Planning and Environmental Consultants

Article 6(3) Appropriate Assessment Screening Report

Clooneeny Bog, Co Longford Decommissioning and Rehabilitation 2022

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1. INTRODUCTION

1.1 Background

McCarthy Keville O'Sullivan Ltd. (MKO) has been appointed to provide the information necessary to allow the undertaking of an Article 6(3) Screening for Appropriate Assessment for the decommissioning and rehabilitation of Clooneeny Bog, Co Longford.

The current project is not directly connected with, or necessary for the management of any European Site, consequently the project has been subject to the Appropriate Assessment Screening process.

The assessment in this report is based on a desk study and field surveys between 2012 and 2021 by Bord na Móna ecologists and on a site visit on the 14th of January 2022 by Inga Reich of MKO. It specifically assesses whether the proposed rehabilitation works will have any impact upon European Sites.

This report has been prepared in accordance with the European Commission guidance document 'Assessment of Plans and Projects Significantly affecting Natura 2000 Sites: Methodological Guidance on the provisions of Article 6(3) and 6(4) of the Habitats Directive 92/43/EEC' (EC, 2021) and the Department of the Environment's Guidance on the Appropriate Assessment of Plans and Projects in Ireland (December 2009, amended February 2010).

In addition to the guidelines referenced above, the following relevant guidance was considered in preparation of this report:

1. *DoEHLG (2010) Appropriate Assessment of Plans and Projects in Ireland Guidance for Planning Authorities. Department of the Environment, Heritage and Local Government,*
2. *European Communities (2018) Managing Natura 2000 Sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC, Office for Official Publications of the European Communities, Luxembourg. European Commission,*
3. *European Communities (2000) Managing Natura 2000 Sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC, Office for Official Publications of the European Communities, Luxembourg. European Commission,*
4. *Directive 92/43/EEC, Office for Official Publications of the European Communities, Luxembourg. European Commission,*
5. *EC (2007) Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC – Clarification of the concepts of: alternative solutions, imperative reasons of overriding public interest, compensatory measures, overall coherence, opinion of the commission. European Commission,*
6. *EC (2013) Interpretation Manual of European Union Habitats. Version EUR 28. European Commission,*
7. *OPR (2021) Appropriate Assessment Screening for Development Management. Practice Note PN01, Office of the Planning Regulator.*

1.2 Appropriate Assessment

1.2.1 Screening for Appropriate Assessment

Screening is the process of determining whether an Appropriate Assessment is required for a plan or project. Consultants or project proponents may undertake a form of screening to establish if an Appropriate Assessment is required and provide advice or may submit the information necessary to allow the Screening to be undertaken. Where it cannot be excluded beyond reasonable scientific doubt, that a proposed plan or project, individually or in combination with other plans and projects, would have a significant effect on the conservation objectives of a European Site, an Appropriate Assessment (Natura Impact Statement) of the plan or project is required.

1.2.2 Appropriate Assessment (Natura Impact Statement)

The term Natura Impact Statement (NIS) is defined in legislation[1]. An NIS, where required, should present the data, information and analysis necessary to reach a definitive determination as to 1) the implications of the plan or project, alone or in combination with other plans and projects, for a European Site in view of its conservation objectives, and 2) whether there will be adverse effects on the integrity of a European Site. The NIS should be underpinned by best scientific knowledge, objective information and by the precautionary principle.

1.2.3 Statement of authority

The site visit was undertaken by Inga Reich (Honours degree in Biology, Ph.D. in Applied Ecology). The report was written by Inga Reich and reviewed by Pat Roberts (B.Sc. (Env.) MCIEEM) who has over 15 years' post graduate experience in ecological consultancy and impact assessment.

[1] *As defined in Section 177T of the Planning and Development Act, 2000 as amended, an NIS means a statement, for the purposes of Article 6 of the Habitats Directive, of the implications of a proposed development, on its own and in combination with other plans and projects, for a European site in view of its conservation objectives. It is required to include a report of a scientific examination of evidence and data, carried out by competent persons to identify and classify any implications for the European site in view of its conservation objectives*

2. DESCRIPTION OF THE PROJECT AND BASELINE ENVIRONMENT

2.3 Site location

Clooneeny Bog is located approximately 2.5km southeast of Cloondara and 2.5km west of Longford town in Co Longford (ITM Grid Ref. X 609904 Y 772792). The N5 runs about 600m to the north of the site and the N63 traverses the southern section of the bog. The site location is shown in Figure 2-1.

2.4 Site description

Clooneeny Bog effectively comprises two separate bogs, a main bog (comprising 358.7 Ha) that until recently was in full industrial peat production and a much smaller bog, closer to Longford town, that is used extensively for domestic sod turf production and which is excluded from the PCAS scope. These bogs are located approximately 1km apart.

Clooneeny Bog is drained by the Fallan River which flows to the west of the bog and by the Cloonkeen stream which flows to the east. Both are tributaries of the Camlin River which in turn discharges into the River Shannon (Upper) and both are flowing through the Lough Forbes Complex SAC and Ballykenny Fisherstown Bog Complex SPA which is approximately 1.5km to the north-west of the site.

Clooneeny Bog is linked by an industrial railway line and a machinery travel path to two further Bord na Móna (BnM) properties to the west, Begnagh Bog and Knappoge Bog. The railway line, which is still maintained to facilitate access through BnM properties, runs from east to west and divides Clooneeny into two main sections, namely; the larger north and smaller southern section.

Clooneeny Bog has a pumped drainage regime, however, pumping will be reduced or turned off prior to rehabilitation. Commercial milled peat extraction was undertaken at Clooneeny Bog between 1985 and 2018 and the peat was used as fuel peat in Lough Ree Power in Lanesborough. Residual peat depths at Clooneeny are deep (>2m) for the most part and reach depths of >4.5m in places, particularly in the southern half of the bog, however, some discrete areas have shallow peat of less than 1m depth. Large sections of the bog still contain significant areas of *Sphagnum* peat. Currently the former peat production area comprises a mosaic of largely bare peat along with pioneering cutaway habitats, in addition to marginal[2] habitats. A raised bog remnant separated from the primary peat extraction extent occurs to the south. A further section of Clooneeny that is located to the east of the main production bog is almost entirely cutover as a result of domestic turf cutting, was never subject to commercial peat extraction, and is therefore excluded from the scope of the proposed PCAS Scheme.

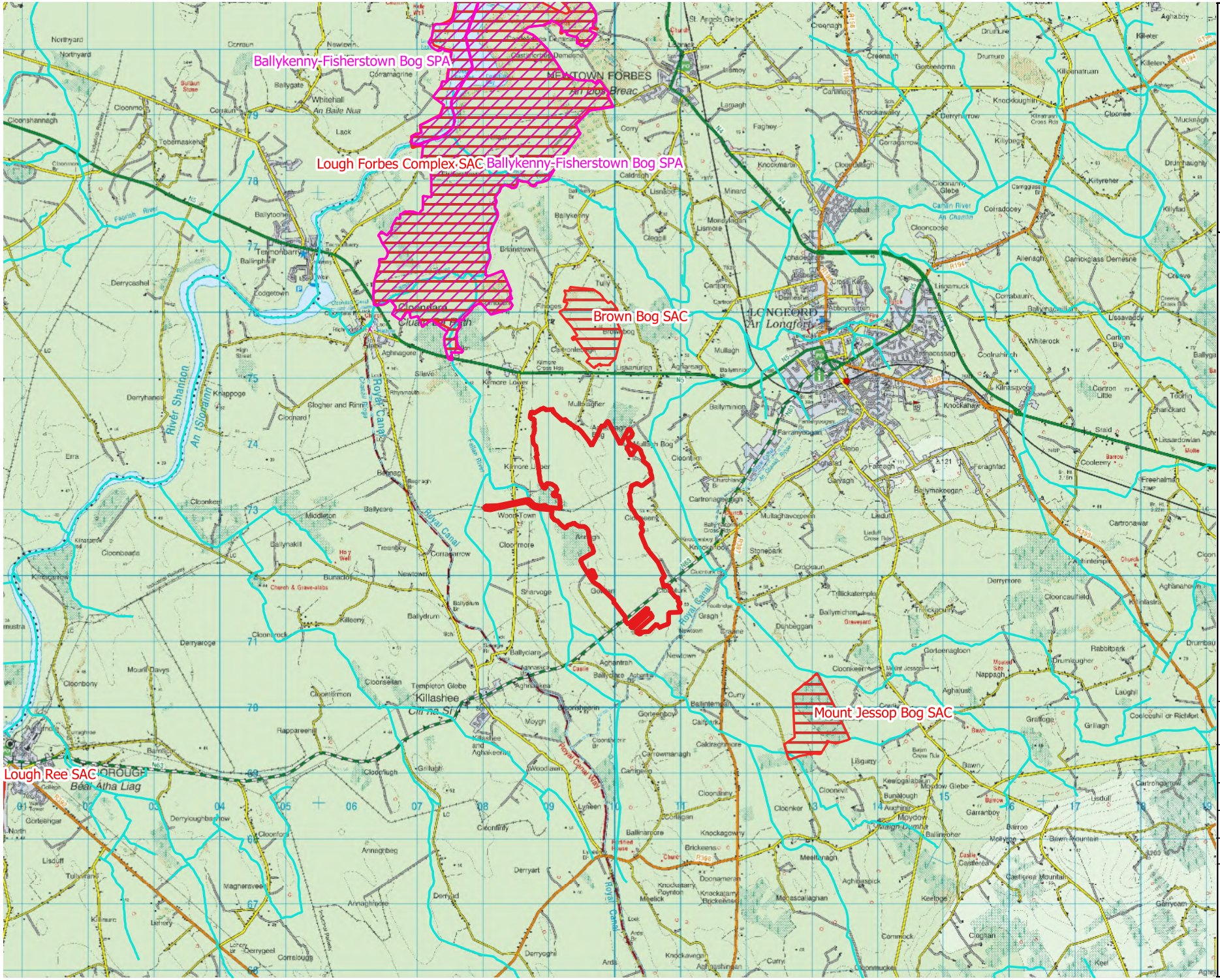
North of the internal rail line in the main production bog, the underlying geology comprises Visean Limestones (undifferentiated)[3]. To the south of the rail line, the Dartry Limestone formation (dolomitised limestone) dark muddy limestone, shale) along with the Ballysteen formation (dark muddy limestone, shale) and the Moathill formation (Limestone, calcareous sandstone and shale), then basal clastics (Rinn point Limestone formation) make up the underlying geology as one moves southwards. The lowest lying areas of the site to be underlain by marl and lacustrine clay (below c. 46m OD), while a ridge of more elevated material (rising to >52m OD) trends through the bog in a south-westerly to north-easterly direction which is likely underlain by glacial till. The underlying geology and subsoil of Clooneeny bog is calcareous.

The future key land-use for the site is amenity and there are proposals for part of the Mid-Shannon Wilderness Park Greenway to utilise the existing railway corridor through the site. Any proposed enhancement measures (ie. targeted drain-blocking) will be positively aligned with current land-uses and will look to facilitate amenity, where possible. There are proposals to extend amenity infrastructure and

[2] *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.*
[3] https://www.gsi.ie/en-ie/data-and-maps/Pages/Bedrock.aspx

rehabilitation will be positively aligned to enable any future amenity development. Re-wetting will be planned as to not to rule out potential future amenity.

The surrounding landscape primarily consists of low-lying agricultural land (pasture) interspersed with other raised bogs, many of which have also been managed by BnM for peat production with some areas utilised for domestic turf-cutting. Some small areas of plantation forestry also occur in the area, particularly to the west and northeast of the site.



Map Legend

- Site boundary
- Special Area of Conservation
- Special Protection Area
- Watercourse

N
O

Drawing Title

Site location Clooneeny Bog

Project Title

Bord na Mona Bog Rehabilitation

Drawn By	Checked By
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211019	2-1
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2.2 Characteristics of the Peatland Climate Action Scheme

2.2.1 Overview

Bord na Móna operates under IPC Licence issued and administered by the EPA to extract peat within the Mount Dillon bog group (Ref. P0504-01), of which Clooneeny Bog is part of. As part of Conditions 10.1 and 10.2 of this license, respectively, decommissioning and rehabilitation (D & R) must be undertaken to ensure the permanent rehabilitation of the cutaway bog lands within the licensed area.

A document titled '*Clooneeny Bog Cutaway Bog Decommissioning and Rehabilitation Plan 2022'* has been prepared specifically to describe the proposed D & R measures at Clooneeny Bog and is appended to this document as Appendix 1.

It is proposed by Government that Bord na Móna (BnM) carry out a Peatland Climate Action Scheme (PCAS) on peatlands previously used for energy production. The additional costs of the proposed Scheme will be supported by Government through the Climate Action Fund and Ireland's National Recovery and Resilience Plan. Bord na Móna have identified a footprint of 33,000 Ha (a subset of the BnM estate that has been used for energy production) as peatlands suitable for enhanced rehabilitation – including Clooneeny Bog. This proposed scheme will significantly go beyond what is required to meet rehabilitation obligations under existing EPA IPC licence conditions.

Decommissioning seeks to address condition 10.1 of license Ref. P0504-01, which 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.

Decommissioning must take place at each bog prior to or concurrent with rehabilitation – the scale of decommissioning per bog varies dependent on the items/ infrastructure previously in place to facilitate prior peat extraction.

Enhanced decommissioning as part of the PCAS will enhance the future after use of the bog for amenity value, security against access for illegal and unsocial activities and general State and community benefit.

Rehabilitation seeks to address the requirements of Condition 10.2 of IPC License Ref. P0504-01 and is based on a reference document prepared by BnM per Bog for which the IPC license is applicable. See the following extract from IPC License Ref. P0504-01:

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

Enhanced rehabilitation interventions supported by the above referenced 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.

2.2.2 Decommissioning and rehabilitation stage

The proposed **decommissioning** at Clooneeny Bog includes:

- clean-up of bog,
- cleaning of existing silt ponds,
- peat stockpile management,

- decommissioning and de-gassing of mobile fuel tanks,
- de-sludging of septic tanks.

If feasible, the bog pumps will be decommissioned and removed.

Enhanced measures include:

- removal of railway lines,
- decommissioning of existing level crossings,
- measures to restrict access to areas of the bog e.g., around silt ponds.

If feasible, bridges and underpasses will be decommissioned, and high voltage power lines will be removed.

Of the 358.7 Ha, 303.5 Ha or 84.6% of the present landcover will be subject to **rehabilitation** measures. These are bespoke interventions designed to stabilise the existing baseline and meet compliance with the requirements of the existing EPA, IPC License and the proposed PCAS (Plate 2-1). Prescriptive measures are unique to the existing baseline habitats and comprise 4 no. broad categories, 1) those associated with dry cutaway (Table 2-1), 2) measures associated with deep peat cutover bog (Table 2-2), 3) those associated with wetland cutaway (Table 2-3) and 4) measures associated with marginal land (Table 2-4). The aim of rehabilitation is as much as possible to place existing peatlands on a trajectory towards a naturally functioning peatland system (Renou-Wilson 2012).

The proposed Clooneeny rehabilitation will be undertaken using standard best practices in peatland restoration. These are based on published information in the Irish context, methodologies developed through rehabilitation trials, best practices employed elsewhere in Europe on peatland rehabilitation and restoration but also the experience of 40 years of research on the after-use development and rehabilitation of the BnM cutaway bogs (Clarke & Rieley 2010), including examples such as the BnM Raised Bog Restoration Project (Bord na Móna 2014).

Access during the D & R phase will be from the existing entrance on the Cloonmore Road at the west of the site, where existing infrastructure is already in place via access tracks to facilitate the previous peat extraction.

In terms of rehabilitation, the ecological and site information collected during BnM ecological baseline surveys, additional site visits, stakeholder input, and monitoring and desktop analysis forms the basis for the planning of peatland rehabilitation at Clooneeny Bog, along with:

- Significant international engagement during this period with other countries in relation to best-practise regarding peatland rehabilitation and after-use through the International Peatland 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;
- Hydrological modelling.

2.2.2.1 Methodology

Decommissioning

Decommissioning at Clooneeny will involve the deployment of a work crew to collect and oversee the removal of any remaining plant or potentially contaminating waste left in situ in line with Condition 7 of License Ref. P0504-01. This condition specifically requires that BnM's procedures for the 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 the IPC license 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 EPA.

Waste sent off-site for recovery or disposal shall only be conveyed to a waste contractor, as agreed by the EPA, 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.

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

- The names of the agent and transporter of the waste;
- The name of the persons responsible for the ultimate disposal/recovery of the waste;
- The ultimate destination of the waste;
- Written confirmation of the acceptance and disposal/recovery of any hazardous waste consignments sent off-site;
- 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;
- Details of any rejected consignments.

A copy of this Waste Management record shall be submitted to the agency as part of the AER for Clooneeny Bog. As required by the license, these waste items will be removed for recycling or disposal, using external contractors with the required waste collection permits, with waste records maintained as required. Where possible, BnM will utilize the appropriate waste hierarchy to identify waste that can reused or recycled ahead of disposal.

The validation of the success of condition 10.1 is carried out through an Independent Closure Audit (ICA), followed by an EPA Exit Audit (EA) and the eventual partial or full surrender of the license. Decommissioning may also include measures to restrict access to the bog or silt ponds.

Lifting of rail lines: this will be facilitated by a manual work crew either a) loading rail line components onto a trailer and removing a) direct to contractor, b) to a consolidation area via tractor, prior to disposal, or c) utilizing the rail line itself to remove the components in reverse order onto a locomotive trailer, with again, the parts being delivered up the rail line to be stored and/or disposed of, in line with IPC license conditions.

Bog area clean up: These bog areas include the parking spaces for production plant and equipment, locations for storing rail line, drainage pipes and stockpile covering. All remaining or unconsolidated old and unused polythene will be collected for recycling or disposal, depending on condition. Any remaining older and immobile plant will be brought in from the bog and removed off site. Any remaining hazardous waste oils, fluids and batteries will be removed off site by qualified appropriate hazardous waste contractors. All remaining unused drainage pipes will be gathered up for reuse, recycling or disposal. All remaining, unconsolidated unused rail line sections will be collected from the bog and stored at the main access location for dismantling.

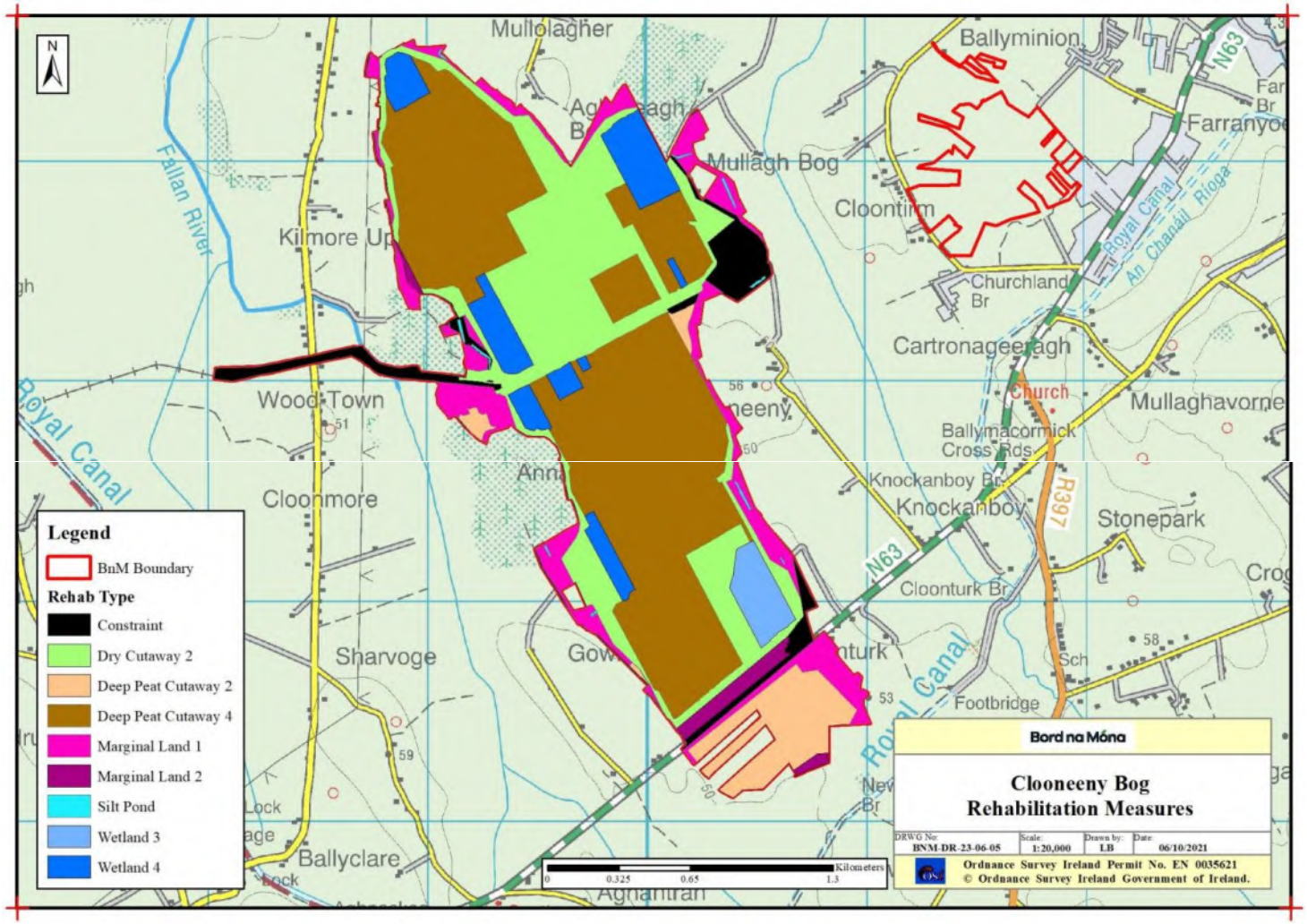

Plate 2-1 Indicative Enhanced Rehabilitation Plan for Clooneeny Bog (extracted from Rehab Plan Mapbook)

Rehabilitation

Dry cutaway rehabilitation packages

The key intervention to be applied to dry cutaway is re-wetting of peat to encourage natural colonisation of typical vegetation and the development of *Sphagnum*-rich peat-forming vegetation communities. This requires managing water-levels close to the surface of the peat for most of the year (100mm ± 50mm). Several different approaches can be taken to this type of restoration/rehabilitation, and three rehabilitation packages with different intensities to managing suitable hydrological conditions are proposed (Table 2-1).

Table 2-1: Extent of dry cutaway rehabilitation proposed at Clooneeny.

Dry Cutaway		Extent (Ha)
DCT1	Blocking outfalls and managing water levels with overflow pipes	1.0
DCT2	Regular drain blocking (3/100 m) + blocking outfalls and managing water levels with overflow pipes + targeted fertiliser treatment	102.9
DCT3	More intensive drain blocking (max 7/100 m) + blocking outfalls and managing water levels with overflow pipes + targeted fertiliser treatment	6.7

The constituent prescriptions which combine to form the dry cutaway rehabilitation packages DCT1, DCT2 and DCT3 at Clooneeny Bog are further described, namely:

1. Blocking outfalls
2. Managing water levels with overflow pipes
3. Regular drain blocking (3/100m)
4. Targeted fertiliser treatment
5. More intensive drain blocking (max 7/100m)

1. Blocking outfalls (Appendix 2, PCAS-0100-014)

The key objective from targeted blocking of outfalls within a bog is to re-wet peat but to manage waterlevels at an appropriate level for the development of wetland and peatland vegetation. This measure optimises re-wetting of cutaway. This measure also has additional benefits of reducing fluvial carbon loss (via water) and also improving water quality leaving the site by reducing emissions of silt and ammonia. Targeted blocking of outfalls is suitable for bogs or portions of bogs that have already had a period of natural colonisation, minimising disturbance to pioneer habitats that are already developing. It is also appropriate for locations where there are establishing habitats and where former drainage infrastructure is already starting to break down. Hydrological modelling and an understanding of site drainage is required to identify appropriate locations for targeted drain-blocking to maximise re-wetting. Drains are blocked at these locations using an excavator by lifting pipes and filling holes with peat or local sub-soils.

Again, the key objective is to manage water-levels at 0-0.1m above the peat surface for as much of the year as possible. Some deeper water is inevitable due to heterogenous topography of the cutaway. This measure can be particularly effective as outfall pipes generally run perpendicular to field drains to catch and transport water off the bog. The outfalls have been piped through high fields. Blocking pipes at the high fields means that the high fields can be converted to natural berms or embankments, creating a compartmented wetland.

An Excavator is used to form a key on either side of the drain which forms the outfall from the bog or field. A strip of peat is taken from the centre of the adjacent field, pushed into the drain and compacted by the bull-dozer tracking over the drain block from the opposite side of the drain to the excavator. The approximate width of the block is 3-5 times the width of the drain. Blocks have to be wide enough to prevent water moving around the blockage and to prevent further leakage when the block subsides. Where possible and available, vegetation is used to cover the peat forming the outfall blockage. This measure is strongly linked with the next in respect of water level management.

2. Managing water levels with overflow pipes (Plate 2-2; Appendix 2, PCAS-0100-014)

This prescription is associated strongly with the blocking of outfalls. Following the blocking of outfalls, some high fields may require overflow pipes to be installed to manage water levels at the required height above peat surface and/or in instances where a series of high fields have been flooded using the cascade effect, the lowermost field may require the outfall to be piped and managed to facilitate access for example.

The first step is to block the existing drain where the pipe exits to stop flows. A new transverse field drain and pipe is then placed above the route of the previously blocked and now redundant pipe, to a specified invert level. The drain holding the new, raised pipe, is filled in using an excavator or bulldozer as appropriate.

Plate 2-2: Examples of installed overflow pipes

3. Regular drain blocking (3/100m) (Appendix 2, PCAS-0100-008)

This measure can be applied to cutover bog, cutaway bog and drained raised bog with different environmental characteristics. It can be applied to residual peat of various depths including deep cutover peat. The main objective is to place peat blockages in drains to raise water levels, re-wetting peat and slowing water movements through the site. Slowing water movement will have additional benefits of reducing fluvial carbon loss (via water) and also improving water quality leaving the site by reducing emissions of silt and ammonia.

The number of peat blockages per 100m is determined by the topography of the site, but an allowance has been estimated at on average 3 blocks per 100m of field drain. The methodology follows NPWS guidelines published by the National Parks and Wildlife Service (Mackin et al., 2017) and in line with methodologies originally developed by McDonagh (1997).

Typical existing bare peat fields are cambered (higher) in the centre and lower towards the drains, helping drainage of the fields but limiting the re-wetting of the central area. The concept of drain blocking is to raise the water levels in the drains to re-wet the cutaway and slow the water movement through the bog. 'Speed Bumps' allow for peat subsidence and to prevent water from flowing over the drain block and eroding it before it becomes stabilised.

Phase 1 begins with the creation of a 'key' on either side of the drain. The dozer cuts down and pushes out peat 0.5-1m from the edge of the drain, with an equivalent section on the other side of the drain.

The next step comprises forming the 'Speed Bump' itself. A strip of peat is taken from the central camber of the field, pushed into the drain and keyed area and compacted by a bull-dozer tracking over the drain block, to form an approximately 5m Wide 'Speed Bump'.

Fields are then completed with Speed Bumps (at an approximate ratio of 3 Per 100m). Speed bumps are profiled to ensure that the overall field profile is lower in the centre and higher over the drain blocks.

4. Targeted fertiliser treatment

Rock phosphate will be applied to areas of bare peat on headlands, high fields and other areas to accelerate establishment of vegetation either by hand or using a tractor. The application rate will be kept to a minimum.

5. More intensive drain blocking (max 7/100m) (Appendix 2, PCAS-0100-009)

This measure can be applied to cutover bog, cutaway bog and drained raised bog with different environmental characteristics. It can be applied to residual peat of various depths including deep cutover peat. The main objective is to block drains with peat barriers to raise water levels, re-wetting peat and slowing water movements through the site. Slowing water movement will have additional benefits of reducing fluvial carbon loss (via water) and also improving water quality leaving the site by reducing emissions of silt and ammonia.

The number of peat blockages per 100m is determined by the topography of the site, but an allowance has been estimated at a maximum of 7 blocks per 100m of field drain. The methodology follows NPWS guidelines published by the National Parks and Wildlife Service (Mackin et al., 2017) and in line with methodologies originally developed by McDonagh (1997). The increased number of peat blockages (compared with the standard measures) will benefit re-wetting and trapping silt on cutaway with slightly greater slopes and will further slow the movement of water from these sites.

1. Before building of dams, the sides and bottom of the ditch is cleaned using the excavator to remove dry degraded peat, to ensure a good peat-to-peat contact. If any vegetation is present, it is carefully removed and left aside for replacement at the end of the process.

2. A 'key' is then cut in either side of the drain approximately 500mm deep, and it is ensured that the width is wider than the actual drain. Approximately 500mm depth of peat is removed from the bottom of the drain also and placed behind the machine for replacement later.

3. An area is opened behind the machine to be used as a borrow pit. Using the surface layer of peat (i.e. the top 100-200mm) is avoided, as it is likely to be very permeable. Only the deeper, more compacted peat is used to build the dam (again, if any vegetation is present, it is carefully removed and left aside for replacement at the end of the process).

4. Peat is then dug out from the borrow pit and placed into the drain compacting it in 300mm layers. The peat is compacted firmly using the excavator bucket before laying more peat from the borrow pit.
5. The dam is built up to a height at least 300mm-500mm above the ground level of the bog to allow for subsequent shrinkage of the peat as it dries. Any vegetation taken in step 1 or step 3 is then placed on the top of the dam, to help bind and stabilise the drain block.)

6. The borrow pit is backfilled with the peat extracted from the bottom of the drain in step 2. The sides of the peat borrow hole are firmly pressed with the excavator bucket to grade the sides of the borrow pit. This enhanced measure's main objective is to block drains with peat dams to raise water levels, re-wetting peat and slowing water movements through the bog.

Deep peat cutover bog rehabilitation packages

The key intervention to be applied to deep peat cutover bog is re-wetting of peat to encourage natural colonisation of typical vegetation and the development of *Sphagnum*-rich peat-forming vegetation communities. This requires managing water-levels close to the surface of the peat for most of the year (0.1m ± 0.05m). Several different approaches can be taken to this type of restoration/rehabilitation, and five rehabilitation packages with different intensities to managing suitable hydrological conditions are proposed (Table 2-2).

Table 2-2: Extent of deep peat cutover bog rehabilitation proposed at Clooneeny.

Deep peat cutover bog		Extent (Ha)
DPT1	Regular drain blocking (3/100 m) + blocking outfalls and managing water levels with overflow pipes	N/A
DPT2	More intensive drain blocking (max 7/100 m) + blocking outfalls and managing water levels with overflow pipes + *Sphagnum* inoculation	17.6

DPT3	More intensive drain blocking (max 7/100 m) + field reprofiling & blocking outfalls and managing water levels with overflow pipes + *Sphagnum* inoculation	6.3
DPT4	Berms and field reprofiling (45m x 60m cell) + blocking outfalls and managing water levels with overflow pipes + drainage channels for excess water + *Sphagnum* inoculation	103.8
DPT5	Cut and fill cell bunding (30m x 30m cell) + blocking outfalls and managing overflows + drainage channels for excess water + *Sphagnum* inoculation	N/A

The constituent prescriptions which combine to form the deep peat cutover bog rehabilitation packages DPT2, DPT3 and DPT4 at Clooneeny Bog are further described below, namely:

1. More intensive drain blocking (max 7/100m) (see *dry cutaway rehabilitation* for details)
2. Blocking outfalls (see *dry cutaway rehabilitation* for details)
3. Managing water levels with overflow pipes (see *dry cutaway rehabilitation* for details)
4. *Sphagnum* inoculation
5. Field reprofiling
6. Berms and field reprofiling (45m x 60m cell)
7. Drainage channels for excess water

4. *Sphagnum* inoculation

The main objective of this enhanced rehabilitation intervention is to accelerate the rate of natural colonisation of *Sphagnum* moss at suitable sites by introducing donor material. The presence of *Sphagnum*-rich vegetation on peatlands brings significant benefits as this is considered a potential carbon sink.

There is potential to use *Sphagnum* inoculation to establish and diversify selected small areas on target sites with *Sphagnum* species, which in turn, and in combination with natural colonisation, can then naturally colonise the remaining deep peat cutover bog area. *Sphagnum* inoculation should only be used in appropriate environmental conditions (water-logged, deep peat with stable water levels and with more acidic water chemistry).

It is proposed to use locally sourced *Sphagnum* and procured donor material, sourced from older established Bord na Móna cutover bog sites where possible, to inoculate Bord na Móna deep peat cutover bogs. Small amounts (handfuls) will be distributed into the newly created cells on deep peat cutover bog. This material can be planted into the soft peat or scattered into shallow water. The use of significant volumes of *Sphagnum* donor material is constrained by the small amount of suitable donor material and donor sites. It is also proposed to use *Sphagnum* donor material developed in greenhouses (e.g., Beadaplugs), where suitable donor material can be made available, and where this is required.

There are significant benefits for climate action from establishing *Sphagnum*-rich peatland vegetation communities. These have been found to quickly develop as carbon sinks (> 10 year). This enhanced measure will be used in combination with some of the other enhanced re-wetting measures (cut and fill cell bunding) to accelerate and optimise the development of *Sphagnum*-rich vegetation on suitable deep peat cutaway sites.

5. Field reprofiling (Appendix 2, PCAS-0100-003/4)

Typical existing bare peat fields are cambered (higher) in the centre and lower towards the drains, helping drainage of the fields but limiting the re-wetting of the central area. The concept of field re-profiling is to level the surface of the individual peat production fields to retain surface water at the required depth. Field re-profiling is developed as a technique to slow the surface water loss from the bog and to retain as much water as possible on the bog, at the required depth.

VARIATION A: This variation of the process, which uses a bull-dozer, can be described as a number of distinct phases.

Phase 1: Re-Profiling of Field Surface
The field is re-profiled using a bull-dozer making a total of 16 passes, with 8 passes up and 8 passes down the length of the former production field, flattening the camber in the centre.

Phase 2: Peat Dam Drain Blocking

Drain blocks are constructed using an excavator operating at a perpendicular direction to the field drains. Initially, a key is cut in the drain approximately 500mm deep, ensuring that it is wider than the actual drain. 500mm of peat is removed from bottom of drain also and placed behind the machine for replacement later.

An area behind the machine, within reach of the excavator arm, is selected is to be used as a borrow pit. Turf and degraded peat is removed from the surface. This material is placed close by to be used as cover later.

'Clay' like peat is extracted from pit and compacted in 300mm layers using the excavator bucket, to form the drain block. The peat is firmly compacted using the machine bucket before laying more peat from the borrow pit. The drain block is built up at least 300-500mm above the ground level of the bog to allow for subsequent shrinkage of the peat as it dries.

The borrow pit is then back filled with the peat extracted from the bottom of the drain. The sides of the borrow pit are pressed down and graded with the excavator bucket. (If any vegetation present, it is carefully removed at the start and left aside for replacement at the end of the process, to help bind and stabilise the top of the drain block.)

The process is then repeated until there is a complete Shallow Field Profile with Regular Drain Blocks along adjacent field drains.

OR

VARIATION B: This variation of the process, which uses a 'screw-leveller' can be described as a number of distinct phases.

Phase 1: Re-Profiling of Field Surface

The production field is re-profiled using a screw-leveller to remove the high central camber and deposit the peat on the lower-lying edges of the same production field.

The Screw-Leveller is towed using a tractor, with a level axis, and will run up one side of the production field and down the other side sufficiently offset from drain to ensure the peat does not enter the drain but forms a mound beside the drain, as the screw leveller passes.

Phase 2 Levelling of Loose Peat

Next a bull-dozer will run up one edge side 1 of the production field and down the other side 2 flattening the loose peat mounds, ensuring a minimal amount of peat enters the drains.

Phase 3 Peat Dam Drain Blocking

Drain blocks are constructed using an Excavator operating at a perpendicular direction to the field drains.

A 'key' is cut in the drain approximately 500mm deep, ensuring that it is wider than the actual drain. 500mm of peat is removed from the bottom of the drain and placed behind the machine for replacement later.

An area behind the machine, within reach of the excavator arm, is selected is to be used as a borrow pit. Turf and degraded peat is removed from the surface. This material is placed close by to be used as cover later. 'Clay' like peat is extracted from pit and compacted in 300mm layers using the excavator bucket, to form the drain block. The peat is firmly compacted using the machine bucket before laying more peat from the borrow pit. The drain block is built up at least 300-500mm above the ground level of the bog to allow for subsequent shrinkage of the peat as it dries.

The borrow pit is then back filled with the peat extracted from the bottom of the drain. The sides of the borrow pit are pressed down and graded with the excavator bucket. (If any vegetation present, it is

carefully removed at the start and left aside for replacement at the end of the process, to help bind and stabilise the top of the drain block.
The process is then repeated until there is a complete Shallow Field Profile with Regular Drain Blocks along adjacent field drains.

6. Berms and field reprofiling (45m x 60m cell) (Appendix 2, PCAS-0100-006)

This measure seeks to create large flat areas or cells of shallow water on bare peat, across multiple fields that are enclosed by shallow berms to retain shallow surface water. The creation of cells will help retain surface water, keeping peat wet and will further slow water movement through the cutaway.

Phase 1: Drain Blocking and Re-Profiling of Fields Surface

Drain blocks are constructed using an Excavator operating at a perpendicular direction to the field drains. A key is cut in the drain approximately 500mm deep ensuring that it is wider than the actual drain. A 500mm depth of peat is removed from bottom of drain also and placed behind the machine for replacement later.

An area behind the machine, within reach of the excavator arm, is selected is to be used as a borrow pit. Turf and degraded peat is removed from the surface. This material is placed close by to be used as cover later. 'Clay' like peat is extracted from pit and compacted in 300mm layers using the excavator bucket, to form the drain block. The peat is firmly compacted using the machine bucket before laying more peat from the borrow pit. The drain block is built up at least 300-500mm above the ground level of the bog to allow for subsequent shrinkage of the peat as it dries.

The borrow pit is then back filled with the peat extracted from the bottom of the drain. The sides of the borrow pit are pressed down and graded with the excavator bucket. (If any vegetation present, it is carefully removed at the start and left aside for replacement at the end of the process, to help bind and stabilise the top of the drain block.

The centre of the cambered field is used as one side of the cell. A bulldozer is used to level and flatten the base of the cell and to infill the drains by removing the camber from the fields. Laser levels are mounted on bull-dozers to allow the machine drivers to move peat and create flat surfaces to the appropriate levels.

Phase 2: Formation of Surface Berms and Levelling Base of Cells

Berms are formed 45m in length and 60m across 4 fields to create an enclosed cell. The berms are relatively shallow (300mm high) and are 5.0 m wide.

The berms are constructed using a bull-dozer pushing the peat obtained from the original field camber to form mounds. The mounds of loose peat are then levelled and compacted using the machine's tracks to ensure that the berm retains shallow water in the cell. The top surface level of the berms is constructed with a high level of accuracy.

Phase 3: Final Profile

Drainage pipes are incorporated into the berm construction at specific locations to manage overflows and prevent berm erosion.

6. Drainage channels for excess water (Appendix 2, PCAS-0100-014)

At some Bord na Móna sites, once drains and pipes are blocked, water can rise to inappropriate levels due to the localised topography (basins). Permanent deeper water can inhibit the development of wetland or peatland vegetation and large open bodies of water are not encouraged, where possible.

An excavator is used to create a V-shaped tap across a high field to allow water pass from a field with water to a field with little or none. The excavator approaches the proposed tap location along the surface of the high field. It then proceeds to excavate a V-shaped trench or drain to the desired depth to permit water to flow between the fields to either side.

This measure will allow greater management of water levels across the cutaway, the benefits of which are listed above and will help protect newly created infrastructure (cell bunds). Hydrological modelling will be key to design these new drainage channels.

Wetland cutaway rehabilitation packages

The key intervention to be applied to wetland cutaway is re-wetting of peat and maximisation of water retention to aid the development of wetland habitats comprising e.g., reed beds. This requires managing water-levels to reach depths of < 0.5m during the summer so wetland vegetation can develop. Several different approaches can be taken to this type of restoration/rehabilitation, and five rehabilitation packages with different intensities to managing suitable hydrological conditions are proposed (Table 2-3).

Table 2-3: Extent of wetland cutaway rehabilitation proposed at Clooneeny.

Wetland Cutaway		Extent (Ha)
WLT1	Turn off or reduce pumping to re-wet cutaway + blocking outfalls and managing water levels with overflow pipes	N/A
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	N/A
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	21.3
WLT4	More intensive drain blocking (max 7/100 m), + blocking outfalls and managing overflows with overflow pipes + transplanting reeds and other rhizomes	29.3
WLT5	More intensive drain blocking (max 7/100 m), + field reprofiling + blocking outfalls and managing overflows with overflow pipes + transplanting reeds and other rhizomes	N/A

The constituent prescriptions which combine to form the Wetland Rehabilitation packages WLT3 and WLT4 at Clooneeny Bog are further described, namely:

1. Turn off or reduce pumping (no explanation required)
2. Blocking outfalls (see *dry cutaway rehabilitation* for details)
3. Managing water levels with overflow pipes (see *dry cutaway rehabilitation* for details)
4. Blocking outfalls (targeted) (see *dry cutaway rehabilitation* for details on blocking outfalls)
5. Constructing larger berms to re-wet cutaway
6. Transplanting reeds and other rhizomes
7. More intensive drain blocking (max 7/100m) (see *dry cutaway rehabilitation* for details)

5. Constructing larger berms to re-wet cutaway (Appendix 2, PCAS-0100-010)

This measure can be applied to cutover bog, cutaway bog and drained raised bog with different environmental characteristics. It can be applied to residual peat of various depths including deep cutover peat. The main objective is to block drains with peat barriers to raise water levels, re-wetting peat and slowing water movements through the site. Slowing water movement will have additional benefits of reducing fluvial carbon loss (via water) and also improving water quality leaving the site by reducing emissions of silt and ammonia.

Typical existing production fields are cambered (higher) in the centre and lower towards the drains, helping drainage of the fields but limiting the re-wetting of the central area. The concept of cross berms is to slow the water movement through the bog and promote the creation of enclosed areas of wetland habitat with shallow water levels – in particular in areas where shallow peat depths remain.

The typical approach can be described as a number of phases.

Phase 1: Forming Key and Initial Drain Block

An excavator is used to form a key in the Drain where the berm crosses. A strip of peat is taken from the central camber of the field, pushed into the drain and compacted by the bull-dozer tracking over the drain block from the opposite side of the drain to the excavator. A key is also formed similarly on the opposite side of the production field at the end of the proposed berm.

Phase 2: Forming Peat Berm

Next the bull-dozer is used to complete the central cross section of Berm by taking peat from the centre of the field and pushing it in line with the field to form an approximately 5m Wide x 500mm High Cross Berm.

6. Transplanting reeds and other rhizomes

Rhizomes will be collected from a donor area and transported to the site where they will be distributed throughout the respected area and replanted using an excavator. Through the other measures in this package, water levels will be kept high enough to encourage the development of reedbeds. This option may likely not be required as there has already been significant natural colonisation.

The number of peat blockages per 100m is determined by the topography of the site, but an allowance has been estimated at a maximum of 7 blocks per 100m of field drain. The methodology follows NPWS guidelines published by the National Parks and Wildlife Service (Mackin *et al.,* 2017) and in line with methodologies originally developed by McDonagh (1997). The increased number of peat blockages (compared with the standard measures) will benefit re-wetting and trapping silt on cutaway with slightly greater slopes and will further slow the movement of water from these sites.

Peat blocks are constructed efficiently by excavator and bulldozer generally operating at a perpendicular direction to the field drains. The process involves clearing the drain by removing dry degraded peat/ vegetation and creating a 'key' (wider than the drain and approximately 0.5m deep) in the drain sides in order to ensure a tight seal is maintained. The drain is subsequently blocked with peat taken from a nearby 'borrow pit' (avoiding the top 0.1-0.2m) and involves placing layer after layer (about 0.3m each) of peat which are compacted in the drain using the bucket of the excavator. The blockage will be built up at least 0.3-0.5m above the ground level of the bog to allow for subsequent shrinkage that occurs during peat drying. If vegetation was removed from the drain before clearing it, this should be placed on top of the blockage. The 'borrow pit' will be filled in with the peat that was extracted from the bottom of the drain and the sides of the pit should be pressed down and graded.

Marginal land rehabilitation packages

Depending on the habitat, marginal land might require drainage of different intensities to managing suitable hydrological conditions (Table 2-4).

Table 2-4: Extent of marginal land rehabilitation proposed at Clooneeny

Marginal Land		Extent (Ha)
MLT1	No work required	32.1
MLT2	More intensive drain blocking (max 7/100 m)	0.6

Some of the marginal land will require no work, while more intensive drain blocking (max 7/100m) is prescribed for other areas. This method has been described in the *dry cutaway rehabilitation* packages section above.

Additional work rehabilitation packages

Additional drain blocking will be carried out in the raised bog remnant in the south of the site (Table 2-5).

Table 2-5 Extent of additional work proposed at Clooneeny

Additional Work		Extent (Ha)
AWT2	Targeted drain blocking (1 per 100m) with excavator	32.1

This method is comparable to the More intensive drain blocking methodology which has been described in the *dry cutaway rehabilitation* packages section above.

2.2.2.2 Timescale

- Decommissioning activities will be completed within a period of 12 months but may be phased across 2 calendar years and are scheduled to be completed before the end of 2022.
- Rehabilitation activities will be completed within a period of approximately 7 months. In general, activities will be carried out between the months of April and October inclusive.
- The decommissioning stage may overlap rehabilitation activities.
- The duration of activities provided are approximate and may be slightly shorter or longer, depending on weather conditions and progress on rehabilitation prescriptions. Activities may cease for the winter months due to rainfall and poor ground conditions. In any case, the rehabilitation period will not be longer than 1 year.
- Normal working times will be daylight hours between 08.00 and 17.30hrs Monday to Friday.

2.2.2.3 Use of natural resources

- There is no land requirement in respect of decommissioning.
- In total, rehabilitation activities will take place on 303.5 Ha of land. As rehabilitation through stabilisation and land cover change is the primary objective, no 'negative quality' land take is associated with rehabilitation. No land take is required for e.g., the storage of vehicles – vehicles are typically left in situ at points of work or on 'headlands'.
- No additional water is required for either decommissioning or rehabilitation.
- Regarding decommissioning, some peat or topsoil material which is contaminated may be removed in line with Schedule 2 of the IPC license. This is considered negligible in magnitude.
- During rehabilitation, minor quantities of existing peat will be excavated from drainage trenches and/or an immediately adjacent borrow pit at peat dam locations and immediately used to form peat dams. Borrow pits are re-instated, as the final step in dam creation, by the excavator driver profiling the surrounding peat/scraw into place over the excavated borrow pit. In each instance the magnitude of extracted peat is negligible. Similarly, the installation of overflow pipes may require excavation of minor quantities of peat, and/or subsoil dependent on location (Insertion of peat blockages/overflow pipes may interact with underlying subsoils where peat depths are shallow). All material used will be from the immediate vicinity and no transport of material will be required.
- Dozers may be used to infill drains with peat displaced by screw levelling. Peat will also be utilised to infill any blocked outfalls or raised drainage pipes.
- Reeds and other rhizomes will be transplanted into wetland cutaway.
- Hydrocarbons will be used on-site during rehabilitation activities and will be limited to the diesel or petrol fuel and mechanical oils used by any onsite site machinery and equipment.
- Fertilisers may be used to treat high fields and headlands to encourage natural colonisation.

Emissions and wastes

- Dust, noise and localised vibration along access routes arising from the arrival and departure of decommissioning vehicles or rehabilitation machinery will be localised to the access tracks or rail line, occur in low volumes and last for a negligible duration – it is common practice on BnM working bogs to leave vehicles in situ once on site, therefore daily trips into and out of the bog are not expected. Dust and noise limits are currently set on IPC licenses.
- Regarding rehabilitation, the extent of dust, noise and localised vibration from individual machines creating peat dams to block drains or blocking outfalls is momentary in duration and therefore considered negligible in magnitude. Creating 'speed bump' blockages or infilling

drains produces a higher potential for the release of dust, however the duration of this is expected to be brief (i.e., with effects lasting less than a day).
- Fuel and some pipes may require to be delivered. No blasting or piling is required.
- General waste will arise from the presence of staff. Very small quantities of chemical waste will be generated, this waste is limited to solid waste oil, such as oily rags.

2.2.3 Operational stage

Operational activities

- Operational activities will mainly comprise non-intrusive environmental & ecological monitoring (including surface water monitoring, vegetation monitoring but also the use of drones to provide catalogues of aerial photography) and may also include minimal works such as repairs to existing peat blockages, adjustment of overflow pipes (where required) and fertilisation to increase successional rates.
- Maintenance of existing silt ponds to reduce emissions to local water bodies, as conditioned by the existing IPC license, will still be required.
- Access will be from the existing entrance on the Cloonmore Road at the west of the site, where existing infrastructure is already in place via access tracks to facilitate the previous peat extraction.

Timing and duration of operational activities

- It is expected that scheduled inspection and maintenance activities will be carried out by a 2-4 person team, typically for 1 day per month, for the foreseeable future.
- Once constructed and commissioned, the proposed decommissioning and rehabilitation will remain permanently in place.

Use of natural resources

- There is limited requirement for the use of natural resources – negligible quantities of peat or subsoil may be used to repair existing or create additional drain blocks.

Emissions and wastes

- There will be negligible exhaust fumes, dust and noise emitted by maintenance vehicles and or other equipment such as drones during occasional maintenance works, such as to outflows.
- Collectively, re-wetting and re-vegetating will minimise any risk of emission to air from dust. During the operational stage of peatland rehabilitation, typical emission of dust from exposed peat to air is expected to cease.
- Following rehabilitation and into the early operational stage Clooneeny Bog may continue to be a carbon source, however as habitats stabilise following intervention, the bog is expected to, over time, become a carbon sink in part.

2.3 Description of the baseline ecological environment

Assessing the impacts of any project and associated activities requires an understanding of the ecological baseline conditions prior to and at the time of the project proceeding. Ecological Baseline conditions are those existing in the absence of proposed activities (CIEEM, 2018).

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, Clooneeny Bog was surveyed in September of 2012. Additional ecological walkover surveys and visits have taken place at Clooneeny Bog between 2012-2021 (visited during winter 2016/17, but also a final confirmatory survey took place in June of 2021). Habitat maps have been updated, where required. This rehabilitation plan is informed by the original baseline survey as well as subsequent confirmatory site walk-over surveys and visits, and updates to baseline data.

Habitat mapping followed best-practise guidance from Smith *et al.* (2011). 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 Atherton *et al.* (2010). A more detailed BnM classification system was previously developed for classifying pioneer cutaway habitats as Fossitt categories were deemed not to be detailed enough for cutaway bog (much of cutaway bog could be classified as Cutover Bog - PB4). Much of the pioneer cutaway vegetation is still at an early stage of its development and cannot be assigned to Fossitt Level 3 categories yet.

A detailed ecological survey report for Clooneeny Bog is contained in Appendix II of Appendix 1.

A walkover survey was conducted on the 14th of January 2022 by Inga Reich to confirm the ecological baseline as identified by Bord na Móna in the preceding surveys and as shown in the habitat map (Figure 2-2). During the survey, signs of badger (foot prints, snuffle holes, faeces) were recorded on and along the railway track that traverses the site.

2.3.1 Habitats

The majority of Clooneeny is in active industrial peat production with peat depth exceeding 2.6m and large areas of the bog can be classified as bare peat **(ED2)**. Pioneering communities are establishing on the cutaway, generally Soft Rush (*Juncus effusus*)-dominated poor fen with less frequent Bog Cotton (*Eriphorum augustifolium)* or Bottle Sedge (*Carex rostrata)* -dominated poor fen **(PF2)**.

Other habitats include birch (*Betula spp*)-dominated scrub (on drier higher ground that is not flooded), pioneer dry heath **(HH1)** (mainly in mosaic with birch scrub but also Gorse (*Ulex europaeus*), wet pioneering purple moorgrass (*Molinia caerulea)*-dominated grassland **(GS4)**, access routes **(BL3)**, riparian zones **(FW2)** with drains and associated habitats such as scrub and developing birch woodland, silt ponds **(FL8)** with gorse/birch scrub and purple moorgrass-dominated grassland around the margin. Overall, the site still contains areas with significant peat depth (>2.6m) with some smaller areas that are becoming cutaway.

The southern section of the main production bog contains a relatively large area of remnant raised bog **(PB1)**. This area is actively used for domestic turf production and a power line is also located within this area. These sections of bog are dry and dominated by heather and are typical of remnant sections of raised bog that are located along the edges of production bogs. Other, smaller sections of bog are located around the margins of the site. The eastern edge of the site contains a significant area of cutover bog **(PB4)** as a result of ongoing domestic turf cutting (Plate 2-4). Turf cutting is still active in this area and the cutover areas are developing a mix of scrub **(WS1)** and soft rush and bog cotton dominated pioneer poor fen **(PF2)**.

A relatively long (1km) travel pass connects Clooneeny Bog with Begnagh Bog to the west. This pass crosses mineral soil and is fringed with a mix of scrub and Oak Ash Hazel woodland **(WN2)**. It also crosses a public road and the Fallan River **(FW2)** (Plate 2-5) which holds stocks of Brown Trout and it would be likely that Otter are present in this watercourse also. Small areas of open water (permanent

pools or lakes) and temporary open water (periodic inundation) **(FL2)** are present in the west and east of the site.

The most common habitats found around the margins of Clooneeny include raised bog **(PB1)**, cutover bog **(PB4)**, scrub **(WS1)**, wet (callows-type) grassland **(GS4)**, birch woodland **(WN7)**, and improved grassland **(GA1)** around the boundary where the official boundary extends into adjacent fields.

2.3.2 Fauna

Signs of pine marten, badger, fox and hare have been recorded from Clooneeny Bog following BnM surveys. On the most recent BnM visit to Clooneeny (July of 2021), 19 species of bird were recorded utilising or associating with habitats onsite including the red-listed Meadow pipit (*Anthus pratensis*) and Common Kestrel (*Falco tinnunculus*) and the amber listed Sand Martin (*Riparia riparia*), and Barn Swallow (*Hirundo rustica*). Lesser Black-backed Gull (*Larus fuscus*), also Amber listed, was recorded overflying the bog. Golden Plover (*Pluvialis apricaria*) and Eurasian Curlew (*Numenius arquata*) (both red-listed) have previously been recorded on or near Clooneeny in the Autumn period (September 2012).

2.3.3 Drainage and connection to European Sites

The bog contains several drainage pathways which drain the southern portion of the bog towards the north-east into the Cloonkeen stream, while the northern portion of the bog drains towards the Fallan River to the west. In total, there are ten treated surface water outlets to the two rivers. The Clonkeen stream flows through the Lough Forbes Complex SAC and Ballykenny Fisherstown Bog Complex SPA after about 7km (following the hydrological pathway) while the Fallan River enters the European Sites after about 3.5km (following the hydrological pathway).

Plate 2-3 View of bare peat revegetating with soft rush in places

Plate 2-4 Cutover, revegetating bog on the eastern margin of the bog

Plate 2-5 Bridge over the River Fallan in the west of the site

Map Legend

- Site boundary
- bare peat
- bog
- built
- cutover bog
- grassland or agriculture
- gravel sub soil
- heath
- pioneer open cutaway habitats
- riparian
- scrub
- scrub & pioneer open cutaway habitats
- wetlands
- woodland

N

Drawing Title

Clooneeny Bog Habitat Map

Project Title

Bord na Mona Bog Rehabilitation

Drawn By	Checked By
IR	PR
Project No.	Drawing No.
211019	3-1
Scale	Date
1:25000	02.02.2022

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2.3.4 Consequences of proposed rehabilitation for current habitats

Apart from the area of remnant raised bog south of the N63, which may eventually be restored to Active Raised Bog within a reasonable timeframe, it is not expected that the site has the potential to develop active raised bog analogous to the priority EU Habitats Directive Annex I habitat within the foreseeable future (ca. 50 years); and 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 PCAS, will improve habitat conditions of the whole bog, making the overall bog wetter and other peatland habitats (e.g., fen, reed swamp, wet woodland) will develop in a wider mosaic that reflects underlying conditions. Some dry areas will develop birch woodland, heath or grassland while other sections are expected to revert to a mosaic of wetland habitat with deeper water (> 0.5 m).

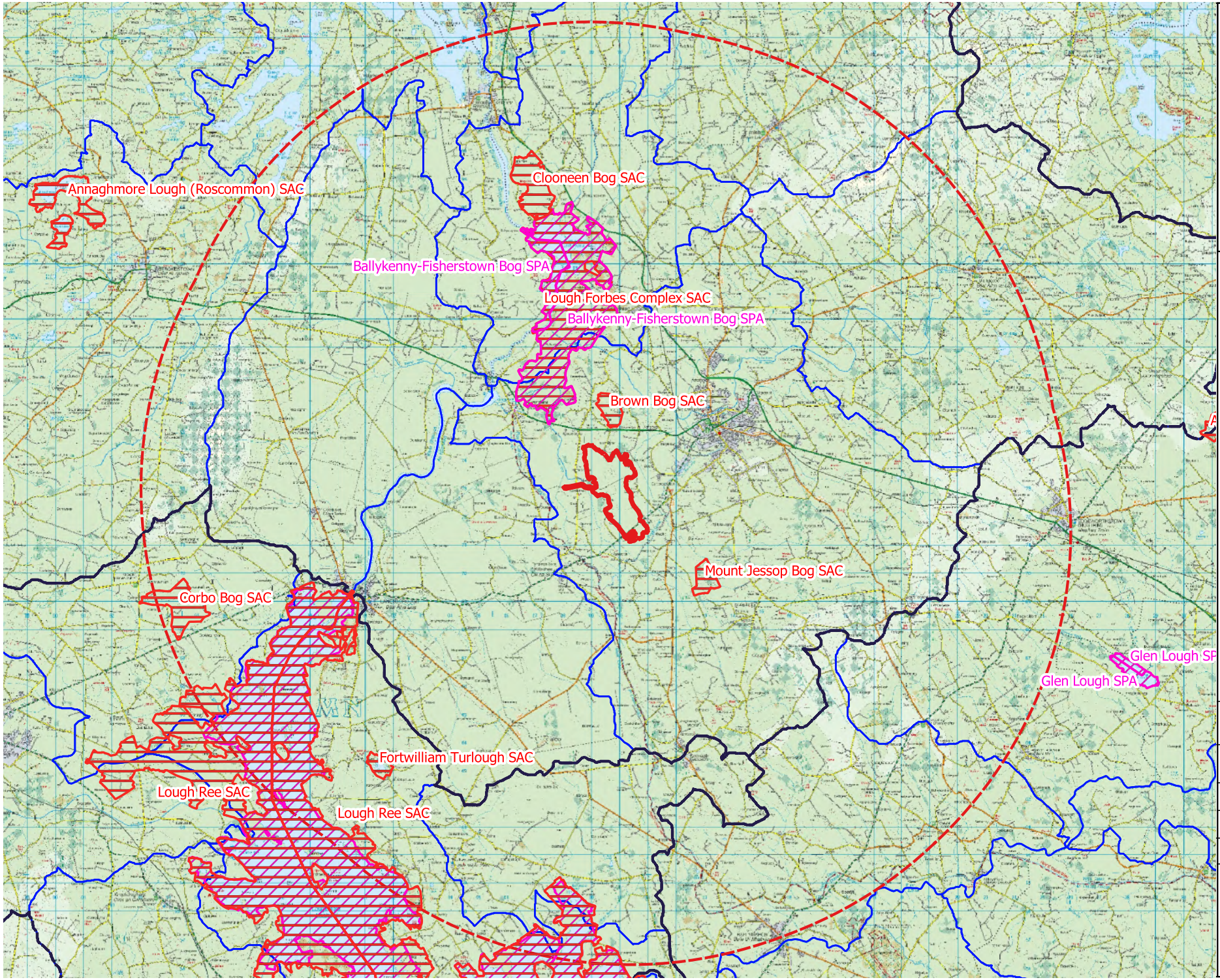
Habitats currently evaluated as not requiring rehabilitation (i.e., marginal land, railway line) will remain in line with existing baseline trends for these habitats.

3. IDENTIFICATION OF RELEVANT EUROPEAN SITES

3.1 Identification of the European Sites within the Likely Zone of Impact

The following methodology was used to establish which European Sites are within the Likely Zone of Impact of the proposed development:

- Initially the most up to date GIS spatial datasets for European designated sites and water catchments were downloaded from the NPWS website (www.npws.ie) and the EPA website (www.epa.ie) on the 05/01/2022. The datasets were utilized to identify European Sites which could feasibly be affected by the proposed development.
- All European Sites within a distance of 15km surrounding Clooneeny Bog were identified and are shown on Figure 3.1. In addition, the potential for connectivity with European Sites at distances of greater than 15km from the site was also considered in this initial assessment. In this case, no potential for the proposed works to result in significant effects on sites located at a distance of over 15km from Clooneeny Bog was identified.
- The catchment mapping was used to establish or discount potential hydrological connectivity between Clooneeny Bog and any European Sites. The hydrological catchments are also shown in Figure 3.1.
- In relation to Special Protection Areas, in the absence of any specific European or Irish guidance in relation to such sites, the Scottish Natural Heritage (SNH) Guidance, *'Assessing Connectivity with Special Protection Areas (SPA)'* (2016) was consulted. This document provides guidance in relation to the identification of connectivity between proposed development and Special Protection Areas. The guidance takes into consideration the distances species may travel beyond the boundary of their SPAs and provides information on dispersal and foraging ranges of bird species which are frequently encountered when considering plans and projects.
- Table 3-1 provides details of all relevant European Sites as identified in the preceding steps and assesses which are within the likely Zone of Impact. The assessment considers any likely direct or indirect impacts of the rehabilitation works, both alone and in combination with other plans and projects, on European Sites by virtue of the following criteria: size and scale, land-take, distance from the European Site or key features of the site, resource requirements, emissions, excavation requirements, transportation requirements and duration of the works were considered in this screening assessment.
- The site synopses and conservation objectives of these sites, as per the NPWS website (www.npws.ie), were consulted and reviewed at the time of preparing this report 05/01/2022.
- Where potential pathways for Significant Effect are identified, the site is included within the Likely Zone of Impact and considered in the Screening Assessment.



Map Legend

- Site boundary
- 15km Buffer
- Special Area of Conservation
- Special Protection Area
- Hydrological Catchment
- Hydrological Subcatchment

Drawing Title
European Sites within 15km radius of Clooneeny Bog

Project Title
Bord na Mona Bog Rehabilitation

Drawn By	Checked By
IR	PR
Project No.	Drawing No.
211019	3-1
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Website: ww.mkoireland.ie

Table 3-1: Identification of European Sites within Likely Zone of Impact

European Sites and distance from Clooneeny Bog	Qualifying Interests/Special Conservation Interests for which the European Site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 05/01/2022)	Conservation Objectives	Likely Zone of Impact Determination
Special Area of Conservation			
Brown Bog SAC [002346] **Distance:** 0.8km	› [7110] Active raised bogs › [7120] Degraded raised bogs still capable of natural regeneration › [7150] Depressions on peat substrates of the Rhynchosporion	Detailed conservation objectives for this site (Version 1, February 2016) were reviewed as part of the assessment and are available at www.npws.ie	There will be no direct effects on this SAC as the project footprint is located entirely outside the designated site. Due to the terrestrial nature of the QI habitats and distance from the site, no complete source-impact-pathway was identified. As such, there is no potential for indirect effects to occur. **This site is not in the Likely Zone of Impact and no further assessment is required.**
Lough Forbes Complex SAC [001818] **Distance:** 1.4km	› [3150] Natural eutrophic lakes with Magnopotamion or Hydrocharition-type vegetation › [7110] Active raised bogs › [7120] Degraded raised bogs still capable of natural regeneration › [7150] Depressions on peat substrates of the Rhynchosporion › [91E0] Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae)	Detailed conservation objectives for this site (Version 1, May 2016) were reviewed as part of the assessment and are available at www.npws.ie	There will be no direct effects on this SAC as the project footprint is located entirely outside the designated site. The is no complete source-impact-pathway for the following habitats due to their terrestrial nature and distance from the site: › [7110] Active raised bogs › [7120] Degraded raised bogs still capable of natural regeneration › [7150] Depressions on peat substrates of the Rhynchosporion

European Sites and distance from Clooneeny Bog	Qualifying Interests/Special Conservation Interests for which the European Site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 05/01/2022)	Conservation Objectives	Likely Zone of Impact Determination
			While the Fallan River and Cloonkeen stream, into which the bog drains, flow through the southern part of this SAC, there is no downstream hydrological connectivity between Clooneeny Bog and any of the aquatic QI habitats of this site as per the Conservation Objectives and review of aerial photography: › [3150] Natural eutrophic lakes with Magnopotamion or Hydrocharition-type vegetation › [91E0] Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae) **This site is not in the Likely Zone of Impact and no further assessment is required.**
Mount Jessop Bog SAC [002202] **Distance:** 2.1km	› [7120] Degraded raised bogs still capable of natural regeneration › [910D] Bog woodland	This site has the generic conservation objective: 'To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected.' (NPWS (2021) Conservation objectives	There will be no direct effects on this SAC as the project footprint is located entirely outside the designated site. Due to the terrestrial nature of the QI habitats and the distance from the site, no complete source-impact-pathway was identified. As such, there is no potential for indirect effects to occur. **This site is not in the Likely Zone of Impact and no further assessment is required.**

European Sites and distance from Clooneeny Bog	Qualifying Interests/Special Conservation Interests for which the European Site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 05/01/2022)	Conservation Objectives	Likely Zone of Impact Determination
		for Mount Jessop Bog SAC [002202] Generic Version 8.0. Department of Culture, Heritage and the Gaeltacht.)	
Clooneen Bog SAC [002348] **Distance:** 8.2km	› [7110] Active raised bogs › [7120] Degraded raised bogs still capable of natural regeneration › [7150] Depressions on peat substrates of the Rhynchosporion › [910D] Bog woodland	Detailed conservation objectives for this site (Version 1, August 2016) were reviewed as part of the assessment and are available at www.npws.ie	There will be no direct effects on this SAC as the project footprint is located entirely outside the designated site. Due to the terrestrial nature of the QI habitats and the distance from the site, no complete source-impact-pathway was identified. As such, there is no potential for indirect effects to occur. **This site is not in the Likely Zone of Impact and no further assessment is required.**
Lough Ree SAC [000440] **Distance:** 8.3km	› [1355] Otter (*Lutra lutra*) › [3150] Natural eutrophic lakes with Magnopotamion or Hydrocharition-type vegetation › [6210] Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) › [7110] Active raised bogs	Detailed conservation objectives for this site (Version 1, August 2016) were reviewed as part of the assessment and are available at www.npws.ie	There will be no direct effects on this SAC as the project footprint is located entirely outside the designated site. The is no complete source-impact-pathway for the following habitats due to their terrestrial nature and distance from the site: › 6210] Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites)

European Sites and distance from Clooneeny Bog	Qualifying Interests/Special Conservation Interests for which the European Site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 05/01/2022)	Conservation Objectives	Likely Zone of Impact Determination
	› [7120] Degraded raised bogs still capable of natural regeneration › [7230] Alkaline fens › [8240] Limestone pavement › [91D0] Bog woodland › [91E0] Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae)		› [7110] Active raised bogs › [7120] Degraded raised bogs still capable of natural regeneration › [8240] Limestone pavement › [91D0] Bog woodland As such, there is no potential for indirect effects on these habitats. Following the precautionary principle, a potential pathway for effect on the following QI habitats and species was identified through surface water connectivity via the Fallan River and Cloonkeen Stream into which the bog drains site and which ultimately flow into Lough Ree: › [3150] Natural eutrophic lakes with Magnopotamion or Hydrocharition-type vegetation › [7230] Alkaline fens › [91E0] Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae) › [1355] Otter (*Lutra lutra*) However, the objective of the works involved in the D & R is to stabilise the bog. These works are specifically, designed to reverse the drainage of the bog and to, minimise the run-off of waters from it. The works will be similar in intensity to the active production that was

European Sites and distance from Clooneeny Bog	Qualifying Interests/Special Conservation Interests for which the European Site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 05/01/2022)	Conservation Objectives	Likely Zone of Impact Determination
			undertaken until recently, but will be less invasive, short term and will involve an estimated six machines/crews working at any one time on the bog for an expected period of 2 years. There is no potential for these works to result in significant effects on downstream watercourses and ecological receptors as the works primarily involve the blocking of drainage pathways from the bog. Following the implementation of the PCAS, there will be no possibility of further effects. As such, in the absence of any mitigation, there is no potential for any significant effect on these QI receptors as a result of water pollution or change to the hydrological regime within the SAC. The potential for disturbance to otter, where it occurs outside the SAC was also assessed. While otter is likely to occur, at least in the vicinity of Clooneeny Bog, the works will not result in any loss of otter habitat, are short term and will not be occurring over the entire bog at any one time, leaving much of the bog and potential otter habitat completely undisturbed. Hence there is no potential for the works, in the absence of any mitigation, to result in significant disturbance to this QI species. **There is no potential for significant effects on this SAC and no further assessment is required.**

European Sites and distance from Clooneeny Bog	Qualifying Interests/Special Conservation Interests for which the European Site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 05/01/2022)	Conservation Objectives	Likely Zone of Impact Determination
Fortwilliam Turlough SAC [000448] **Distance:** 11.5km	› [3180] Turloughs	Detailed conservation objectives for this site (Version 1, February 2018), were reviewed as part of the assessment and are available at www.npws.ie	There will be no direct effects on this SAC as the project footprint is located entirely outside the designated site. Due to the absence of a hydrological connection and the distance from the site, no complete source-impact-pathway was identified for the QI habitat. As such, there is no potential for indirect effects to occur. **This site is not in the Likely Zone of Impact and no further assessment is required.**
Corbo Bog SAC [002349] **Distance:** 13.2km	› [7110] Active raised bogs › [7120] Degraded raised bogs still capable of natural regeneration › [7150] Depressions on peat substrates of the Rhynchosporion	Detailed conservation objectives for this site (Version 1, November 2015) were reviewed as part of the assessment and are available at www.npws.ie	There will be no direct effects on this SAC as the project footprint is located entirely outside the designated site. Due to the terrestrial nature of the QI habitats and the distance from the site, no complete source-impact-pathway was identified. As such, there is no potential for indirect effects to occur. **This site is not in the Likely Zone of Impact and no further assessment is required.**
Special Protection Area			

European Sites and distance from Clooneeny Bog	Qualifying Interests/Special Conservation Interests for which the European Site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 05/01/2022)	Conservation Objectives	Likely Zone of Impact Determination
Ballykenny-Fisherstown SPA [004101] **Distance:** 1.4km	› [A395] Greenland white-fronted goose (*Anser albifrons flavirostris*)	This site has the generic conservation objective: '*To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA'* (NPWS (2021) Conservation objectives for Ballykenny-Fisherstown SPA [004101] Generic Version 8.0. Department of Culture, Heritage and the Gaeltacht.)	There will be no direct effects on this SPA as the project footprint is located entirely outside the designated site. The Fallan River and Cloonkeen stream, into which the bog drains, flow through the southern part of this SPA and a potential pathway for effect on supporting habitats for Greenland white-fronted goose was identified. However, the objective of the works involved in the D & R is to stabilise the bog. These works are specifically designed to reverse the drainage of the bog and to minimise the run-off of waters from it. The works will be similar in intensity to the active production that was undertaken until recently, but will be less invasive, short term and will involve an estimated six machines/crews working at any one time on the bog for an expected period of 2 years. There is no potential for these works to result in significant effects on downstream watercourses and ecological receptors as the works primarily involve the blocking of drainage pathways from the bog. Following the implementation of the PCAS, there will be no possibility of further effects. As such, in the absence of any mitigation, there is no potential for any significant effect on supporting habitats as a result of water pollution or change to the hydrological regime within the SPA.

European Sites and distance from Clooneeny Bog	Qualifying Interests/Special Conservation Interests for which the European Site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 05/01/2022)	Conservation Objectives	Likely Zone of Impact Determination
			The potential for disturbance to Greenland white-fronted goose, where they occur outside the SPA, was also assessed. No Greenland white-fronted geese have been reported from the SPA since 1991 (as per Site Synopsis) and while suitable habitat exists in the vicinity of Clooneeny Bog, BnM have not recorded any specimens on site during any of their surveys. In addition, the works will not result in any loss of habitat, are short term and will not be occurring over the entire bog at any one time, leaving much of the bog completely undisturbed. Hence, there is no potential for the works, in the absence of any mitigation, to result in significant disturbance to this SCI species. **There is no potential for significant effects on this SAC and no further assessment is required.**
Lough Ree SPA [004064] **Distance:** 8.3km	› [A004] Little grebe (*Tachybaptus ruficollis*) › [A038] Whooper swan (*Cygnus cygnus*) › [A050] Wigeon (*Anas penelope*) › [A052] Teal (*Anas crecca*) › [A054] Mallard (*Anas penelope*) › [A056] Shoveler (*Anas clypeata*) › [A061] Tufted duck (*Aythya fuligula*)	This site has the generic conservation objective: *'To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA'*	There will be no direct effects on this SPA as the project footprint is located entirely outside the designated site. Following the precautionary principle, a potential pathway for effect on all SCI species and their habitats was identified through surface water connectivity via the Fallan River and Cloonkeen Stream into which the bog drains and which ultimately flow into Lough Ree. However, the objective of the works involved in the D

European Sites and distance from Clooneeny Bog	Qualifying Interests/Special Conservation Interests for which the European Site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 05/01/2022)	Conservation Objectives	Likely Zone of Impact Determination
	› [A065] Common scoter (*Melanitta nigra*) › [A067] Goldeneye (*Bucephala clangula*) › [A125] Coot (*Fulica atra*) › [A140] Golden plover (*Pluvialis apricaria*) › [A142] Lapwing (*Vanellus vanellus*) › [A193] Common tern (*Sterna hirundo*) › [A999] Wetland and waterbirds	To acknowledge the importance of Ireland's wetlands to wintering waterbirds, this site has a second conservation objective: *'To maintain or restore the favourable conservation condition of the wetland habitat at Lough Corrib SPA as a resource for the regularly-occurring migratory waterbirds that utilise it.'* (NPWS (2020) Conservation objectives for Lough Ree SPA [004064] Generic Version 7.0. Department of Culture, Heritage and the Gaeltacht.)	& R is to stabilise the bog. These works are specifically designed to reverse the drainage of the bog and to minimise the run-off of waters from it. The works will be similar in intensity to the active production that was undertaken until recently, but will be less invasive, short term and will involve an estimated six machines/crews working at any one time on the bog for an expected period of 2-3 years. There is no potential for these works to result in significant effects on downstream watercourses and ecological receptors as the works primarily involve the blocking of drainage pathways from the bog. Following the implementation of the PCAS, there will be no possibility of further effects. As such, in the absence of any mitigation, there is no potential for any significant effect on supporting habitats as a result of water pollution or change to the hydrological regime within the SPA. The potential for disturbance to the SCI species, where they occur outside the SPA was also assessed. There is no habitat on or adjacent to the site for the following SCI species: › [A065] Common scoter (*Melanitta nigra*) › [A067] Goldeneye (*Bucephala clangula*) › [A193] Common tern (*Sterna hirundo*)

European Sites and distance from Clooneeny Bog	Qualifying Interests/Special Conservation Interests for which the European Site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 05/01/2022)	Conservation Objectives	Likely Zone of Impact Determination
			Clooneeny Bog is outside the core foraging range of Whooper swan (SNH, 2016) so it is unlikely that it will be used by birds associated with this SPA. The following SCI species has been recorded at Clooneeny bog during a BnM survey in 2012: › [A140] Golden plover (*Pluvialis apricaria*) In the absence of any significant wetlands on site, there is only limited habitat available for any other SCI species and many of the wintering or passage wildfowl species are likely to occur in the site only, when there is deep enough water on areas of the bog. This may be limited dependant on pumping regimes, rainfall, flood levels in adjacent watercourse or floodplains. In addition, the works will not result in any loss of habitat, are short term and will not be occurring over the entire bog at any one time, leaving much of the bog completely undisturbed. Hence, there is no potential for the works, in the absence of any mitigation, to result in significant disturbance to these SCI species. **There is no potential for significant effects on this SAC and no further assessment is required.**

3.2 European Sites with the potential to be significantly affected by the PCAS activities

No European Site has the potential to be significantly impacted by the proposed works.

3.3 Likely cumulative impact of the PCAS activities on European Sites, in-combination with other plans and projects

3.3.1 Review of other plans and projects

The potential for the rehabilitation works to contribute to a cumulative impact on European Sites was considered. The following plans and projects were considered for their potential to result in in-combination effects:

- The Planning Application Finders of Longford and Roscommon County Council were consulted on the 05.01.2022 and a number of mostly small-scale proposed or consented developments were found within 5km of Clooneeny Bog. Larger projects that were considered include an application for the development of a ten year permission for a solar farm on a site of approximately 34.54 hectares consisting of the following; 184,500 m^2 of solar photo-voltaic panels on ground mounted steel frames; Ring main unit substation and associated hard standing; 12 no. inverter/transformer stations on 6 no. hardstandings; underground power and communication cables and ducts; boundary security fence; CCTV cameras; upgraded internal access tracks; new internal access tracks, internal bridge crossing and associated drainage infrastructure; and temporary construction compounds and all associated site services and works. The proposed development seeks to form an extension to the adjoining previously permitted "Middleton House" Solar Farm which was permitted under Longford County Council Reg. Ref 18135. Access to the proposed development is provided via the permitted "Middleton House" Solar Farm via the L-11261 local road.
- The proposal for the Mid Shannon Wilderness Park Greenway was also considered. The proposed 73km cycling & walking 'greenway' route network primarily follows the Bord na Móna industrial railway network routes through former industrial bogland south and west of Longford town, linking with the Royal Canal 4km North-West of Ballymahon. It consists of 61 km of greenway along decommissioned Bord na Móna rail lines; 6 km of greenway along existing roads; 6 km of greenway through existing cutaway bog and ancillary facilities. The AASR carried out for this proposal found that there was no potential for significant effects on European Sites.
- Bord na Móna provided a GIS shapefile of bogs where decommissioning and rehabilitation activities are scheduled to occur within the same timeframe as in Clooneeny Bog. Three bogs within the Mount Dillon bog group, that share downstream connectivity to European Sites, were identified, namely Knappoge, Begnagh and Glenlough.
- Parts of Clooneeny Bog (within and outside the areas owned and under the control of Bord na Móna) are currently being used by domestic turf cutters to harvest peat. These areas are ecologically and hydrologically linked to the area owned by Bord na Móna where rehabilitation is planned. In addition, unauthorised turbary is likely to occur at various locations within 15km of Clooneeny Bog, including several locations where the pathways for downstream in combination effects on European Sites may exist, primarily via drainage to EPA blue line watercourses.
- There is a current ongoing NPWS Raised Bog Restoration Project, however, there are no raised bogs within 15 km of Clooneeny Bog, where restoration might overlap with the D & R activities in 2022.
- The County Longford Heritage Plan 2019-2024, Longford County Development Plan 2021-2027, Roscommon County Development Plan 2021-2027 (Draft) and County Roscommon Heritage Plan 2017-2021 were also consulted and considered as part of this assessment. CPO

3.9 of the Longford County Development Plan 2021-2027 explicitly states 'Support collaboration between local authorities, the Midland Regional Transition Team and relevant stakeholders and the development of partnership approaches to integrated peatland management for a just transition that incorporates any relevant policies and strategies such as the Bord na Móna Biodiversity Plan 2016-2021 and the national Climate Mitigation and Adaptation Plans. This shall include support for the rehabilitation and/or re-wetting of suitable peatland habitats.'

3.3.2 Conclusion of in-combination/cumulative assessment

Due to the nature, scale and short-term duration of the PCAS activities, no pathway or mechanism for the proposed works to result in any significant effect on any European Site was identified when considered on its own during the assessment process and therefore there is no potential for it to contribute to any such effects when considered in-combination with any other development or works.

The review of plans and projects that is described above did not reveal any additional potential pathways for effect on European Sites that may have arisen as a result of those plans or projects.

4. ARTICLE 6(3) APPROPRIATE ASSESSMENT SCREENING STATEMENT AND CONCLUSIONS

The findings of this Screening Assessment are presented following the European Commission's Assessment of Plans and Projects Significantly affecting Natura 2000 Sites: Methodological Guidance on the provisions of Article 6(3) and 6(4) of the Habitats Directive 92/43/EEC (EC, 2001) and Managing Natura 2000 Sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC (EC, 2018) as well as the Department of the Environment's Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities (DoEHLG, 2010).

4.1 Data collected to carry out assessment

In preparation of the assessment, the following sources were used to gather information:

- Review of NPWS Site Synopses, mapping and Conservation Objectives for the various European Sites within the Likely Zone of Impact.
- Review of 2019 EU Habitats Directive (Article 17) Report.
- Review of OS maps and aerial photographs of the site of the proposed development.
- Review of online web-mappers: National Parks and Wildlife Service (NPWS), Environmental Protection Agency (EPA), Water Framework Directive (WFD).
- Review of relevant databases including National Biodiversity Ireland Database (NBDC).
- Review of other plans and projects within the area.
- Review of location and layout mapping for proposed rehabilitation.
- Review of the results of previous ecological surveys of Clooneeny Bog.
- Review of the detailed description of proposed rehabilitation measures, including methodologies specific to the main categories of land types under consideration.
- Review of Clooneeny Bog Drainage Management Plan from RPS
- Review of BnM's Peatland Climate Action Scheme Environmental Management Plan.
- Liaison with Chris Cullen and Sorcha Cahill from Bord na Móna.
- Site visit conducted by Inga Reich on 14/01/2022.

4.2 Concluding statement

It is concluded beyond reasonable scientific doubt, in view of best scientific knowledge, on the basis of objective information and in light of the conservation objectives of the relevant European Sites, that the proposed works, individually or in combination with other plans and projects, will not have a significant effect on any European Site.

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APPENDIX 1

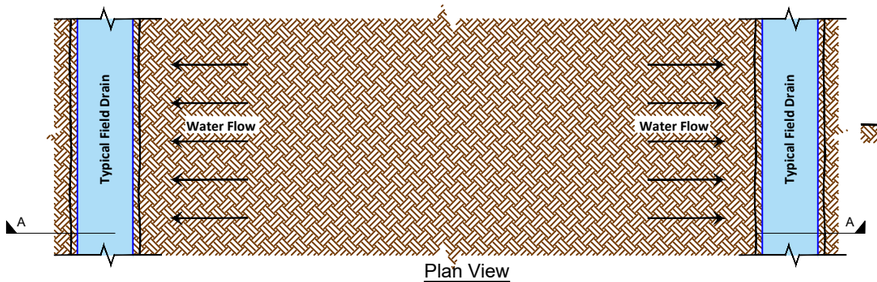
CLOONEENY BOG - CUTAWAY BOG DECOMMISSIONING AND REHABILITATION PLAN 2022

APPENDIX 2

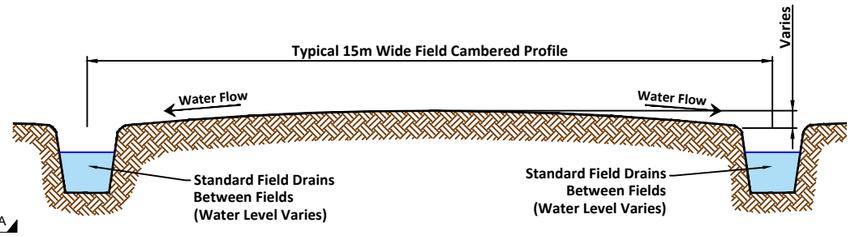
REHABILITATION METHODS

Existing Layout:

Typical existing bare peat fields are cambered (higher) in the centre and lower towards the drains, helping drainage of the fields but limiting the re-wetting of the central area. The concept of field re-profiling is to level the surface of the individual peat production fields to retain surface water at the required depth.



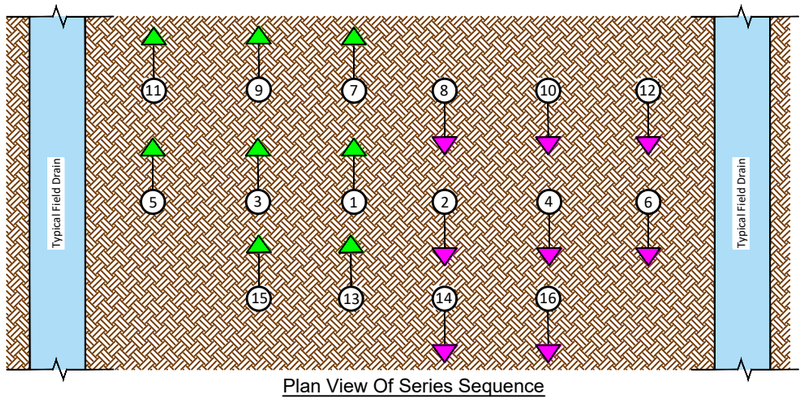
Plan View
(N.T.S.)



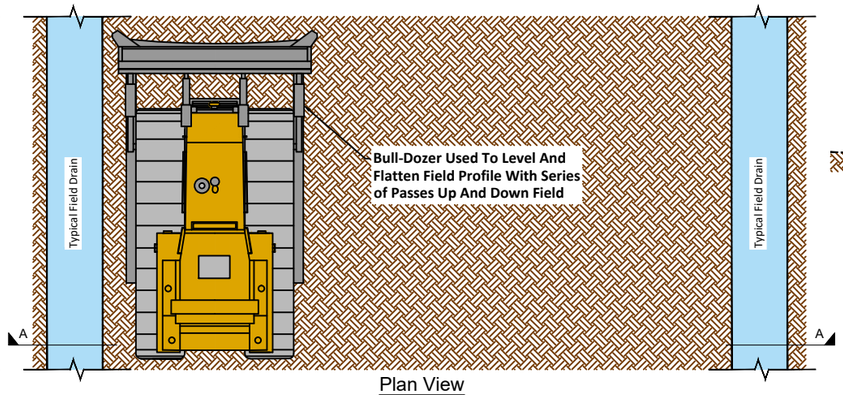
Section A-A
(N.T.S.)

Phase 1
Re-Profiling of Field Surface

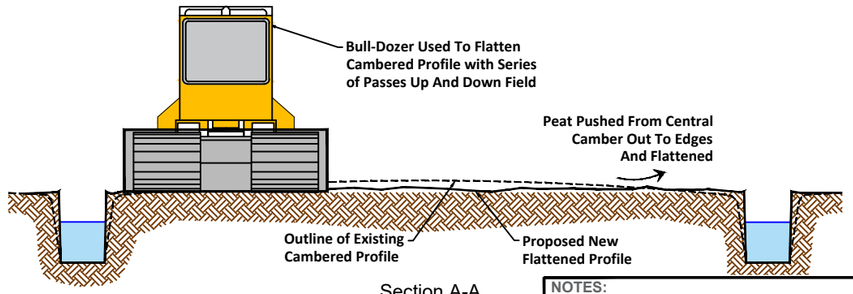
Field to be re-profiled using bull-dozer making a total of 16 passes, 8 passes up and 8 passes down, flattening the camber on the production field. (Sequence of runs shown below)



Plan View Of Series Sequence
(N.T.S.)



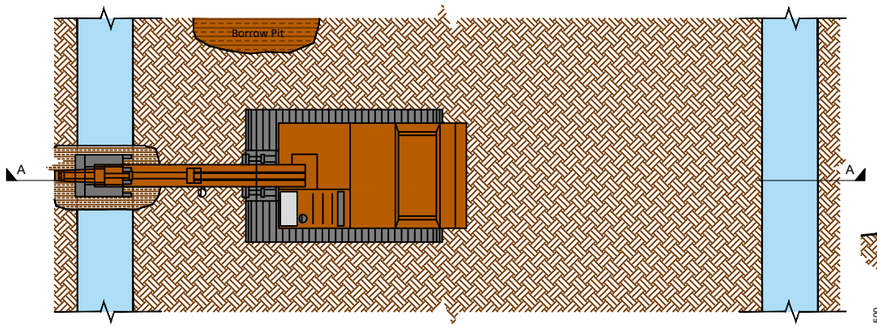
Plan View
(N.T.S.)



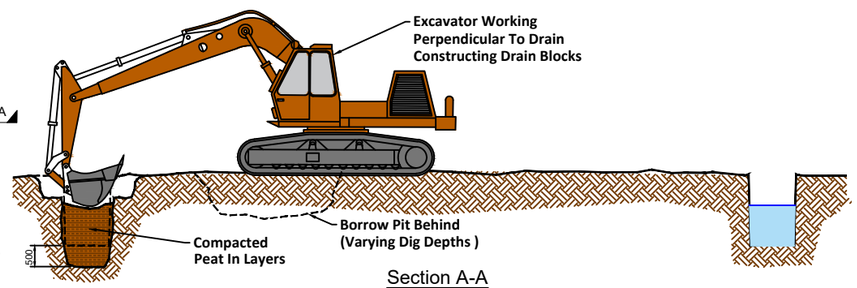
Section A-A
(N.T.S.)

Phase 2
Peat Drain Blocking

Drain blocks are constructed using an Excavator operating at a perpendicular direction to the field drains.
Key is cut in the drain approximately 500mm deep, and ensuring that it is wider than the actual drain. 500mm of peat is removed from bottom of drain also and placed behind the machine for replacement later.
Area behind the machine is to be used as a borrow pit. Remove turf and degraded peat. Place this material close by to be used as cover later. 'Clay' like peat is extracted from pit and compacted in 300mm layers using the excavator bucket.
The peat is firmly compacted using the machine bucket before laying more peat from the borrow pit.
The drain block is built up at least 300-500mm above the ground level of the bog to allow for subsequent shrinkage of the peat as it dries.
The borrow pit is back filled with the peat extracted from the bottom of drain. The sides of the borrow pit are to be pressed down and graded with the excavator bucket.
(NOTE: If any vegetation present, it should be carefully removed at the start and left aside for replacement at the end of the process, to help bind and stabilise the top of the drain block.)



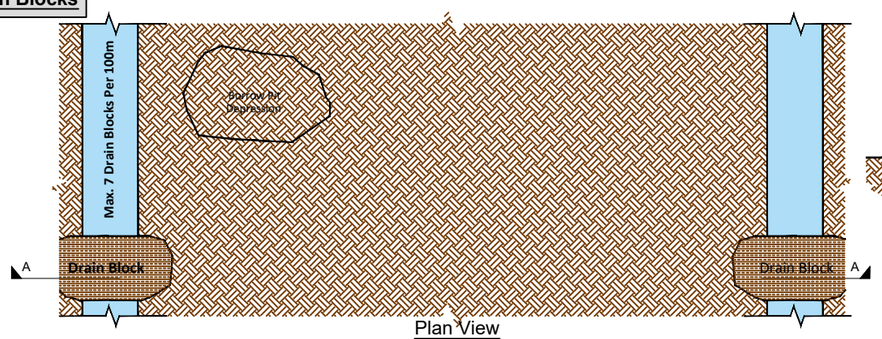
Plan View
(N.T.S.)



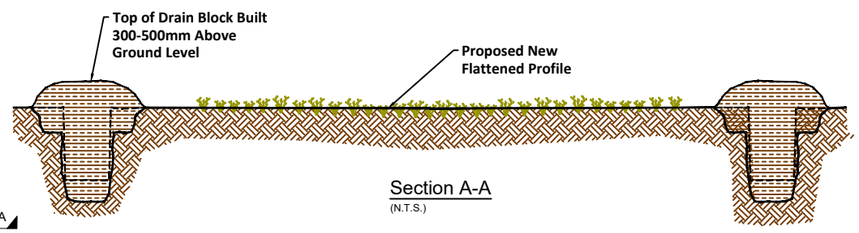
Section A-A
(N.T.S.)

Complete Shallow Field Profile with Regular Drain Blocks

Field re-profiling is developed as a technique to slow the surface water loss from the bog and to retain as much water as possible on the bog, at the required depth.



Plan View
(N.T.S.)



Section A-A
(N.T.S.)

NOTES:

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
2. REFER TO RELEVANT SITE PLAN TO ENSURE SPECIFIC DRAIN BLOCKS HAVE BEEN INSTALLED DOWNSTREAM PRIOR TO COMMENCING ANY RE-PROFILING WORKS, TO RETAIN ANY SILT THAT MAY ENTER THE DRAINS.
3. REFER TO RELEVANT SITE PLAN FOR No. OF DRAIN BLOCKS SPECIFIED PER 100M DRAIN LENGTH.
4. REFER TO RELEVANT SITE PLAN FOR SPECIFIC FINISHED GROUND LEVELS TO BE ACHIEVED.
5. ALL DETAILS TO BE AGREED WITH BORD NA MONA OPERATIONS PRIOR TO CONSTRUCTION.
6. OPERATORS TO CONFORM WITH ALL STANDARD OPERATING PROCEDURES.
7. ALL WORKS TO BE CARRIED OUT IN ACCORDANCE WITH THE SPECIFICATION FOR THE PARTICULAR BOG AND WITH THE REQUIREMENTS OF THE REHABILITATION PLAN, ANY NATURA IMPACT STATEMENT RECOMMENDED MEASURES IF APPLICABLE, ARCHAEOLOGY REPORTS AND ANY OTHER SPECIFIC ECOLOGICAL MEASURES OR ENVIRONMENTAL REPORTS FOR THIS BOG.

STATUS

Rev	Description	Issued By	Date
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.		.	.
.		.	.
b	Issued For Approval	P.K.	25/02/21
a	Issued For Information	P.K.	29/01/21

BORD NA MÓNA
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Bord Na Móna Engineering Department
LEABEG, TULLAMORE CO. OFFALY
Tel. 057 9345900
Fax. 057 9345160

PROJECT:
Peatland Climate Action Scheme
PCAS

TITLE:
Rehabilitation Method DPT 3A
Field Re-profiling

Drawn By:		Checked By:		Approved:
CAD	Designer	Discip. Lead	Design Lead	Design Manager
P.K.	-	D.K.	P.N.	P.N.

Date: 18/12/20 | Scale: Not to Scale A3 | Stage: For Approval

Drawing No.: PCAS-0100-003 | Rev: b

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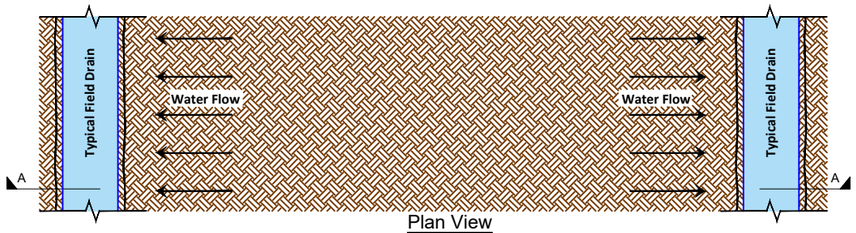
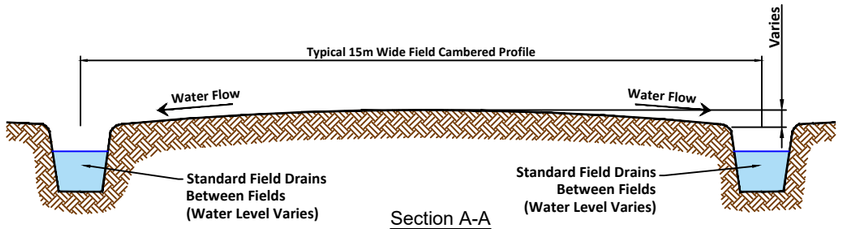
Existing Typical Field Layout:

Typical existing bare peat fields are cambered (higher) in the centre and lower towards the drains, helping drainage of the fields but limiting the re-wetting of the central area.
The concept of field re-profiling is to level the surface of the individual peat production fields to retain surface water at the required depth.



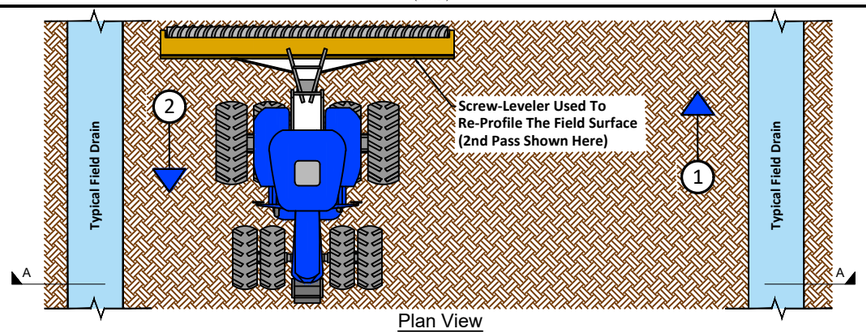
Plan View
(N.T.S.)



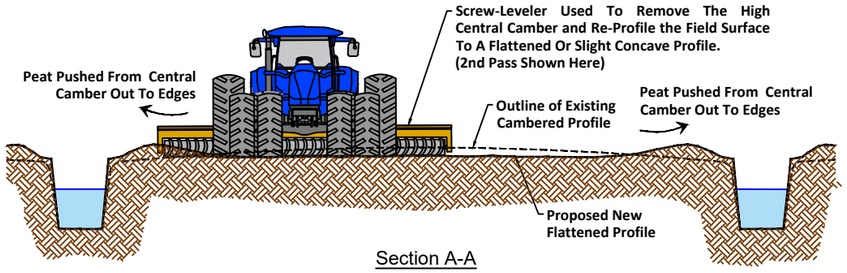
Section A-A
(N.T.S.)

Phase 1
Re-Profiling of Field Surface

The production field is re-profiled using a screw-leveler to remove the high central camber from individual production fields and deposit the peat on the lower-lying edges of the same production field.
The Screw-Leveler is towed using a tractor, with a level axis, will run up one side ① of the production field and down the other side ②, sufficiently offset from drain to ensure the peat does not enter the drain but forms a mound beside the drain.



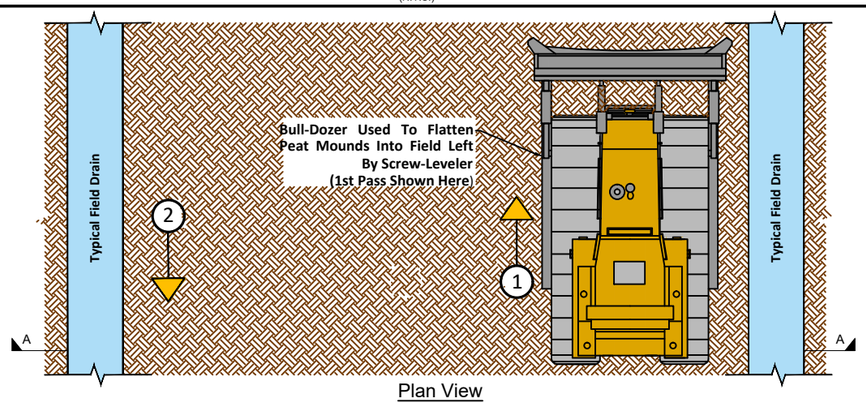
Plan View
(N.T.S.)



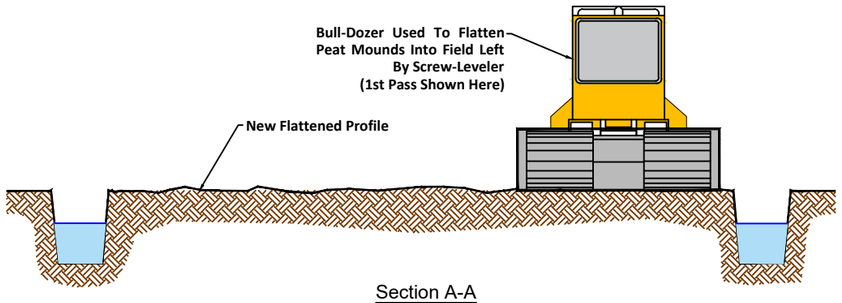
Section A-A
(N.T.S.)

Phase 2
Leveling of Loose Peat

Next the Bull-dozer will run up one edge side ① of the production field and down the other side ② flattening the loose peat mounds, ensuring a minimal amount of peat enters the drains.



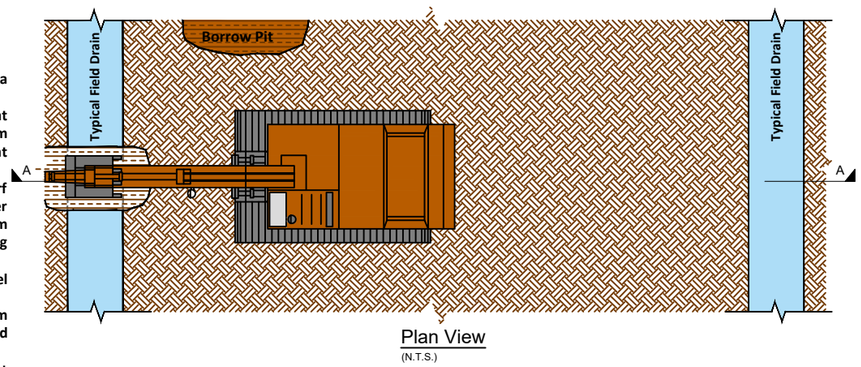
Plan View
(N.T.S.)



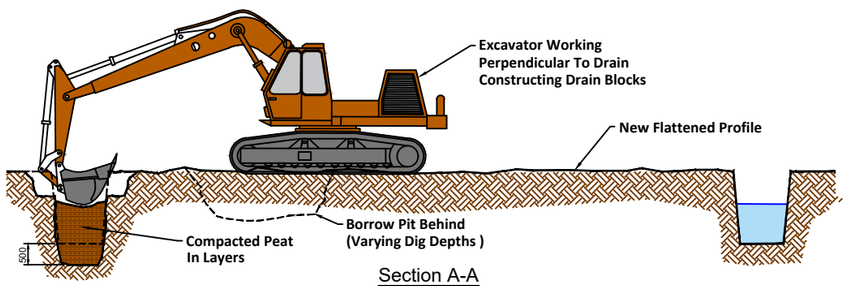
Section A-A
(N.T.S.)

Phase 3
Peat Drain Blocking

Drain blocks are constructed using an Excavator operating at a perpendicular direction to the field drains.
Key is cut in the drain approximately 500mm deep, and ensuring that it is wider than the actual drain. 500mm of peat is removed from bottom of drain also and placed behind the machine for replacement later.
Area behind the machine is to be used as a borrow pit. Remove turf and degraded peat. Place this material close by to be used as cover later. 'Clay' like peat is extracted from pit and compacted in 300mm layers using the excavator bucket. The peat is firmly compacted using the machine bucket before laying more peat from the borrow pit.
The drain block is built up at least 300-500mm above the ground level of the bog to allow for subsequent shrinkage of the peat as it dries.
The borrow pit is back filled with the peat extracted from the bottom of drain. The sides of the borrow pit are to be pressed down and graded with the excavator bucket.
(NOTE: If any vegetation present, it should be carefully removed at the start and left aside for replacement at the end of the process, to help bind and stabilise the top of the drain block.)



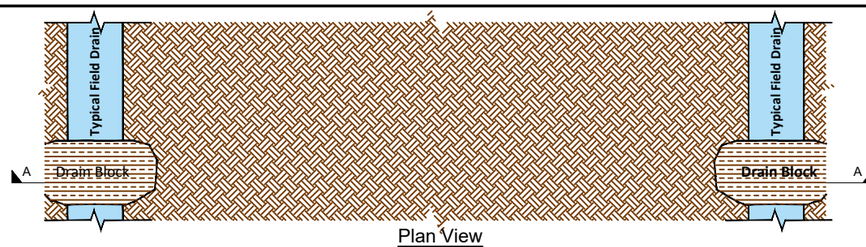
Plan View
(N.T.S.)



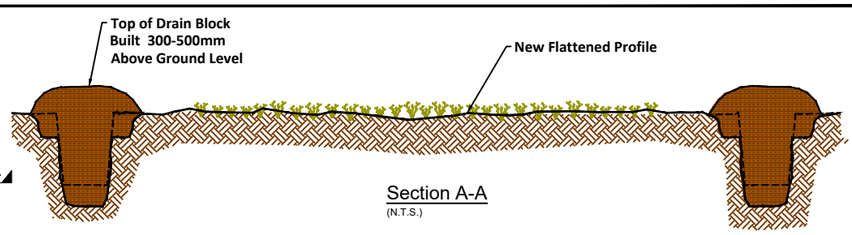
Section A-A
(N.T.S.)

Complete Flattened Field Profile

Field re-profiling is developed as a technique to slow the surface water loss from the bog and to retain as much water as possible on the site. Each re-profiled field will hold a shallow layer of water. In time, these shallows have been shown to quickly infill with peatland vegetation.



Plan View
(N.T.S.)



Section A-A
(N.T.S.)

NOTES:

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
2. REFER TO RELEVANT SITE PLAN TO ENSURE SPECIFIC DRAIN BLOCKS HAVE BEEN INSTALLED DOWNSTREAM PRIOR TO COMMENCING ANY RE-PROFILING WORKS, TO RETAIN ANY SILT THAT MAY ENTER THE DRAINS.
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STATUS

Rev	Description	Issued By	Date
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b	For Approval	P.K.	03/03/21
a	Issued For Information	P.K.	07/01/21

BORD NA MÓNA
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Bord Na Móna Engineering Department
LEABEG, TULLAMORE CO. OFFALY
Tel. 057 9345900
Fax. 057 9345160

PROJECT:
Peatland Climate Action Scheme
PCAS

TITLE:
Rehabilitation Method DPT 3B
Field Re-profiling

Drawn By:		Checked By:		Approved:
CAD	Designer	Discip. Lead	Design Lead	Design Manager
P.K.	-	D.K.	P.N.	P.N.

Date: 18/12/20 | Scale : Not to Scale A3 | Stage: For Approval

Drawing No.: PCAS-0100-004 | Rev: b

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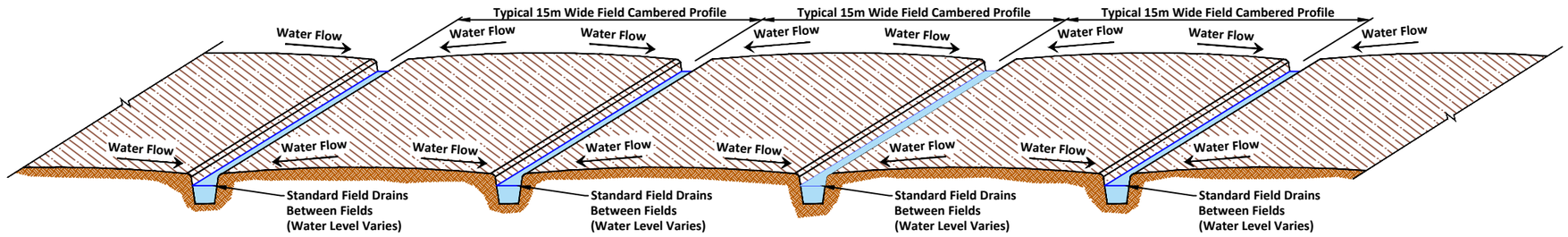
Existing Layout:

Typical existing bare peat fields are cambered (higher) in the centre and lower towards the drains, helping drainage of the fields but limiting the re-wetting of the central area.



NOTES:

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
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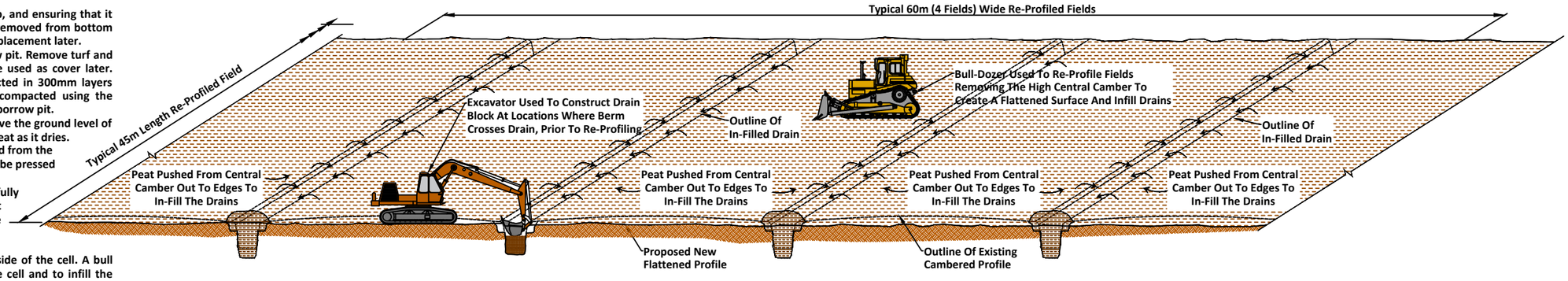
Phase 1
Drain Blocking And Re-Profiling of Fields Surface

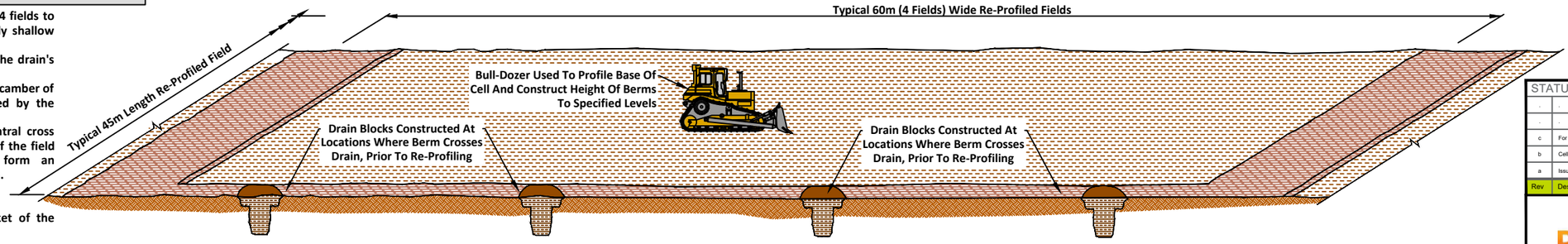
Drain blocks are constructed using an Excavator operating at a perpendicular direction to the field drains.
Key is cut in the drain approximately 500mm deep, and ensuring that it is wider than the actual drain. 500mm of peat is removed from bottom of drain also and placed behind the machine for replacement later.
Area behind the machine is to be used as a borrow pit. Remove turf and degraded peat. Place this material close by to be used as cover later. 'Clay' like peat is extracted from pit and compacted in 300mm layers using the excavator bucket. The peat is firmly compacted using the machine bucket before laying more peat from the borrow pit.
The drain block is built up at least 300-500mm above the ground level of the bog to allow for subsequent shrinkage of the peat as it dries.
The borrow pit is back filled with the peat extracted from the bottom of drain. The sides of the borrow pit are to be pressed down and graded with the excavator bucket.
(NOTE: If any vegetation present, it should be carefully removed at the start and left aside for replacement at the end of the process, to help bind and stabilise the top of the drain block.)

The centre of the cambered field is used as one side of the cell. A bull dozer is used to level and flatten the base of the cell and to infill the drains by removing the camber from the fields. Laser levels are mounted on bull-dozers to allow the machine drivers to move peat and create flat surfaces to the appropriate levels.



Phase 2
Formation of Surface Berms And Levelling Base of Cells

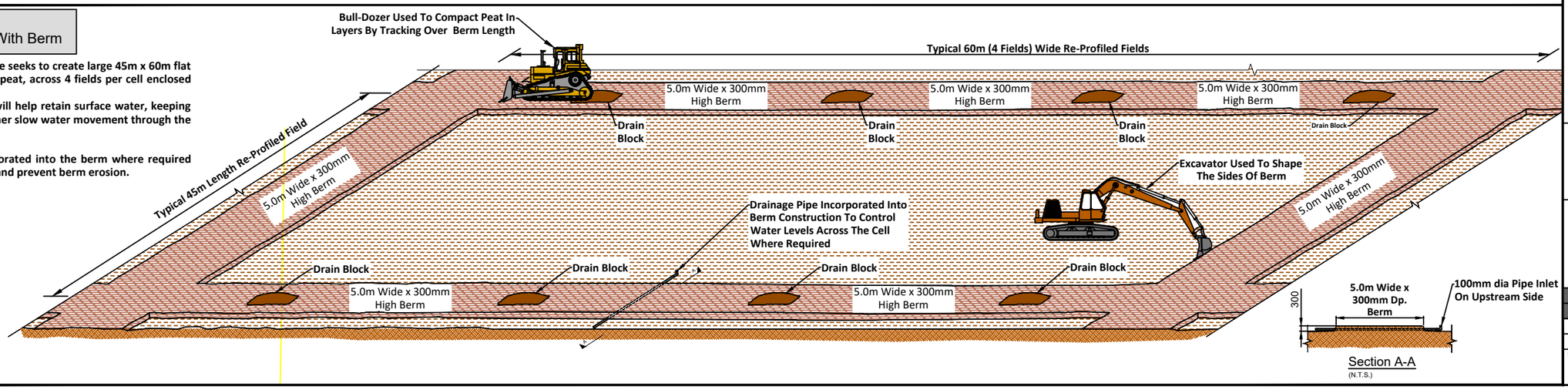
Berms are formed 45m in length and 60m across 4 fields to create an enclosed cell. The berms are relatively shallow (300mm high) and are 5.0 m wide.
An Excavator is used to form a key(5m long) in the drain's edges where the berm crosses.
A strip of peat(5m wide) is taken from the central camber of the field, pushed into the drain and compacted by the bull-dozer tracking over the drain block.
Next the bull-dozer is used to complete the central cross section of Berm by taking peat from the centre of the field and pushing it in line with the field to form an approximately 5m Wide x 300mm High Cross Berm.
The peat material in the berm is compacted in layers by the dozer tracking over it.
Berm edge profile is shaped by using the bucket of the excavator.



Final Profile:
45m x 60m Cell With Berm

This enhanced measure seeks to create large 45m x 60m flat areas or cells on bare peat, across 4 fields per cell enclosed by shallow berms.
The creation of cells will help retain surface water, keeping peat wet and will further slow water movement through the bog.

Drainage pipes incorporated into the berm where required to manage overflows and prevent berm erosion.



STATUS			
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c	For Approval	P.K.	24/02/21
b	Cell Size Text Amended	P.K.	28/01/21
a	Issued For Information	P.K.	07/01/21
Rev	Description	Issued By	Date

BORD NA MÓNA
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Bord Na Móna Engineering Department
LEABEG, TULLAMORE CO. OFFALY
Tel. 057 9345900
Fax. 057 9345160

PROJECT:
Peatland Climate Action Scheme (PCAS)

TITLE:
Rehabilitation Method DPT 4
45m x 60m Cell With Berms

Drawn By:		Checked By:		Approved:
CAD	Designer	Discip. Lead	Design Lead	Design Manager
P.K.	-	D.K.	P.N.	P.N.
Date: 22/12/20		Scale : Not to Scale	A3	Stage: For Approval
Drawing No.: PCAS-0100-006				Rev: c

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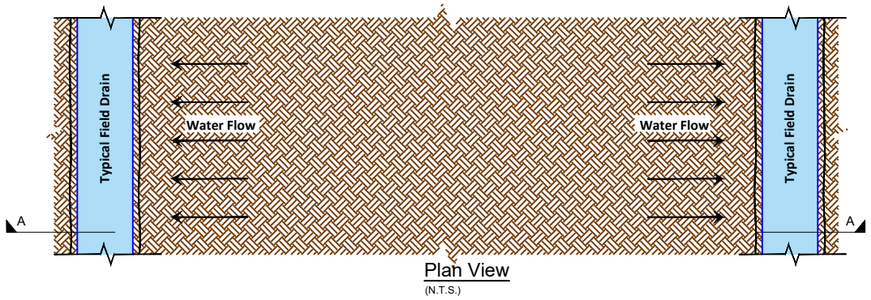
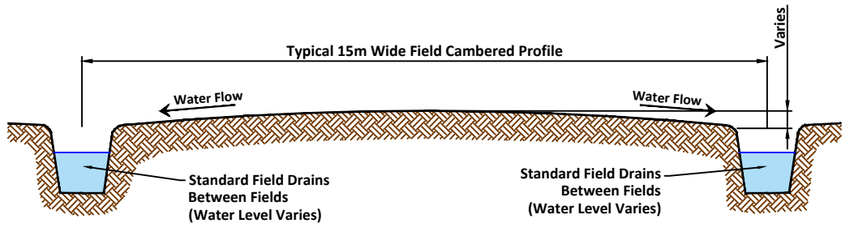
Existing Layout:

Typical existing bare peat fields are cambered (higher) in the centre and lower towards the drains, helping drainage of the fields but limiting the re-wetting of the central area.
The concept of drain blocking is to raise the water levels in the drains to re-wet the cutaway and slow the water movement through the bog.



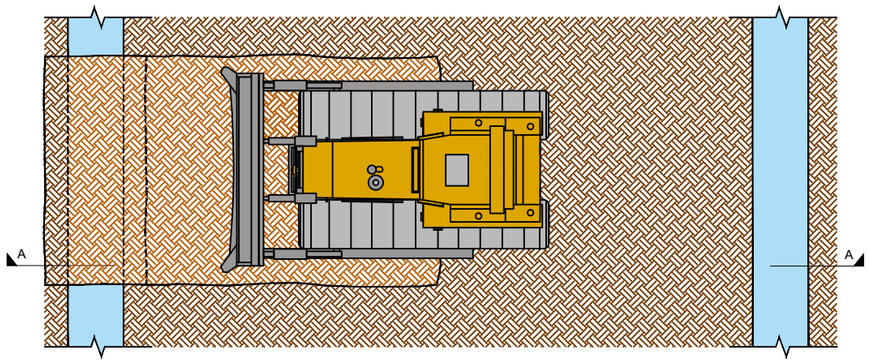
Plan View
(N.T.S.)



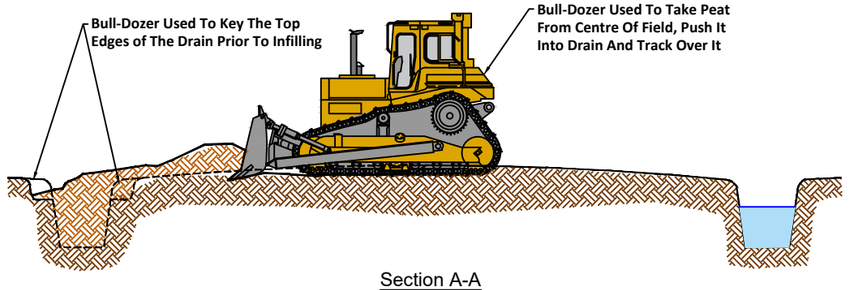
Section A-A
(N.T.S.)

Phase 1
Forming 'Speed Bump'

The Bull-dozer is used to create a 5m Length key along both edges of the drain, approximately 500mm Wide x 500mm Deep.
Next a strip of peat is taken from the central camber of the field, pushed into the drain and compacted by the bull-dozer tracking over the drain block, to form an approximately 5m Wide 'Speed Bump'.



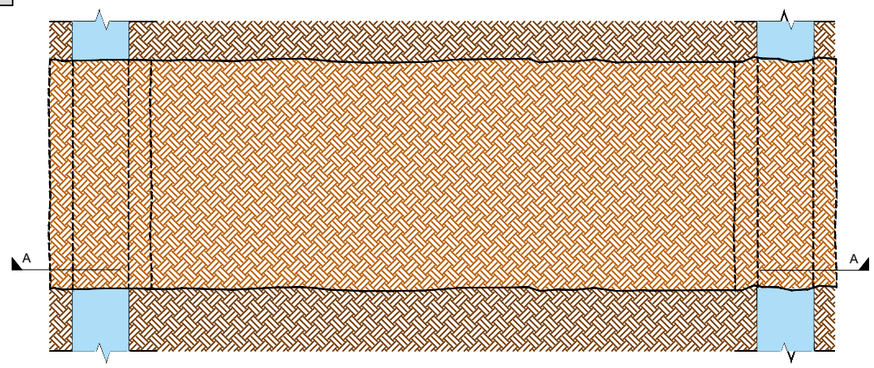
Plan View
(N.T.S.)



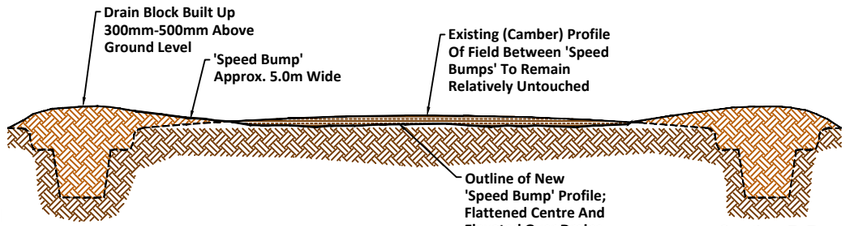
Section A-A
(N.T.S.)

Complete Fields With Speed Bump (3 Per 100m)

Drain Blocks are built up at least 300mm-500mm above the existing ground level to allow for peat subsidence and to prevent water from flowing over the drain block and eroding it before it becomes stabilised.



Plan View
(N.T.S.)



Section A-A
(N.T.S.)

Section B-B
(N.T.S.)

NOTES:

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
2. REFER TO RELEVANT SITE PLAN TO ENSURE SPECIFIC DRAIN BLOCKS HAVE BEEN INSTALLED DOWNSTREAM PRIOR TO COMMENCING ANY RE-PROFILING WORKS, TO RETAIN ANY SILT THAT MAY ENTER THE DRAINS.
3. REFER TO RELEVANT SITE PLAN FOR No. OF DRAIN BLOCKS SPECIFIED PER 100M DRAIN LENGTH.
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STATUS

Rev	Description	Issued By	Date
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.		.	.
c	For Approval	P.K.	03/03/21
b	'Key' Added To Top Edges Of Drain at Drain Block Locations	P.K.	09/02/21
a	Issued For Information	P.K.	29/01/21

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PROJECT:
Peatland Climate Action Scheme
PCAS

TITLE:
Rehabilitation Method DCT 2
'Speed Bump' Peat Drain Block

Drawn By:		Checked By:		Approved:
CAD	Designer	Discip. Lead	Design Lead	Design Manager
P.K.	-	D.K.	P.N.	P.N.

Date: 13/01/21 | Scale : Not to Scale A3 | Stage: For Approval

Drawing No.: PCAS-0100-008 | Rev: c

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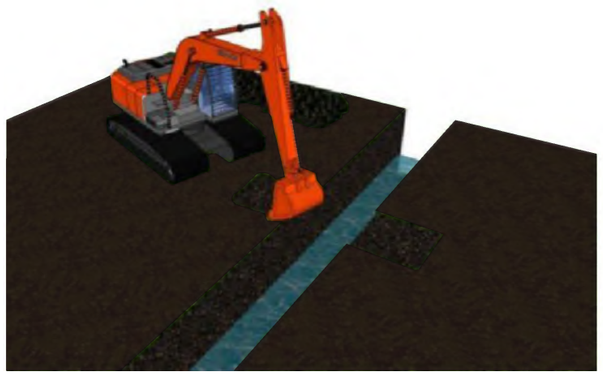
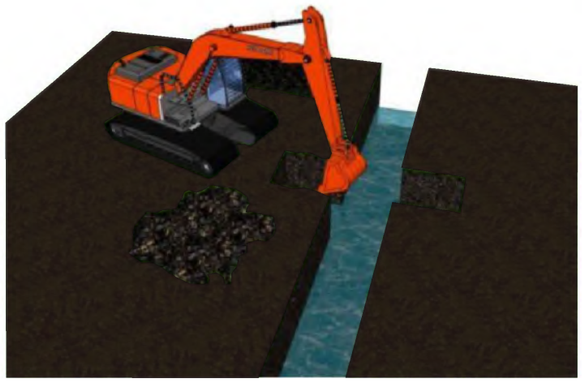
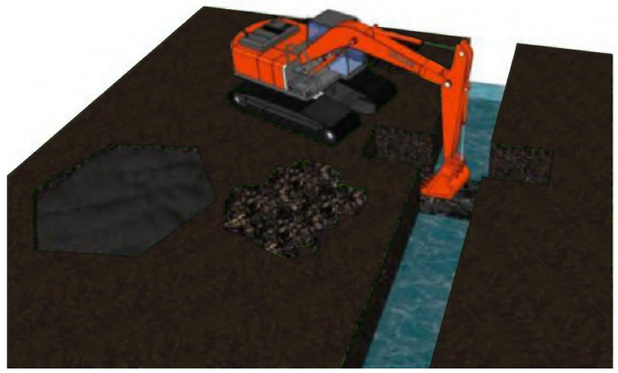
1. Before building of drain blocks, the sides and bottom of the ditch is cleaned using the excavator to remove dry degraded peat, to ensure a good peat-to-peat contact.
(If any vegetation present, it should be carefully removed and left aside for replacement at the end of the process.)

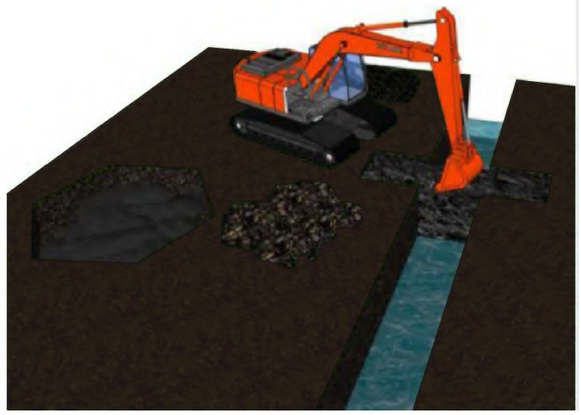




2. Cut key in either side of the drain approximately 500mm deep, and ensure that it is wider than the actual drain.
Remove 500mm of peat from bottom of the drain also and place behind the machine for replacement later.

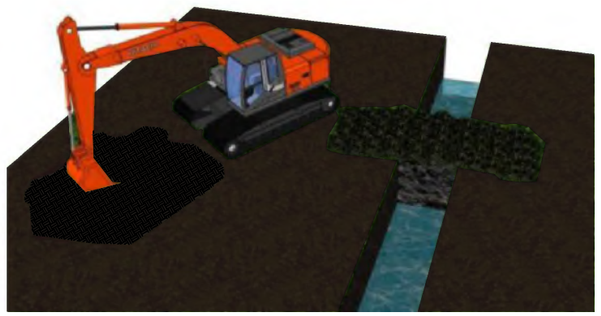
3. Open an area behind machine to be used as a borrow pit. Avoid using the surface layer of peat (top 100-200mm) which is likely to be very permeable. Only use the deeper, more compacted peat to build the drain block.
(If any vegetation present, it should be carefully removed and left aside for replacement at the end of the process.)





4. Dig out peat from the borrow pit and place into the drain compacting in 300mm layers. Compact the peat firmly using the excavator bucket before laying more peat from the borrow pit.

5. Build the drain block up at least 300mm-500mm above the ground level of the bog to allow for subsequent shrinkage of the peat as it dries.
(Take any vegetation removed in step 1 and step 3 and place on the top of the drain block, to help bind and stabilise the drain block.)



6. Backfill the borrow pit with the peat extracted from the bottom of the drain in step 2. Press down on the sides of the peat borrow hole with the excavator bucket to grade the sides of the borrow pit.

This enhanced measure's main objective is to block drains with peat drain blocks to raise water levels, re-wetting peat and slowing water movements through the bog.

NOTES:

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3. REFER TO RELEVANT SITE PLAN FOR No. OF DRAIN BLOCKS SPECIFIED PER 100M DRAIN LENGTH.
4. REFER TO RELEVANT SITE PLAN FOR SPECIFIC FINISHED GROUND LEVELS TO BE ACHIEVED.
5. ALL DETAILS TO BE AGREED WITH BORD NA MONA OPERATIONS PRIOR TO CONSTRUCTION.
6. OPERATORS TO CONFORM WITH ALL STANDARD OPERATING PROCEDURES.
7. ALL WORKS TO BE CARRIED OUT IN ACCORDANCE WITH THE SPECIFICATION FOR THE PARTICULAR BOG AND WITH THE REQUIREMENTS OF THE REHABILITATION PLAN, ANY NATURA IMPACT STATEMENT RECOMMENDED MEASURES IF APPLICABLE, ARCHAEOLOGY REPORTS AND ANY OTHER SPECIFIC ECOLOGICAL MEASURES OR ENVIRONMENTAL REPORTS FOR THIS BOG.

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STATUS

Rev	Description	Issued By	Date
b	For Approval	P.K.	25/02/21
a	Issued for Information	P.K.	29/01/21

PROJECT:
Peatland Climate Action Scheme
PCAS

TITLE:
Rehabilitation Method DCT 3
Peat Drain Blocking

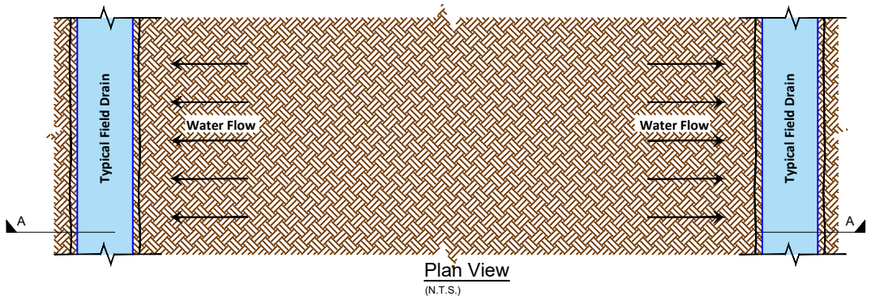
Drawn By:		Checked By:		Approved:
CAD	Designer	Discip. Lead	Design Lead	Design Manager
P.K.		D.K.	P.N.	P.N.

Date: 13/01/21 Scale : N.T.S. A3 Stage: For Approval

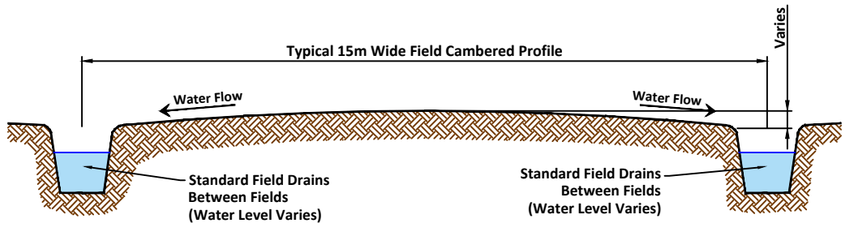
Drawing No.: PCAS-0100-009 Rev: b

Existing Layout:

Typical existing bare peat fields are cambered (higher) in the centre and lower towards the drains, helping drainage of the fields but limiting the re-wetting of the central area.
The concept of Cross berms is to slow the water movement through the bog.



Plan View
(N.T.S.)



Section A-A
(N.T.S.)

NOTES:

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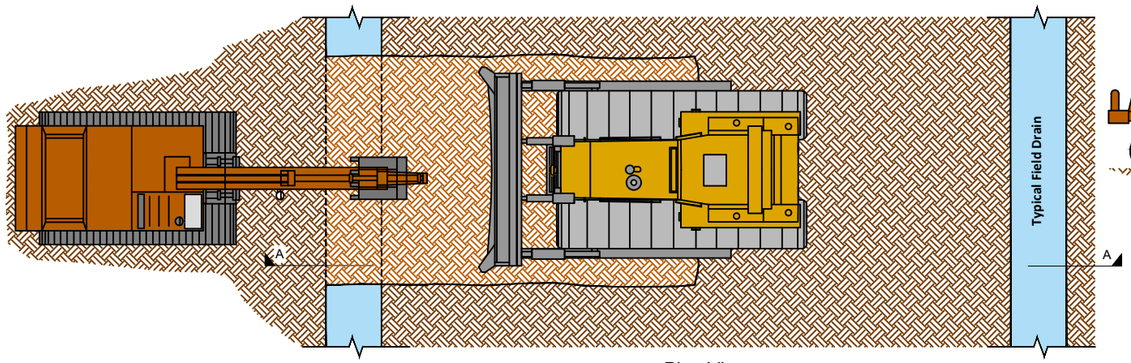
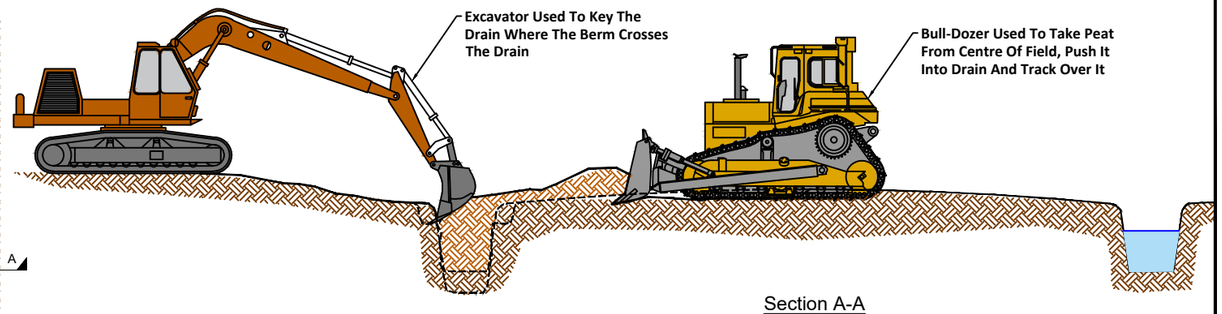
Phase 1
Forming Peat Berm

An Excavator is used to form a key in the drain where the berm crosses.
A strip of peat is taken from the central camber of the field, pushed into the drain and compacted by the bull-dozer tracking over the drain block.



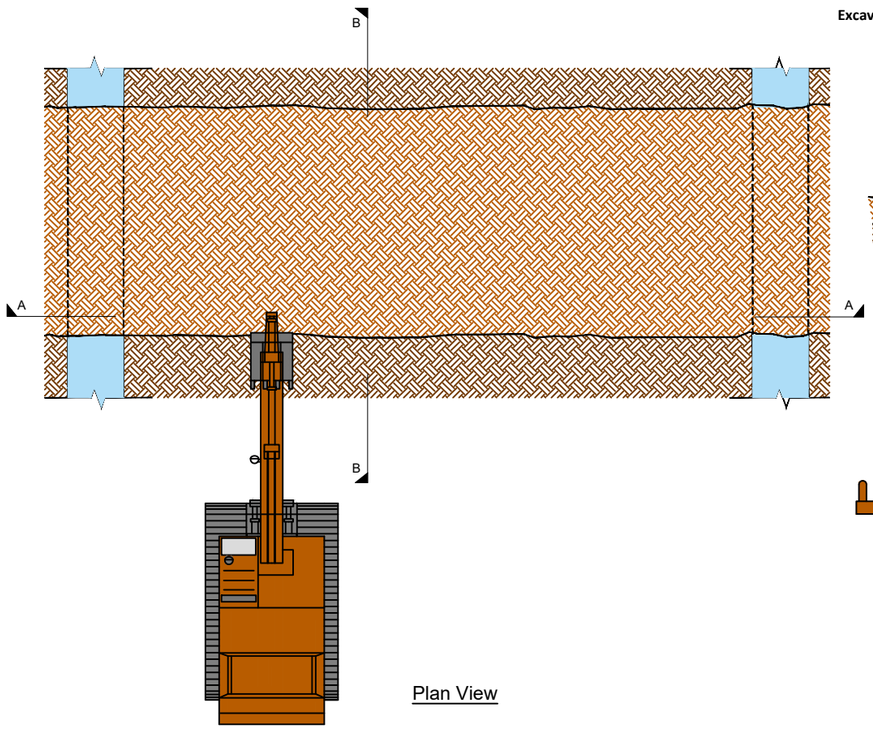
Plan View
(N.T.S.)



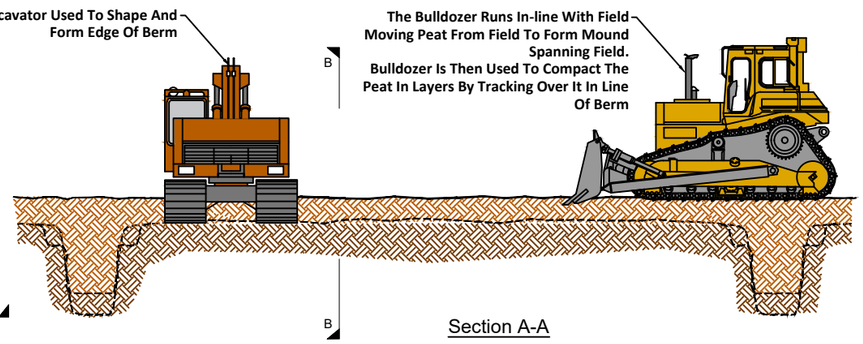
Section A-A
(N.T.S.)

Phase 2
Forming Peat Berm

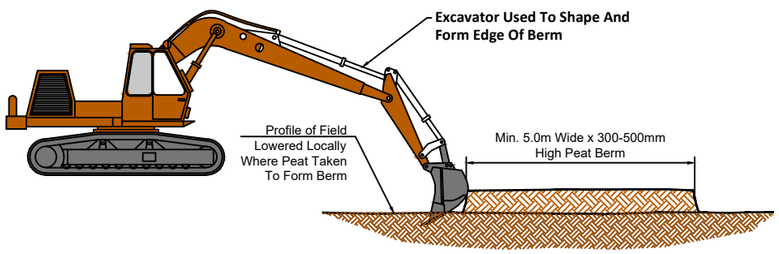
Next the bull-dozer is used to complete the central cross section of Berm by taking peat from the centre of the field and pushing it in line with the field to form a minimum 5m Wide x 300-500mm High Cross Berm.
The peat material in the berm is compacted in layers by the dozer tracking over it.
The excavator bucket is used to form and shape the edges of the compacted berm.



Plan View



Section A-A



Section B-B

STATUS

Rev	Description	Issued By	Date
.		.	.
.		.	.
c	Berm Dimensions And Details Revised	P.K.	11/03/21
b	Berm Height Increased And Trench Detail Added	P.K.	25/02/21
a	Issued For Information	P.K.	29/01/21

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PROJECT:
Peatland Climate Action Scheme
PCAS

TITLE:
Rehabilitation Method WLT 3
Peat Berm

Drawn By:		Checked By:		Approved:
CAD	Designer	Discip. Lead	Design Lead	Design Manager
P.K.	-	D.K.	P.N.	P.N.
Date: 28/01/21		Scale : Not to Scale	A3	Stage: Information
Drawing No.: PCAS-0100-010				Rev: c

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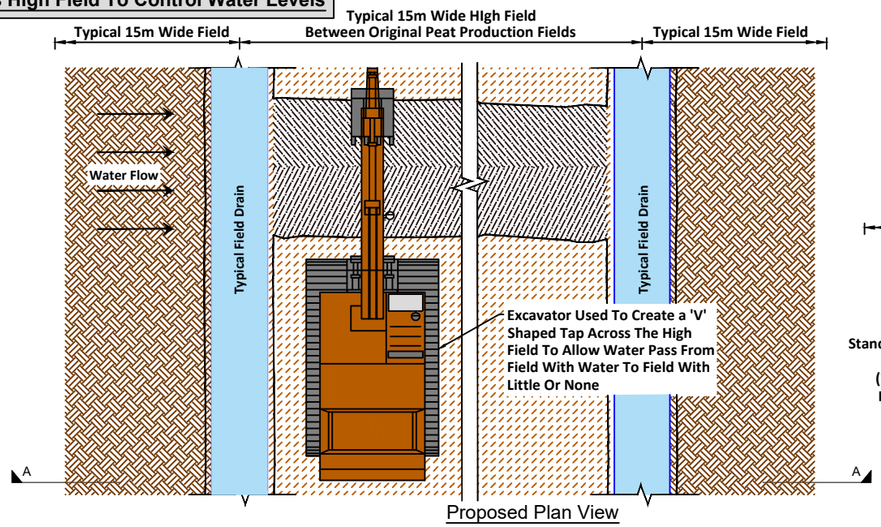
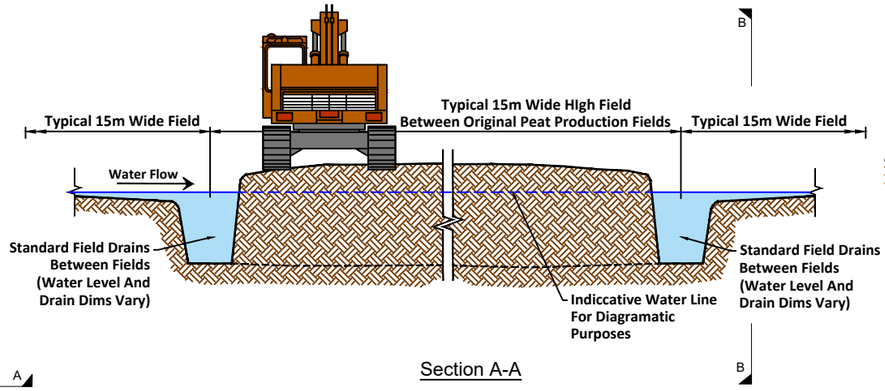
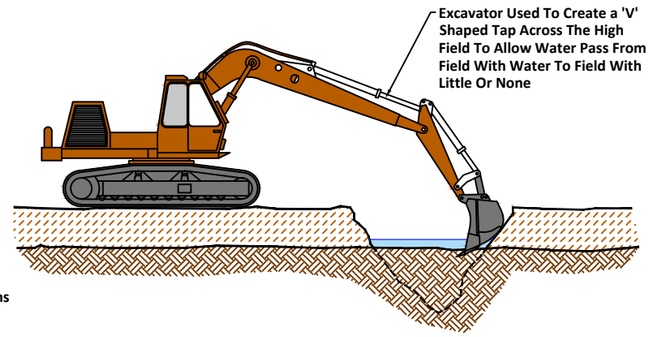
'V' Tap Across High Field To Control Water Levels



Proposed Plan View



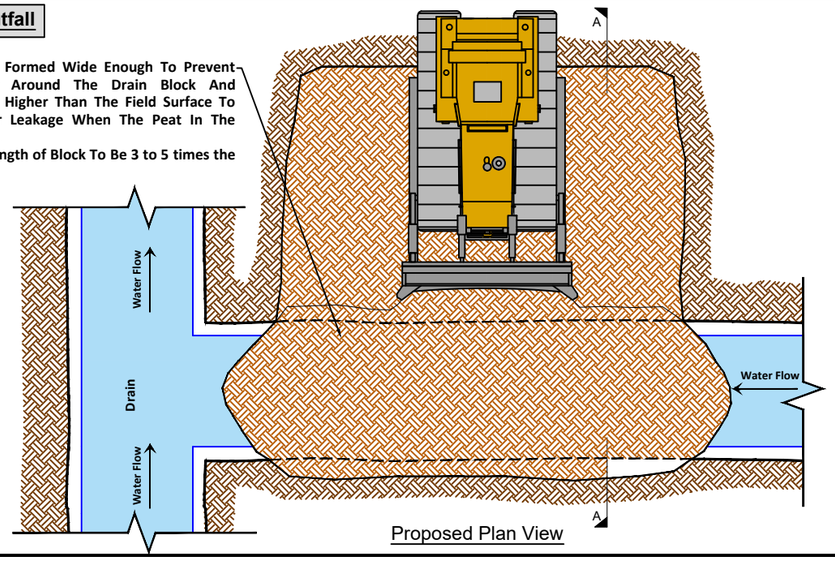
Section A-A



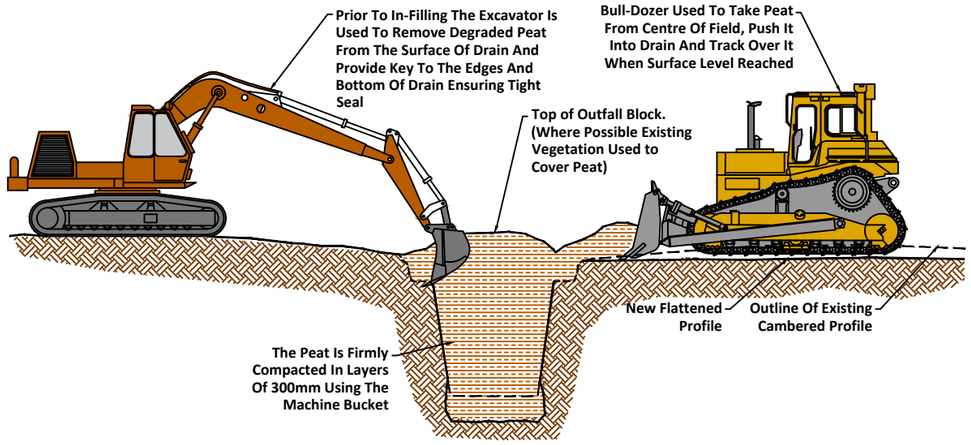
Section B-B

Blocking Of Outfall

The Blocks Are Formed Wide Enough To Prevent Water Moving Around The Drain Block And 300mm-500mm Higher Than The Field Surface To Prevent Further Leakage When The Peat In The Blocks Subsides.
Approximate Length of Block To Be 3 to 5 times the Width Of Drain

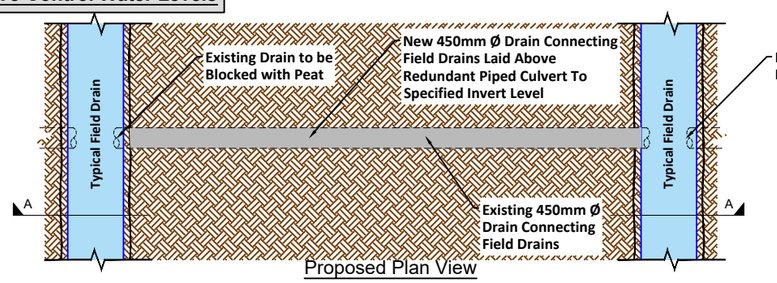


Proposed Plan View

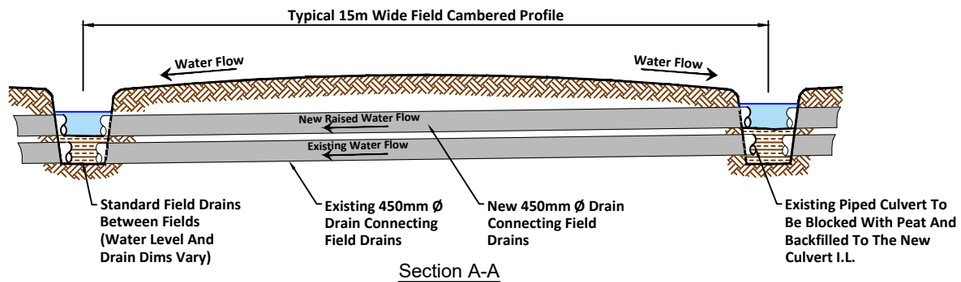


Section A-A

Raise Piped Culverts To Control Water Levels

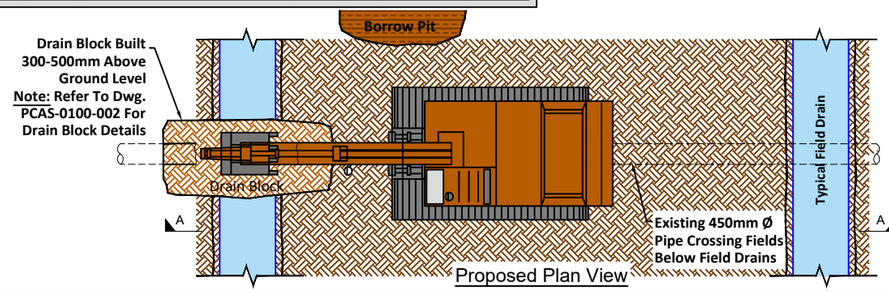


Proposed Plan View

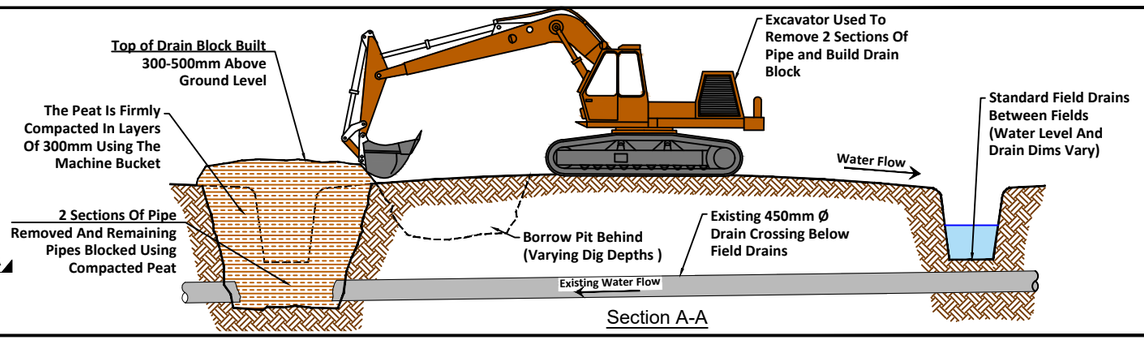


Section A-A

Blocking Of Piped Field Drain Running Below Open Field Drains



Proposed Plan View



Section A-A

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STATUS

Rev	Description	Issued By	Date
d	Piped Field Drain Block Detail Added	P.K.	12/07/21
c	'Key' Added to Base Of Drain For Blocking Of Outfall Control Measure	P.K.	03/03/21
b	For Approval	P.K.	25/02/21
a	Issued For Information	P.K.	29/01/21

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LEABEG, TULLAMORE CO. OFFALY
Tel. 057 9345900
Fax. 057 9345160

PROJECT:
Peatland Climate Action Scheme
PCAS

TITLE:
Modifying of Outfalls
& Managing Water Levels

Drawn By:		Checked By:		Approved:
CAD	Designer	Discip. Lead	Design Lead	Design Manager
P.K.	-	D.K.	P.N.	P.N.
Date: 20/01/21		Scale: Not to Scale	A3	Stage: For Approval

Drawing No.: PCAS-0100-014
Rev: d

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