Bord na Móna

Bloomhill East Bog

Cutaway Bog Decommissioning and Rehabilitation Plan 2025

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 licence condition requires Bord na Móna agree with the EPA the measures that will provide for rehabilitation, i.e., stabilisation of Bloomhill 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 Bloomhill 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*, Bord na Móna in developing a package of measures, 'the Scheme', for enhanced decommissioning, rehabilitation and restoration of cutaway peatlands referred to as, the Peatlands Climate Action Scheme'. However, only the additional costs associated with the additional and enhanced rehabilitation, i.e., measures which go beyond the existing standard mandatory decommissioning and rehabilitation requirements arising from Condition 10 will be eligible for support. The additional costs of the Scheme will be supported by Government, administered by the Department of Environment, Climate and Communications (DECC), while the National Parks and Wildlife Service (NPWS) will act as the Scheme regulator.*

While this document outlines the enhanced rehabilitation measures planned for Bloomhill 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.

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

Bord na Móna finalised a rehabilitation plan for Bloomhill Bog in 2022. The 2022 plan focused on the west side of Bloomhill, as the east side of Bloomhill was constrained from rehabilitation at that time. Rehabilitation has been completed on with west side of Bloomhill. The constraint on the east side of Bloomhill is now removed. The Bloomhill East 2025 draft plan focuses on the remaining area of Bloomhill that has not been rehabilitated yet.

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

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NON-TECHNICAL SUMMARY

- Bord na Móna is planning to rehabilitate Bloomhill East Bog, located 5 km south of Athlone and 1.5 km west of the village of Ballynahown in County Westmeath.
- Industrial peat harvesting has finished at Bloomhill East Bog since 2020.
- Bord na Móna are obliged to carry out peatland rehabilitation via an IPC Licence issued by the Environmental protection Agency. In addition, the Government has agreed to support peatland rehabilitation via the establishment of the Peatland Climate Action Scheme (PCAS). This is funded via the government and by Bord na Móna.
- Bord na Móna have already rehabilitated a significant portion of Bloomhill Bog to the west of the road that divides the site. This rehabilitation was outlined in a plan for the site finalised in 2022. This plan (draft 2025) is focused on rehabilitation of the remainder of the site (Bloomhill East).
- The key objective of peatland rehabilitation is environmental stabilisation. This means the establishment of habitats and vegetation back onto the bare peat, and minimising impacts to downstream waterbodies. The bog was drained in the past to allow peat production. Better results for water quality improvements, climate action, the reduction of carbon emissions and biodiversity are achieved when the remaining peat is re-wetted. This means drain-blocking and other measures to raise water levels to the surface of the bog and to encourage the natural colonisation of vegetation.
- In general, soggy ground conditions are preferred. This means the remaining peat is wet and that plants that prefer wetter conditions, like Bog Cotton and Reeds will thrive.
- Many Bord na Móna bogs 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 and Birch woodland, and in time a naturalised peatland can be restored.
- Re-wetting peat is also better for climate action. This reduces carbon emissions as re-wetting the remaining peat reduces carbon losses such as the production of carbon dioxide, the main greenhouse gas. The site is expected to still be a reduced carbon source for some time, but eventually the carbon sink function can re-establish as peat-forming conditions are restored. This will take some time.
- The development of a range of habitats in Bloomhill 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 wetland habitats.
- Bloomhill East Bog was drained and developed for industrial peat production in 1981. Peat production ceased in 2020. Therefore, much of the bog currently comprises of bare peat. A small part of the bog has already established pioneer peatland habitats.
- Bord na Móna plan to carry out rehabilitation work in 2025.
- Measures proposed for Bloomhill East Bog include internal drain blocking and other measures required to raise water levels to the surface of the peat (changing levels of pipes for example). Some fertiliser will be spread on headlands and other areas (a small part of the overall area) to encourage vegetation growth.
- These rehabilitation measures will be planned by a team consisting of ecologists, hydrologists and engineers. It is a principle of Bord na Móna rehabilitation planning that no actions will be taken that would negatively impact on adjacent land. No boundary drains will be blocked. Water will still leave the site via the existing outlets.

- It will take some time for vegetation and habitats to fully develop at Bloomhill East Bog, and a peatland ecosystem to be restored. However, it is expected that most of the site will be developing pioneer habitats after 5-10 years.
- Bord na Móna are planning the development of an amenity trail along the western and eastern headlands of Bloomhill East Bog as part of the wider Midlands Network Trail. This trail also passes through other Bord na Móna bogs in the wider area including Bloomhill, Ballaghurt, Derries, Turraun, Oughter and Boora West bogs. The amenity trail at Bloomhill East Bog will consist of shared cycle and walkways, associated signage and fencing. The planned amenity route has been mapped as a constraint on rehabilitation maps.
- Peatland rehabilitation of the Bord na Móna bogs will bring a range of benefits to the local community via improvements to the local landscape and is also important for supporting national policies and strategies in relation to reduction of carbon emissions from these peatlands, supporting biodiversity and improvements to water quality.

1. INTRODUCTION

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

Bord na Móna finalised a rehabilitation plan for Bloomhill Bog in 2022 (Bloomhill-Final-Rehab-Plan-v6.pdf). The 2022 plan focused on the west side of Bloomhill as the east side of Bloomhill was constrained from rehabilitation at that time. Rehabilitation has been completed on the west side of Bloomhill. The constraint on the east side of Bloomhill is now removed. This Bloomhill East 2025 draft plan focuses on the remaining area of Bloomhill that has not been rehabilitated yet.

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 actions;
- Budget and Costings; and
- Associated aftercare, maintenance and monitoring.

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

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

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

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

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

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

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.

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

1.1 Constraints and Limitations

This document covers the area of Bloomhill East Bog as shown on drawing BNM-DR-26-03-RP-01.

Bord na Móna remain fully committed to rehabilitating the whole bog and meeting the conditions of the IPC Licence. Any consideration of any other future after-uses for Bloomhill East Bog, will be conducted in adherence to the relevant planning guidelines, and consultation with relevant authorities, and will be considered within the framework of this rehabilitation plan.

Bord na Móna are planning the development of an amenity trail along the western and eastern headlands of Bloomhill East Bog as part of the Midlands Network Trail, which also passes through other Bord na Móna bogs in the wider area including Bloomhill, Ballaghurt, Derries, Turraun, Oughter and Boora West bogs. The amenity development at Bloomhill East Bog will consist of shared cycle and walkways, associated signage and fencing. The planned amenity route has been mapped as a constraint on rehabilitation maps. It is anticipated that this work will commence in 2025.

Parts of Bloomhill East Bog (outside the areas owned and under the control of Bord na Móna) are currently used by domestic turf cutters to harvest peat. These areas are ecologically and hydrologically linked to the area owned by Bord na Móna where rehabilitation is planned. Nevertheless, Bord na Móna are aware of such issues which may constrain the proposed rehabilitation actions, and this rehabilitation plan considered potential impacts of these on the delivery of the stated objectives.

Rehabilitation in other areas of the bog may also be constrained due to other property issues or issues such as rights of way. There are some known archaeology records on Bloomhill East Bog. All rehabilitation measures proposed at Bloomhill East Bog will consider the sensitivity of these records.

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 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 Bord na Móna ecological baseline survey, additional confirmatory site visits (covering the period 2011 to 2024 inclusive) and monitoring and desktop analysis forms the basis for the development of the rehabilitation plan for the bog, along with:

- Experience of 40 years of research on the after-use development and rehabilitation of the Bord na Móna cutaway bogs (Clarke, 2010; Bord na Móna, 2016);
- Significant international engagement during this period with other counties in relation to best practice regarding peatland rehabilitation and after-use through the International Peat Society and the Society for Ecological Restoration (Joosten & Clarke, 2002; Clarke & Rieley, 2010; Gann *et al*., 2019);
- Consultation and engagement with internal and external stakeholders;
- GIS Mapping;
- BNM drainage surveys;
- Bog topography and LIDAR data;
- Previous research studies on site;
- Hydrological modelling; and
- The development of a Methodology Paper 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 Bloomhill 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, Bord na Móna and An Foras Taluntais.
- Bonn *et al*. (2017). Peatland restoration and ecosystem services- science, policy and practice.
- Carroll *et al*. (2009). *Sphagnum* in the Peak District. Current Status and Potential for Restoration. Moors for the Future Report No 16.
- Clark & Rieley (2010). Strategy for responsible peatland management.
- Eades *et al*. (2003). The Wetland Restoration Manual.
- Farrell & Doyle (2003). Rehabilitation of Industrial Cutaway Atlantic Blanket Bog, NW Mayo, Ireland.
- Gann *et al*. (2019). International Principles and Standards for the practice of Ecological Restoration.

- Hinde *et al*. (2010). *Sphagnum* re-introduction project: A report on research into the re-introduction of *Sphagnum* mosses to degraded moorland. Moors for the Future Research Report 18.
- 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.
- BNM (2022) Bloomhill (West) Final Rehabilitation Plan : Bloomhill-Final-Rehab-Plan-v6.pdf

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 2021 – 2024;
- Spatial data in respect of Article 17 reporting, available online at https://www.npws.ie/maps-and-data/habitat-and-species-data/article-17.

2.2 Consultation

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

2.3 Field Surveys

Bord na Móna carried out a baseline ecological survey of all of its properties in 2009-2012 and developed habitat maps. As part of this exercise, Bloomhill East Bog was surveyed in March 2012. Habitat maps were updated in 2017. A survey also took place in December 2024, in advance of the preparation of this rehabilitation plan. Habitat maps have been updated, where required. This rehabilitation plan is informed by the original baseline survey as well as subsequent confirmatory site walk-over surveys and visits, and updates to baseline data.

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

A detailed ecological survey report for Bloomhill East Bog is contained in Appendix III.

3. SITE DESCRIPTION

Bloomhill East Bog is located approximately 5 km south of Athlone and 1.5 km west of the village of Ballynahown in County Westmeath. The Offaly-Westmeath County boundary runs southeast to northwest through the centre of the bog. Bloomhill East Bog is part of the Blackwater group of bogs and is a constituent part of the wider Bloomhill Bog, forming the largest eastern lobe. Bloomhill East Bog is divided from the wider Bloomhill Bog by a network of local roads.

Rehabilitation and re-wetting started at Bloomhill in 2022. The area west of the road that divides the site has been re-wetted.

The majority of the Bloomhill East is dominated by bare peat and is developing pioneer vegetation. The surrounding landscape is a mosaic primarily consist of low-lying agricultural land (pasture) interspersed with other cutover bogs, many of which have also been managed by Bord na Móna for peat production with some areas utilised for domestic turf-cutting. A large mineral island, outside BNM ownership, also known as Bloomhill, occurs to the west of Bloomhill East bog, primarily consisting of agricultural and residential lands.

Bloomhill East Bog has a gravity drainage regime. No mapped EPA watercourses occur within the bog boundary. The Boor stream (EPA Code: 26B07) flows westerly above the northern boundary of Bloomhill East and discharges to the River Shannon. The Shannon (Upper)_120 series of streams flow in a generally westerly direction into the River Shannon and drain different sections of the Bloomhill Bog complex. The four unnamed streams eventually confluence at varying locations moving downstream towards the discharge point to the River Shannon. The central stream drains the southern section of Bloomhill East, and confluence with the other series of streams.

The River Shannon Upper is designated as part of the River Shannon Callows SAC and the Middle Shannon Callows SPA. The boundaries of both of these EU sites overlap the western boundary of Bloomhill East Bog.

See Drawing number BNM-DR-26-03-RP-01 titled **Bloomhill East Bog: Bog Site Location**, included in the accompanying Mapbook[1] , which illustrates the location of Bloomhill East Bog in context to the surrounding area.

3.1 Status and Situation

3.1.1 Site history

Bloomhill East Bog has been in peat production since 1981. The peat was primarily harvested for fuel peat to be used in Cloghan Power Station, Derrinlough Brickette Factory and West Offaly Power in Shannonbridge, Offaly. The bog still retains deep residual peat in some places.

3.1.2 Current land-use

Industrial peat extraction has now completely ceased. The majority of the Bloomhill East Bog former production area is bare peat.

Sections of intact raised bog are present along the margins of the site; however, these areas are drying out and are for the most part subject to domestic turf cutting. There are also areas of scrub, immature woodland and

[1] Cutaway Bog Decommissioning and Rehabilitation Plan - Bloomhill East Bog Map Book

mature birch dominated woodland in the site margins. Some areas have also been constrained from the rehabilitation plan due to landownership considerations that are being investigated.

Bloomhill East Bog still has some remaining peat stockpiles. The peat stock on the bog will be subject to decommissioning as part of the rehabilitation measures. This process is described fully in Appendix XIV.

A network of former industrial railway occurs in Bloomhill East Bog. It is anticipated that the rail lines will be decommissioned shortly.

Bord na Móna are planning the development of an amenity trail along the western and eastern headlands of Bloomhill East Bog as part of the Midlands Trail Network, which also passes through other Bord na Móna bogs in the wider area including Bloomhill (West), Ballaghurt, Derries, Turraun, Oughter and Boora West bogs. The amenity development at Bloomhill East Bog will consist of shared cycle and walkways, associated signage and fencing. The planned amenity route has been mapped as a constraint on Bloomhill East rehabilitation maps. It is anticipated that this work will commence in 2025.

3.1.3. Socio-Economic conditions

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

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

In respect of Bloomhill East Bog, jobs included in the above study would have included those to facilitate extraction of peat at Bloomhill, and associated processing and transfer to the relevant power station, in addition to staff employment at workshops and the main Bord na Móna facility located at Leabeg.

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

Employment numbers have now 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 Bord na Móna at present, with approximately 135 roles directly involved in PCAS.

3.2 Geology and Peat Depths

GSI bedrock geology data indicates that Bloomhill East is underlain by two different bedrock units: the Navan Beds formation, which consists of dark limestone, mudstone, and sandstone, which underlies most of the bog including most of the northern and central portion of the bog. The remaining southern portion of the bog (along with a small pocket to the north) is underlain by the Ballysteen formation, characterised by dark, muddy limestone and shale. Several faults underlie the bog, including northwest to southeast trending faults and west – east trending faults. There is a small pocket of undifferentiated Old Red Sandstone immediately west of the bog, outside the boundary of the bog.

Subsoils underlying extant peat are predominantly marl across the majority of Bloomhill East Bog, with limestone till underlying part of the eastern/southern extent along the margins (See Drawing number BNM-DR-26-03-29 titled **Bloomhill East Bog: Indicative Sub-peat Substrate**). Quaternary sediment maps show that Bloomhill East Bog is mapped as cutover raised peat, surrounded by carboniferous limestone till along with an area of limestone sands and gravels, and eskers to the south.

3.2.2 Peat type and depths

Commercial peat extraction commenced at Bloomhill East Bog in 1981. Most the site retains relatively deep residual peat with some smaller pockets of shallow residual peat depths where the peat has been cutaway. Peat depths have been mapped across the bog using GPR and are provided in figure *BNM-DR-26-03-04: Peat depths*. Most of Bloomhill East has deep peat remaining (1.5 - 5m), although there are some shallow pockets of peat in some areas, particularly to the south-east which has some areas with peat depths of <1m.

3.3 Key Biodiversity Features of Interest

3.3.1 Current habitats

Bloomhill East Bog is still dominated by bare peat habitats with some minor development of pioneer vegetation communities. Some small waterbodies have developed in topographical depressions. The margins of the bog are dominated by scrub, immature woodland and some more mature woodland habitats. Silt ponds are present, and riparian vegetation has developed around them. Some small, degraded bog remnants exist in parts of the margins of the bog.

The most common vegetation communities/habitats[2] present in the former production area at Bloomhill East Bog include:

- Bare peat (0-50% cover) (BP) (Plate 3-1 – 3-2).
- Pioneer vegetation communities along drains including pioneer *Eriophorum angustifolium* community (poor fen) (pEang), pioneer *Juncus bulbosus* community (pJbulb), pioneer *Juncus effusus* community (pJeff) and emergent *Betula*-dominated community (A) (eBir) (Plate 3-3).
- Pioneer dry heath (dHeath) (in mosaic with Purple Moorgrass-dominated grassland (gMol) and Birch/Willow scrub (oBir)) (Plate 3-4).

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

- Open water/wetlands have developed in depressions, with development of pioneer communities including pioneer *Triglochin palustris* community (pTrig), *Phragmites australis* community (pPhrag) and *Typha* community (pTyp).
- Mosaics of heath and scrub with Birch/Willow scrub (oBir), dry *Calluna* dominated vegetation (dHeath) and dry pioneer Purple Moorgrass-dominated grassland (gMol).

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

- Cutover Bog (PB4)
- Scrub (WS1)
- Raised bog (PB1)
- Birch woodland (WN7)
- Wet grassland (GS4)

See Drawing number BNM-DR-26-03-RP-17 titled **Bloomhill East Bog: Current Habitat Map**, included in the accompanying Mapbook, which illustrates the habitats at Bloomhill East Bog. See also Table 3-1 for photographic plates of habitats (taken in 2024).

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

Table 3-1 Photos of Habitats at Bloomhill East Bog

Photos of habitats at Bloomhill East Bog (2024)	
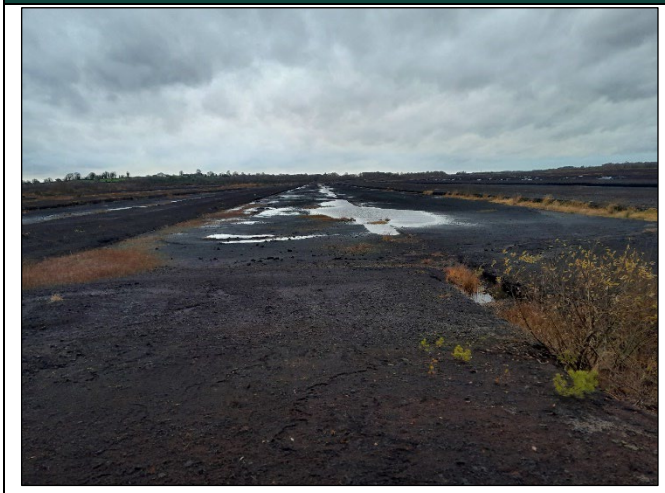	
Plate 3-1 Bare peat dominates across the former production area, with some minor development of vegetation along the drains.	*Plate 3-2 Bare peat dominates across the former production area, with pioneer Eriophorum angustifolium (pEang) developing along the drains.*
	
Plate 3-3 Pioneer vegetation including Eriophorum angustifolium (pEang) developing along high fields.	*Plate 3-4 Pioneer vegetation including dry Calluna dominated vegetation (dHeath) and Molinia caerulea (gMol) along high fields.*

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3.3.2 Species of conservation interest

A number of species of conservation concern have been recorded at Bloomhill East Bog. The following is a summary of the records of these species available within both BnM records and those of the National Biodiversity Centre.

Multiple mammal species were recorded on Bloomhill East bog during BNM surveys carried out in 2023 and 2024 including Irish Hare (*Lepus timidus subsp. hibernicus)*, Red Fox (*Vulpes Vulpes)*, Fallow Deer (*Dama dama)*, Eurasian Badger (*Meles meles)* and Pine Marten (*Martes martes)*.

Butterfly species recorded on Bloomhill East Bog include Grayling (*Hipparchia Semele*) and Holly Blue (*Celastrina argiolus*). Brimstone Butterfly (*Gonepteryx rhamni),* Common Blue (*Polyommatus icarus),* Speckled Wood (*Pararge aegeria),* Peacock *(Aglais io)* and Green Veined White (*Pieris napi)* have been previously recorded in the wider Bloomhill Bog.

Bird species of conservation interest recorded from the bog include the BOCCI[4] Red listed species Snipe (*Gallinago gallinago*), Woodcock (*Scolopax rusticola*), Kestrel (*Falco tinnunculus*) and Curlew (*Numenius arquata*) the Amber listed Mallard (*Anas platyrhynchos*) and Teal (*Anas crecca*).

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

Fallow Deer *(Dama dama)* have been recorded on of Bloomhill East Bog.

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

3.4 Statutory Nature Conservation Designations

There are a number of European Sites (SAC's or SPA's) in close proximity (i.e. within a 5km radius at minimum) to Bloomhill East Bog. A number of NHA's (Natural Heritage Areas) and pNHA's (Proposed Natural Heritage Areas) also occur within 5km of Bloomhill East Bog (See Drawing number BNM-DR-26-03-RP-23 titled **Bloomhill East Bog: Proximity to Designated Sites**).

The Middle River Shannon Callows SPA (Site Code: 004096) and River Shannon Callows SAC (Site Code: 000216) overlap with parts of the western bog boundary. Qualifying interests for the Middle River Shannon Callows SPA are Whooper Swan, Wigeon, Corncrake, Golden Plover, Lapwing, Black-tailed Godwit, Black-headed Gull and Wetland/Waterbirds. The qualifying interests (abbreviated) of the River Shannon SAC are *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils, Lowland hay meadows, Alkaline fens, Limestone pavements, Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* and Otter.

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

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

Pilgrim's Road Esker SAC (Site code: 001776) is located 2.4 km southwest of Bloomhill East bog and is designated for the habitat Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210].

Mongan Bog SPA (Site Code: 004017) and Mongan Bog SAC (Site Code: 000580) are situated 3.4 km southwest of Bloomhill East Bog. The qualifying interests of the SAC are Active raised bogs, Degraded raised bogs still capable of natural regeneration and Depressions on peat substrates of the Rhynchosporion. The qualifying interest of Mongan Bog SPA is Greenland White-fronted Goose (*Anser albifrons flavirostris).*

Fin Lough SAC (Site Code: 000576) is located approximately 4.6 km southwest of Bloomhill East Bog and is designated for Alkaline fens and Geyer's Whorl Snail (*Vertigo geyeri).*

The following NHA's and pNHA's are also situated within 5 km of Bloomhill East Bog; River Shannon Callows pNHA (Site Code: 000216), Mongan Bog pNHA (Site Code: 000580), Fin Lough (Offaly) pNHA (Site Code: 000576), Clonfinlough Esker pNHA (Site Code: 000892), Doon Esker Wood pNHA (Site Code: 001830), Clonlyon Glebe Bog pNHA (Site Code: 000893), Clonydonnin Bog NHA (Site Code: 000565), Carrickynagthan Bog NHA (Site Code: 001623), Pilgrim's Road Esker pNHA (Site Code: 001776) and Clornan Wood pNHA (Site Code: 000894).

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. Mongan Bog Wetland (Ramsar Site No. 416) situated is situated 3.4 km southwest of Bloomhill East Bog. It is an internationally important wintering ground for Greenland White-fronted Geese.

3.5 Hydrology and Hydrogeology

Bloomhill East Bog lies within the Upper Shannon Catchment (Catchment ID: 26G) as defined by the EPA under the Water Framework Directive (WFD) and is situated within the Shannon [Lower]_SC_010 Sub-Catchment. The bog is located along the floodplain of the River Shannon. Bloomhill East Bog contains several drainage pathways which primarily drain in a westerly direction towards the River Shannon.

The Boor River (EPA Code: 26B07) flows westerly outside the northwestern boundary of the bog, discharging to the River Shannon Upper (EPA Code: 26S02) which flows within 500 m of the western margins of Bloomhill East Bog. An unnamed tributary stream of the River Shannon (EPA Segment Code: 26_ 2157) arises in the eastern boundaries of Bloomhill East Bog and flows southwest through the wider Bloomhill Bog to the south.

Five outfall points and associated silt pond infrastructure exist on Bloomhill East Bog former production area. Outfalls are situated in the northern, eastern and southeastern boundaries of the bog. The outfalls in the west discharge water into the Shannon while the outfall in the north discharge into the Boor River.

Bloomhill East Bog currently has a gravity drainage regime. Depression analysis (see drawing number BNM-DR-26-03-RP-09 titled *Bloomhill East Bog: Depression Analysis*) indicates that parts of the bog are in a natural basin with significant potential for re-wetting, with the assumption that all drains would be blocked. It is likely that a portion of the basins in the cutaway will re-wet with deeper water, creating a mosaic of wetland habitats, when drains are blocked.

Regional hydrological data suggest that Bloomhill East Bog receives average precipitation of 913mm/yr (1981-2010), with an estimated annual effective rainfall rate of 456mm/yr based on GSI data. The GSI also estimate an annual average recharge rate of 18-19mm/year for Bloomhill East Bog. Based on estimates of recharge, the available precipitation that may become runoff (assuming no change in storage) ranges from 397mm/year – 439mm/yr. This equates to an annual runoff rate of c. 3,970 – 4,390 m3/ha.

GSI bedrock geology data indicates that Bloomhill East is underlain by two different bedrock units: the Navan Beds formation, which underlies most of the bog including most of the northern and central portion of the bog. The remaining southern portion of the bog (along with a small pocket to the north) is underlain by the Ballysteen formation. All of these units are classified as Locally Important Aquifers (Bedrock which is Moderately Productive only in Local Zones). Several faults underlie the bog, including northwest to southeast trending faults and west – east trending faults.

Two mineral exploration boreholes are situated just outside the boundary of the bog: one drilled in 1979 to a depth of 16.15m, which encountered "bouldery till" outside the southwest boundary, and another from 1977 reaching 32.6m, which found limestone shale interbedded with quarzitic sandstone at the northwest boundary. Four boreholes are mapped as occurring on the elevated till mound at the centre of Bloomhill Bog complex: one reaching a depth of 4.6m (bedrock not encountered), another reaching a depth of 14m (bedrock reported at 2.1m), a third from 5.5m (bedrock reported at 5.5m) reported as having a poor yield class (21.8 m3/day), and a fourth reaching 44.5m (bedrock reported at 5.7m) and classified as a poor yield class (36 m3/day).

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 maps show that Bloomhill East Bog is mapped as cutover raised peat, surrounded by carboniferous limestone till along with an area of limestone sands and gravels, and eskers to the south. These eskers and sand and gravel units are classified as a locally important (LI) gravel aquifer, located approximately 500m south of the bog.

Groundwater vulnerability is classified as moderate across the entire bog, with the area of elevated limestone till to the west being classified as high vulnerability. While Groundwater Vulnerability is typically used to indicate the susceptibility to groundwater pollution, it can provide a useful proxy indication of likely groundwater flow rates in the surrounding area.

Groundwater vulnerability is 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.

3.6 Emissions to surface-water and watercourses

Drainage is an important feature of industrial peat production and there were extensive field drains maintained throughout bog areas to facilitate industrial peat production annually, each of which eventually drains into a terminal silt pond that allows for settlement of suspended solids before entering the main river systems. In accordance with the existing Integrated Pollution Control licence, all drainage water from bog lands in a licensed area is discharged via an appropriately designed silt pond treatment arrangement as required in Condition 6.6. of the licence.

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

Bloomhill East Bog has eight treated surface water outlets to the receiving waters. These are the IE_SH_26S021800 SHANNON (Upper)_120 (River Shannon) and the IE_SH_26B071200 BOOR_020 (Boor River).

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-26-03-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 4.26 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 0.387 mg/l with a range of 0.005 to 1.53 mg/l, while suspended solids for the same period indicated a range of <2 to 37mg/l with an average of 7.5 mg/l.

Table 3-2 Decommissioning and Rehabilitation Programme Water Quality Monitoring.

Bog	SW	Monitoring	pH	SS mg/l	TS mg/l	Ammonia mg/l	TP mg/l	COD mg/l	Colour
Bloomhill	SW-30	Q2 23	7.4	3	133	0.031	<0.05	48	103
Bloomhill	SW-32	Q2 23	7.3	<2	276	0.16	<0.05	65	174
Bloomhill	W-33	Q2 23	7.4	<2	152	0.023	<0.05	46	102
Bloomhill	SW-34	Q2 23	7.5	<2	259	0.071	<0.05	59	169
Bloomhill	SW-35	Q2 23	7.3	<2	269	0.155	<0.05	61	172

Bog	SW	Monitoring	pH	SS mg/l	TS mg/l	Ammonia mg/l	TP mg/l	COD mg/l	Colour
Bloomhill	SW-36	Q2 23	7.4	2	255	0.134	<0.05	56	191
Bloomhill	SW-37	Q2 23	7.5	<2	157	0.317	<0.05	61	231
Bloomhill	SW-38	Q2 23	7.9	<2	380	0.053	<0.05	30	101
Bloomhill	SW-39	Q2 23	7.9	2	396	0.05	<0.05	33	100
Bloomhill	SW-40	Q2 23	6.8	6	270	0.591	0.27	121	648
Bloomhill	SW-41	Q2 23	7.5	<2	240	0.095	<0.05	54	183
Bloomhill	SW-42	Q2 23	7.9	2	352	0.008	<0.05	34	114
Bloomhill	SW-43	Q2 23	5.4	37	174	1.53	0.13	145	1305
Bloomhill	SW-29	Q2 23	7.5	4	303	0.627	<0.05	67	199
Bloomhill	SW-45	Q3 22	7.5	3	251	0.338	0.12	80	222
Bloomhill	SW-45	Q2 19	7.4	<5	184	0.12	<0.05	70	193
Bloomhill	SW-46	Q2 19	8.1	<5	160	0.02	<0.05	22	44
Bloomhill	SW-45	Q1 18	7.5	5	134	1.5	0.05	46	119
Bloomhill	SW46	Q1 18	7.9	5	410	0.04	0.05	43	108

Rehabilitation of cutaway peatland is closely linked with control of emissions. One of the criteria for successful rehabilitation is stabilisation through re-vegetation, which will stabilise all substrates and in turn remove the need for further silt control measures. Re-wetted peat also aids the primary objective of stabilizing peat, as when peat is re-wetted it is not vulnerable to wind erosion. Re-wetted peat and the development of wet peatland habitats can also act as sinks for silt and mobile peat, and increases additional retention time for solids, and the peatland vegetation can quickly stabilise this material within blocked drains on site (by acting like constructed wetlands).

Water quality of water discharges from restored peatlands normally improves as a result of bog restoration measures and the restoration of natural peatland processes (Bonn *et al*. 20017). Bog restoration is also expected to improve water attenuation of the site as the drains are blocked, slowing water movement and water release from the site. Restored peatlands help slow the release of water and aid the natural regulation of floods downstream (Minayeva *et al*., 2017). The National River Basin Management Plan (NRBMP) 2022-2027 (DHPCLG, 2024) is the key national plan for Ireland to achieve the objectives of the Water Framework Directive (WFD). The NRBMP outlines how key actions such as the Bord na Móna peatland rehabilitation is expected to have a positive impact on water quality and help the NRBMP deliver its objectives in relation to the WFD.

Water will still discharge from designated emission points when rehabilitation at Bloomhill East Bog has been completed. This discharge will have improved water quality and there will be increased wetland attenuation, meaning slower release of water. This is expected to have a positive impact on status of downstream water bodies. While water quality improvements assist in meeting water frameworks directive ambitions and targets, they can also improve drinking water sources in applicable catchments with drained peatlands and the potential for associated reduction in treatment requirements at drinking water treatment facilities.

Decommissioning and Rehabilitation Programme Water Quality Monitoring

The licence obligation of quarterly sampling regime on a selected number of ponds to be sampled over a 3-year cycle 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 Bloomhill 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 2025. 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 0.008 to 1.53 mg/l with an average of 0.387 mg/l. Results for suspended solids for the same period indicated a range of <2 to 37mg/l with an average of 7.5 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.

3.7 Fugitive Emissions to air

None.

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

3.8 Carbon emissions

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 Bloomhill 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 as regenerating wet deep peat vegetation on deep peat areas, with smaller areas developing wetland habitats on shallow peat with open water, reed swamp and fen habitats with alkaline emission factors. Birch woodland is expected to develop on the drier mounds and along peripheral headlands.

3.9 Current ecological rating

(Following NRA (2009) Evaluation Criteria)

The majority of Bloomhill East Bog is dominated by bare peat and so is considered to be of **Local Importance (lower value)**. The margins of the production bog contain some habitats of higher value including remnant raised bog, developing calcareous grassland on disused railway tracks and Birch woodland considered to be of **Local Importance (higher value)**. Smaller portions of the site where discrete sections of the BnM property overlap the SAC boundaries have been assigned a rating of **International Importance**, due to their European designation status.

4. CONSULTATION

4.1 Consultation to date

Consultation seeks to engage an audience of relevant stakeholders at both a national and local level. National stakeholders have been identified from varied bog restoration and rehabilitation efforts undertaken by Bord na Móna over the past 40 years, with particular emphasis on engagement with stakeholders during 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 Bloomhill East Bog, with various stakeholders in relation to:

- General consultation with range of stakeholders at annual Bord na Móna Biodiversity Action Plan review days 2010-2018.
- 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).

To inform the current Plan, both national and local stakeholders, including neighbours whose land adjoins Bloomhill 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 Bloomhill 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 Bord na Móna response to issues raised during consultation

N/A.

5. REHABILITATION GOALS AND OUTCOMES

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

- Meeting conditions of IPC Licence.
- Stabilisation or reduction in water quality parameters of water discharging from the site (e.g. suspended solids).
- Reducing pressure on receiving 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 ongoing and future amenity land-use planning. Integrating rehabilitation measures with planned amenity infrastructure on site. It is not proposed to carry out any rehabilitation actions to change or negatively affect any amenity infrastructure.
- The main goal and outcome of this plan is the successful rehabilitation (environmental stabilisation) of peatlands used for industrial peat production at the bog in a manner that is acceptable to both external stakeholders and to Bord na Móna and which optimise climate action and other ecosystem service benefits.

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

- It will take some time for stable naturally functioning habitats to fully develop at Bloomhill East Bog. This will happen over a longer timeframe than the implementation of this rehabilitation plan.
- Re-wetting residual peat will initially maintain and enhance the carbon storage capacity of the bog. There is scientific consensus that restoration of hydrology of damaged bogs can improve carbon storage, water storage and attenuation and help support biodiversity both on the site and in the catchment (See Section 3.8). This will reduce carbon emissions from the site from a larger carbon source to a smaller carbon source. In time, the bog has the capacity to develop in part as a carbon sink. PCAS is expected to deliver significant contributions to Ireland's climate action.
- It is not expected that the cutover bog in the former production area 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). Part of the bog contains residual deep peat and 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 habitats to support biodiversity and local attenuation of water flows from the bog.
- WFD status in receiving water bodies can be affected by peatlands and peat extraction but is also affected by other sources such as agriculture. In addition, receiving water bodies that are assessed as At Risk from peatlands and from peat extraction are likely to have several contributary sources of impacts (private

peat extraction and Bord na Móna). Reducing pressures due to former peat extraction activities at Bloomhill East Bog will contribute to stabilising or improving water quality status of receiving water bodies in general. Ultimately, improving the WFD status of the receiving water body will depend on reducing pressure from a range of different sources, including peatlands in general (private and Bord na Móna).

- 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.
- Bord na Móna are also carrying out rehabilitation measures in some adjacent bogs (e.g. Bunahinly and Kilgarvan to the north, west Bloomhill, and Ballaghurt to the south). There are expected to be cumulative water quality and other ecosystem service benefits to receiving water bodies River Shannon (Lower), from rehabilitation more than one bog in the same catchment.

6. SCOPE OF REHABILITATION

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

- The area of Bloomhill East Bog within the PCAS rehabilitation footprint. (See Drawing number BNM-DR-26-03-RP-01 titled **Bloomhill East Bog: Bog Site Location**).
- 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. Bloomhill 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 Bloomhill 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.
- Much of the site has a mix of deep peat and shallow residual peat. The local environmental conditions of Bloomhill East Bog mean that a combination of deep peat measures, dry cutaway measures and wetland creation are the most suitable rehabilitation approach for shallow peat areas.
- Bord na Móna have defined the key goal and outcome of rehabilitation at Bloomhill East Bog as **environmental stabilisation** of the site via **optimising climate action benefits, where possible**. The re-wetting of residual deep peat will be optimised, **setting the site on a trajectory towards the development of peat-forming communities on residual deep peat, where possible.** While the shallow peat in the cutaway will be optimised **towards the development of wetlands/Reed Swamp and fen.**
- Integrating rehabilitation measures with future potential amenity projects. It is not proposed to change any bog conditions that would affect any planned amenity.
- Rehabilitation of Bloomhill 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.

6.1 Key constraints

- **Bog conditions.** Rehabilitation outcomes of bogs are constrained by the environmental characteristics of the particular bog. For example, there is potential for raised bog restoration at some sites where there has not been significant industrial peat extraction, and where the peat body is largely intact (deep peat sites that are drained). At other sites, where most of the peat mass has been removed, the environmental characteristics will have changed radically (peat depths, hydrology, water chemistry, substrate type, nutrient status, etc.) and there will therefore be different habitat outcomes (wetlands, fen, heathland, grassland and Birch woodland). At Bloomhill East Bog, peat depths of above 1.1m occur over most of the site with sections containing residual peats of >2.6m. Some pockets of shallower peat exist in the southwest section of the site.
- Furthermore, there are local factors (such as topography and drainage) that will influence the future trajectory of this bog. At Bloomhill East Bog, most of the former production area is bare peat. There are some areas of pioneer cutaway vegetation communities developing near the field drains or in wet topographical depressions. There are more developed scrub, immature woodland and woodland habitats

as well as raised bog remnants in the marginal areas of the site. These need to be considered as part of the wider rehabilitation work.

- **Potential land-use.** Bord na Móna reviewed the potential to develop a potential renewable energy project at Bloomhill Bog East. This review has been completed and Bord na Móna made the decision not to develop a renewable energy project at this site. Bord na Móna remain committed to rehabilitating all of Bloomhill East Bog and to meeting IPC Licence conditions for this bog.
- **Surrounding landscape and neighbours.** Another key constraint is the interaction between the Bord na Móna sites and the surrounding landscape. Care has to be taken that no active rehabilitation management is carried out that could negatively and knowingly impact on surrounding land. This includes any hydrological management on neighbouring farmland, as well as potential changes to the hydrology of surrounding designated sites. 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. If this occurs, rehabilitation measures will be reviewed and adapted. An archaeological impact assessment of the proposed rehabilitation at Bloomhill East Bog will be carried out (Appendix IX). Rehabilitation in areas of archaeological interest will be avoided or amended (e.g. buffers in line with Best Practice) to avoid or minimise impact to any archaeological features (Appendix IX). A togher exists on the northwestern part of Bloomhill East Bog and has been mapped as a constraint on the rehabilitation plan.
- **Public Rights of Way**. Where a public right of way or similar burden exists on Bord na Móna property, consideration will be given to ensuring that this remain intact where possible. In some instances, depending upon previous land uses and management, alternative solutions may be required. These will be explored in consultation with local communities and statutory bodies during the consultation work associated with the decommissioning and rehabilitation work described here. No known rights of way exist at Bloomhill East Bog.
- **Amenity Development.** Bord na Móna are planning the development of an amenity trail along the western and eastern headlands of Bloomhill East Bog as part of the Midlands Network Trail, which also passes through other Bord na Móna bogs in the wider area including Bloomhill, Ballaghurt, Derries, Turraun, Oughter and Boora West bogs. The amenity development at Bloomhill East Bog will consist of shared cycle and walkways, associated signage and fencing. The planned amenity route has been mapped as a constraint on rehabilitation maps. Due to its location on high fields and headlands (more elevated land), this proposed amenity will have limited impact on planned re-wetting. It is anticipated that this work will commence in 2025.

6.2 Key Assumptions

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

6.3 Key Exclusions

The scope of this rehabilitation plan does not cover:

- The west side of Bloomhill. Rehabilitation of this area was dealt with the rehabilitation plan for Bloomhill Bog in 2022 (Bloomhill-Final-Rehab-Plan-v6.pdf).
- The longer-term raised bog restoration trajectory of the site. The plan covers the short-term rehabilitation **actions** and **a monitoring and after-care programme** to monitor the rehabilitation during the Scheme and to respond to any needs. It is expected that this rehabilitation plan will set the site on an enhanced and accelerated trajectory towards stabilisation and deep peat re-wetting. The plan does not set any goals or outcomes, for example, the extent (specific area) of active raised bog habitat (ARB) that may develop at this site in the long-term. This is beyond the scope of this rehabilitation plan.
- This plan is not intended to be an after-use or future land-use plan for Bloomhill 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 Bord na Móna as:

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

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

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

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

As the monthly monitoring program at Bloomhill East Bog continues during the implementation of the rehabilitation measures planned for 2025, and data from the 2024/25 monitoring program is compiled, further analysis will be completed to identify any ongoing trends.

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

- Optimising the extent of suitable hydrological conditions to optimise climate action and other ecosystem service benefits (optimising and maximising residual peat re-wetting). This will be measured by an aerial survey after rehabilitation has been completed.

- Accelerating the trajectory of the bog towards becoming a reduced carbon source/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, Heather-dominated bog vegetation, scrub, poor fen, and birch woodland, where conditions are suitable. Some of these habitats have already in part established as pioneer vegetation/wetlands and woodland. It will take some time for stable naturally functioning habitats to fully develop at Bloomhill East 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 Sites can be re-monitored in the future and compared against this baseline.	2025-2027

Criteria type	Criteria	Target	Measured by	Expected Timeframe
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 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 (Bord na Móna and external).** Bord na Móna maintains a provision on its balance sheet to pay for these future costs. Bord na Móna is fully committed to meeting its obligations relating to rehabilitation and decommissioning under the Integrated Pollution Control Licence. It is expected that additional costs of enhanced rehabilitation will be supported by Government through the Climate Action Fund and Ireland's National Recovery and Resilience Plan.
- **Bord na Móna to have sufficient resources (staff and training) to deliver the planned rehabilitation with required associated skills and competencies.**
- **Bord na Móna to have sufficient resources (suitable machinery) and staff to maintain this machinery.**
- **Weather conditions to be within normal limits over the rehabilitation plan timeframe.** Long periods of wet weather have the capacity to significantly affect ground conditions and constrain the delivery of rehabilitation. The potential impact of wet weather on ground conditions can be reduced by appropriate planning and management. Bord na Móna have significant experience of managing these issues through 70 years of working in these peatland environments.
- **Rehabilitation measures to be effective.** The rehabilitation measures proposed in this plan are based on 40 years of Bord na Móna experience of peatland management and best practice applied internationally in peatland management. Measures proposed in this plan have already been shown to be affective at other sites. Bord na Móna will apply a flexible and adaptable approach to the more innovative

rehabilitation measures proposed in this plan. If measures are not initially effective, Bord na Móna will review any requirement for additional practical rehabilitation.

- **Natural colonisation of vegetation to develop semi-natural habitats at a rate within the normal limits.** The development of naturally functioning semi-natural habitats on degraded bog takes time. It may take 30-50 years for active raised bog vegetation to re-develop on suitable cutaway that was previously bare peat. However, Bord na Móna experience has demonstrated the effectiveness of these type of measures for re-wetting bog and creating carbon sinks (Renou-Wilson *et al*. 2018).
- Rehabilitation measures have been designed to accelerate and work with natural colonisation and other natural processes. Bord na Móna experience of rehabilitation has shown that re-wetting improves conditions for natural colonisation and that natural colonisation is accelerated where the environmental conditions are most suitable. Rehabilitation measures have been designed to modify the conditions of areas within sites where conditions are less suitable for natural colonisation (modifying hydrology, topography, nutrient status or availability of potential seed sources).
- **Monitoring to be robust and effective.** Rehabilitation Monitoring will be established to validate the success of rehabilitation as required by Condition 10 of the IPC Licence and to verify the benefits of the proposed enhanced measures to optimise climate action. This will focus on 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-26-03-RP-22 titled Bloomhill East Bog: Aerial Imagery 2020

BNM-DR-26-03-RP-04 titled Bloomhill East Bog: Peat Depths

BNM-DR-26-03-RP-03 titled Bloomhill East Bog: LiDAR Map

BNM-DR-26-03-RP-09 titled Bloomhill East Bog: Depression Analysis

The rehabilitation actions themselves will be a combination of PCAS measures to re-wet peat. The distribution of these measures is provisionally outlined in drawing titled **BNM-DR-26-03-RP-05 Bloomhill East Bog: Rehabilitation Measures** in the accompanying Mapbook (note that the actual distribution of these measures may be subject to change in response to stakeholder consultation and refinement of the enhanced rehabilitation measures.)

These enhanced measures for Bloomhill East Bog will include (see Table 8.1):

- Drain blocking around existing wetland or standing water to create/promote the spread of wetland habitats.
- Re-wetting some areas of the bog through regular field drain blocking to create three peat barriers every 100 m along each field drain.
- The creation of berms across some sections of the bog to control/retain water levels. This measure seeks to retain shallow (< 10 cm) water conditions across multiple fields.
- Re-alignment of piped drainage and the creation of high-level swales through high fields to manage water levels and water flows through the site.
- Modifying water levels at outfalls, as it may be desirable to change and control water levels at the site over time, e.g. to increase water levels as the site becomes increasingly vegetated. This will further slow the movement of water through and out of Bloomhill East Bog.
- Some small bog remnants around the margins of the bog will be targeted for drain-blocking.
- Deep Peat measures including field re-profiling, on deeper peat; intensive drain blocking (max 7/100 m) and modifying outfalls, and management of water levels with overflow pipes and blocking of internal outfalls.
- Regular drain blocking (3/100) on dry cutaway along with the modifying outfalls and management of water levels, along with organic fertiliser application.

- Targeted fertiliser applications to accelerate vegetation establishment on areas of **bare peat** on headlands and high fields, and within certain areas of dry cutaway. Areas where vegetation has established do not need fertiliser application.
- Initial hydrological modelling indicates 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. It is inevitable that some small sections will naturally have deeper water due to the topography at this site). Water-levels will be adjusted at outfalls and by adjusting piped drainage.
- Inoculation of *Sphagnum* will be considered in the future as part of the Peatlands and People LIFE project.
- The existing silt ponds will be retained and maintained during the rehabilitation phase. During the monitoring and verification phase the silt ponds will be continually inspected and maintained, where appropriate. When it is deemed that the silt ponds are not required, as the bog has been successfully stabilised and there is no silt run-off, the condition of the silt ponds will be reviewed. The silt ponds will either be de-watered (water levels lowered to a level where the silt pond will naturally develop as a small wetland feature), left in situ, or infilled (where discharges do not require silt control).

Table 8.1: Types of and areas for enhanced rehabilitation measures at Bloomhill East Bog. Note that the types of rehab and areas of rehab may change in response to stakeholder consultation and refinement of the enhanced rehabilitation measures.

Type	Rehab Code	Enhanced Rehabilitation Measure	Extent (Ha)
Dry Cutaway	DCT1	Modifying outfalls and managing water levels with overflow pipes.	15.7
	DCT2	Regular drain blocking (3/100m), modifying outfalls and managing water levels with overflow pipes and targeted fertiliser treatment.	46.5
Wetland	WLT2	Turn off or reduce pumping to re-wet cutaway, blocking outfalls and managing water levels with overflow pipes and targeted blocking of outfalls within a site.	0.7
	WLT4	More intensive drain blocking (max 7/100 m), modifying outfalls and managing overflows, transplanting Reeds and other rhizomes.	164.3
Deep Peat	DPT2	More intensive drain blocking (max 7/100 m) and modifying outfalls and managing overflows.	35.4
	DPT3	More intensive drain blocking (max 7/100 m), + field reprofiling + modifying outfalls and managing overflows.	11.2
Marginal land	MLT1	No work required.	28.9
Marginal land	MLT2	Targeted Drain Blocking.	0.8
Additional Work	AW2	Targeted Drain Blocking.	6
Silt ponds	Silt pond	Silt ponds.	0.9
Constraint	Constraint	Other Constraints (Rights of Way, Turf cutting, Amenity, Archaeology, extant high bog).	23
Total			**333.4**

8.1 Completed and ongoing

- A very small part of the site is already re-vegetating, with some cover of pioneer vegetation developing a mosaic of typical cutaway peatland and wetland habitats. Bare peat areas within the cutaway parts of the site are reducing as vegetation develops and consolidates.

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

- Seek formal approval of the enhanced plan, noting the alternative standard plan should funding from the Scheme not materialise from the EPA.
- Agree an *ex ante* budget of eligible costs (based on the approved enhanced plan) with the Scheme regulator.
- Develop a detailed site plan with engineering drawings outlining how the various rehabilitation methodologies (The Scheme PCAS) will be applied to Bloomhill East Bog. This will take account of peat

depths, topography, drainage, and hydrological modelling (see **BNM-DR-26-03-RP-05 Bloomhill East Bog: Enhanced Rehabilitation Measures** 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, turbary and existing land agreements is to be carried out.
- A review of remaining milled peat stocks is to be carried out.
- An ecological appraisal of the potential impacts of the planned rehabilitation on the presence of sensitive ground-nesting bird breeding species (e.g. breeding waders) is to be carried out. The scheduling of rehabilitation operations will be adapted, where required.
- Ensure all activities comply with the environmental protection requirements of the IPC Licence.
- Carry out Appropriate Assessment of the Rehabilitation Plan.
- Track implementation and enforcement of the relevant IPC Licence conditions, the mitigation measures (AA) and other environmental control measures during the implementation of the rehabilitation plan.

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

- Carry out proposed measures as per the detailed site plan. This will include a combination of bunding and drain blocking on deep peat, and fertiliser application targeting bare peat areas of headlands, high fields and other areas (where required) in addition to wetland creation and management prescriptions. All rehabilitation will be carried out with regard to best practice environmental control measures (Appendix IV).
- Monitor the success of rehabilitation measures in relation to developing suitable hydrological conditions.
- Carry out the proposed monitoring, as outlined.
- While natural colonisation has commenced since peat production ceased, Phase 2 actions will be carried out in targeted areas to accelerate re-vegetation and colonisation of target species. Phase 2 actions may include seeding of targeted vegetation.
- Silt ponds will be monitored during this period and there will be continued maintenance and cleaning to prevent potential run-off of suspended solids from the site during the rehabilitation phase.
- Submit an *ex post* report to the Scheme regulator to verify the eligible measures to be carried out in year 1 of the Scheme, and an *ex ante* estimate for year 2 of the Scheme; and so on for each year of the Scheme.

8.4 Long-term (>3 years)

- Evaluate success of short-term rehabilitation measures outlined above and remediate where necessary.
- Delivery of a monitoring, aftercare and maintenance programme (See section 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.

8.5 Timeframe

- **2025**: Short-term planning actions.
- **2025-2026**: Short-term practical actions.
- **2026-2027**: Long term practical actions. Evaluate success of short-term rehabilitation measures outlined above and remediate where necessary.
- **2028**: Decommission silt-ponds, if necessary.

8.6 Budget and costing

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

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

Bord na Móna maintains a provision on its balance sheet to pay for the future costs of **standard** rehabilitation and decommissioning. This is updated every year - for more information see the Bord na Móna Annual Report (Bord na Móna, 2024). Bord na Móna is fully committed to meeting its obligations relating to rehabilitation and decommissioning under the Integrated Pollution Control Licence.

At this time, a 'standard' rehabilitation provision (sufficient to discharge the requirement of Condition 10 in the licence) has been 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 Bord na Móna in consultation with interested parties. Other after-uses can be proposed for licensed areas and must go through the required assessment process and planning procedures.

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

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

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

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

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

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

10. REFERENCES

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

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

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

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

Scope of rehabilitation

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

- The area of Bloomhill 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. Bloomhill East Bog is part of the Blackwater Bog group.
- The current condition of Bloomhill East Bog. The majority of the bog remains as bare peat. Pioneer cutaway vegetation is developing across parts of the site.
- 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 Bloomhill East Bog will be left unblocked as blocking boundary drains could affect adjacent land.
- Land-use.

Rehabilitation goals and outcomes

The key rehabilitation goal and outcome for Bloomhill East Bog is environmental stabilisation of the site via wetland creation. 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).
- Receiving water bodies have been classified under the River Basin Management Plan and this classification includes waters that are 'At Risk' from peatlands and peat extraction. The success criteria will be that the 'At Risk' classification will see improvements in the associated pressures from this peatland or if remaining At Risk, that there is an improving trajectory in the pressure from this peatland.

Rehabilitation targets

- Demonstrating the delivery of the rehabilitation through site visits and through updated aerial photography (indicating presence of peat 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 using a dozer 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 wetlands.
- 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. Rehabilitation measures and target area.

Type	Code	Description	Area (Ha)
Dry cutaway	DCT1	Blocking outfalls and managing water levels with overflow pipes	
Deep peat	DPT1	Regular drain blocking (3/100 m) + blocking outfalls and managing water levels with overflow pipes	
Wetland	WLT1	Turn off or reduce pumping to re-wet cutaway + blocking outfalls and managing water levels with overflow pipes	
Marginal Land	MLT1	No work required	
Additional Works	AW1	Targeted drain blocking	
Other	Silt Pond	Silt ponds	
Other	Constraint	Rights of Ways, Turf Cutting, Amenity, Archaeology	
Total			

See Drawing number BNM-DR-26-03-RP-20 titled Bloomhill East Bog: Standard Rehab Measures included in the accompanying Mapbook which illustrates the standard rehab measures to be applied.

Monitoring, after-care and maintenance

- There will be initial quarterly monitoring assessments of the site to determine the general status of the site, the condition of the silt-ponds, assess the condition of the rehabilitation work, assess the progress of natural colonisation, monitoring of any potential impacts on neighbouring land and general land security. The number of site visits will reduce after 2 years to bi-annually. These site visits will assess the need to additional rehabilitation.
- Water quality monitoring will be established.
- Monitoring results will be maintained, trended and reported on each year as part of the requirement to report on Condition 10.1 of the IPC Licence on Bog Rehabilitation in the Annual Environmental Report, which will be available in April each year at www.epa.ie.
- The parameters to be included (as per condition 6.2 of the IPC Licence) include monthly monitoring for pH, Flow, Suspended Solids, Total Solids, Total Phosphorus, Total Ammonia, Colour, and COD.
- This sampling regime on a selected number of silt ponds will be carried out over a two-year cycle. The original (licence) requirement was for a quarterly sampling regime.
- Where other uses are proposed for the site, these will be assessed by Bord na Móna in consultation with interested parties. Other after-uses can be proposed for licensed areas and must go through the required assessment and planning procedures.

Validation and IPC Licence surrender

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

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

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), Clonboley, Killeglan and Derrydoo-Woodlough). The latter three bogs are classed as restored raised bogs, still contain active bog habitat (that qualifies as the Annex I EU Habitats Directive habitat) and now form the core of the Bord na Móna Raised Bog Restoration Project due to their high biodiversity value and bog restoration potential. NPWS have identified the Clonboley bog cluster as having high ecological value within the recent assessment of raised bog SACs, NHAs and non-designated sites (NPWS 2014[6]). Several of these sites have been restored during the period 2011-2020.

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

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

A breakdown of the component bog areas for the Blackwater Bog Group IPC 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 2017. Attymon is a deep peat cutover bog.	Attymon Bog formerly supplied fuel sod peat. Coillte have developed a portion of the former production area for conifer forestry. Rehabilitation ongoing	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
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 harvesting ever took place on the main section.	A small sub-section has been used for sod turf production. Bog restoration was carried out in 2013-2014 Rehabilitation (raised bog restoration) complete	2020	Updated 2024 Rehab ongoing 2025
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	Ballaghhurt Bog formerly supplied a range of commercial functions including horticultural peat and fuel peat. Pioneer cutaway vegetation communities are naturally developing on some cutaway areas.	2020	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. Coilte 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-Kilgarvan Bog during the 1990's. Residual Deep peat remains on these bogs.	Bunahinly-Kilgarvan formerly supplied milled horticultural peat and fuel peat. Much of the former production area is bare peat. Part of Bunihinly has been re-wetted.	2020	Finalised 2021 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

Bog Name	Area (ha)	Stage of development	Land-Use and History	Peat Production Cessation	Rehab Plan Status
Cornafulla	460	Cutover Bog Industrial peat production commenced at Cornafulla Bog in 1987. This bog still retains relatively deep residual peat.	Cornafulla Bog formerly supplied milled horticultural peat and fuel peat. Much of the former production area or cutaway is bare peat.	2020	Draft 2017
Cornaveagh	492	Cutover Bog Industrial peat production commenced at Cornaveagh Bog in 1970's and ceased in 2020. This bog still retains relatively deep residual peat.	Cornaveagh Bog formerly supplied milled horticultural peat and fuel peat. Much of the former production area footprint or cutaway is bare peat.	2020	Draft 2017
Culliaghmore	442	Cutover Bog Industrial peat production commenced at Culliaghmore Bog in 1960's and ceased in 2020. Much of this bog is cutaway, with some pockets of deeper residual peat.	Culliaghmore Bog formerly supplied milled horticultural peat and fuel peat. Much of the former production area footprint or cutaway is bare peat. Some pioneer cutaway vegetation communities are naturally colonising cutaway areas.	2020	Draft 2017
Garryduff	970	Cutaway Bog Industrial peat production commenced at Garryduff Bog in 1960's. The majority of this bog is cutaway.	Much of the former production area footprint or cutaway is bare peat. Extensive natural development of pioneer cutaway vegetation communities is present on cutaway areas. 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-26-03-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: This report outlines an ecological survey of the entire Boomhill bog and thus some of the information may not be pertinent to the area of Bloomhill East Bog discussed in this rehab plan. This report should not be taken as a management plan for the site as other land-uses may still be considered. Information within this report may inform the development of other land-uses and identify areas with particular biodiversity value.

Bog Name:	**Bloomhill**	**Area (ha):**	891ha
Works Name:	Blackwater	**County:**	Offaly/Westmeath
Recorder(s):	DF, PE, DD	**Survey Date(s):**	23rd & 26th March 2012

Habitats present (in order of dominance)

The most common habitats present at this site include:

- Bare peat (BP) (Codes refer BnM classification of pioneer habitats of production bog)
- Riparian zones (RIP)
- Pioneer Purple Moorgrass-dominated grassland (gMol) with Gorse-dominated scrub (eGor)
- Pioneer Soft Rush-dominated poor fen (pJeff)
- Pioneer Reedbed (pPhrag) (in marginal small drainage ditch)
- Pioneer dry heath (dHeath) with open Birch-dominated scrub (oBir) or Purple Moorgrass-dominated grassland (gMol) (generally in old cutover or marginal bog areas).
- Riparian areas (RIP)
- Silt ponds (Silt) with associated habitats

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

- Marginal raised bog (PB1) (Codes refer to Heritage Council habitat classification, Fossitt 2000), See Appendix II.)
- Cutover bog (PB4)
- Raised bog (PB1)
- Scrub (WS1)
- Birch woodland (WN7)
- Wet grassland (GS4) (privately managed farmland)

Description of site

Bloomhill is located approximately 4km southwest of Ballynahown in County Offaly. The Offaly-Westmeath County boundary runs southeast to northwest through the centre of the Bloomhill East bog. Bloomhill is part of the Blackwater group of bogs.

Bloomhill Bog can be divided into five main lobes; Bloomhill East lies to the north-east. Bloomhill East Bog is divided from the wider Bloomhill Bog by a network of local roads. Bloomhill East is connected to Bunahinly/Kilgarvan bog to the north via a rail link. The River Shannon flows within 0.5 km of the western edge of the site. Industrial peat production began in Bloomhill in 1981. The majority of Bloomhill has been mapped as bare peat with little vegetation in the former production areas.

Several areas of remnant raised bog remain along the edges of the site. These areas are small, with the largest example of this habitat along the northern boundary. The largest section was dominated by Heather but also contained Bog Asphodel, Bog Myrtle and Cladonia along with *Sphagnum cuspidatum*, *S. capillifolium* and *S*. *magellanicum*. A significant section of this area had been ditched and was quite dry with no quaking feel to it. Curlew were present in this area at the time of the ecological survey and were heard calling. The remaining, smaller, sections of raised bog around the margins of the site were very dry and were becoming colonised with Gorse, Pine and Birch.

A section of the site, along the western boundary, consists of an area of wet grassland, wet willow woodland and cutaway bog. The wet grassland is located between the Curraghboy River and the wet willow woodland. This area is actively grazed by horses and cattle and was never managed for peat production. A band of wet willow woodland is also located alongside the wet grassland. The woodland consisted of Willow, Birch, Alder, Bog Myrtle, Common Reed, Meadow Sweet, Mint, Purple Moor Grass and Greater Tussock Sedge. At least some of the woodland was located on very old cutover bog.

A section of former production bog was beginning to become re-vegetated with a mix of Soft Rush and Heather. This area appeared to contain deep peat but was subject to periodic inundation.

Other, fringe habitats were comprised of wet grassland that was grazed, Birch woodland, dominated by Birch and scrub that consisted of Gorse and Birch. A section of Birch woodland to the west of the site had recently been felled, presumably for firewood. This area is within the BnM boundary.

Overall the majority of Bloomhill has been mapped as bare peat.

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

- Designated sites that partially overlap the bog include the River Shannon Callows SAC (site code 000216) and Middle Shannon Callows SPA (Site Code: 004096).
- Mongan Bog SAC (site code 000580) is located adjacent to the bog and is owned by An Taisce. This SAC overlaps with the travel path that connects Bloomhill to Blackwater Bog to the south.

Adjacent habitats and land-use

Cutover bog (PB4), Birch woodland (WN7), scrub (WS1), raised bog (PB1), improved agricultural grassland (GA1) and wet grassland (GS4) all border the site. There is a significant amount of callows type wet grassland to the west of the site adjacent to the River Shannon. The bog encircles a raised area that is primarily used as agricultural grassland. An Esker (Pilgrim's Way SAC) is located to the south west of the site and is comprised of agricultural grassland (GA1) and scrub (WS1).

Watercourses (major water features on/off site)

- The Boor River passes along the northern boundary of the site.
- The Curraghboy River passes through a section of the site.
- A tributary of the Curraghboy River passes through a section of the site, towards the south. This stream was canalised and did not contain any aquatic or riparian vegetation.
- The River Shannon passes within 0.5 km from the western boundary of the site.
- All water courses on the site are part of the Shannon River Basin District.

Peat type and sub-soils

A mixture of fen peat and "red" or "*Sphagnum*" peat exists on the site, with the majority of the latter. Remaining peat depths show that a large proportion of the site contains in excess of 2.6m of peat remaining. No gravel or marl are exposed around the site. The hill (Bloomhill) that is surrounded by the bog is underlain with sandstone.

Fauna biodiversity

Birds

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

- Kestrel (a pair)
- Mallard (20+)
- Teal (6)
- Curlew (calling in the north of the site).
- Other more common species include Heron, Starling, Robin, Long Tailed Tit, Grey Crow, Magpie and Blackbird.

Mammals

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

- Deer (most likely Fallow)
- Otter
- Pine Marten
- Hare
- Fox

Other species

Frog

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 Bord na Móna staff and updated as required.

APPENDIX V: BIOSECURITY

The potential for importation or introduction of non-native plant species (such as Japanese Knotweed, Himalayan Balsam, etc.) during future rehabilitation management, such as drain-blocking using excavators, has the potential to result in the establishment of invasive species within the site. Section 49 of the European Communities (Birds and Natural Habitats) Regulations 2011 prohibits the introduction and dispersal of invasive alien species (particularly plant species) listed on Part 1 (third column) of the 'Third Schedule'.

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

- 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

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

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

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

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

1 EPA IPC Licence

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

2 The Peatlands Climate Action Scheme (PCAS)

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

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

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

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

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

3 National Climate Policy

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

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

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

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

4 National Peatlands Strategy

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

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

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

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

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

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

5 National River Basin Management Plan 2022-2027 (Water Framework Directive)

The River Basin Management Plan for Ireland 2022-2027 (Department of Housing, Local Government and Heritage, 2022) 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 Bord na Móna 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 Bord na Móna was in the process of phasing out the extraction of peat for energy production, that it set a target to rehabilitate 9,000 ha of cutaway bogs (covering 25 peatlands) by 2021 (in 2018) and will look to implement best-available mitigation measures to further reduce water quality impacts caused by peat extraction while the phasing-out process is taking place. This NRBMP 2022-2027 rehabilitation target was superseded by the acceleration of the Bord na Móna de-carbonisation programme and the Scheme **(PCAS)**.

The development of site rehabilitation plans and the delivery of peatland rehabilitation by Bord na Móna was expected to have a positive impact on water quality and will help the NRBMP 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 Bord na Móna in 2021 was expected to have a significant positive impact on water quality of receiving water courses by reducing the impact of peat extraction as a key pressure on particular water courses. This is now being supported by the results and conclusions of the draft 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. Bord na Móna are working with NPWS to identify bog restoration and other re-wetted cutaway sites that can contribute towards Irelands targets for the Nature Restoration Law.

8 National Conservation Designations

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

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

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

Bord na Móna has played a key role in the development of the National Raised Bog Special Area of Conservation Management Plan 2017-2022 and the Review of the Raised Bog Natural Heritage Area Network. Several Bord na Móna sites were assessed by the National Parks and Wildlife Service as part of the above Plan and Review and there is an expectation that several Bord na Móna sites will be designated as SACs and NHAs in the future. This

will reinforce the network of protected raised bog sites and replace in part sites that will be de-designated as they have been deemed to be significantly damaged and are deemed to have no raised bog restoration prospects. PCAS is expected to restore several sites that will contribute to The National Raised Bog Special Areas of Conservation (SACs) Management Plan 2017-2022 targets in relation to the restoration of raised bog habitat.

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

10 All-Ireland Pollinator Plan 2021-2025

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

11 Land-use Planning Policies

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

12 National Archaeology Code of Practice

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

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

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

13 Bord na Móna Biodiversity Action Plan 2016-2021

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

One example of a key CBD target is:

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

The EUs headline target for progress by 2020 is to:

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

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

14 Bord na Móna Commitments

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

In line with Bord na Móna's accelerated decarbonisation programme, the company made a further commitment to a significantly larger rehabilitation target. This was reflected in our plans to rehabilitate a further 20,000 hectares of cutaway and cutover bog to wetland and woodland mosaics by 2025. In addition, we planned to restore a further 1,000 hectares of raised bog habitat by 2025. 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. Bord na Móna 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, Bord na Móna 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 Bord na Móna. The company will continue to demonstrate environmental responsibility and continue to deliver on these commitments in relation to peatland rehabilitation and in relation to the future management of these lands to maximise their benefits, particularly their ecosystem service benefits, along with the sustainable development of a portion of the land bank for other uses, such as renewable energy.

APPENDIX VII: DECOMMISSIONING

1. Condition 10 Decommissioning

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

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

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

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

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

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

Item	Description	Bloomhill East Decommissioning Plan
1	Clean-up of remaining or unconsolidated waste or materials located in Bogs, Yards, Buildings and Offices	Clean-up of Bog
2	Cleaning Silt Ponds	Cleaning Silt Ponds
3	Decommissioning Peat Stockpiles	Peat Stockpile Management
4	Decommissioning or Removal of Buildings and Compounds	Decommissioning or Removal of Buildings and Compounds
5	Decommissioning Fuel Tanks and associated facilities	Where relevant
6	Decommissioning and Removal of Bog Pump Sites	Where relevant
7	Decommissioning or Removal of Septic Tanks	Where relevant

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

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

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

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

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

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

waste.

7.3.3 The ultimate destination of the waste.

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

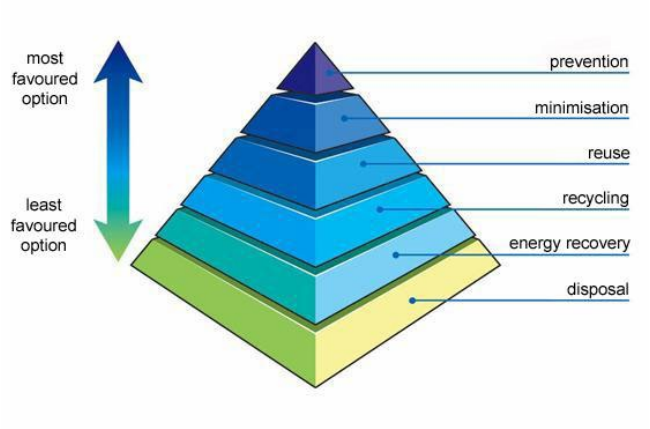
7.3.5 The tonnages and EWC Code for the waste materials listed in *Schedule 2(i) Hazardous Wastes for Disposal/Recovery* and *Schedule 2(ii) Other Wastes for Disposal/Recovery* sent off-site for disposal/recovery.

7.3.6 Details of any rejected consignments.

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

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

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



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

2. Enhanced Decommissioning.

The remaining infrastructure does not constitute a risk to the environment and would not be a requirement of condition 10 of the licence. The removal of these are deemed as enhanced measures. These may enhance the future after use 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	Bloomhill East Decommissioning Plan
1	Removal of Railway Lines	Removal of Railway Lines
2	Decommissioning Bridges and Underpasses	Where Applicable
3	Decommissioning Railway Level Crossing	Where Applicable
4	Restricting Access (bogs and silt ponds)	Restricting Access to Bog
5	Removal of High Voltage Power Lines	Where Applicable

APPENDIX VIII: GLOSSARY

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

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

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

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

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

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

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

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

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

APPENDIX IX: EXTRACTIVE WASTE MANAGEMENT PLAN

(Minimisation, treatment, recovery and disposal)

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

Scope:
This plan covers IPPC Licence's Ref P0502-01, Blackwater group of bogs located in Co. 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 ores levelled out. As required by condition 6.6, these silt lagoons are cleaned twice per annum or more often if inspections dictate. These silt cleanings are also deposited on the same location, adjacent to the silt pond, where they may be levelled periodically to allow room for subsequent cleanings. These mounds of silt pond excavation material and cleanings are generally no higher that 2-3 metres.

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

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

2.0 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 31st of December 2012. The Plan shall be reviewed at least once every five years thereafter in a manner agreeable to the Agency and amended in the event of substantial changes to the operation of a waste facility or to the waste deposited. Any amendments shall be notified to the Agency.
All extractive waste shall be managed in accordance with the Extractive Waste Management Plan. A report on the implementation of the Extractive Waste Management Plan shall be provided in the AER.

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

2.3 Condition 7.7 Excavation Voids
7.7.1 Unless otherwise agreed by the Agency, only extractive waste shall be placed in excavation voids.
7.7.2 When placing extractive waste into excavation voids for rehabilitation and construction purposes, the licensee shall, in accordance with regulation 10 of the Waste Management (Management of Waste from the Extractive Industries) Regulations, 2009, and the Extractive Waste Management Plan:

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

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

3.0 Minimisation.
3.1 Silt pond excavation material and cleanings.
IPPC Licence conditions require all production areas to be serviced by an appropriately designed silt pond based on storage volume and retention time. Condition 6.6 requires all ponds to be cleaned bi-annually and more often if inspections dictate, so the only opportunity for minimisation of same is

through Standard Operating Procedures. These are required under condition 2.2.2 (i) regarding minimisation of suspended solids, and are in-place to minimise the generation of silt, which in-turn will minimise the generation of silt pond waste.

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

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

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

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

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

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

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

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

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

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

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

7.0 Extractive Waste Management Plan

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

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

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

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

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

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

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

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

Classification in accordance Annex II.

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

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

Closure plan. (Bog Rehabilitation Plan).
Condition 10.1 – 10.3 of the IPPC Licence requires the following:

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

10.2 Cutaway Bog Rehabilitation Plan:

- 10.2.1 The licensee shall prepare, to the satisfaction of the Agency, a fully detailed and costed plan for permanent rehabilitation of the cutaway boglands within the licensed area. This plan shall be submitted to the Agency for agreement within eighteen months of the date of grant of this licence.

- 10.2.2 The plan shall be reviewed every two years and proposed amendments thereto notified to the Agency for agreement as part of the AER. No amendments may be implemented without the written agreement of the Agency.

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

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

10.4 A final validation report to include a certificate of completion for the Rehabilitation Plan, for all or part of the site as necessary, shall be submitted to the Agency within six months of execution of the plan. The licensee shall carry out such tests, investigations or submit certification, as requested by the Agency, to confirm that there is no continuing risk to the environment. This plan including maps and ecological classifications are available on file at the Allen Clonsast 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 Bog Group IPPC Licence P0502-01.

APPENDIX X: MITIGATION MEASURES FOR THE APPLICATION OF FERTILISER

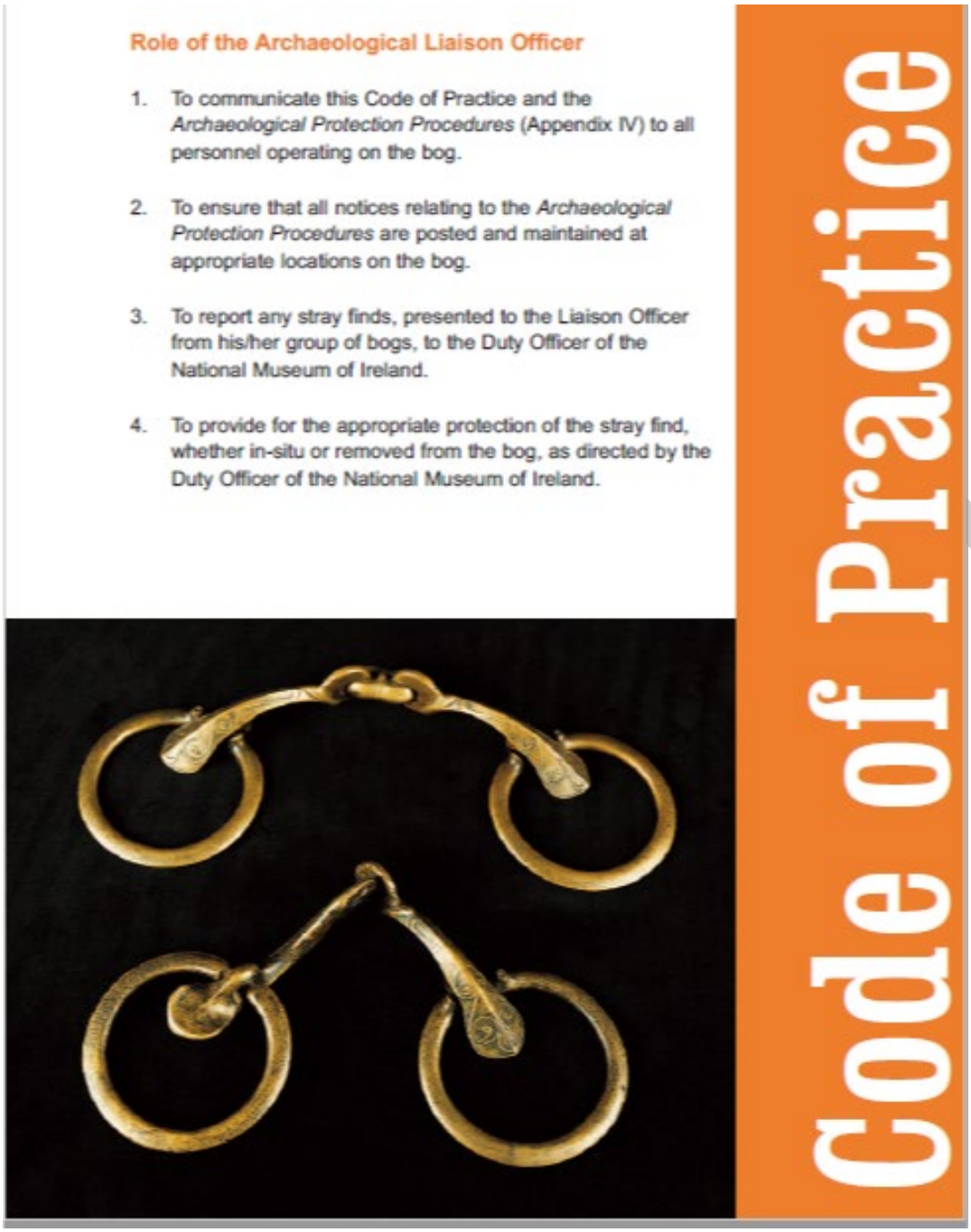
- Any fertiliser used will be Rock Phosphate and will not be applied in the following conditions:
    1. The land is waterlogged;
    2. The land is flooded, or it is likely to flood;
    3. The land is frozen, or covered with snow;
    4. Heavy rain is forecast within 48 hours (forecasts will be checked 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/resources/faqs/environment--you/faq-listing 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



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Code of Practice

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

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

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

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

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

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

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

1) Purpose

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

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

2) Procedure

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

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

Your Archaeological Liaison Officer is ……

3) Records

Revision Index			
Revision	Date	Description of change	Approved
1	13/09/2020	First release	EMcD
2			

Archaeological Impact Assessment of Proposed Bog Decommissioning and Rehabilitation at Bloomhill East Bog, Cos. Offaly and Westmeath

Draft

Report For

Bord Na Móna Energy Ltd.

Author

Dr. Charles Mount

Bord Na Móna Project Archaeologist

Introduction

The EPA (2020) *Guidance on the process of preparing and implementing a bog rehabilitation plan* notes that the licensee should characterise the bog prior to embarking on detailed planning and implementation. This characterisation should detail how the land is classified in terms of statutory protections, e.g. as European sites, world heritage sites, RAMSAR sites, National Heritage Areas, national monuments, archaeological heritage, etc. This archaeological impact assessment report was prepared by Dr. Charles Mount for Bord na Móna Energy Ltd to fulfil this characterisation in relation to archaeological heritage. It represents the results of a desk-based assessment and field survey of the impact of proposed bog rehabilitation of c.333 hectares at Bloomhill East Bog, Cos. Offaly and Westmeath on the known archaeological heritage of the bog. The proposed rehabilitation actions will be a combination of measures to create wetlands and re-wet deep peat as outlined in the draft Methodology Paper for the proposed Bord na Móna Decommissioning, Rehabilitation and Restoration Scheme. These enhanced measures for Bloomhill East Bog will include (See Table 1):

Type	Rehab Code	Enhanced Rehabilitation Measure	Extent (Ha)
Dry Cutaway	DCT1	Modifying outfalls and managing water levels with overflow pipes.	15.7
	DCT2	Regular drain blocking (3/100m), modifying outfalls and managing water levels with overflow pipes and targeted fertiliser treatment.	46.5
Wetland	WLT2	Turn off or reduce pumping to re-wet cutaway, blocking outfalls and managing water levels with overflow pipes and targeted blocking of outfalls within a site.	0.7
	WLT4	More intensive drain blocking (max 7/100 m), modifying outfalls and managing overflows, transplanting Reeds and other rhizomes.	164.3
Deep Peat	DPT2	More intensive drain blocking (max 7/100 m) and modifying outfalls and managing overflows.	35.4
	DPT3	More intensive drain blocking (max 7/100 m), + field reprofiling + modifying outfalls and managing overflows.	11.2
Marginal land	MLT1	No work required.	28.9
Marginal land	MLT2	Targeted Drain Blocking.	0.8
Additional Work	AW2	Targeted Drain Blocking.	6
Silt ponds	Silt pond	Silt ponds.	0.9

Constraint	Constraint	Other Constraints (Rights of Way, Turf cutting, Amenity, Archaeology, extant high bog).	23
Total			**333.4**

Table 1. Types of and areas for enhanced rehabilitation measures at Bloomhill East Bog.

- Drain blocking around existing wetland or standing water to create/promote the spread of wetland habitats.
- Re-wetting some areas of the bog through regular field drain blocking to create three peat barriers every 100 m along each field drain.
- The creation of berms across some sections of the bog to control/retain water levels. This measure seeks to retain shallow (< 10 cm) water conditions across multiple fields.
- Re-alignment of piped drainage and the creation of high-level swales through high fields to manage water levels and water flows through the site.
- Modifying water levels at outfalls, as it may be desirable to change and control water levels at the site over time, e.g. to increase water levels as the site becomes increasingly vegetated. This will further slow the movement of water through and out of Bloomhill East Bog.
- Some small bog remnants around the margins of the bog will be targeted for drain-blocking.
- Deep Peat measures including field re-profiling, on deeper peat; intensive drain blocking (max 7/100 m) and modifying outfalls, and management of water levels with overflow pipes and blocking of internal outfalls.
- Regular drain blocking (3/100) on dry cutaway along with the modifying outfalls and management of water levels, along with organic fertiliser application.
- Targeted fertiliser applications to accelerate vegetation establishment on areas of bare peat on headlands and high fields, and within certain areas of dry cutaway. Areas where vegetation has established do not need fertiliser application.
- Initial hydrological modelling indicates 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. It is inevitable that some small sections will naturally have deeper water due to the topography at this site). Water-levels will be adjusted at outfalls and by adjusting piped drainage.
- Inoculation of Sphagnum will be considered in the future as part of the Peatlands and People LIFE project.
- The existing silt ponds will be retained and maintained during the rehabilitation phase. During the monitoring and verification phase the silt ponds will be continually inspected and maintained, where appropriate. When it is deemed that the silt ponds are not required, as the bog has been successfully stabilised and there is no silt run-off, the condition of the silt ponds will be reviewed. The silt ponds will either be de-watered (water levels lowered to a level where the silt pond will naturally develop as a small wetland feature), left in situ, or infilled (where discharges do not require silt control).

Bloomhill East Bog is located c.1km west of Ballinahown, Co. Westmeath, and west of the N62 road. The bog is east of the dryland island of Bloomhill and the Offaly/Westmeath county boundary runs through the bog. The overall rehabilitation area occupies the townlands of Ballynahownwood, Clonaderg, and Cloncraff or Bloomhill, on OS 6 inch sheets Offaly No. 6 and Westmeath No. 35.

Methodology

This is a desk-based archaeological assessment that includes a collation of existing written and graphic information to identify the likely archaeological potential of Bloomhill East Bog followed by a field survey. The overall extent of the rehabilitation is indicated in Fig. 1. This area was examined using information from:

- The IAWU Peatland Survey
- Bord na Móna Re-assessment survey 2009
- The Sites and Monuments Record that is maintained by the Dept of Housing, Local Government and Heritage
- The topographical files of the National Museum of Ireland.
- The Excavations database
- Previous assessments
- Field survey

An impact assessment has been prepared, and recommendations have been made.

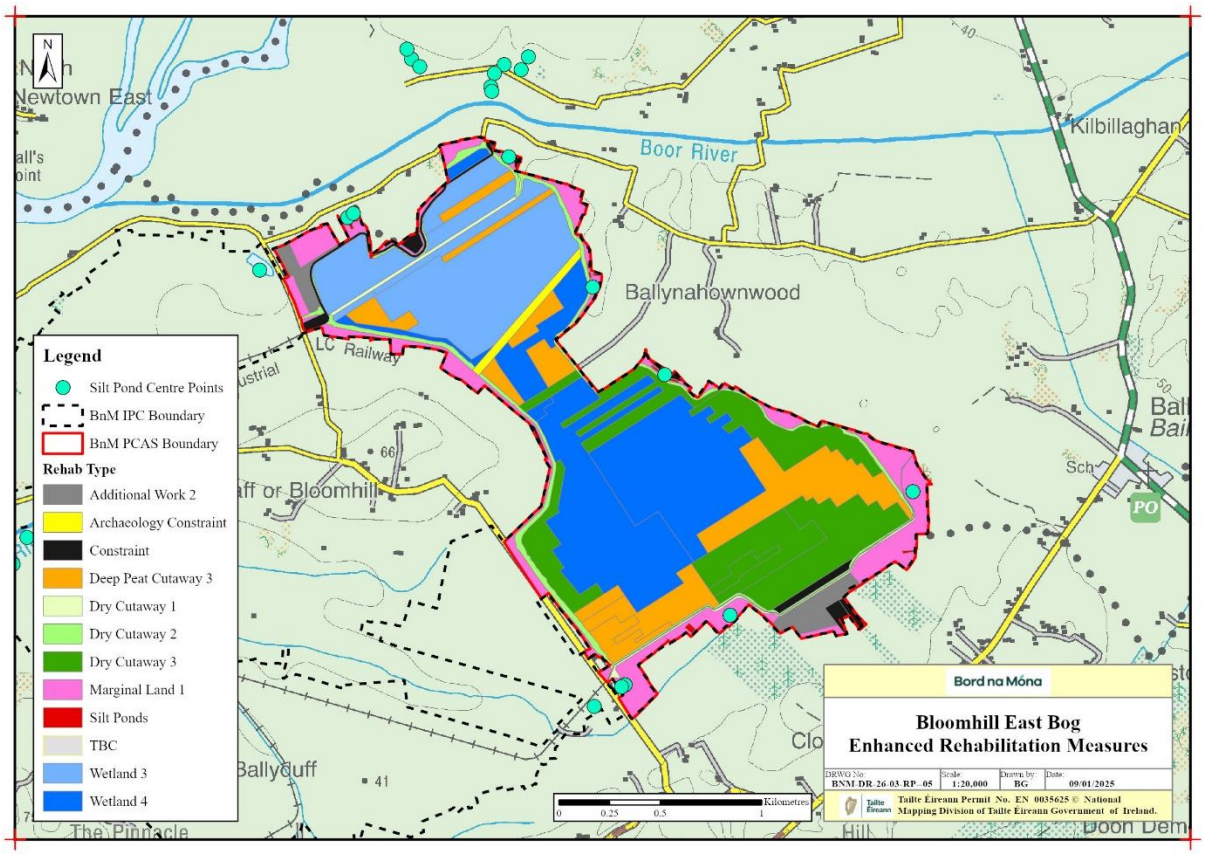

Fig. 1. Bloomhill East Bog, Cos. Offaly and Westmeath.

Desktop assessment

1980s Excavations

After the report of the discovery of a Road - gravel/stone trackway running for 0.95km across Bloomhill East Bog (RMP WM035-017/OF006-001001) in Bloomhill to Ballynahownwood townlands to the National Museum of Ireland the monument was excavated on behalf of the Bord na Móna and the office of Public Works by Thaddeus Breen in 1983 and 1986 (E395, Breen *et al.* 1988). Two cuttings were excavated each at the Offaly and Westmeath ends of the trackway. The trackway was found to be a multi-period construction dating from the sixth to thirteenth centuries AD.

Peatland survey

Bloomhill East Bog was surveyed by the Irish Archaeological Wetland Unit (IAWU) in 1992 as part of the Archaeological Survey of Ireland Peatland Survey (Unlicensed). Forty-three sightings of archaeological material were made (see Table 2). There are records of the depth below the contemporary bog surface of the sightings. Thirty-seven of the sightings were identified on the of surface and the remaining 15 ranged from 0.08-0.91m below the surface. These archaeological sightings were notified to the Archaeological Survey of Ireland. The medieval Road-Gravel/Stone trackway (WM-035-017/OF006-001001) (excavated in 1983 and 1986 by Breen, E395) was also excavated by the Aonghus Moloney and Conor McDermott of the IAWU in 1992 (92E0176) with a cutting at the Westmeath Ballynahownwood townland end.

SMR_NO	SMR Class	IAWU Cat._No.	IAWU Class	Townland	ITM E	ITM N	Depth BS m
OF006-001001-	Redundant record	OF-CBL 0021	WOWO	Cloncraff or Bloomhill	604803	732802	0.25
OF006-001002-	Road - class 3 togher	OF-CBL 0014	TOGH	Cloncraff or Bloomhill	606891	733839	0.00
OF006-001003-	Road - class 3 togher	OF-CBL 0012	TOGH	Cloncraff or Bloomhill	606866	733804	0.00
OF006-001004-	Road - class 2 togher	OF-CBL 0004	TOGH	Cloncraff or Bloomhill	606974	733798	0.00
OF006-077----	Road - class 2 togher	OF-CBL 0008	TOGH	Cloncraff or Bloomhill	607082	733642	0.00
OF006-084---- WM035-017----	Road - gravel/stone trackway - peatland	OF-CBL 0001	GRRD	Cloncraff or Bloomhill	606868	734033	0.00
OF006-085----	Redundant record	OF-CBL 0002	WOWO	Cloncraff or Bloomhill	606878	733812	0.08
OF006-086----	Redundant record	OF-CBL 0003	WOWO	Cloncraff or Bloomhill	607184	733438	0.00
OF006-087----	Road - class 3 togher	?	-	Cloncraff or Bloomhill	607017	733757	-
OF006-088----	Redundant record	OF-CBL 0005	TOGH	Cloncraff or Bloomhill	607017	733756	0.00
-	-	OF-CBL 0006	WOWO	Cloncraff or Bloomhill	607048	733772	0.00
OF006-089----	Redundant record	OF-CBL 0007	WOWO	Cloncraff or Bloomhill	606999	733837	0.00
OF006-090----	Redundant record	I OF-CBL 0009	WOWO	Cloncraff or Bloomhill	606911	733802	0.10
OF006-091----	Road - class 3 togher	OF-CBL 0010	TOGH	Cloncraff or Bloomhill	606927	733807	0.00
OF006-092----	Redundant record	OF-CBL 0013	WOWO	Cloncraff or Bloomhill	606898	733829	0.00
OF006-093----	Redundant record	OF-CBL 0015	WOWO	Cloncraff or Bloomhill	607042	733734	0.00
-	-	OF-CBL 0016	WOWO	Cloncraff or Bloomhill	606951	733632	0.00
OF006-100----	Redundant record	OF-CBL 0024	PORO	Cloncraff or Bloomhill	607074	733698	0
OF006-101----	Redundant record	OF-CDG 0001	WOWO	Clonaderg	608168	732753	0.00
OF006-102----	Redundant record	OF-CDG 0002	WOWO	Clonaderg	608089	732734	0.10
OF006-103----	Redundant record	OF-CDG 0003	WOWO	Clonaderg	608148	732774	0.00
OF006-104----	Redundant record	OF-CDG 0004	WOWO	Clonaderg	608084	732773	0.20
WM035-016----	Road - class 3 togher	WM-BHD 0020	TOGH	Ballynahownwood	607197	733739	0.17
OF006-084---- WM035-017----	Road - gravel/stone trackway – peatland	WM-BHD 0021	GRRD	Cloncraff or Bloomhill	607099	734048	0.00
WM035-018----	Road - class 2 togher	WM-BHD 0001	TOGH	Ballynahownwood	607162	733493	0.00
WM035-019----	Road - class 3 togher	WM-BHD 0002	TOGH	Ballynahownwood	607198	734208	0.00
WM035-020----	Redundant record	WM-BHD 0003	WOWO	Ballynahownwood	607030	733993	0.00
WM035-021----	Structure - peatland	WM-BHD 0004	WOWO	Ballynahownwood	607013	733982	0.00
WM035-022----	Road - class 3 togher	WM-BHD 0005	WOWO	Ballynahownwood	607021	733908	0.00
WM035-023----	Redundant record	WM-BHD 0006	WOWO	Ballynahownwood	607137	733992	0.00

WM035-024----	Structure - peatland	WM-BHD 0007	WOWO	Ballynahownwood	607144	733988	0.10
WM035-025----	Road - class 3 togher	WM-BHD 0008	TOGH	Ballynahownwood	607158	733987	0.00
WM035-026----	Road - class 3 togher	WM-BHD 0009	WOWO	Ballynahownwood	607181	733913	0.00
WM035-027----	Road - class 3 togher	WM-BHD 0010	TOGH	Ballynahownwood	607077	733818	0.00
WM035-028----	Road - class 3 togher	WM-BHD 0011	TOGH	Ballynahownwood	607154	733802	0.13
WM035-029----	Road - class 3 togher	WM-BHD 0012	WOWO	Ballynahownwood	607086	733828	0.00
WM035-030----	Road - class 3 togher	WM-BHD 0013	TOGH	Ballynahownwood	607071	733845	0.00
WM035-031----	Structure - peatland	WM-BHD 0014	WOWO	Ballynahownwood	607064	733846	0.00
WM035-032----	Redundant record	WM-BHD 0015	WOWO	Ballynahownwood	607050	733791	0.00
WM035-033----	Road - class 3 togher	WM-BHD 0016	WOWO	Ballynahownwood	607207	734200	0.10
WM035-034----	Road - class 3 togher	WM-BHD 0017	TOGH	Ballynahownwood	607230	733736	0.00
WM035-035----	Road - class 3 togher	WM-BHD 0018	WOWO	Ballynahownwood	607064	733822	0.00
WM035-036----	Road - class 3 togher	WM-BHD 0019	TOGH	Ballynahownwood	607209	733760	0.00

Table 2. List of sightings in Bloomhill East Bog made by the IAWU with SMR concordance.

Recorded Monuments

The Record of Monuments and Places (RMP) for Cos. Offaly and Westmeath which was established under Section 12 of the National Monuments (Amendment) Act, 1994 was examined as part of the assessment (DAHGI 1995 and 1997). These records were published by the Minister in 1995 and 1997 and include sites and monuments that were known in Bloomhill East Bog before that date. This review established that there are several RMPs located in the proposed rehabilitation area (see Table 3 and Fig. 1).

SMR_NO	RMP Class	SMR Class	Townland	ITM E	ITM N
OF006-001---	**Togher Complex**	Redundant record Road - class 3 togher Road - class 3 togher Road - class 2 togher	Cloncraff or Bloomhill	604803	732802
OF006-077----	**Togher**	Road - class 3 togher	Cloncraff or Bloomhill	607082	733642

Table 3. Sites in Bloomhill East Bog entered in the RMP.

Sites and Monuments Record

The Sites and Monuments Record (SMR) which is maintained by the Department of Housing, Local Government and Heritage was examined as part of the assessment on the 30th of January 2025. The SMR consists of records included in the RMP and sites and monuments notified to the Dept. since the publication of the RMP. This review established that there are 41 entries in the SMR in the proposed rehabilitation area (see Tables 2 and Fig. 3).

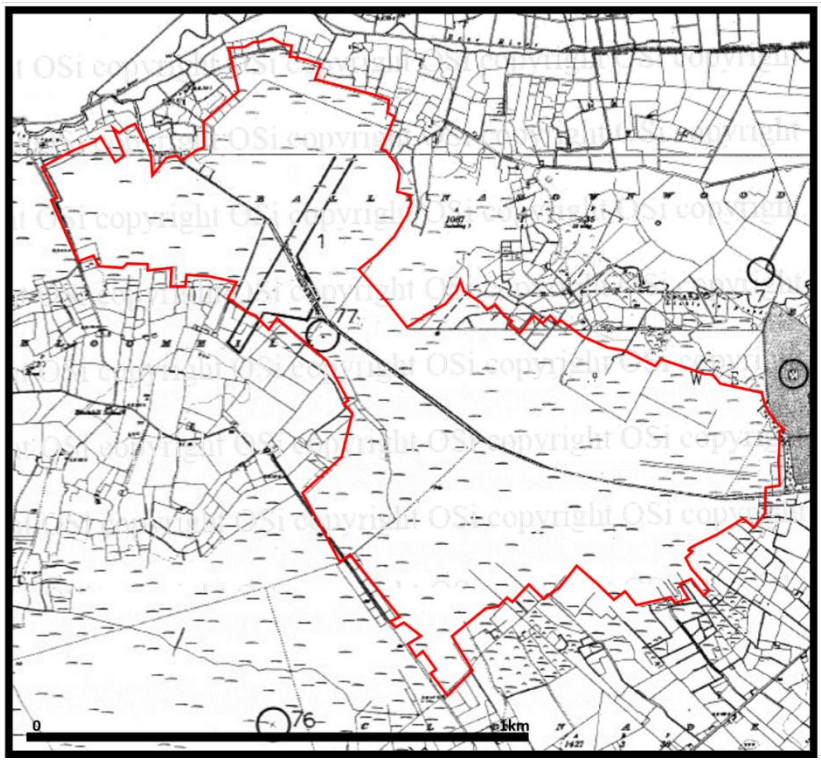

Fig. 1. Bloomhill East Bog, Cos. Offaly and Westmeath, detail of the Record of Monuments and Places map sheets Offaly Nos. 6 and Westmeath No. 35. The proposed rehabilitation area is outlined with the red line. There are Recorded Monuments in the rehabilitation area.

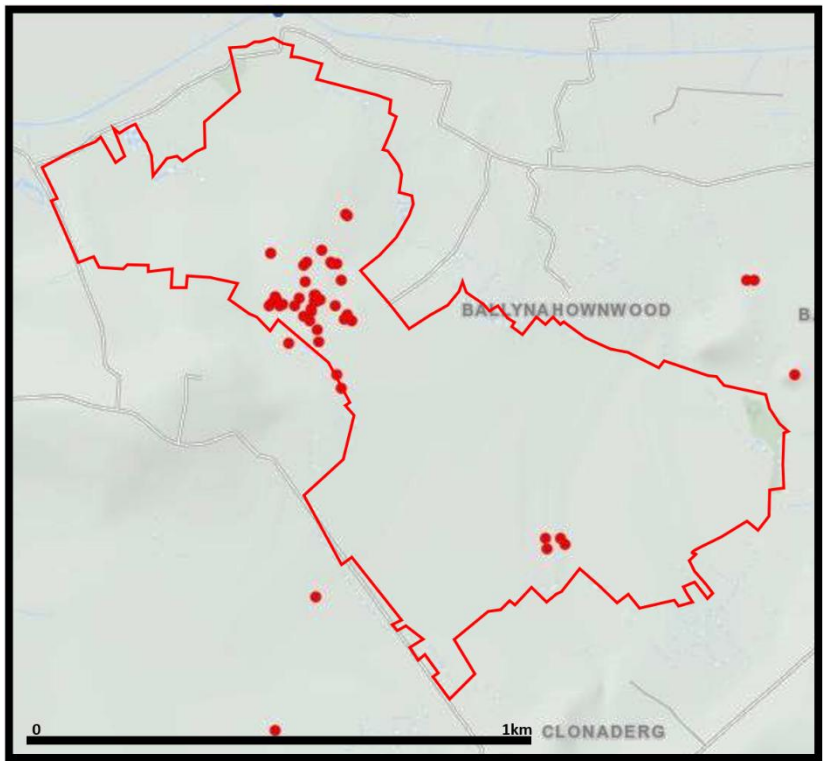

Fig. 2. Bloomhill East Bog, Co. Offaly, detail of the Sites and Monuments Record. The proposed rehabilitation area is outlined with the red line.

Bord na Móna Re-assessment survey 2009

Bloomhill East Bog was re-surveyed by the Bord na Móna Re-assessment survey 2009 (Rohan 2009, License No. 09E0404). At the time of the survey the bog was in production. A handheld GPS was used to find the location of the previously identified sites but, with the exception of the Road - gravel/stone trackway – peatland (RMP OF006-084----/WM035-017----) they were no longer extant. Fifteen sightings of the Road - gravel/stone trackway – peatland (OF-BML001a-0) RMP OF006-084----/WM035-017---- were recorded mostly on the field surface with one in the drain face along with an additional five sightings of new material (see Table 4).

SMR_NO	SMR Class	IAWU Cat._No.	Re-assessment Survey Cat._No.	Townland	ITM E	ITM N	Depth BSm
OF006-084----WM035-017----	Road - gravel/stone trackway - peatland	OF-CBL 0001 WM-BHD 0021	OF-BML001a	Cloncraff or Bloomhill	606896.2	733792.9	-
OF006-084----WM035-017----	Road - gravel/stone trackway - peatland	OF-CBL 0001 WM-BHD 0021	OF-BML001b	Cloncraff or Bloomhill	606929.2	733847.9	-
OF006-084----WM035-017----	Road - gravel/stone trackway - peatland	OF-CBL 0001 WM-BHD 0021	OF-BML001b	Cloncraff or Bloomhill	606963.2	733884.9	-
OF006-084----WM035-017----	Road - gravel/stone trackway - peatland	OF-CBL 0001 WM-BHD 0021	OF-BML001d	Cloncraff or Bloomhill	607004.2	733930.9	-
OF006-084----WM035-017----	Road - gravel/stone trackway - peatland	OF-CBL 0001 WM-BHD 0021	OF-BML001e	Cloncraff or Bloomhill	606963.2	733884.9	-
OF006-084----WM035-017----	Road - gravel/stone trackway - peatland	OF-CBL 0001 WM-BHD 0021	OF-BML001f	Cloncraff or Bloomhill	607072.2	734003.9	-
OF006-084----WM035-017----	Road - gravel/stone trackway - peatland	OF-CBL 0001 WM-BHD 0021	OF-BML001g	Cloncraff or Bloomhill	607108.1	734047.8792	-
OF006-084----WM035-017----	Road - gravel/stone trackway - peatland	OF-CBL 0001 WM-BHD 0021	OF-BML001h	Cloncraff or Bloomhill	607108.2	734079.9	-
OF006-084----WM035-017----	Road - gravel/stone trackway - peatland	OF-CBL 0001 WM-BHD 0021	OF-BML001i	Cloncraff or Bloomhill	607182.2	734121.9	-
OF006-084----WM035-017----	Road - gravel/stone trackway - peatland	OF-CBL 0001 WM-BHD 0021	OF-BML001j	Cloncraff or Bloomhill	607108.2	734079.9	-
OF006-084----WM035-017----	Road - gravel/stone trackway - peatland	OF-CBL 0001 WM-BHD 0021	OF-BML001k	Cloncraff or Bloomhill	607258.1	734218.8	-
OF006-084----WM035-017----	Road - gravel/stone trackway - peatland	OF-CBL 0001 WM-BHD 0021	OF-BML001l	Cloncraff or Bloomhill	607285.1	734246.8	-
OF006-084----WM035-017----	Road - gravel/stone trackway - peatland	OF-CBL 0001 WM-BHD 0021	OF-BML001m	Cloncraff or Bloomhill	607343.1	734310.8	-
OF006-084----WM035-017----	Road - gravel/stone trackway - peatland	OF-CBL 0001 WM-BHD 0021	OF-BML001n	Cloncraff or Bloomhill	607364.1	734349.8	-
OF006-084----WM035-017----	Road - gravel/stone trackway - peatland	OF-CBL 0001 WM-BHD 0021	OF-BML001o	Cloncraff or Bloomhill	607386.1	734368.8	-
-	Archaeological wood	-	OF-BML002	Ballynahownwood	607370.1	733707	0.05
-	Archaeological wood	-	OF-BML003	Ballynahownwood	607297.1	733620	-
-	Hurdle panel	-	OF-BML004	Ballynahownwood	607492.1	733653	0.22
-	Archaeological wood	-	OF-BML005	Ballynahownwood	607492.1	733653	0.20
-	Archaeological wood	-	OF-BML006	Ballynahownwood	607761	733733.9	0.31

Table 4. Sightings of archaeological material in Bloomhill East Bog made during the 2009 Re-assessment survey.

Previous assessments

Bloomhill East Bog has been the subject of an Environmental Impact Assessment Report caried out by Irish Archaeological Consultancy LTD in 2018 for Bord na Móna Energy Limited in relation to IPC Licence P0500-

01. The assessment noted the sightings made in the IAWU survey in 1992 and the 2009 Re-assessment Survey and noted that there was a moderate to high potential for archaeological features to be uncovered during the course of any future development works in Bloomhill East Bog. This assessment included a review of the topographical files and finds registers of the National Museum of Ireland intended to identify all archaeological objects from the bog reported to the Museum by that date and these are included below in Table 4 (Pers Comm. Jane Whitaker).

Reported finds

As noted above the EIAR carried out by Irish Archaeological Consultancy LTD in in relation to IPC Licence contains a complete list of the known archaeological objects from Bloomhill East Bog reported to the National Museum of Ireland up to 2018 and these are included in Table 5.

Townland	Museum No.	Description
Clonascra	1965:46	Pot quern stone
Clonascra	1977:2188.1-4	4 wooden pegs

Table 5. List of archaeological finds from Bloomhill East Bog reported to the National Museum of Ireland.

Archaeological investigations

Reports of additional archaeological excavations and licensed monitoring in the study area listed in the excavations database at excvations.ie were examined as part of the assessment. There are no additional reports of archaeological investigation carried out in the rehabilitation area.

Field Survey

A field survey of Bloomhill Bog will be completed in 2025.Bloomhill Bog is considered to be suitable for a field survey as it:

- has wide drains at regular spaced intervals,
- appears from recent aerial photography not to be densely overgrown with vegetation.

Impact assessment

A total of 63 sightings of archaeological material were identified and recorded in Bloomhill East Bog by the IAWU in 1992 and the Re-assessment Survey in 2009 and 41 of these were entered into the Sites and Monuments Record. The Re-assessment Survey 2009 found that none of the sightings made by the IAWU in 1992 survived except for the Road - gravel/stone trackway (RMP WM-035-017/OF006-001001) that extends across Cloncraff or Bloomhill and Ballynahownwood townlands. This was identified in fifteen sightings (OF-BML001a-o). Five sightings of additional archaeological material were made in 2009 (see Table 6). Examination of LIDAR depth data at the locations of the 2009 sightings indicates that the line of the Road - gravel/stone trackway RMP WM-035-017/OF006-001001 survives. This monument is also visible in aerial photography and LIDAR imagery (see Fig. 3). The other sightings numbered OF-BML002-6 need to be checked by the field survey.

SMR_NO	SMR Class	IAWU Cat._No.	Re-assessment Survey Cat._No.	Townland	ITM E	ITM N	Depth BSm	2020 depth	2008 depth	Status
OF006-084----WM035-017----	Road - gravel/stone trackway	OF-CBL 0001 WM-BHD 0021	OF-BML001a	Cloncraff or Bloomhill	606896.2	733792.9	-	3.59	4.10	Extant
OF006-084----WM035-017----	Road - gravel/stone trackway	OF-CBL 0001 WM-BHD 0021	OF-BML001b	Cloncraff or Bloomhill	606929.2	733847.9	-	4.08	4.63	Extant

OF006-084----WM035-017----	Road - gravel/stone trackway	OF-CBL 0001 WM-BHD 0021	OF-BML001b	Cloncraff or Bloomhill	606963.2	733884.9	-	4.49	4.63	Extant
OF006-084----WM035-017----	Road - gravel/stone trackway	OF-CBL 0001 WM-BHD 0021	OF-BML001d	Cloncraff or Bloomhill	607004.2	733930.9	-	4.03	4.41	Extant
OF006-084----WM035-017----	Road - gravel/stone trackway	OF-CBL 0001 WM-BHD 0021	OF-BML001e	Cloncraff or Bloomhill	606963.2	733884.9	-	4.49	4.63	Extant
OF006-084----WM035-017----	Road - gravel/stone trackway	OF-CBL 0001 WM-BHD 0021	OF-BML001f	Cloncraff or Bloomhill	607072.2	734003.9	-	4.03	4.19	Extant
OF006-084----WM035-017----	Road - gravel/stone trackway	OF-CBL 0001 WM-BHD 0021	OF-BML001g	Cloncraff or Bloomhill	607108.1	734047.8792	-	3.63	4.08	Extant
OF006-084----WM035-017----	Road - gravel/stone trackway	OF-CBL 0001 WM-BHD 0021	OF-BML001h	Cloncraff or Bloomhill	607108.2	734079.9	-	3.68	3.49	Extant
OF006-084----WM035-017----	Road - gravel/stone trackway	OF-CBL 0001 WM-BHD 0021	OF-BML001i	Cloncraff or Bloomhill	607182.2	734121.9	-	3.75	2.86	Extant
OF006-084----WM035-017----	Road - gravel/stone trackway	OF-CBL 0001 WM-BHD 0021	OF-BML001j	Cloncraff or Bloomhill	607108.2	734079.9	-	3.68	3.49	Extant
OF006-084----WM035-017----	Road - gravel/stone trackway	OF-CBL 0001 WM-BHD 0021	OF-BML001k	Cloncraff or Bloomhill	607258.1	734218.8	-	3.16	3.60	Extant
OF006-084----WM035-017----	Road - gravel/stone trackway	OF-CBL 0001 WM-BHD 0021	OF-BML001l	Cloncraff or Bloomhill	607285.1	734246.8	-	3.65	3.62	Extant
OF006-084----WM035-017----	Road - gravel/stone trackway	OF-CBL 0001 WM-BHD 0021	OF-BML001m	Cloncraff or Bloomhill	607343.1	734310.8	-	3.33	3.93	Extant
OF006-084----WM035-017----	Road - gravel/stone trackway	OF-CBL 0001 WM-BHD 0021	OF-BML001n	Cloncraff or Bloomhill	607364.1	734349.8	-	3.89	4.30	Extant
OF006-084----WM035-017----	Road - gravel/stone trackway	OF-CBL 0001 WM-BHD 0021	OF-BML001o	Cloncraff or Bloomhill	607386.1	734368.8	-	3.87	4.24	Extant
-	Archaeological wood	-	OF-BML002	Ballynahown wood	607370.1	733707	0.05	3.57	4.68	?
-	Archaeological wood	-	OF-BML003	Ballynahown wood	607297.1	733620	-	2.54	3.94	?
-	Hurdle panel	-	OF-BML004	Ballynahown wood	607492.1	733653	0.22	3.57	4.71	?
-	Archaeological wood	-	OF-BML005	Ballynahown wood	607492.1	733653	0.20	3.57	4.71	?
-	Archaeological wood	-	OF-BML006	Ballynahown wood	607761	733733.9	0.31	2.62	3.51	?

Table 6. Sightings of archaeological material in Bloomhill East Bog made during the 2009 Re-assessment survey with the depth of peat removed since 2008.

Fig. 3. Bloomhill East Bog, Co. Offaly. Google earth aerial image taken May 2021 indicating the extent of the Road - gravel/stone trackway RMP WM-035-017/OF006-001001 crossing the bog.

Recommendations

The line of the Road - gravel/stone trackway RMP WM-035-017/OF006-001001 which extends extends across Cloncraff or Bloomhill and Ballynahownwood townlands should be preserved *in situ* with a 20m buffer zone (see Table 7). Should any previously unknown archaeological material be uncovered during the rehabilitation works, it should be avoided and reported to the Bord na Móna Archaeological Liaison Officer and the National Museum of Ireland.

Note this is a draft desktop report and will be revised with the results of the field survey carried out in 2025. As there will be a full field survey observing the surfaces and every second drain face, archaeological monitoring during rehabilitation works is not recommended.

SMR_NO	SMR Class	IAWU Cat._No.	Re-assessment Survey Cat._No.	Townland	ITM E	ITM N	Status	Recommendation
OF006-084----WM035-017----	Road - gravel/stone trackway	OF-CBL 0001 WM-BHD 0021	OF-BML001a	Cloncraff or Bloomhill	606896.2	733792.9	Extant	20m Buffer zone
OF006-084----WM035-017----	Road - gravel/stone trackway	OF-CBL 0001 WM-BHD 0021	OF-BML001b	Cloncraff or Bloomhill	606929.2	733847.9	Extant	20m Buffer zone
OF006-084----WM035-017----	Road - gravel/stone trackway	OF-CBL 0001 WM-BHD 0021	OF-BML001b	Cloncraff or Bloomhill	606963.2	733884.9	Extant	20m Buffer zone
OF006-084----WM035-017----	Road - gravel/stone trackway	OF-CBL 0001 WM-BHD 0021	OF-BML001d	Cloncraff or Bloomhill	607004.2	733930.9	Extant	20m Buffer zone
OF006-084----WM035-017----	Road - gravel/stone trackway	OF-CBL 0001 WM-BHD 0021	OF-BML001e	Cloncraff or Bloomhill	606963.2	733884.9	Extant	20m Buffer zone
OF006-084----WM035-017----	Road - gravel/stone trackway	OF-CBL 0001 WM-BHD 0021	OF-BML001f	Cloncraff or Bloomhill	607072.2	734003.9	Extant	20m Buffer zone
OF006-084----WM035-017----	Road - gravel/stone trackway	OF-CBL 0001 WM-BHD 0021	OF-BML001g	Cloncraff or Bloomhill	607108.1	734047.8792	Extant	20m Buffer zone
OF006-084----WM035-017----	Road - gravel/stone trackway	OF-CBL 0001 WM-BHD 0021	OF-BML001h	Cloncraff or Bloomhill	607108.2	734079.9	Extant	20m Buffer zone

OF006-084----WM035-017----	Road - gravel/stone trackway	OF-CBL 0001 WM-BHD 0021	OF-BML001i	Cloncraff or Bloomhill	607182.2	734121.9	Extant	20m Buffer zone
OF006-084----WM035-017----	Road - gravel/stone trackway	OF-CBL 0001 WM-BHD 0021	OF-BML001j	Cloncraff or Bloomhill	607108.2	734079.9	Extant	20m Buffer zone
OF006-084----WM035-017----	Road - gravel/stone trackway	OF-CBL 0001 WM-BHD 0021	OF-BML001k	Cloncraff or Bloomhill	607258.1	734218.8	Extant	20m Buffer zone
OF006-084----WM035-017----	Road - gravel/stone trackway	OF-CBL 0001 WM-BHD 0021	OF-BML001l	Cloncraff or Bloomhill	607285.1	734246.8	Extant	20m Buffer zone
OF006-084----WM035-017----	Road - gravel/stone trackway	OF-CBL 0001 WM-BHD 0021	OF-BML001m	Cloncraff or Bloomhill	607343.1	734310.8	Extant	20m Buffer zone
OF006-084----WM035-017----	Road - gravel/stone trackway	OF-CBL 0001 WM-BHD 0021	OF-BML001n	Cloncraff or Bloomhill	607364.1	734349.8	Extant	20m Buffer zone
OF006-084----WM035-017----	Road - gravel/stone trackway	OF-CBL 0001 WM-BHD 0021	OF-BML001o	Cloncraff or Bloomhill	607386.1	734368.8	Extant	20m Buffer zone

Table 7. Sightings of the Road - gravel/stone trackway RMP WM-035-017/OF006-001001 that survive in Bloomhill East Bog with ITM coordinates.

Conclusion

This is a desk-based archaeological assessment and includes a collation of existing written and graphic information to identify the likely archaeological potential of the proposed rehabilitation area. The line of the Road - gravel/stone trackway RMP WM-035-017/OF006-001001 which extends extends across Cloncraff or Bloomhill and Ballynahownwood townlands should be preserved *in situ* with a 20m buffer zone. Should any previously unknown archaeological material be uncovered during the rehabilitation works, it should be avoided and reported to the Bord na Móna Archaeological Liaison Officer and the National Museum of Ireland.

Note this is a draft desktop report and will be revised with the results of the field survey carried out in 2025. As there will be a full field survey observing the surfaces and every second drain face, archaeological monitoring during rehabilitation works is not recommended.

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Dr. Charles Mount
4 February 2025

APPENDIX XIII: WATER QUALITY MONITORING RESULTS FOR BLOOMHILL EAST BOG

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	Bloomhill East	SW36	N/S	8	N/S	<2	N/S	N/S	5	<2	11	7	3	<2	3	2	7	11	4	3	3	2	2	n/s	<2	14	5	2	
Blackwater	P0502-01	Bloomhill East	SW37	N/S	10	N/S	<2	N/S	N/S	<2	<2	7	3	8	<2	4	<2	2	<2	<2	<2	<2	<2	<2	n/s	<2	2	10	<2	
Blackwater	P0502-01	Bloomhill East	SW40	3	8	N/S	3	N/S	N/S	<2	20	8	5	<2	<2	<2	<2	2	4		4	14	13	<2	n/s	7	3	2	3	
Blackwater	P0502-01	Bloomhill East	SW41	<2	13	N/S	<2	N/S	N/S	<2	<2	<2	<2	<2	<2	<2	<2	3	2	<2	<2	<2	<2	3	n/s	<2	<2	<2	5	
Blackwater	P0502-01	Bloomhill East	SW42	<2	31	N/S	2	N/S	N/S	<2	<2	6	<2	6	<2	<2	<2	2	7	<2	2	<2	<2	<2	n/s	<2	5	<2	3	
Blackwater	P0502-01	Bloomhill East	SW43	13	3	N/S	<2	N/S	N/S	<2	15	12	4	12	<2	3	<2	<2	5	2	3	16	8	6	n/s	<2	20	5	7	
Blackwater	P0502-01	Bloomhill East	SW45	N/S	4	N/S	N/S	N/S	N/S	<2	<2	<2	2	<2	<2	<2	<2	5	3	3	<2	<2	3	n/s	<2	<2	N/S	N/S		
		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				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	Bloomhill East	SW36	N/S	241	N/S	218	N/S	N/S	243	206	201	192	150	159	191	216	261	190	191	150	146	140	124	N/S	111	268	305	134	
Blackwater	P0502-01	Bloomhill East	SW37	N/S	404	N/S	348	N/S	N/S	376	312	308	346	282	399	396	377	351	280	2220	170	155	175	161	N/S	136	293	486	250	
Blackwater	P0502-01	Bloomhill East	SW40	522	486	N/S	486	N/S	N/S	558	434	328	572	289	427	411	494	211	171	N/S	383	382	386	255	N/S	324	430	522	345	
Blackwater	P0502-01	Bloomhill East	SW41	224	211	N/S	219	N/S	N/S	272	214	185	260	170	186	166	166	168	188	177	163	168	175	191	N/S	220	294	215	123	
Blackwater	P0502-01	Bloomhill East	SW42	223	224	N/S	229	N/S	N/S	275	114	182	256	131	162	135	146	137	263	114	146	129	145	108	N/S	223	266	190	121	
Blackwater	P0502-01	Bloomhill East	SW43	270	161	N/S	141	N/S	N/S	200	335	330	296	279	232	199	141	116	158	150	179	298	310	277	N/S	285	506	350	401	
Blackwater	P0502-01	Bloomhill East	SW45	N/S	198	N/S	N/S	N/S	N/S	228	239	181	268	200	194	136	158	153	209	162	156	146	169	222	N/S	220	184	N/S	N/S	
		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	Bloomhill East	SW36	N/S	54	N/S	51	N/S	N/S	72	78	80	78	34	57	66	74	93	49	75	59	59	65	60	N/S	56	63	85	93	
Blackwater	P0502-01	Bloomhill East	SW37	N/S	80	N/S	69	N/S	N/S	83	87	82	89	48	100	105	97	92	78	60	49	52	45	58	N/S	51	76	82	72	
Blackwater	P0502-01	Bloomhill East	SW40	121	109	N/S	110	N/S	N/S	109	107	95	120	49	96	106	119	43	47	50	96	107	98	78	N/S	91	121	126	122	
Blackwater	P0502-01	Bloomhill East	SW41	57	54	N/S	57	N/S	N/S	66	75	75	82	20	64	55	50	57	56	72	58	61	75	69	N/S	69	50	48	58	
Blackwater	P0502-01	Bloomhill East	SW42	48	49	N/S	23	N/S	N/S	60	43	64	66	61	55	37	45	51	63	48	43	41	55	42	N/S	66	59	51	48	
Blackwater	P0502-01	Bloomhill East	SW43	63	50	N/S	<10	N/S	N/S	54	64	121	95	77	66	60	47	43	45	48	61	99	82	77	N/S	89	86	70	67	
Blackwater	P0502-01	Bloomhill East	SW45	N/S	49	N/S	N/S	N/S	N/S	60	71	75	86	16	64	63	52	54	45	63	59	60	51	80	N/S	95	72	N/S	N/S	
		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				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	Bloomhill East	SW36	N/S	7.1	N/S	6.5	N/S	N/S	7.4	7.7	7.6	7.7	7.8	7.7	7.6	7.5	7.2	7.5	7.5	7.6	7.8	7.8	7.7	N/S	7.8	7.3	7.2	7	
Blackwater	P0502-01	Bloomhill East	SW37	N/S	7.2	N/S	6.9	N/S	N/S	7.2	7.5	7.4	7.3	7.8	7.4	7.3	7.2	7	7.2	7.3	7.4	7.6	7.3	7.6	N/S	7.7	6.5	6.9	6.9	
Blackwater	P0502-01	Bloomhill East	SW40	7.2	7.1	N/S	6.8	N/S	N/S	6.9	7.3	7.3	7	7.4	7.2	7.2	6.8	6.9	7.3	7.4	7	7.5	7.5	7.4	N/S	7.4	6.8	6.7	6.8	
Blackwater	P0502-01	Bloomhill East	SW41	7.1	7	N/S	6.9	N/S	N/S	6.9	7.6	7.5	7.3	7.5	7.3	7.2	7.2	6.9	7.1	7.1	7.2	7.7	7.6	7.6	N/S	7.3	6.7	7	6.9	
Blackwater	P0502-01	Bloomhill East	SW42	7.6	7.6	N/S	7.4	N/S	N/S	7.3	8.1	7.7	7.7	7.7	7.8	7.7	7.7	7.6	7.4	7.8	7.6	7.9	8	8	N/S	7.6	7	7.4	7.5	
Blackwater	P0502-01	Bloomhill East	SW43	6.4	6.3	N/S	6.2	N/S	N/S	6.5	6.9	6.9	7	7.2	6.9	6.8	6.7	6.5	6.7	6.7	6.8	7.3	7.2	7.1	N/S	7.1	5.8	5.9	5.6	
Blackwater	P0502-01	Bloomhill East	SW45	N/S	6.5	N/S	N/S	N/S	N/S	6.8	7.4	7.8	7.3	7.4	7.3	7.1	6.8	6.6	6.9	7.3	7.3	7.5	7.6	7.5	N/S	7.2	7	N/S	N/S	
		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	Bloomhill East	SW36	N/S	<0.05	N/S	<0.05	N/S	N/S	<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	N/S	<0.05	0.05	<0.05	<0.05	
Blackwater	P0502-01	Bloomhill East	SW37	N/S	<0.05	N/S	<0.05	N/S	N/S	<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	N/S	<0.05	<0.05	<0.05	<0.05	
Blackwater	P0502-01	Bloomhill East	SW40	0.24	0.18	N/S	0.2	N/S	N/S	0.19	0.42	0.35	0.26	0.33	0.23	0.2	0.18	<0.05	<0.05	<0.05	0.15	0.6	<0.05	0.24	N/S	<0.05	0.13	0.22	0.08	
Blackwater	P0502-01	Bloomhill East	SW41	<0.05	<0.05	N/S	<0.05	N/S	N/S	<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	N/S	0.32	<0.05	<0.05	<0.05	
Blackwater	P0502-01	Bloomhill East	SW42	<0.05	<0.05	N/S	<0.05	N/S	N/S	<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	N/S	<0.05	<0.05	<0.05	<0.05	
Blackwater	P0502-01	Bloomhill East	SW43	<0.05	<0.05	N/S	<0.05	N/S	N/S	<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	N/S	<0.05	<0.05	<0.05	<0.05	
Blackwater	P0502-01	Bloomhill East	SW45	N/S	<0.05	N/S	N/S	N/S	N/S	<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	0.12	N/S	<0.05	<0.05	N/S	N/S	
		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	Bloomhill East	SW36	N/S	123	N/S	69	N/S	N/S	211	293	315	311	386	364	307	256	248	255	306	329	326	316	360	N/S	358	251	208	131	
Blackwater	P0502-01	Bloomhill East	SW37	N/S	151	N/S	110	N/S	N/S	143	164	183	206	211	154	215	173	168	141	223	173	180	199	239	N/S	184	138	113	164	
Blackwater	P0502-01	Bloomhill East	SW40	302	246	N/S	243	N/S	N/S	232	357	314	247	390	274	292	257	151	90	124	224	310	219	382	N/S	307	273	258	301	
Blackwater	P0502-01	Bloomhill East	SW41	136	168	N/S	124	N/S	N/S	112	235	243	202	226	181	211	124	158	155	236	186	232	245	198	N/S	134	201	143	193	
Blackwater	P0502-01	Bloomhill East	SW42	222	214	N/S	158	N/S	N/S	153	400	262	243	353	316	261	238	258	164	340	241	322	319	344	N/S	268	74	187	712	
Blackwater	P0502-01	Bloomhill East	SW43	84	67	N/S	40	N/S	N/S	65	138	175	171	166	107	132	79	80	89	100	102	141	129	181	N/S	115	143	52	75	
Blackwater	P0502-01	Bloomhill East	SW45	N/S	26	N/S	N/S	N/S	N/S	118	197	237	151	266	214	173	108	59	169	249	146	25	149	251	N/S	125	191	N/S	N/S	
		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	Bloomhill East	SW36	N/S	0.674	N/S	0.607	N/S	N/S	0.687	0.596	0.312	0.542	0.399	0.896	1.500	1.160	0.703	0.235	0.377	0.292	0.264	0.248	0.224	N/S	0.205	0.259	0.703	0.726	
Blackwater	P0502-01	Bloomhill East	SW37	N/S	0.390	N/S	0.265	N/S	N/S	0.252	1.320	0.530	0.303	0.091	0.354	0.542	0.337	0.367	0.478	0.588	0.542	0.276	0.258	0.839	N/S	0.145	0.163	0.796	0.833	
Blackwater	P0502-01	Bloomhill East	SW40	0.170	0.196	N/S	0.209	N/S	N/S	0.138	0.037	0.927	0.322	0.358	0.327	0.703	0.455	1.200	0.593	0.597	0.170	0.021	0.019	0.337	N/S	0.145	0.143	0.333	0.463	
Blackwater	P0502-01	Bloomhill East	SW41	0.584	0.701	N/S	0.545	N/S	N/S	0.531	0.172	0.198	0.473	0.152	0.347	0.459	0.613	0.646	0.470	0.331	0.381	0.064	0.079	0.055	N/S	0.217	0.303	0.575	0.581	
Blackwater	P0502-01	Bloomhill East	SW42	0.866	1.060	N/S	0.652	N/S	N/S	0.732	<0.005	0.601	0.420	0.179	0.453	0.630	0.966	0.893	0.619	0.303	0.428	0.076	0.085	0.032	N/S	0.325	0.607	0.735	1.13	
Blackwater	P0502-01	Bloomhill East	SW43	0.497	0.536	N/S	0.427	N/S	N/S	0.393	0.076	0.038	0.884	0.325	0.469	0.683	0.583	0.762	0.678	0.701	1.350	0.684	0.781	1.280	N/S	0.796	0.522	0.51	0.626	
Blackwater	P0502-01	Bloomhill East	SW45	N/S	0.394	N/S	N/S	N/S	N/S	0.343	0.102	0.063	0.144	0.063	0.050	0.093	0.243	0.281	0.353	0.060	0.115	0.056	0.152	0.338	N/S	0.315	0.093	N/S	N/S	
		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				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	Bloomhill East	SW36	N/S	17.2	N/S	13.5	N/S	N/S	27.4	27.5	24.2	61.1	24.2	23.3	25.9	35.1	35.1	13.7	26.9	24.2	22	20	21.8	N/S	20.5	19.3	33.3	34.8	
Blackwater	P0502-01	Bloomhill East	SW37	N/S	33.3	N/S	24.9	N/S	N/S	31.2	28.3	28	41.3	26.5	35.8	38	34.7	34.7	23.5	20	18.3	18.8	18.3	19.9	N/S	18.6	27.7	24.9	25.4	
Blackwater	P0502-01	Bloomhill East	SW40	48.9	42.7	N/S	40	N/S	N/S	43.2	36.6	34.1	59.1	33	34.7	39.3	15.3	15.3	15.1	15.8	36.3	34.1	30.2	28.1	N/S	30	46.9	52.1	47.8	
Blackwater	P0502-01	Bloomhill East	SW41	23.4	20.2	N/S	20	N/S	N/S	25.5	27.2	26.5	39.2	26.2	22.6	22.9	22.2	22.2	17.3	26.4	22.8	23.7	22.8	24.9	N/S	26.8	19.2	20	21.5	
Blackwater	P0502-01	Bloomhill East	SW42	20	17.3	N/S	16.3	N/S	N/S	23.1	13.1	22.3	46.8	18.6	18.5	16.9	18.7	18.7	20.3	16.4	18.5	16.1	17.4	14.8	N/S	26.1	19.3	20.4	16.3	
Blackwater	P0502-01	Bloomhill East	SW43	14.3	14.8	N/S	9.59	N/S	N/S	17.8	27.2	38.8	35.8	33.7	25.3	22.7	13.3	13.3	12.7	15	20.1	22.5	20.4	33.9	N/S	31.3	21.7	23.9	19.7	
Blackwater	P0502-01	Bloomhill East	SW45	N/S	19.2	N/S	N/S	N/S	N/S	22.8	26.7	27.8	38.3	29.4	25.2	23.3	20.7	20.7	16.9	23.7	23.4	30.1	28.7	28.5	N/S	29.4	22.3	N/S	N/S	
		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				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
				1/1/23	1/2/23	1/3/23	1/4/23	1/5/23	1/6/23	1/7/23	1/8/23	1/9/23	1/10/23	1/11/23	1/12/23	1/1/24	1/2/24	1/3/24	1/4/24	1/5/24	1/6/24	1/7/24	1/8/24	1/9/24	1/10/24	1/11/24	1/12/24
Blackwater	P0502-01	Bloomhill East	SW36	3	14	2	3	2	3	4	<2	7	<2	<2	5	2	<2	<2	2	3	<2	4	2	<2	2	2	<2
Blackwater	P0502-01	Bloomhill East	SW37	2	<2	<2	4	<2	3	4	<2	<2	3	<2	2	2	<2	3	<2	<2	2	9	12	6	3	<2	2
Blackwater	P0502-01	Bloomhill East	SW40	<2	<2	<2	4	6	8	4	7	5	3	4	2	3	N/S	<2	<2	5	6	2	11	11	7	10	2
Blackwater	P0502-01	Bloomhill East	SW41	<2	<2	2	2	<2	10	5	<2	<2	<2	<2	2	3	<2	10	<2	2	3	5	<2	<2	5	2	2
Blackwater	P0502-01	Bloomhill East	SW42	3	<2	<2	7	2	<2	<2	<2	<2	2	<2	<2	5	3	<2	<2	30	4	2	<2	<2	<2	<2	<2
Blackwater	P0502-01	Bloomhill East	SW43	12	11	6	9	37	<2	33	34	35	11	19	35	11	20	14	13	3	34	37	35	20	14	32	6
Blackwater	P0502-01	Bloomhill East	SW45	N/S	8	N/S	10	12	5	2	<2	N/S	5	N/S	N/S	N/S	N/S	<2	4	3	2	6	<2	N/S	N/S	<2	8
		Monthly Rainfall (Gurteen) (mm)		85.4	18.5	111.6	54.8	42.9	66.7	163.3	96.3	121.4	123.1	81.2	115	68.8	124.3	115.3	76.6	63.6	48.6	47	58.1	53.4	70.5	60.1	61

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
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
				1/1/23	1/2/23	1/3/23	1/4/23	1/5/23	1/6/23	1/7/23	1/8/23	1/9/23	1/10/23	1/11/23	1/12/23	1/1/24	1/2/24	1/3/24	1/4/24	1/5/24	1/6/24	1/7/24	1/8/24	1/9/24	1/10/24	1/11/24	1/12/24
Blackwater	P0502-01	Bloomhill East	SW36	372	314	333	242	191	153	166	251	318	401	346	400	340	264	457	276	224	239	189	121	112	91.8	117	271
Blackwater	P0502-01	Bloomhill East	SW37	296	230	325	302	231	146	197	446	399	492	374	316	283	265	273	322	259	318	266	205	169	65	218	306
Blackwater	P0502-01	Bloomhill East	SW40	454	412	479	494	648	201	304	325	602	868	668	528	510	N/S	582	605	431	514	298	334	244	335	379	434
Blackwater	P0502-01	Bloomhill East	SW41	164	148	224	189	183	313	214	241	218	273	228	192	179	194	226	234	152	180	147	79.5	140	169	184	196
Blackwater	P0502-01	Bloomhill East	SW42	244	183	197	163	114	93.1	199	193	151	244	235	261	148	175	275	154	483	114	105	109	84.4	108	135	173
Blackwater	P0502-01	Bloomhill East	SW43	359	502	345	348	1305	736	676	587	624	379	548	920	462	489	385	468	249	269	640	580	546	542	285	287
Blackwater	P0502-01	Bloomhill East	SW45	N/S	224	N/S	322	506	205	142	290	N/S	280	N/S	N/S	N/S	N/S	188	307	197	211	174	145	N/S	N/S	194	216
		Monthly Rainfall (Gurteen) (mm)		85.4	18.5	111.6	54.8	42.9	66.7	163.3	96.3	121.4	123.1	81.2	115	68.8	124.3	115.3	76.6	63.6	48.6	47	58.1	53.4	70.5	60.1	61

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
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
				1/1/23	1/2/23	1/3/23	1/4/23	1/5/23	1/6/23	1/7/23	1/8/23	1/9/23	1/10/23	1/11/23	1/12/23	1/1/24	1/2/24	1/3/24	1/4/24	1/5/24	1/6/24	1/7/24	1/8/24	1/9/24	1/10/24	1/11/24	1/12/24
Blackwater	P0502-01	Bloomhill East	SW36	89	61	74	70	56	53	64	84	98	106	101	82	95	54	83	71	75	78	74	59	55	52	56	82
Blackwater	P0502-01	Bloomhill East	SW37	58	54	54	55	61	86	62	94	90	97	76	63	66	74	52	58	58	70	86	76	67	58	60	68
Blackwater	P0502-01	Bloomhill East	SW40	107	101	97	99	121	68	88	125	132	148	135	101	116	N/S	96	113	106	108	79	93	84	84	81	103
Blackwater	P0502-01	Bloomhill East	SW41	38	51	46	53	54	97	76	67	70	67	53	45	55	42	35	61	50	62	70	26	61	61	58	57
Blackwater	P0502-01	Bloomhill East	SW42	50	44	45	47	34	<10	69	60	55	63	65	52	48	45	43	45	108	41	42	54	33	40	43	48
Blackwater	P0502-01	Bloomhill East	SW43	53	72	86	96	145	132	171	164	186	89	89	120	69	58	51	77	82	131	148	167	234	98	27	65
Blackwater	P0502-01	Bloomhill East	SW45	N/S	77	N/S	72	93	56	58	91	N/S	83	N/S	N/S	N/S	N/S	43	75	69	68	63	59	n/s	N/S	77	78
		Monthly Rainfall (Gurteen) (mm)		85.4	18.5	111.6	54.8	42.9	66.7	163.3	96.3	121.4	123.1	81.2	115	68.8	124.3	115.3	76.6	63.6	48.6	47	58.1	53.4	70.5	60.1	61

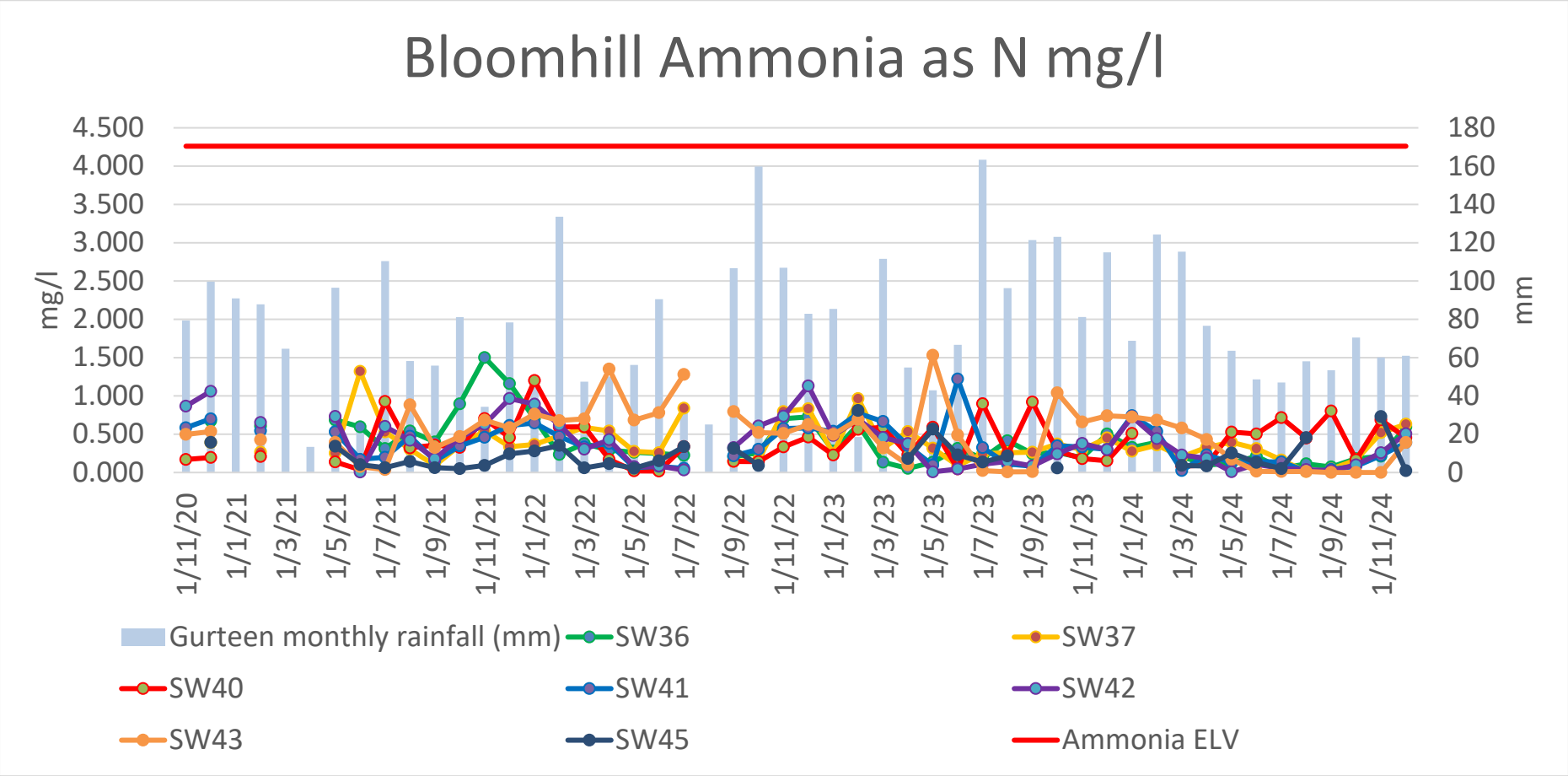
PCAS SW Sampling Scheme				pH	pH	pH	pH	pH	pH	pH	pH	pH	pH	pH	pH	pH	pH	pH	pH	pH	pH	pH	pH	pH	pH	pH	pH
Bog Group	Licence No	Bog Name	SW Code GIS	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
				1/1/23	1/2/23	1/3/23	1/4/23	1/5/23	1/6/23	1/7/23	1/8/23	1/9/23	1/10/23	1/11/23	1/12/23	1/1/24	1/2/24	1/3/24	1/4/24	1/5/24	1/6/24	1/7/24	1/8/24	1/9/24	1/10/24	1/11/24	1/12/24
Blackwater	P0502-01	Bloomhill East	SW36	7	7.3	7.1	7.5	7.4	7.7	7.6	7.4	7.3	7.2	7.1	7.1	6.9	6.9	6.8	7.2	7.3	7.3	7.5	7.5	7.6	7.7	7.4	7.1
Blackwater	P0502-01	Bloomhill East	SW37	6.7	7.3	6.7	7.2	7.5	7.7	7.5	7.1	7	6.7	6.7	6.8	6.4	6.7	6.5	7.2	7.2	7.2	7.6	7.5	7.6	7.7	7.4	6.8
Blackwater	P0502-01	Bloomhill East	SW40	6.7	7	6.7	7	6.8	7.8	7.3	6.8	6.9	6.7	6.6	6.2	6.8	N/S	6.5	6.9	7	6.9	7.2	7.1	7.1	7.2	7.1	6.7
Blackwater	P0502-01	Bloomhill East	SW41	6.7	7.2	6.9	7.2	7.5	7.4	7.4	7.4	7.4	7.1	6.8	6.7	6.8	6.9	6.7	7.1	7.6	7.4	7.7	8.8	7.5	7.4	7.2	6.8
Blackwater	P0502-01	Bloomhill East	SW42	7.2	7.7	7.5	7.7	7.9	8.1	7.6	7.6	7.7	7.8	7.4	7.2	7.4	7.7	7.1	7.7	5.2	7.7	7.9	7.7	8.2	7.8	7.5	7.4
Blackwater	P0502-01	Bloomhill East	SW43	4.9	5.8	6	5.9	5.4	5.5	5.6	6.4	6.2	5.1	5.1	4.7	5.2	5.1	4.8	4.8	7.1	5.2	5.2	5.8	5.1	6.4	7.1	5.2
Blackwater	P0502-01	Bloomhill East	SW45	N/S	7	N/S	6.7	6.6	7.2	7.3	6.8	N/S	6.5	N/S	N/S	N/S	N/S	6.2	6.5	7.2	7.2	7.3	7.2	N/S	N/S	7.1	6.3
		Monthly Rainfall (Gurteen) (mm)		85.4	18.5	111.6	54.8	42.9	66.7	163.3	96.3	121.4	123.1	81.2	115	68.8	124.3	115.3	76.6	63.6	48.6	47	58.1	53.4	70.5	60.1	61

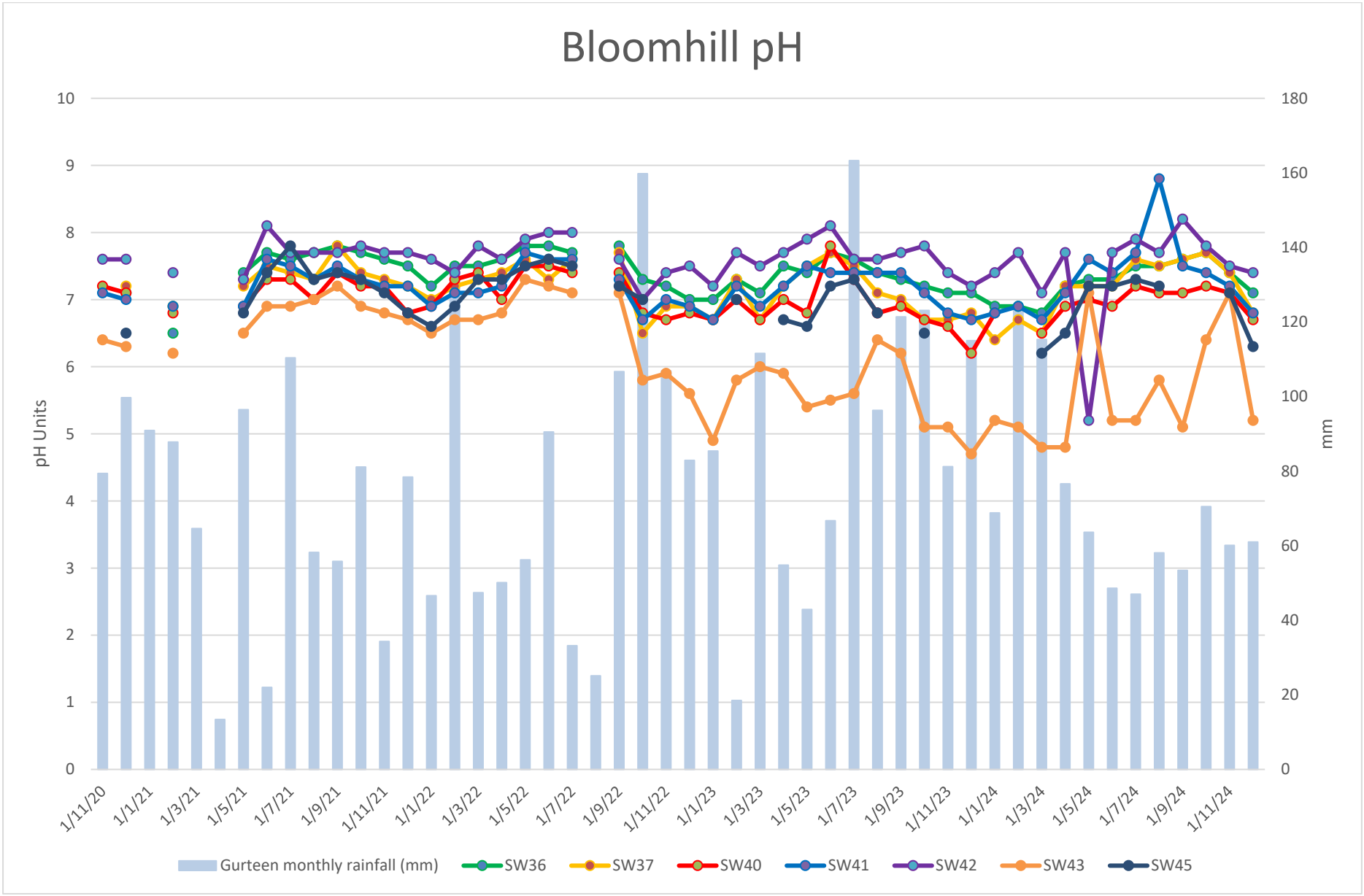
PCAS SW Sampling Scheme				TP as P	TP as P	TP as P	TP as P	TP as P	TP as P	TP as P	TP as P	TP as P	TP as P	TP as P	TP as P	TP as P	TP as P	TP as P	TP as P	TP as P	TP as P	TP as P	TP as P	TP as P	TP as P	TP as P	TP as P	TP as P
Bog Group	Licence No	Bog Name	SW Code GIS	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	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
				1/1/23	1/2/23	1/3/23	1/4/23	1/5/23	1/6/23	1/7/23	1/8/23	1/9/23	1/10/23	1/11/23	1/12/23	1/1/24	1/2/24	1/3/24	1/4/24	1/5/24	1/6/24	1/7/24	1/8/24	1/9/24	1/10/24	1/11/24	1/12/24
Blackwater	P0502-01	Bloomhill East	SW36	<0.05	0.08	<0.05	0.05	<0.05	<0.05	<0.05	<0.05	0.12	0.13	<0.05	<0.05	<0.05	<0.05	0.07	<0.05	0.08	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Blackwater	P0502-01	Bloomhill East	SW37	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.06	0.06	<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	Bloomhill East	SW40	0.16	0.2	0.16	0.29	<0.05	0.05	0.26	0.21	0.31	0.31	<0.05	0.05	<0.05	N/S	0.17	0.16	0.27	0.26	0.16	0.35	0.53	0.27	0.25	0.2
Blackwater	P0502-01	Bloomhill East	SW41	<0.05	<0.05	<0.05	<0.05	0.27	0.27	<0.05	<0.05	0.06	0.08	<0.05	<0.05	<0.05	<0.05	0.07	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Blackwater	P0502-01	Bloomhill East	SW42	<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	<0.05	0.08	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Blackwater	P0502-01	Bloomhill East	SW43	<0.05	<0.05	<0.05	0.05	<0.05	0.07	0.08	0.1	0.12	0.08	<0.05	0.08	0.07	<0.05	0.07	<0.05	0.1	0.07	0.08	<0.05	<0.05	0.06	0.05	<0.05
Blackwater	P0502-01	Bloomhill East	SW45	N/S	0.09	N/S	0.08	0.07	0.1	<0.05	<0.05	N/S	0.06	N/S	N/S	N/S	N/S	0.06	0.07	0.06	0.05	0.05	0.15	N/S	N/S	<0.05	<0.05
		Monthly Rainfall (Gurteen) (mm)		85.4	18.5	111.6	54.8	42.9	66.7	163.3	96.3	121.4	123.1	81.2	115	68.8	124.3	115.3	76.6	63.6	48.6	47	58.1	53.4	70.5	60.1	61

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
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
				1/1/23	1/2/23	1/3/23	1/4/23	1/5/23	1/6/23	1/7/23	1/8/23	1/9/23	1/10/23	1/11/23	1/12/23	1/1/24	1/2/24	1/3/24	1/4/24	1/5/24	1/6/24	1/7/24	1/8/24	1/9/24	1/10/24	1/11/24	1/12/24
Blackwater	P0502-01	Bloomhill East	SW36	189	220	268	253	255	264	307	18/0	286	430	232	255	215	180	190	262	242	273	279	343	302	298	320	255
Blackwater	P0502-01	Bloomhill East	SW37	91	83	100	271	157	198	181	144	151	79	173	95	151	118	52	153	126	161	187	205	182	202	250	116
Blackwater	P0502-01	Bloomhill East	SW40	353	293	229	354	270	260	307	282	323	323	236	74	267	N/S	156	193	278	307	300	360	321	288	307	247
Blackwater	P0502-01	Bloomhill East	SW41	291	140	139	209	240	325	228	176	204	82	179	139	181	100	61	181	274	217	284	356	277	227	216	150
Blackwater	P0502-01	Bloomhill East	SW42	427	301	226	430	352	360	215	256	415	309	249	76	145	242	114	299	85	376	368	315	334	290	281	186
Blackwater	P0502-01	Bloomhill East	SW43	53	52	228	156	172	167	227	173	207	105	160	73	241	91	41	97	186	149	172	182	241	246	211	97
Blackwater	P0502-01	Bloomhill East	SW45	N/S	341	N/S	170	142	262	263	189	N/S	257	N/S	N/S	N/S	N/S	43	99	188	203	258	299	N/S	N/S	211	104
		Monthly Rainfall (Gurteen) (mm)		85.4	18.5	111.6	54.8	42.9	66.7	163.3	96.3	121.4	123.1	81.2	115	68.8	124.3	115.3	76.6	63.6	48.6	47	58.1	53.4	70.5	60.1	61

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
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
				1/1/23	1/2/23	1/3/23	1/4/23	1/5/23	1/6/23	1/7/23	1/8/23	1/9/23	1/10/23	1/11/23	1/12/23	1/1/24	1/2/24	1/3/24	1/4/24	1/5/24	1/6/24	1/7/24	1/8/24	1/9/24	1/10/24	1/11/24	1/12/24
Blackwater	P0502-01	Bloomhill East	SW36	0.279	0.626	0.135	0.053	0.134	0.315	0.185	0.415	0.246	0.26	0.194	0.502	0.327	0.394	0.209	0.096	0.123	0.211	0.054	0.113	0.072	0.181	0.212	0.594
Blackwater	P0502-01	Bloomhill East	SW37	0.245	0.965	0.319	0.535	0.317	0.09	0.246	0.259	0.265	0.373	0.297	0.452	0.277	0.358	0.204	0.33	0.394	0.312	0.163	0.013	0.044	0.166	0.52	0.631
Blackwater	P0502-01	Bloomhill East	SW40	0.228	0.562	0.592	0.232	0.591	0.046	0.898	0.236	0.92	0.278	0.181	0.153	0.51	N/S	0.083	0.096	0.528	0.503	0.716	0.449	0.802	0.167	0.686	0.454
Blackwater	P0502-01	Bloomhill East	SW41	0.538	0.774	0.666	0.35	0.095	1.22	0.324	0.111	0.082	0.348	0.333	0.301	0.743	0.536	0.0244	0.229	0.130	0.141	0.138	0.018	0.041	0.082	0.221	0.391
Blackwater	P0502-01	Bloomhill East	SW42	0.483	0.694	0.457	0.377	0.008	0.046	0.109	0.145	0.085	0.242	0.38	0.298	0.728	0.443	0.228	0.185	0.009	0.108	0.053	0.038	0.021	0.1	0.258	0.507
Blackwater	P0502-01	Bloomhill East	SW43	0.497	0.692	0.326	0.099	1.53	0.488	0.025	0.008	0.011	1.04	0.659	0.74	0.725	0.682	0.58	0.431	0.174	0.016	0.012	0.013	<0.005	<0.005	<0.005	0.392
Blackwater	P0502-01	Bloomhill East	SW45	N/S	0.81	N/S	0.182	0.566	0.23	0.136	0.216	N/S	0.058	N/S	N/S	N/S	N/S	0.092	0.085	0.255	0.131	0.05	0.456	N/S	N/S	0.73	0.023
		Monthly Rainfall (Gurteen) (mm)		85.4	18.5	111.6	54.8	42.9	66.7	163.3	96.3	121.4	123.1	81.2	115	68.8	124.3	115.3	76.6	63.6	48.6	47	58.1	53.4	70.5	60.1	61

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
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
				1/1/23	1/2/23	1/3/23	1/4/23	1/5/23	1/6/23	1/7/23	1/8/23	1/9/23	1/10/23	1/11/23	1/12/23	1/1/24	1/2/24	1/3/24	1/4/24	1/5/24	1/6/24	1/7/24	1/8/24	1/9/24	1/10/24	1/11/24	1/12/24
Blackwater	P0502-01	Bloomhill East	SW36	30.2	17.3	29.7	25	23.9	18.2	21.7	30.1	34.9	40.9	41.4	35.5	35	28.2	25.9	29.8	26.2	26.8	27.1	22.5	20.1	18.9	20.3	32.6
Blackwater	P0502-01	Bloomhill East	SW37	18.4	19.7	21.3	21.8	20.6	23.2	19	34.8	31	34.8	8.7	24.4	21.5	17.8	18.4	24	14.4	22.4	21.9	22.6	19	18.1	21	27.3
Blackwater	P0502-01	Bloomhill East	SW40	41.6	39.8	43	41.9	45.5	22.8	30.7	48.7	45.8	65.5	54.8	42.8	45.5	N/S	38.3	45.4	34.7	35.8	28.7	29.1	27.1	29.9	31.8	42
Blackwater	P0502-01	Bloomhill East	SW41	14.5	20.1	18.6	21	22.6	32.7	26.2	25.5	25.3	25.6	22.7	17.7	19.8	18	17	26.3	18.6	20	22.5	21.8	21.9	21	21.4	20.5
Blackwater	P0502-01	Bloomhill East	SW42	15.8	14.9	17.7	17.4	15.4	12.4	23.9	21.9	18.4	23.8	24.4	19	16.3	16.6	17.6	18.2	20.6	13.1	15	16	11.3	14.9	15.6	19.2
Blackwater	P0502-01	Bloomhill East	SW43	11.3	16.2	27.3	30.8	20.2	29.1	35.9	36.5	41.3	22.5	18.7	15.2	14	10.5	11	16.4	28.1	23.8	28.9	27	43.9	50.2	47.5	18.8
Blackwater	P0502-01	Bloomhill East	SW45	N/S	28.4	N/S	23	23.6	20.1	18.8	36.2	N/S	25.6	N/S	N/S	N/S	N/S	14	25.9	22.3	20.6	21.3	22.8	N/S	N/S	27.5	25.1
		Monthly Rainfall (Gurteen) (mm)		85.4	18.5	111.6	54.8	42.9	66.7	163.3	96.3	121.4	123.1	81.2	115	68.8	124.3	115.3	76.6	63.6	48.6	47	58.1	53.4	70.5	60.1	61


Bloomhill Ammonia as N mg/l
mg/l
mm
4.500
4.000
3.500
3.000
2.500
2.000
1.500
1.000
0.500
0.000
180
160
140
120
100
80
60
40
20
0
1/11/20
1/1/21
1/3/21
1/5/21
1/7/21
1/9/21
1/11/21
1/1/22
1/3/22
1/5/22
1/7/22
1/9/22
1/11/22
1/1/23
1/3/23
1/5/23
1/7/23
1/9/23
1/11/23
1/1/24
1/3/24
1/5/24
1/7/24
1/9/24
1/11/24
Gurteen monthly rainfall (mm)
SW36
SW37
SW40
SW41
SW42
SW43
SW45
Ammonia ELV


Bloomhill pH
pH Units
mm
10
9
8
7
6
5
4
3
2
1
0
180
160
140
120
100
80
60
40
20
0
1/11/20
1/1/21
1/3/21
1/5/21
1/7/21
1/9/21
1/11/21
1/1/22
1/3/22
1/5/22
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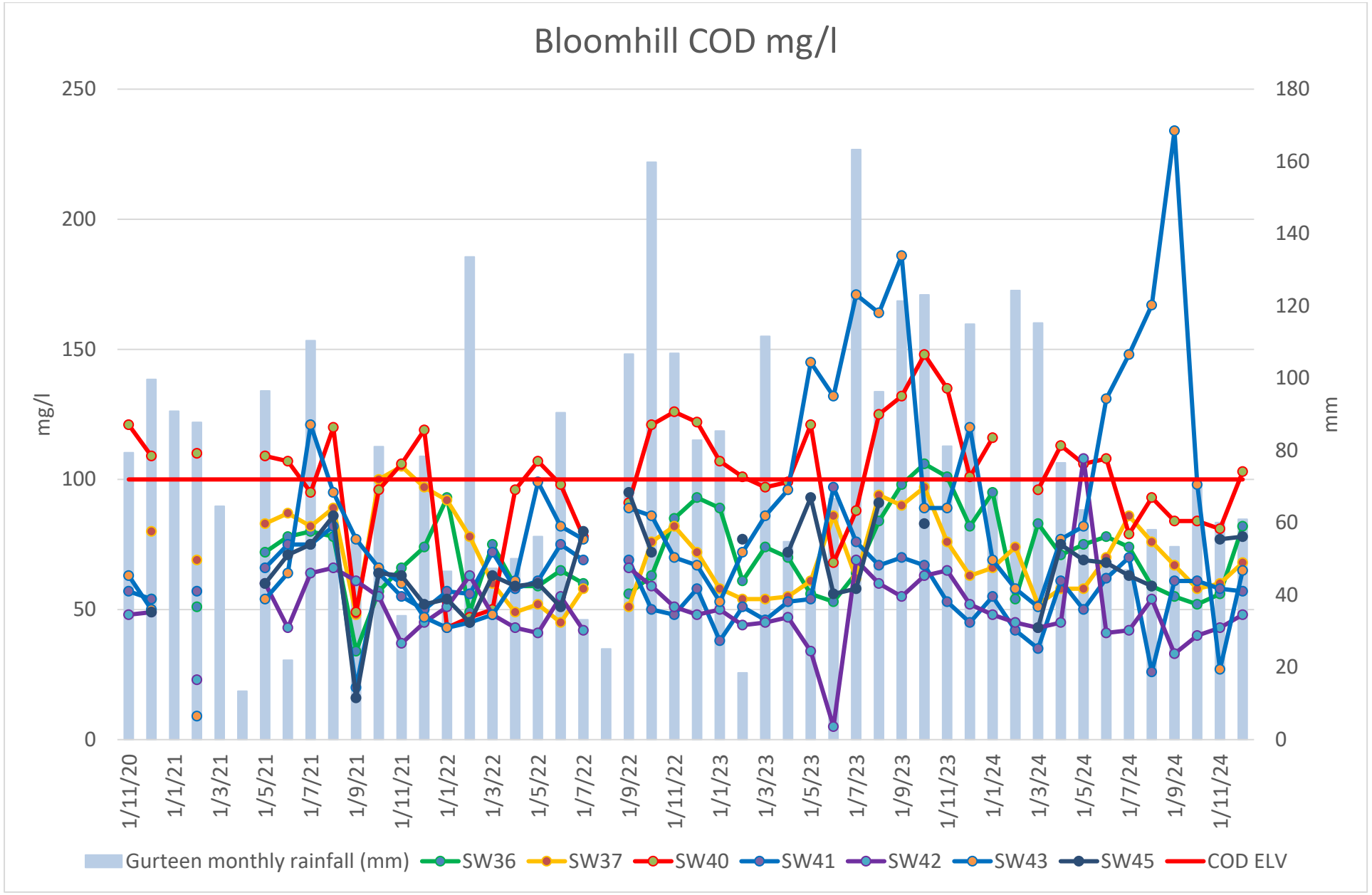
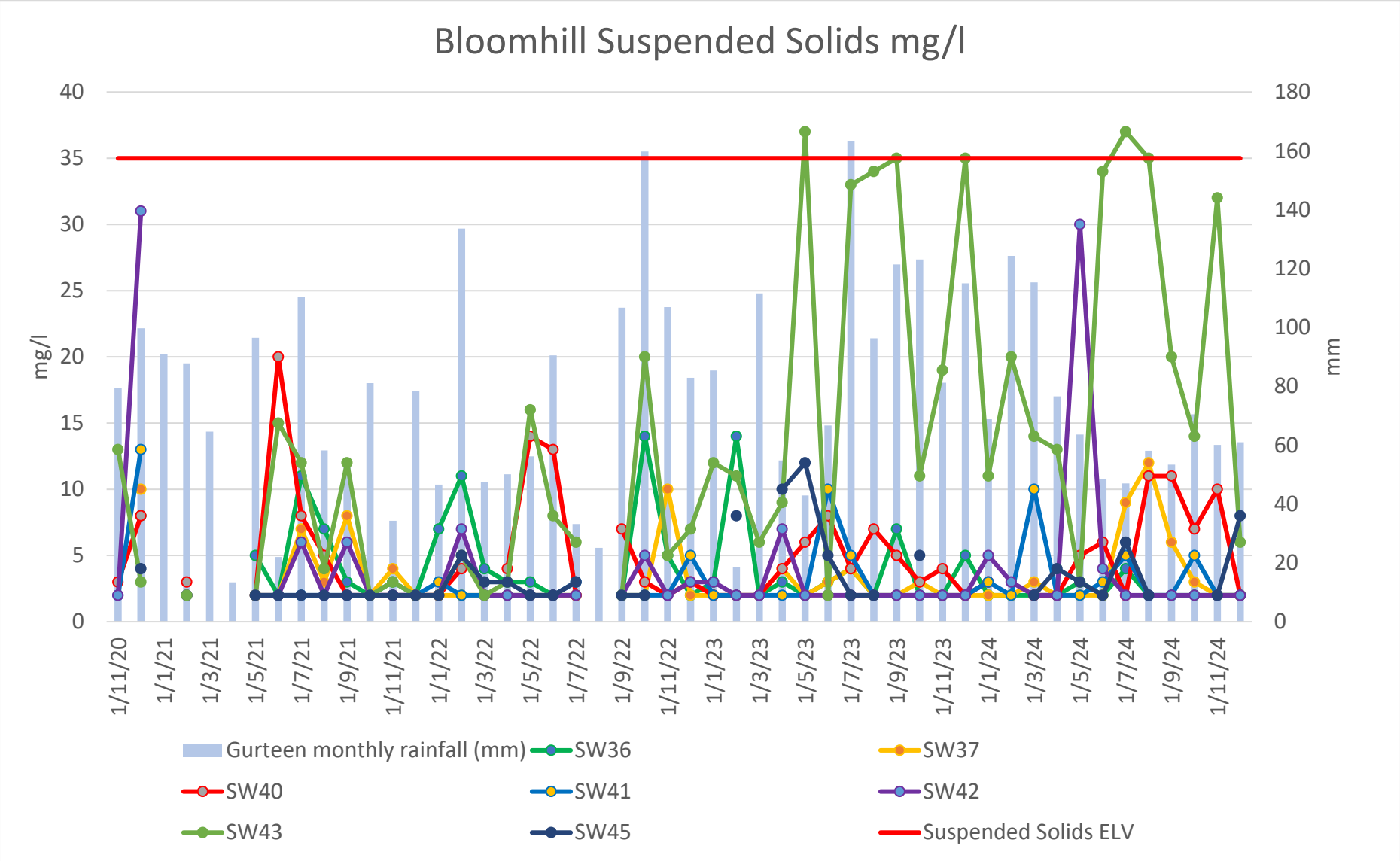
1/7/23
1/9/23
1/11/23
1/1/24
1/3/24
1/5/24
1/7/24
1/9/24
1/11/24
Gurteen monthly rainfall (mm)
SW36
SW37
SW40
SW41
SW42
SW43
SW45


Bloomhill COD mg/l
mg/l
mm
250
200
150
100
50
0
180
160
140
120
100
80
60
40
20
0
1/11/20
1/1/21
1/3/21
1/5/21
1/7/21
1/9/21
1/11/21
1/1/22
1/3/22
1/5/22
1/7/22
1/9/22
1/11/22
1/1/23
1/3/23
1/5/23
1/7/23
1/9/23
1/11/23
1/1/24
1/3/24
1/5/24
1/7/24
1/9/24
1/11/24
Gurteen monthly rainfall (mm)
SW36
SW37
SW40
SW41
SW42
SW43
SW45
COD ELV


Bloomhill Suspended Solids mg/l
mg/l
mm
0
5
10
15
20
25
30
35
40
0
20
40
60
80
100
120
140
160
180
1/11/20
1/1/21
1/3/21
1/5/21
1/7/21
1/9/21
1/11/21
1/1/22
1/3/22
1/5/22
1/7/22
1/9/22
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1/7/23
1/9/23
1/11/23
1/1/24
1/3/24
1/5/24
1/7/24
1/9/24
1/11/24
Gurteen monthly rainfall (mm)
SW36
SW37
SW40
SW41
SW42
SW43
SW45
Suspended Solids ELV

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.