Appendix 1 - Peatland Carbon Emission Assessment

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Making Sustainability Happen

Revision Record

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Basis of Report

Executive Summary

- This assessment calculates peat-related emissions using an adapted Peatland Code approach and emission factors from the UK Peatland Emissions Inventory rather than volumetric assumptions.
- In response to feedback in relation to transboundary consultation, the approach provides a means to account for peat related emissions as a result of the development by accounting for baseline condition, peat management and extraction related emissions as well as accounting for restoration activities onsite providing a robust estimate of development related peat emissions
- A desk-based peatland condition assessment (PCA) and site survey identified key peatland classes, each with specific emission factors.
- Baseline emissions for the development and compensation areas were estimated at **320.85 t CO_2e** annually (**8983.8 t CO_2e** over the project lifetime).
- Peat excavation increases emissions by **+8088.40 t CO_2e** above baseline over the project lifetime.
- Restoration activities, such as drain blocking and habitat enhancement, are projected to avoid **4413.08 t CO_2e** over the lifetime of the Proposed Development.
- Overall, with a 20% buffer (to account for uncertainties), net emissions increase by **3675.28 t CO_2e**, with planned restoration significantly offsetting peat disturbance impacts.

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Acronyms and Abbreviations

tCO_2e	Tons CO_2 equivalent
$tCO_2eha^{-1}a^{-1}$	Tons CO_2 equivalent per hectare per year
DSF	Dry Stack Facility

1.0 Introduction

1.1 Background

1.1.1 This Transboundary Statement (TBS) is made having regard to the information contained within the Transboundary Representations (TBRs) in relation to the proposed Mine development (Planning Application Ref: LA10/2017/1249/F, PAC Ref C005). This report has been prepared by Dr. [redacted], Principal at SLR. [redacted] holds a BSc (hons) Environmental Geology, an MSc in Geochemistry and a PhD in Earth Sciences, with 10 years of experience in peatland condition and restoration monitoring and assessment, including peer reviewed scientific papers, policy documents, governmental reports and membership of scientific and technical advisory groups.

1.1.2 Whilst relevant TBRS are covered within the Carbon Neutrality Transboundary Statement, this appendix provides context for the concerns with relation to peatland carbon accounting. The relevant TBRs are listed below for ease of reference:

- **Environmental Justice Network Ireland -** poor carbon accounting and no accounting for planned destruction of carbon sinks (protected peatland);
- **Donegal County Council** The mine site will be a highly industrialised site with significant anthropogenic factors impacting the environment. Risks from the construction and operation phases are significantly higher from the mine than the current existing agricultural use. Further to this, t**he level of disruption to the environment that the mine site requires, and the disturbance of significant amounts of blanket bog, will cause more harm in terms of hydrology and carbon footprint than the betterment plan can accommodate for.**
- **1501 Friend of the Earth (Jo) -** There are unassessed **cross border climate impacts on** water abstraction, impoundments, drainage and **peatlands**.
- **TBA1206 - Peatland** is an efficient carbon store so this **carbon would be lost**, adding to climate change and impacting our ability to meet climate targets regionally.
- **TBA1537 -** Failure to account for destruction of peatlands in carbon accounting plans
- **TBA1548** - Environmental Law & Justice Research Group (UCD) - Failure to address the role of peatlands as carbon sink

Furthermore, in the context of assertions of non-compliance by Friends of the Earth with the CCANI, I have interrogated the peat emissions to inform the updated GHG assessment being carried out by Turley and in particular the NI specific emissions. This report also addresses issues with methodologies currently used to assess carbon impacts from peat management activities by applying emission factors which form the basis of UK Land Use, Land-Use Change, and Forestry (LULUCF) sector[1] and Peatland Code[2] assessment of peatland based emissions.

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[1] Evans, C., Artz, R., Moxley, J., Smyth, M-A., Taylor, E., Archer, N., Burden, A., Williamson, J., Donnelly, D., Thomson, A., Buys, G., Malcolm, H., Wilson, D., Renou-Wilson, F., Potts J. (2017). Implementation of an emission inventory for UK peatlands. Report to the Department for Business, Energy and Industrial Strategy, Centre for Ecology and Hydrology, Bangor.88pp.

[2] IUCN UK Peatland Programme (2024) *Peatland Code Version 2.1 - October 2024*. Edinburgh: IUCN UK Peatland Programme

1.2 Proposed Development

1.2.1 Only the Proposed Infrastructure Site and Proposed Compensation areas contain peat: see **Appendix A; Figure 1**.

1.2.2 Whilst peat has been identified within the Proposed Infrastructure Site; and the ecology and depth of peat previously investigated and characterised, the value of the peat areas as carbon sinks and their impact on transboundary issue are raised as issues.

1.2.3 The consideration of these representations included:

- a desk study review of available information; and
- a site reconnaissance and walkover survey.

The TBS presents the consequences for peat-based emissions from the Proposed Development from the information collated and assessment undertaken.

1.2.4 This TBS should be read in conjunction with Hydrology, Hydrogeology and Ecology sections of the Environmental Statement (ES) and Addenda, which provide a background to and assessment of the geological, ecological, hydrogeological and hydrological conditions at the Site.

1.3 Scope and Objectives

This TBS outlines the baseline conditions present within the Proposed Development and aims to identify areas of active peatland. The report has been undertaken in accordance with best practice guidance[3,4,5,6,7].

1.3.1 The report aims to:

1) Responds to the transboundary representations made and issues raised;
2) Determines the baseline emissions across the Proposed Development through a desk-based peatland condition assessment and site validation.
3) Determines the impact of peat management issues and any restoration activities on the carbon balance of the Proposed Development
4) Considers the only other relevant material before the Inquiry for completeness

[3] Burden, A., Radbourne, A., Williamson, J., Evans C., 2020 A rapid method for basic peatland condition and national-scale satellite analysis

[4] Bradley, A.V., Mitchell, E., Dryden, I., Fallaize C., Islam, M,T., Large, D.J., Andersen, R., Marshall C., (In press) Analysis of an InSAR "bog breathing" based classification of peatland condition relative to field observations in Cairnsmore NNR, NatureScot Research Report 1269

[5] Crichton Carbon Centre (2015) Annex 1 Field Protocol and Guidance, Developing Peatland Carbon Metrics and Financial Modelling to Inform the Pilot Phase UK Peatland Code' Report to Defra for Project NR0165.

[6] JNCC. 1994. Guidelines for the Selection of Biological SSSIs. Part 2: Detailed Guidelines for Habitats and Species Groups. Chapter 8 Bogs. JNCC, Peterborough.

[7] SNH Peatland Condition Assessment https://www.nature.scot/sites/default/files/2023-02/Guidance-Peatland-Action-Peatland-Condition-Assessment-Guide-A1916874.pdf [accessed November 2025]

2.0 Peat Related Emissions Calculation

2.1 Approach

2.1.1 This assessment uses an approach based on the Peatland Code adapted to take into account the absence of certain relevant condition classes such as Industrial Peat Cut, Extensive grassland and Heather/Grass dominated Bog within the Code, but which are present on site and within the National Peatland Emissions Inventory[8].

2.1.2 This approach is better than a volumetric loss assumption because whilst emission factors within the UK Peatland Emission inventory are subject to change, they represent a standardised way of calculating emissions and are implemented in UK Land Use, Land-Use Change, and Forestry (LULUCF) sector emissions reporting and in UK government backed Peatland Code Carbon Credits[9].

Volumetric calculations are much less evidenced, with requirements including current bulk density, degree of oxidation, hydrological flow pathways, gas content, exact reuse technique and the carbon implications either not routinely collected and/or not sufficiently understood to provide a credible measure of carbon emissions/volume. This then leads to unsupported assumptions of 100% loss, particularly where in the few studies covering storage and peat management activities suggest carbon losses are likely to be at 90% retention rather than loss[10].

2.2 Methodology

The approach used a desk-based peatland condition assessment to identify hydrological features for which an emission factor can be applied, and which was then validated in July 2025 during a site walkover survey as outlined in the Peatland Code 2.1 Field Protocol[11] **(Appendix A; Figure 2 & 3**).

2.2.1 The site walkover identified four main condition classes present on site. These are listed in Table A. These emission factors form the basis for UK LULUCF[12] reporting and the updated Peatland Code 2.1[29]

Table A: Emission Factors used within the Assessment

Condition Class	Emission Factor ($tCO_2eq\ ha^{-1}a^{-1}$)	Source
Drained Artificial	3.32	Evans et al., (2023)[17]
Drained Hagg/Gulley	2.51	Evans et al., (2023)

[8] Evans, Chris ; Artz, Rebekka; Burden, Annette ; Clilverd, Hannah ; Freeman, Ben; Heinemeyer, Andreas; Lindsay, Richard; Morrison, Ross ; Potts, Jackie; Reed, Mark; Williamson, Jennifer . 2023 Aligning the Peatland Code with the UK Peatland Inventory [Final report]. London, Department for Environment, Food & Rural Affairs, 55pp.

[9] IUCN UK Peatland Programme (2024) Peatland Code: Guidance Version 2.1. Edinburgh:

[10] Detrey, I.R. (2022) Bog in a Box: Is Long Term Peat Storage for Future Restoration Viable? Doctoral thesis, University of the Highlands and Islands. Available at: https://pure.uhi.ac.uk/en/studentTheses/bog-in-a-box/ (Accessed: 4 November 2025)

[11] IUCN UK Peatland Programme (2024) *Peatland Code Field Protocol v2.1: Assessing eligibility, determining baseline condition category and monitoring change*. Available at: www.iucn-uk-peatlandprogramme.org

[12] **National Atmospheric Emissions Inventory (NAEI) (2024)** *Projections of Emissions and Removals from the LULUCF Sector to 2050/2100*. Available at: https://naei.energysecurity.gov.uk/sites/default/files/2025-01/LULUCF_Projections_2022i.pdf [Accessed 2 December 2025].

Condition Class	Emission Factor ($tCO_2eq\ ha^{-1}a^{-1}$)	Source
Heather/Grass Dominated Bog	3.32	Evans et al., (2023)
Extensive Grassland on Peat	15.88	Evans et al., (2023)
Industrial Peat Cut	18.82	Evans et al., (2023)
Modified Rewetted	0.32	Evans et al., (2023)

A baseline emission for the Site was calculated for peatland areas to determine the pre-construction carbon emissions from the infrastructure and compensation area. This assumes an area of drainage influence around drainage features of 30m within the Drained Artificial and Drained Hagg/Gulley Class. This is consistent with the approach in the Peatland Code.

Avoided Emissions were calculated by determining the areas present within the retained enhancement areas and the peat compensation areas. For example, drained artificial peatland targeted for drain blocking would be expected to move towards a Modified Rewetted condition, representing a 10.375 times reduction in emissions compared to baseline[17].

Peat Management related emissions were calculated compared to the baseline. Emission factors based on a proxy of industrially cut peat are considered a suitable proxy, because that involves similar disturbance to those likely to be experienced during excavation. Areas of excavated peat are considered in the model to be converted to industrial peat cut condition for a period of 5 years. These areas are then replaced by extensive grassland (the target for soils on the dry stack) after 5 years for the remaining duration of the project to reflect revegetation of the surface and settlement.

Overall emissions relative to baseline were then calculated by subtracting baseline emissions within excavated peat areas from the higher assumed emissions from peat management. Emissions reductions from restoration were then subtracted from that of peatland management to determine the overall annual carbon impact of peat activities associated with the Proposed Development. As used in the Peatland Code[28], a 1.2 times buffer was used to model carbon leakage and ensure annual emissions were fully captured and were available to be offset.

2.3 Baseline Peatland Condition and Emissions

2.3.1 Peatland Condition within the Proposed Development is dominated by peatland in Drained Artificial, Modified (Heather/Grass Dominated Bog) and extensive grassland. The key drivers of peat condition are historical peat-cutting, hill drainage, and agricultural conversion (**Appendix A; Figure 2 & 3**). None of the site is in near natural condition.

2.3.2 Peatland within the Proposed Infrastructure Site comprises approximately 24.315 ha in a Drained Artificial Condition, 9.011 ha of modified (Heather/Grass Dominated Bog) and 4.329 ha of extensive grassland on peat.

2.3.3 Within this area approximately 12.722 ha is in drained artificial condition, 4.195 ha in modified (Heather/Grass Dominated Bog) condition and 3.155 ha of extensive grassland on peat is targeted for excavation on site, with the remainder forming part of an ecological enhancement area as part of the habitat management proposals.

2.3.4 Peatland within the Proposed Compensation Area comprises approximately 36.029 ha of drained artificial peatland with 6.717 classified as modified (Heather/Grass Dominated Bog).

2.3.5 Using these classifications and emission factors derived from the UK Peatland Emission inventory (summarised in **Table B**) baseline emissions from the Proposed Development were calculated, indicating baseline emissions of **320.85 tCO_2 e $ha^{-1}a^{-1}$** with total emissions over the Proposed Development lifetime of **8983.8 t CO_2e**.

Table B: Baseline Emissions Summary in Infrastructure Development Area and Compensation Area

Site Area	Sub-Area	Annual Baseline Emissions ($tCO_2eq\ ha^{-1}a^{-1}$)
Infrastructure Development Area	Peat Excavation	106.26
	Enhancement Area	72.68
Compensation Area	Compensation Area	141.92
Total Annual Emissions		320.85
Total Emissions (28 years)		8983.8

2.3.6 The incorporation of peatland condition into the measures of baseline emission from peat indicates background emissions are more than twice that predicted using the volumetric approach.

2.4 Peat Management Related Emissions

2.4.1 By using emission factors from industrially cut peatland as a proxy for peat management, the impacts on peatland emissions were calculated and are summarised in **Table B**. As an additional step a buffer of approx. 1.2 times the projected emissions was implemented in line with other schemes such as Peatland Code[28].

2.4.2 Peat Management activities on site are calculated to increase emissions from the excavated peatland within the first 5 years by **347.04 t CO_2 eq a^{-1}** (**Table C**) compared to Baseline emissions (**Table B**).

After 5 years it is expected that revegetation will occur and given the targeted habitats on the dry stack resemble extensive grassland on peat, it is expected that emissions will decrease from those similar to industrial peat cutting and converting to extensive grassland. This reduces annual emissions to **276.23 t CO_2 eq a^{-1}** (**Table C**) and compared to baseline emissions (**Table B**). Whilst it is expected that revegetation would occur faster than 5 years post restoration, 5 years represents a conservative estimate. After 25 years, approximately **+8088 .4 tCO_2e** is likely to be generated above those expected within a no development scenario.

Table C: Peat Management Emissions Summary

Site Area	Years since excavation	Emissions Factor	Annual Baseline Emissions ($tCO_2eq\ a^{-1}$)	Change vs Baseline ($tCO_2eq\ a^{-1}$)
Peat Management	0 – 5	18.82	377.76	+347.04
	5 – 28	15.88	318.74	+276.23
Lifetime additional emissions				**+8088.40**

Using this approach compared to the volumetric approach, even whilst applying a conservative 20% buffer to account for uncertainties, indicates peat management related emissions indicate a carbon retention of approximately 80%.

The result of this analysis is entirely in keeping with the empirical data regarding peat storage, which indicates 90% retention over periods of 50 years and shows that the volumetric approach is not grounded in real world conditions, whereas an emission factor based approach such as is used in LULUCF sector and National Peatland Inventory

Reporting[13] and within the Peatland Code[14] can better simulate the impacts of peat management.

2.5 Proposed Restoration Activities

2.5.1 Using emission factors reflecting changed peatland condition associated with the restoration of Proposed Habitat Enhancement and Compensation Areas (defined as part of Habitat Management Plans), avoided emissions were calculated and are summarised in **Table D**. In order to account for areas of failed restoration, a buffer of approx. 20% of the projected emissions is applied to ensure emission reductions are truly estimated in line with the Peatland Code methodology.

2.5.2 Given much of the Site is in drained artificial condition, dominated by drains, rewetting by zippering and wave damming is assumed. These represent well understood techniques with a high success rate. Areas of extensive grassland would also be targeted for conversion to modified heather/grass dominated bog through drain blocking, removal of all fertiliser application and grazing, as well as seeding with peatland species with the additional benefit of nutrient neutrality. An additional Compensation Area has been targeted for drain-blocking and peat cut restoration, to repair the impacts of drainage and rewet the underlying peatlands (**Appendix A; Figure 4**).

2.5.3 The impact of peatland restoration within retained peats within the Proposed Infrastructure Area and Compensation Area is likely to result in **157.61 tCO_2 eq a^{-1}** reduction in emissions from the Site, equating to approximately **-4413.08 tCO_2e** over the lifetime of the project.

Table D: Post-Restoration Emissions from Planned Restoration Activities on Site

Site Area	Annual Emissions ($tCO_2eq\ a^{-1}$)	Change vs Baseline ($tCO_2eq\ a^{-1}$)
Enhancement Area	23.15	-49.52
Compensation Area	33.83	-108.09
Total Annual Emissions	56.98	-157.61
Total Emissions (Project Lifetime)	1595.44	-4413.08

2.6 Overall Peat Carbon Balance

2.6.1 When baseline emissions, peat management related emissions and avoided emissions associated with planned restoration are combined with a 20% buffer, to account for uncertainty, peat emissions are predicted to increase by **3675.28 tCO_2 eq** over the Proposed Development lifetime (Table E). Without the application of a precautionary buffer, there would be a net loss of **1831.31 tCO_2 eq** over the Proposed Development lifetime.

[13] Evans, Chris ; Artz, Rebekka; Burden, Annette ; Clilverd, Hannah ; Freeman, Ben; Heinemeyer, Andreas; Lindsay, Richard; Morrison, Ross ; Potts, Jackie; Reed, Mark; Williamson, Jennifer . 2023 Aligning the Peatland Code with the UK Peatland Inventory [Final report]. London, Department for Environment, Food & Rural Affairs, 55pp.

[14] IUCN UK Peatland Programme (2024) Peatland Code: Guidance Version 2.1. Edinburgh:

Table E: Peat Land Use Related Emissions Over the Proposed Development Lifetime

Site Area	28 year Emissions (tCO_2eq)
Baseline Emissions	**8983.8**
Peat Management Related Emissions (Relative to Baseline) Site Lifetime	**+8088.40**
Peat Restoration Avoided Losses	**-4413.08**
Net Emission with 20% buffer	**+3675.28**

2.6.2 This shows that whilst proposed peat management contributes negatively to the carbon balance within the Proposed Development, this is offset by proposed habitat restoration activities on site. Further, to achieve a net balance, approximately 354 ha of restoration from drained artificial to modified rewetted (achieved by drain blocking) would be required to offset peat-based emissions from the Proposed Development.

2.6.3 Previous estimates:

- Underestimate existing baseline emissions across the Proposed Development.
- Overestimate carbon losses from peat management by using theoretical maximum values not grounded in empirical data.
- Ignore the impact of restoration works by dismissing them as not being feasible without thorough analysis.

2.6.4 As a result, this has resulted in an unsupported estimate of peat-based emissions, which is almost an order of magnitude greater than might be expected.

2.6.5 The results of this assessment are broadly in line with measures of peat retention within peat storage, utilises methodologies used to determine carbon impacts which are based on empirical data and form the basis of National Peatland Carbon Inventory Reporting[17] and Voluntary Carbon Credits under the Peatland Code[19] and incorporates the positive carbon benefits of wider restoration and enhancement opportunities within the Proposed Development.

2.6.6 By applying an adapted Peatland Code methodology and UK Peatland Emissions Inventory emission factors, this assessment provides an accurate and empirical evidence-based estimate of emissions from peat and addresses the issues raised in the TBRs identified above. While peat excavation increases emissions, planned restoration measures significantly offset these impacts, resulting in a net increase of approximately **3675.28 tCO_2e** over the project lifetime.

3.0 Existing Estimate of Peatland Emissions before the PI

3.1.1 The approach adopted above is more appropriate and robust than Nature Positive Carbon and Greenhouse Gas Impact Statement of Case (hereafter referred to as the Nature Positive report) prepared for Fermanagh and Omagh District Council uses a volumetric approach to calculate peat emissions derived from figures provided within the 2017 Peat Management Plan (PMP)[15].

3.1.2 This is derived from the Scottish Governments Carbon Calculator tool[16] which gives an assumed carbon concentration, peat density, volume removed during construction and an assumed loss rate. These inputs are used to provide an indication of the size of the peat reservoir disturbed and an estimate of emissions, based on the presumed peat loss rate.

3.1.3 This produces estimates of between **23,000** to **32,926 t CO_2e** associated with the excavation, minus an indicative baseline emission from the area of approximately **4960 t CO_2e**.

3.2 Limitations of a Volumetric Approach to Peat Management Emissions

The volumetric approach used within the Nature Positive report provides only a high-level reporting and represents a simple model of peat decomposition. The approach is based on a protocol that has not ostensibly changed since 2014. A 2025 evidence assessment by the Scottish Government's independent research organisation, ClimateXChange[17] found that many assumptions and emission factors are outdated, contrary to the Nature Positive assertion that this represents 'the best currently available method to calculate emissions from land use change on peat rich sites in the UK'.

Further, whilst a formal replacement has not been created and legacy versions of the Carbon Calculator are still being used as the requirement has not been superseded for renewable development in Scotland, it is not currently accessible from the SEPA website and industry has begun to use in-house alternatives which represent a means to better reflect current peat management practices on site, whilst still relying on volumetric approaches to estimate carbon losses.

3.2.1 The volumetric approach has a number of limitations and built in assumptions which make it a poor indicator of actual emissions, set out below.

Lack of empirical basis for calculations

3.2.2 The basis for the carbon loss is based on a theoretical maximum, rather than empirical data . using It does not use emission factors used for national and international emission reporting on annual emissions and is not grounded in real world measurements from a variety of land-use classifications.

3.2.3 The model includes only basic parameters such as carbon content and density, which are largely assumed (as is the case within the FODC statement of case[18]). It then assumes a carbon loss associated with peat management which have not been measured and assumes that any restoration activities would not offset carbon emissions without providing evidence to support this.

3.2.4 The presumed carbon contents and densities represent those of active peatlands. Given that all the peats within the infrastructure development areas are now in a modified, drained artificial, drained eroded or converted into intensive grazing, these values are unlikely to be correct as this is not factored into the carbon calculations.. In summary the peat on site is in a degraded condition contrary to the assumptions in the Nature Positive report and is actually emitting carbon as opposed to actively storing it

3.2.5 Degraded peat is characterised by higher bulk densities, lower Total Organic Carbon (TOC), reduced water tables and reduced hydrological connectivity/porosity[19]. Oxidised peat is also likely to feature more recalcitrant material and decompose at different rates to freshly drained peats, which does not feature within the carbon loss calculation[20].

3.2.6 Peat soils represent a complex system with decomposition dependent on numerous factors including water table, porosity, hydrological connectivity, compaction, source material, balance of vascular and non-vascular plants, climate (soil temperature, soil moisture), bacterial communities[21], peat thickness and oxidation history, peat structure and humification as well as consideration of land management factors.

Calculation of baseline condition

3.2.7 The FODC calculations[13] provide an estimate of baseline emissions within the footprint of peat extraction activities, however retained peats within both the proposed enhancement areas and compensation areas are not included. In order to examine whether carbon neutrality has been achieved, it cannot be assumed that:

1) peatland present on site is active e.g. actively sequestering carbon; and
2) peat condition and therefore emission factors can be calculated without a peatland condition assessment.

3.2.8 Peatland Condition Assessment (Appendix A; Figure 2 & 3) of the Site shows that no areas of peat within the infrastructure development areas, enhancement areas or compensation areas is in near natural condition. The majority of these areas are in a drained artificial, drained eroded or modified state as a result of historical peat cutting, drainage and grazing. Within the lower ground areas of agricultural conversion to intensive grazing and forestry have also occurred.

3.2.9 All condition classes identified are classified within the UK peatland emissions inventory as being net emitters of carbon. This is also true of the wider landscape where similar land use profiles are present. The FODC report[22] although recognising some areas of retained peat are net emitters in a baseline scenario, do not provide the basis for the emission factors used. The report also does not incorporate peat emissions across the entire area, which are much greater than the 15.9 ha excavated, and should be incorporated into any estimates of site scale land-based emissions.

3.2.10 This is particularly important as the proposed ecological enhancement and compensation activities are likely to result in avoided emissions, relative to baseline emissions and therefore form part of the net land-based carbon emissions generated on site. Peatland restoration and rewetting also has other ecosystem service benefits including preserving any in-situ archaeological remains, reducing dissolved organic and particulate content offsite, improving water quality offsite as well as boosting biodiversity and habitats on site.

Impact of restoration on site

3.2.11 Contrary to the FODC's assertion[23] that restoration activities planned on site (Appendix A; Figure 4) would not result in any net improvement in carbon emissions, such activities are widely recognised as an accepted form of carbon emission reduction through avoided emissions. This means avoided emissions are not included at all within the FODC estimates, making the estimates presented incomplete.

3.2.12 Further restoration of peatlands through rewetting and revegetation forms the basis of not only government funded grant schemes such as the Scottish Governments Peatland Action Programme and a major component of National Peat Strategy including DAERA's Northern Ireland Peat Strategy to 2040[24]. It also forms the basis for both the UK's Peatland Code[25] and also Peatland Finance Ireland[26].

3.2.13 Whilst restoration for commercial projects does not provide the additionality required for such voluntary carbon schemes, it does provide avoided emissions reductions compared to baseline. For example, restoration of peatland in drained artificial condition to drained rewetted condition represents an approximate **3 t CO_2 e /ha** decrease in annual emissions (**Table A**).

3.2.14 These can be easily achieved through well-established techniques, for example drain blocking which with appropriate monitoring, reporting and validation (MRV) should contribute to the overall land-use carbon balance on site.

Carbon Retention

3.2.15 The assumptions within the Nature Positive report regarding 77% to 100% loss are not evidenced. They also assume instantaneous emissions upon excavation; however this is not the case. Given the presumed **37,885 t CO_2 e** modelled from the excavation of 16.99 ha and an emissions factor equivalent to that found in other bare peat settings e.g. industrial peat extraction, it would take more than 70 years to exhaust the predicted carbon stock.

3.2.16 Empirical measures on the controls of decomposition rate on peat on a volumetric basis are rare and exclusively within lab settings[27,28]. Measurements of the impact of peat management on emissions on a volumetric basis have not been conducted, particularly given many best practice approaches have been developed in the last few years and are not present in guidance. These aim to minimise storage and ensure peat stores are kept wet, which would reduce peat carbon emission impacts.

3.2.17 Given any extracted peat is targeted for rehabilitation of the dry storestack, with the aim of producing a heath surface or to a lesser extent, rehabilitating former peat cuts, modelling total loss whilst appropriate if the peat was combusted is overly conservative.

3.2.18 The conservative nature of this approach is also exemplified by existing conditions on site. Many of the land management activities on the Proposed Development site are as intensive or more so than as the peat management option proposed within the PMP. For example, widespread peat removal and turnover has been a feature of the landscape for at least the last century, as evidenced by the presence of extensive peat cutting, tree planting on deep peat and conversion of the lower slopes by peat removal, drainage, ploughing, fertilisation and reseeding. Given the longevity of the management activities (>100 years) it would be expected that peat would have disappeared, however peat remains on site in all but the locations where peat was physically removed for animal bedding and fuel. This indicates that: 1) oxidative loss is not a linear process with time since disturbance as described in the literature[29]; and 2) that revegetation of the bare surface is likely to reduce the rate and impact of disturbance over time.

Whilst there is limited research into the long-term storage of peat, these do not support the conclusion that between 77-100% of peat is lost at the point of excavationis . For example, over timescales of 50 years, a study of peat storage in Shetland[30] showed that whilst long term storage was not favourable in producing restoration ready peat, due to inconsistent water tables, changes in microbial biomass and mixing with mineral matter, the study concluded that retention of carbon was successful during the peat storage after excavation.

3.2.19 The amount of peat contained within the stores was estimated to be between 586,000m^3 and 672,000m^3 between 3.53.5 and 4 times that within the Proposed Development. This represents was calculated as a potential carbon reservoir of around 11,4,900 t. Using a conservative estimate based on all subsidence being classed as oxidative loss, the carbon loss from the two stores was estimated to be around 12300 t over 50 years, representing less than around 10% of the total carbon store. Further, much of the observed compaction is likely to have been the result of primary and secondary consolidation, rather than oxidative loss, despite imperfect preservation conditions within the peat store.

3.2.20 The results from the study[30] of peat storage represents a carbon retention rate of around 90% post excavation rather than the presumed total loss used in the FODC[19] representations of between 77 and 100% with the proposed storage period primarily within the construction phase, which at maximum would represent a tenth of the storage period observed within the Shetland study[30]. This clearly demonstrates the lack of scientific basis for the retention estimates used in the FODC calculations[19].

3.3 Conclusions

Overall the FODC[31] answers the wrong question when applied to emissions calculation, it succeeds in giving an indication of the size of the reservoir affected by the peat management activities within the Proposed Development. However by failing to consider the rates of carbon loss, the controls on peat decomposition and empirical data on degraded peatland emissions alongside an assumption that the area of peatland is active (eg. is sequestering carbon) the author is forced to rely on unsubstantiated estimates of peat retention which are highly conservative and subjective. The approach also fails to account for the positive benefits of proposed restoration activities on the site. Consequently, we do not believe the assessment to be an accurate reflection of the peat land use related emissions from the Proposed Development and propose an emissions based approach to more accurately assess peatland emission impacts.

3.3.1 In relation to the transboundary responses, we present a detailed assessment of baseline and post construction emissions grounded in real world measures of annual peatland emissions which form the basis of international and national LULUCF reporting using accepted methodologies within the voluntary carbon credit sector namely Peatland Code. This incorporates the impacts of restoration and peat management activities and aligns with current empirical measures of carbon retention from peat management activities.

3.3.2 With specific relation to the TB comments and feedback in relation to peatland carbon accounting;

- **Environmental Justice Network Ireland -** poor carbon accounting and no accounting for planned destruction of carbon sinks (protected peatland) –

As explained above, the approach accounts for baseline condition, peat management and extraction related emissions as well as accounting for restoration activities onsite providing a robust estimate of development related peat emissions.

- **Donegal County Council** The mine site will be a highly industrialised site with significant anthropogenic factors impacting the environment. Risks from the construction and operation phases are significantly higher from the mine than the current existing agricultural use. Further to this, the level of disruption to the environment that the mine site requires, and the disturbance of significant amounts of blanket bog, will cause more harm in terms of hydrology and carbon footprint than the betterment plan can accommodate for -

As explained above, the approach accounts for baseline condition, peat management and extraction related emissions as well as accounting for restoration activities onsite providing a robust estimate of development related peat emissions. It indicates that there will be a smaller net loss of peat carbon than estimated previously and suggests potential offsite and onsite approaches to accommodate this

- **1501 Friend of the Earth (Jo)** - There are unassessed cross border climate impacts on water abstraction, impoundments, drainage and peatlands. **–**

  As explained above, the approach accounts for baseline condition, peat management and extraction related emissions as well as accounting for restoration activities onsite providing a robust estimate of development related peat emissions

- TBA1537 - Failure to account for destruction of peatlands in carbon accounting plans -

  As explained above, the approach accounts for baseline condition, peat management and extraction related emissions as well as accounting for restoration activities onsite providing a robust estimate of development related peat emissions.

- TBA1548 - Environmental Law & Justice Research Group (UCD) - Failure to address the role of peatlands as carbon sink -

  As explained above, the approach accounts for baseline condition, peat management and extraction related emissions as well as accounting for restoration activities onsite providing a robust estimate of development related peat emissions.

Appendix A Figures

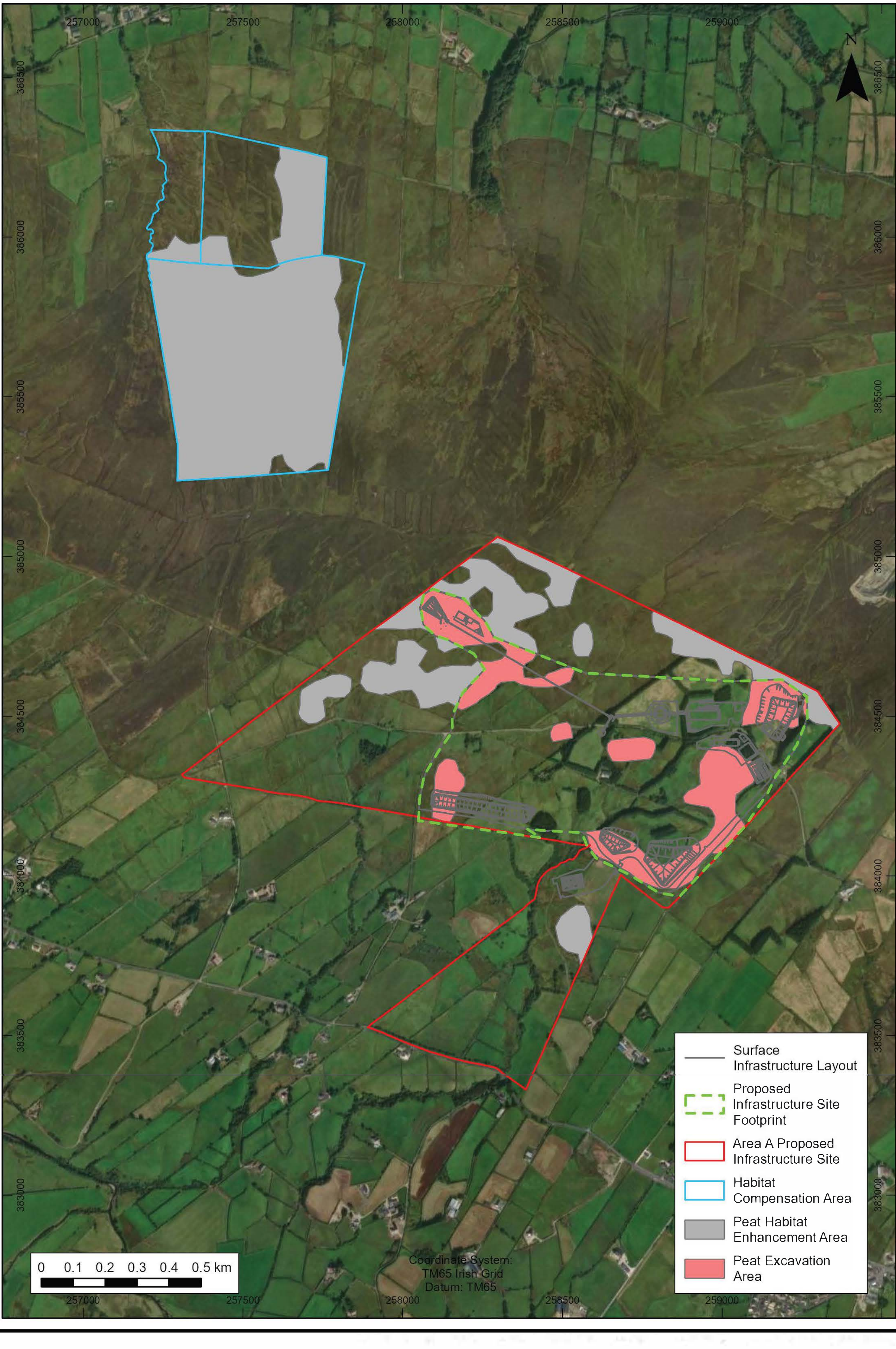
Appendix 1 - Peatland Carbon Emission Assessment

Currighinault Project

Dalradian Resources Ltd

SLR Project No.: 428.013424.00001

2 December 2025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Surface Infrastructure Layout
Proposed Infrastructure Site Footprint
Area A Proposed Infrastructure Site
Habitat Compensation Area
Peat Habitat Enhancement Area
Peat Excavation Area
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Coordinate System: TM65 Irish Grid
Datum: TM65


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Surface Infrastructure Layout
Hill Drains
Vegetated Gulley
Proposed Infrastructure Site Footprint
Area A Proposed Infrastructure Site
Extensive Grassland
Rough Grazing
Habitat Compensation Area
Peat Cut
Peat Habitat Enhancement Area
Peat Excavation Area
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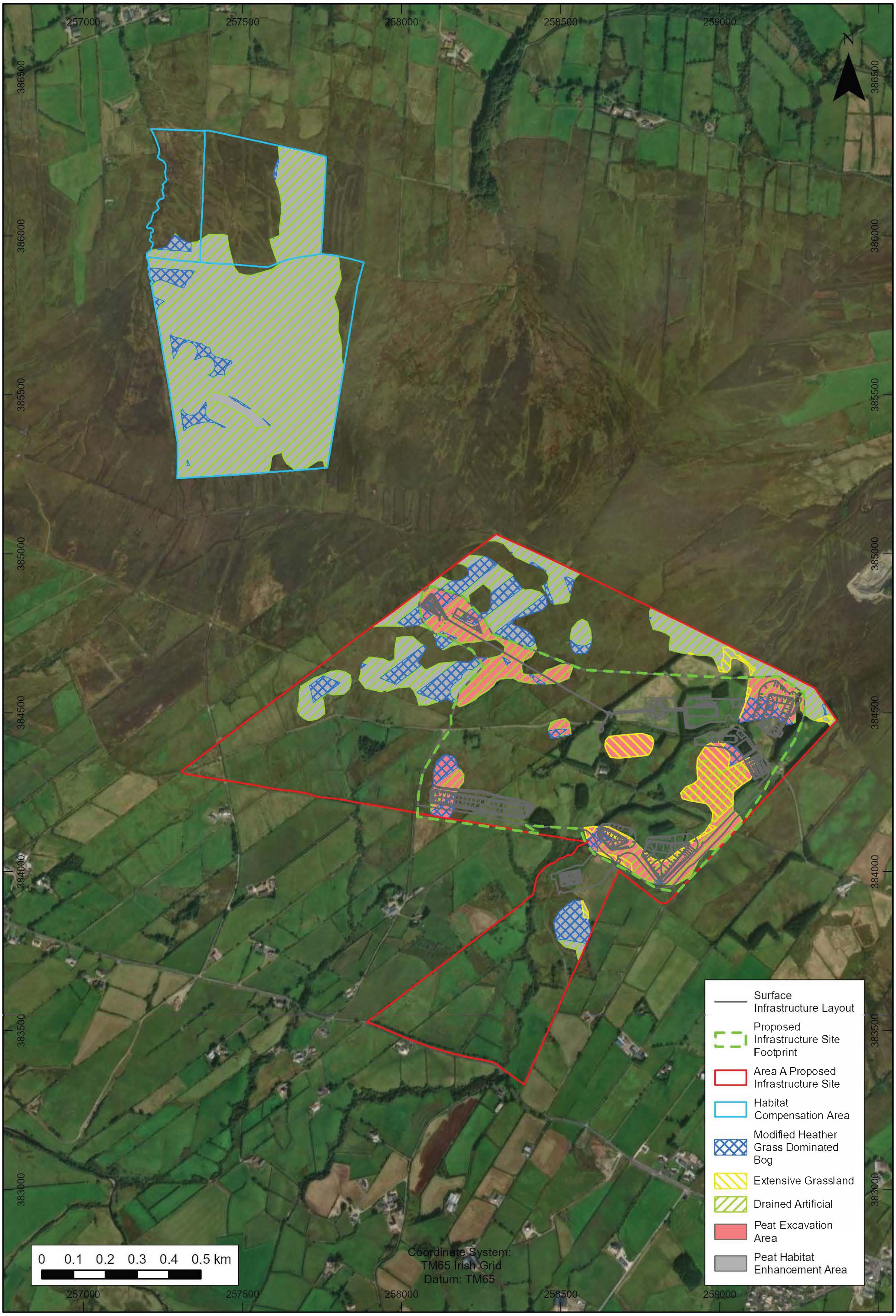

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Surface Infrastructure Layout
Proposed Infrastructure Site Footprint
Area A Proposed Infrastructure Site
Habitat Compensation Area
Modified Heather Grass Dominated Bog
Extensive Grassland
Drained Artificial
Peat Excavation Area
Peat Habitat Enhancement Area
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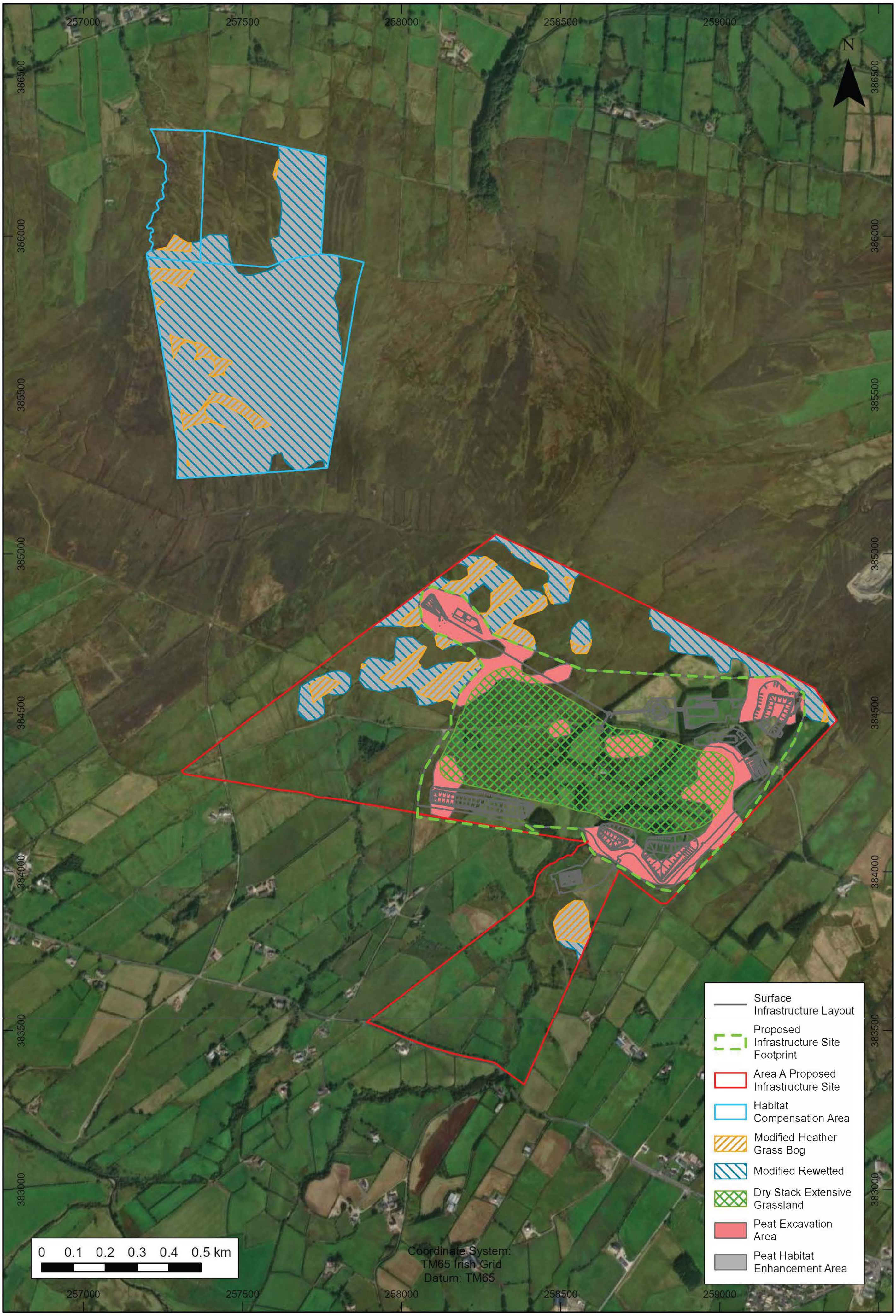
Coordinate System: TM65 Irish Grid
Datum: TM65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Surface Infrastructure Layout
Proposed Infrastructure Site Footprint
Area A Proposed Infrastructure Site
Habitat Compensation Area
Modified Heather Grass Bog
Modified Rewetted
Dry Stack Extensive Grassland
Peat Excavation Area
Peat Habitat Enhancement Area
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Coordinate System: TM65 Irish Grid
Datum: TM65

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