Derrycolumb Bog

Cutaway Bog Decommissioning and Rehabilitation Plan 2021

Addendum 1

Document Control Sheet	
Document Name:	Derrycolumb Bog Decommissioning and Rehabilitation Plan 2021 – Addendum 1
Document File Path:	
Document Status:	Final

This document comprises:	DCS	TOC	Text (Body)	References	Maps	No. of Appendices

Rev. 1.0	Author(s):	Checked By:	Approved By:
Name(s):	CC	MMC	MMC
Date:	28/05/2021	28/05/2021	28/05/2021

Table of Contents

1. INTRODUCTION

Bord na Móna operates under IPC Licence issued and administered by the EPA to extract peat within the Mount Dillon bog group (Ref. PO504-01). As part of Condition 10.2 of this license, a rehabilitation plan must be prepared for permanent rehabilitation of the boglands within the licensed area.

This report – *Derrycolumb Bog Decommissioning and Rehabilitation Plan 2021 – Addendum 1* – should be read in conjunction with – *Derrycolumb Bog Decommissioning and Rehabilitation Plan 2021*.

This report – Derrycolumb Bog Decommissioning and Rehabilitation Plan 2021 – Addendum 1 - outlines the findings of the Appropriate Assessment reporting carried out in respect of proposed PCAS activities at Derrycolumb Bog, and re-produces the specific water quality related mitigation measures that are listed in the Natura Impact Assessment of the Derrycolumb Bog Decommissioning and Rehabilitation Plan 2021[1].

This include, where relevant, both bespoke measures designed to mitigate the potentially adverse effects identified in the Appropriate Assessment reporting but also any Best Practice measures which also mitigate the potential for adverse effects on European Sites.

All such measures are to be implemented as part of an Environmental Management Plan (hereafter EMP) to be overseen by PCAS staff.

Additionally it is acknowledged that IPC license conditions (Conditions 2.2, 2.4, 2.5, 3.2, 4.1, 4.2, 4.4, 4.5, 4.6, 6.0, 9.0, 11.0, 12.0, 13.0, schedule 1, 3, & 4 of the Mount Dillon IPC Licence) will be implemented as part of an EMP.

2. APPROPRIATE ASSESSMENT REPORTING FINDINGS

Appropriate Assessment Stage One Screening of all European sites identified within a 15km radius of the proposed development evaluated that the potential for significant effects on the Special Conservation Interests or Qualifying Interests of two no. European Sites could not be excluded. In particular, the potential for indirect effects via a deterioration in water quality, and from disturbance to /displacement to fauna.

Thus, the respective elements were brought forward for further critical examination in the Natura Impact Statement Report to inform the Appropriate Assessment process.

Following examination and analysis, and taking account of the protective measures proposed, the potential for:

- Disturbance and displacement of SCI waterbird species occurring within Lough Ree SPA;
- Impacts to the following Annex I habitats as a result of deterioration in water quality Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation (3150) and alkaline fens (7230) in the downstream sections of Lough Ree SAC,
- Disturbance and / or displacement of the otter population associated with Lough Ree SAC.

[1] Delichon Ecology (2021) Cutaway Bog Decommissioning and Rehabilitation Plan Natura Impact Statement Derrycolumb Bog, Co. Longford

were not found to result in adverse effects due to the timing of the works and the protective measures proposed.

The key protective measure being retention of silt laden water and potentially deleterious materials associated with the decommissioning and rehabilitation works to the project footprint. The attenuation of silt and particulate matter generated as a result of the proposed works is a key mitigation measure for the proposed rehabilitation and decommissioning works. The main source of potential impact to influence significant adverse effects to the downstream areas of the Lough Ree SAC relate to particulate matter run-off from the site, during the rehabilitation works. A key consideration in this regard will be drain blocking as described in Section 3.1.5 below. This methodology relies on the placement of terminal dams at the extremity of the drain; i.e. that closest to watercourse within the receiving environment. The securing of strategic peat dams will allow the hydraulic separation between the proposed rehabilitation works and the receiving and downstream aquatic environment, and in so doing isolating these works from sensitive ecological and environmental receptors within the project zone of influence and in the case of Derrycolumb Bog and the River Lough Ree SAC. Other key mitigation measures include the standard best practice environmental control measures, measures to avoid berm failure, the utilisation of existing surface water management infrastructure and the provision of further bespoke surface water management and mitigation measures.

There were no significant effects identified which would adversely affect the Special Conservation Interests or conservation objectives of the various SPA's under consideration with regard to the densities, range or conservation status of the waterbird species and their supporting wetland habitats.

There were no significant effects identified which would adversely affect the Qualifying Interests or conservation objectives of the various SAC's under consideration with regard to the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected.

The conclusion of the NIS is reproduced below:

'The provisions of Article 6 of the 'Habitats' Directive 92/43/EC (2000) defines integrity as the 'coherence of the sites ecological structure and function, across its whole area, or the habitats, complex of habitats and/or population of species for which the site is classified'. It is clear that, given the application of prescribed protective measures for the avoidance of impacts and the implementation of the required mitigation measures, the proposed development will not give rise to adverse effects on the integrity of any of the identified European sites evaluated herein.'

3. APPROPRIATE ASSESSMENT MITIGATION

The following sub-sections re-produce from the NIS the range of water-quality related mitigation measures that will be implemented during the PCAS and form part of the PCAS design.

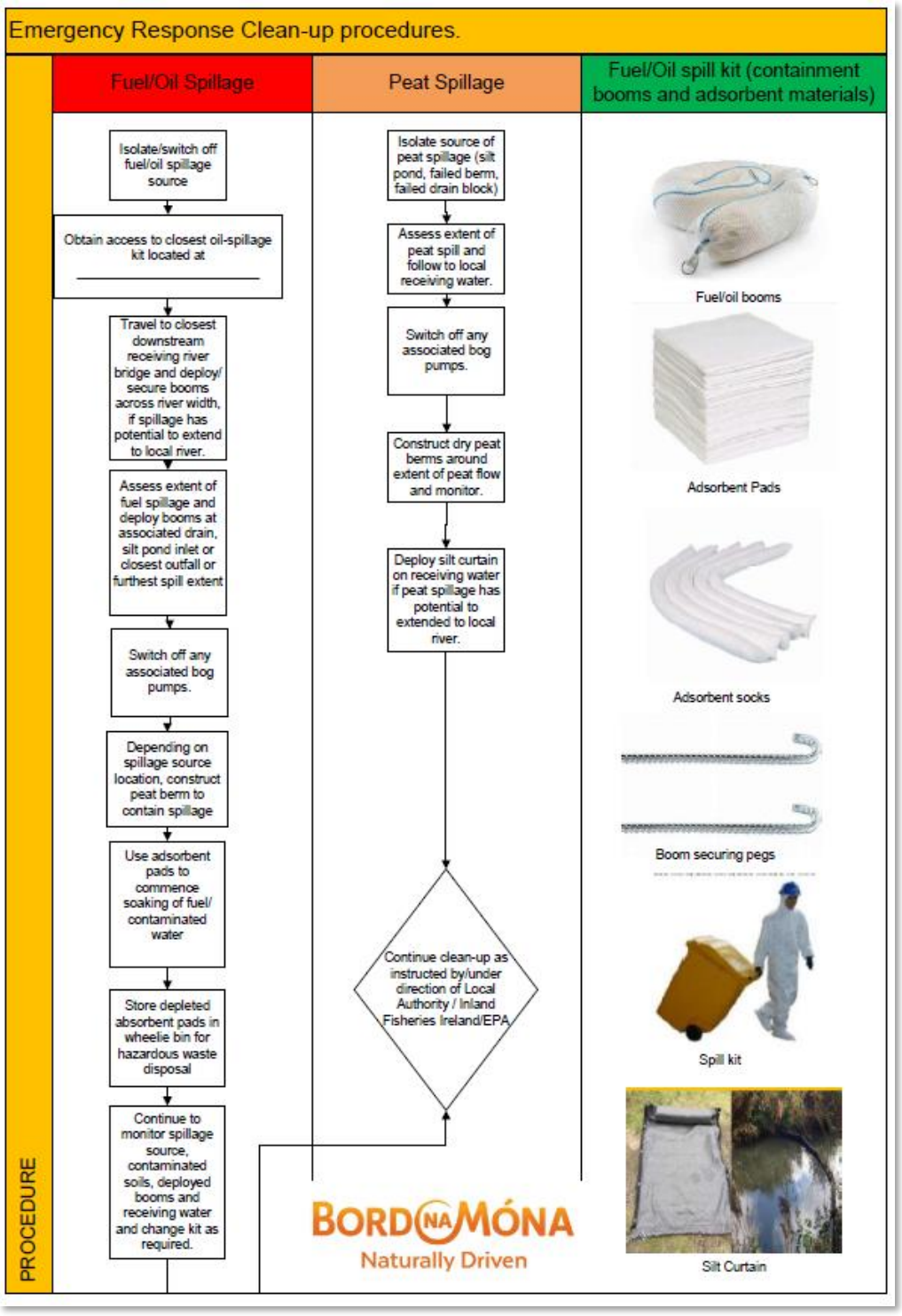
3.1 Description of the Measure

3.1.2 Best Practice Environmental Control Measures to be applied to Decommissioning and Rehabilitation Works

The following Best Practice Environmental Control measures are to be applied as standard to ensure compliance with IPC license Conditions:

- Bog restoration/rehabilitation works will be restricted to within the footprint of the proposed rehabilitation works area.
- The proposed rehabilitation works will have due regard to noise limits and hours of operation (i.e. dusk and dawn) to minimise any potential disturbance on resident and local fauna that utilise the site and immediate environs.
- A standard operating procedure overseen by the Project Ecologist will be in place for all PCAS activities to avoid any significant effects on breeding birds. This will include ground nesting birds and will apply to silt pond cleaning, and cutaway activities. Restriction zones will be in place to avoid effects on any identified ground nesting birds/waterfowl as appropriate.
- All plant and equipment for use will comply with the Construction Plant and Equipment Permissible Noise Levels Regulations (SI 359/1996).
- The proposed works will be restricted to daylight hours and there will be no requirement for artificial lighting.
- Silt ponds will be inspected and maintained as per the IPC Licence.
- During periods of heavy precipitation and run-off, works will be halted.
- Works will be carried out using a suitably sized machine and, in all circumstances, excavation depths and volumes will be minimised where possible.
- All machines will be regularly checked and maintained prior to arrival at the site to prevent hydrocarbon leakage.
- Hoses and valves will be checked regularly for signs of wear and will be closed and securely locked when not in use.
- Fuelling and lubrication of equipment shall only be carried out in designated areas away from surface water drainage features and ecologically sensitive areas.
- Waste oils and hydraulic fluids will be collected in leak-proof containers and removed from the site for disposal or re-cycling.
- All waste will be sorted by the works crews, managed within the site in designated waste disposal facilities, and removed to a licenced waste facility, in line with BnM Standard operating practice.

- Vehicles will never be left unattended during refuelling.
- No direct discharges to waters will be made. No washings from vehicles, plant or equipment will be carried out on site.
- All plant refuelling will take place using mobile fuel bowsers. Only dedicated trained and competent personnel will carry out refuelling operations.
- All fuels required for machinery and equipment will be stored in a designated location, away from main traffic activity, at the nearest BnM Compound. All fuel will be stored in bunded, locked storage containers. Diesel or petrol fuel and mechanical oils will also be used by site vehicles.
- Mobile storage such as fuel bowsers will be bunded to 110% capacity to prevent spills. Tanks for bowsers and generators shall be double skinned. When not in use, all valves and fuel trigger guns from fuel storage containers will be locked. All pumps using fuel or containing oil will be locally and securely bunded where there is the possibility of discharge to waters.
- Potential impacts caused by spillages etc. during rehabilitation works will be reduced by keeping spill kits and other appropriate equipment on-site.
- Site works will be carried out in accordance with 'best practice'. In order to ensure compliance and implementation of 'best practice', these measures will be communicated to relevant Bord na Móna staff and updated as required.
- All waste water will be removed by a licenced waste contractor to a licenced waste water treatment facility.
- Any fertiliser used will be Rock Phosphate and will not be applied in the following conditions:
    1. The land is waterlogged;
    2. The land is flooded, or it is likely to flood;
    3. The land is frozen, or covered with snow;
    4. Heavy rain is forecast within 48 hours (forecasts will be checked from Met Éireann).
    5. The ground slopes steeply and there is a risk of water pollution, when factors such as surface run-off pathways, the presence of land drains, the absence of hedgerows to mitigate surface flow, soil condition and ground cover are taken into account.
- No fertiliser will be spread on land within 2 metres of a surface watercourse.
- Buffer zones in respect of waterbodies, as specified on https://www.epa.ie/about/faq/name,57156,en.html, will be adhered with at all times with regard to fertiliser application.
- The below image / flow chart (**Figure 17 reproduced from the NIS**) provides Bord na Móna's proposed clean up procedures for fuel/oil and peat.

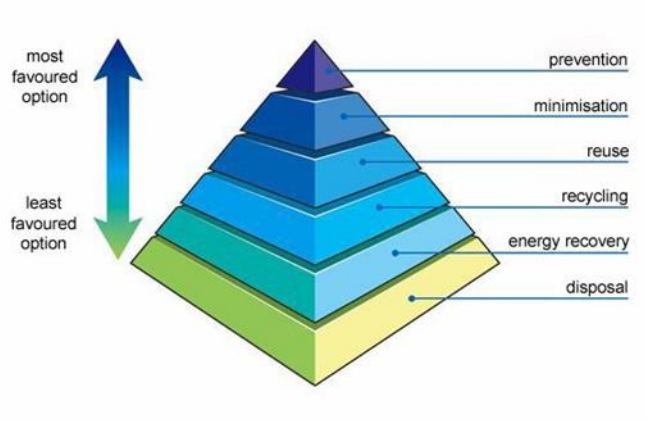


- **Figure 16: BnM Emergency Response Clean Up Procedures**

3.1.2 Best Practice Measures around the treatment of Waste

Condition 7 of the IPC licence for Peat Extraction at Derrycolumb Bog requires waste items to be disposed of or recovered as follows:

- Disposal or recovery of waste shall take place only as specified in Schedule 2(i) Hazardous Wastes for Disposal/Recovery and Schedule 2(ii) Other Wastes for Disposal/Recovery of this licence and in accordance with the appropriate National and European legislation and protocols. No other waste shall be disposed of/recovered either on-site or off-site without prior notice to, and prior written agreement of, the Agency.
- Waste sent off-site for recovery or disposal shall only be conveyed to a waste contractor, as agreed by the Agency, and only transported from the site of the activity to the site of recovery/disposal in a manner which will not adversely affect the environment.
- A full record, which shall be open to inspection by authorized persons of the Agency at all times, shall be kept by the licensee on matters relating to the waste management operations and practices at this site. This record shall as a minimum contain details of the following:
    - 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 the site.
- As required by the licence, these waste items will be removed for recycling or disposal, using external contractors with the required waste collection permits, as agreed by the EPA, with waste records maintained as required for inspection by authorized persons of the EPA at all times.
- Where possible, Bord na Móna will utilize the appropriate waste hierarchy to identify waste that can reused or recycled ahead of disposal.



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

These best practice measures have been included for the protection of watercourses in the receiving environment, downstream connected European Sites (River Barrow and River Nore SAC) and their nutrient sensitive and water dependent habitats and species of Qualifying Interest.

3.1.3 Best Practice & Biosecurity

The potential for importation or introduction of non-native plant species (such as Japanese Knotweed, Himalayan Balsam, etc.) has been identified. Section 49 of the European Communities (Birds and Natural Habitats) Regulations 2011 prohibits the introduction and dispersal of invasive alien species (particularly plant species) listed on Part 1 (third column) of the 'Third Schedule'.

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

- Records of problematic invasive species within the various bog units will be marked out with signs to highlight areas of infestation to personnel.
- All plant machinery will be restricted from disturbing known colonies of invasive species.
- All plant machinery will avoid unnecessary crossings to adjoining lands.
- For any material entering the site, the supplier must provide an assurance that it is free of invasive species.
- All plant and equipment employed on the proposed works (e.g. diggers, tracked machines, footwear etc.) must be thoroughly cleaned down using a power washer unit, and washed into a dedicated and contained area prior to arrival on site and on leaving site to prevent the spread of invasive aquatic / riparian species such as (but not limited to) Japanese knotweed (*Fallopia japonica*) and Himalayan Balsam (*Impatiens glandulifera*). A sign off sheet must be maintained by the contractor to confirm cleaning;
- Good site hygiene will be employed to prevent the introduction and spread of problematic invasive alien plant species (i.e. Japanese Knotweed (*Fallopia japonica*), Himalayan Balsam (*Impatiens glandulifera*), Himalayan Knotweed (*Persicaria wallichii*), etc.) by thoroughly inspecting and washing vehicles prior to entering the works area.

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

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

- All water quality monitoring equipment which has been used in water will be treated with a disinfectant or a strong saline solution and then thoroughly dried (ideally over 24 hours) BEFORE being used in water again.

- Check, Clean, Dry protocol will be adhered with before and after visiting a river or lake for monitoring, in line with Best Practice[2] or for activities such as Sphagnum inoculation.
- Virkon Aquatic will be available as required.

These best practice measures have been included for the protection of watercourses in the receiving environment, downstream connected European Sites (Lough Ree SPA / SAC) and their nutrient sensitive and water dependent habitats and species of Qualifying Interest.

3.1.4 Silt Ponds

Silt Ponds – 10 no. Silt ponds with a total volume of 15958.14m^3 and area of 1.0ha are in place at Derrycolumb Bog. There are seven treated surface water outlets to the Ledwithstown IE_SH_26L840850 and Drumnee IE_SH_26D080850 rivers and eventually the Shannon Upper IE_SH_25SO21660.

These silt ponds and associated outfalls, already stipulated and in use as mitigation measures in respect of Peat Extraction under IPC license, will continue to function as an attenuation measures in terms of sediment release to receiving waterbodies. It should be noted, that the silt pond network at Derrycolumb Bog will not be the sole mitigation measure to attenuate silt laden waters emanating from the site during the project construction and operational phases. The design of the PCAS scheme requires the creation of internal drain blocking measures (including terminal dams), which will in itself reduce the possibility of surface run-off to the receiving environment during the rehabilitation works. Once rehabilitation works are completed and the bog has been rehabilitated, the bog will act as a natural repository for surface water, regulating and slowing the movement of surface water from Derrycolumb Bog to the receiving environment. It is considered that the silt pond network will provide further attenuation and regulation to those measures associated with the PCAS measures during the project construction phase and the rewetted peatland habitat during the project's operational phase.

Regular cleaning and reporting on same already forms part of annual (AER) reporting submitted to EPA. All Silt Ponds at Derrycolumb Bog are currently compliant with EPA requirements. **Table 23 of the NIS,** reproduced below, and **Figure 18 of the NIS**, reproduced overleaf summarise and illustrate the onsite Silt Pond locations, the latter also illustrates the current flow regime within the main drainage network (into which any other drains also feed). Continued maintenance and reporting on same will be reported on annually until IPC license Surrender.

Table 23: Silt Ponds in use at Derrycolumb Bog

Bog Name	IPC License Reference	Pond No.	Area (m^2)	Volume (m^3)
Derrycolumb	504_01	103/104	1416.66	2124.99
Derrycolumb	504_01	DC100A/B	1226.83	1838.07
Derrycolumb	504_01	DC104D	775.11	1162.66
Derrycolumb	504_01	DC102	347.93	521.89
Derrycolumb	504_01	DC101	1096.45	1644.68
Derrycolumb	504_01	DC101B	1236.29	1854.43
Derrycolumb	504_01	DC104C	1058.51	1587.77
Derrycolumb	504_01	DC98	639.66	959.50
Derrycolumb	504_01	DC98A	1333.22	1999.83

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

Derrycolumb	504_01	DC99	1509.54	2264.32
		Total	**10,640.20**	**15958.14**

The above capacity is considered sufficient for the purposes of decommissioning and rehabilitation.

The attenuation of silt and particulate matter generated as a result of the proposed works is a key mitigation measure for the proposed rehabilitation and decommissioning works. The main source of potential impact to influence significant adverse effects to the downstream areas of Lough Ree SAC relate to particulate matter run-off from the site, during the rehabilitation works. A key consideration in this regard will be drain blocking as described in Section 3..1.5 below. This methodology relies on the placement of terminal dams at the extremity of the drain; i.e. that closest to watercourse within the receiving environment. The securing of strategic peat dams will allow the hydraulic separation between the proposed rehabilitation works and the receiving and downstream aquatic environment, and in so doing isolating these works from sensitive ecological and environmental receptors within the project zone of influence and in the case of Derrycolumb Bog and Lough Ree SPA / SAC.

This mitigation measure has been included for the protection of watercourses in the receiving environment, downstream connected European Sites (Lough Ree SPA / SAC) and their nutrient sensitive and water dependent habitats and species of Qualifying Interest.

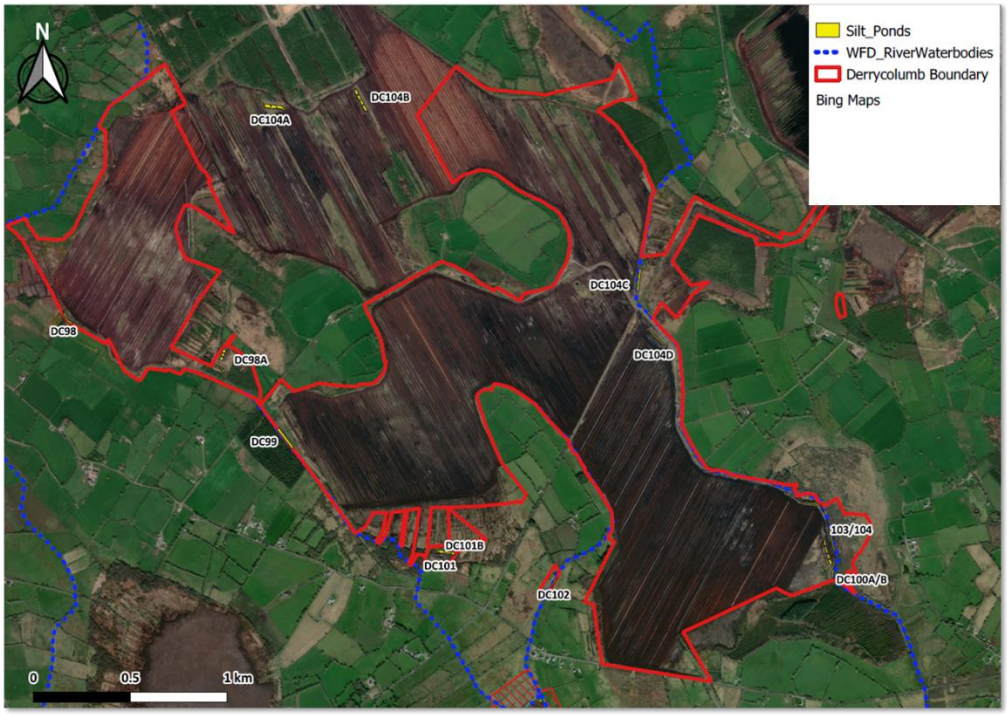


Figure 18 of the NIS

3.1.5 Measures to avoid runoff when carrying out drain blocking

The principal mitigation for proposed rehabilitation works at Derrycolumb Bog will involve securing the works area from the receiving environment when rehabilitation works are ongoing. This will include the creation of terminal dams at the margins of the rehabilitation works. These dams will secure the works area from the receiving environment, in particular downstream watercourses. These terminal dams are an integral part of the rehabilitation design works and comprise mitigation by design.

- All Silt ponds will be cleaned prior to the commencement of upstream drain blocking.
- When blocking drains, terminal dams i.e. the dams at the extremity of the drain and closest to any hydrologically connected watercourses, will be blocked first with AT MINIMUM 2 IN SERIES STANDARD DAMS, to prevent sediment release from subsequent dam insertion. This will form a hydraulic barrier between subsequent drain works and other rehabilitation works at the bog and the receiving and surrounding environment.
- The functionality and efficacy of these terminal dams will be monitored by the Project Ecologist/Environmental Supervisor and audited by the project engineering team. If the structural competency of the terminal dams become compromised, additional mitigation will be secured on site, such as silt fencing or additional check dams.
- Dams will be inspected during periods of dry weather to ensure no 'cracking' of peat has occurred which might allow for discharge.
- Discharge from all rehabilitated areas will be directed into silt ponds.
- Outfalls and overflow pipes from e.g. bunded cells will be directed into silt ponds.
- An Emergency Response Plan will be available in the event of any inadvertent release of a large volume of sediment.
- The above will be overseen by a suitably qualified Environmental Supervisor with support from members of the BnM Ecology Team.

This mitigation measure has been included for the protection of watercourses in the receiving environment, downstream connected European Sites (Lough Ree SPA / SAC) and their nutrient sensitive and water dependent habitats and species of Qualifying Interest.

3.1.6 Measures for cleaning Silt Ponds

Cleaning of silt ponds integrated into or adjoining EPA Blue line features, such as the Ledwithstown watercourse, will follow the below best practice measures.

- Consideration of seasonal restrictions for instream works (works to commence between April / May – October inclusive) and requirement to liaise / notify Inland Fisheries Ireland (IFI) in advance of cleaning works commencing.
- Cleaning works to align with best practice measures, including BnM Standard Operating Procedures (SOPs) for works within and near watercourses, works with hydrocarbons, biosecurity measures when working at and different watercourses and waterbodies..
- Cognisance of capture of non-target aquatic species (Crayfish, lamprey, small fish etc.) within the dredged material and the secure rescue and translocation of these species downstream of the pond cleaning works. Cleaning of silt ponds will be completed under licence (where required) and in accordance with strict biosecurity measures. Silt ponds will be cleaned from the inlet point to the outlet point allowing fish and aquatic life to migrate downstream as the works progress. The silt pond cleaning works and species translocation efforts will be overseen by a suitably qualified Ecologist/Ecological Clerk of Works and ongoing monitoring undertaken by the project ecologist.
- Excavated silt material will be placed at least 20m away from the blue line feature and will be deposited into corralled berms and thereafter secured into the nearby ground with the back of the machine excavator bucket, to ensure particulate matter is not mobilised during or following rainfall events.

It should be noted, that the silt pond network at Derrycolumb Bog will not be the sole mitigation measure to attenuate silt laden waters emanating from the site during the project construction and operational phases. The design of the PCAS scheme requires the creation of internal drain blocking measures, which will in itself reduce the possibility of surface run-off to the receiving environment during the rehabilitation works. However, the functionality of a silt pond feature is based on its capacity to assimilate and attenuate ongoing surface water flows. Silt ponds need to be cleaned and emptied regularly to ensure they have sufficient capacity to operate efficiently.

Once rehabilitation works are completed and the bog has been rehabilitated, the bog will act as a natural repository for surface water, regulating and slowing the movement of surface water from Derrycolumb Bog to the receiving environment. It is considered that the silt pond network will provide further attenuation and regulation to those measures associated with the PCAS measures during the project construction phase and the rewetted peatland habitat during the project's operational phase.

This mitigation measure has been included for the protection of watercourses in the receiving environment, downstream connected European Sites (Lough Ree SPA / SAC) and their nutrient sensitive and water dependent habitats and species of Qualifying Interest.

3.1.7 Silt Control Design Features

Further detail is provided in this section on the proposed wetland attenuation area near the south-eastern corner of Derrycolumb Bog, in addition to silt control measures for Derrycolumb Bog.

It is anticipated that once the pump near the south-eastern corner of the site is turned off, water levels within the nearby bog area will rise. Therefore, it is proposed to create an attenuation area at this location that will allow the settlement and subsequent controlled release of attenuated water from this section of the bog. This measure will also provide optimum water depth in this area for proposed rehabilitation measures. The development of the attenuation area in this location is a bespoke silt attenuation measure that will inadvertent release of silt as a result of flood related pathways. Furthermore, it is proposed to develop DPT4 cell bunding south of the attenuation area. The DPT4 features will act as individual silt ponds further mitigating the risk of silt release from this area to the receiving environment. The location of the silt control measures and silt ponds for Derrycolumb Bog are presented in **Figure 19 of the NIS,** reproduced below.

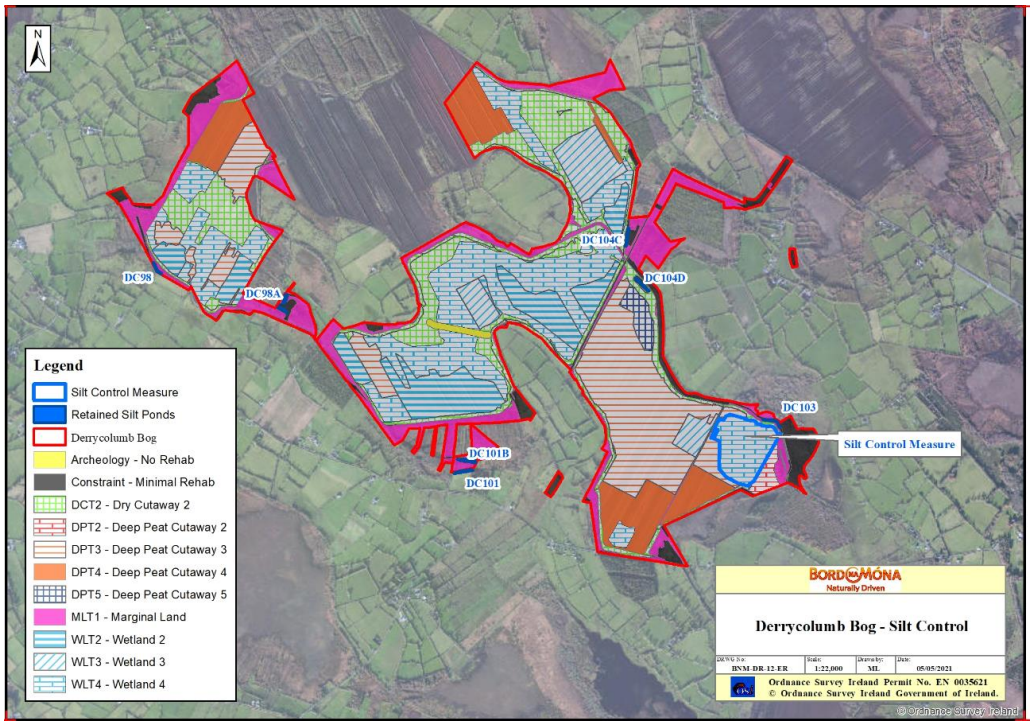


Figure 19 of the NIS

3.1.8 Mitigation when undertaking flood avoidance measures and retention of hydraulic barriers

The following mitigation and best practice measures will be undertaken at the Derrycolumb Bog site. Although drain blocking and consequent and hydrological rewetting of the Derrycolumb Bog site will occur, it is not intended to rewet or hydrologically alter adjoining lands or those areas surrounding the Derrycolumb Bog site. To this end, the following mitigation measures will be implemented:

- Maintenance of peripheral drains and where required, provision of additional drains, to create hydraulic barriers between the site and the receiving environment. This will mean that lands and local drainage patterns associated with the margins of the BnM site will be maintained;
- Maintenance of specified internal drains to avoid flooding where required to maintain existing drainage of adjacent lands. In some instances this may include re-grading or widening of specific existing drains which currently act as preferential flow paths through the bog.
- Monitoring of adjacent lands will also be specified.

This mitigation measure has been included for the protection of watercourses in the receiving environment, downstream connected European Sites (Lough Ree SPA / SAC) and their nutrient sensitive and water dependent habitats and species of Qualifying Interest.

3.1.9 Mitigation during upgrade of boundary or peripheral drains outside of the proposed rehabilitation footprint

Boundary drains may require upgrading to retain their functionality as hydraulic breaks between the site and adjoining lands. These works will be completed during periods of low flow and will follow the below sequencing:

- Prior to commencement of channel works, at least 2 no. check dams will be placed at the downstream end of the drainage channel to control the flow of suspended sediment downstream to receiving watercourses.
- The most downstream check dam will comprise locally sourced turves and double bagged sand bags to initially secure and check downstream flow within the channel. At least 10m upstream of this check dam, a peat dams will be created and keyed into the adjoining drainage channel banks following the methodologies presented in **Section 2.6 of the NIS**.
- The build-up of silt material upstream of the constructed check dams will be monitored during upgrade works and the silt material will be removed from the drainage channel during works as it builds up. The material will be removed from the channel, spread and levelled into the adjacent field, a minimum of 10m from the nearest drain.
- The constructed check dams will be inspected during periods of dry weather to ensure no 'cracking' of peat has occurred which might allow for discharge.
- Upon completion of the upgrade works, all silt will be removed from the drainage channel immediately upstream of the 2 standard drain blocks prior their removal. The 2 standard drain blocks will only be removed once all upgrade works are completed and once all water within the channel is suitably settled with no evidence of suspended solids within the water column.
- Where a new drain is required, it will be formed and established prior to connecting the drainage channel to wider drainage network. Only once it has formed and become established, with the bed and banks stabilised will it be connected to the wider drainage network. This approach will minimise to a negligible level the potential for suspend solids to be generated in waters within the new drainage channel and conveyed downstream to receiving watercourses and European Sites.
- An Emergency Response Plan will be available in the event of any inadvertent release of a large volume of sediment.

The set up of these features will be overseen by a suitably qualified Ecologist/Ecological Clerk of Works and ongoing monitoring undertaken by the project ecologist.

This mitigation measure has been included for the protection of watercourses in the receiving environment, downstream connected European Sites (Lough Ree SPA / SAC) and their nutrient sensitive and water dependent habitats and species of Qualifying Interest.

3.1.10 Mitigation to prevent Berm Failure

The below mitigation measures will be put in place when constructing and working with berm features as part of the bog rewetting and rehabilitation process. The berm design adopts an empirical design approach. It is proposed to apply proven sizes, proportions, materials, and assemblies from existing successful rehabilitation measures and flood defence berm features carried out in the past by Bord na Mona. This represents mitigation for the proposed rehabilitation works through design; i.e. integrating key design principles into the rehabilitation efforts to restrict potential berm failure and consequent run-off to the receiving environment. Further details on berm design and mitigation incorporated into berm design is provided in **Appendix E of the NIS- Engineering and Rehabilitation Design Specification.**

- The selection of an appropriate drain block spacing.

• Drain blocks are formed at a minimum of 300mm higher than the adjacent ground level and are relatively wide to create a relatively strong structure out of peat that will mitigate water flow eroding the drain block construction.

• The provision of a key in the drain ensures a tight seal is maintained and a strong structure is developed to mitigate the formation of preferential flow paths around the edges of the drain block.

• Operators assigned to this work element are familiar with the technique and process and provide effective robust drain blocks. The operators are experienced and capable of adapting to the particular conditions encountered within the bog.

• Qualified, experienced Engineers overseeing the works during the installation phase ensure that quality procedures of the various elements are implemented and effectively meet the standards for quality service and performance.

Mitigation through maintenance and avoidance:

• Ongoing monitoring of completed peat drain blocks in the weeks after formation will ensure they have consolidated.

• The risk associated with peat drain block failure from an environmental and rehabilitation measures impact is generally categorised as low as a peat drain block failure will result in an impact that is localised and silt control measures are provided upstream of all discharge points. There is an allowance for a reactive approach to remediation measures where required.

• A post rehabilitation Lidar and imagery survey will take place which will capture any areas where failures occurred resulting in remediation measures in a particular area if required. The Lidar survey will be implemented when the rehabilitation measures have been in place for a reasonable period of time allowing areas of weakness or potential concern to become apparent.

• In the event of a peat drain block failure, the adjacent peat drain blocks will generally have sufficient capacity to accommodate any additional hydrostatic pressures generated ensuring the negative impact

- If, after heavy rainfall, significant water flows in the drains cause localised drain block failure, the regular and frequent placing of drain blocks along the drain further downstream will mitigate the impact to the immediate area.

As peat drain blocks are designed to retain water on the cutover resulting in a reduction in discharge into the boundary drains, preventing any negative impacts on adjacent agricultural land.

This mitigation measure has been included for the protection of watercourses in the receiving environment, downstream connected European Sites (River Barrow and River Nore SAC) and their nutrient sensitive and water dependent habitats and species of Qualifying Interest.

This mitigation measure has been included for the protection of watercourses in the receiving environment, downstream connected European Sites (Lough Ree SPA / SAC) and their nutrient sensitive and water dependent habitats and species of Qualifying Interest.

3.1.11 Standard Operating Procedures for Loading of remaining Peat Stockpiles within Derrycolumb Bog

The loading and removal of the remaining milled peat stockpiles at Derrycolumb Bog will take place in 2021 and will follow the below Standard Operating Procedures (SOPs). The below schematic / flow diagram displays how peat loading and removal will be completed at the Derrycolumb Bog site. This will ensure that loading and removal of remaining peat stockpiles will be controlled, will follow an agreed protocol and will not result in the release or spread or milled peat to the receiving or surrounding environment and by extension European Sites within the project Zone of Influence.

This mitigation measure has been included for the protection of watercourses in the receiving environment, downstream connected European Sites (Lough Ree SPA / SAC) and their nutrient sensitive and water dependent habitats and species of Qualifying Interest.

General Dust Control Steps:

The following measures will be put in place when loading and removing remaining peat stockpiles from Derrycolumb Bog.

- Wind Socks will be installed at all Bog Areas that have on-going complaints or are classed as Dust
- Sensitive, so that wind speed and direction can be assessed. BNM Item Number (412958).
- Any dust mitigation measures will be recorded and referenced on the daily return sheet.
- Headland peat collection will be recorded on PQMS form 023.
- Idle travel will be avoided as much as practically possible.
- Use grass paths and far headlands where possible when travelling in dust sensitive areas.
- Avoid travelling near main highways, dwellings and areas deemed as problematic regarding dust impact.
- Keep the headlands continuously ridged.
- Shelter Belts and Wind Breaks are used where feasible.
- Stockpiles are covered as per the Area Polycovering Plan.
- Machinery maintains slow speeds when travelling along headlands.
- All Continuous Improvement initiatives regarding Dust Mitigation will be fully investigated and supported by bog areas.

Headland Harvesting

- Keep the headland continuously ridged.
- Harvest headland peat every third crop, as per FS-PR-13 standard.

  · By Haku trailer where possible or,

  · Harvest to fields, disengage crossing drains and outfalls.

  · By utilising headland harvesters.

- Hydraulic Harrows where available, spoons will be lifted when travelling on a headland.
- Headland peat collection will be fully documented and recorded on PQMS form 023.
- Miller drums will be disengaged and lifted when approaching or travelling on a headland.
- Slow speeds should be maintained on a headland.
- Optimise routes to avoid dust sensitive areas.

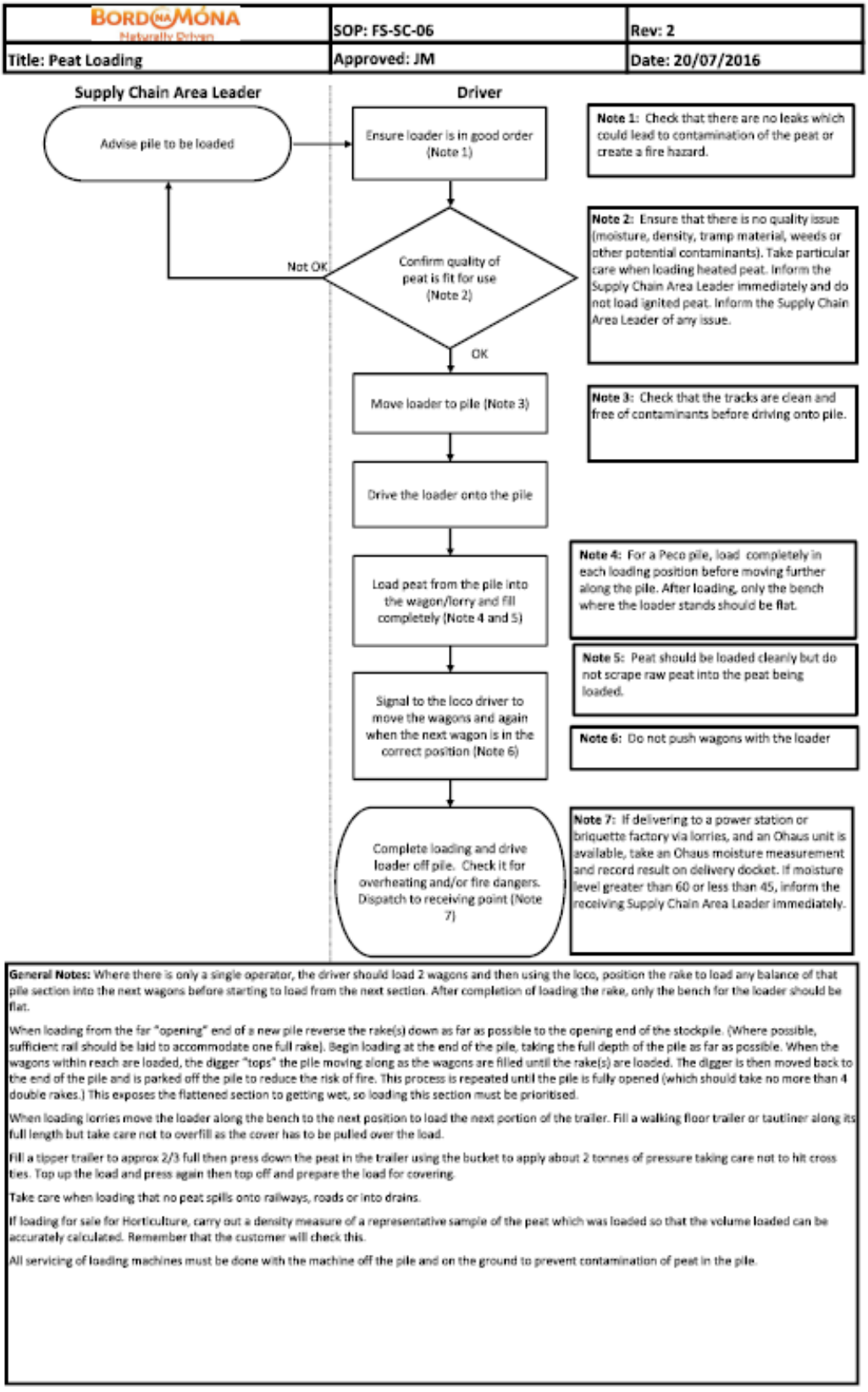


Figure 20: BnM Peat Loading SOPs

3.2 Effectiveness of these Measures

The Mitigation Measures (Project Design Measures, Management Plans, Environmental Emergency Response Measures and Best Practice Measures), listed above, have been developed by the hydrological/drainage and ecological expert members of the Decommissioning and Rehabilitation project team in Bord na Móna and use best practice water quality protection techniques which are tried and tested regularly across the country. Furthermore, a suitably qualified Environmental Supervisor will be employed during the construction stage to monitor the effectiveness of these measures on a daily basis. The Environmental Supervisor will be supported and assisted by members of the BnM Ecology Team as required. An Environmental Management Plan (EMP) has also been prepared for the proposed works (See **Appendix F of the NIS**).

The watercourse crossing, drainage and water quality measures have been developed using relevant legislation, guidance and literature including:

3.2.1 Guidance

- Inland Fisheries Ireland (2016) Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters;
- NRA (2008) Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes; and,
- OPW (2013) Construction, Replacement or Alteration of Bridges and Culverts.
- Brew, T. & Gillagan, N. (2019). Environmental Guidance: Drainage Maintenance and Construction
- EPA Ireland; Managing the Impact of Fine Sediment on River Ecosystems

Pollution Prevention Guidance Notes (PPGs) & Guidance for Pollution Prevention (GPP)[3]

- PPG 1: Understanding your environmental responsibilities - good environmental practices
- GPP 2: Above ground oil storage tanks
- PPG 3: Use and design of oil separators in surface water drainage systems
- GPP 4: Treatment and disposal of wastewater where there is no connection to the public foul sewer
- GPP 5: Works and maintenance in or near water
- PPG 6: Working at construction and demolition sites
- PPG 7: Safe storage - The safe operation of refuelling facilities
- GPP 8: Safe storage and disposal of used oils
- GPP 8: Safe storage and disposal of used oils
- GPP 8: Safe storage and disposal of used oils
- GPP 19: Vehicles: Service and Repair
- GPP 21: Pollution incident response planning
- GPP 22: Dealing with spills
- GPP 26 Safe storage - drums and intermediate bulk containers
- PPG 27: Installation, decommissioning and removal of underground storage tanks

[3]https://www.netregs.org.uk/environmental-topics/pollution-prevention-guidelines-ppgs-and-replacement-series/guidance-for-pollution-prevention-gpps-full-list/

Construction Industry Research and Information Association (CIRIA) [4]

- CIRIA Report C502 Environmental Good Practice on Site;
- CIRIA Report C532 Control of Water Pollution from Construction Sites: Guidance for consultants and contractors;
- CIRIA Report C648 Control of Pollution from Linear Construction Project; Technical Guidance;
- CIRIA Handbook C650 Environmental good practice on site;
- CIRIA Handbook C651 Environmental good practice on site checklist;
- CIRIA Report C609 - SuDS – hydraulic, structural & water quality advice; and,
- CIRIA Report C697 – The SuDS Manual.

Invasive Species Guidance

- Managing Japanese knotweed on development sites - The Knotweed Code of Practice produced by the Environmental Agency (2013)[5];
- NRA Guidelines on The Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads (2010)[6];
- Managing Invasive Non-native Plants in or near Freshwater, Environment Agency (2010)[7];
- Best Practice Management Guidelines Japanese knotweed *Fallopia japonica*, Invasive Species Ireland (2015);
- IFI Biosecurity Protocol for Field Survey Work, Inland Fisheries Ireland (2010[8]).

3.3 Implementation of Mitigation Measures

The Mitigation Measures (Project Design measures, Management Plans, Environmental Emergency Procedures and Best Practice Measures) will be implemented by the Project Manager/PSCS and BnM Project Staff during the Decommissioning and Rehabilitation stage. Implementation of the Mitigation Measures, will be implemented under an Environmental Management Plan for Derrycolumb Bog Decommissioning and Rehabilitation.

All protection measures have been designed in line with Best Practice and constitute the Best Available techniques following scientific literature and field baseline verification. As such there is a very high degree of confidence in their likely success.

Implementation of the mitigation measures for the Decommissioning and Rehabilitation activities will be the responsibility of Bord na Mona Operations and supervision of the works will be carried out by this Bord na Móna Department incorporating Area leaders, Operations Managers and Project Supervisor Construction Stage (PSCS).

In addition, implementation of the mitigation measures will be monitored and inspected by Bord na Móna Environmental, Ecology and Engineering Departments, who are independent of Bord Na Mona Operations.

[4] Available from https://www.ciria.org/

[5] http://cfinns.scrt.co.uk/wp-content/uploads/2014/06/2013-code-of-practice.pdf

[6]https://www.tii.ie/technical-services/environment/construction/Management-of-Noxious-Weeds-and-Non-Native-Invasive-Plant-Species-on-National-Road-Schemes.pdf

[7] https://www.midsussex.gov.uk/media/1725/managing-invasive-non-native-plants.pdf

[8] https://www.fisheriesireland.ie/Biosecurity/biosecurity-protocol-for-field-survey-work.html

Project Ecologists, Engineers and Environmental Compliance Officers will be appointed for each bog and they will ensure that measures are carried out in accordance with an Site-Specific Environmental Management Plan which sets out the required mitigation measures for each bog and defines the pertinent individual roles. The Ecologist, Environmental Compliance Officer, Engineer, H & S Manager, Site Supervisor and PSCS will have a 'stop works' authority.

3.4 Degree of confidence in the likely success of the mitigation measure

All protection measures have been designed in line with Best Practice and constitute the Best Available techniques following scientific literature and field baseline verification. As such there is a very high degree of confidence in their likely success.

3.5 Monitoring of the Implementation and Effectiveness of the Mitigation Measures

A degree of Monitoring is required under Condition 10.1 of the IPC license under which Peat Extraction and now Decommissioning and Rehabilitation is to take place. This environmental monitoring carried out during the aftercare and maintenance period of Decommissioning and Rehabilitation, has to ensure no Environmental Pollution has been caused, and is subject to an Independent Closure Audit (ICA) followed by an EPA Exit Audit (EA) in order to facilitate IPC License surrender.

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

- There will be **initial quarterly monitoring assessments** of the site to determine the general status of the site, the condition of the silt-ponds, assess the condition of the rehabilitation work, monitoring of any potential impacts on neighbours land, general land security, boundary management, dumping and littering.
- The number of these site visits will reduce after 2 years to bi-annually and then after 5 years to annual visits.
- These monitoring visits will also consider any requirements, if required, for further practical rehabilitation measures.
- The **baseline condition of the site will be established** post-rehabilitation implementation by using an aerial drone survey to take an up-to-date aerial photo, when rehabilitation is completed. The extent of bare peat will be assessed using this baseline data, and habitat maps will be updated, if required.
- **A water quality monitoring programme** at the bog will be established. The main objective of this water quality monitoring programme will be to establish a baseline and then monitor the impact of peatland rehabilitation on water quality from the bog. Monitoring of key environmental variables will include: Ammonia, Phosphorous, Suspended solids (silt), pH and conductivity. Water quality samples will be collected from the main drainage system from the bog at a designated point, before water leaves the site. Water quality samples will be collected at monthly intervals during rehabilitation and for 2 years thereafter. Results will be reviewed for potential exceedances of SSCO thresholds likely to result in negative quality effects on downstream European Site targets.
- If, after three years, key criteria for successful rehabilitation are being achieved and critical success factors are being met, then the water quality monitoring programme will be reviewed, with consideration of potential ongoing research on site. The water quality data, the drone surveys and the habitat mapping will be collated and will be submitted to the EPA as part of the final validation report.

- If, after three years, key criteria for successful rehabilitation have **not** been achieved and critical success factors have **not** been met, then the rehabilitation measures and status of the site will be evaluated and enhanced, where required. This evaluation may indicate no requirement for additional enhancement of rehabilitation measures but may demonstrate that more time is required before key criteria for rehabilitation has been achieved. Monitoring of water quality will then also continue for another period to be defined.
- Where other uses are proposed for the site, these will be assessed by Bord na Móna in consultation with interested parties. Other after-uses can be proposed for licensed areas and must go through the appropriate assessment process and planning procedures.

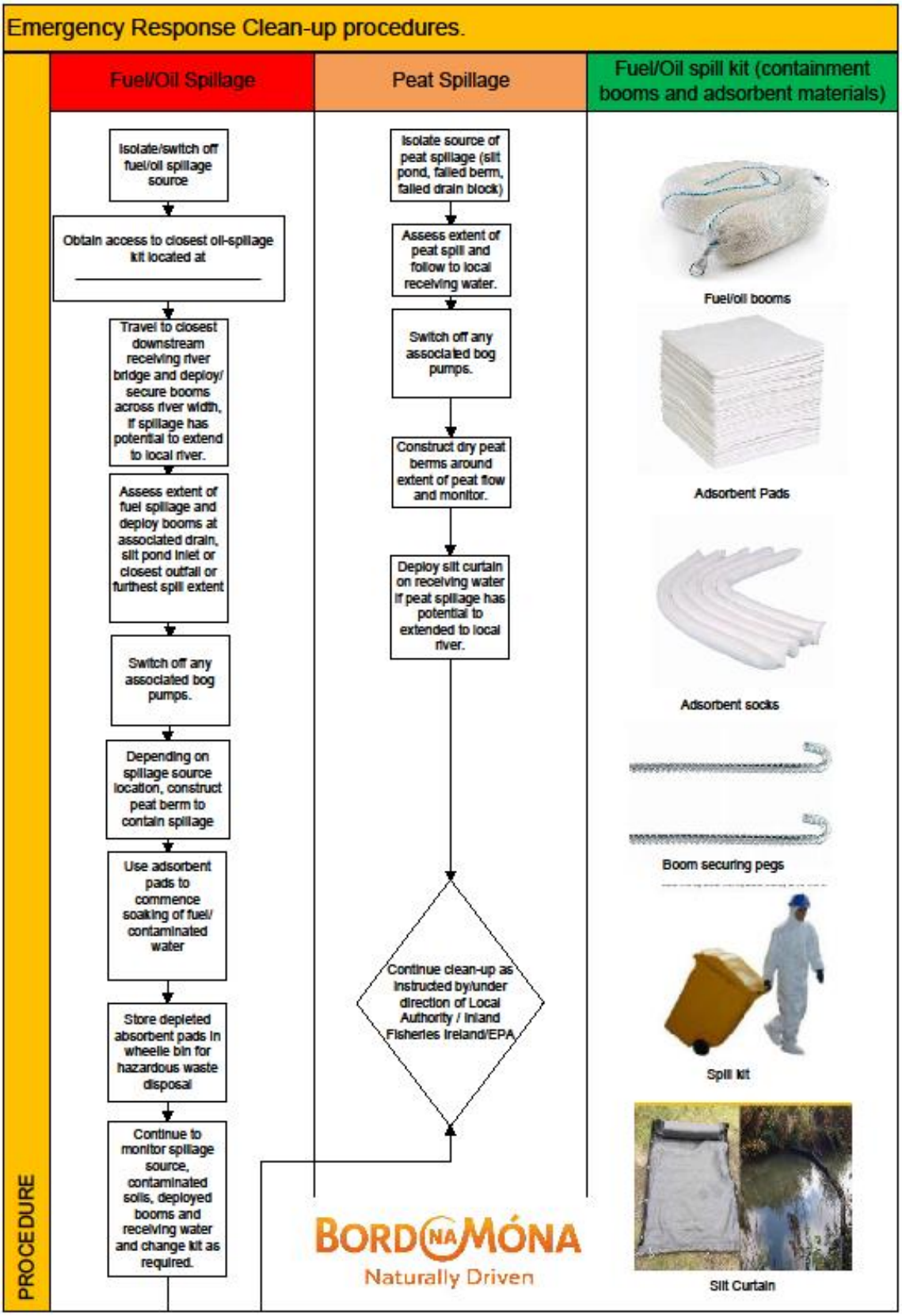
3.6 How any mitigation failure will be addressed

The Mitigation measures prepared specifically for this project have been designed in line with Best Practice and constitute the Best Available techniques following scientific literature and Best Practice. The Mitigation Measures are considered to be robust and proven measures which will avoid adverse effects to European Sites.

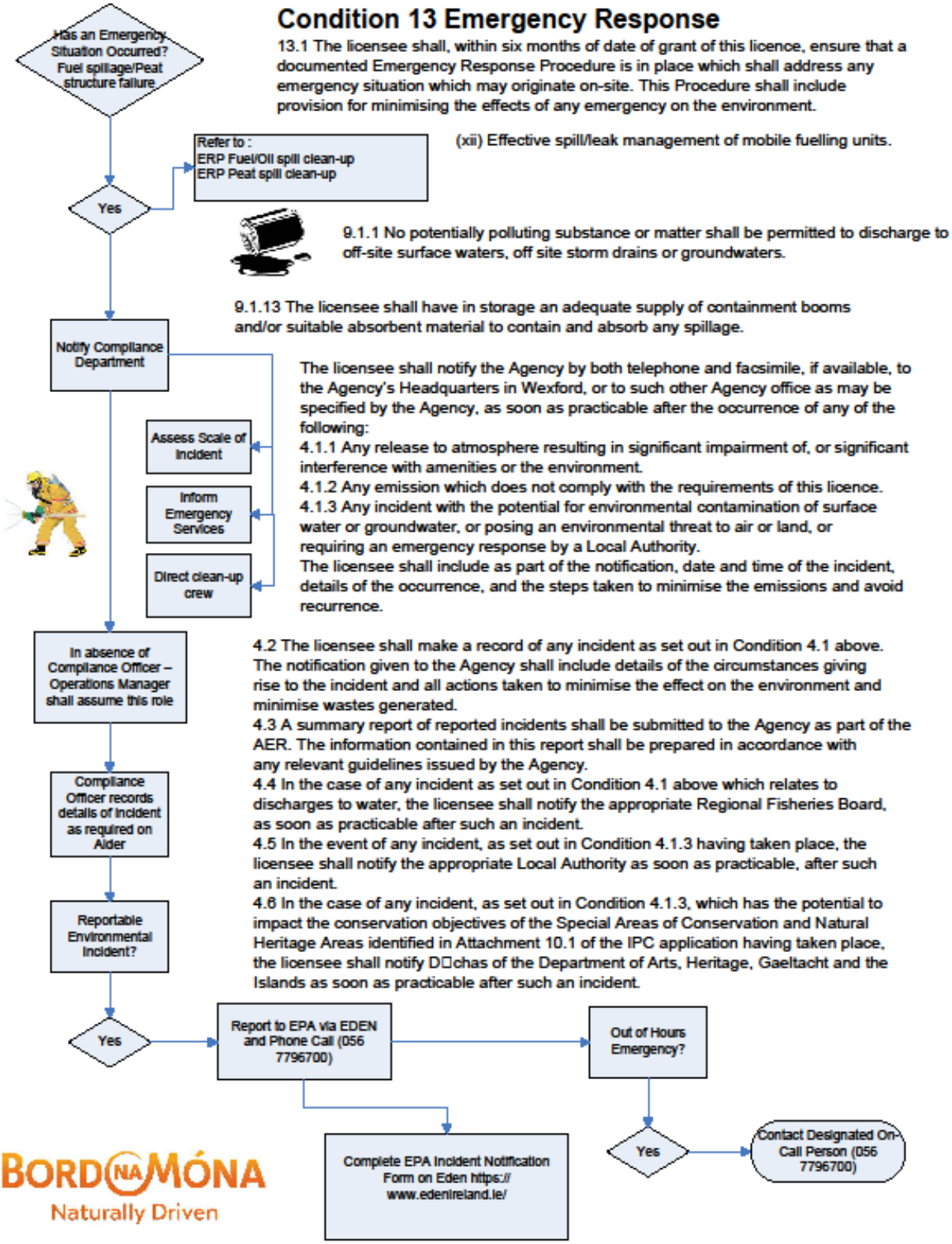
On this basis, it can be confidently concluded that failures in the mitigation measures and their prescribed outcomes will be avoided.

Nonetheless contingency measures will be in place for unforeseen events such as oil/fuel spillages, water pollution or any inadvertent release of sediment. This will ensure any unforeseen potentially adverse effects are identified in a timely manner and appropriate remedial action taken immediately. The Ecologist, Environmental Compliance Officer, Engineer, H & S Manager, Site Supervisor and PSCS will have a ‘stop-works’ authority to temporarily stop works over part of the site to avoid an infringement of the Environmental Commitments or an unforeseen environmental event. Works will not be allowed to re-commence until the issue is resolved.

Appendix 1


Emergency Response Clean-up procedures.
PROCEDURE
Fuel/Oil Spillage
Isolate/switch off fuel/oil spillage source
Obtain access to closest oil-spillage kit located at
Travel to closest downstream receiving river bridge and deploy/ secure booms across river width, if spillage has potential to extend to local river.
Assess extent of fuel spillage and deploy booms at associated drain, silt pond inlet or closest outfall or furthest spill extent
Switch off any associated bog pumps.
Depending on spillage source location, construct peat berm to contain spillage
Use adsorbent pads to commence soaking of fuel/ contaminated water
Store depleted absorbent pads in wheelie bin for hazardous waste disposal
Continue to monitor spillage source, contaminated soils, deployed booms and receiving water and change kit as required.
Peat Spillage
Isolate source of peat spillage (silt pond, failed berm, failed drain block)
Assess extent of peat spill and follow to local receiving water.
Switch off any associated bog pumps.
Construct dry peat berms around extent of peat flow and monitor.
Deploy silt curtain on receiving water if peat spillage has potential to extended to local river.
Continue clean-up as instructed by/under direction of Local Authority / Inland Fisheries Ireland/EPA
BORD NA MÓNA
Naturally Driven
Fuel/Oil spill kit (containment booms and adsorbent materials)
Fuel/oil booms
Adsorbent Pads
Adsorbent socks
Boom securing pegs
Spill kit
Silt Curtain

EP 5.0 General Emergency Response (IPC Licence Condition 13)



Condition 13 Emergency Response

13.1 The licensee shall, within six months of date of grant of this licence, ensure that a documented Emergency Response Procedure is in place which shall address any emergency situation which may originate on-site. This Procedure shall include provision for minimising the effects of any emergency on the environment.

(xii) Effective spill/leak management of mobile fuelling units.

9.1.1 No potentially polluting substance or matter shall be permitted to discharge to off-site surface waters, off site storm drains or groundwaters.

9.1.13 The licensee shall have in storage an adequate supply of containment booms and/or suitable absorbent material to contain and absorb any spillage.

The licensee shall notify the Agency by both telephone and facsimile, if available, to the Agency's Headquarters in Wexford, or to such other Agency office as may be specified by the Agency, as soon as practicable after the occurrence of any of the following:
4.1.1 Any release to atmosphere resulting in significant impairment of, or significant interference with amenities or the environment.
4.1.2 Any emission which does not comply with the requirements of this licence.
4.1.3 Any incident with the potential for environmental contamination of surface water or groundwater, or posing an environmental threat to air or land, or requiring an emergency response by a Local Authority.
The licensee shall include as part of the notification, date and time of the incident, details of the occurrence, and the steps taken to minimise the emissions and avoid recurrence.

4.2 The licensee shall make a record of any incident as set out in Condition 4.1 above. The notification given to the Agency shall include details of the circumstances giving rise to the incident and all actions taken to minimise the effect on the environment and minimise wastes generated.
4.3 A summary report of reported incidents shall be submitted to the Agency as part of the AER. The information contained in this report shall be prepared in accordance with any relevant guidelines issued by the Agency.
4.4 In the case of any incident as set out in Condition 4.1 above which relates to discharges to water, the licensee shall notify the appropriate Regional Fisheries Board, as soon as practicable after such an incident.
4.5 In the event of any incident, as set out in Condition 4.1.3 having taken place, the licensee shall notify the appropriate Local Authority as soon as practicable, after such an incident.
4.6 In the case of any incident, as set out in Condition 4.1.3, which has the potential to impact the conservation objectives of the Special Areas of Conservation and Natural Heritage Areas identified in Attachment 10.1 of the IPC application having taken place, the licensee shall notify D□chas of the Department of Arts, Heritage, Gaeltacht and the Islands as soon as practicable after such an incident.