/l Pt Co	mg/l Pt Co	mg/l Pt Co	mg/l Pt Co	mg/l Pt Co	mg/l Pt Co	mg/l Pt Co	mg/l Pt Co	mg/l Pt Co
				1/11/20	1/12/20	1/1/21	1/2/21	1/3/21	1/4/21	1/5/21	1/6/21	1/7/21	1/8/21	1/9/21	1/10/21	1/11/21	1/12/21	1/1/22	2/2/22	2/3/22	2/4/22	1/5/22	1/6/22	1/7/22	1/8/22	1/9/22	1/10/22	1/11/22	1/12/22		
Blackwater	P0502-01	Blackwater East Bog	SW74	176	167	191	129	354				49.4	134		144	117	146	172		94.8	100	83.8	200		212	803	237	278	163		
Blackwater	P0502-01	Blackwater East Bog	SW75	158	155	184	132	116		141		68.4	108	53	134	90.8		87.7		81.4	91.7	78.4	207		209	79.1	221	199	143		
Blackwater	P0502-01	Blackwater East Bog	SW76	184	348	347	130	116		140		71	105	53.4	136	88.4	109	89.6		80.6	89.8	76.9	199		197	71.6	221	198	144		
Blackwater	P0502-01	Blackwater East Bog	SW80	181	184	182	127	109		139		69.2	103	56.9	136	87.3	172	89.4		86.3	89	73.6	208		203	80.1	221	192	146		
Blackwater	P0502-01	Blackwater East Bog	SW87	480	192	272	271					128		127	71.9	177	178			144	126	98.1	92.5		98	64.5	309		153		
		Monthly Rainfall (Gurteen) (mm)		79.4	99.7	90.9	87.8	64.6	13.4	96.5	22	110.4	58.2	55.8	81.1	34.3	78.4	46.6	133.6	47.4	50.1	56.2	90.5	33.2	25.1	106.7	159.8	106.9	82.9		

PCAS SW Sampling Scheme				COD	COD	COD	COD	COD	COD	COD	COD	COD	COD	COD	COD	COD	COD	COD	COD	COD	COD	COD	COD	COD	COD	COD	COD	COD	COD	COD
Bog Group	Licence No	Bog Name	SW Code GIS	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
				1/11/20	1/12/20	1/1/21	1/2/21	1/3/21	1/4/21	1/5/21	1/6/21	1/7/21	1/8/21	1/9/21	1/10/21	1/11/21	1/12/21	1/1/22	2/2/22	2/3/22	2/4/22	1/5/22	1/6/22	1/7/22	1/8/22	1/9/22	1/10/22	1/11/22	1/12/22		
Blackwater	P0502-01	Blackwater East Bog	SW74	51	41	44	43	76				22	25		58	51	45	57		42	40	35	54		55	33	78	66	60		
Blackwater	P0502-01	Blackwater East Bog	SW75	48	45	45	45	44		39		23	33	33	47	41		38		35	34	30	53		42	31	65	60	60		
Blackwater	P0502-01	Blackwater East Bog	SW76	47	74	70	40	41		41		25	36	35	51	39	38	37		34	25	27	62		68	33	65	57	57		
Blackwater	P0502-01	Blackwater East Bog	SW80	58	41	44	43	42		37		11	21	33	48	39	45	32		35	32	26	54		54	28	68	59	56		
Blackwater	P0502-01	Blackwater East Bog	SW87	111	45	54	71						37		52	42	50	54		53	51	43	42		48	42	71		63		
		Monthly Rainfall (Gurteen) (mm)		79.4	99.7	90.9	87.8	64.6	13.4	96.5	22	110.4	58.2	55.8	81.1	34.3	78.4	46.6	133.6	47.4	50.1	56.2	90.5	33.2	25.1	106.7	159.8	106.9	82.9		
		COD Trigger Level		100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100		

PCAS SW Sampling Scheme				pH	pH	pH	pH	pH	pH	pH	pH	pH	pH	pH	pH	pH	pH	pH	pH	pH	pH	pH	pH	pH	pH	pH	pH	pH	pH	pH
Bog Group	Licence No	Bog Name	SW Code GIS	pH Units	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
				1/11/20	1/12/20	1/1/21	1/2/21	1/3/21	1/4/21	1/5/21	1/6/21	1/7/21	1/8/21	1/9/21	1/10/21	1/11/21	1/12/21	1/1/22	2/2/22	2/3/22	2/4/22	1/5/22	1/6/22	1/7/22	1/8/22	1/9/22	1/10/22	1/11/22	1/12/22		
Blackwater	P0502-01	Blackwater East Bog	SW74	7.6	7.5	7.4	7.2	7.2				8	7.7		7.6	7.8	7.8	7.5		7.7	7.9	7.8	7.7		7.6	8.1	7.5	7.3	7.4		
Blackwater	P0502-01	Blackwater East Bog	SW75	7.7	7.8	7.5	7.6	7.8		7.7		8	7.9	8.1	7.8	7.9		7.9		7.9	8	8	7.6		7.5	8	7.4	7.6	7.5		
Blackwater	P0502-01	Blackwater East Bog	SW76	7.5	7.6	7.5	7.6	7.8		7.7		8	7.9	8.1	7.8	7.9	7.7	7.9		7.9	8	8	7.6		7.6	8	7.4	7.6	7.5		
Blackwater	P0502-01	Blackwater East Bog	SW80	8.1	7.7	7.5	7.6	7.8		7.7		8	7.9	8.1	7.8	7.9	7.9	7.9		7.9	8	8	7.6		7.6	8	7.4	7.5	7.5		
Blackwater	P0502-01	Blackwater East Bog	SW87	7	7.5	7.2	6.9						7.4		7.5	7.4	7.8	7.5		7.6	8.2	8	7.8		7.7	7.9	7.3		7.3		
		Monthly Rainfall (Gurteen) (mm)		79.4	99.7	90.9	87.8	64.6	13.4	96.5	22	110.4	58.2	55.8	81.1	34.3	78.4	46.6	133.6	47.4	50.1	56.2	90.5	33.2	25.1	106.7	159.8	106.9	82.9		

PCAS SW Sampling Scheme				TP as P	TP as P	TP as P	TP as P	TP as P	TP as P	TP as P	TP as P	TP as P	TP as P	TP as P	TP as P	TP as P	TP as P	TP as P	TP as P	TP as P	TP as P	TP as P	TP as P	TP as P	TP as P	TP as P	TP as P	TP as P	TP as P	TP as P
Bog Group	Licence No	Bog Name	SW Code GIS	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
				1/11/20	1/12/20	1/1/21	1/2/21	1/3/21	1/4/21	1/5/21	1/6/21	1/7/21	1/8/21	1/9/21	1/10/21	1/11/21	1/12/21	1/1/22	2/2/22	2/3/22	2/4/22	1/5/22	1/6/22	1/7/22	1/8/22	1/9/22	1/10/22	1/11/22	1/12/22		
Blackwater	P0502-01	Blackwater East Bog	SW74	<0.05	<0.05	<0.05	<0.05	<0.05				<0.05	<0.05		<0.05	<0.05	<0.05	<0.05		0.06	<0.05	<0.05	<0.05		<0.05	<0.05	0.07	0.13	<0.05		
Blackwater	P0502-01	Blackwater East Bog	SW75	<0.05	<0.05	<0.05	<0.05	<0.05		<0.05		<0.05	<0.05	<0.05	<0.05	<0.05		<0.05		<0.05	<0.05	<0.05	<0.05		<0.05	<0.05	<0.05	<0.05	<0.05		
Blackwater	P0502-01	Blackwater East Bog	SW76	<0.05	<0.05	<0.05	<0.05	<0.05		<0.05		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		<0.05	<0.05	<0.05	<0.05		<0.05	<0.05	<0.05	<0.05	<0.05		
Blackwater	P0502-01	Blackwater East Bog	SW80	<0.05	<0.05	<0.05	<0.05	<0.05		<0.05		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		<0.05	<0.05	<0.05	<0.05		<0.05	<0.05	<0.05	<0.05	<0.05		
Blackwater	P0502-01	Blackwater East Bog	SW87	0.06	<0.05	<0.05	<0.05						0.05		<0.05	0.06	<0.05	<0.05		<0.05	0.05	<0.05	<0.05		<0.05	<0.05	<0.05		<0.05		
		Monthly Rainfall (Gurteen) (mm)		79.4	99.7	90.9	87.8	64.6	13.4	96.5	22	110.4	58.2	55.8	81.1	34.3	78.4	46.6	133.6	47.4	50.1	56.2	90.5	33.2	25.1	106.7	159.8	106.9	82.9		

PCAS SW Sampling Scheme				TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS
Bog Group	Licence No	Bog Name	SW Code GIS	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
				1/11/20	1/12/20	1/1/21	1/2/21	1/3/21	1/4/21	1/5/21	1/6/21	1/7/21	1/8/21	1/9/21	1/10/21	1/11/21	1/12/21	1/1/22	2/2/22	2/3/22	2/4/22	1/5/22	1/6/22	1/7/22	1/8/22	1/9/22	1/10/22	1/11/22	1/12/22		
Blackwater	P0502-01	Blackwater East Bog	SW74	281	238	172.337	247	131				426	424		271	339	343	N/R		380	351	380	358		355	8	295	332	251		
Blackwater	P0502-01	Blackwater East Bog	SW75	345	314	245	336	392		298		437	415	523	393	401		N/R		381	383	410	356		419	463	318	380	234		
Blackwater	P0502-01	Blackwater East Bog	SW76	246	246	304	307	323		310		453	480	500	324	391	218	N/R		396	399	422	323		419	399	379	393	284		
Blackwater	P0502-01	Blackwater East Bog	SW80	292	324	133	298	345		325		463	454	559	415	351	319	N/R		402	384	410	373		398	435	356	385	258		
Blackwater	P0502-01	Blackwater East Bog	SW87	253	263		308						395		218	461	203	N/R		287	344	331	349		328	254	220		336		
		Monthly Rainfall (Gurteen) (mm)		79.4	99.7	90.9	87.8	64.6	13.4	96.5	22	110.4	58.2	55.8	81.1	34.3	78.4	46.6	133.6	47.4	50.1	56.2	90.5	33.2	25.1	106.7	159.8	106.9	82.9		

PCAS SW Sampling Scheme				Ammonia as N	Ammonia as N	Ammonia as N	Ammonia as N	Ammonia as N	Ammonia as N	Ammonia as N	Ammonia as N	Ammonia as N	Ammonia as N	Ammonia as N	Ammonia as N	Ammonia as N	Ammonia as N	Ammonia as N	Ammonia as N	Ammonia as N	Ammonia as N	Ammonia as N	Ammonia as N	Ammonia as N	Ammonia as N	Ammonia as N	Ammonia as N	Ammonia as N	Ammonia as N	Ammonia as N	Ammonia as N
Bog Group	Licence No	Bog Name	SW Code GIS	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
				1/11/20	1/12/20	1/1/21	1/2/21	1/3/21	1/4/21	1/5/21	1/6/21	1/7/21	1/8/21	1/9/21	1/10/21	1/11/21	1/12/21	1/1/22	2/2/22	2/3/22	2/4/22	1/5/22	1/6/22	1/7/22	1/8/22	1/9/22	1/10/22	1/11/22	1/12/22		
Blackwater	P0502-01	Blackwater East Bog	SW74	0.14	0.202	0.176	0.171	0.11				0.081	0.539		0.121	0.286	0.081	0.102		0.135	0.112	0.162	0.304		0.300	0.119	.0063	0.064	0.068		
Blackwater	P0502-01	Blackwater East Bog	SW75	0.054	0.092	0.126	0.068	0.102		0.073		0.136	0.141	0.068	0.065	0.129		0.076		0.093	0.075	0.177	0.303		0.297	0.112	0.054	0.059	0.071		
Blackwater	P0502-01	Blackwater East Bog	SW76	0.045	0.162	0.179	0.085	0.108		0.064		0.126	0.139	0.067	0.063	0.119	0.025	0.067		0.095	0.082	0.113	0.211		0.216	0.110	0.053	0.047	0.084		
Blackwater	P0502-01	Blackwater East Bog	SW80	0.021	0.091	0.127	0.088	0.104		0.067		0.127	0.115	0.075	0.068	0.089	0.096	0.068		0.092	0.071	0.114	0.300		0.245	0.111	0.052	0.057	0.078		
Blackwater	P0502-01	Blackwater East Bog	SW87	0.213	0.186	0.464	0.132						0.138		0.158	0.034	0.222	0.105		0.046	0.032	0.019	0.055		0.045	0.033	0.368		0.089		
		Monthly Rainfall (Gurteen) (mm)		79.4	99.7	90.9	87.8	64.6	13.4	96.5	22	110.4	58.2	55.8	81.1	34.3	78.4	46.6	133.6	47.4	50.1	56.2	90.5	33.2	25.1	106.7	159.8	106.9	82.9		
		Ammonia Trigger Level		3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7		

PCAS SW Sampling Scheme				DOC	DOC	DOC	DOC	DOC	DOC	DOC	DOC	DOC	DOC	DOC	DOC	DOC	DOC	DOC	DOC	DOC	DOC	DOC	DOC	DOC	DOC	DOC	DOC	DOC	DOC	DOC
Bog Group	Licence No	Bog Name	SW Code GIS	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
				1/11/20	1/12/20	1/1/21	1/2/21	1/3/21	1/4/21	1/5/21	1/6/21	1/7/21	1/8/21	1/9/21	1/10/21	1/11/21	1/12/21	1/1/22	2/2/22	2/3/22	2/4/22	1/5/22	1/6/22	1/7/22	1/8/22	1/9/22	1/10/22	1/11/22	1/12/22		
Blackwater	P0502-01	Blackwater East Bog	SW74	21	19	16.6	13.7	24.7				8.18	75		22.3	18.3	18.8	22	Note1	15.8	16	14	20		22	10.3	28.8	27.5	20.6		
Blackwater	P0502-01	Blackwater East Bog	SW75	19.8	18.4	16.8	14.8	13		15.6		8.33	76.6	8.95	19.4	14.1		14	Note1	12.5	13	11.4	20.5		21.6	9.87	25.1	22.3	18.4		
Blackwater	P0502-01	Blackwater East Bog	SW76	22.1	32.2	29.2	14.1	12.9		15.5		8.77	76.9	9.43	18.7	14.1	15	13.7	Note1	12.5	13.1	10.8	23.1		22.8	9.67	25	22.1	18.4		
Blackwater	P0502-01	Blackwater East Bog	SW80	23.5	18.7	17.9	14.2	12.8		15.7		8.36	75.5	8.84	19.2	14.1	18.3	13.5	Note 1	12.7	13.4	11.2	21.2		21.6	9.9	25.5	22.2	18.5		
Blackwater	P0502-01	Blackwater East Bog	SW87	47.5	19.4	20.4	25						71.5		20.6	11.6	12.2	21.7	Note 1	19.8	18.5	16.9	16.9		16.8	14	26.9		24.8		
		Monthly Rainfall (Gurteen) (mm)		79.4	99.7	90.9	87.8	64.6	13.4	96.5	22	110.4	58.2	55.8	81.1	34.3	78.4	46.6	133.6	47.4	50.1	56.2	90.5	33.2	25.1	106.7	159.8	106.9	82.9		

APPENDIX XIV. STOCKPILE DECOMMISSIONING PROCEDURE

Scope
All IPC licensed peatlands with residual peat stockpiles requiring decommissioning and rehabilitation, as required by Condition 10.

The aim of this Stockpile Decommissioning Procedure is to stabilise any remaining stockpiles by depositing the peat in the two drains located immediately adjacent to the stockpile field, enabling the re-shaping of the stockpile to facilitate stabilization and revegetation.

Condition 10:
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.

Procedure:

1. Strip any remaining stockpile protection and remove using the poly wrapper for recycling.
2. Ensure the silt pond servicing this pile field catchment has been cleaned within the last six months as per condition 6.8, and visually inspected as per condition 6.7, prior to any pile decommissioning.
3. Where stockpiles occur within areas planned for rehabilitation, such planned rehabilitation measures (regular drain blocking) will be implemented in advance of any stockpile decommissioning, with priority given to the required adjacent stockpile field drains.
4. Once the rehabilitation measure above has been completed, proceed to reprofile the stockpile as per below.
5. Using suitable available excavator/dozer to make a safe ramp up onto the end of the pile.
6. Track up onto the pile and establish a safe level base.
7. Using the machine to reduce and reprofile the pile height and deposit into the adjoining pile field drains. The residual height to be determined based on stockpile size and area required to reprofile.
8. Work along the pile using this method until reaching the pile end.
9. Using a suitable machine, track the peat into the pile field drain along both sides of the pile, ensuring the final level is below the existing drain blocks and any damage to existing drain blocks avoided.
10. If required, use a suitable machine to track along the top of the reprofiled stockpile to level and flatten the profile to reduce the runoff gradient.
11. Fertiliser application and any grass seed mix should be applied to each stockpile following completion of the above steps, to accelerate the stabilisation.