Dean Moor
Solar Farm

Environmental Statement: Appendix 8.4 – Otter and Vole Survey Report

on behalf of **FVS Dean Moor Limited**

March 2025
Prepared by: Stantec UK Ltd
PINS Ref: EN010155
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Firma Energy

ib vogt

Dean Moor
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Otter and Water Vole Survey Report

Appendix 8.4

March 2024

DEAN MOOR SOLAR FARM

OTTER AND WATER VOLE SURVEY REPORT

APPENDIX 8.4

PREPARED ON BEHALF OF FVS DEAN MOOR LIMITED

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1 Introduction

1.1 Overview

1.1.1 This report presents the results of an otter and water vole survey for the Dean Moor Solar Farm (the Proposed Development), commissioned by FVS Dean Moor Limited. This Otter and Water Vole Survey Report forms Appendix 8.4 of Chapter 8 – Biodiversity of the PEIR for the Proposed Development.

1.1.2 The Proposed Development is located on land between the villages of Gilgarran and Branthwaite in West Cumbria (the Site) which is situated within the administrative area of Cumberland Council (the Council).

1.1.3 The purpose of the otter and water vole survey is to identify the presence of these species across the Site, and the potential for the watercourses to support these species. The results will be used to inform the ecological impact assessment, as well as the evolving design of the Proposed Development.

1.2 Site Location and Description

1.2.1 The Site is 279.50 hectares ('ha') in area and is located between the villages of Gilgarran and Branthwaite in West Cumbria (PEIR Figure 1.1). The Site is bisected by a minor road that runs between Gilgarran and Branthwaite Edge hereafter referred to as the "Gilgarran Road".

1.2.2 The Site is predominantly pasture that is grazed by sheep. It is generally drained by a series of unnamed minor watercourses which run broadly south to north and west to east in Area C. The watercourses coalesce near Branthwaite Rigg and flow north to ultimately join the River Derwent.

1.2.3 The land within the Site has a varied topography with steep-sided hills associated with Thief Gill in Area C; and flat land to the north, east and west around Areas A and B. Small areas of plantation woodland are present in and adjacent to Areas A and B.

1.2.4 Land surrounding the Site is dominated by grazing pasture and arable farmland, with large areas of plantation woodland also located north, east and west of the Site.

1.3 Proposed Development

1.3.1 The Proposed Development comprises the proposed construction, operation and maintenance, and decommissioning of a renewable energy generating project on 279.50ha of land between the villages of Gilgarran and Branthwaite in West Cumbria.

1.3.2 The Proposed Development will have the capacity to export up to 150MW of electricity at any time. The generating station would also involve the construction and operation of up to 100MW of BESS.

1.3.3 A concept layout of the Proposed Development is presented in the PEIR (Figure 3.1). Site areas are shown on PEIR Figure 3.3.

1.4 Report Objectives

1.4.1 The objectives of this report are to:

- Outline survey methodologies and relevant survey guidance; and
- Detail the results of the survey.

2 Methods

2.1 Field Survey

2.1.1 Surveys of otter *Lutra lutra* and water vole *Arvicola amphibius* were undertaken following industry guidance[1],[2].

2.1.2 The survey covered three watercourses and four ponds within or adjacent the Site. Three of the four ponds are in or adjacent Areas A and B, while the watercourses and the remaining pond are within Area C of the Site (Figures 1-3). The pond in Area C is ephemeral and was dry during the otter and water vole surveys.

2.1.3 Each of the watercourses was divided into subsections for ease of description and survey, as well as to reflect occasional changes in characteristics. The watercourses were divided into the following subsections: 1a, 1b, 2a, 2b, 2c, 2d, 2e, 3a, and 3b (Figure 2). Photographs of each watercourse subsection are provided at the end of this report (Photographs 6-14).

2.1.4 Ponds on the Site are labelled Pond 1, Pond 2, Pond 3, and Pond 4 (See Figures 1-3). Photographs of ponds present during the otter and water vole surveys are shown in Section 5 (Photographs 15-17).

2.1.5 Target Notes were produced to describe obvious features of the watercourses and their banks such as water flow rate, bankside vegetation composition, areas of dense vegetation cover, and apparent localised pollution. Target Note descriptions are in Table 3 and their locations are shown on Figure 3.

2.1.6 Surveys were carried out in suitable weather conditions. The amount of rainfall prior to each survey was considered when planning, to ensure that surveys were not undertaken when the water levels were high (which

[1] Ecology of the European otter. (2003). Chanin, P. Conserving Natura 2000 Rivers Ecology Series.10. Peterborough, English Nature

[2] The Water Vole Mitigation Handbook. (2016) Dean, M, Strachan R., Gow, D. and Andrews R, (2016). Published by the Mammal Society.

would result in field signs being lost or obscured). Dates of the survey visits and weather conditions are provided in Table 1.

Table 1: Otter and water vole survey details

Visit no.	Date	Cloud cover (oktas)	Temperature	Wind speed	Precipitation
1	06/07/ 2023	8	14 °C	2F	None
2	11/10/ 2023	5	11 °C	1F	Light rain for 20 minutes of survey

2.1.7 Covered culverts were present between subsections 2a and 3a as well as subsections 2b and 2c. As such these portions of watercourse were not surveyed.

2.1.8 Four trail cameras were deployed on 23 November 2023 for 7 days. Locations of trail cameras were chosen to rule out uncertainty in some spraint findings (runny, not-solid spraints) which could potentially be American mink *Neovison vison*.

2.1.9 Trail camera 1 was deployed on watercourse subsection 2a under a concrete bridge positioned upstream near Target Note 23. Trail camera 2 was deployed on watercourse subsection 2d surrounded by a small plantation woodland and positioned upstream near Target Note 12. Trail cameras 3 and 4 were deployed on watercourse subsection 1b near a series of spraints between Target Notes 18 and 19. Trail camera 3 was deployed nearer Target Note 19 under a concrete bridge positioned downstream. Trail camera 4 was deployed nearer Target Note 18 above a culverted pipe positioned downstream.

2.1.10 During each otter survey visit a systematic search was completed looking for any signs of otter activity such as droppings (either spraints or anal jelly), feeding remains, footprints/tracks, slides, couches, and signs of habitation (for instance holts or other resting sites). Hydrological features, such as depth and flow rate and physical features such as width and bank profile and vegetation were estimated and recorded. The length of each

watercourse was walked, and habitat suitability for otter within a 50m buffer of the watercourses was noted. This included features such as fallen trees or bankside holes close to the water that could provide lying-up or other resting sites.

2.1.11 During each water vole survey visit, a systematic check was undertaken for signs of water vole activity or occupation. These include droppings, footprints, characteristic vegetation feeding remains, grass lawns, latrines, and burrows/pathways in vegetation. The bank profile, substrate, and bankside vegetation characteristics were also noted.

2.2 Limitations

2.2.1 No significant constraints to the survey were identified. Some parts of the watercourses were inaccessible due to the presence of covered culverts. This is not considered to be a constraint to the survey as these areas have low suitability for otter and water vole.

3 Results and Interpretation

3.1 General Waterbody Descriptions

3.1.1 The watercourses and ponds are set in an agricultural landscape that is dominated by improved pasture grassland and, to the south, rough grazing. There is limited tree cover in the southern section of the Site.

3.2 Watercourses

3.2.1 Overall, the watercourses on the Site are fairly shallow and narrow. Watercourse subsections 1a and 1b are superficially similar, although 1b has more shade overall, occasional deep pools and areas with steep sides. Watercourse 2 is more variable along its length. Subsection 2a is shallow throughout, 2b is also shallow but contained orange algal blooms, 2c is heavily shaded by *Juncus* sp. (up to 95%) with slower flowing water than other subsections of watercourse 2 and is separated from 2b by a covered culvert. Subsections 2d and 2e are separated as 2e is located in a steep gorge. Watercourse subsections 3a and 3b are superficially similar, although 3b has faster flowing water than 3a.

3.3 Ponds

3.3.1 Ponds 1 and 2 have similar marginal vegetation with banksides dominated by bulrush *Typha latifolia*; while the bankside vegetation of Pond 3 is mostly grassland. Pond 4 was dry at the time of survey.

3.3.2 Table 2 gives an overview of the characteristics of each pond and watercourse. The ponds are shown on Figures 1 and 2 and the watercourse subsections are shown on Figure 2.

3.3.3 Table 3 provides Target Note descriptions, the locations of which are shown on Figure 3. Target Notes are also referred to in Table 2 as appropriate.

Table 2: Habitat descriptions of waterbodies

Survey area reference	Habitat description
Pond 1	Marginal vegetation includes Alexanders *Smyrnium olusatrum*, water mint *Mentha aquatica*, floating sweet-grass *Glyceria fluitans*, greater pond sedge *Carex riparia*, marsh thistle *Cirsium palustre*, bulrush *Typha latifolia*, meadowsweet *Filipendula ulmaria*, horsetail *Equisetum* sp., and marsh bedstraw *Galium palustre.* Shallow banks surrounded by 20 m of swamp dominated by a floating mat of bulrush.
Pond 2	Marginal species include Alexanders, water mint, floating sweet-grass, greater pond sedge, marsh thistle, bulrush, meadowsweet, horsetail sp., and marsh bedstraw. Alder *Alnus glutinosa* is scattered throughout the habitat. Shallow banks dominated by bulrush.
Pond 3	Shallow banks of marshy grassland. An island in the middle of the pond is dominated by goat willow scrub.
Pond 4	Ephemeral pond, dry at the time of survey
Watercourse 1	Primarily shallow water and banks with rocky substrate and occasional pools (Figure 2, TN 18-22). A low to moderate water flow throughout. Most of the watercourse is open without shade; where shade is present it ranges from 5%-20% (Figure 2, TN 18-22). Bank vegetation consists of *Juncus* sp. and grasses. (Figure 2, TN 18).
Watercourse 2	Primarily shallow water with a pebble substrate and rock slabs throughout apart from subsections 2b and 2c which are 90%-95% overgrown with *Juncus* sp. (Figure 2, TN 5, 6, and 7). Areas of orange algae blooms in subsections 2a-d, (Figure 2, TN 6, 9, 10, and 13). A moderate water flow is present throughout all of the watercourse apart from subsections 2a and 2c with dry areas during the first survey (Figure 2, TN 8 and 24). A coniferous woodland is present alongside subsection 2d (Figure 2, TN 12), and there is a gradient change creating a small cascade in this subsection (Figure 2, TN 14). Areas of shade are present in subsections 2d and 2e ranging from 5%-50% (Figure 2, TN 11, 13, 15, 16, and 17). Grassland species dominate part of subsection 2a (Figure 2, TN 23). Subsection 2e is a more complex habitat with a mosaic of structural features (Figure 2, TN 17).
Watercourse 3	Shallow water with moderate flow throughout. Bankside vegetation of tall ruderal vegetation, *Juncus* sp. and grasses overgrown in areas up to 100% (Figure 2, TN 1 and 4). Orange algae present (Figure 2, TN 2). Dry areas during the first survey (Figure 2, TN 3).

Table 3: Target Note descriptions of watercourse subsection habitats.

Target Note	Watercourse subsection	Habitat description
1	3a	Overgrown with *Juncus* sp. and grasses. 100% cover.
2	3a	Orange algae within watercourse, choked with *Juncus* sp. and grasses.
3	3a	Dry part of watercourse.
4	3b	Overgrown with *Juncus* sp. and tall ruderal vegetation, shade 90%.
5	2c	Shallow part of watercourse also heavily covered by *Juncus* sp. 95%.
6	2b	Orange algae within watercourse, area heavily covered by *Juncus* sp. 90%.
7	2b	Shallow part of watercourse, overgrown with *Juncus* sp.
8	2b	Dry part of watercourse.
9	2b	Orange algae within watercourse and 95% shallow area.
10	2a	Orange algae within watercourse and 55% shallow area. Bankside vegetation *Juncus* sp. and grasses.
11	2d	Shallow and free flowing area with clear water and 5% shade.
12	2d	Coniferous woodland, rocky substrate free flowing over rocks with pools. No evidence of burrows, signs, tracks.
13	2d	Shallow area with orange algae and 50% shade.
14	2d	Gradient change, mini waterfall.
15	2d	Shallow, rocky substrate with grass bankside vegetation and 20% shade.
16	2d	Shallow, rocky substrate with grass bankside vegetation and 20% shade.
17	2e	Steep sided gorge with 10% shade. Shallow clear and free flowing over rocky substrate with occasional pools. Bankside vegetation *Juncus* sp. and grasses. Burrows on bank with characteristics of rat burrows (larger size, location, and habitats adjacent to watercourse) and no evidence of water voles (droppings, feeding, runs in vegetation) nearby.
18	1b	Shallow open banks with 20% shade. Bankside vegetation *Juncus* sp. and grasses.
19	1b	Steep sided with free-flowing steps, rocky substrate, and occasional deep pools. Less than 10% shade.
20	1a	Shallow, open bank with a rocky substrate and less than 10% shade.
21	1a	Shallow, open bank with rocky substrate, occasional pool and less than 5% shade.

Target Note	Watercourse subsection	Habitat description
22	1a	Shallow, open bank with rocky substrate, occasional pool and less than 5% shade.
23	2a	Shallow open area with rocky substrate, cross terraces and bankside vegetation of grasses.
24	2a	A dry area of watercourse which runs through a coniferous woodland.

3.4 Results of Otter Survey

3.4.1 The results of the otter survey and the Target Note locations are mapped on Figure 3, and photographs of key evidence of activity is shown in Photographs 1-5.

3.4.2 Evidence of the presence of otter was not found on the first visit, nor in the ponds during any survey.

3.4.3 Evidence of the presence of otter was found on several locations within and along the bank of the watercourses on the second visit (Figure 3). Following the second survey visit, trail camera footage captured otter presence on the Site. Footage of American mink was not captured.

3.4.4 The following evidence of otter was recorded:

- Spraint: subsections 1a, 1b, 2a, 2b, and 2d (Photographs 1, 2 and 3);
- Potential otter couch: subsection 2b (Photograph 4); and
- Otter footage: subsection 1b (Photograph 5).

3.4.5 Two spraints were also recorded during the Preliminary Ecological Appraisal on 26 April 2023 in watercourse subsections 2d and 2e.

3.4.6 The watercourses provide commuting, potential resting (Figure 3, and Photographs 4 and 5) and potential foraging habitat for otter. A potential resting place was found on watercourse subsection 2b (Photograph 4). Movement of otter through the Site is evident (Photographs 1-5) although the food resource within and around the streams may be limited.

3.4.7 Spraint was absent from watercourse subsections 2c, 2e 3a, and 3b. Subsection 2c may be used less by otter as it is a short stretch of

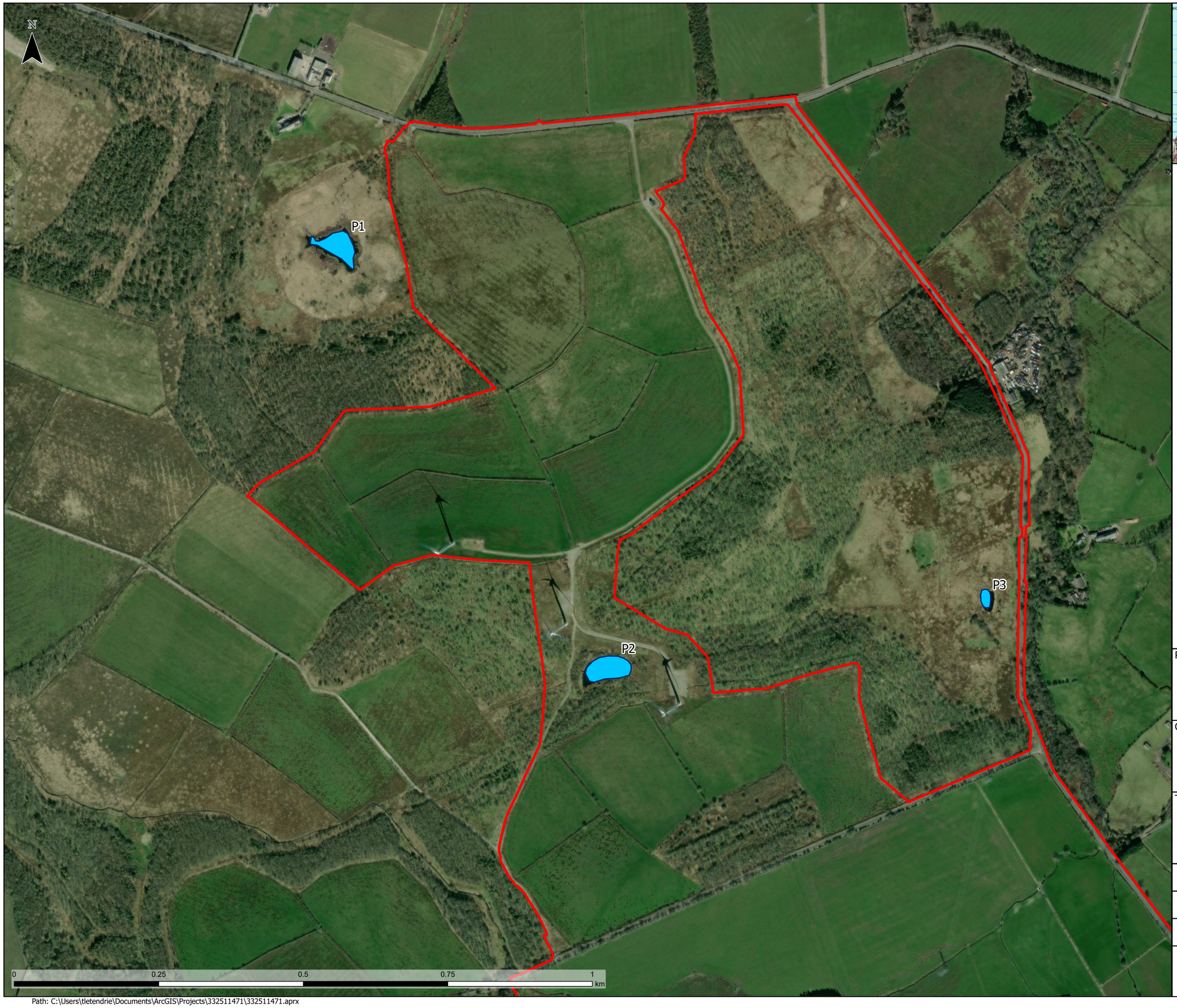
watercourse, with slow flowing water and isolated from other suitable habitat by a covered culvert. While spraint was not found in watercourse 2e during either survey it was found during the Preliminary Ecological Appraisal performed earlier in 2023 (Appendix 8.1).

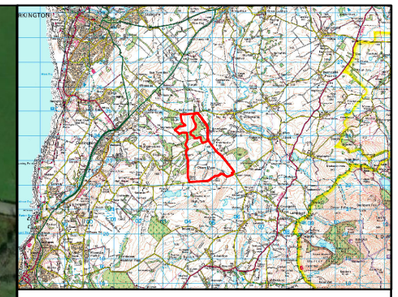
3.4.8 The survey found no evidence of holts. Holt creation opportunities may be limited given the open nature of many watercourse banks (tree and scrub cover is absent or intermittent) and the degree to which poaching by livestock has occurred along stretches of the banksides. Although the watercourses may provide limited habitation or feeding opportunities for otter, they are at least used by commuting otters.

3.5 Results of Water Vole Survey

3.5.1 The surveys found no evidence of water vole.

4 Figures





Legend

- Draft Order Limits
- Standing Water

Project Title

Dean Moor Solar Farm

Client

FVS Dean Moor Limited

Title

DEAN MOOR SOLAR FARM
DEVELOPMENT CONSENT ORDER
Otter and Water Vole: Ponds Area A and Area B

Scale: 1:6,000 @ A3	Date: 07/03/2024
Drawn: TL	Checked: IA
Figure: 1	Rev: A

Stantec

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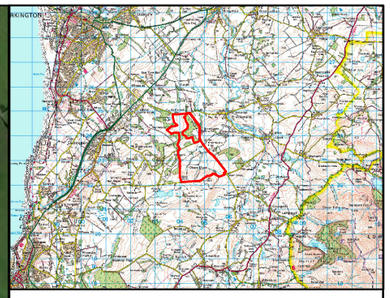

Legend

- Draft Order Limits
- Survey Area (Stretch of Watercourse)
- Standing Water

Project Title

Dean Moor Solar Farm

Client

FVS Dean Moor Limited

Title

DEAN MOOR SOLAR FARM
DEVELOPMENT CONSENT ORDER
Watercourses and Ponds: Area C

Scale: 1:6,500 @ A3	Date: 07/03/2024
Drawn: TL	Checked: IA
Figure: 2	Rev: A

Stantec

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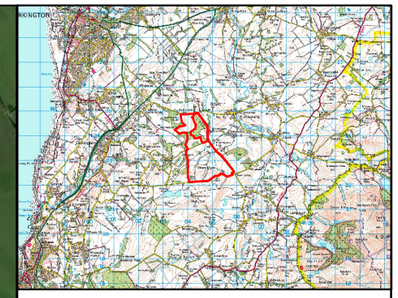

Legend

- Draft Order Limits
- Standing Water
- Survey Transect (July - no evidence found)
- Target Note
- Otter Spraint
- Otter Resting Site

Project Title

Dean Moor Solar Farm

Client

FVS Dean Moor Limited

Title

DEAN MOOR SOLAR FARM
DEVELOPMENT CONSENT ORDER
Otter and Water Vole Survey Results

Scale: 1:6,500 @ A3	Date: 07/03/2024
Drawn: TL	Checked: IA
Figure: 3	Rev: A

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5 Site Photographs

Photograph 1: Otter spraint and anal jelly, location subsection 1a watercourse.

Photograph 2: Showing habitat context of Photograph 1 location.

Photograph 3: Small spraint with fishbones from watercourse subsection 2a.

Photograph 4: Potential otter couch (flattened grass on right-hand side of culvert). Location subsection 2b watercourse.

Photograph 5: Trail camera image of otter. Location subsection 1b NY 05138 22841 (under a concreate bridge looking downstream).

Photograph 6: Watercourse subsection 1a.

Photograph 7: Watercourse subsection 1b

Photograph 8: Watercourse subsection 2a.

Photograph 9: Watercourse subsection 2b.

Photograph 10: Watercourse subsection 2c.

Photograph 11: Watercourse subsection 2d.

Photograph 12: Watercourese subsection 2e looking upstream at habitat dominated by tall rush vegetation.

Photograph 13: Watercouse subsection 3a.

Photograph 14: Watercourse subsection 3b

Photograph 15: Pond 1

Photograph 16: Pond 2

Photograph 17: Pond 3