Ummeras Bog

Cutaway Bog Decommissioning and Rehabilitation Plan 2021

This document seeks to address the requirements of Condition 10.2 of IPC License Ref. P0506-01:

> "*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 Ummeras Bog upon cessation of peat production and compliments the licence requirement to decommission the site.

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

Industrial peat production has now permanently ceased at Ummeras Bog.

In addition, to preparing this document to comply with Condition 10 of IPC Licence Ref. P0506-01, due regard was also given to the proposed Peatlands Climate Action Scheme (PCAS) announced by the Minster. This Scheme will see the Minister support, via the Climate Action Fund, Bord na Móna in developing a package of measures, 'the proposed 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 proposed Scheme will be supported by Government through the Climate Action Fund, 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 Ummeras 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 proposed Scheme) is also included. The inclusion of the 'standard' measures together with the enhanced measures in this document allows the Scheme Regulator to distinguish and objectively determine the specific interventions (and their associated costs) eligible for support under the proposed Scheme.

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

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

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SUMMARY

Name of bog: Ummeras **Area:** 302 ha

Site description:

- Ummeras Bog was drained and developed for industrial peat production in 1973 and has been in active peat production since 1980. Industrial peat production ceased in 2019.
- The majority of the former peat production footprint is bare peat (~75%) and contains active drainage channels. A small part of the former production area has developed pioneer cutaway habitats.
- Remnant peat depths are generally over 2.5m; Ummeras is considered a **deep peat** cutover bog.

Rehabilitation goals and outcomes

Bord na Móna is committed to discharging the obligations arising from Condition 10 of the IPC licence. The primary goals and outcomes of this plan are:

- Meeting conditions of the IPC Licence
- Stabilisation or improvement in water quality parameters (e.g. suspended solids).
- Optimising hydrological conditions for **climate action benefits as part of PCAS**. This will be achieved via **deep peat re-wetting.**
- Optimising hydrological conditions for the development of embryonic *Sphagnum*-rich vegetation communities in suitable deep residual peat areas.
- Optimising hydrological conditions for the development of other cutaway peatland habitats including Reed Swamp, fen and wet woodland on shallow cutaway peats.
- Rehabilitation will support the National Policies on Climate Action and GHG mitigation by maintaining and enhancing the current condition peat storage capacity of the bog (locking the carbon into the ground). In time, it is expected that the bog will develop its carbon sink function, in part, as *Sphagnum* communities are restored and develop across the bog. It will also support Ireland's commitments towards Water Framework Directive, the National Biodiversity Action Plan, and the National River Basin Management Plan 2018-2021.
- Optimising hydrological conditions for the protection of exposed archaeological structures, their retention in situ and preservation into the future.
- Note that will take some time for stable naturally functioning peatland and wetland habitats to fully develop at Ummeras Bog.

Scope of rehabilitation

The principal scope of this rehabilitation plan is defined by:

- The area of Ummeras Bog.
- EPA IPC Licence - Ref. P0506-01. As part of Condition 10.2 of this license, a rehabilitation plan must be prepared for permanent rehabilitation of the boglands within the licensed area. The key objective of 'rehabilitation', as required by this licence, is achieved by the **environmental stabilisation** of the bog.
- **The proposed Scheme (PCAS)** includes enhanced measures which are designed to exceed/meet the standard stabilisation requirements as defined by the IPC Licence and to enhance the ecosystem services of Ummeras Bog, in particular, optimising **climate action benefits**.
- The local environmental conditions of this bog. Ummeras Bog has variable environmental characteristics with a range of residual peat depths, hydrology and topography. Part of the bog has large remnants of deep peats and is suited to deep peat re-wetting.
- The key goals and outcomes of rehabilitation at this bog outlined above.
- To minimise potential impacts on neighbouring land, some boundary drains around Ummeras Bog will be left unblocked as blocking boundary drains could affect adjacent land. This includes active private turbary

Criteria for successful rehabilitation:

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

- Rewetting of residual peat in the former area of industrial peat production to slow water movement across the site to retain silt, accelerating the development of vegetation cover via natural colonisation, and reducing the area of bare exposed peat (IPC Licence validation) through the creation of further wetland/peatland habitat. (IPC Licence validation).
- Stabilising or reduce key potential emissions to water (e.g. suspended solids) (IPC Licence validation). This will be measured via water quality monitoring (suspended solids and ammonia) for at least 2 years after the rehabilitation has been completed (IPC Licence validation).
- Reducing pressure from peat production on the local river catchment (WFD) (IPC Licence validation). This will be measured by the EPA WFD monitoring programme.
- Optimising the extent of suitable hydrological conditions for climate action and setting the site on a trajectory towards establishment of a mosaic of compatible peatland and wetland habitats, and eventually towards a reduced carbon source/carbon sink (Climate action verification). This will be measured by an aerial survey and a bog condition assessment after rehabilitation has been completed.
- Reduction in carbon emissions (Climate action verification). Baseline monitoring will be carried after rehabilitation is completed (during the scheme). It is proposed that sites can be monitored against this baseline in the future.
- Improvement in biodiversity and ecosystem services. (Climate action verification).

Summary of measures:

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

- Planning actions, including developing a detailed site plan and carrying out a hydrology and drainage assessment.
- Carry out an ecological appraisal of the potential impacts of the planned rehabilitation.
- Carry out proposed measures, which will be a combination of drain blocking, peat field re-profiling, cell-bunding, wetland measures and fertiliser applications targeting headlands, high fields and other areas (where required).
- Phase 2 measures may include seeding of targeted vegetation and inoculation of *Sphagnum* in suitable areas.
- Silt ponds will continue to be maintained during the rehabilitation and decommissioning phase.
- Evaluate success of short-term rehabilitation measures outlined above and remediate, where necessary.
- Decommissioning of silt-ponds will be assessed and carried out, where required.

Timeframe:

- 2020-2021: Short-term planning actions.
- 2021: Short-term practical actions.
- 2021-2024: Any Long term practical actions; Evaluate success of short-term rehabilitation measures outlined above and remediate, where necessary.
- 2024: Decommission silt-ponds, if necessary.

Budget and Costing

- The rehabilitation plan outlined in this document is predicated on the understanding that it is the Minister's intention to support, via the Climate Action Fund, Bord na Móna in developing a package of measures, 'the proposed Scheme', for enhanced decommissioning, rehabilitation and restoration of

cutaway peatlands referred to as, the Peatlands Climate Action Scheme'. *However, only the additional costs associated with the additional and enhanced rehabilitation, i.e, measures which go beyond the existing standard mandatory decommissioning and rehabilitation requirements arising from Condition 10 will be eligible for support.*

- In relation to the pre-existing Condition 10 IPC Licence requirement to carry out what can be termed the 'standard' decommissioning and rehabilitation, Bord na Móna maintains a Provision on its balance sheet to pay for these future costs when industrial peat extraction ceases. This is updated every year. For more information see the Bord na Móna Annual Report (Bord na Móna 2020). Bord na Móna is fully committed to meeting its obligations relating to rehabilitation and decommissioning under the Integrated Pollution Control Licence.

Monitoring, after-care and maintenance

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

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

Additional Monitoring:

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

Validation and IPC Licence surrender

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

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

1. INTRODUCTION

Bord na Móna operates under IPC Licence issued and administered by the EPA to extract peat within the Kilberry bog group (Ref. P0506-01). As part of Condition 10.2 of this license, a rehabilitation plan must be prepared for permanent rehabilitation of the boglands within the licensed area. The bog is part of the Kilberry bog group (see Appendix II for details of the bog areas within the Kilberry Bog Group). Ummeras Bog straddles the Co. Offaly and Co. Kildare border.

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 proposed Scheme will be supported by Government through the Climate Action Fund, 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 proposed 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 proposed Scheme. Bord na Móna have now announced the complete cessation of industrial peat production across its estate (January 2021).

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

It is envisaged that the 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 drain-blocking and cell bunding;
- re-profiling that will deliver suitable conditions for development of wetlands, fens and bog habitats;
- targeted fertiliser applications,
- seeding of targeted vegetation; and
- proactive inoculation of suitable peatland areas with *Sphagnum.*

These are collectively designed to optimise hydrological conditions (ideally and where possible water-levels <10 cm) for climate action benefits and to accelerate the trajectory of the site towards a naturally functioning ecosystem, and eventually a reduced carbon source/carbon sink again. In some areas of dry cutaway this trajectory will be significantly longer and it is not feasible in the short-term to re-wet some areas, which will develop other habitats. Other areas will naturally have deeper water). 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.

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

1.1 Constraints and Limitations

This document seeks to address the requirements of Condition 10.2 of IPC License Ref. P0506-01:

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

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

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

Industrial peat extraction at Ummeras Bog permanently ceased in 2019. A significant portion of the former peat production area is bare peat with emerging cutaway vegetation communities. The combination of active enhanced rehabilitation measures and natural colonisation will quickly establish pioneer vegetation. Nevertheless, it will take some time (30-50 years) for naturally functioning peatland ecosystems to fully re-establish.

Parts of Ummeras Bog (outside the areas owned and under the control of Bord na Móna) are currently used by domestic turf cutters to harvest peat. There has also been private commercial peat extraction adjacent to Ummeras Bog. These areas are ecologically and hydrologically linked to the area owned by Bord na Móna where rehabilitation is planned. It is beyond the scope of this rehabilitation plan to address turf cutting issues on Ummeras Bog that are outside of the control of Bord na Móna. Nevertheless, Bord na Móna are aware of such issues which may constrain the proposed rehabilitation actions, and this rehabilitation plan considered potential impacts of these on the delivery of the stated objectives.

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

2. METHODOLOGY

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

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

- Experience of 40 years of research on the after-use development and rehabilitation of the Bord na Móna cutaway bogs (Clarke, 2010; Bord na Móna, 2016);
- Significant international engagement during this period with other counties in relation to best-practise regarding peatland rehabilitation and after-use through the International Peat Society and the Society for Ecological Restoration (Joosten & Clarke, 2002; Clarke & Rieley, 2010; Gann *et al*., 2019);
- Consultation and engagement with internal and external stakeholders;
- GIS Mapping;
- BNM drainage surveys;
- Bog topography and LIDAR data:
- Hydrological modelling; and
- The development of a **Methodology Paper (draft) outlining the proposed 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 Ummeras Bog, in particular, optimising **climate action benefits**.

2.1 Desk Study

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

- 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.
- Quinty & Rochefort (2003). Peatland Restoration Guide, second edition. Canadian *Sphagnum* Peat Moss Association and New Brunswick Department of Natural Resources and Energy.
- Regan*, et. al.* (2020). Ecohydrology, Greenhouse Gas Dynamics and Restoration Guidelines for Degraded Raised Bogs. EPA Research Report. Prepared for the Environmental Protection Agency by Trinity College Dublin.
- Renou-Wilson *et al*. (2011). BOGLAND - Sustainable Management of Peatlands in Ireland. STRIVE Report No 75 prepared for the Environmental Protection Agency.
- Schouten (2002). Conservation and Restoration of Raised Bogs: Geological, Hydrological and Ecological Studies. Dúchas - The Heritage Service of the Department of the Environment and Local Government, Ireland;
- Thom (2019). Conserving Bogs – Management Handbook.
- Wheeler & Shaw (1995). Restoration of Damaged Peatlands – with Particular Reference to Lowland Raised Bogs Affected by Peat Extraction.
- Wittram *et al*. (2015). A Practitioners Guide to Sphagnum Reintroduction. Moors for the Future Partnership.

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

- Kilberry Integrated Pollution Control Licence;
- Kilberry 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 2018 – 2021,
- Bord na Móna Annual Report 2020,

2.2 Consultation

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

2.3 Field Surveys

Bord na Móna carried out a baseline ecological survey of all of its properties in 2009-2012 and developed habitat maps. As part of this exercise, Ummeras Bog was surveyed in February 2011. Additional ecological monitoring and visits have taken place at Ummeras Bog between 2011 and 2020 to inform rehabilitation planning and habitat maps have been updated, where required. This rehabilitation plan is informed by the original baseline survey as well as subsequent site walk-over surveys and visits, and updates to baseline data.

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

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

3. SITE DESCRIPTION

Ummeras Bog is located approximately 2.5km south-east of Bracknagh, 3 km North of Monasterevin and c.4.5km south-west of Rathangan. It straddles the border between Co. Offaly to the north and Co. Kildare to the south (see Figure 3.1). The surrounding landscape is dominated by farmland largely consisting of improved grassland. There is some conifer plantation on older cutover bog and other peatlands in the local area (See Figure 3.2). The Grand Canal is located to the east of the site. The Slate River flows to the north of the site and meets the Figile, where it then flows south to the west of Ummeras Bog to meet the Barrow.

There is a small isolated section to the north-east of the main bog. This area was never developed by Bord na Móna and contains old and active cutover bog.

3.1 Status and Situation

3.1.1 Site history

An old peat works site pre-dating Bord na Móna was located at Ummeras (near Ummeras House) to the east of the current Bord na Móna property and adjacent to the Grand Canal. Peat for live-stock bedding was harvested in this area in the late 19th century and the old OSI 2nd edition 6-inch map indicates that a tramway to take the peat to the canal was built along some of the tracks through the adjacent cutover bog.

Bord na Móna started to level and cut drains at Ummeras Bog in 1973. Sod peat moss was originally harvested in 1980 and then harvesting of milled moss peat began in 1989. A works area is located at the south-east corner of the main section. A permanent railway runs along the southern boundary of the site into the works area. Horticultural peat moss has been harvested from this site although in recent years there was a switch to harvesting of milled fuel peat.

3.1.2 Current land-use

Industrial peat production has now completely ceased at Ummeras Bog. The entire bog is not within the ownership of Bord na Móna and domestic turf cutting (turbary) is having an impact on the bog, both within and outside the BnM boundary. There is a small length of bog railway and some other infrastructure on this site (Figure 3.5).

Ummeras Bog is being used as one of the study sites for the EPA-funded and TCD-led SmartBOG research project. This project is measuring Greenhouse Gas fluxes using chambers in different parts of Ummeras Bog.

Future land-use at Ummeras Bog has not been defined by Bord na Móna.

3.1.3. Socio-Economic conditions

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

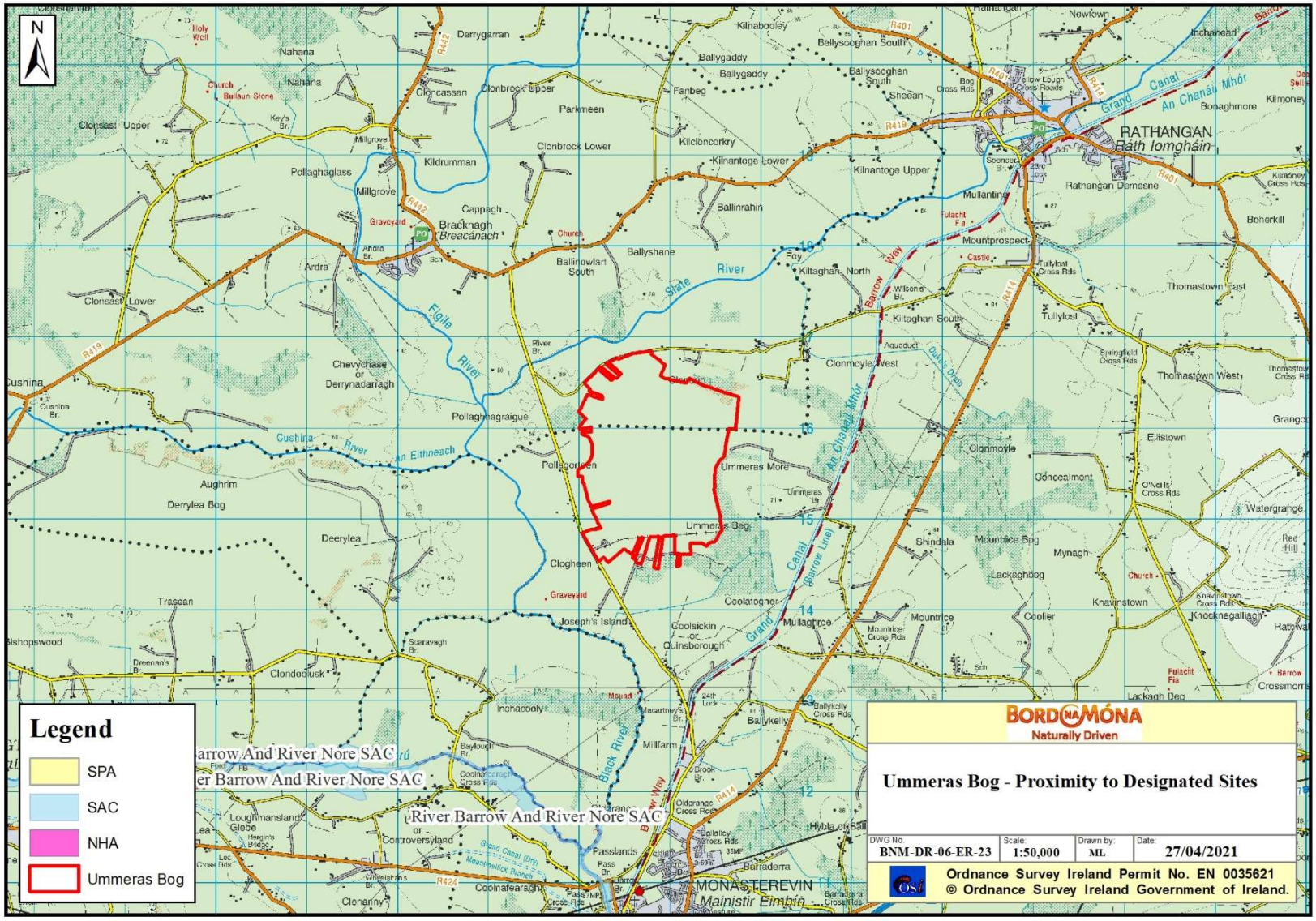

Figure 3.1 Location of Ummeras Bog in context to other Bord na Móna bogs and surrounding area.

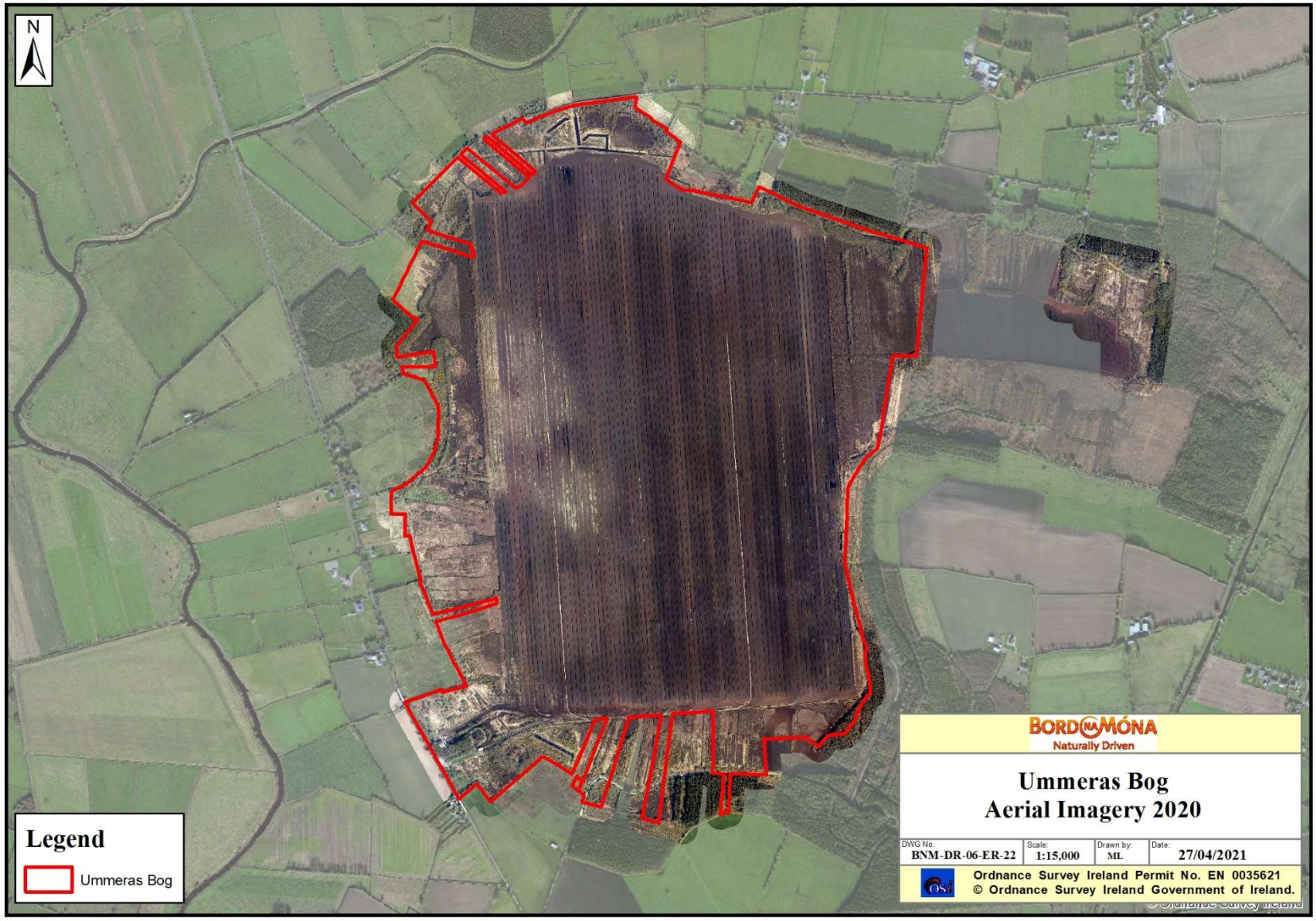

Figure 3.2 Aerial photo of Ummeras Bog.

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

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

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

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

3.2 Geology and Peat Depths

3.2.1 Sub-soil geology

The majority of the underlying geology at Ummeras Bog is dark limestone and shale, with the southern and eastern tip of the bog underlain by limestone and calcareous shale[1]. The underlying soils and sub-soils are classed as 'Raised Bog Cutover Peat'. A glacial gravel ridge has become exposed in the mid-eastern part of the site (Visible in Figures 8.1 & 8.3).

Lacustrine deposits (lake deposits) are also present under the peat (lacustrine shell marl) at the northern end of the site. The peat is underlain by glacial deposits interbedded with glacio-fluvial deposits over limestone bedrock in places. The glacial deposits generally consist of grey gravelly clay/silt.

3.2.2 Peat type and depths

Since Ummeras Bog has only been harvested for commercial peat production relatively recently, the majority of the bog still has remnant peat depths in excess of 2.5m. The peat is still red/brown in places (indicator of acidic *Sphagnum* peat) (see Figure 8.2).

However, part of the eastern side of the bog where a gravel ridge has become exposed has much shallower peat and is classed as cutaway.

3.3 Key Biodiversity Features of Interest

The majority of Ummeras Bog within the Bord na Móna boundary is dominated by bare peat (Figure 3.3). The Grand Canal is located to the east of the site, the Slate River flows to the north of the site and meets the Figile River, where it then flows south to meet the River Barrow.

[1] https://www.gsi.ie/en-ie/data-and-maps/Pages/Bedrock.aspx

Figure 3.3. View of the interface between high bog and cutover peatland landscape at Ummeras Bog.

3.3.1 Current habitats

Much of the site comprises extensive areas dominated by bare peat, although there is some emerging pioneer poor fen vegetation and some small areas of Birch woodland (See Figure 8.1). Some of the habitats present around the margins of the site such as remnant high bog (PB1), cutover bog and scrub (WS1) have moderate-high local ecological value as a refuge for local fauna. One more significant area is the ditched degraded raised bog in the north-east corner. This section has intact vegetation and still has some remnant *Sphagnum* cover and newer *Sphagnum* cover developing in depressions. Patches of Birch woodland and wet grassland are located along the margins of the site.

A habitat map of the site is shown in Figure 3.4.

3.3.2 Species of conservation interest

Silt ponds on Ummeras Bog are visited by Kingfisher; this species is of particular conservation interest as it is listed on Annex I of the EU Habitats Directive. Woodcock (BoCCI Red-listed), Hen Harrier Teal and Snipe (BoCCI Amber-listed) have been recorded using the site in winter.

Marsh Fritillary butterfly has been recorded on the bog remnant along the western margin; this species is on Annex I of the EU Habitats Directive.

Other species of conservation interest that have been recorded using the site include Red Squirrel, Irish Hare and Badger (protected under the Irish Wildlife Act).

3.3.3 Invasive species

No invasive species, as listed under Regulation (EU) 1143/2014 on the prevention and management of the introduction and spread of invasive alien species, have been recorded at Ummeras Bog (Appendix V). 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

The Grand Canal pNHA (NPWS site code 002014) is located c.200m to the east of the small, isolated bog remnant and just under 1km to the east of the remainder of Ummeras Bog (Figure 3.1).

3.4.1 Other Nature Conservation Designations

The Ramsar Convention entered into force in Ireland on 15th March 1985. Ireland currently has 45 sites/wetlands designated as Wetlands of International Importance (Ramsar Sites). These cover a surface area of 66,994ha. There are no Ramsar Sites in the local vicinity of Ummeras Bog (i.e. within 3km) The closest Ramsar Sites to Ummeras Bog include Pollardstown Fen (Kildare) and Raheenmore Bog (Offaly).

https://www.arcgis.com/apps/MapTour/index.html?appid=cd6e1a247bdc4179b9dfc0461e950f1e#

3.5 Hydrology and Hydrogeology

Ummeras Bog has a gravity drainage regime. The site currently is relatively dry as field drains actively drain water towards the silt ponds and off site. Initial hydrological modelling indicates the bog has topographical basins that are expected to develop a mosaic of wetland habitats when rehabilitation and drain-blocking is carried out (Figure 8.4). Several of these sub-basins in the site (e.g. south-east corner) are starting to re-wet naturally as drainage is more impeded.

Ummeras Bog is located in the River Barrow catchment. The Bord na Móna bog is drained through silt ponds into the Figile River (and its tributaries), which itself drains into the River Barrow which is just over 3km south of Ummeras Bog.

The north of the bog drains through a series of silt ponds into agricultural field drains which enter the Slate River c.250m from the boundary of the Bord na Móna bog. The Slate River itself drains into the Figile River a further 1.8km downstream. A silt pond on the western side of Ummeras Bog drains through 1km of agricultural field drains into the Figile River. Another silt pond in the south-west corner of Ummeras Bog drains through agricultural field drains into the Ummeras Stream, c. 700 downstream of the bog and onto the Figile River a further 300m downstream. A separate silt pond in the south-east corner of Ummeras Bog also drains, through forestry and land drains into the Ummeras Stream, c. 500m downstream of the Bord na Móna boundary. This drain meets the Ummeras Stream c. 1.8km upstream from the Figile River.

Silt ponds are present at the edges of the bog where they drain into the respective watercourses indicated above (see Figure 3.5).

The bog is largely located in an area with a locally important bedrock aquifer (Li) with Bedrock that is moderately productive only in local zones (EPA map-viewer). However, the southern and eastern periphery of the site is also over a regionally important Karstified (diffuse) aquifer (Rkd). An aquifer is an underground body of water-bearing rock or unconsolidated materials (gravel or sand) from which groundwater can be extracted in useful amounts. GSIs Aquifer classes are divided into three main groups based on their resource potential, and further subdivided based on the type of openings through which groundwater flows. There are nine aquifer categories in total. Locally important aquifers are capable of supplying locally important abstractions (e.g. smaller public water

supplies, group schemes), or good yields (100-400 m^3/d). Regionally important aquifers should have (or be capable of having) a large number of 'excellent' yields: in excess of approximately 400 m^3 per day. These data give an indication of sub-surface deposits (bedrock and unconsolidated materials) in terms of their groundwater resource potential and dominant groundwater flow type.

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

The peat is underlain in sections by lacustrine (lake-bed) deposits interbedded with glacio-fluvial deposits over limestone bedrock. The glacial deposits generally consist of grey gravelly clay/silt. The bog water table across the site is expected to be high when bog drains are blocked. The ability of the shallow peat water to interact with the underlying regional groundwater flows is limited by the relative permeability of the underlying glacial deposits.

3.6 Emissions to surface-water and water-courses

Drainage is an important feature of industrial peat production and there were extensive field drains maintained throughout bog areas to facilitate industrial peat production annually, each of which eventually drains into a terminal silt pond that allows for settlement of suspended solids before entering the main river systems (see Figure 3.6).

In accordance with the existing Integrated Pollution Control licence, all drainage water from boglands in a licensed area is discharged via an appropriately designed silt pond treatment arrangement as required in Condition 6.6. of the licence.

The silt ponds are inspected and maintained in accordance with the licence.

Silt ponds are the key silt control infrastructure to control potential emissions from industrial peat production sites. As required under licence, BnM have a number of procedures for how it manages and maintains its silt pond network. The silt that builds up in silt ponds is excavated on a regular basis by Bord na Móna to facilitate an efficient level of silt control. Silt ponds will continue to be maintained during the rehabilitation and decommissioning. Silt pond decommissioning will be considered when sites are deemed to be on a trajectory of environmental stability and peatland rehabilitation has been completed. There are four locations where water flows exit at Ummeras Bog, with single silt ponds at three of these exits and a complex of three silt ponds at the northern exit.

Ummeras bog has 4 treated surface water outlets to the Slate River IE_SE_14S010300 and the Figile River IE_SE_14F010600. Peat extraction was not identified as a pressure in both rivers in the second cycle of the river basin management plan but the Slate is indicated as being so in the third cycle, currently under preparation.

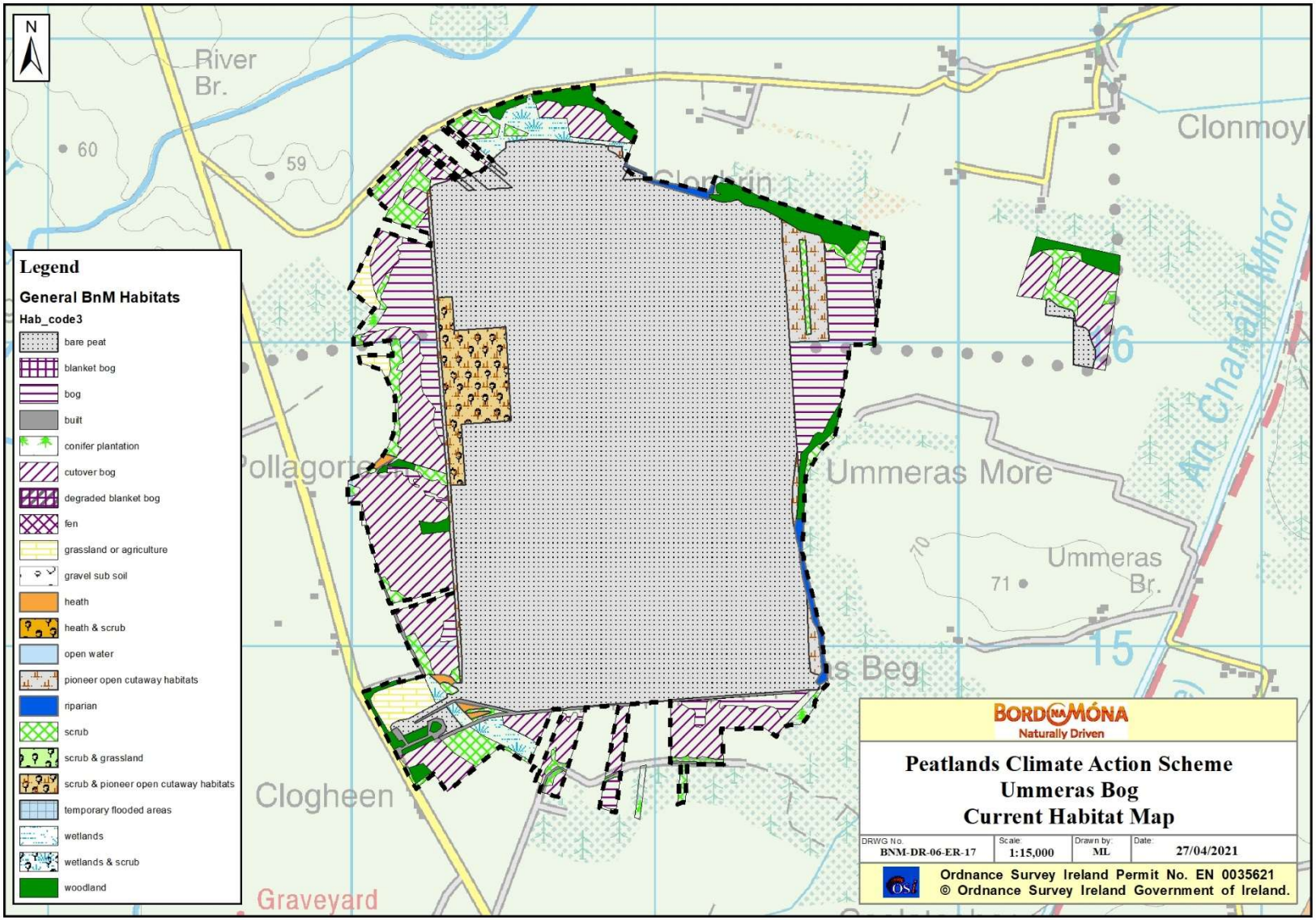

Figure 3.4 Habitat map of Ummeras Bog showing Bord na Móna habitat categorisation

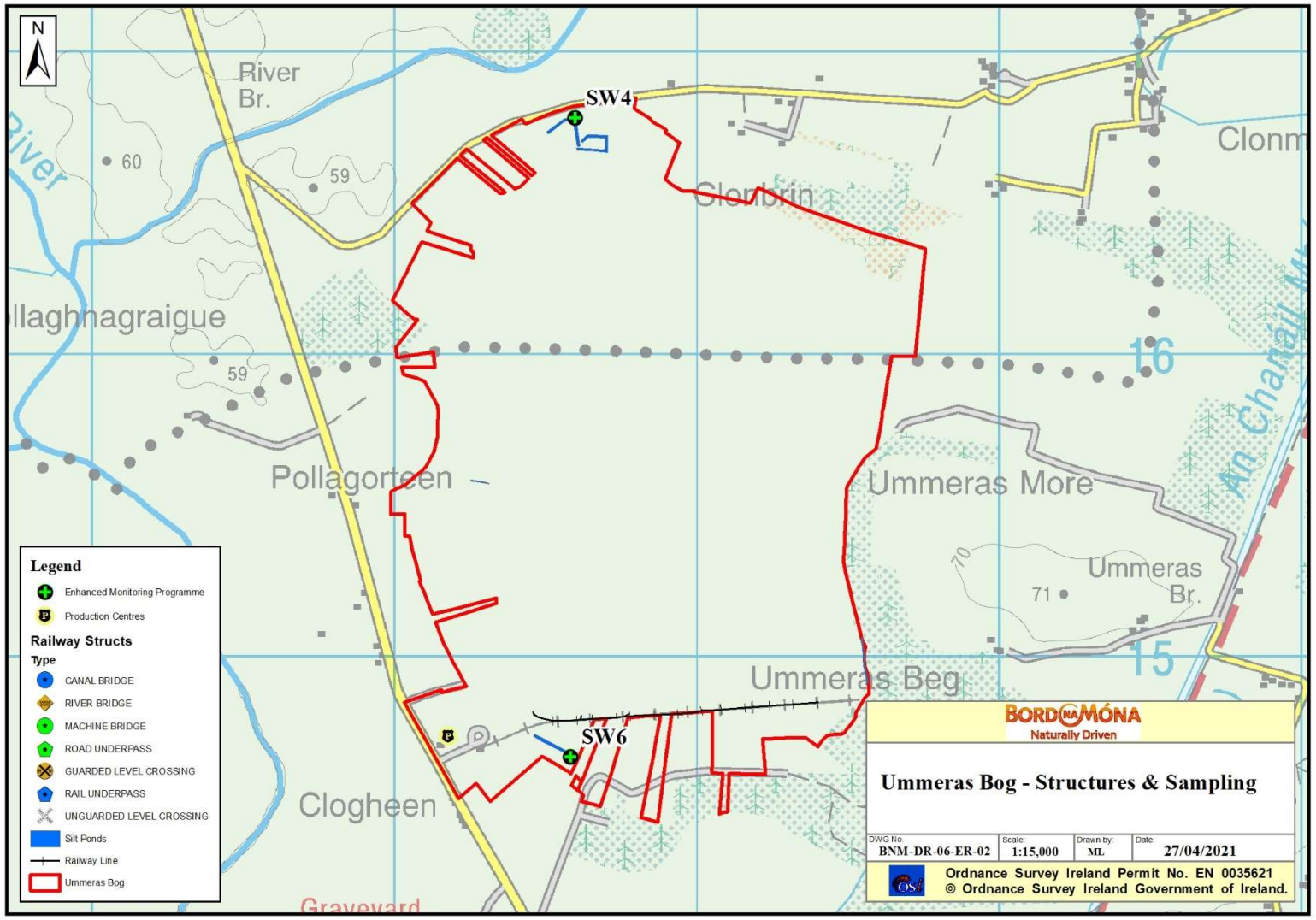

Figure 3.5. Map of Ummeras Bog showing structures and designated emission points.

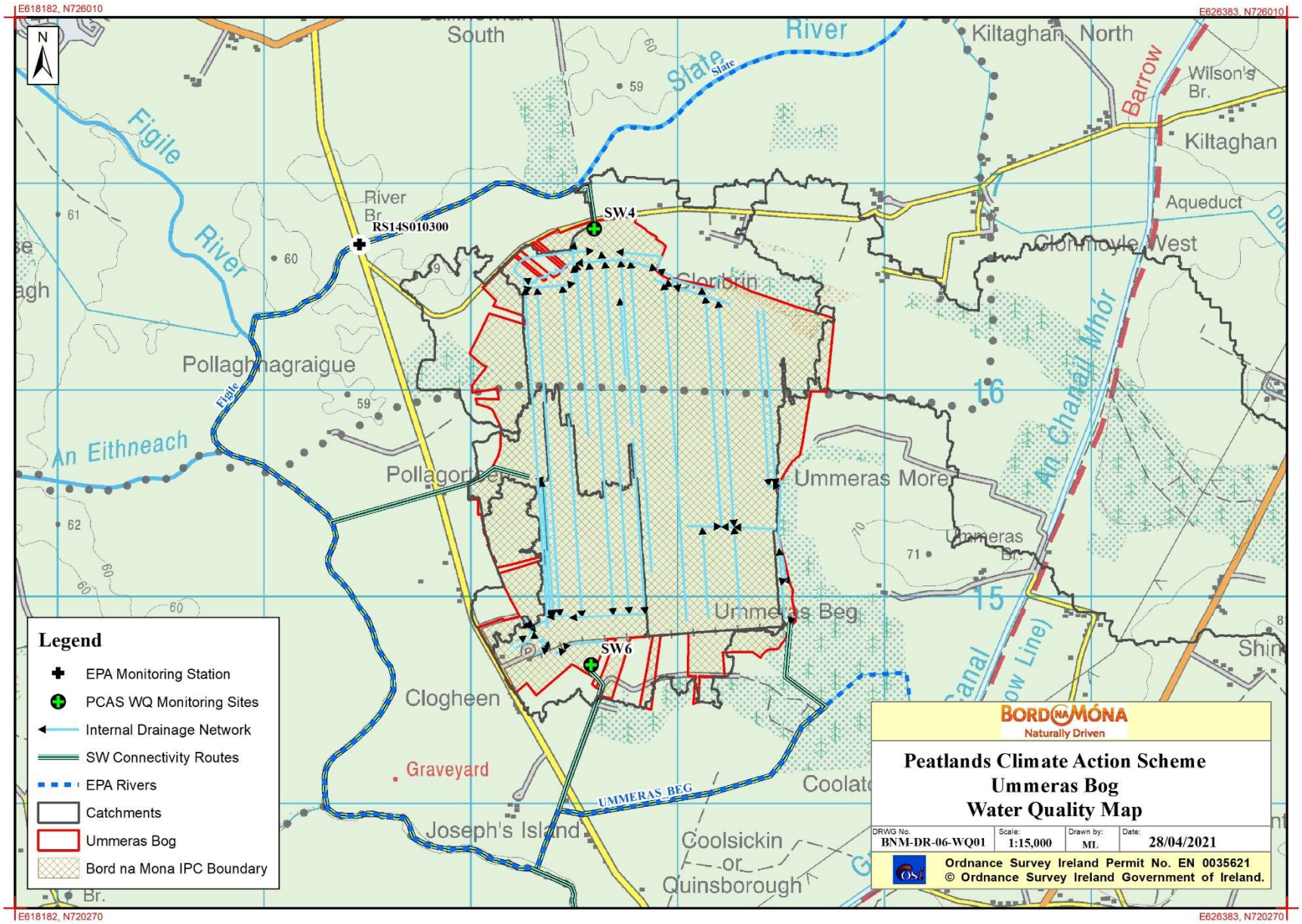

Figure 3.6. Map of Ummeras Bog showing water management features and water quality monitoring points.

There are no EPA records of emissions of suspended solids or Ammonia from the bog to downstream water-courses exceeding IPC licence limits. As part of the rehabilitation plan and validation, surface water quality will be monitored to establish an expected stabilization or improvement in water quality parameters. The main emission limit value associated with this bog is 35mg/l suspended solids, with trigger levels for ammonia of 4.53mg/l and COD 100mg/l.

Initial monthly ammonia concentrations from August to January 2021 have a range of 0.182 to 2.86mg/l with an average of 1.43mg/l.

From an analysis if any monitoring over the past 5 yrs. of the IPC licence environmental monitoring programme, indicate that results were under the ELV for SS and the trigger level for Ammonia, and within the majority of the trigger level for COD (Table 3.1).

Table 3.1 EPA Monitoring data (EPA) for the previous five years in relation to Ummeras Bog

Bog	SW	Monitoring	Sampled	pH	SS	TS	Ammonia	TP	COD	Colour
Ummeras	SW-4	Q3 20	12/08/2020	7.3	2	233	2.01	0.05	109	408
Ummeras	SW-5	Q3 20	12/08/2020	7.7	2	374	0.108	0.07	74	223
Ummeras	SW-6	Q3 20	12/08/2020	6.5	2	226	1.17	0.05	134	680
Ummeras	SW-6A	Q3 20	12/08/2020	6.7	2	190	0.641	0.05	118	438
Ummeras	SW-5	Q3 19	11/07/2019	7.1	5	204	0.02	0.11	77	489
Ummeras	SW-6	Q3 19	11/07/2019	7	6	222	0.02	0.07	77	485
Ummeras	SW-6A	Q3 19	11/07/2019	7.5	5	230	1.2	0.23	135	253
Ummeras	SW-4	Q3 19	11/07/2019	7.7	5	300	0.54	0.09	96	169
Ummeras	SW-5	Q1 18	22/03/2018	7.7	5	265	1.4	0.05	64	207
Ummeras	SW-6	Q1 18	22/03/2018	7.5	5	198	0.7	0.05	69	296
Ummeras	SW-6A	Q1 18	22/03/2018	7.8	5	264	1.4	0.05	48	138
Ummeras	SW-4	Q1 18	22/03/2018	7.6	5	270	1.5	0.05	71	270
Ummeras	SW-6	Q1 17	14/03/2017	7.4	5	248	2.5	0.05	90	332
Ummeras	SW-6A	Q1 17	14/03/2017	7.8	5	294	1.3	0.05	100	255
Ummeras	SW-4	Q4 16	24/11/2016	7.4	5	180	0.11	0.05	91	142

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

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

Water will still discharge from designated emission points when rehabilitation at Ummeras has been completed. This discharge will have improving water quality and there will be increased wetland attenuation, meaning slower release of water. This is expected to have a positive impact on status of the key water body receptors.

3.7 Fugitive Emissions to air

Rehabilitation of the cutaway peatland will seek to re-wet the dry peat where possible, and re-vegetate all areas (whether wet or dry). Collectively, ceasing industrial peat production, re-wetting and re-vegetating will minimise any risk of emission to air from dust.

3.8 Carbon emissions

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

The EPA-funded CarbonRestore Project (Renou-Wilson et. al. 2012) found that rewetting of drained peatlands can lead to restoration of functional peatland, such as the return of typical plant and animal species, which in turn may lead to the restoration of peat-formation and the carbon sink function. The EPA NEROS project carried out GHG flux research at Moyarwood Bog and found that Moyarwood Bog was overall a Carbon sink (sink for CO_2 and a source for Methane) 6 years after bog restoration was carried out (Renou-Wilson et al. 2018).

It is expected that Ummeras Bog will become a reduced Carbon source following rehabilitation. The site does have potential to develop as a carbon sink, in part, in the longer term. 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. This site is expected to develop embryonic *Sphagnum*-rich peat-forming habitats along with other cutaway peatland habitats including open water, Reed Swamp and fen. Birch woodland is expected to develop on the drier mounds and peripheral headlands.

3.9 Current ecological rating

(Following NRA (2009) Evaluation Criteria)

The majority of this site can be rated as having a **local ecological value – lower value (E)** as it is dominated by production bog with bare peat. Some marginal habitats such as bog woodland, raised bog (PB1), scrub and some cutover bog/degraded raised bog have **local ecological value – higher value** (D) rating.

It is expected that the overall ecological value of this site will increase in the future as the site re-vegetates, matures and forms semi-natural habitats, such as more extensive areas of embryonic *Sphagnum*-rich peat-forming vegetation.

3.10 Ummeras Bog Characterisation Summary

Ummeras Bog is located approximately 2.5km south-east of Bracknagh, 3 km North of Monasterevin and c.4.5km south-west of Rathangan, straddling the border between Cos Offaly and Kildare. Ummeras Bog has been in commercial peat production since the mid-1970s, with all commercial peat extraction ceasing in 2019. The bog comprises a range of cutover habitats including deep residual peat (>2 m), shallow cutaway that has started to revegetate naturally and some small areas of wetlands. There are also some bog fragments around the edge of Ummeras Bog,

The bog can be broadly divided into four categories:

1. bog remnants;
2. deep residual peat;
3. shallow cutaway bog; and
4. marginal and other dry areas of the former production area.

The bog is separated into these four areas to assist rehab planning. In reality, there are natural transitions between these areas where there are ecological and environmental gradients in relation to residual peat, etc. These are summarised further as follows.

(1) The north-eastern bog remnant is the only bog remnant with raised bog restoration potential. Note that this remnant was formerly in sod-moss production, but this was abandoned over 25 years ago. This area has deep residual peat and has now substantially re-vegetated with heather, and some *Sphagnum* is developing in some of the former drains. There is potential for bog restoration in this section. Other bog remnants are quite small, narrow and subject to ongoing turf cutting via turbary.

(2) A significant part of the former production area is residual deep peat. Ground-water is less likely to have a significant influence on the development of vegetation in these areas so If this peat can be re-wetted, and a stable water level developed close to the peat surface, it is expected to develop embryonic *Sphagnum*-rich vegetation in part. There are indications of alkaline ground-water influence in the drains to the north of the site so a mosaic with poor fen habitat is likely. The topography of this area is variable. Some of this area is modelled as wet and should be relatively straight-forward to re-wet once drains are blocked. Some of this area is modelled as dry and more intensive deep peat measures with bunding, re-profiling and cell berms are proposed to optimise hydrological conditions for the development of re-wetted peatland habitats.

(3) The shallow cutaway bog is towards the central and western side of Ummeras Bog. This former production area has shallow or no residual peat and the sub-soil is exposed. The sub-soil is limestone-based glacial deposits, and likely to have a more alkaline influence on the vegetation. This area is expected to develop as Birch Woodland and other typically drier cutaway habitats.

(4) Marginal areas, including headlands and high fields are likely to remain relatively dry. Drain-blocking and some fertiliser application is proposed on these area, where Birch woodland and other drier habitats are expected to develop.

4. CONSULTATION

4.1 Consultation to date

Consultation seeks to engage an audience of relevant stakeholders at both a national and local level. National stakeholders have been identified from varied bog restoration and rehabilitation efforts undertaken by Bord na Móna over the past 40 years, with particular emphasis on engagement with stakeholders during their Biodiversity Action Plan programme, since 2010. National Stakeholders includes relevant government departments and agencies, relevant semi-state bodies, NGOs and other environmentally-focused groups with a national remit.

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

- General consultation with range of stakeholders at annual Bord na Mona Biodiversity Action Plan review days 2010-2018.
- Archaeological Liaison Committee (National Museum of Ireland & Dept of Culture Heritage and the Gaeltacht).
- Carbon flux research on site as part of the EPA-funded SmartBog Project.

Consultation was carried out in 2019 on an earlier draft of this plan and additional consultation was carried out in 2020/2021.

The Ummeras Community Development Group have recently developed a long-term vision for the bog as a peatlands park for local and tourist amenity to enhance the overall biodiversity and amenity value. https://umeraspeatlandspark.ie. https://kildare-nationalist.ie/2020/07/01/ambitious-plans-for-the-rebirth-of-umeras-bog/.

The long-term amenity aspects **could** include walk and cycleways on the bog as well as lakes, a bog railway and a visitor centre. The community group are planning to fund a feasibility and design study. The local group have engaged with Bord na Móna in 2020 and Bord na Móna met a representative on site along with a representative from NPWS to chat about the potential project and about Bord na Móna's plans for peatland rehabilitation. This potential project has developed significant local interest in the local community. Bord na Móna are currently considering this community groups proposal and will consider future proposals in the context of Bord na Móna's own potential future land-use plans (BnM continues to consider options for commercial uses and other land-uses across its land-bank). Bord na Móna have continued to engage with the local community and Kildare County Council in relation to this proposal, as well as other local stakeholders and neighbours to the bog.

To inform the current Plan, both national and local stakeholders, including neighbours whose land adjoins Ummeras 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) have been contacted. Any identified local interest groups have been sought and informed of the opportunity to engage with this rehabilitation plan, and when identified have been invited to submit their comments or observations in relation to the proposed rehabilitation at Ummeras Bog (see Appendix XI).

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

4.2 Issues raised by Consultees

To date, a number of issues have been raised by consultees during the consultation process for both the current and previous drafts of the rehabilitation plan for Ummeras Bog – these are summarised below.

4.2.1 Assessments of rehabilitation

Queries on pre-rehabilitation assessments were raised by NPWS, Kildare and Offaly County Councils, the National Museum of Ireland and a number of local residents in relation to Appropriate Assessment, Environmental Impact Assessment and Strategic Environmental Assessment.

4.2.2 Restoration scope

Restoration/rehabilitation of marginal habitats was raised by IPCC and BCI as worthy of consideration within the rehabilitation measures to support carbon sequestration and biodiversity objectives. IWAI sought to align PCAS rehabilitation with their own goals on natural heritage locally.

Local landowners sought to ensure that no private property was included within the plan and queried possible future designation for Ummeras Bog following the proposed rehabilitation.

4.2.3 Monitoring

Further details on monitoring of ecological metrics, including water quality, carbon sequestration and biodiversity, and how and where reporting on this monitoring would take place, was raised in the IPCC submission and by Kildare County Council. Butterfly Conservation Ireland also suggested that monitoring of Large Heath butterfly be considered to assess the success of the proposed rehabilitation actions.

The ICMSA queried if a hydrological baseline was being established on surrounding private land in relation to assessing ex-situ impacts arising from re-wetting. Michael Fitzmaurice TD queried what monitoring was being undertaken to assess carbon emission reductions and storage within the bogs as part of PCAS.

4.2.4 Flooding of adjacent land

Michael Fitzmaurice TD, IFA, ICMSA and a number of local landowners and residents queried likely impacts arising from the proposed re-wetting associated with the rehabilitation in relation to flooding on adjoining lands and, specifically, with regards to the maintenance of drains. The IFA also raised the issue of Health and Safety in relation to raising water levels as well as possible impacts on land and property prices. Local landowners and residents raised the issue of risks to pets and livestock.

OPW welcomed the water retention measures associated with the proposed rehabilitation and associated benefits of flood risk reduction within the River Barrow catchment.

4.2.5 Other potential impacts arising from rehabilitation

Local residents and landowners queried the ecological value arising from the rehabilitation proposed, including specific reference to a lack of *Sphagnum* on the bog at present.

Local landowners and residents raised concerns about emissions from re-wetted bogs, including Ammonia toxicity, smell and suspended solids entering the local rivers, and suggested that wetlands harbour disease. Concerns in relation to displacement of badgers resulting in the spread of TB locally was also highlighted.

4.2.6 Land Management

The ICMSA and local landowners and residents queried the long-term management of the Bord na Móna's estate, particularly in relation to maintenance of boundary fencing to exclude livestock from the bogs and maintenance of drainage.

The NARGC suggested that heather be established on large area of the cutaways as this is beneficial from biodiversity and pollinators. NARGC were also keen to minimise the spread of scrub and woodland habitats to reduce habitats from predators (such as foxes) and were keen to seek control of so-called "vermin" species on the rehabilitated bogs.

4.2.7 Other issues (including amenity)

Opportunities to develop amenities on the bog to support local communities was raised by a number of consultees, including the Kildare Branch of BirdWatch Ireland, Ummeras Community Development, Ummeras Bog Conservation Group, IPC and, IWAI.

Other issues (raised by IPCC and local landowners and residents) included after use of the bog and turf cutting on the margins of the bog (outside of the area owned by Bord na Móna).

Archaeological end of life survey of all the bogs were requested by National Museum of Ireland and National Monuments Unit.

For a complete summary of submissions received and replies, see Appendix XI.

4.3 Bord na Móna response to issues raised during consultation

4.3.1 Assessments of rehabilitation

AA screening will be undertaken on all the bogs as part of PCAS and this is currently being undertaken by external consultants for Ummeras Bog. Where required, Natura Impact Statements shall be completed and submitted to the Minister in accordance with 42(9) and 42(10) of the Habitats Regulation, noting that Bord na Móna is prescribed as a 'public authority' under this legislation. In relation to the SEA Directive and EIAR Directive, this has been considered and the legal advice to date is that the scheme does not come under these Directives.

An Archaeological Impact Assessment (AIA) is also being undertaken on all the bogs in PCAS. The aim for known archaeology on these bogs is to accomplish preservation in situ and we are taking steps to identify and avoid all known archaeology. We are doing this by including all known archaeology on our GIS from the AIA process, and either excluding or defining a buffer zone around these features, which will then be excluded from any ground works in these areas in the final plan. It is anticipated that any archaeology will benefit hugely from the ultimate remit of the rehabilitation, in that water tables will be raised thereby preserving in-situ. There is also an identified procedure for managing reports of stray finds that may arise during rehabilitation works.

An archaeological end of life survey of all the bogs as requested by National Museum of Ireland and National Monuments Unit is not part of the current scope of the scheme. Bord na Móna would be happy to assist such a survey, where possible.

4.3.2 Restoration scope

The scope of this rehabilitation plan covers the former Derrycolumb Bog industrial peat production area. As part of the PCAS, all restoration/rehabilitation options have been developed to support climate action and biodiversity objectives.

Bord na Móna will not be entering or carrying work out work on any private third party lands.

It is not possible to confirm whether or not that Ummeras Bog will not become a designated area in the future, however this is unlikely given the current status of the bog. It should be noted that such a designation is purely a decision for the Government and not Bord na Móna.

4.3.3 Monitoring

As part of the PCAS, a monitoring and verification plan has been developed to support climate action and biodiversity objectives. This will include stratified monitoring of bog condition, habitats and biodiversity at several different scales. Some fauna monitoring (pollinator transect) is proposed as part of the monitoring and verification at Ummeras Bog during the period of the scheme (2021-2025). However, note that fauna typically take longer to respond to the changes in vegetation colonisation and habitats arising from the proposed rehabilitation measures identified for Ummeras Bog. The re-colonisation of species such as Large Heath is likely to take a longer timeframe.

Water monitoring is undertaken as part of Bord na Móna's IPC licence obligations, and this will continue until such a time as the licence can be surrendered.

Ummeras Bog is being used as one of the study sites for the EPA-funded and TCD-led SmartBOG research project which measures Greenhouse Gas fluxes using chambers in different parts of the site. It is expected that there will be several years research at Ummeras Bog that will hopefully capture the short-term change in bog condition from relatively dry and undrained to re-wetted and rehab carried out.

4.3.4 Flooding of adjacent land

It is the intention of Bord na Móna that the re-wetting of the bogs will be carried out in such a manner that does not impact on third party lands including adjoining private turf banks.

External consultants have been appointed to carry out a hydrological assessment, to identify any potential impacts to neighbouring lands and, where required, the rehab design will be amended to prevent any identified impact. Please note that climate change is considered in the hydrological assessment. Information on these hydrological assessments will be made available through our website.

The rehabilitation measures will generally result in reduced runoff and drainage from the existing peat fields through a mixture of techniques including, drain blocking, cell bunding and re-profiling. It is intended that these measures will not significantly alter the existing topographical catchments and that the spine of the drainage

networks will be retained by Bord na Móna. Based on evidence from other bogs, rehabilitation measures will reduce the run-off from the bog by returning the peatlands towards its natural water retention function

Bord na Móna will continue to manage their land bank into the future. As peat production has now ceased on Bord na Móna lands and rehabilitation measures will be carried out, a regular drainage maintenance programme will not be required or carried out as would have been the case in the past. However, if issues arise with the Bord na Móna internal drainage system that affects upstream or downstream landowners, then these issues will be addressed by Bord na Móna.

4.3.5 Other potential impacts arising from rehabilitation

In relation to the ecological value of Ummeras Bog, Bord na Móna have a team of very experienced Ecologists who are qualified to assess the existing and future ecology and habitats of the bog. Re-wetting of the bog will increase the biodiversity on the bog and will not displace wildlife currently living there. If required, *Sphagnum* moss will be procured externally for inoculation on the site. Re-wetting the bog will reduce carbon emissions and set the bog on a trajectory towards becoming a carbon sink.

In relation to queries on Ammonia toxicity, impacts on forestry and a statement regarding “peat being released to the River Barrow”, please note that Bord na Móna peat extraction activities have been licensed by the Environmental Protection Agency since 2000. Bord na Móna have provided silt control to the satisfaction of the EPA and do not release peat to the River Barrow or any other river. There is ongoing monitoring of our discharges to surface waters and there have been no breaches in our licence conditions in Ummeras Bog. Rewetting of the bog will improve water quality and will reduce ammonia levels from the bog.

The re-wetting measures will be carried out in Ummeras in areas of bare peat which is not suitable for badgers. Badgers are protected under the Wildlife Act and no work shall be carried out that would cause any disturbance to a protected species.

All raised bogs are wetlands and there is no evidence to support the statement that “Wetlands are host to countless diseases”. Also, Bord na Móna have rehabilitated 20,000 hectares of bog and odour from re-wetted areas has not been noted as an issue.

4.3.6 Land Management

Bord na Móna will continue to have responsibilities for managing the land in their ownership as any landowner would. In addition, land still under an IPC licence will need to be managed in accordance with that licence.

It is expected that re-wetting will reduce area being colonised by Birch and other scrub species as conditions will be more suitable for wetter species. However, in drier areas that cannot be re-wetted, particularly where there is shallow (or no) residual peat, it is inevitable that drier vegetation communities, including Birch woodland and Heather-dominated vegetation, will develop. Although Heather-dominated habitats can support particular peatland species, these habitats (analogous to drier raised bog Face-bank ecotope) are typically associated with emitting Carbon from the remnant peat deposits. Such areas will be minimised within PCAS and habitats that reduce carbon emissions and, especially habitats with the potential to sequester carbon (such as *Sphagnum*-rich embryonic bog communities) will be promoted. However, it is expected that as naturally functioning peatland ecosystems develop that are analogous to embryonic raised bog, these will colonise with Heather and other ericoid species in time and typical raised bog hummocks will re-develop. Raised bog habitat in good condition is

known to support species such as Red Grouse and Curlew and in time these sites could regain this potential. There is potential to trial some Heather inoculation in some rehabilitated peatland with suitable conditions.

4.3.7 Other issues (including amenity)

Creating amenity such as walking tracks is not part of the direct scope of PCAS. However, PCAS will enable and support future amenity development. Amenity such as the peatlands park proposed by Ummeras Community Development Group can be positively aligned and integrated to after-use plans following the completion of the proposed rehabilitation at Ummeras Bog. Rehabilitation measures proposed for Ummeras Bog do not need to be amended to integrate any future amenity track positioned along the margin of the former production bog or along the former bog railway.

Numerous communications, regarding multiple potential issues at Ummeras Bog, were made with a local landowner. After contact by the solicitor representing the same landowner, communications responsibilities for these issues have now been passed on to the BnM legal team.

Other issues, including after-use and management issues outside the boundary of Ummeras Bog, are acknowledged but are specifically outside the scope of this rehabilitation plan. This includes reference to the cessation of turf-cutting on private lands. Bord na Móna rehabilitation proposals will not impact on private turf-cutting and will have no impact on private turf-cutting outside Bord na Móna boundaries.

4.3.8 Concluding statement.

- No specific issues were raised during consultation that required significant changes to the substance of the rehabilitation plan.
- Issues raised by several consultees in relation to potential impacts on adjacent land are acknowledged and have been accounted for during the hydrological analysis and in the rehabilitation plan.
- Several marginal drains will not be blocked to avoid impacts on adjacent lands, or turf-banks.
- No changes were required to the rehabilitation plan to enable any potential future amenity or other land-use

5. REHABILITATION GOALS AND OUTCOMES

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

- Meeting conditions of IPC Licence.
- Stabilisation or reduction in water quality parameters of water discharging from the site (e.g. suspended solids).
- Reducing pressure on receiving water-bodies that have been classified as At Risk from peatlands and from peat extraction, via stabilization or improving water-quality from this bog, and therefore, reducing pressures.
- Optimising hydrological conditions for **climate action benefits as part of PCAS**. Optimising hydrology for the development of embryonic *Sphagnum*-rich vegetation communities on deep peat, where possible, and eventually naturally functioning peatland habitats.
- Optimising hydrological conditions for the protection of any exposed archaeological structures, their retention in situ and preservation into the future, where possible.
- 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 Ummeras Bog. This will happen over a longer time-frame than the implementation of this rehabilitation plan
- Re-wetting residual peat will initially maintain and enhance the carbon storage capacity of the bog. There is scientific consensus that restoration of hydrology in damaged bog can improve carbon storage, water storage and attenuation and help support biodiversity both on the site and in the catchment (See Section 3.8). This will reduce carbon emissions from the site from a larger carbon source to a smaller carbon source. In time, the site has the capacity to develop in part as a carbon sink. PCAS is expected to deliver significant contributions to Ireland's climate action.
- It is not expected that the site has the potential to develop active raised bog (ARB) analogous to the priority EU Habitats Directive Annex I habitat within the foreseeable future (c.50 years). Furthermore, only a proportion of the bog has potential to develop *Sphagnum*-rich habitats in this timeframe. Nevertheless, re-wetting across the entire bog, as part of the Scheme, will improve habitat conditions of the whole bog, making the overall bog wetter. Other peatland habitats will develop in a wider mosaic that reflects underlying conditions.
- Rehabilitating former industrial peat production bog will also in the longer-term support other ecosystem services such as such the development of new habitat to support biodiversity and local attenuation of water flows from the bog.
- WFD status in receiving water bodies can be affected by peatlands and peat extraction, but is also affected by other sources such as agriculture. In addition, receiving water bodies that are assessed as At Risk from peatlands and from peat extraction are likely to have several contributary sources of impacts (private peat extraction and Bord na Móna). Reducing pressures due to former peat extraction activities at Derrycashel 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).

6. SCOPE OF REHABILITATION

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

- The area of Ummeras Bog (Figure 3.1).
- EPA IPC Licence - Ref. P0506-01. As part of Condition 10.2 of this license, a rehabilitation plan must be prepared for permanent rehabilitation of the boglands within the licensed area.
- The proposed rehabilitation is designed to exceed the requirements as defined by the IPC Licence. PCAS is designed to enhance the ecosystem services of Ummeras Bog, in particular, optimising **climate action benefits**. The proposed omprovements will mean that environmental stabilization is achieved (meaning IPC obligations are met) and, in addition, significant other ecosystem service benefits will be accrued.
- The local environmental conditions of Ummeras Bog identify residual deep peat re-wetting as the most suitable rehabilitation approach for different part of this site.
- The key objective of rehabilitation, as defined by this licence, is **environmental stabilisation** of the bog. Bord na Móna have defined the key goal and outcome of rehabilitation at Ummeras Bog as **environmental stabilisation** and **optimising deep peat re-wetting, and setting the site on a trajectory towards the development of embryonic peat-forming (*Sphagnum*-rich) vegetation communities on deep peat, where possible, and other wet peatland habitats, where suited.**
- Rehabilitation of Ummeras Bog will support multiple national strategies of climate action, biodiversity action and other key environmental strategies such was the Water Framework Directive.
- **Time frame.** Rehabilitation measures will be carried out during the period of PCAS (2020-2025). The surrender of the licence is likely to extend beyond the PCAS timeframe.
- It is not proposed to carry out any rehabilitation in the narrow marginal raised bog remnants along the western, southern and south-eastern margins. Generally, these bog remnants are narrow, or are subject to turbary, and do not have positive bog restoration prospects.

6.1 Key constraints

- **Potential Future Land-use.** A local community group have also developed a vision for a potential peatlands park on the site. Potential future uses at Ummeras must undergo the appropriate consenting and development process as required. Any future use at Ummeras Bog would be considered by Bord na Móna in the context of the land bank status. In the event that Bord na Móna make the decision to support any proposed project, it is likely that the rehabilitation measures proposed in this plan will be compatible with the any potential future development that has key objectives of amenity and biodiversity. Amenity could be integrated with the post-rehabilitated peatland landscape.
- **Bog conditions.** Rehabilitation outcomes of sites are constrained by the environmental characteristics of these particular areas. For example, much of the peat mass has been removed at many sites, the environmental characteristics of these areas have therefore changed radically (peat depths, hydrology, water chemistry, substrate type, nutrient status, etc.) and there will therefore be different habitat outcomes (wetlands, fen, heathland, grassland and Birch woodland). On parts of Ummeras Bog, only a certain proportion of peat has been removed leaving a largely un-vegetated surface over deep peat deposits whilst on other areas almost all the peat layer has been removed, with subsoil visible. There are local factors that will influence the future trajectory of this site (underlying alkaline sub-soil) which need to be considered as part of the wider rehabilitation work.

- **Surrounding landscape and neighbours.** Another key constraint is the interaction between the Bord na Móna sites and the surrounding landscape. Care will be taken that no active rehabilitation management is carried out that could negatively and knowingly impact on surrounding land. This includes the hydrology of neighbouring farmland and neighbouring turbary or turf-banks. It is anticipated that the work proposed here (blocking drains and re-wetting cutaway peatlands) will not have any flooding impacts on adjacent land. In general, marginal drains will **not be blocked**.
- **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.
- **Archaeology**. The discovery of monuments or archaeological objects during peatland rehabilitation may potentially constrain the rehabilitation measures proposed for a particular area. While the rehabilitation will optimise hydrological conditions for the protection of exposed archaeological structures, their retention in situ and preservation into the future, any new archaeology may require rehabilitation measures will be reviewed and adapted. If this occurs, rehabilitation measures will be reviewed and adapted. An archaeological impact assessment of the proposed rehabilitation at Ummeras Bog has been carried out (Appendix IX). The recommendations of this appraisal will be incorporated into the rehabilitation plan to minimise impacts on known archaeology. Should any previously unknown archaeological material be uncovered during the rehabilitation works, it should be avoided and reported to Bord na Móna Archaeological Liaison Officer and the National Museum of Ireland.

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 small, isolated piece of Bord na Mona property to the east of the main bog. This area was never developed by Bord na Mona. It contains a mosaic of cutaway peatland habitats already.
- The longer-term development of stable naturally functioning habitats to fully develop at Ummeras Bog. The plan covers the short-term rehabilitation **actions** and **an additional monitoring and after-care programme** to monitor the rehabilitation and to respond to any needs.
- This plan is not intended to be an after-use or future land-use plan for Ummeras 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 silt run-off).

In addition, Bord na Móna wish to optimise climate action and other ecosystem service benefits via additional rehabilitation measures. These measures will significantly go beyond what is required to meet rehabilitation and decommissioning obligations under existing EPA IPC licence conditions. The proposed interventions will mean that environmental stabilisation is achieved (meaning IPC obligations are met) and, in addition, significant other benefits particularly for climate action will be accrued.

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

- Rewetting of deep peat in the former area of industrial peat production to offset potential silt run off and to encourage development of vegetation cover via natural colonisation through a combination of rehabilitation measures, and reducing the area of bare exposed peat. 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.
- 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.

(See Table 7.1 for a summary of the criteria for successful rehabilitation and associated monitoring.)

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

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

As the monthly monitoring program at Ummeras continues in 2021 during the rehabilitation works, and data from the 2020 monitoring program is compiled, further trending will be produced to verify any ongoing trends.

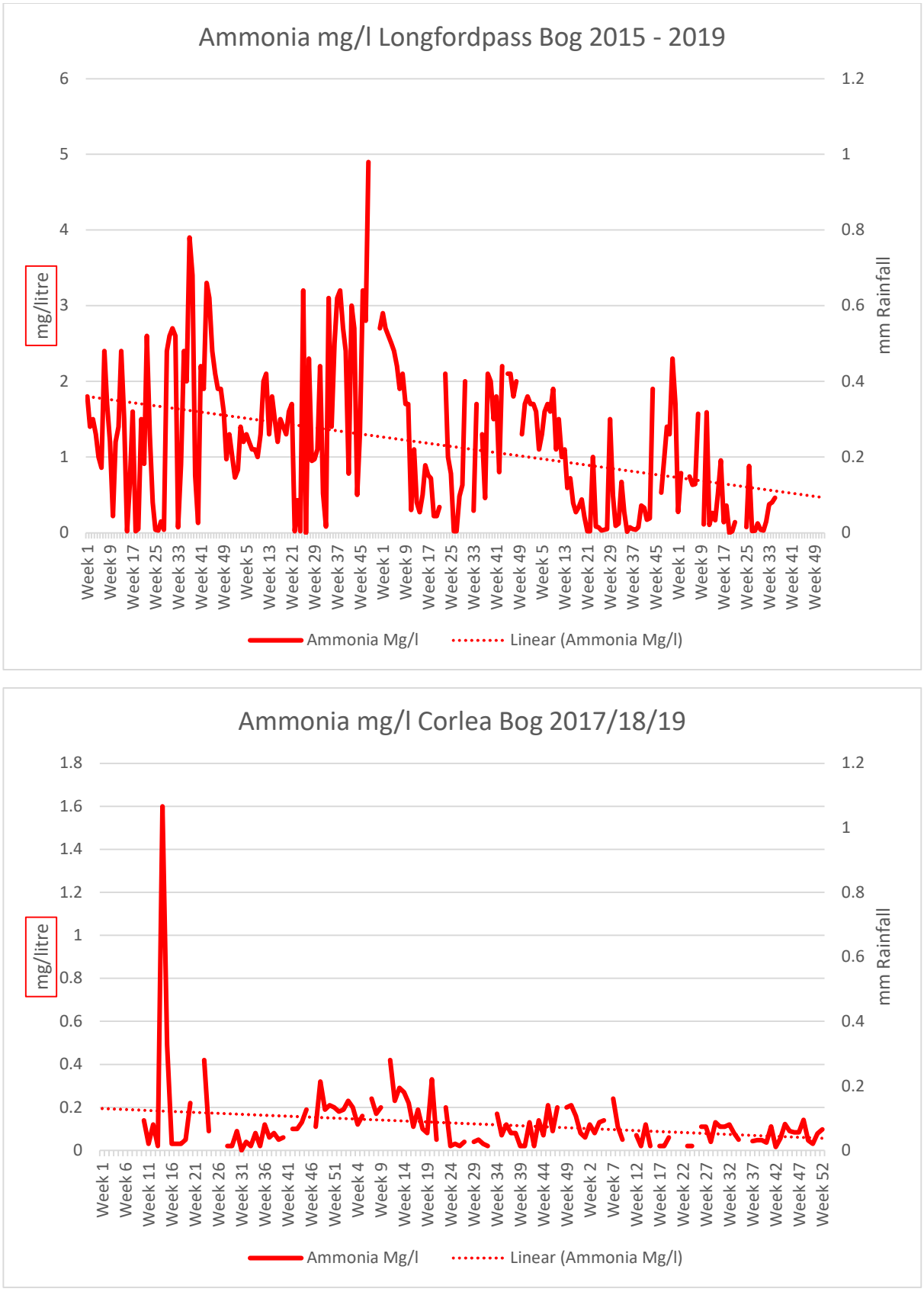

Figure 7.1. Ammonia levels at Longfordpass and Corlea Bogs.

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 deep peat re-wetting). This will be measured by an aerial survey after rehabilitation has been completed.
- Accelerating the trajectory of the site towards becoming a reduced carbon source/carbon sink and eventually naturally functioning peatland habitats (heath, scrub, poor fen and embryonic *Sphagnum*-rich raised bog peatland communities, where conditions are suitable). These habitats will generally establish initially as pioneer vegetation. This will be measured through habitat mapping and the development of cutaway bog condition assessment. This cutaway bog condition assessment will include assessment of environmental and ecological indicators such as vegetation cover, vegetation communities, presence of key species, *Sphagnum* cover, bare peat cover and water levels. Baseline monitoring will be carried after rehabilitation is completed (during the scheme). It is proposed that sites can be monitored against this baseline in the future.
- Reduction in carbon emissions. This will be estimated via a combination of habitat condition assessment and application of appropriate carbon emission factors derived from other sites. Baseline monitoring (habitat condition) will be carried after rehabilitation is completed (during the scheme). It is proposed that sites can be monitored against this baseline in the future.
- 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 time-frames.

Criteria type	**Criteria**	**Target**	**Measured by**	**Expected Time-frame**
IPC validation	Rewetting of the drained high bog area	Delivery of planned rehabilitation measures. This will be a combination of drain blocking, bunding and re-profiling	Aerial photography after rehabilitation has been completed – to demonstrate measures (drain-blocking)	2021-2024

IPC validation	Key water quality parameters Ammonia, Phosphorous, Suspended solids, pH and conductivity	Stabilization Improvement of key water quality parameters	Water quality monitoring. Started in advance of the proposed rehabilitation.	2021-2023
IPC validation	Reducing pressure from peat production on the local water body catchment (WFD)	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	EPA WFD monitoring programme	WFD schedule
Climate action verification	Optimising the extent of suitable hydrological conditions to optimise climate action and setting the site on a trajectory towards establishment of a mosaic of compatible peatland habitats	Optimal extent of suitable hydrological conditions Indicators of establishment of compatible cutaway habitats	Aerial photography, Cutaway bog condition map and Habitat mapping to map extent of suitable hydrological conditions. Baseline monitoring to be carried out during the scheme when rehabilitation is complete. Sites can be re-monitored in the future and compared against this baseline.	2021-2025
Climate action verification	Biodiversity and ecosystem services. Habitat establishment Presence of key species – Sphagnum Breeding and wintering birds Pollinators	Improvement in biodiversity and ecosystem services.	Metrics that relate to selected biodiversity and ecosystem services Presence of key species – Sphagnum – Walkover survey Breeding birds – Breeding bird survey Pollinators – Pollinator walk Baseline monitoring to be carried out during the scheme when rehabilitation	2021-2024

			is complete. Sites can be re-monitored in the future and compared against this baseline.	

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.

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

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

- **Funding to pay for resources required to deliver the planned rehabilitation (Bord na Móna and external).** Bord na Móna maintains a Provision on its balance sheet to pay for these future costs when industrial peat extraction ceases. Bord na Móna is fully committed to meeting its obligations relating to rehabilitation and decommissioning under the Integrated Pollution Control Licence. It is expected that additional costs of enhanced rehabilitation will be supported by Government through the Climate Action Fund.
- **Bord na Móna to have sufficient resources (staff and training) to deliver the planned rehabilitation with required associated skills and competencies.**
- **Bord na Móna to have sufficient resources (suitable machinery) and staff to maintain this machinery.**
- **Weather conditions to be within normal limits over the rehabilitation plan timeframe.** Long periods of wet weather have the capacity to significantly affect ground conditions and constrain the delivery of rehabilitation. The potential impact of wet weather on ground conditions can be reduced by appropriate planning and management. Bord na Móna have significant experience of managing these issues through 70 years of working in these peatland environments.
- **Rehabilitation measures to be effective.** The rehabilitation measures proposed in this plan are based on 40 years of Bord na Móna experience of peatland management and best practise applied internationally in peatland management. Measures proposed in this plan have already been shown to be affective at other sites. Bord na Móna will apply a flexible and adaptable approach to the more innovative rehabilitation measures proposed in this plan**.** If measures are not initially effective, Bord na Móna will review any requirement for additional practical rehabilitation.
- **Natural colonisation of vegetation to develop semi-natural habitats at a rate within the normal limits.** The development of naturally functioning semi-natural habitats on cutaway peatland takes time. Pioneer vegetation can develop relatively quickly (3-10 years) and wetland habitats can develop relatively quickly. Birch woodland make take 20-30 years to develop. However, it may take 50 years for active raised bog vegetation to re-develop on ground that was previously cutaway. Different environmental conditions will have a significant impact on the rate of natural colonisation, and as a result of the combination of different environmental conditions and the application of different rehabilitation measures, there will be a variety of habitat outcomes.
- Rehabilitation measures have been designed to accelerate and work with natural colonisation and other natural processes. Bord na Móna experience of rehabilitation has shown that re-wetting improves conditions for natural colonisation and that natural colonisation is accelerated where the environmental

conditions are most suitable. Rehabilitation measures have been designed to modify the conditions of areas within sites where conditions are less suitable for natural colonisation (modifying hydrology, topography, nutrient status or availability of potential seed sources).

- **Monitoring to be robust and effective.** Rehabilitation Monitoring will be established to validate the success of rehabilitation as required by Condition 10 of the IPC Licence and to verify the benefits of the proposed 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 (Figure 8.1-8.4) 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 (Figure 8.4) indicates those areas that are likely to re-wet when drains are blocked, based on the current topography, and areas where water levels may have to be modified, where needed. Enhanced rehabilitation measures will look to optimise hydrological conditions for re-wetting peat in other areas. This planning is also essential for matching the most sustainable rehabilitation methodology to the most suitable cutaway environment to maximise the benefits of the resource outlay (maximising cost/benefit).

The rehabilitation actions will be a combination of PCAS measures to re-wet peat. The distribution of these measures is provisionally outlined in Figure 8.5. (Note that the actual distribution of these measures may be subject to change in response to stakeholder consultation and future refinement of the enhanced rehabilitation measures.)

These enhanced measures for Ummeras Bog will include (see Figure 8.5)**:**

- Re-wetting the deep peat areas of the bog using berms, drain blocking and field re-profiling. This enhanced measure seeks to create large (c. 45m x 60m) flat areas or cells of shallow (< 10 cm) water conditions on bare peat, across multiple fields that are enclosed by shallow berms to retain shallow surface water;
- In some areas, a cut-and-fill cell bunding technique is proposed. The cut and fill cell bunding approach aims to create 'saucers' or flat bunded areas (cells) on peat with berms to hold shallow water at appropriate levels;
- Re-wetting some deep peat areas of the bog through regular more intensive drain blocking using an excavator to create up to a max of 7 no. peat blockages every 100 m along each field drain, along with field re-profiling and drain infilling if required;
- Re-alignment of piped drainage;
- Blocking drains in targeted marginal (degraded) high bog/cutaway areas and re-wetting, where possible, using an excavator to install peat blockages, up to a max of 7/100m. Some bog remnants are too small to benefit from this approach;
- Targeted fertiliser applications on bare peat areas to accelerate vegetation establishment on headlands and high fields.
- Seeding of vegetation and inoculation of *Sphagnum* in suitable deep residual peat; and
- Modifying water levels at outfalls. This will further slow the movement of water through and out of Ummeras Bog.
- Water level management through blocking of outfalls, overflow management, field re-profiling, and the creation of berms to rewet cutaway.
- Silt ponds will be retained and maintained during the rehabilitation phase. During the monitoring and verification phase silt ponds will be continually inspected and maintained, where appropriate. When it is deemed that 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. 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).

Silt ponds will be retained and maintained during the rehabilitation phase. During the monitoring and verification phase silt ponds will be continually inspected and maintained, where appropriate. When it is deemed that 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. 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).

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

- Seek formal approval of the enhanced plan from the EPA;
- Agree an *ex ante* budget of eligible costs (based on the approved enhanced plan) with the Scheme regulator;
- Develop a detailed site plan with detailed site drawings outlining how the various rehabilitation methodologies (the proposed PCAS) will be applied to Ummeras Bog. This will take account of peat depths, topography, drainage and hydrological modelling. (See map for an indicative view of the application of different rehabilitation methodologies);
- Carry out a hydrology and drainage management assessment of the proposed enhanced rehabilitation measures;
- Carry out a review of known archaeology and an archaeological impact assessment of the proposed rehabilitation. Incorporate the results of this assessment into the rehabilitation plan to minimise known archaeological disturbance, where possible;
- Carry out a review of remaining milled peat stocks;
- Carry out a review of issues that may constrain rehabilitation such as known rights of way, turbary and existing land agreements. A known right of way exists along across one of the Bord na Móna margins.
- Carry out an ecological appraisal of the potential impacts of the planned rehabilitation, if needed, such as the presence of sensitive ground-nesting bird breeding species (e.g. Curlew) or larval webs of Marsh Fritillary butterfly, etc. The scheduling of rehabilitation operations will be adapted, as mitigation; and
- Ensure all activities comply with the environmental protection requirements of the IPC Licence.
- Carry out Appropriate Assessment of the Rehabilitation Plan. Incorporate any required mitigation measures from the AA in the plan for the delivery of rehabilitation and decommissioning across the site.
- Track implementation and enforcement of the relevant IPC Licence conditions, the mitigation measures (AA) and other environmental control measures during the implantation of the rehabilitation plan.

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

- Carry out proposed measures as per the detailed site plan. This will include a combination of drain blocking, peat field re-profiling, cell-bunding and fertiliser applications targeting headlands, high fields and other areas (where required). All rehabilitation will be carried out with regard to environmental control measures (Appendix IV);
- Monitor the success of rehabilitation measures in relation to developing suitable hydrological conditions;
- Carry out the proposed monitoring, as outlined.

- While natural colonisation is expected to commence almost immediately once peat production ceases, Phase 2 actions will be carried out in targeted areas to accelerate re-vegetation and colonisation of target species. Phase 2 actions may include seeding of targeted vegetation and inoculation of *Sphagnum*;
- Silt ponds will be monitored during this period and there will be continued maintenance and cleaning to prevent silt run-off from the site during the rehabilitation phase; and
- Submit an *ex post* report to the Scheme regulator to verify the eligible works 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 proposed Scheme.

8.3 Long-term (>3 years)

- Evaluate success of short-term rehabilitation measures outlined above and remediate where necessary;
- Evaluate opportunity for conservation grazing option post re-wetting including available resources for management and husbandry;
- 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; and
- Reporting to the EPA will continue until the IPC License is surrendered.

8.4 Timeframe

- **2020-2021**: Short-term planning actions.
- **2021**: Short-term practical actions.
- **2021-2024**: Long term practical actions. Evaluate success of short-term rehabilitation measures outlined above and remediate where necessary.
- **> 2024**: Decommission silt-ponds, if necessary

8.5 Budget and costing

Bord na Móna (BnM) appreciates the Minister's intention to support, via the Climate Action Fund, Bord na Móna in developing a package of measures, 'the proposed 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 proposed 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 licence compliance costs of mandatory standard rehabilitation and decommissioning when industrial peat extraction ceases. This is updated every year - for more information see the Bord na Móna Annual Report (Bord na Móna 2020). 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 'mandatory' rehabilitation provision (sufficient to discharge the requirement of Condition 10 in the licence) has been be allocated to the site based on the area of different types of cutaway across the site (See Appendix I).

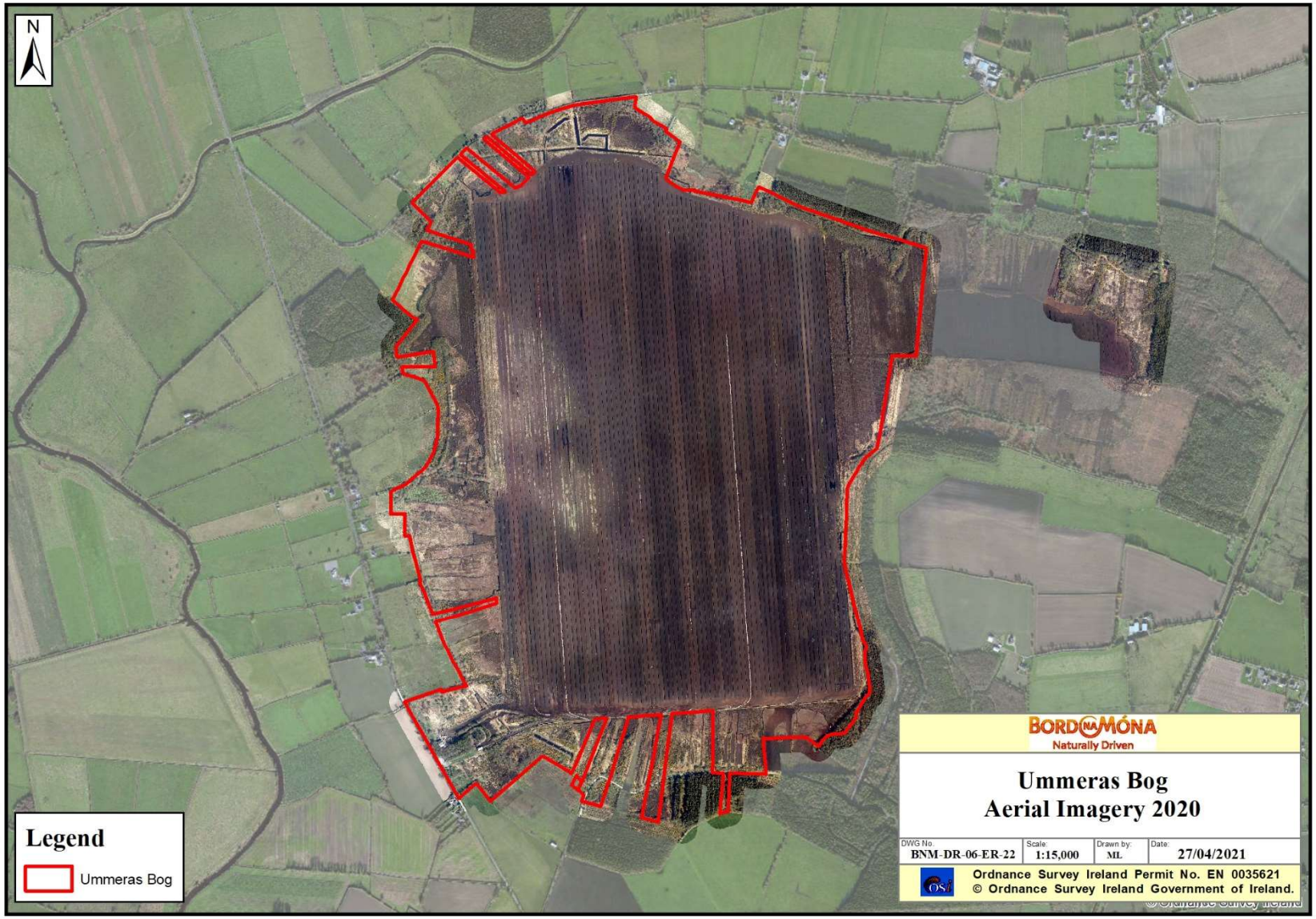

Figure 8.1. Aerial photo of Ummeras Bog. The vegetating ridge on the western side of the bog is visible.

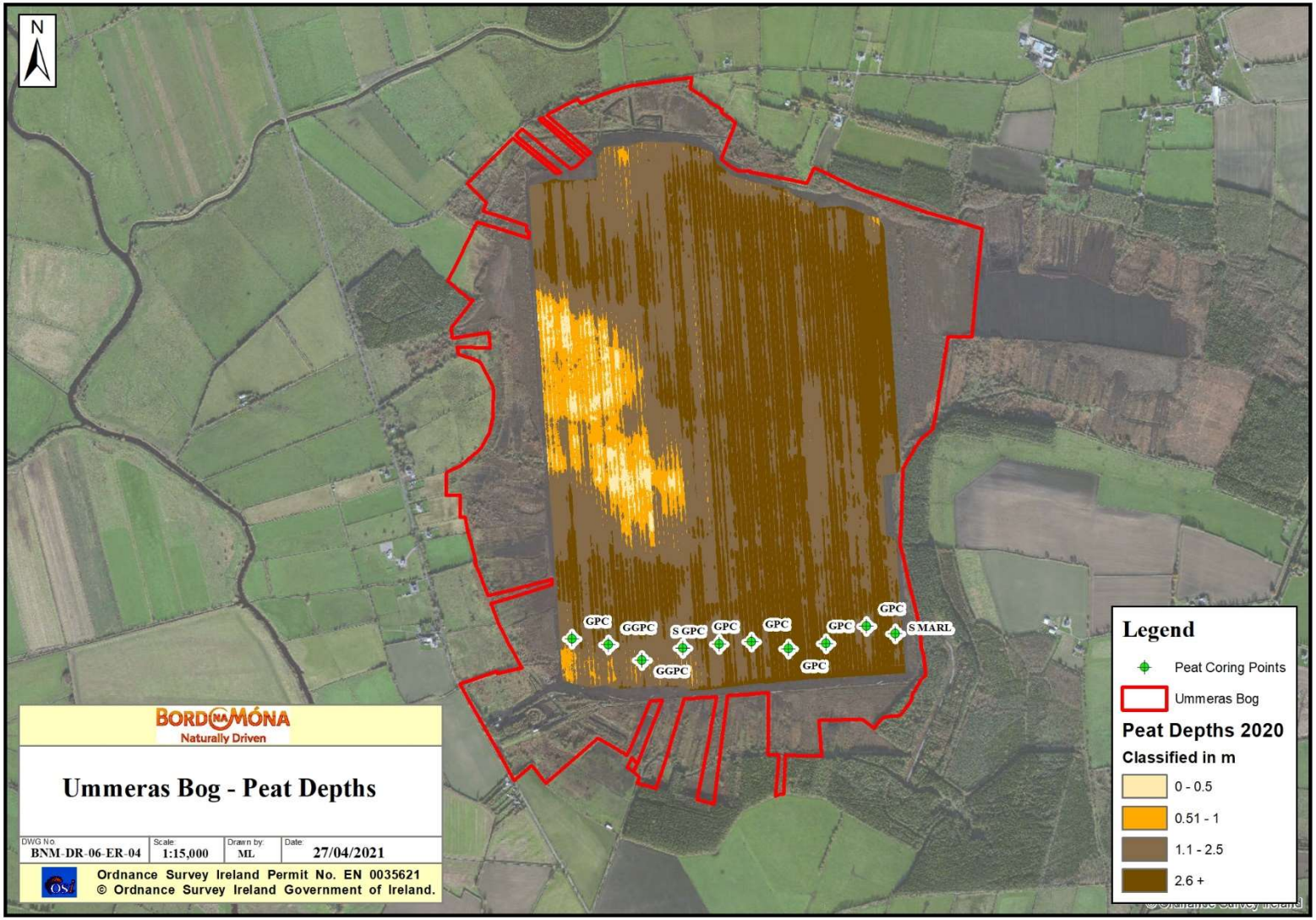

Figure 8.2. Peat depth map for Ummeras Bog. The majority of the bog is characterised as deep peat cutover bog.

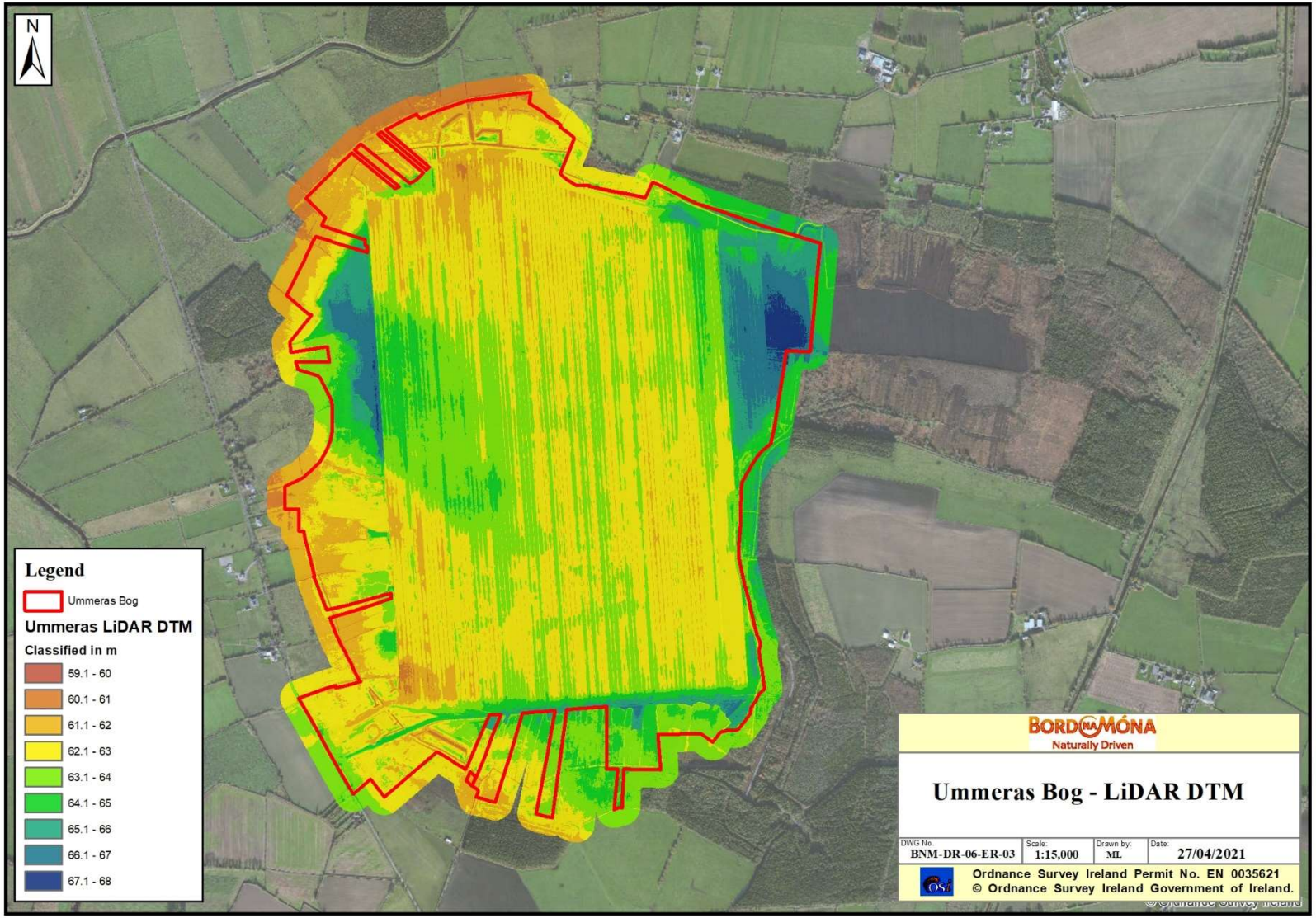

Figure 8.3. LIDAR topography map of Ummeras Bog. Low areas and basins are orange-yellow, more elevated areas are blue. The ridge present on the western side of the bog is visible.

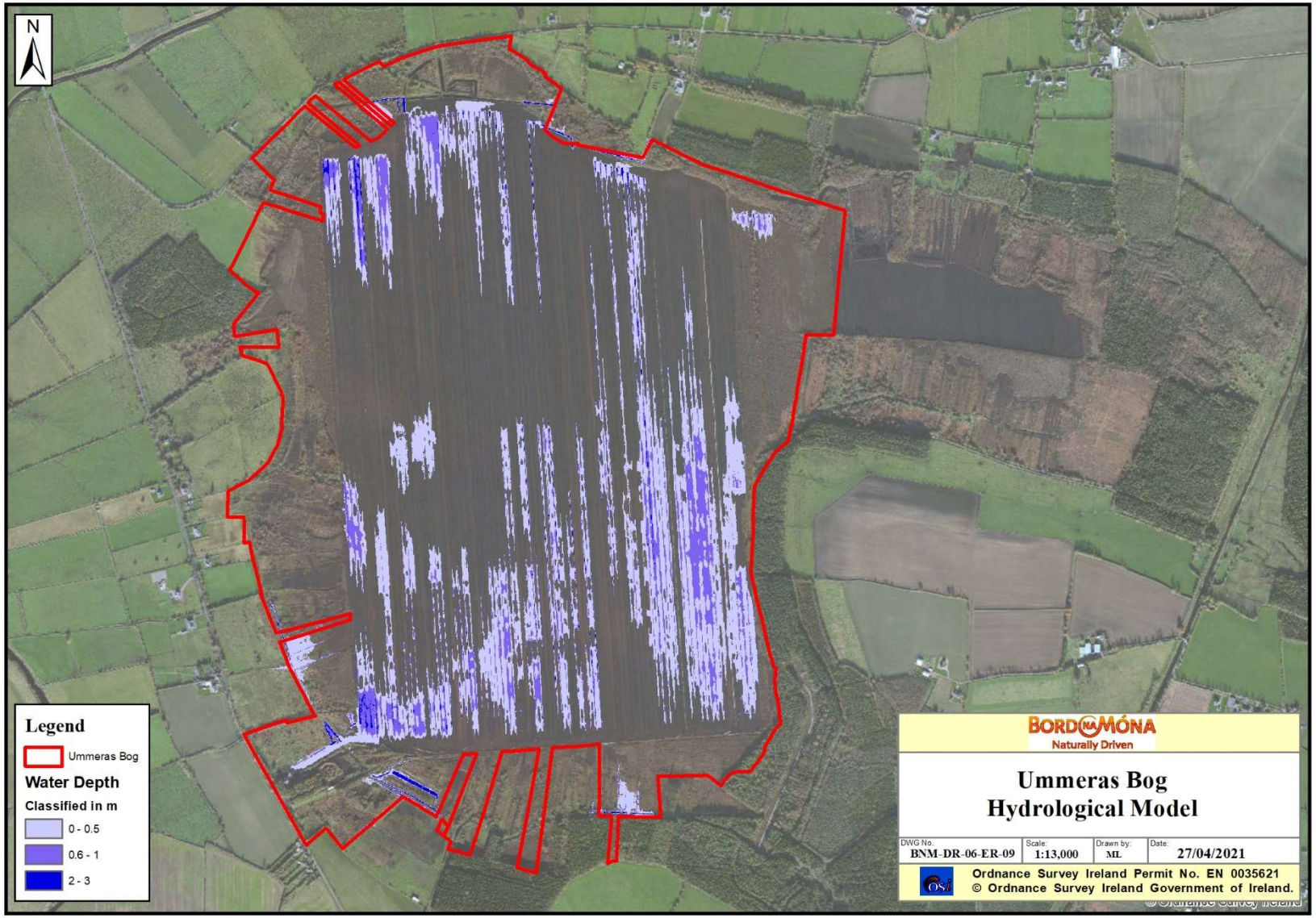

Figure 8.4. Hydrological modelling for Ummeras Bog showing range of expected water depths based on current topography.

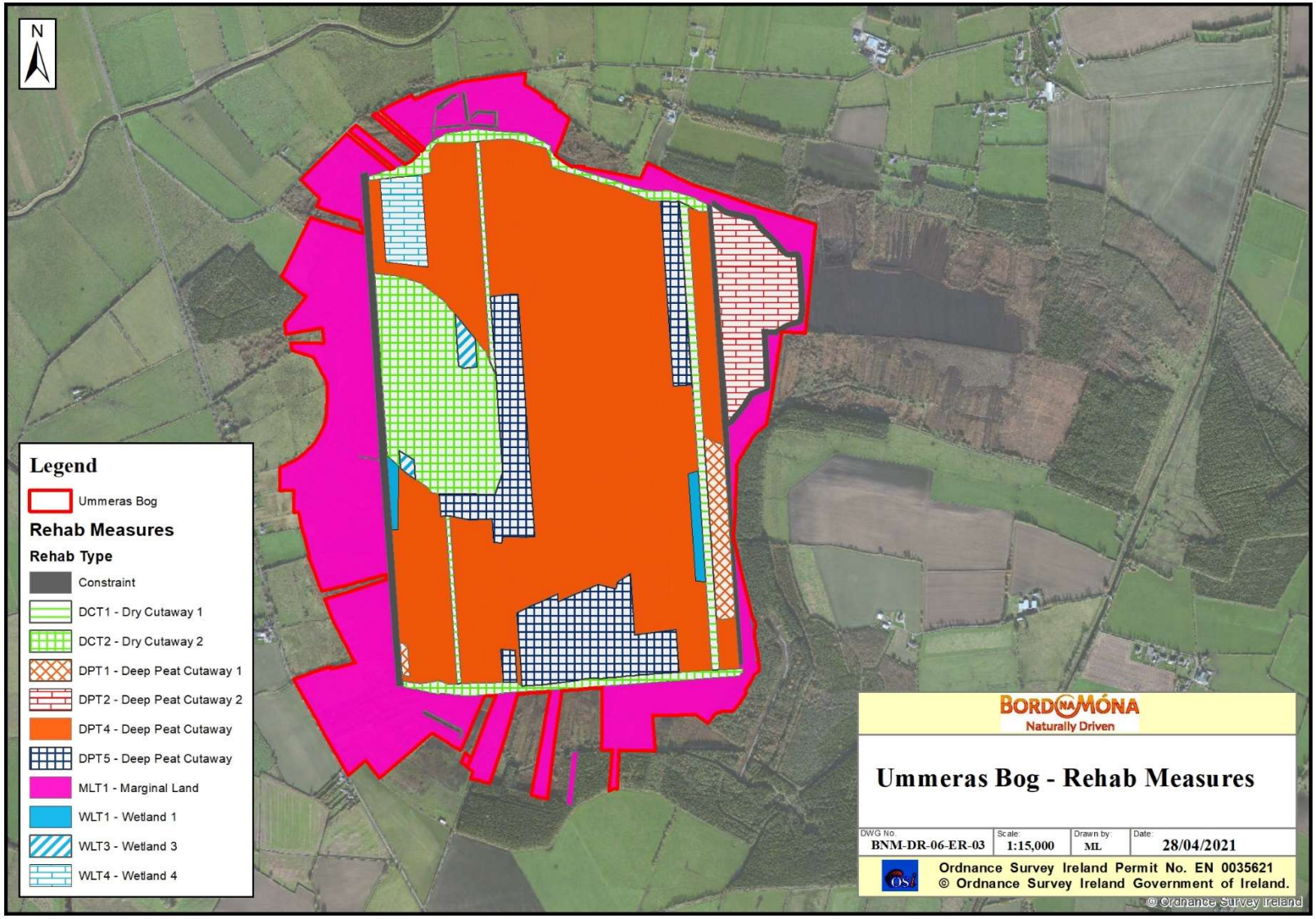

Figure 8.5. Indicative Enhanced Rehabilitation Plan for Ummeras Bog. Note that the actual distribution of these measures may be subject to change in response to stakeholder consultation and refinement of the enhanced rehabilitation measures.

Table 8.1 Enhanced rehabilitation measures and target area at Ummeras Bog. 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.

Type	Code	Description	Area (Ha)
Deep peat cutover bog8	DPT1	Regular drain blocking (3/100 m) + blocking outfalls and managing water levels with overflow pipes	4.0
	DPT2	More intensive drain blocking (7/100 m) + blocking outfalls and managing overflows	11.4
	DPT3	More intensive drain blocking (7/100 m), + field reprofiling + blocking outfalls and managing overflows	
	DPT4	Berms and field re-profiling (45m x 60m cell) + blocking outfalls and managing overflows + drainage channels for excess water + *Sphagnum* inoculation	120.8
	DPT5	Cut and Fill cell bunding (30m x 30m cell) + blocking outfalls and managing overflows + drainage channels for excess water + *Sphagnum* inoculation	26.6
Dry cutaway	DCT1	Blocking outfalls and managing water levels with overflow pipes	6.4
	DCT2	Regular drain blocking (3/100 m) + blocking outfalls and managing water levels with overflow pipes + targeted fertiliser treatment	28.7
	DCT3	More intensive drain blocking (7/100 m) + blocking outfalls and managing overflows + targeted fertiliser treatment	
Wetland cutaway	WLT1	Turn off or reduce pumping to re-wet cutaway + blocking outfalls and managing water levels with overflow pipes	1.8
	WLT2	Turn off or reduce pumping to re-wet cutaway + blocking outfalls and managing water levels with overflow pipes + Targeted blocking of outfalls within a site	
	WLT3	Turn off or reduce pumping to re-wet cutaway + blocking outfalls and managing water levels with overflow pipes + Targeted blocking of outfalls within a site + constructing larger berms to re-wet cutaway + transplanting Reeds and other rhizomes	1.1
	WLT4	More intensive drain blocking (7/100 m), + blocking outfalls and managing overflows + transplanting Reeds and other rhizomes	4.0
	WLT5	More intensive drain blocking (7/100 m), + field reprofiling + blocking outfalls and managing overflows + transplanting Reeds and other rhizomes	
Marginal land	MLT1	No work required	79.0
	MLT2	More intensive drain blocking (7/100 m)	
	MLT3	More intensive drain blocking (7/100 m) + blocking outfalls and managing overflows with + boundary berm	
Other		Silt-ponds	1.0
		Constraints	8.7
		Archaeology constraints	
Total			292.5

9. 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 required.
- **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 three 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 a minimum of 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, Flow, Suspended Solids, Total Solids, Total Phosphorus, Total Ammonia, Colour, and COD.
- This monthly sampling regime on a selected number of silt ponds will be carried out over a two-year cycle. 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 appropriate 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 (Similar to ecotope mapping). This assessment will include assessment of on environmental and ecological indicators such as vegetation cover, vegetation communities, presence of key species, *Sphagnum* cover, bare peat cover and water levels.
- The condition of the bog can be assessed using the condition assessment and suitable Greenhouse Gas (GHG) emission factors can be assigned to different habitats. GHG emission factors have been determined for various peatland habitats in Ireland (Wilson *et al.*, 2015) and are constantly being refined with more and more research. BnM is actively supporting research into GHG fluxes in different rehabilitated peatland habitats. This means that potential GHG emissions can be estimated from the site, as the site continues along its trajectory towards a naturally functioning peatland ecosystem.
- It is proposed to monitor the improvement of some biodiversity ecosystem services. A breeding bird and Pollinator monitoring programme will be established. Specific pollinator indicators will be monitored (Bee and Butterfly). To be defined in relation to monitoring of the overall proposed Scheme and after consultation with stakeholders.

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

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

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

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

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

In the event that the proposed 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.

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 Ummeras Bog (Figure 3.1).
- EPA IPC Licence - Ref. P0506-01. As part of Condition 10.2 of this license, a rehabilitation plan must be prepared for permanent rehabilitation of the boglands within the licensed area. Ummeras Bog is part of the Kilberry Bog group.
- The current condition of Ummeras Bog. This site has gravity drainage. The majority of the site is bare peat. Pioneer dry cutaway and wetland 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. some boundary drains around Ummeras Bog will be left unblocked as blocking boundary drains could affect adjacent land.

Rehabilitation goals and outcomes

The key rehabilitation goal and outcome for Ummeras Bog is environmental stabilisation of the site via natural colonisation and residual peat re-wetting. This is defined as:

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

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

Criteria for successful rehabilitation:

- Rewetting of residual peat in the former area of industrial peat production to offset potential 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). This will be measured via water quality monitoring (suspended solids and ammonia).
- That the main water body associated with surface water from this bog continues to be excluded in the EPA's list of peat pressure water bodies as reported in the River Basin Management Plans. Where the water body has been identified as under pressure from peat extraction, that the intervening EPA monitoring programme associated with its Programme of Measures for this water body shows positive improvements in water quality impacts that were attributable to the original peat extraction activity.

Rehabilitation targets

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

Rehabilitation measures: (see Figure Ap-1)

- Blocking field drains in the former industrial production area using a dozer/excavator to create regular peat barriers (three barriers per 100 m) along each field drain;
- Re-alignment of piped drainage to manage water levels across the site.
- Fertiliser treatment of high fields and headlands (typically slow to naturally re-colonise) to encourage natural colonisation, if needed. (It is noted that the application of fertiliser may need additional assessment and approval as per the IPC Licence).
- No measures are planned for the surrounding marginal peatland habitats.
- Silt ponds will continue to be maintained during rehabilitation and decommissioning.
- Evaluate success of short-term rehabilitation measures and enhance where necessary.
- Decommissioning of silt-ponds will be assessed and carried out, where required.

Timeframe:

- 2021. 1st phase of rehabilitation. Field drain blocking.
- 2021. 2nd phase. Further realignment of piped drainage and other re-wetting measures dependent on success of 1st phase rehabilitation, ongoing monitoring of water levels and re-vegetation.
- 2023-2024. Evaluate success of short-term rehabilitation measures outlined above and remediate where necessary. Other enhancement measures such as fertiliser treatment will be carried out. These will be determined by ongoing monitoring.
- 2023-2024. Decommission silt-ponds, if necessary.

Table AP-1. Rehabilitation measures and target areas.

Type	Code	Description	Area (Ha)
Deep Peat	DPT1	Regular drain blocking (3/100 m) + blocking outfalls and managing water levels with overflow pipes	162.8
Dry Cutaway	DCT1	Blocking outfalls and managing water levels with overflow pipes	35.1
Wetland cutaway	WLT1	Turn off or reduce pumping to re-wet cutaway + blocking outfalls and managing water levels with overflow pipes	6.9
Marginal land	MLT1	No work required	79.0
Other		Silt-ponds/ constraint	8.7
		Archaeology	0
Total			**292.5**

Monitoring, after-care and maintenance

- There will be initial quarterly monitoring assessments of the site to determine the general status of the site, the condition of the silt-ponds, assess the condition of the rehabilitation work, asses the progress of natural colonisation, monitoring of any potential impacts on neighbouring land and general land security. The number of site visits will reduce after 2 years to bi-annually. These site visits will assess the need to 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, 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 License is surrendered. The bog will be included in the full licence surrender process as per the Guidance to Licensees on Surrender, Cessation and Closure of Licensed Sites (EPA, 2012) when:

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

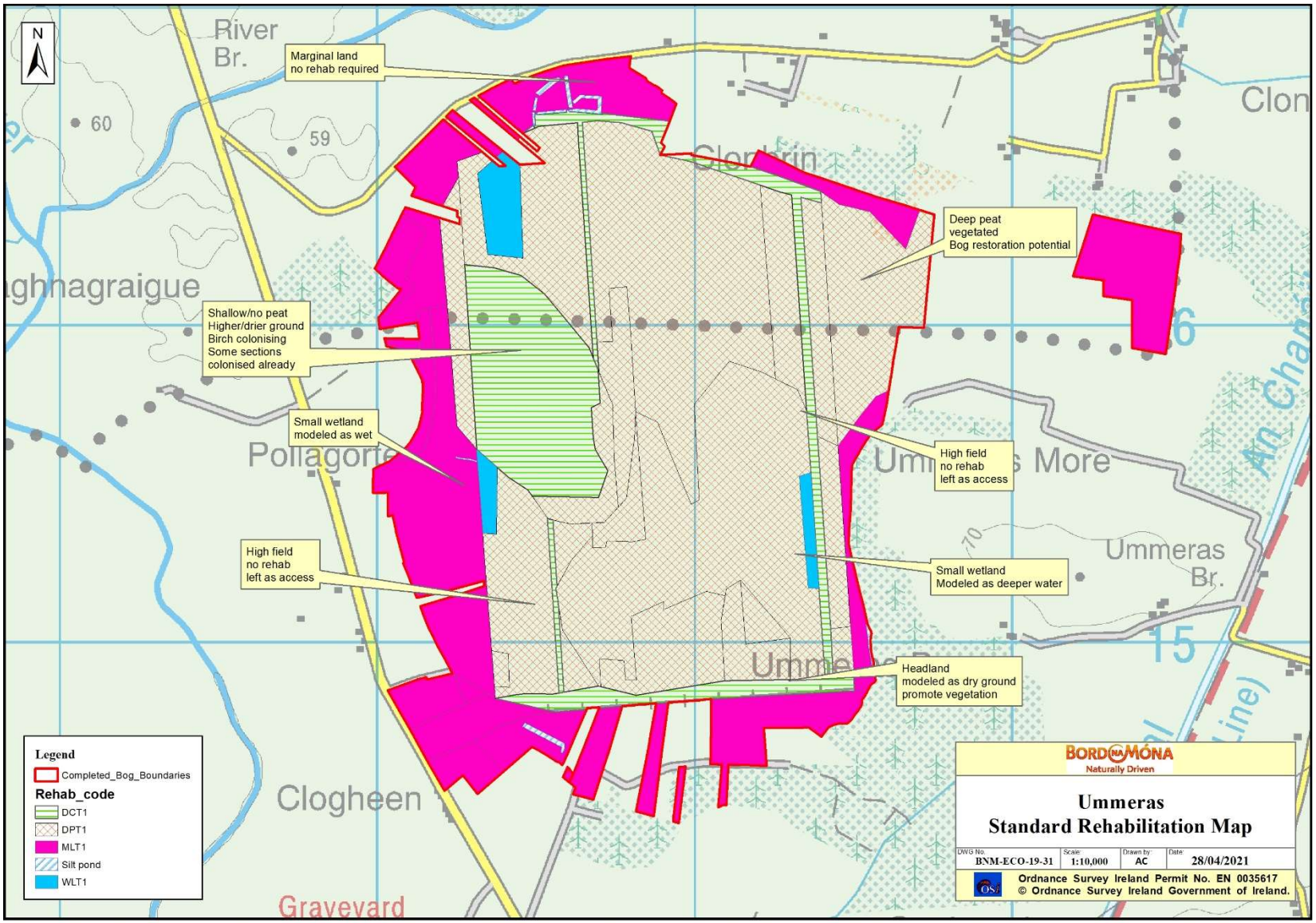


Figure Ap-1. Indicative adapted standard rehabilitation plan for Ummeras Bog.

APPENDIX II: BOG GROUP CONTEXT

The Kilberry Bog Group IPC Licensed area is made up of five bog areas (Allen (Mouds), Gilltown, Kilberry, Prosperous and Ummeras) most of which were in active milled peat production up to 2019. These bogs primarily supplied horticultural peat with some fuel peat. Fuel peat was transported to other Bord na Móna facilities, depending on market demand. Bogs that have been in milled peat production for decades have been slowly becoming cutaway as horticultural peat is extracted from the individual bog areas.

Industrial peat production history varies across the Kilberry Bog group, so there is a wide range of residual peat depths present. The majority of the bogs have been in active peat production until recently and are bare peat, and a small proportion has become cutaway. Kilberry Bog has had a long peat production history that has focused on horticultural peat production. Cutaway areas where the more acidic horticultural peat has been harvested still have relatively deep peat reserves, as much of the fuel peat at these sites has not been utilised. Ummeras and Mouds Bog both have areas where horticultural peat has been completely harvested and fuel peat was also harvested. Prosperous and Gilltown have a much younger milled-peat production history and more acidic peat is still present in the upper levels of these sites. More acidic peat can lead to the development of Heather-dominated communities in places or where it is wet, *Sphagnum*-rich vegetation (embryonic peat forming communities) can establish. Examples of these types of communities can be seen at Kilberry.

The rehabilitation plan for the Kilberry Bog Group encompasses all areas involved in industrial peat production including milled peat production areas and associated facilities.

A breakdown of the component bog areas for the Kilberry Bog Group IPC License Ref. P0506-01 is outlined in Table Ap-2.

Table Ap-2: Kilberry Bog Group names, area and indicative status

Bog Name	Area (ha)	Stage of development	Land-Use and History	Peat Production Cessation	Rehab Plan Status
Allen (Mouds)	433	Cutover Bog Industrial peat production commenced at Allen Bog in 1956. This bog still retains residual deep peat.	Allen (Mouds) Bog formerly supplied mainly horticultural peat. Most of the site is bare peat and some naturally colonising cutaway is already present.	2021	Draft 2017
Gilltown	344	Cutover Bog Industrial peat production commenced at Gilltown Bog in 1976. This bog still retains residual deep peat.	Gilltown Bog formerly supplied mainly horticultural peat. The majority of the bog is bare peat and there is some naturally colonising cutaway.	2021	Draft 2017
Kilberry	978	Cutover Bog Industrial peat production commenced at Kilberry Bog in 1941. This bog still retains residual deep peat.	Peat extraction history at Kilberry Bog pre-dates Bord na Móna. Kilberry Bog formerly supplied mainly horticultural peat. The majority of the bog is currently bare peat. There is some naturally colonising cutaway at different stages. There have also been several re-wetting and Sphagnum inoculation rehabilitation trials at Kilberry.	2021	Draft 2017
Prosperous	217	Cutover Bog Industrial peat production commenced at Prosperous Bog in 1980's. This bog still retains residual deep peat.	Prosperous Bog formerly supplied mainly horticultural peat.	2021	Draft 2017

			The majority of the bog is bare peat and there is some naturally colonising cutaway.		
Ummeras	292	Cutover Bog Industrial peat production commenced at Ummera Bog in 1972. This bog still retains residual deep peat.	Ummeras Bog formerly supplied mainly horticultural peat The majority of the bog is bare peat and there is some naturally colonising cutaway.	2019	Finalised Plan 2021
Total	1602				

APPENDIX III: ECOLOGICAL SURVEY REPORT

Ecological Survey Report

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

Bog Name:	**Ummeras**	**Area (ha):**	302 ha
Works Name:	**Horticultural**	**County:**	Kildare/Offaly
Recorder(s):	MMC & DF MMC 2018	**Survey Date(s):**	17/02/2011 21/05/2018

Habitats present (in order of dominance)

The most common habitats present on the production bog at this site include:

- Bare peat;
- Pioneer dry heath
- Drained raised bog
- Birch scrub (in and around silt pond areas and on cutaway area)
- Pioneer poor fen with Bog Cotton (around margins of production bog)
- Silt ponds with Gorse/Birch scrub and Purple Moorgrass-dominated grassland
- Riparian zones (with drains and associated habitats such as scrub)
- Access zones with Purple Moorgrass-dominated grassland

The most common habitats found around the margins of the production area include:

- Active and regenerating cutover bog (PB4) (Codes refer to Heritage Council habitat classification; Fossitt, 2000)
- Scrub (WS1)
- Raised bog (PB1) (minor remnants, some ditched, being cut for domestic sod peat)
- Birch woodland (WN7) (northern end)
- Conifer plantation (WD4)
- Hedgerows (WL1)
- Mixed broad-leaved/conifer woodland (WD2) (around Works)
- Improved grassland (GA1) around the boundary where the GIS boundary extends into adjacent fields
- Wet grassland (GS4) (old cutover)

Description of site

Ummeras Bog is located along the west Co. Kildare border, 3 km north of Monasterevin. This bog is somewhat isolated from other Bord na Móna properties, although Derrylea Bog is located 2.5 km to the west of it. It was originally part of the Coolnamona Works Group. There are two sections with the main section containing the former

production bog and a smaller section to the north-east containing old and active cutover bog. This smaller section has probably never been occupied by Bord na Móna.

The landscape in this area is relatively flat. The Grand Canal is located to the east of the site. The Slate River flows to the north of the site and meets the Figile, where it then flows south to meet the Barrow. The surrounding landscape is dominated by farmland with improved grassland prominent. There is some conifer plantation on older cutover bog and other peatlands in the local area. A private peat harvesting company is using part of the overall bog adjacent to the BnM property.

An old peat works site was located at Ummeras (near Ummeras House) to the east of the current Bord na Móna property and adjacent to the Grand Canal. Peat for live-stock bedding was harvested in this area in the late 19th century and the old OSI 2nd edition 6-inch map indicates that a tramway to take the peat to the canal was built along some of the tracks through the adjacent cutover bog.

Ummeras bog is a relatively young production bog. Bord na Móna started to level the bog and cut drains in 1973. Sod peat moss was originally harvested in 1980 and then harvesting of milled moss peat began in 1989. A works area is located at the south-east corner of the main section. A permanent railway runs along the southern boundary of the site into the works area. Horticultural peat moss has been harvested from this site although in recent years there was a switch to harvesting of milled fuel peat. The peat is still red/brown in places (indicator of acidic *Sphagnum* peat) although it is noticeable that peat harvesting has lowered the surface of the bog significantly comparing to the surrounding intact high bog remnants. There was virtually no recolonisation on the recently-active production bog.

The north-east part of the main section contains several fields that are developing typical pioneer cutaway habitats. This area seems to be an area of high bog that was ditched and harvested to some extent. However, harvesting has ceased and the bog is now developed degraded raised bog vegetation dominated by Heather. The peat is dry and relatively firm. With the Heather there is frequent *Cladonia* spp. lichen cover, *Hypnum jutlandicum* and *Campylopus introflexus.* There are occasional small hummocks of S. *papillosum* present on the high bog surface but they are degrading and there are also occasional hummocks of *S. capillifolium*, S. *papillosum* and some *S. cuspidatum* in the drains. However, most of the drains do not contain much *Sphagnum*. Sitka Spruce from the adjacent conifer plantation is colonising the edge of this area along with some scattered Birch. Several Snipe and 1 Woodcock were recorded in this area. There is a taller ridge of peat running north-south through this area that has some mature Birch scrub/ woodland developing. Further east and adjacent to the private peat company there is a section of ditched high bog that does not seem to have been harvested to any great extent at all.

Examples of other typical pioneer cutaway communities are only seen around the margins of the former production bog in undisturbed sections of access zones and associated with silt ponds. These are not significant in their extent. There is some colonisation of Common Bog Cotton in mosaic with bare peat along the eastern boundary as well as some Soft Rush. There are also indicators of more acidic peat with occasional clumps of Heather and Hare's-tail Bog-cotton, although these species are frequently seen around the margins of cutaway bog. Purple Moorgrass is a prominent feature of vegetated sections along access routes, silt ponds and along the riparian zone to the east of the site.

The smaller isolated section of the BnM Ummeras GIS property to the north-east of the main area was not examined during the field-survey. Aerial photos indicate that the majority of this area contains old regenerating cutover bog (PB4). There is also some milled bare peat where the private peat company extracted peat moss.

There are typical small raised bog remnants and active and inactive cutover bog along the southern margin of the site. Domestic peat-cutting is quite intensive and in several places the high bog has been cut up to the railway, which marks the 'boundary' of the peat production area. Some older cutover bog is developing Gorse and Birch scrub and Heather-dominated stands. There are also some patches of cutover bog that have recently been planted with conifers (private planting) but this cover a minor area. There is some better-developed Birch-dominated woodland/scrub at the northern end of the site along the margin.

Some mixed conifer-broadleaved woodland has been planted in several small blocks around the Works. This woodland contains Birch and Japanese Larch, Spruce and Alder.

2018.

Some pioneer cutaway vegetation is emerging along the western margin. A gravel ridge has been exposed. This is being colonised by Soft Rush, Bog Cotton, Birch and Willow. Several fields along the western margin were out of peat production at the time of the survey. Birch, Rushes and other species are colonising an adjacent area on the exposed ridge along the edges of drains. It is expected that this ridge will develop drier habitats in the future. Shell marl is being exposed at the northern end of the bog.

The high bog area located at the NE corner is still relatively degraded. There are sections in various stages but overall the bog is in poor condition with limited potential for significant active bog development in the short-term. The southern boundary strip is very intensively drained and may have been used for sod moss or Heather production in the past. This section has potential as a turf cutting re-location area.

The high bog remnants around the margins of the site are diminishing in size as they are cut for sod turf. Most are very disturbed and are dominated by Facebank Ecotope (Heather). Many have significant slumping and cracking, and or have had vegetation removed from the surface.

Watercourses (major water features on/off site)

- There are no significant water-courses on the site
- Silt ponds to the north drain towards the Slate River (within 200 m to the north of the site). The Slate River flows to the Black River.
- Silt ponds to the west of the site drain towards the Black River (flows along the western side of the site within 400 m).
- The Grand Canal (Barrow line) is within 1 km to the east of the site.
- This bog is located in the River Barrow catchment.

Peat type and sub-soils

Upper fen peat is mainly exposed at present, although there is still some more acidic peat still present in places in the main production bog. About 1-2 m of peat is still present on the site. Some marl was exposed in the northern silt ponds.

Shell marl is being exposed at the northern end of the site.

Blue-clay marl is being exposed on the gravel ridge being exposed in the middle of the site.

Fauna biodiversity

Birds

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

- Snipe (10)
- Woodcock (1)
- Teal (21)
- Common Birds noted during the survey included Robin, Blackbird, Bullfinch, Wren and Pheasant.
- Kingfisher has been noted by local staff on the site using the silt ponds occasionally.

Mammals

Signs of several mammals were noted on the site

- Hare
- Badger
- Fox
- Mink and Fallow Deer have been noted on the site occasionally by local staff.

Fungal biodiversity

N/A

References

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

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

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 increasing risks of siltation, 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

No invasive plant species have been recorded at Ummeras Bog.

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 works area.

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

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

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

APPENDIX VI. POLICY AND REGULATORY FRAMEWORK

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

Today, Bord na Móna is undertaking a number of highly significant actions in support of climate policy. These actions involve a radical transformation and decarbonisation of nearly the entire Bord na Móna business. This transformation will be driven by unlocking the full potential of our land and creating significant value for Ireland and the Midlands in particular. Bord na Móna have now announced the complete cessation of industrial peat production across its estate (January 2021).

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. P0506-01). As part of Condition 10.2 of this license, a rehabilitation plan must be prepared for permanent rehabilitation of the boglands within the licensed area. The bog is part of the Mount Dillon Bog 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) appreciates the Minister's intention to support, via the Climate Action Fund, Bord na Móna in developing a package of measures, 'the proposed Scheme', for the enhanced decommissioning, rehabilitation and restoration of cutaway peatlands, referred to as the 'Peatlands Climate Action Scheme'. The proposed Scheme includes lands previously used to supply peat for electricity generation within the State. The enhanced decommissioning, rehabilitation and restoration of the peatlands funded by the proposed 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.

It is envisaged that Bord na Móna carry out an enhanced decommissioning, rehabilitation and restoration scheme, (PCAS), across a footprint of 33,000 ha (a subset of the BnM estate that has been used for energy production). This proposed 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 costs associated with the additional and enhanced measures, i.e., those which go beyond the existing decommissioning and rehabilitation requirements arising from Condition 10, will be eligible for support under the proposed Scheme.*

The proposed enhanced rehabilitation measures detailed in this document, are predicated on the understanding that the element of the rehabilitation, over and above the 'standard' measures necessary to comply with pre-existing Condition 10 IPC Licence requirements, will be deemed eligible costs for the Scheme regulator.

For the avoidance of doubt, should the proposed 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. 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 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.

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

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

The NRBMP outlines how peat extraction can be a potentially significant pressure on various water quality parameters. Peatland rehabilitation of Bord na Móna cutaway (in addition to other measures) is part of the WFD (2018-2021) programme of measures. The NRBMP takes account of the fact that Bord na Móna is in the process of phasing out the extraction of peat for energy production, that it set a target to rehabilitate 9,000 ha of cutaway

bogs (covering 25 peatlands) by 2021 (in 2018) and will look to implement best-available mitigation measures to further reduce water quality impacts caused by peat extraction while the phasing-out process is taking place. This NRBMP rehabilitation target is set to be superseded by the acceleration of the Bord na Móna de-carbonisation programme and PCAS.

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

6 National Biodiversity Action Plan 2016-2021

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

7 National conservation designations

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

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

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

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

will reinforce the network of protected raised bog sites and replace in part sites that will be de-designated as they have been deemed to be significantly damaged and are deemed to have no raised bog restoration prospects.

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

9 All-Ireland Pollinator Plan 2015-2020

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

10 Land-use planning policies

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

Kellysgrove Bog is located in an area zoned by Galway County Council as open countryside.

11 National Archaeology Code of Practise

Bord na Móna operates under an agreed Code of Practice regarding archaeology with the Department of Arts, Heritage and the Gaeltacht and the National Museum of Ireland which provides a framework to enable the Company to progress peat extraction whilst carrying out archaeological mitigation. 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 endeavour to adhere to this code of practise during the peatland rehabilitation phase and appropriate archaeology mitigation is carried out before and during cutaway peatland rehabilitation. An Archaeological Impact Assessment is being carried out for the proposed rehabilitation at this site (Appendix XII). The recommendations of this assessment will be incorporated into the rehabilitation plan

to minimise impacts on known archaeology. In addition, Bord na Móna will adhere to the Archaeology Code of Practise relating to management of stray archaeological finds that may arise during cutaway peatland rehabilitation and decommissioning.

12 Bord na Móna Biodiversity Action Plan 2016-2021

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

One example of a key CBD target is:

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

The EUs headline target for progress by 2020 is to:

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

The Kellysgrove Bog Rehabilitation Plan is aligned to the CBD target and the EU Biodiversity Strategy target and will help Ireland meet its commitment to these international Biodiversity polices.

13 Bord na Móna commitments

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

The company announced that peat production would be cut by over 50 percent in 2019 and would entirely cease over most of its lands by the mid-2020s. Bord na Móna have now announced the complete cessation of industrial peat production across its estate (January 2021). 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 Climate Action Plan 2019, the Water Framework Directive, etc.) and rehabilitation guidelines set down by the Environmental Protection Agency. To date, 15,000 hectares of cutaway and cutover bog have been rehabilitated using this approach with 5,000 hectares in active rehabilitation.

In line with Bord na Móna's accelerated decarbonisation programme, the company has also committed to a significantly larger rehabilitation target. This is 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 plan to restore a further 1,000 hectares of raised bog habitat by 2025. These targets are significant in both timing and scale and are indicative of Bord na Móna's increased new ambition in this area.

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.

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

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

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

APPENDIX VII. DECOMMISSIONING

1. **Condition 10 Decommissioning**

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

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

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

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

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

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

Item	Description	Ummeras Decommissioning Plan
1	Clean-up of remaining or unconsolidated waste or materials located in Bogs, Yards, Buildings and Offices	Not Applicable
2	Cleaning Silt Ponds	Not Applicable
3	Decommissioning Peat Stockpiles	Not Applicable
4	Decommissioning or Removal of Buildings and Compounds	Not Applicable
5	Decommissioning Fuel Tanks and associated facilities	Not Applicable
6	Decommissioning and Removal of Bog Pump Sites	Not Applicable
7	Decommissioning or Removal of Septic Tanks	Not Applicable

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

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

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

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

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

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

waste.

7.3.3 The ultimate destination of the waste.

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

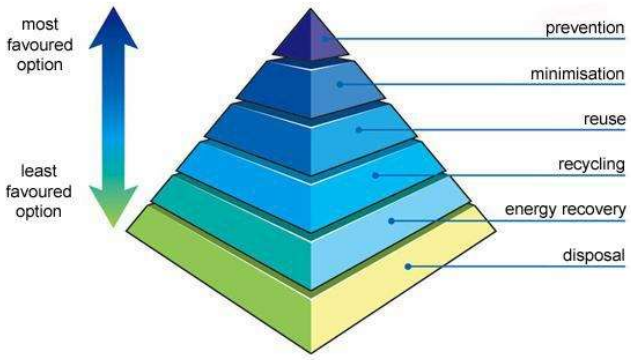
7.3.5 The tonnages and EWC Code for the waste materials listed in *Schedule 2(i) Hazardous Wastes for Disposal/Recovery* and *Schedule 2(ii) Other Wastes for Disposal/Recovery* sent off-site for disposal/recovery.

7.3.6 Details of any rejected consignments.

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

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

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



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

2. Enhanced Decommissioning.

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

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

APPENDIX VIII. GLOSSARY

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

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

Dry cutaway bog: Cutaway bog is categorised as dry cutaway where it is not practical or feasible to re-wet these areas completely. It is inevitable that some areas of cutaway will remain relatively dry due to the 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 (ie. at the margin) where the peat can not be re-wetted due to boundary constraints. Dry cutaway may also develop in situations where there a relatively steep slope that inhibits re-wetting. The majority of dry cutaway will develop towards grassland, heath, scrub and dry woodland habitats.

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

Enhanced rehabilitation: This is defined as rehabilitation carried out under proposed 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 proposed 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 proposed Scheme.*

Environmental stabilisation: The key objective of peatland rehabilitation is **environmental stabilisation** of the former industrial peat production areas and the stabilisation of any potential emissions from the bog that related to the former industrial peat extraction activities.

Environmental stabilisation is defined as:

- Carrying out planned peatland rehabilitation.

- Setting former bare peat industrial peat production areas on a trajectory towards naturally functioning peatland habitats, via planned peatland rehabilitation, the restoration of wetter hydrological conditions and encouragement of natural colonisation.
- Stabilisation or downward trajectory of key water quality parameters (e.g. suspended solids, ammonia),
- Meeting IPC Licence conditions.

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 may also act as rehabilitation.

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

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

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

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

APPENDIX IX. EXTRACTIVE WASTE MANAGEMENT PLAN

(Minimisation, treatment, recovery and disposal)

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

Scope:
This plan covers IPPC Licence's P0506-01, Blackwater Group of Bogs in Counties Roscommon, Galway, Offaly and Westmeath,

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

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

2.0 P0506-01 IPPC Licence Extractive Waste Conditions

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

7.0 Extractive Waste Management Plan

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

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

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

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

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

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

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

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

Classification in accordance Annex II.

Waste Material	Description	**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 Mountdillon 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 IPPC Licence P0506-01.

APPENDIX XI. CONSULTATION SUMMARIES

Table APXI -1 Consultees contacted

Bog Name	Contact Organisation	Contact Name	Date of Issue	Communication Format	Date Response Received	Response format
Ummeras	Offaly County Council - Chief Executive	General e-mail contact (webmaster@offalycoco.ie)	12/01/2021	E-mail		
Ummeras	Offaly County Council - Senior Planner	AM	12/01/2021	E-mail		
Ummeras	Kildare County Council	Environment section	12/01/2021	E-mail		
Ummeras	Kildare County Council	Contact email	12/01/2021	E-mail		
Ummeras	Kildare County Council	BL	12/01/2021	E-mail		
Ummeras	Offaly County Council - Heritage Officer	AP	12/01/2021	E-mail		
Ummeras	*Offaly County Councillors - Edenderry District*	*Cllr. Mark Hackett*	12/01/2021	E-mail		
Ummeras	*Offaly County Councillors - Edenderry District*	*Cllr. Noel Cribbin*	12/01/2021	E-mail		
Ummeras	*Offaly County Councillors - Edenderry District*	*Cllr. Eddie Fitzpatrick*	12/01/2021	E-mail		
Ummeras	*Offaly County Councillors - Edenderry District*	*Cllr. John Foley*	12/01/2021	E-mail		
Ummeras	*Offaly County Councillors - Edenderry District*	*Cllr. Robert McDermott*	12/01/2021	E-mail		

Ummeras	*Offaly County Councillors - Edenderry District*	*Cllr. Liam Quinn*	12/01/2021	E-mail		
Ummeras	*Offaly County Council*	*Mary Hussey*			26/01/2021	E-mail
Ummeras	*Kildare County Councillors - Kildare - Newbridge District*	*Cllr. Anne Connolly*	12/01/2021	E-mail		
Ummeras	*Kildare County Councillors - Kildare - Newbridge District*	*Cllr. Noel Connolly*	12/01/2021	E-mail		
Ummeras	*Kildare County Councillors - Kildare - Newbridge District*	*Cllr Suzanne Doyle*	12/01/2021	E-mail		
Ummeras	*Kildare County Councillors - Kildare - Newbridge District*	*Cllr. Kevin Duffy*	12/01/2021	E-mail	12/01/2021	E-mail
Ummeras	*Kildare County Councillors - Kildare - Newbridge District*	*Cllr Noel Heavey*	12/01/2021	E-mail		
Ummeras	*Kildare County Councillors - Kildare - Newbridge District*	*Cllr Fiona McLoughlin Healy*	12/01/2021	E-mail		
Ummeras	*Kildare County Councillors - Kildare - Newbridge District*	*Cllr.Peggy O'Dwyer*	12/01/2021	E-mail		
Ummeras	*Kildare County Councillors - Kildare - Newbridge District*	*Cllr Tracey O'Dwyer*	12/01/2021	E-mail		
Ummeras	*Kildare County Councillors - Kildare - Newbridge District*	*Cllr. Chris Pender*	12/01/2021	E-mail		
Ummeras	*Kildare County Councillors - Kildare - Newbridge District*	*Cllr Robert Power*	12/01/2021	E-mail		
Ummeras	*Kildare County Councillors - Kildare - Newbridge District*	*Cllr Mark Stafford*	12/01/2021	E-mail		

Ummeras	*TD Kildare*	*Cathal Berry*	12/01/2021	E-mail		
Ummeras	*TD Kildare*	*Martin Heydon*	12/01/2021	E-mail		
Ummeras	*TD Kildare*	*Sean O'Feraghail*	12/01/2021	E-mail		
Ummeras	*TD Kildare*	*Patricia Ryan*	12/01/2021	E-mail		
Ummeras	TD Laois/Offaly	*Barry Cowen*	12/01/2021	E-mail		
Ummeras	TD Laois/Offaly	*Charlie Flanagan*	12/01/2021	E-mail		
Ummeras	TD Laois/Offaly	*Sean Fleming*	12/01/2021	E-mail		
Ummeras	TD Laois/Offaly	*Carol Nolan*	12/01/2021	E-mail		
Ummeras	TD Laois/Offaly	*Brian Stanley*	12/01/2021	E-mail		
Ummeras	Kildare County Council	*Edwina Moore*	12/01/2021	E-mail	01/02/2021	E-mail
Ummeras	Kildare County Council	*Ken Kavanagh*	12/01/2021	E-mail	01/02/2021	E-mail
Ummeras	Kildare County Council	*Mary McCarthy*	12/01/2021	E-mail	12/02/2021	E-mail
Ummeras	Eastern and Midland Regional Assembly	General e-mail contact	12/01/2021	E-mail		
Ummeras	Environmental Protection Agency	BM	12/01/2021	E-mail		
Ummeras	Environmental Protection Agency	ID	12/01/2021	E-mail		
Ummeras	Environmental Protection Agency	BK	12/01/2021	E-mail		
Ummeras	National Parks and Wildlife Service	BL	12/01/2021	E-mail		
Ummeras	NPWS Regional Network	District Conservation Officer	12/01/2021	E-mail		
Ummeras	Dept of the Housing Local Government and Heritage	Malcom Noonan (Minister of State at the Department of Housing, Local Government and Heritage)	12/01/2021	E-mail		

Ummeras	National Monuments Service	MK	12/01/2021	E-mail	25/01/2021	E-mail
Ummeras	National Museum of Ireland (Irish Antiquities Division)	IM	12/01/2021	E-mail	28/12/2020	E-mail
Ummeras	Minister for Environment, Climate and Communications	Minister - Eamon Ryan	12/01/2021	E-mail		
Ummeras	Dept. of Environment, Climate and Communications	NR	12/01/2021	E-mail		
Ummeras	Minister of state for Agriculture with responsibility for Land use and Biodiversity	Pippa Hackett Minister of State for Land Use and Biodiversity)	12/01/2021	E-mail		
Ummeras	Inland Fisheries Ireland	General e-mail contact	12/01/2021	E-mail		
Ummeras	Waterways Ireland	General e-mail contact	12/01/2021	E-mail		
Ummeras	The Heritage Council	LS	12/01/2021	E-mail		
Ummeras	An Forum Uisce (The Water Forum)	General e-mail contact	12/01/2021	E-mail		
Ummeras	OPW	General e-mail contact	12/01/2021	E-mail		
Ummeras	An Taisce	General e-mail contact	12/01/2021	E-mail		
Ummeras	Friends of the Earth	Oisin Coughlan	12/01/2021	E-mail		
Ummeras	Friends of the Irish Environment	General e-mail contact	12/01/2021	E-mail		
Ummeras	Birdwatch Ireland	General E-mail address	12/01/2021	E-mail	01/02/2021	E-mail
Ummeras	Irish Peatlands Conservation Council	General e-mail contact	12/01/2021	E-mail	22/02/2021	E-mail
Ummeras	Irish Wildlife Trust	General e-mail contact	12/01/2021	E-mail		

Ummeras	Bat Conservation Ireland	General e-mail contact	12/01/2021	E-mail		
Ummeras	Woodlands of Ireland	General e-mail contact	12/01/2021	E-mail		
Ummeras	Butterfly Conservation Ireland	JH/info email	12/01/2021	E-mail	13/01/2021	E-mail
Ummeras	Community Wetlands Forum (part of Irish Rurallink)	General e-mail contact		E-mail		
Ummeras	Turf Cutters and Contractors Association		10/12/2020	Post		
Ummeras	Offaly Public Participation Network (PPN)	General e-mail contact	12/01/2021	E-mail		
Ummeras	Kildare Public Participation Network (PPN)	General e-mail contact	12/01/2021	E-mail		
Ummeras	Sustainable Water Action Network (SWAN)	http://www.swanireland.ie/	12/01/2021	E-mail		
Ummeras	Irish Farmers Association (Laois Offaly and Westmeath Office)	General e-mail contact	12/01/2021	E-mail		
Ummeras	Irish Farmers Association (Kildare Wexford and Wicklow)	DP	12/01/2021	E-mail		
Ummeras	Irish Farmers Association	WD	12/01/2021	E-mail	02/02/2021	E-mail
Ummeras	National Association of Regional Game Councils	Email - nargc@nargc.ie	12/01/2021	E-mail		
Ummeras	Midlands National Shooting centre	General e-mail contact	12/01/2021	E-mail		
Ummeras	ICMSA (Irish Creamery Milk Suppliers Association)	General e-mail contact	12/01/2021	E-mail	07/12/2020	E-mail

Ummeras	ICSA (Irish Cattle and Sheep Farmers Association	General e-mail contact	12/01/2021	E-mail		
Ummeras	Midlands & East Regional WFD Operational Committee	RS - Co-ordinator Local Authority Water Programme	12/01/2021	E-mail		
Ummeras	Shannon Flood Risk State Agency Co-ordination Working Group	JS - Flood Risk Management Policy	12/01/2021	E-mail		
Ummeras	CARO (Climate Action Regional Office) Eastern and Midlands	AD	12/01/2021	E-mail		
Ummeras	Irish Raptor Study Group	General e-mail contact	12/01/2021	E-mail		
Ummeras	Ummeras Community Development	Eddie Smith	12/01/2021	E-mail	12/01/2021	E-mail
Ummeras	Local resident	FK	12/01/2021	E-mail		
Ummeras	Local resident	LC	02/02/2021	E-mail		E-mail
Ummeras	Ummeras Bog Conservation Group		02/02/2021	E-mail	31/01/2021	E-mail
Ummeras	Local resident	MH			01/02/2021	E-mail
Ummeras	Local resident	AK			19/01/2021 & 29/01/2021	E-mail

Table APXI -2 Response summary from Consultees contacted

Organisation	Summary of Response by Stakeholder	BnM Response
Offaly County Council	Request for all draft rehabilitation plans in Co. Offaly.	BnM provided the requested documents. A virtual meeting, including a general PCAS presentation, was held for Offaly County Council on 10/02/2021
Offaly County Council	Offaly County Council e-mailed a submission to outline potential for integration of PCAS with opportunities regarding the Offaly County Council Inaugural Digital Strategy 2020-2022.	A meeting on Offaly's digital strategy was held between BnM and Offaly County Council on 04/03/2021.
Kildare County Councillors - Kildare - Newbridge District	Councillor KD emailed BnM to voice support for PCAS scheme for Ummeras Bog and request that he be included in any consultation process going forward.	BnM contacted Cllr. by phone call and e-mail 19/01/2021 to discuss PCAS at Ummeras Bog. A meeting was held between BnM and Kildare County Council staff and Councillors on 11/02/2021 to discuss PCAS at bog sites in Kildare.
Kildare County Council	Contacted BnM to request information on the Peat Harvesting Status of the Kildare Bogs	BnM responded via e-mail on 04/02/2021 to advise that BnM have permanently ceased peat production on all bogs
Kildare County Council	In response to receipt of a draft rehab plan, Kildare County Council advised that exact locations of areas for water quality sampling testing for monitoring phase of project would be required by Kildare County Council.	BnM responded by e-mail on 05/02/2021 to advise Kildare County Council that all requested data would be provided through interaction with LAWPRO.
Kildare County Council	Submission provided on behalf of Kildare County Council on PCAS project at Ummeras Bog. Suggestions on improvements to the content of the rehabilitation plans were as follows; 1) Details of adjacent landowners 2) Details of hydrological models 3) Stakeholder consultation details 4) Details on the measurement or assessment process for ongoing carbon sequestration 5) Suggest that effective standardised measurement processes be implemented for the ongoing monitoring of biodiversity on PCAS sites 6) Recommend that Appropriate Assessment be carried out to ensure that no adverse impacts on nearby European sites are caused by PCAS 7) Provide details on how archaeological constraints will be addressed by PCAS at bog sites.	BnM acknowledged and responded via e-mail on 02/03/2021 to provide answers to queries raised and assure BnM will give due cognisance to all points within the rehabilitation plan for Ummeras Bog.

Offaly County Council	Submission provided on behalf on Offaly County Council on a number of PCAS bogs including Ummeras on 22/02/2021. Key points raised were; 1) Requested that details of security fencing to be identified and detailed on plans. 2) Long term rehabilitation plan to be provided addressing above areas of consideration post 2024 if required. 3) Public Rights of Way access locations are to be maintained with relevant stakeholders and marked on drawings. 4) A number of technical issues with draft rehabilitation plans. 5) Advised BnM to carefully consider after use of bogs as part of PCAS 6) Request that the impact of PCAS on surrounding roads be considered as part of rehabilitation plans. 7) Advised that long term management (post 2024) is considered by BnM. 8) Advised that Appropriate assessment and the habitats directive are taken into account by BnM. 9) Advised that BnM consider management of flooding & water pollution, fire risk, invasive species and waste management as part of PCAS.	A virtual meeting/general presentation on PCAS to between BnM and Offaly Councillors and OCC personnel was conducted on 10/02/2021. BnM provided further PCAS documentation on request, via e-mail on 27/01/2021. Refer to Section 4 for response on issues raised. Dialogue with Offaly County Council is ongoing.
NPWS Regional Network	NPWS responded through e-mail thread on the 02, 03,07,09/12/2020 in relation to all PCAS bogs. The main point discussed were to advise of the requirement to investigate if assessment under the SEA and Birds directives for each site.	BnM acknowledged via e-mail to address queries on 09/12/2021. Also, a phone conversation with local NPWS Conservation Ranger on 11/01/2021 discussed biodiversity and rehabilitation measures on PCAS bogs including Ummeras.
National Museum of Ireland (Irish Antiquities Division)	Responded through e-mail 28/12/2020 in relation to all PCAS bogs. Issues raised were; 1) The request that due diligence be taken during works to protect any archaeologically significant findings or areas 2) The NMI reiterated the importance of peatlands for the preservation of archaeology and requested they be consulted as part of any EIA undertaken	BnM acknowledged and responded via e-mail on 28/12/2020 to assure BnM will give due cognisance to all points within all rehabilitation plans for Ummeras Bog. A virtual meeting on PCAS between BnM and NMI was held on 18/01/2021
Kildare Branch, Birdwatch Ireland	Email to remind BnM of the frequent use of Ummeras bog by birdwatchers. Also, voiced support of PCAS in general.	BnM responded through e-mail and phone conversation on 02/02/2021.

Butterfly Conservation Ireland	Responded to consultation via e-mail on 13/01/2020 with submission on Ummeras Bog. Concerns raised were: 1) Alterations to the text of the rehab plan. 2) Request for all turf cutting on BnM land to end. 3) Suggest monitoring for Large Heath Butterfly or food plant Hare's-tail Cottongrass. 4) Suggested alterations to habitat design in rehab plan to further connect regional high bog habitats. 5) Raised concerns over future land use. 6) Reminded BnM to give due consideration with regards to the confirmed breeding nearby of Marsh fritillary.	BnM acknowledged via e-mail; Phone conversation with JH 19/01/2021 and follow-up e-mail on 05/02/2021 & 08/02/2021.
ICMSA (Irish Creamery Milk Suppliers Association)	Responded to consultation regarding the PCAS project at large on multiple dates throughout ongoing discourse. Concerns raised included future management and care and maintenance of BnM sites, particularly in relation to boundary drains, with a request for a written commitment to avoid impacts on adjacent lands. Also sought a baseline assessment of hydrology on BnM land and neighbouring areas.	Two meetings were held between BnM and ICMSA representatives on 17/12/2020 and on 03/03/2021 to present details on PCAS to the ICMSA and members. Dialogue is ongoing.
Irish Farmers Association	Responded to consultation regarding Ummeras and the PCAS project at large on multiple dates throughout ongoing discourse. Specific submission on Ummeras Bog received from Westmeath, Offaly and Laois IFA Office. Concerns raised were: 1) Potential for flooding on adjacent lands. 2) Health and Safety 3) Perceived potentially detrimental impact of PCAS on property value 4) Reiterated the desire of the IFA that people who have been cutting turf on bogs should retain this right.	A working group has been established at a high level between BnM and IFA on various issues including PCAS. A meeting was held between BnM and IFA representatives on 18/02/2021 to present details on PCAS. Dialogue is ongoing.
LS (The Heritage Council)	Responded to consultation via e-mail on 04/01/2021 asking for more information on PCAS in general and looking to be involved in any seminar or information events.	BnM responded via phone conversation on 11/01/2021. Dialogue is ongoing.
Irish Raptor Study Group	Responded to consultation via email on 09/01/2021 asking for more information on PCAS in general.	BnM acknowledged and responded to queries via email on 11/01/2021; Phone conversation with RWP 21/01/2021.

National Association of Regional Game Councils (NARGC)	Responded seeking a meeting and made a general PCAS submission. Main points raised were: 1. Need to grow heather in the cutaways as part of PCAS 2. Need to remove birch and other tree species and avoid scrub encroachment. 3. Control of "vermin" species.	A virtual meeting was held between BnM and NARGC representatives on 28/01/2021 (when a presentation was provided) to provide details on PCAS to the NARGC and members. Dialogue is ongoing.
Dept. of Agriculture, Food & the Marine (DAFM)	Submission by e-mail to express support for PCAS in general. Submission recommended; 1) That local landowners and stakeholders be considered as part of the consultation process. 2) EIA assessment be carried out prior to PCAS works. 3) Hydrological assessments are carried out with a view to protecting adjoining lands from adverse impacts.	BnM acknowledged and responded via e-mail on 02/03/2021to assure that all points raised within the submission will be considered. A virtual meeting/PCAS presentation was held for DAFM on 11/12/2020.
Ummeras Community Development	Submission by e-mail to express support for PCAS and to request permission to post any BnM consultation literature on the social media pages of Ummeras community development. Submission by e-mail on 23/02/2021 declaring support for project and gratitude for the comprehensive nature of the stakeholder engagement undertaken by BnM. Submitted a note on the following points; 1) Aligning the rehabilitation with potential after-use of Ummeras Bog 2) Retention of Peatland Industrial Heritage 3) Facilitation of future access 4) Adjacent rejuvenated cutaway bog 5) Key biodiversity features of interest including photos of Hen Harrier and Sand Martin on Ummeras Bog.	A consultation meeting/presentation of PCAS plans was provided for Ummeras Community Development group by BnM on 09/02/2021. BnM requested that specific consultation material was not posted on social media.
Local resident (FK)	A local resident and landowner e-mailed BnM on 12/01/2021 to advise that after reading the draft rehabilitation plans that there were concerns regarding the proposed PCAS rehabilitation at Ummeras Bog. Following the meeting on 28/01/2021, a number of issues with the information provided during the meeting and a number of requests for the addressing of these issues were made over a number of e-mails throughout January and February 2021, including further requests for various meetings with BnM as well as updates on stakeholder engagement. The following are issues raised or concerns expressed over during this period within emails Note that the correspondence stated concerns are based on the advice of a "Hydrogeologist, an Environmentalist, a booklet submitted by the Department of the Environment, Heritage	BnM acknowledged and responded via telephone conversation on 13/01/2021 to discuss issues raised. This was followed up by a virtual meeting, including a PCAS Presentation followed by a Q&A session, to a local group of residents on 28/01/2021. BnM sent an email on 04/02/ advising that after a period consideration, BnM PCAS team were passing over consultation with FK to the BnM legal team following contact

	and Local Government and a second booklet from the Department of Agriculture, Fisheries and Marine". To date, no independent reports from these individuals has been provided. Furthermore, nether booklet has been forwarded, although it appears that one is related to the construction of wetlands in relation to waste water treatment. 1. The proposed plans would interfere with private property and request that private property be omitted from the rehabilitation plan; 2. Ummeras bog is unsuitable for re-wetting and that disastrous implications would result on private property as a result of re-wetting. A separate request sought that BnM prepare satisfactory rehabilitation plans to adhere to the planning process; 3. Several requests for the appointment of an independent hydrologist (with the suggestion that one be appointed by Kildare County Council) to assess the impacts of any re-wetting scheme at Ummeras Bog and that any such assessment be available for public review. Similar issues about re-wetting raised included regarding danger to livestock and pets by water and sinkholes if re-wetting plans proceeded were expressed and clarity was sought on language used in the rehab plan in relation to impact of prolonged rainfall on rehabilitation and properties being "hydrologically and ecologically linked" to the bogs.; 4. Concerns linked to separate comments referencing set-back distances (cited from a booklet relating to constructed wetlands associated with waste water treatment) from houses not being satisfied (in relation to the proposed rehabilitation measures); 5. Queried the ecological value of Ummeras Bog in its current state, separately stating that nothing would grow on bare peat and that there was no *Sphagnum* growing on the bog to provide a source for the proposed rehabilitation; 6. A number of concerns were raised regarding the future management of the BnM property, including consideration of BnM responsibilities should BnM no longer remain as an entity or if the property was sold, as well as site management issues such as illegal dumping and fencing the site to prevent access by livestock, pets or the general public. A specific request in writing that "BnM, are knowingly prepared to assume all responsibility and risk associated with the rewetting of Ummeras bog"; 7. Concerns expressed that drains be management and maintained at source and advised that other agencies would be contacted regards alleged emissions arising	by a solicitor on behalf of the consultee on 19/01/2021 and again on 26/01/2021. Dialogue is ongoing

	from Ummeras Bog, including contacting EPA about suspended solids entering the River Barrow and Coillte in relation to Ammonia toxicity exposure; 8. Expressed concerns about the "implication" by BnM staff at the meeting that the high bog at Ummeras would be subject to re-wetting; 9. Expressed concerns about the re-wetting of the bog driving the spread of TB on adjacent farmland through the displacement of mammal life at Ummeras caused by the rewetting of bogland; 10. Separately stating that wetlands are host to countless diseases. A separate concern regarding the odour of any potential wetlands habitat developed at Ummeras Bog was also expressed; 11. Concerns for local turfcutters were expressed in relation to cessation of turf cutting on private property in two years; 12. To request for the contact details of the authors of the draft rehabilitation plans and a meeting with same; 13. Concern expressed in relation to the underlying geology (karst limestone) in the area making re-wetting unsuitable – cracks and fissures could open underground causing sinkholes. Concern that water will impact the surface and make the ground unstable. 14. Confirmation that Ummeras bog will not become a designated area in the future.	
Local resident (LC)	Emailed BnM after receiving a draft copy of the Ummeras rehab plan to request inclusion in the consultation phase of PCAS and re-assurance that PCAS activities would not interfere with the local hydrology in a way that would adversely impact his land.	BnM acknowledged and responded via e-mail and phone conversation on 02/02/2021 to assure BnM will rehabilitate the bog in a way that does not adversely impact third party landholdings.
Local residents (MH/RF)	Submission received by e-mail to express support for the PCAS scheme however expressed concerns regarding any potential re-wetting of high bog and requested that an independent hydrologist be utilised to assess the hydrological impacts of rehabilitation of Ummeras Bog.	BnM acknowledged and responded via e-mail to assure BnM will give due cognisance to all points within the rehabilitation plan for Ummeras Bog.
Local resident (AK)	E-mail contact from solicitor acting on behalf of consultee to inform BnM that private property, owned by client must not be considered part of PCAS proposals. On 22/02/2021 a further submission was made by via email by consultee in which the following points were raised; 1) Advised that the Author is the owner of Ummeras Farm	Contact with this stakeholder was passed to the BnM legal team due to contact from the legal representative. Dialogue is ongoing

	2) Advised that in the opinion of an auctioneer, the re-wetting of Ummeras Bog will adversely impact the value of their property. **No report attached with submission.** 3) Advised that BnM "can do as they wish on their own property so long as it does not adversely impact the Kirwan property". **4)** Advised that on the advice of an independent hydrogeologist that Ummeras Bog is unsuitable for re-wetting. **No report was attached to the submission.** 5) Advised that the author strongly opposes the re-wetting of the high bog. 6) Requested that an independent hydrogeological assessment be undertaken prior to any PCAS works. 7) Requested that BnM remove private property from the rehabilitation plan. 8) Acknowledged that BnM project manager has passed communication with the family to the BnM legal team as a result of communication from the solicitor representing the family. The author requested that direct communication and engagement to re-commence. **9)** The author suggests that government drafted booklets with information on sites suitable for re-wetting are being ignored by BnM. **No booklet was attached to submission.** 10) Demand for assessments, the contact details of those that carry out assessments, detailed maps, written future management plans, confirmation that the site will not become a designated site in the future and for further consultation/engagement. 11) Advised BnM that there is concern that the displacement of animals from the bog post re-wetting will help spread bovine TB. 12) Advised BnM that the bog will not become a carbon trap.	
Local resident (MK)	**1)** Informed BnM Independent hydrogeologist advised that Ummeras Bog is unsuitable for re-wetting. **No report was attached to submission.** 2) Requested that an independent hydrogeological assessment be arried out by BnM prior to works. 3) Requested that BnM remove private property from rehabilitation plans. 4) Acknowledged that BnM project manager has passed communication with the Kirwan family to the BnM legal team as a result of communication from the solicitor representing the Kirwans. Request made for direct communication and engagement to re-commence.	Contact with this stakeholder was passed to the BnM legal team due to contact from the legal representatives of the family. Dialogue is ongoing

	5) Request for clarification on language used at a stakeholder virtual meeting 28/01/2021. 6) Request for flood defence measures to be put in place prior to works. 7) Request for clarification on future plans of BnM regarding potential flooding of private land. 8) Provided text from a Department of the Environment, Heritage and Local Government and a second by the Department of Agriculture, Fisheries and Marine booklet. **No booklet attached to submission.** 9) Advised that BnM have been made acutely aware of the unsuitability of Ummeras Bog for re-wetting. 10) BnM advised on the potential for loss of livestock to the bog should re-wetting proceed. 11) Advised that the writer knows that BnM are aware of the presence of sinkholes on Ummeras Bog and that the bog has a history of moving. Advised that the author of the submission will make this fact public knowledge should BnM proceed with the "amenity aspect of re-wetting the bog". 12) Advised BnM that the re-wetting of the bog would displace wildlife currently living there-in. 13) Advised that the re-wetting of Ummeras will not create a carbon trap. 14) Advised that the timing of PCAS scheme is questionable as it is taking place "under the cover of covid". 15) Advised that any damages to Kirwan property as a result of PCAS will be sought against BnM in the highest court.	
Local Resident (EH)	E-mail contact on 22/02/2021 to advise BnM that the author is opposed to any re-wetting at Ummeras Bog. This is based on a number of concerns; 1) The concern that re-wetting may adversely impact the private well from which her family draws household water 2) The devaluation of property 3) The devastation of adjoining land 4) The destruction of local turf banks 5) The request for clearly outlined plans, detailing how BnM intends to ensure that the land surrounding Ummeras is protected from the re-wetting process	BnM acknowledged and responded via e-mail to assure BnM will give due cognisance to all points within the rehabilitation plan for Ummeras Bog.

Ummeras Bog Conservation Group	E-mail submission received from the group to voice support for the PCAS project at Ummeras Bog. A list of bird, plant, mammal and pollinator species recorded by the group at Ummeras Bog were supplied as part of this submission. A number of suggestions for enhancements to the PCAS project were made also.	BnM acknowledged and responded via e-mail to assure BnM will give due cognisance to all points within the rehabilitation plan for Ummeras Bog.
Irish Peatlands Conservation Council	E-mail submission received from the group to voice support for the PCAS project at Ummeras. A number of points were raised within the submission; 1) Advised that Ummeras Bog is suited to rehabilitation as there is scope for integration of amenity and conservation projects in the area. 2) Reiterate the desire that BnM work closely with interested parties and local councils to ensure that PCAS fulfils full potential. 3) Advised that species specific conservation plans are integrated into the PCAS rehabilitation plans for Ummeras Bog.	BnM acknowledged and responded via e-mail to assure BnM will give due cognisance to all points within the rehabilitation plan for Ummeras Bog. A virtual meeting and general PCAS presentation was provided by BnM for IPCC on 25/02/2021.
Local landowner (GS)	Following presentation provided to local residents, sent email on 29/01/2021 to request meeting on site to seek reassurance that their land would not be impacted by rehabilitation.	Following presentation provided to local residents, sent email on 29/01/2021 confirm that, due to COVID-19 restrictions, no meeting could currently take place. However, it was proposed to discuss issues via telephone conversation with BnM staff on site. Dialogue is ongoing.
Local landowner and qualified engineer, (MM)	Sent e-mail on 25/01/2021 requesting more information on rehabilitation, to express interest and support in the proposed rehabilitation and sought further information, particularly in relation to the engineering aspects of the project.	BnM acknowledged and responded via e-mail to invite MMcC to the local residents virtual meeting on 28/01/2021 (which she attended)
Local resident; (TG)	E-mail supporting re-wetting of Ummeras Bog	BnM acknowledged and responded via e-mail to acknowledge and offer thanks for the support.
OPW (Jackie Stewart)	E-mailed submission, specifying Ummeras Bog, on 22/01/2021. A number of points were raised in the submission including; 1) A statement in the submission confirming that there are no likely impacts from PCAS activities to the Brosna Arterial Drainage Management scheme. 2) Statement to confirm that while the River Barrow drains the lands around Ummeras bog, the bog area is not within the benefitting lands of the Barrow direct drainage. 3) Welcoming the potential of PCAS to increase water retention within the River Barrow catchment and thus reduce flood risk in the region.	BnM acknowledged and responded with answers to drainage queries via e-mail on 26/01/2021

IWAI Kildare (Dara o Cionnaith)	E-mailed submission related to Ummeras Bog and adjacent Grand Canal on 22/02/2021. Points raised in the submission included; 1) IWAI Kildare provided documentation outlining their proposed marina development at Ummeras. 2) IWAI Kildare suggest aligning the natural heritage of the bog through PCAS with IWAI goals to ensure economic prosperity and sustainability	BnM acknowledged and responded via e-mail on 22/02/2021 to assure BnM will give due cognisance to all points within the rehabilitation plan for Ummeras Bog.

APPENDIX IX. ARCHAEOLOGY

Role of the Archaeological Liaison Officer

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

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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 Naturally Driven	**Procedure: ENV017**	**Rev: 1**
Title: Archaeological Findings	**Approved: EM**	**Date: 13/10/2020**

1) Purpose

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

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

2) Procedure

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

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

Your Archaeological Liaison Officer is ……

3) Records

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

Archaeological Impact Assessment of Proposed Bog Rehabilitation at Ummeras Bog, Co. Kildare/Offaly. Dr. Charles Mount. Nov 2020.

Archaeological Impact Assessment of Proposed Bog Decommissioning and Rehabilitation at Ummeras Bog, Co. Kildare

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 of the impact of proposed bog rehabilitation of c.302 hectares at Ummeras Bog, Co. Kildare 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 Ummeras Bog will include:

- Blocking field drains in the former industrial production area using a dozer/excavator to create regular peat barriers (three barriers per 100 m) along each field drain;
- Re-alignment of piped drainage to manage water levels across the site.
- Fertiliser treatment of high fields and headlands (typically slow to naturally re-colonise) to encourage natural colonisation, if needed. (It is noted that the application of fertiliser may need additional assessment and approval as per the IPC Licence).
- No measures are planned for the surrounding marginal peatland habitats.
- Silt ponds will continue to be maintained during rehabilitation and decommissioning.
- Evaluate success of short-term rehabilitation measures and enhance where necessary.
- Decommissioning of silt-ponds will be assessed and carried out, where required.

Ummeras Bog is located c.3.5km north of Monasterevin, Co. Kildare, to the east of the L1002 road. The bog occupies the townlands of Clogheen, Clonbrin, Coolsickin or Quinsborough, Pollagorteen, Pollaghnagraigue, Ummeras Beg and Ummeras More on OS 6 inch sheets Kildare No 21 and Offaly No. 28.

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 Ummeras Bog. The extent of the rehabilitation is indicated in Fig. 1. This area was examined using information from:

- The IAWU Peatland Survey
- The Bord na Móna excavation programme
- The Sites and Monuments Record that is maintained by the Dept of Housing, Local Government and Heritage
- The Excavations database
- Previous assessments

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

Desktop assessment

Recorded Monuments

The Record of Monuments and Places (RMP) for Cos. Kildare and Offaly which were established under Section 12 of the National Monuments (Amendment) Act, 1994 were examined as part of the assessment (DAHGI 1995 and 1996). This record was published by the Minister in 1995 and includes sites and monuments that were known in Ummeras Bog before that date. This review established that there are no RMPs situated in the proposed rehabilitation area or vicinity (see Fig. 1). The closest RMP to the rehabilitation area, KD021-002----is a decoy pond on dryland in Coolsickin Or Quinsborough townland more than c.0.17km south of the rehabilitation area.

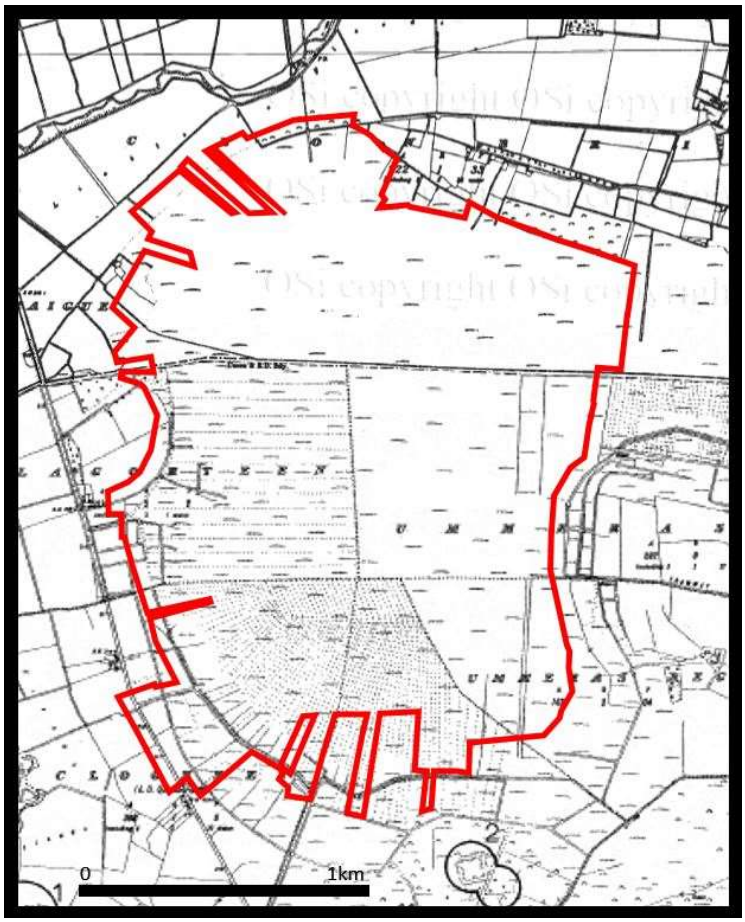

Fig. 1. Ummeras Bog, Co. Kildare, detail of the Record of Monuments and Places map sheets Kildare No 21 and Offaly No. 28. The proposed rehabilitation area is outlined with the redline. There are no Recorded Monuments in the rehabilitation area.

Peatland survey

Ummeras Bog was not part of the IAWU peatland survey. Ummeras Bog was surveyed as part of the Peatland Survey 2005 (License No. 05E0827) for the the Department of the Environment, Heritage and Local Government. (Whitaker 2006). The bog was walked at an interval of every second drain. There were no archaeological sites recorded during the survey.

Fig. 2. Ummeras Bog, Co. Kildare, detail of the Sites and Monuments Record. The proposed rehabilitation area is outlined with the redline. There are no SMRs in the rehabilitation area.

Archaeological investigations

Reports of 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 any archaeological investigations carried out in the rehabilitation area.

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 11th of February 2021. 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 no monuments entered in the SMR in the proposed rehabilitation area (see Fig. 2)

Reported finds

There are no reports of archaeological finds recorded in the Topographical Files of the National Museum of Ireland from Ummeras Bog.

Previous assessments

Ummeras 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 that no archaeological sites or finds have been reported from the bog and concluded that there was a moderate potential for archaeological features to be uncovered during the course of any future development works in Ummeras Bog.

Impact assessment

The proposed works have the potential to impact previously unknown archaeological material.

Recommendations

There is no known archaeological material in Ummeras Bog. 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.

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. There is no known archaeological material in Ummeras Bog. 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.

References

DAHGI 1995. Recorded Monuments Protected under Section 12 of the National Monuments (Amendment) Act, 1994. County Kildare.

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Whitaker 2006. Peatland Survey 2005 Allen, Kilberry & Coolnamóna Bogs Counties Kildare, Laois, Meath, Offaly, & Westmeath. Unpublished Report for the Department of the Environment, Heritage and Local Government.

Dr. Charles Mount
15 February 2021