Tionscadal Soláthair Uisce
Water Supply Project

Environmental Impact Assessment Report (EIAR)

Volume 6 of 6: Appendices

(Appendix 8.4) Targeted Habitat Surveys Report

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Contents

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1. Introduction

1. The Lower River Shannon at Parteen Basin, downstream of Lough Derg (County Tipperary), is the preferred abstraction location and option for a new water supply source for the Eastern and Midlands Region of Ireland.

2. The Water Supply Project Eastern and Midlands Region (the Proposed Project) will involve raw water abstraction from Parteen Basin at the Raw Water Intake and Pumping Station (RWI&PS) site, followed by pumping to a Water Treatment Plant (WTP) approximately 2.6km north-east in the townland of Incha Beg in County Tipperary. Following treatment, the treated water will be pumped to a Break Pressure Tank (BPT) at the highest elevation of the pipeline, where the water pressure will be managed. From the BPT the water will flow by gravity through the midlands to a Booster Pumping Station (BPS) in the townland of Coagh Upper in County Offaly. The BPS will be required when the demand for water increases above approximately 170 million litres per day (Mld). From the BPS the treated water will continue to a Termination Point Reservoir (TPR) at Peamount in County Dublin.

3. A Construction Working Width will be temporarily required for the period of construction of the Raw Water Rising Mains, Pressure Pipeline and Gravity Pipeline and their subsequent reinstatement. It will generally be 50m in width but will be locally wider near features such as crossings, access and egress points from the public road network and Pipe Storage Depots.

4. This Proposed Project will also involve the uprate of one Electric Supply Board (ESB) 38 kV powerline from Ardnacrusha to Birdhill, County Tipperary. This proposed line uprate is to facilitate the Proposed Project, and specifically to provide for power connections to the proposed RWI&PS and WTP sites near Birdhill, County Tipperary. The 38 kV powerline runs in a north-east direction, across predominantly wet grassland (GS4), dry calcareous and neutral grassland, and improved agricultural grassland (GA1). The powerline also crosses the Lower River Shannon, which is, at this location, designated as a Special Area of Conservation (SAC) and is of international importance.

5. This report has been prepared to provide a summary of all targeted habitat surveys that were undertaken as part of baseline surveys for the Proposed Project and previous iterations of the project between 2016 and 2021. These targeted habitat surveys were undertaken in areas considered to be potentially nationally important or greater. Multidisciplinary Surveys have been carried out along the route of the Proposed Project, during which other habitats within the Proposed Project and previous iterations of the project were mapped. These habitats are shown in EIAR Figures 8.4 to 8.107. The purpose of these surveys was to undertake detailed vegetation surveys with the aim of identifying habitats of conservation significance and reporting on any correspondence with habitats listed on Annex I of the EU Habitats Directive (EEC 1992). The majority of sites were surveyed only once throughout the six years while others (11) were subject to a second assessment. This second assessment was used to gather more recent data on the condition and extent of the habitats, or to revisit sites where access was restricted in previous years. In addition, some sites were not surveyed again as the Proposed Project was re-routed away from them and therefore, they will not be impacted by the pipeline. A summary of the survey effort is provided in Table 1.1.

Table 1.1: Summary of Targeted Habitat Survey

Locations	Survey Area	Survey Years							
		Jun 2016	Aug 2016	Mar 2017	Jun 2017	Aug 2018	Aug 2019	Aug 2020	Sep 2021
Sites of Interest within the Potential Zone of Influence (ZoI) of the Proposed Project	Coagh Upper Fen, County Offaly	✓	—	—	—	—	✓	—	—
	Ponds near Lough Ourna pNHA, County Tipperary	—	✓	—	—	—	—	—	—
	Ardcroney Turlough, County Tipperary	—	✓	—	—	—	—	—	—
	Derrinclare Cutover, County Offaly	—	✓	—	—	—	—	—	—
	Valley Pond and Woodland at Cangort Park, County Offaly	—	✓	—	—	—	—	—	—
	Island Bog, County Offaly	—	✓	—	—	—	—	—	—
	Drumachon Bog, County Kildare	—	✓	—	—	—	—	—	—
	WTP, County Tipperary	—	—	—	✓	—	—	✓	—
	Grassland West of Ashley Park, County Tipperary	—	—	—	✓	—	—	—	—
	Ballythomas Turlough, County Tipperary	—	—	✓	✓	—	—	—	—
	Grasslands at the N52 Crossings, County Tipperary	—	—	—	✓	—	—	—	—
	Eminiska Grassland, County Tipperary	—	—	✓	✓	—	—	—	✓
	Killananny Bog Woodland	—	—	—	✓	—	—	—	—
	Reask Woodland	—	—	—	✓	—	—	—	—
	Rathlumber Woodland	—	—	—	✓	—	—	—	—
	Ballynakill Bog Woodland	—	—	—	✓	✓	—	—	—
	Cushaling Peatland (a)	—	—	—	✓	✓	—	—	—
	Cushaling Bog Woodland, County Kildare (surveyed from adjacent lands)	—	—	—	✓	—	—	—	—
	Drummond Woodland	—	—	—	✓	✓	—	—	—
	Timahoe East Peatland and Woodland, County Kildare	—	—	—	✓	✓	—	—	—
	Timahoe East Peatland and Grassland (b), County Kildare	—	—	—	✓	✓	—	—	—
	Timahoe East Scrubland, County Kildare	—	—	—	✓	—	—	—	—
	Timahoe East Woodland, County Kildare	—	—	—	✓	—	—	—	—

Locations	Survey Area	Survey Years							
		Jun 2016	Aug 2016	Mar 2017	Jun 2017	Aug 2018	Aug 2019	Aug 2020	Sep 2021
	Derryvaroge Peatland	—	—	—	✓	✓	—	—	—
	Kilmastulla Woodland, County Tipperary	—	—	—	—	✓	—	—	—
	Boher Grassland, County Tipperary	—	—	—	—	✓	—	—	—
	Boher/Ballinteenoe Woodland, County Tipperary	—	—	—	—	✓	—	—	—
	Gortmore Grassland, County Tipperary	—	—	—	—	✓	—	—	—
	Kilcoman/Clareen Grassland, County Tipperary	—	—	—	—	✓	—	—	—
	Kilcoman/Clareen Grassland, County Tipperary	—	—	—	—	✓	—	—	—
	Ballyhimkin Treeline, County Tipperary	—	—	—	—	✓	—	—	—
	Drumroe Spring, County Tipperary	—	—	—	—	✓	—	—	—
	Eminiska Spring and Grassland, County Tipperary	—	—	—	—	✓	—	—	—
	Knockanacree Woodland, County Tipperary	—	—	—	—	✓	—	—	—
	Knockanacree Scrub, County Tipperary	—	—	—	—	✓	—	—	—
	Newtown Woodland, County Tipperary	—	—	—	—	✓	—	—	—
	Behamore Woodland, County Tipperary	—	—	—	—	✓	—	—	—
	Toora Grassland, County Offaly	—	—	—	—	✓	—	—	—
	Boveen Grassland, County Offaly	—	—	—	—	✓	—	—	—
	Kilmaine Grassland, County Offaly	—	—	—	—	✓	—	—	—
	Breaghmore Treeline, County Offaly	—	—	—	—	✓	—	—	—
	Cloghanmore Woodlad, County Offaly	—	—	—	—	✓	—	—	—
	Annamore and Annabeg Bog, County Offaly	—	—	—	—	✓	—	—	—
	Ballynacarrig Grassland, County Offaly	—	—	—	—	✓	—	—	—
	Ballynacarrig/Derries Woodland, County Offaly	—	—	—	—	✓	—	—	—
	Derries Grassland, County Offaly	—	—	—	—	✓	—	—	—
	Rathfeston Peatland, County Offaly	—	—	—	—	✓	—	—	—

Locations	Survey Area	Survey Years							
		Jun 2016	Aug 2016	Mar 2017	Jun 2017	Aug 2018	Aug 2019	Aug 2020	Sep 2021
	Rathfeston Bog Woodland, County Offaly	—	—	—	—	✓	—	—	—
	Clonad Peatland (a), County Offaly	—	—	—	—	✓	—	—	—
	Clonad Bog Woodland, County Offaly	—	—	—	—	✓	—	—	—
	Clonad Peatland (b), County Offaly	—	—	—	—	✓	—	—	—
	Clonarrow/Riverlyons Bog Woodland, County Offaly	—	—	—	—	✓	—	—	—
	Clonarrow/Riverlyons Peatland (a), County Offaly	—	—	—	—	✓	—	—	—
	Clonarrow/Riverlyons Peatland (b), County Offaly	—	—	—	—	✓	—	—	—
	Clonarrow/Riverlyons Grassland and Treeline, County Offaly	—	—	—	—	✓	—	—	—
	Drumcaw/Mountlucas Peatlands (a), County Offaly	—	—	—	—	✓	—	—	—
	Drumcaw/Mountlucas Peatlands (b), County Offaly	—	—	—	—	✓	—	—	—
	Drumcaw/Mountlucas Bog Woodland, County Offaly	—	—	—	—	✓	—	—	—
	Newtown Bog Woodland, County Offaly	—	—	—	—	✓	—	—	—
	Newtown Peatland, County Offaly	—	—	—	—	✓	—	—	—
	Newtown/Esker More Grasslands, County Offaly	—	—	—	—	✓	—	—	—
	Esker More Bog Woodland, County Offaly	—	—	—	—	✓	—	—	—
	Esker More/Rathlumber Peatland, County Offaly	—	—	—	—	✓	—	—	—
	Rathlumber Grassland, County Offaly	—	—	—	—	✓	—	—	—
	Ballynakill Woodland, County Offaly	—	—	—	—	✓	—	—	—
	Ballynakil/Ballykileen Peatland, County Offaly	—	—	—	—	✓	—	—	—
	Kilcumber Woodland (a), County Offaly	—	—	—	—	✓	—	—	—
	Kilcumber Woodland (b), County Offaly	—	—	—	—	✓	—	—	—
	Kilcumber/Cloncant Peatland, County Offaly	—	—	—	—	✓	—	—	—
	Cushaling Peatland (b), County Offaly	—	—	—	—	✓	—	—	—
	Cushaling Grassland, County Offaly	—	—	—	—	✓	—	—	—

Locations	Survey Area	Survey Years							
		Jun 2016	Aug 2016	Mar 2017	Jun 2017	Aug 2018	Aug 2019	Aug 2020	Sep 2021
	Cushaling Peatland (c), County Offaly	—	—	—	—	✓	—	—	—
	Ticknevin Peatland (a), County Offaly, County Kildare	—	—	—	—	✓	—	—	—
	Ticknevin Peatland (b), County Kildare	—	—	—	—	✓	—	—	—
	Kilkeaskin/Drehid Peatland, County Kildare	—	—	—	—	✓	—	—	—
	Timahoe East Peatland, County Kildare	—	—	—	—	✓	—	—	—
	Timahoe East Grassland, County Kildare	—	—	—	—	✓	—	—	—
	Timahoe East Peatland and Grassland (a), County Kildare	—	—	—	—	✓	—	—	—
	Derryvarouge Peatland (b), County Kildare	—	—	—	—	✓	—	—	—
	Derrycrib Woodland, County Kildare	—	—	—	—	✓	—	—	—
	Newtownmoneenluggagh Woodland, County Kildare	—	—	—	—	✓	—	—	—
	Barreen Woodland, County Kildare	—	—	—	—	✓	—	—	—
	Breaghmore Grassland, County Offaly	—	—	—	—	—	✓	—	—
	Rathmore Spring, County Offaly	—	—	—	—	—	✓	—	—
	Coolfin Glebe Transition Mire, County Offaly	—	—	—	—	—	✓	—	—
	RWI&PS, County Tipperary	—	—	—	—	—	—	✓	—
	Raheenduff Fen, County Offaly	—	—	—	—	—	—	✓	—
	Mountpellier Grassland (38 kV Uprate Works), County Limerick	—	—	—	—	—	—	✓	—
	Rowing Club Grasslands (38 kV Uprate Works), County Clare	—	—	—	—	—	—	—	✓
	Grassland near Lough Ourna, County Tipperary (roadside survey)	—	—	—	—	—	—	✓	✓
	Derryvarroge, Cloona, County Kildare	—	—	—	—	—	—	—	✓
	Coologmartin, Cloona, County Kildare	—	—	—	—	—	—	—	✓

2. Methodology

6. The purpose of these targeted habitat surveys was to identify any habitats of conservation significance and/or habitats listed on Annex I of the EU Habitats Directive.

7. In order to inform the conclusions as to whether a habitat was of Annex I quality or had any correspondence with Annex I habitats, the following references were consulted:

    - A Guide to Habitats in Ireland (Fossitt 2000)
    - National Survey of Native Woodlands (Perrin *et al*. 2008)
    - The Irish Semi-Natural Grasslands Survey 2007-2012. Irish Wildlife Manuals, No. 78 (O'Neill *et al.* 2013)
    - The Status of EU Protected Habitats and Species in Ireland (NPWS 2013)
    - Raised Bog Monitoring Project (Fernandez *et al*. 2013)
    - Results of a Monitoring Survey of Bog Woodland (Cross and Lynn 2013)
    - Interpretation Manual of European Union Habitats. Version EUR 28 (European Commission 2013)
    - Monitoring Guidelines for the Assessment of Petrifying Springs in Ireland. Irish Wildlife Manuals, No. 94 (Lyons and Kelly 2016)
    - National Raised Bog Special Areas of Conservation Management Plan 2017-2022 (NPWS 2017)
    - Irish Wetland Types (Irish Ramsar Wetlands Committee 2018).

8. The National Roads Authority (NRA) Guidelines for Assessment of Ecological Impacts of National Road Schemes (NRA 2009) was used to inform an assessment of the biodiversity value of each site.

9. Targeted habitat surveys were carried out between 2016 and 2021. The targeted habitats surveys carried out between 2016 and 2020 were carried out by Wetland Surveys Ireland (WSI), while the surveys carried out in 2021 were completed by Dr. John Conaghan. Over the six years of targeted surveys the methodologies varied slightly; details of how each survey was carried out are outlined in Section 2.1 to Section 2.6.

10. During the surveys, the habitats present at each site were classified according to Fossitt (2000), and where relevant, according to Annex I of the EU Habitats Directive (EEC 1992). General survey target notes were recorded on a GPS device. Geotagged photographs were taken at each site to facilitate their incorporation into GIS. Additional photographs were also taken at regular intervals during field surveys to assist with subsequent interpretation and to record features in the wider landscape.

11. Where required, surveys carried out in 2016, 2017, 2019 and 2020 used a 4m^2 quadrat to collect relevé data. This represents a standard approach to vegetation description and analysis. Relevé data was recorded in a digital database running on a GPS enabled field computer. All plant species within the quadrat were recorded and the cover abundance value was applied. The Domin scale (Domin 1923) of cover abundance was used during the survey and is as follows:

    - + – 1 individual, no measurable cover
    - 1 – <4% cover, with few individuals
    - 2 – <4% cover, with several individuals
    - 3 – <4% cover, with many individuals
    - 4 – 4-10% cover
    - 5 – 11-25% cover
    - 6 – 26-33% cover
    - 7 – 34-50% cover

- 8 – 51-75% cover
- 9 – 76-90% cover
- 10 – 91-100% cover.

12. Physical abiotic attributes were also recorded within each quadrat, and included slope, aspects, grazing impacts, soil type, soil/peat depth, substrate stability, cover and height values for different plant groups.

2.1 Targeted Habitat Surveys 2016

13. Targeted wetland surveys were carried out across five sites within the study area of the Proposed Project and previous iterations of the project during August 2016. These surveys were caried out by WSI.

14. The aim of the surveys was to determine the possible occurrence of EU Annex I habitats at sites that were previously subject to Fossitt Habitat Surveys. Relevé data was collected for the sites that were deemed to have potential for Annex I habitat. All plant species within the quadrat were recorded and cover abundance value was applied. The Domin scale (Domin 1923) of cover abundance was used during the survey.

2.2 Targeted Habitat Surveys 2017

15. Several sites within the study area of the Proposed Project and previous iterations of the project were surveyed during the spring and summer of 2017. During March 2017, a number of sites (those that were deemed potential turloughs) were surveyed by Dr. Patrick Crushell, when each of these sites would likely have been in flood. Additionally, during the period of 19 to 30 June, a number of sites were surveyed by Dr. Peter Foss and Dr. Mary Catherine Gallagher.

16. In total, 30 sites were surveyed during these periods. During the surveys, habitats present at each site were classified according to Fossitt (2000) and where relevant according to Annex I of the EU Habitats Directive (EEC 1992). Survey target notes were recorded on a GPS enabled field computer. Additionally, representative vegetation relevés were recorded; 30 in total.

2.3 Targeted Habitat Surveys 2018

17. A total of 66 sites within the Proposed Project study area and previous iterations of the project were surveyed during the period of 13 to 17 August by Dr. Peter Foss and Dr. Mary Catherine Gallagher and during the period of 20 to 24 August by Dr. Peter Foss and Mr. Brendan Kirwan.

2.4 Targeted Habitat Surveys 2019

18. Four sites within the Proposed Project study area and previous iterations of the project were surveyed during the period of August and September 2019 by Dr. Patrick Crushell, Dr. Mary Catherine Gallagher and Mr. Brendan Kirwin. Four of these sites were attempted to be surveyed in 2018, however, due to no permission from the landowner they were surveyed in 2019 instead. One of the five sites (Coagh Upper Fen) was previously surveyed in 2016 and was revisited in 2019 to assess the current ecological status at that time.

2.5 Targeted Habitat Surveys 2020

19. Five sites of potential ecological interest within the Proposed Project study area and previous iterations of the project were identified for targeted ecological walkover surveys in 2020. These surveys were carried out in August 2020 by Dr. Patrick Crushell and Dr. Mary Catherine Gallagher of WSI. Two of the sites, the RWI&PS and WTP, had previously been surveyed by WSI in 2016 and 2017, respectively (EIAR Appendix A8.1: Parteen Habitat Assessment and Annex C). The purpose of the 2020 target habitat surveys was to identify the current ecological status of these sites, identify any habitats of conservation significance, with particular reference to habitats listed on Annex I of the EU Habitats Directive, and collect additional relevé information where deemed necessary.

2.6 Targeted Habitat Surveys 2021

20. A number of ecological sites within or adjacent to the Proposed Project and previous iterations of the project were surveyed during the period 17 to 24 September 2021 by Dr. John Conaghan.

21. The aim of these targeted habitat surveys was to identify any habitats of conservation significance and habitats listed on Annex I of the EU Habitats Directive. During the survey, habitats present at each site were classified according to Fossitt (2000) and where relevant according to Annex I of the EU Habitats Directive. General survey target notes were recorded which referred to features of interest within the site. Photographs were taken at each site and were also taken at regular intervals during the field survey to assist with subsequent interpretation and to record features in the wider landscape.

2.7 Survey Limitations

22. One of the 20 sites surveyed in 2017 (Cushaling Bog Woodland) was only surveyed from a distance using binoculars as access was not possible for health and safety reasons (i.e. the presence of a bull and deep drainage ditches; Figure 46). The view attained was adequate to confidently classify and describe the habitat present at this site. A further two sites (grasslands near Lough Ourna (TY18417N; Figure 13) and grasslands in Ballylusky (UNRZ), Figure 15, located between the Grasslands at the N52 Crossing and the Grasslands at Coolderry, County Tipperary) were not surveyed due to no permission to survey being granted by the landowner and are therefore not included in the results. Aerial imagery shows that this site is a potential Turlough, however, it is located outside of the Proposed Project Application Boundary.

23. In 2018, six of the 66 sites were not surveyed as they could not be accessed. Where possible, a note was made of the likely habitat present based on interpretation of aerial imagery and any previously collected survey data. These sites were grasslands near Lough Ourna (Figure 13), Knockanacree Woodland (Figure 17), Rath More Spring (Figure 22), Kilmaine Grassland (Figure 25), Breaghmore Grasslands (Figure 25), and Annamore and Annabeg Bog (Figure 30) (Annex D).

24. In 2019, one site (grasslands near Lough Ourna (TY18417N; Figure 13)) was not surveyed as land access was not permitted. The site had been identified as a potential wetland/semi-natural grassland, however as it was not possible to survey the site and evaluation of its biodiversity value could not be made.

25. In 2020, two sites were not surveyed as land access was not permitted. Access was not granted to two folios along the 38 kV Uprate Works (CE49781F and CE15532), so they were not surveyed and could not be viewed from a distance. Furthermore, the grasslands near Lough Ourna (TY18417N) were only surveyed from a distance as land access was not permitted. This site is shown in Figure 13.

26. In 2021, the grasslands near Lough Ourna (TY18417N) were only surveyed from a distance as land access was not permitted. This site is shown in Figure 13.

27. There were no survey limitations during the 2016 targeted surveys. Access was available for all sites and the surveys were carried out during the optimal survey season for habitat assessments.

3. Results

3.1 Targeted Habitats Survey 2016

28. A total of six sites were surveyed during the 2016 targeted surveys. Of the six sites surveyed, four sites were found to support EU Annex I habitats: Ardcroney Turlough, Derrinclare Cutover, Island Bog and Dromachon Bog. Details of these Annex I habitats are provided in Section 3.1.1 to Section 3.1.4. Table 3.1 provides a summary of the sites examined in 2016 and indicates their location and whether any habitats were recorded which conformed to EU Habitats Directive Annex I habitats. Details of the sites that did not have any correspondence with EU Habitats Directive Annex I habitats are presented in Annex B. It should be noted, the redline boundary shown in Annex B is the project boundary at the time of survey. The results of the Coagh Upper Fen 2016 survey are documented in EIAR Appendix A8.3: Site Description of Coagh Upper Fen, Co. Offaly and are not included in this report.

Table 3.1: Summary Results of the Locations Examined during the Targeted Habitat Surveys in 2016

Site Name	Survey Date	Figure Number	Reason for Survey	Summary Results	Main Habitat Type Present / Comment	Annex Habitat
Ponds Near Lough Ourna pNHA	15 to 18 August 2016	13	Potential turlough	Two ponds surveyed to determine if they were turloughs. Area around ponds were heavily poached by cattle. Ponds may be linked with Lough Ourne pNHA but were not considered Turloughs. Additional information in Annex B.	GA1	No - Non-Annex Habitat
Ardcroney Turlough	15 to 18 August 2016	14	Potential turlough	This site corresponds with the EU Habitats Directive priority Annex I habitat Turloughs (3180) (Section 3.1.1).	FL6	Yes - Annex I Habitat
Derrinclare Cutover	15 to 18 August 2016	19	Potential bog/fen habitat	Fen habitat occurs in the lower lying parts of the site. The fen areas correspond with both the EU Habitats Directive priority Habitat Calcareous fens with *Cladium mariscus* and species of the *Craicion davallianea* (7210) and non-priority habitat type Alkaline Fens (7230) (Section 3.1.2).	PF1, PB4, WS1	Yes - Annex I Habitat
Valley Pond and Woodland at Cangort Park	15 to 18 August 2016	19	Potential native woodland	Mature beech woodland on a ridge sloping down to an artificial pond. Habitat did not correspond with EU Habitats Directive Annex I Habitats. Additional information in Annex B.	WD1, FL8	No - Non-Annex Habitat
Island Bog	15 to 18 August 2016	41	Potential active raised bog habitat	Small, isolated parts of the raised bog correspond with the EU Habitats Directive priority habitat Active Raised Bogs (7110) (Section 3.1.3).	PB1	Yes - Annex I Habitat
Dromachon Bog	15 to 18 August 2016	50	Potential active raised bog habitat	Three areas of raised bog correspond with EU Habitats Directive priority habitat Active Raised Bogs (7110) (Section 3.1.4).	PB1	Yes - Annex I Habitat

3.1.1 Ardcroney Turlough

29. This dry basin (at the time of survey), located immediately west of the village of Ardcroney and just south of the Proposed Project, was found to contain a turlough showing clear vegetation zonation (Photo 3.1). Examination of past aerial photography indicates that the area is prone to extensive flooding. Throughout the turlough basin there were occasional limestone boulders/bedrock visible at the surface. This site corresponds with the EU Habitats Directive priority Annex I habitat Turloughs (3180). The extent of the turlough is indicated in Figure 14 and the relevé data is outlined in

30. Table 3.2.

31. Following the NRA (2009) assessment criteria, this habitat was assessed as being nationally important due to the presence of the non-designated Turlough (3180).

Photo 3.1: Overview of Turlough Basin at Ardcroney, County Tipperary

Table 3.2: Relevé data from Ardcroney Turlough, County Tipperary

Relevé Data	Relevé Number	
	Ardcroney Turlough Relevé 1	Ardcroney Turlough Relevé 2
Easting (ITM)	588976	588974
Northing (ITM)	687233	687221
Size m^2	4	4
Slope (degrees)	Flat	Flat
Aspect	NA	NA
Substrate type	Loam	Loam
Substrate stability	Very firm	Very firm
Management	Possible low level of cattle grazing. Little visible evidence	Grazing - cattle
Adjacent land use	Grazing - cattle	Grazing - cattle
Grazing evidence (within relevé)	No evidence of grazing	Area grazed by cattle
Number of plant species in quadrat	11	12
Height tree layer cm	0	0
Height shrub layer cm	0	0
Height herb layer cm	50	25
Total vegetation cover (%)	100	95
Tree cover (%)	0	0
Shrub cover (%)	0	0

Relevé Data		Relevé Number	
		Ardcroney Turlough Relevé 1	Ardcroney Turlough Relevé 2
Herb grass cover (%)		100	95
Bryophyte cover (%)		10	10
Litter cover (%)		0	0
Rock cover (%)		0	0
Bare peat / soil cover (%)		0	5
Species Common Name	**Species Scientific Name**	**Species Cover (Domin Scale)**	**Species Cover (Domin Scale)**
Creeping bent	*Agrostis stolonifera*	-	4
Hairy sedge	*Carex hirta*	2	2
Common spike-rush	*Eleocharis palustris*	8	-
Marsh bedstraw	*Galium palustre*	-	3
Water mint	*Mentha aquatica*	6	3
Forget-me-not	*Myosotis laxa*	2	5
Reed canary-grass	*Phalaris arundinacea*	2	-
Greater plantain	*Plantago major*	-	2
Amphibious bistort	*Polygonum amphibium*	5	5
Silverweed	*Potentilla anserina*	8	4
Meadow buttercup	*Ranunculus acris*	2	-
Thread-leaved water-crowfoot	*Ranunculus trichophyllus*	5	9
Marsh yellow-cress	*Rorippa palustris*	-	3
Blue water-speedwell	*Veronica anagallis aquatica*	2	2
Possibly striated feather-moss	*Moss pleurocarpus* (possibly *Eurhynchium striatum)*	4	4

3.1.2 Derrinclare Cutover

32. This cutover bog (PB4) area has been abandoned for a considerable time and has been allowed to regenerate a variety of semi-natural vegetation types, including secondary bog communities, birch (*Betula pubescens)* scrub (WS1) and woodland and gorse (*Ulex europeaus)* scrub, mixed deciduous and conifer woodland, and fen communities. This site is included in the Map of Irish Wetlands (Foss & Crushell 2011) under site code OF123 Derrinclare Cutover. Prior to this survey, only limited site data was available as the site was identified from interpretation of aerial photography. The authors are not aware of any other documented ecological data for the site.

33. The fen habitat occurs in the lower lying parts of the site that were subject to peat cutting in the past. The fen vegetation has established in areas under the influence of mineral rich ground water, probably as a result of past cutting extending into the mineral substrate beneath the former bog (Photo 3.2). The fen communities included areas of great fen-sedge (*Cladium mariscus)* fen and black bog-rush (*Schoenus nigricans)* fen. The fen areas were rich in brown mosses including yellow starry feather-moss (*Campylium stellatum),* hooked scorpion-moss *(Scorpidium scorpioides)*, and the liverwort (*Aneura pinguis)* (Photo 3.3). The fen habitat occurred in an intimate mosaic together with scrub and regenerating bog communities. The extent of the habitat is indicated in Figure 19; however, it should be noted that the eastern extent of the site, which appears to support similar wetland habitat, was not surveyed in 2016.

34. These fen areas correspond with both the EU Habitats Directive priority habitat Calcareous fens with great fen-sedge and species of the *Caricion davallianae* (7210) and the Annex I non-priority habitat type Alkaline fens (7230).

35. During the vegetation survey of Derrinclare, three active larval webs of marsh fritillary (*Euphydryas aurinia*) butterfly were recorded towards the southern edge of the site. This is an EU Habitats Directive Annex II listed species.

36. Following the NRA (2009) assessment criteria, these habitats were assessed as being nationally important due to the presence of the following Annex I habitats and Annex II species: Calcareous Fens with great fen-sedge (7210), Alkaline fens (7230) and Marsh Fritillary (1065).

Photo 3.2: Cutover Bog (PB4) with Secondary Regenerating Alkaline Fen at Derrinclare, County Offaly

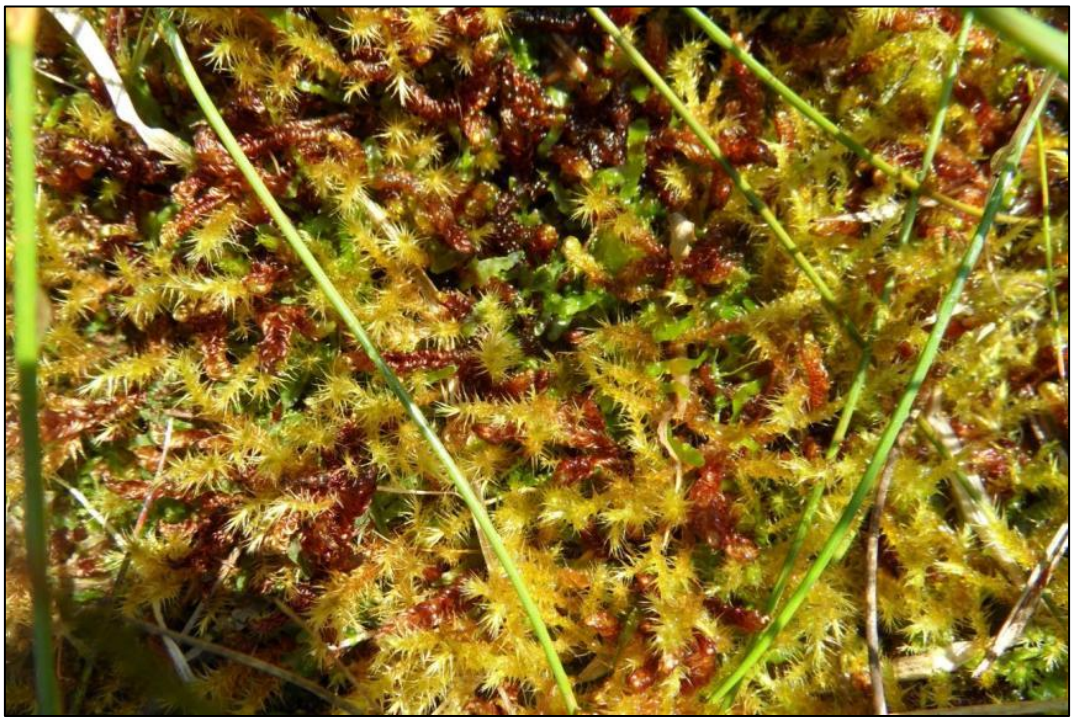

Photo 3.3: Brown Mosses Dominating the Ground Layer confirming Base Rich Fen (PF1) Conditions at Derrinclare, County Offaly

3.1.3 Island Bog, County Offaly

37. Island bog, located south of Daingean, County Offaly, consists of two raised bog (PB1) remnants on either side of the local public road running north to south through the area (Figure 41). This site is included in the Map of Irish Wetlands (Foss & Crushell 2011) under site code OF252 Clonarrow Ballynakill Cutover Complex and OF253 Clonad Rathfeston Cutover Complex. Prior to this survey, only limited site data was available as the site was identified from aerial photography.

38. The classification of bog vegetation for the Island Bog and Dromachon Bog habitats follows the system developed by Kelly and Schouten (2002) and adopted by NPWS in recent monitoring projects (Fernandez *et al.* 2014). The bog habitats were divided into community complexes, which are characterised by vegetation communities and then amalgamated into ecotopes (Fernandez *et al.* 2014).

39. The more extensive western area of high bog has been severely impacted by drainage and does not support any active raised bog habitat (Photo 3.4). The peat substrate was dry and firm underfoot. The area mainly corresponds with sub-marginal ecotope dominated heather (*Calluna vulgaris*), cross-leaved heath (*Erica tetralix*), and Deergrass (*Trichophorum germanicum*). There was poor sphagnum cover (ca 15%), principally red bog-moss (*S.Capillifolium*), papillose bog-moss (*S. papillosum*), and soft bog-moss (*S.tennellum*) and an absence of aquatic feathery bog-moss (*S.Cuspidatum*). Numerous bare peat hummock and hollow areas indicating fire within five or six years of survey, and scarce reindeer moss (*Cladonia portentosa*) were recorded. High bog slopes gently down towards the public road to the east were noted. No obvious *Rhynchosporion* depressions were found. Hare's-tail cottongrass (*Eriophorum vaginatum*) was scarce. Very limited restoration potential was noted considering the degraded and isolated nature of the remnant high bog.

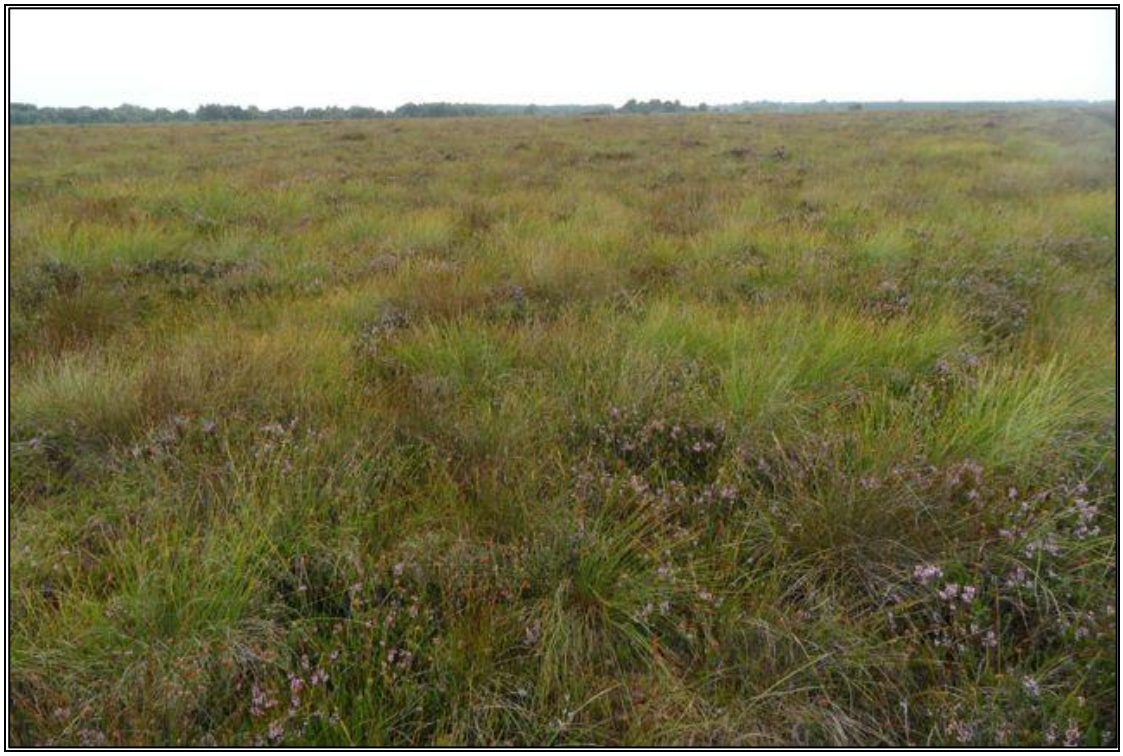

Photo 3.4: Western Side of Island Bog Showing Degraded Bog Surface with Deer Sedge, Classified as Sub-Marginal Ecotope

40. The smaller eastern high bog remnant was previously cut by a turf cutting machine, which left the surface scraw somewhat intact although a ridge and furrow topography was evident.

41. The cut area in the centre of the high bog remnant showed evidence of secondary bog regeneration possibly the result of surface subsidence (Photo 3.5 and Photo 3.6). Sphagnum cover in this area was approximately 80%, composed primarily of papillose bog-moss, red bog-moss and magellanic bog-moss (*S.magellanicum*) and occasional feathery bog-moss. Ten cut channels circa 1.5m apart ran in an east-

west direction through approximately 100m of the bog remnant. A low hummock and lawn structure occurred. There were no pools present. Hare's-tail cottongrass was frequent with scattered white beak-sedge (*Rhynchospora alba*) in depressions. This community equates to sub-central ecotope (active raised bog PB4) with an affinity to community complex 10/9/3 but without the occurrence of carnation sedge (*Carex panicea*). Data from a vegetation relevé recorded in this area is presented in Table 3.3.

42. This area, although recovering from past damage, corresponds with EU Habitats Directive priority habitat Active raised bogs (7110). However, it was a small, isolated example and the long-term conservation prospects for the habitat are considered poor. The extent of active raised bog (PB1) recorded at the site is indicated in Figure 41.

43. The remaining high bog surrounding this wetter active bog area comprised inactive sub-marginal ecotope, which was firm underfoot with Sphagnum cover of only 10-15%, with significant areas of bare peat present, as a result of past fire damage. These areas do not support active raised bog.

44. Following the NRA (2009) assessment criteria, this habitat was assessed as having local importance (lower value) due to the limited raised bog vegetation present. The majority of this site has been heavily impacted by peat cutting.

Photo 3.5: Eastern Section of High Bog that Supports a Small Area of Active Raised Bog (PB1)

Photo 3.6: Active Raised Bog (PB1) within Eastern Section of Island Bog

Table 3.3: Relevé Data from Active Raised Bog PB1 (Sub-Central Ecotope) at Island Bog, County Offaly

Relevé Data		Relevé Number
		Island Bog Relevé 1
Easting (ITM)		648371
Northing (ITM)		724803
Size m^2		4
Slope (degrees)		Flat
Aspect		NA
Substrate type		Peat
Substrate stability		Some quaking
Management		None
Adjacent land use		Peat cutting (mechanical)
Grazing evidence (within relevé)		No evidence of grazing
Number of plant species in quadrat		17
Height tree layer cm		0
Height shrub layer cm		20
Height herb layer cm		40
Total vegetation cover (%)		100
Tree cover (%)		0
Shrub cover (%)		35
Herb grass cover (%)		50
Bryophyte cover (%)		80
Litter cover (%)		0
Rock cover (%)		0
Bare peat / soil cover (%)		0
Species Common Name	**Species Scientific Name**	**Species Cover (Domin Scale)**
Heather	*Calluna vulgaris*	5

Relevé Data		Relevé Number
		Island Bog Relevé 1
Cross-leaved heath	*Erica tetralix*	4
Hare's-tail cottongrass	*Eriophorum vaginatum*	5
Common cottongrass	*Eriophorum angustifolium*	4
White beak-sedge	*Rhynchospora alba*	5
Bog asphodel	*Narthecium ossifragum*	4
Round-leaved sundew	*Drosera rotundifolia*	3
Bog-rosemary	*Andromeda polifolia*	3
Deergrass	*Trichophorum cespitosum*	4
Papillose bog-moss	*Sphagnum papillosum*	8
Magellanic bog-moss	*Sphagnum magellanicum*	4
Red bog-moss	*Sphagnum capillifolium*	5
Soft bog-moss	*Sphagnum tenellum*	4
Feathery bog-moss	*Sphagnum cuspidatum*	4
Lustrous bog-moss	*Sphagnum subnitens*	3
Reindeer moss	*Cladonia portentosa*	3
Bog groove-moss	*Aulacomnium palustre*	3

3.1.4 Dromachon Bog, County Kildare

45. This area of intact high bog occurs east of Derrinturn and north of the Drehid Waste Facility in County Kildare. The two areas of high bog were surrounded by abandoned cutaway bog to the north and south and by agricultural land to the east and west, with birch woodland on cutaway bog between intact bog and farmland. This site is included in the Map of Irish Wetlands (Foss & Crushell 2011) under site code KE116 Drumachon Bog - Timahoe North. The site was also surveyed and included in the The Bog of Allen Habitat and Heritage Report by the Irish Peatland Conservation Council (IPCC) (Hurley 2005).

46. The two high bog remnants (referred to as eastern and western) were separated from one another by a wooded access track which was probably used as a train track by Bord na Móna when the surrounding bogs were being industrially harvested. The eastern side was extensively drained and corresponds with heavily degraded bog. There was an absence of active raised bog communities in this area (Photo 3.7).

Photo 3.7: Eastern side of Drumachon Bog Showing Degraded Bog Surfaces

47. The western high bog (Photo 3.8) area included significant areas of active raised bog (PB1), comprising mainly sub-central ecotope, community complex 10/4[1] as illustrated in Photo 3.9.

Photo 3.8: Western Section of Raised Bog (PB1) at Drumachon which Supports Active Raised Bog (7110) Annex I Habitat

[1] *10 = Sphagnum, 4 = Rhynchospora alba*

Photo 3.9: Active Raised Bog PB1 (Sub-Central Ecotope) at Drumachon, County Offaly

48. Data from the relevé recorded in this area is presented in Table 3.4.

49. There were also a number of large depressions or possibly infilling pools within the sub-central area which correspond with central ecotope, community complex 14, the wettest type of active raised bog (PB1) (Photo 3.10). These features are likely to be the result of subsidence and secondary re-wetting.

Photo 3.10: Active Raised Bog (PB1) Habitat at Drumachon. *Sphagnum* Depressions that Correspond with Central Ecotope

50. Both of these ecotope types correspond with the EU Habitats Directive priority habitat Active raised bogs (7110) (DAHG 2014). The approximate extent of active raised bog at the site is indicated in Figure 50.

51. Following the NRA (2009) assessment criteria, this habitat was assessed as being of county importance due to the presence of active raised bog (7110), however, it does not fulfil the criteria for national or international importance.

Table 3.4: Relevé Data from Active Raised Bog (PB1) (Sub-Central Ecotope) at Drumachon, County Kildare

Relevé Data		Relevé Number
		Drumachon Relevé 1
Easting (ITM)		675205
Northing (ITM)		733444
Size m^2		4
Slope (degrees)		Flat
Aspect		NA
Substrate type		Peat
Substrate stability		Some quaking
Management		None
Adjacent land use		Turf cutting / Access track
Grazing evidence (within relevé)		No evidence of grazing
Number of plant species in quadrat		21
Height tree layer cm		0
Height shrub layer cm		20
Height herb layer cm		30
Total vegetation cover (%)		100
Tree cover (%)		0
Shrub cover (%)		35
Herb grass cover (%)		30
Bryophyte cover (%)		100
Litter cover (%)		0
Rock cover (%)		0
Bare peat / soil cover (%)		0
Species Common Name	**Species Scientific Name**	**Species Cover (Domin Scale)**
White beak-sedge	*Rhynchospora alba*	5
Heather	*Calluna vulgaris*	5
Cross-leaved heath	*Erica tetralix*	4
Bog-rosemary	*Andromeda polifolia*	3
Bog asphodel	*Narthecium ossifragum*	4
Hair's-tail cottongrass	*Eriophorum vaginatum*	4
Common cotton-grass	*Eriophorum angustifolium*	3
Great sundew	*Drosera anglica*	3
Round-leaved sundew	*Drosera rotundifolia*	3
Cowberry	*Vaccinium oxycoccos*	4
Magellanic bog-moss	*Sphagnum magellanicum*	9
Red bog-moss	*Sphagnum capillifolium*	5
Papillose bog-moss	*Sphagnum papillosum*	5
Feathery bog-moss	*Sphagnum cuspidatum*	5

Relevé Data		Relevé Number
		Drumachon Relevé 1
Lustrous bog-moss	*Sphagnum subnitens*	3
Bog-moss flapwort	*Odontoschisma sphagni*	4
Heath star-moss	*Campylopus introflexus*	3
Soft bog-moss	*Sphagnum tenellum*	4
White beak-sedge	*Rhynchospora alba*	5
Heather	*Calluna vulgaris*	5
Cross-leaved heath	*Erica tetralix*	4

3.2 Targeted Habitats Survey 2017

52. A total of thirty sites were surveyed during the 2017 targeted surveys. Table 3.5 provides a summary of the sites examined and indicates their location, where relevé data was recorded and whether any habitats were recorded which conformed to EU Habitats Directive Annex I habitats. Of the 30 sites surveyed, two sites were found to support EU Annex I habitats: Ballythomas (Turlough (3180)) and Eminska grassland (*Moloinia* Meadows (6140)). Details of these two Annex I habitats are provided in Section 3.2.1 and Section 3.2.2.

53. Details of the sites that did not have any correspondence with EU Habitats Directive Annex I habitats are presented in Annex C. It should be noted, the redline boundary shown in Annex C is the project boundary at the time of survey.

Table 3.5: Summary Results of the Locations Examined during the Targeted Habitat Surveys in 2017

Site Name	Survey Date	Figure Number	Reason for Survey	Quadrat Code No. *(where applicable)*	Summary Results	Main Habitat Type Present / Comment	Annex Habitat
WTP	19 June 2017	6	Permanent infrastructure site. Water Treatment Plant (WTP) site.	Q1; Q2; Q3; Q4	Relevé data presented; No Annex I Habitats recorded	GS4; GS4/GA1	No – Non-Annex
Grassland West of Ashley Park	20 June 2017	14	Potential pluvial flooding / turlough	Q5; Q6	Relevé data presented; No Annex I Habitats recorded	GA1	No – Non-Annex
Ballythomas Turlough	20 June 2017	14	Potential pluvial flooding / turlough	Q9; Q10	Relevé data presented; Annex I Habitat recorded: Turlough (3180) (Section 3.2.1)	FL6; Turlough (3180)	Yes – Annex I Habitat
Grasslands at the N52 Crossings	20 June 2017	15	Potential pluvial flooding / turlough	Q7; Q8	Relevé data presented; No Annex I Habitats recorded	GA1	No – Non-Annex
Eminiska Grassland	21 June 2017	16	Potential pluvial flooding / turlough	Q11; Q12	Relevé data presented; Annex I Habitat recorded: Molinia meadow (6410) (Section 3.2.2)	GS4. GS4; Molinia Meadows (6410) present	Yes – Annex I Habitat
Killananny Bog Woodland	22 June 2017	34	Potential bog woodland	Q13	Relevé data presented; No Annex I Habitats recorded	WN7 Non-Annex bog woodland	No – Non-Annex

Site Name	Survey Date	Figure Number	Reason for Survey	Quadrat Code No. *(where applicable)*	Summary Results	Main Habitat Type Present / Comment	Annex Habitat
Reask Woodland	22 June 2017	35	Potential bog woodland	Q14	Relevé data presented; No Annex I Habitats recorded	WN7 Non-Annex bog woodland	No – Non-Annex
Rathlumber Woodland	23 June 2017	43	Potential bog woodland	Q15; Q16	Relevé data presented; No Annex I Habitats recorded	WN7 Non-Annex bog woodland	No – Non-Annex
Ballynakill Bog Woodland	23 June 2017	44	Potential bog woodland	Q17	Relevé data presented; No Annex I Habitats recorded	WN7 Non-Annex bog woodland	No – Non-Annex
Cushaling Peatland (a)	27 June 2017	46	Potential bog woodland	Q24	Relevé data presented; No Annex I Habitats recorded	WN7 Non-Annex bog woodland	No – Non-Annex
Drummond Woodland	27 June 2017	49	Potential bog woodland	Q25	Relevé data presented; No Annex I Habitats recorded	WN7 Non-Annex bog woodland	No – Non-Annex
Timahoe East Peatland and Woodland	29 June 2017	50	Potential bog woodland / degraded raised bog	Q31; Q32; Q33	Relevé data presented; No Annex I Habitats recorded. *Luzula pilosa* site, one of only three locations in County Kildare.	PB1; WN7 Non-Annex bog woodland. Q33: *Luzula pilosa* site	No – Non-Annex
Timahoe East Scrub	28 June 2017	51	Potential bog woodland	Q27	Relevé data presented; No Annex I Habitats recorded	WS1	No – Non-Annex
Timahoe East Woodland	28 June 2017	51	Potential bog woodland	Q28	Relevé data presented; No Annex I Habitats recorded	WN2	No – Non-Annex
Timahoe East Peatland and Grassland (b)	28 June 2017	51	Potential bog woodland / PB4 regenerating bog	Q29	Relevé data presented; No Annex I Habitats recorded	WN7 Non-Annex bog woodland; WN2	No – Non-Annex
Derryvaroge Peatland	26 June 2017	52	Wet heath / degraded raised bog / poor fen and flush	Q18; Q19; Q20; Q21; Q22; Q23	Relevé data presented; No Annex I Habitats recorded	PB1/PB4; WN7/WS1; PB4/GS3; PF2	No – Non-Annex
Cushaling Bog Woodland	27 June 2017	46	Potential bog woodland	No relevé data available	Non-Annex bog woodland. No access possible due to ditches and bull; examination from distance	WN7	No – Non-Annex

3.2.1 Ballythomas Turlough

54. This dry shallow basin (at the time of survey in June 2017) is located 1.8km west north-west of the village of Ardcroney, County Tipperary (Figure 14). The site was not reported as a turlough in any previously published data (Mayes 2008a & 2008b; O'Neill & Martin 2015a & 2015b). The authors are not aware of any documented ecological data for the site.

55. The site was initially visited by Dr. Patrick Crushell in March 2017 when the basin was flooded to depths in excess of 0.5m in places. Based on that visit it was not possible to confirm with any high degree of certainty whether the site qualified as a turlough, as detailed examination of the basin and the associated vegetation types and features could not be undertaken due to flooding. During the March 2017 survey, three mute swans (*Cygnus olor*) and approximately 50 black-headed gulls (*Chroicocephalus ridibundus*) were observed using the site. The water level within the central part of the basin was estimated to be greater than 50cm in March 2017, a further qualifying feature of a turlough, even though the basin was only partially filled with water and not flooded as extensively as shown in aerial photography of the site dating from November 2014 and March 2016 (Image 3.1).

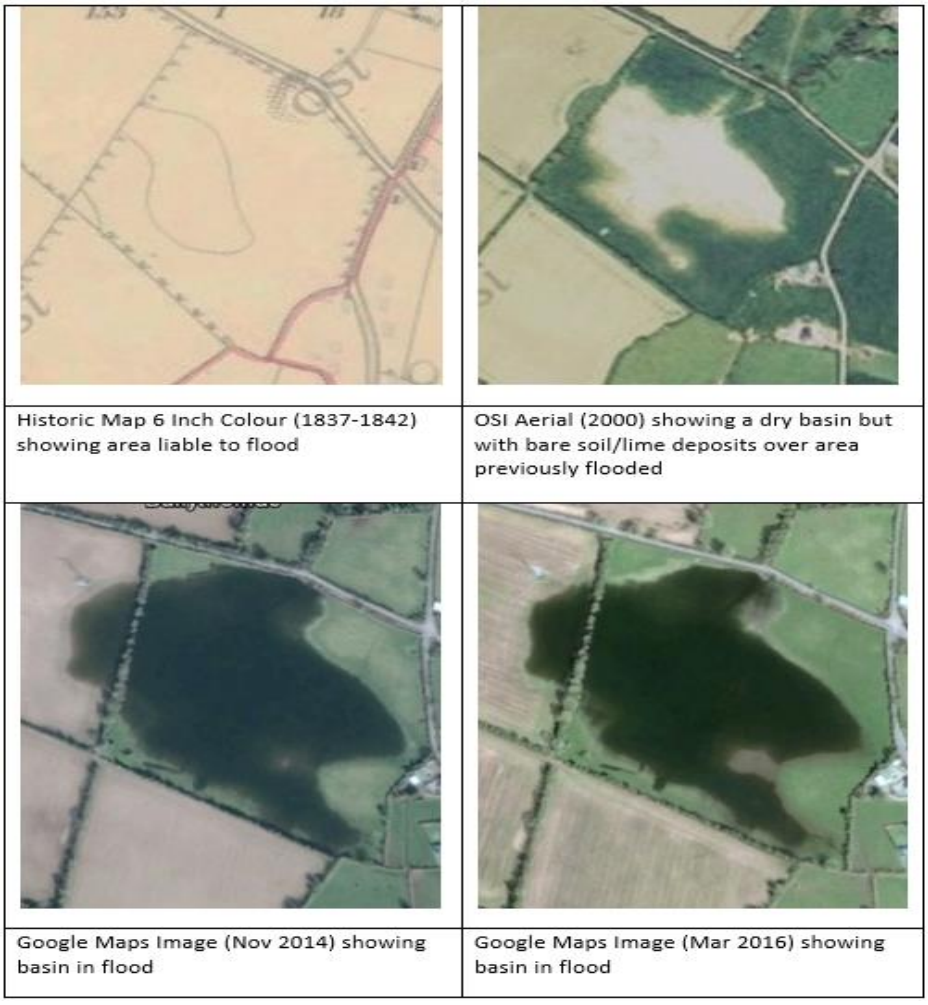

Image 3.1: Historic Maps and Aerial Photography Showing the Previous Extent of Flooding within the Depression at Ballythomas on Various Dates

56. Examination of past historic maps and aerial photography taken in different years (1995, 2000, 2005, 2010, 2011, 2014 and 2016) confirms that the area is regularly prone to alternative periods of extensive flooding and dry conditions, one of the characteristic features of turlough habitats (O'Neill & Martin 2015a & 2015b).

57. The site was visited again in June 2017. During this site visit, the entire basin was dry (Photo 3.11). A number of limestone boulders/exposed bedrock were observed within the turlough depression. These

bare limestone boulders/bedrocks are visible as bare rock areas within the grassland covering the site (Photo 3.12). Bedrock geology maps indicate the site is underlain by Dinantian Upper Impure Limestones. Subsoil map data indicates that the basin is composed of lake sediments undifferentiated.

Photo 3.11: Overview of Turlough basin at Ballythomas in June 2017

Photo 3.12: Limestone Boulder/Bedrock Recorded within Turlough Depression at Ballythomas in March 2017

58. During the June 2017 vegetation survey, the dry depression was found to contain a number of vegetation zones as one moved from the higher grassland area within the field containing the turlough depression down the slope towards the lowest lying area in the centre of the depression. Three main vegetation zones were observed within the basin as described in the following paragraphs. Two vegetation relevés were recorded from the central part of the turlough basin (Table 3.6).

59. The upper margin of the basin was dominated by semi-improved dry calcareous neutral grassland (GS1) that is subject to grazing by cattle. The key grassland species present included ribwort plantain (*Plantago lanceolata*), perennial rye-grass (*Lolium perenne*), cat's-ear (*Hypochaeris radicata*), common sorrel (*Rumex acetosa*), common mouse-ear (*Cerastium fontanum*), white clover (*Trifolium repens*), hairy sedge (*Carex hirta*), meadow buttercup (*Ranunculus acris*), creeping buttercup (*R. Repens*), red clover (*Trifolium pratense*), Yorkshire fog (Holcus lanatus), sweet vernal-grass (*Anthoxanthum odoratum),* yarrow (*Achillea millefolium*), crested dogs-tail (*Cynosurus cristatus*), dandelion (*Taraxacum officinale),* and creeping bent (*Agrostis stolonifera*). This area appears to lie above the upper extent of the flood zone of the turlough based on flooding extent as shown by the 2014 and 2016 aerial photography (Photo 3.13).

60. Moving down into the turlough basin the next vegetation zone was characterised by a similar community to that described above with the occurrence of increasing amounts of silverweed (*Potentilla anserina)* and a lack of some of the drier grassland species. Data from a relevé recorded in this vegetation zone, in the south-east of the basin, is presented in Table 3.6.

61. In the lowest part of the turlough basin the vegetation was characterised by a dense sward of amphibious bistort (*Polygonum amphibium)* and a high cover of silverweed with some small areas of bare mud often showing signs of cattle poaching. Few of the other grassland species recorded higher up the basin were recorded here. Maximum vegetation height was 80cm. Many of the plant species were relatively immature, most likely due to the shorter time period exposed to un-flooded terrestrial conditions. Relevé data, recorded in the lowest area of the western part of the basin, is presented in Table 3.6.

62. Running through the north-western edge of the turlough depression is an interrupted, gappy hawthorn (*Crataegus monogyna*) hedgerow (Photo 3.13), indicating that the hedgerow is subjected to periodic flooding which results in poor growth of shrub species due to waterlogging. The hedgerow was not flooded during the March and/or June 2017 site visits.

Photo 3.13: Flooded Turlough Basin at Ballythomas in March 2017. Non-continuous Hedgerow in the Background

63. Based on the information collected from the two site visits to this location, it is the opinion of the authors that the site corresponds with the EU Habitats Directive priority Annex I habitat Turloughs (3180). The extent of this turlough, based on interpretation of past maps, aerial photography is approximately 6.6 ha as illustrated in Figure 14.

64. Following the NRA (2009) assessment criteria, this habitat was assessed as national importance as it comprises a 'viable area' of the priority Annex I habitat Turloughs (3810).

Table 3.6: Relevé Data form Ballythomas Turlough, County Tipperary

Relevé Data		Relevé Number	
		Relevé 1	Relevé 2
Easting (ITM)		587591	587686
Northing (ITM)		687683	687585
Size m^2		4	4
Slope (degrees)		Level	Level
Aspect		NA	NA
Substrate type		Clay	Mineral Soil
Substrate stability		Firm	Very firm
Management		Grazing - cattle	Grazing - cattle
Adjacent land use		Grazing - cattle	Grazing - cattle
Grazing evidence (within relevé)		Area grazed by cattle	Area grazed by cattle
Number of plant species in quadrat		9	10
Height tree layer cm		0	0
Height shrub layer cm		0	0
Height herb layer cm		80	65
Total vegetation cover (%)		100	100
Tree cover (%)		0	0
Shrub cover (%)		0	0
Herb grass cover (%)		100	100
Bryophyte cover (%)		0	0
Litter cover (%)		0	0
Rock cover (%)		0	0
Bare peat / soil cover (%)		0	0
Species Common Name	**Species Scientific Name**	**Species Cover (Domin Scale)**	
Creeping bent	*Agrostis stolonifera*	5	8
Marsh foxtail	*Alopecurus geniculatus*	2	4
Hairy sedge	*Carex hirta*	1	2
Tall fescue	*Festuca arundinacea*	-	4
Water mint	*Mentha aquatica*	2	-
Greater plantain	*Plantago major*	-	1
Amphibious bistort	*Polygonum amphibium*	5	-
Silverweed	*Potentilla anserina*	8	8
Creeping buttercup	*Ranunculus repens*	4	5
Curled dock	*Rumex crispus*	4	+
Chickweed	*Stellaria media*	2	4
Nettle	*Urtica dioica*	-	+

3.2.2 Eminiska Grassland

65. This wet grassland (GS4) site is located 3.8km north-west of Cloghjordan, County Tipperary. The authors are not aware of any previous documented ecological data for the site.

66. The site was subject to survey in March 2017 and again in June 2017. The site consisted of an area of wet grassland (GS4) and scrub (WS1) vegetation, divided by a central treeline running in an almost east-west direction, with an associated drainage ditch. A freshwater spring was recorded emerging in an area of remnant scrub (WS1) in the north-eastern part of the site. The flow from the spring was diverted by two divergent drainage ditches. The site had recently undergone land 'improvement' which included clearance of scrub vegetation and maintenance or excavation of drainage ditches on the site, especially in the southern part of the site. These works are likely to have reduced the extent of wet grassland habitat (GS4) within the site so that only the northern part of the site still contains areas of good quality wet grassland (GS4). The southern part of the site is dominated by a more rank grassland with extensive areas of marshy vegetation dominated by tall grasses and meadow sweet (*Filipendula ulmaria)* (Figure 16).

67. The northern part of the site was covered in a sward of species rich grassland, with butterfly orchid (*Platanthera chlorantha*) (Photo 3.14). A total of 36 species were recorded within the 4m^2 quadrat (Table 3.7). Analysis of the relevé data collected indicates that this grassland area corresponds with the EU Annex I Habitat type *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) (6410) (Devaney *et al.* 2013 and O'Neill *et al.* 2013). Recent drainage works undertaken at the site at the time were likely to have impacted on the habitat at the site and may lead to further degradation.

68. Following the NRA (2009) assessment criteria, this habitat is of county importance as it contains an area of Annex I habitat. In addition, it contains semi natural habitat types of high biodiversity value in a county context.

Photo 3.14: Butterfly Orchid - A Characteristic Species of Molinia Meadows Recorded at Eminiska, County Tipperary

Table 3.7: Relevé Data form Eminiska Grassland, County Tipperary

Relevé Data	Relevé Number
	Relevé 1
Easting (ITM)	593976
Northing (ITM)	689346
Size m^2	4
Slope (degrees)	Flat
Aspect	NA
Substrate type	Peat/Marl

Relevé Data		Relevé Number
		Relevé 1
Substrate stability		Firm
Management		Possible low level of cattle grazing. Little recent evidence
Adjacent land use		Grazing - cattle
Grazing evidence (within relevé)		No evidence of grazing
Number of plant species in quadrat		36
Height tree layer cm		5
Height shrub layer cm		0
Height herb layer cm		100
Total vegetation cover (%)		95
Tree cover (%)		<5
Shrub cover (%)		0
Herb grass cover (%)		95
Bryophyte cover (%)		60
Litter cover (%)		5
Rock cover (%)		0
Bare peat / soil cover (%)		5
Species Common Name	**Species Scientific Name**	**Species Cover (Domin Scale)**
Sweet vernal-grass	*Anthoxanthum odoratum*	5
Brachythecium	*Brachythecium sp.*	4
Lesser quaking-grass	*Briza minor*	3
Pointed spear-moss	*Calliergonella cuspidata*	5
Cuckooflower	*Cardamine pratensis*	3
Common yellow-sedge	*Carex demissa*	3
Glaucous sedge	*Carex flacca*	3
Tawny sedge	*Carex hostiana*	3
Common sedge	*Carex nigra*	4
Carnation sedge	*Carex panicea*	6
Meadow thistle	*Cirsium dissectum*	5
Marsh thistle	*Cirsium palustre*	1
Tree-moss	*Climacium dendroides*	4
Common spotted-orchid	*Dactylorhiza fuchsii*	1
Marsh horsetail	*Equisetum palustre*	3
Red fescue	*Festuca rubra*	4
Meadowsweet	*Filipendula ulmaria*	4
Ash	*Fraxinus seedlings*	3
Marsh-bedstraw	*Galium palustre*	3
Yorkshire fog	*Holcus lanatus*	5
Marsh pennywort	*Hydrocotyle vulgaris*	+
Compact rush	*Juncus conglomeratus*	+
Soft rush	*Juncus effusus*	2
Heath woodrush	*Luzula multiflora*	4
Water mint	*Mentha aquatica*	5

Relevé Data		Relevé Number
		Relevé 1
Purple moor-grass	*Molinia caerulea*	7
Adder's-tongue	*Ophioglossum vulgatum*	1
Greater butterfly-orchid	*Platanthera chlorantha*	+
Tormentil	*Potentilla erecta*	2
Neat feather-moss	*Pseudoscleropodium purum*	4
Lesser spearwort	*Ranunculus flammula*	4
Springy turf-moss	*Rhytidiadelphus squarrosus*	4
Devil's-bit scabious	*Succisa pratensis*	3
White clover	*Trifolium repens*	2
Marsh arrowgrass	*Triglochin palustris*	+
Tufted vetch	*Vicia cracca*	2

3.3 Targeted Habitats Survey 2018

69. None of the sites that were surveyed during the 2018 targeted habitats surveys were found to support Habitats Directive Annex I habitats. All sites surveyed are shown in Annex D. It should be noted, the redline boundary shown in Annex D is the project boundary at the time of survey. However, marsh fritillary webs were found at three sites: Clonarrow/Riverlyons Peatland (a); and Ticknevin Peatland (a) and (b). All of these sites had extensive areas of marsh fritillary suitable habitat.

3.4 Targeted Habitats Survey 2019

70. Four sites were surveyed during the 2019 targeted surveys. Of the four sites surveyed, two sites were found to support EU Annex I habitats: Coagh Upper Fen and Coolfin Glebe Transition Mire. Details of these Annex I habitats are provided in Section 3.4.1 and Section 3.4.2. Table 3.8 provides a summary of the sites examined in 2019 and indicates their location and whether any habitats were recorded which conformed to EU Habitats Directive Annex I habitats. Details of the sites that did not have any correspondence with EU Habitats Directive Annex I habitats are presented in Annex E. It should be noted, the redline boundary shown in Annex E is the project boundary at the time of survey.

Table 3.8: Summary Results of the Locations Examined during the Targeted Habitat Surveys in 2019

Site Name	Survey Date	Figure Number	Reason for Survey	Summary Results	Main Habitat Type Present / Comment	Annex Habitat
Breaghmore Grassland	2 September 2019	25	Re-attempt to access lands with no access in 2018.Potential semi-natural grassland.	Improved grassland and wet grassland habitat, no potential for Annex I Habitat. Additional information in Annex E.	GA1/GS4	No - Non-Annex Habitat
Rathmore Spring	2 September 2019	22	Re-attempt to access lands with no access in 2018. Potential spring habitat.	This site is not a spring and is dominated by improved agricultural grassland and wet grassland. Additional information in Annex E.	GA1/GS4	No - Non-Annex Habitat
Coagh Upper Fen	21 August 2019	26	To confirm occurrence of blunt flowered rush and confirm condition and extent is unchanged since 2016.	This survey confirmed the occurrence of *Juncus subnodulosus* and further assessed the condition of the fen habitat that was previously recorded in 2016 (Section 3.4.1).	PF1	Yes - Annex I Habitat

Site Name	Survey Date	Figure Number	Reason for Survey	Summary Results	Main Habitat Type Present / Comment	Annex Habitat
Coolfin Glebe Transition Mire	21 August 2019	31	Re-attempt to access lands with no access in 2018. Potential bog habitat.	This site consisted of a low-lying wetland area which corresponds with the EU Habitats Directive transition mire (7140) (Section 3.4.2).	PF2	Yes - Annex I Habitat

3.4.1 Coagh Upper Fen

71. This site is located within the Coagh Upper townland, approximately 10km east of Birr, County Offaly (Figure 26). This site was previously surveyed by WSI in 2016 (EIAR Appendix A8.3: Site Description of Coagh Upper Fen, Co. Offaly). This survey identified the occurrence of sharp flowered rush (*Juncus acutiflorus*); however, recommendations were made to carry out a return visit during the month of August to identify blunt-flowered rush (*Juncus subnodulosus*) during its flowering period.

72. The aim of the field survey was to confirm the potential occurrence of the blunt-flowered rush as being present within the site. This species is typically associated with base-rich conditions and is a key indicator of alkaline fen habitat. The previous survey undertaken in July 2016 was inconclusive as to the presence of the species as the survey was undertaken prior to the flowering season for this species.

73. The follow up survey confirmed that blunt-flowered rush occurred abundantly at the site together with sharp flowered rush. The species was present throughout the area as previously described by WSI (EIAR Appendix A8.3: Site Description of Coagh Upper Fen, Co. Offaly). The site was in similar condition and character as described in 2016 and the evaluation of the site remains the same (Photo 3.15). Fen Bedstraw (*Galium uliginosum*) is an additional species confirmed at the site during the 2019 survey. This species is not listed for protection but has a restricted distribution in Ireland, being mainly found in calcareous fens in the central part of the country.

Photo 3.15: Coagh Upper Fen

74. Fauna species recorded during the 2019 survey included a heath snail (*Helicella itala)* and the four spotted orb weaver spider (*Araneus quadratus*).

75. Although the fen area is extremely small in extent, it is of local importance (higher value) as it corresponds to Alkaline Fen, a habitat listed on Annex I of the EU Habitats Directive.

76. There was no relevé data recorded within this habitat during the 2019 surveys. A more detailed assessment and evaluation was carried out in 2016 and results of this are within EIAR Appendix A8.3: Site Description of Coagh Upper Fen, Co. Offaly.

3.4.2 Coolfin Glebe Transition Mire

77. The site comprises a low-lying wetland area of approximately 3.5ha in extent occurring 3km south-east of Kilcormac, County Offaly (Figure 31). A public road running north to south forms the western boundary. The wetland was surrounded by intensively managed grassland occurring on elevated lands. A former raised bog (PB1) that was in commercial extraction occurred approximately 1km south of the wetland. The aim of the survey was to assess the ecological significance of habitats present within this wetland site.

78. The principal habitat within the site was transition mire (7140). The surface within this habitat was extremely wet and quaking comprising a floating mat dominated by bottle sedge (*Carex rostrata*) and bogbean (*Menyanthes trifoliata*). Brown mosses including spear moss (*Calliergonella cuspidata*) dominated the bryophyte layer. Relevé 1 was recorded in the central part of the transition mire (Table 3.9). The habitat represents a good example of transition mire with typical species assemblage, a high stable water table, and no impacting activities recorded.

79. The southern margin of the transition mire supported a rich fen (PF1) vegetation typical of alkaline fen. Here black bog-rush dominated with devil's bit-scabious (*Succisa pratensis*), and quaking grass (*Briza media*) occurring abundantly. The substrate was relatively firm peat with no standing water. Relevé 2 was recorded in this area to the south of the transition mire (Table 3.9).

80. Following the NRA (2009) assessment criteria, this habitat has been assessed as local importance (higher value) as it contains an area of Annex I habitat.

Table 3.9: Relevé Data from Coolfin Glebe, County Offaly

Relevé Data	Relevé Number	
	Relevé 1	Relevé 2
Easting (ITM)	619897	619882
Northing (ITM)	711137	711090
Size m^2	4	4
Slope degrees	0	0
Aspect	South	South
Substrate type	Peat	Peat
Stability	Floating mat	Firm
Quadrat Water table depth cm	0	0
Comments on hydrology in quadrat	High water table, no drainage within site, some marginal drains define site boundaries	Slightly raised area towards southern part of site, water table below surface
Quadrat management	None	None
Adjacent land use	Grazing - cattle	Grazing - cattle
Quadrat grazing evidence	No evidence of grazing	No evidence of grazing
Number of plant species in quadrat	21	24
Height of vegetation cm	30	40
Height herb layer cm	30	40
Total vegetation cover as percent	100	100
Percent bryophyte cover	100	10
Percent tree cover	0	0
Percent shrub cover	0	0

Relevé Data		Relevé Number	
		Relevé 1	Relevé 2
Percent herb / grass / sedge		60	100
Habitat type fossitt		PF3 Transition mire & quaking bog	PF1 Rich fen and flush
EU habitat quality		7140 Transition mires and quaking bogs	Alkaline fens (7230)
Species Scientific Name	**Species Common Name**	**Species Cover (Domin Scale)**	
Creeping bent	*Agrostis stolonifera*	3	-
Bog pimpernel	*Anagallis tenella*	3	-
Sweet vernal-grass	*Anthoxanthum odoratum*	-	3
Common quaking-grass	*Briza media*	-	5
Giant spear-moss	*Calliergon giganteum*	+	-
Pointed spear-moss	*Calliergonella cuspidata*	9	4
Heather	*Calluna vulgaris*	-	+
Marsh-marigold	*Caltha palustris*	4	-
Cuckoo-flower	*Cardamine pratensis*	3	-
Star sedge	*Carex echinata*	-	4
Carnation sedge	*Carex panicea*	-	3
Bottle sedge	*Carex rostrata*	5	-
Sedge sp.	*Carex sp.*	-	3
Meadow thistle	*Cirsium dissectum*	-	3
Tree-moss	*Climacium dendroides*	+	-
Marsh cinquefoil	*Comarum palustre*	-	+
Marsh orchid sp.	*Dactylorhiza spp.*	-	2
Short-fruited willowherb	*Epilobium obscurum*	+	-
Water horsetail	*Equisetum fluviatile*	4	-
Common cottongrass	*Eriophorum angustifolium*	3	3
Eyebright sp.	*Euphrasia sp.*	-	2
Yorkshire fog	*Holcus lanatus*	-	3
Marsh pennywort	*Hydrocotyle vulgaris*	3	3
Sharp-flowered rush	*Juncus acutiflorus*	3	-
Jointed rush	*Juncus articulatus*	-	3
Hard rush	*Juncus inflexus*	-	+
Water mint	*Mentha aquatica*	4	3
Bogbean	*Menyanthes trifoliata*	5	-
Purple moor-grass	*Molinia caerulea*	-	5
Lousewort	*Pedicularis sylvatica*	+	-
Common reed	*Phragmites australis*	+	-
Bog pondweed	*Potamogeton polygonifolius*	+	-
Tormentil	*Potentilla erecta*	-	3
Selfheal	*Prunella vulgaris*	-	3
Lesser spearwort	*Ranunculus flammula*	2	-
Creeping buttercup	*Ranunculus repens*	+	-
Black bog-rush	*Schoenus nigricans*	-	6

Relevé Data		Relevé Number	
		Relevé 1	Relevé 2
Hooked scorpion-moss	*Scorpidium scorpioides*	+	-
Bog stitchwort	*Stellaria alsine*	-	+
Devil's-bit scabious	*Succisa pratensis*	-	6
Red clover	*Trifolium pratensis*	-	3

3.5 Targeted Habitats Survey 2020

81. Five sites were surveyed during the 2020 targeted surveys. Of the five sites surveyed, one site was found to support EU Annex I habitats: Alkaline Fen (7230). Details of this Annex I habitat is provided in Section 3.5.1. Table 3.10 provides a summary of the sites examined in 2020 and indicates their location and whether any habitats were recorded which conformed to EU Habitats Directive Annex I habitats. Details of the sites that did not have any correspondence with EU Habitats Directive Annex I Habitats are presented in Annex F. It should be noted, the redline boundary shown in Annex F is the project boundary at the time of survey.

Table 3.10: Summary Results of the Locations Examined during the Targeted Habitat Surveys in 2020

Site Name	Survey Date	Figure Number	Reason for Survey	Summary Results	Main Habitat Type Present / Comment	Annex Habitat
RWI&PS	10 to 11 August 2020	6	Permanent infrastructure site. Survey to confirm condition and extent is unchanged since 2016.	This site is dominated by mixed conifer woodland on the western parts and conifer plantation to the east. There was no potential for Annex I Habitat. Additional information and relevé data are provided in Annex F.	WD2, WD4	No - Non-Annex Habitat
WTP	10 August 2020	6	Permanent infrastructure site. Survey to confirm condition and extent is unchanged since 2017.	This site is dominated by wet grassland and is grazed by cattle. Additional information and relevé data are provided in Annex F.	GS4, WL2	No - Non-Annex Habitat
Raheenduff Fen	11 August 2020	38	Potential fen habitat.	This site is *Schoenus* dominated rich fen with the eastern edges dominated by wet grassland and scrub. Surveys confirmed that this site is linked with the EU Habitats Directive Annex I Habitat Alkaline Fens (7230). Further detail on this habitat and relevé data are outlined in Section 3.5.1.	PF1, GS4, WS1	Yes - Annex I Habitat*
Mountpellier Grassland (38 kV Uprate Works)	31 August 2020	3	Site located within Lower River Shannon SAC (site code: 002165). To determine the presence or absence of Annex I habitats.	This site consisted of improved agricultural grassland with pockets of poor wet grassland. Additional information and relevé data are provided in Annex F.	GA1, GS4	No - Non-Annex Habitat

Site Name	Survey Date	Figure Number	Reason for Survey	Summary Results	Main Habitat Type Present / Comment	Annex Habitat
Grasslands Near Lough Ourna	11 August 2020	13	Potential wetland/semi natural grassland.	This site had no available access but was viewed from the roadside. This site was dominated by dry meadows and grassy verges and had no correspondence with Annex I Habitats. Additional information on this site is provided in Annex F.	GS2	No - Non-Annex Habitat

*Please note this habitat is no longer considered Annex due to development works carried out after 2020 (Photo 3.17)

3.5.1 Raheenduff Fen

82. This site is located in the townland of Raheenduff, approximately 8km south-east of Tullamore, County Offaly (Figure 38). The target area surveyed was comprised of *Schoenus* dominated rich fen (PF1) adjoined by wet grassland (GS4), with scrub (WS1) encroaching from the field boundaries in some places throughout the site (Photo 3.16).

Photo 3.16: Raheenduff Fen during 2020 Surveys

83. The south-eastern part of the site was comprised of wet grassland (GS4) with scrub (WS1) encroaching from the field boundaries. This wet grassland (GS4) was dominated by hard rush (*Juncus inflexus),* meadowsweet, and silverweed. Other species present included yorkshire fog, sweet vernal grass, marsh thistle (*Cirsium palustre*), purple loosetrife (*Lythrum salicaria*), and hairy willowherb*,* with small patches of purple moor-grass (*Molinia caerulea*) and black sedge (*Carex nigra*). Scrub species present included hawthorn, European gorse, willow (*Salix sp.),* bramble (*Rubus fruticosus agg*.), bracken (*Pteridium aquilinum*), ash (*Fraxinus excelsior*), and sycamore (*Acer pseudoplatanus).*

84. In the northern part of the site the wet grassland (GS4) transitioned into *Schoenus* fen comprised of black bog-rush, soft rush (*Juncus effusus*), tormentil (*Potentilla erecta*), devil's-bit scabious and quaking-grass. A complete species list from a relevé taken within the fen area is presented in Table 3.11 (Relevé 1). This site had abundant devil's-bit scabious and comprises suitable habitat for marsh fritillary, however no webs were observed during the walkover survey.

85. A tufa spring, with curled hookmoss (*Palustriella commutata*), yellow starry feather-moss, and rusty hook-moss (*Scorpidium revolvens*) occurred in the east of the site. The spring was surrounded by species comprising a typical *Schoenus* fen community. Although the fen area was small in extent, it is of high local importance as it corresponds to alkaline fen, a habitat listed on Annex I of the EU Habitats Directive. Past drainage has impacted the hydrological integrity of the fen and is likely to have caused a loss of fen habitat.

Table 3.11: Raheenduff Fen Relevé Results

Relevé Data		Relevé Number
		Relevé 1
Easting (ITM)		640583
Northing (ITM)		720087
Size m^2		4
Slope (degrees)		<5
Aspect		North
Substrate type		Peat
Substrate stability		Firm
Management		Grazing - horses
Adjacent land use		Grazing - horses
Grazing evidence (within relevé)		No evidence of grazing
Number of plant species in quadrat		9
Height tree layer (cm)		25
Height shrub layer (cm)		10-20
Height herb layer (cm)		50
Total vegetation cover (%)		90
Tree cover (%)		60
Shrub cover (%)		0
Herb grass cover (%)		75
Bryophyte cover (%)		70
Litter cover (%)		0
Rock cover (%)		0
Bare peat / soil cover (%)		0
Species Common Name	**Species Scientific Name**	**Species Cover (Domin Scale)**
Bog pimpernel	*Anagallis tenella*	3
Common quaking-grass	*Briza media*	3
Pointed spear-moss	*Calliergonella cuspidata*	4
Marsh horsetail	*Equisetum palustre*	3
Soft rush	*Juncus effusus*	3
Purple moor-grass	*Molinia caerulea*	5
Tormentil	*Potentilla erecta*	4
Black bog-rush	*Schoenus nigricans*	8
Devil's-bit scabious	*Succisa pratensis*	5

86. This site was subject to a walkover survey on 25 May, 2022, by a TOBIN hydrogeologist. This survey found the site to be impacted by drainage and construction works (not associated with the Proposed Project) and is therefore no longer considered to contain any Annex I habitats (Photo 3.17).

Photo 3.17: Raheenduff Fen during Survey in May 2022

3.6 Targeted Habitats Survey 2021

87. Five sites were surveyed during the 2021 targeted surveys. Of the five sites surveyed, one site supported EU Annex I habitat: Molinia meadows on calcareous, peaty or clayey-silt-laden soils (6410). This habitat was also surveyed in 2017. Details of this Annex I habitat are provided within Section 3.6.1 and Section 3.2.2. Table 3.12 provides a summary of the sites examined in 2021 and indicates their location and whether any habitats were recorded which conformed to EU Habitats Directive Annex I habitats. Details of the sites that did not have any correspondence with EU Habitats Directive Annex I Habitats are presented in Annex G. It should be noted, the redline boundary shown in Annex G is the project boundary at the time of survey.

Table 3.12: Summary Results of the Locations Examined during the Targeted Habitat Surveys in 2021

Site Name	Survey Date	Figure Number	Reason for Survey	Summary Results	Main Habitat Type Present / Comment	Annex Habitat
Rowing Club Grasslands	17 August 2021	3	Re-attempt to access restricted lands. Adjacent to Lower River Shannon SAC. Survey to determine the presence or absence of Annex I habitats.	This site is dominated by dry meadows and grassy verges. There was no evidence of grazing throughout the site. Additional information and species lists are provided in Annex G.	GS2	No - Non-Annex Habitat

Site Name	Survey Date	Figure Number	Reason for Survey	Summary Results	Main Habitat Type Present / Comment	Annex Habitat
Eminiska Grassland	18 August 2021	16	Re-survey of Annex I habitat recorded in 2017 to confirm condition and extent is unchanged and to collect more recent data.	This site is dominated by wet grassland with *Molinia cerulea* as the dominant species. A semi natural woodland dominates in the north-west. Surveys in 2017 confirmed that this site is linked with the EU Habitats Directive Annex I Habitat *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (6410). Further detail on this habitat and relevé data is outlined in Section 3.6.1.	GS4, WD1	Yes - Annex I Habitat
Grasslands near Lough Ourna	18 August 2021	13	Attempt to re-access restricted lands. Potential wetland/semi natural grassland.	This site is dominated by improved agricultural grassland. This site was not accessed on the day due to access restrictions but was viewed from the public road. Additional information is provided in Annex G.	GA1, GS4	No - Non-Annex Habitat
Derryvarroge Grasslands and Woodland	24 August 2021	52	Potential turlough	This site is dominated by improved agricultural grassland, meadow grassland and marsh with conifer plantation to the south. Some of the grassland areas were heavily grazed by horses at the time of the survey. Additional information and species list for each habitat are provided in Annex G.	GA1, GM1, GS2 WD4	No - Non-Annex Habitat
Coologmartin Grasslands	24 August 2021	51	Potential semi-natural grassland	This site is dominated by improved agricultural grassland with small areas of wet grassland. Some of the grassland areas were moderately grazed by horses at the time of the survey. Additional information and species list for each habitat are provided in Annex G.	GA1, GS4, GM1	No - Non-Annex Habitat

3.6.1 Eminiska Grassland

88. This site (Figure 16) was surveyed by WSI in March and June 2017 (Section 3.2.2). In addition, Dr. John Conaghan resurveyed the area in September 2021, to collect more recent data on the extent and condition of the habitat.

89. The majority of this area was dominated by wet grassland vegetation (GS4) in which purple moor-grass was the dominant species. Other frequent plant species in the vegetation included compact rush (*Juncus conglomeratus*), sweet vernal grass, meadow sweet, devil's-bit scabious and purple loosestrife. It would appear that this vegetation corresponds to the Annex I habitat (6410) *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (Photo 3.18). It should be noted however that the habitat was ungrazed and, as a result, the vegetation was tall, rank and relatively species-poor with a high plant litter cover. The dominant soil type within the survey area was cutover peat.

90. One of the fields within the area supported a more semi-improved wet grassland flora dominated by creeping buttercup (*Ranunculus repens*), timothy (*Phleum pratense*), soft rush, red clover, ribwort plantain, silverweed and tufted hairgrass (*Deschampsia cespitosa*). The full species list of this habitat is outlined in Table 3.13.

91. The land to the south of the survey area was dominated by improved agricultural grassland (GA1).

92. Semi-natural broadleaved woodland (WD1) on dry soil dominated by varying mixtures of birch, ash and grey willow (*Salix cinerea*) dominated the north-western end of the survey area. Most of the ash was affected by ash die-back. The canopy height of the woodland was generally between 6m and 10m. The ground layer was species-poor with bramble dominating throughout. Small areas of gorse and willow scrub (WS1) also occurred along the north-eastern boundary of the survey area.

93. Following the NRA (2009) assessment criteria, this habitat is of county importance as it contains an area of Annex I habitat.

Photo 3.18: *Molinia* Meadow Vegetation at Eminiska

Table 3.13: Species List for Wet Grassland (GS4) Habitat

Species Scientific name	Species Common Name	Relative abundance
*Molinia caerulea**	Purple moor-grass	Dominant
*Anthoxanthum odoratum**	Sweet vernal-grass	Abundant
Juncus effusus	Soft rush	Abundant
Agrostis stolonifera	Creeping bent	Locally abundant
Holcus lanatus	Yorkshire fog	Locally abundant
Ranunculus repens	Creeping buttercup	Locally abundant
Calliergonella cuspidata	A moss	Frequent
Cirsium palustre	Marsh thistle	Frequent
*Cirsium dissectum**	Meadow thistle	Frequent
*Filipendula ulmaria**	Meadowsweet	Frequent
Deschampsia cespitosa	Tufted hair-grass	Frequent
*Juncus conglomeratus**	Compact rush	Frequent
*Lythrum salicaria**	Purple loosestrife	Frequent
Phleum pratense	Timothy	Frequent

Species Scientific name	Species Common Name	Relative abundance
Plantago lanceolata	Ribwort plantain	Frequent
*Potentilla erecta**	Tormentil	Frequent
Potentilla anserina	Silverweed	Frequent
Schedonorus arundinaceus	Tall fescue	Frequent
*Succisa pratensis**	Devils bit scabious	Frequent
Trifolium pratense	Red clover	Frequent
*Vicia cracca**	Tufted vetch	Frequent
*Carex flacca**	Glaucous sedge	Occasional
Centaurea nigra	Common knapweed	Occasional
Cirsium arvense	Creeping thistle	Occasional
Epilobium hirsurum	Great willowherb	Occasional
*Festuca rubra**	Red fescue	Occasional
Juncus inflexus	Hard rush	Occasional
*Mentha aquatica**	Water mint	Occasional
Ranunculus acris	Meadow buttercup	Occasional
*Ranunculus flammula**	Lesser spearwort	Occasional
Rhytidiadelphus squarrosus	A moss	Occasional
Taraxacum officinale	Dandelion	Occasional
Trifolium repens	White clover	Occasional
Carex disticha	Brown sedge	Rare
*Galium palustre**	Marsh bedstraw	Rare
*Juncus acutiflorus**	Sharp-flowered rush	Rare
*Lathyrus pratensis**	Meadow vetchling	Rare

* = Species more typical of *Molinia* meadow habitat (6410)

3.7 Species of Conservation Concern

94. Only one plant species of note, hairy wood-rush (*Luzula pilosa*), was recorded during the targeted habitat surveys in June 2017.

95. The native species, hairy wood-rush, was recorded in an area of mature birch woodland at the edge of a raised bog (PB1) remnant area at Timahoe in County Kildare (Annex C, Relevé 33) (Photo 3.19).

96. The Atlas of the British and Irish Flora (Preston *et al.* 2002) describes the species as: "*A tufted, grass-like perennial herb of woods and other moist but well-drained shaded places, often on roadside-banks and in hedgerows, generally on fairly acidic soils but not confined to them. Plants usually occur in leaf-litter or moss-dominated sites, and competition is rarely tolerated. A decline, especially in C. & E. England, has taken place and analysis of the database reveals that most of these losses have occurred since 1950*". The species has no specific conservation status in Ireland.

97. In the woodland at Timahoe, three specimens of the plant were found on dry peat in the shaded birch woodland understory (see report for Relevé 33 in Annex C for further site data). This species is relatively uncommon in Ireland, being recorded in 235no. 10km tetrads, the majority located in Northern Ireland and in south-east Ireland. The National Biodiversity Centre Database lists only two other 10km tetrads for the occurrence of this species in County Kildare (Image 3.2).

Photo 3.19: *Luzula pilosa* in Birch Woodland on Cutover at Timahoe, County Kildare

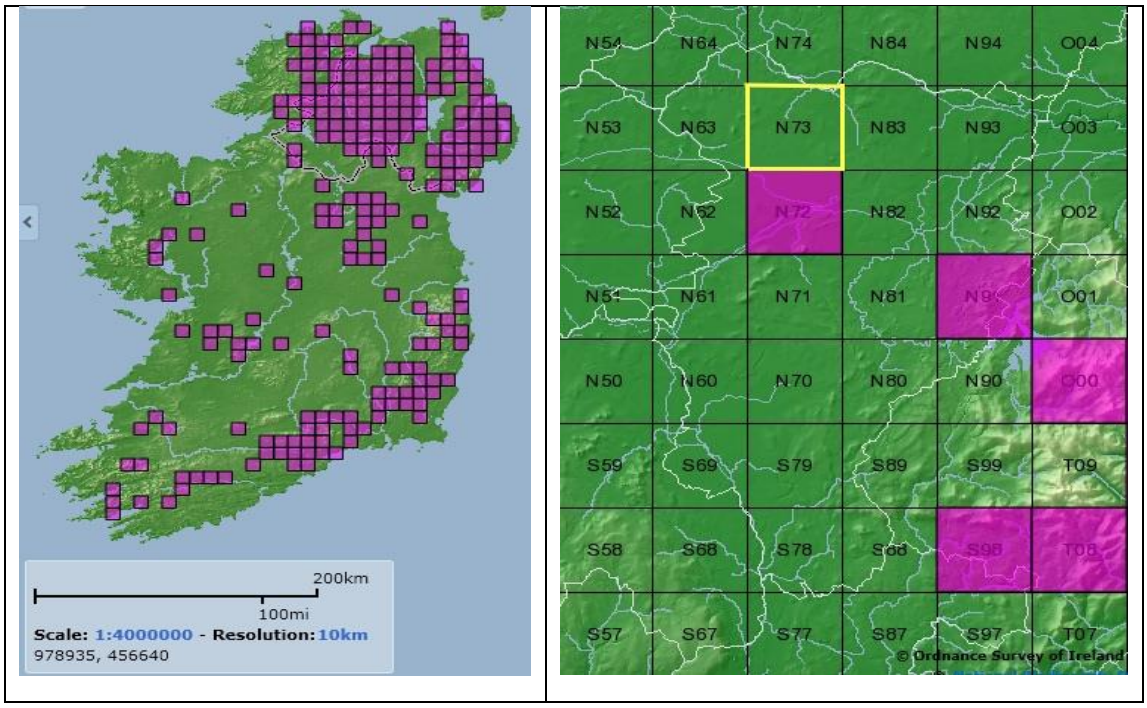

Image 3.2: National Biodiversity Data Centre Distribution Maps Showing 10km Square Distribution of *Luzula pilosa* (in purple) (Ireland on left hand image, County Kildare on right hand image). The 2017 Survey Sighting is a New Record for Square N73 (yellow outline)

4. Discussion and Evaluation

98. There were nine Annex I habitats recorded within the study area of the Proposed Project and previous iterations of the project during the targeted habitat surveys between 2016 and 2021. However, as stated in Section 3.5.1, surveys carried out in 2022 discovered that Raheenduff Fen no longer holds habitats that correspond with any listed under the EU Habitats Directive Annex I habitats. None of the Annex I habitats recorded in the study area are located within the Application Boundary of the Proposed Project (these habitats were avoided by careful route selection).

99. The identification of these Annex I habitats throughout the six years of surveys resulted in a number of changes to the Proposed Project Boundary and also outlined constraint areas in the wider study areas of the Proposed Project:

- Turlough at Ardcrony, County Tipperary. Habitat surveys carried out in August 2016 classified this site as a priority Annex I habitat, Turloughs (3180). The 'Preferred 200m Pipeline Corridor' at the time of survey was subsequently re-routed to avoid this habitat. This site is now located approximately 375m south of the Proposed Project (Figure 14)
- Turlough at Ballythomas, County Tipperary. Habitat surveys carried out in July 2017 classified this site as the priority Annex I habitat, Turloughs (3180). The 'Indicative 50m Pipeline Corridor' at the time of survey was subsequently re-routed to avoid this habitat. The potential extent of the turlough is now located approximately 20m south of the Proposed Project's Application Boundary (Figure 14)
- Species rich *Molinia* grassland with fen affinities was noted at Eminiska, County Tipperary. Habitat surveys carried out in July 2017 and September 2021 classified this site as the Annex I habitat, *Molinia* meadows (6410). The 'Indicative 50m Pipeline Corridor' at the time of survey was subsequently re-routed to avoid this habitat. This habitat is now located approximately 20m north of the Proposed Project and is separated from the Proposed Project by a deep drainage ditch (Figure 16)
- The non-priority Annex I habitat Alkaline fens (7230) area dominated by black bog-rush (*Schoenus fen*) was recorded in Coagh Upper, County Offaly. The fen area is located on a break in slope at the base of a steep hill. Water levels in the fen are likely to be maintained by overland surface water runoff and groundwater. The soil under the fen is composed of a thin peat layer with mineral soil with calcareous tufa deposits in some areas. The 'Indicative 50m Pipeline Corridor' at the time of survey was re-routed to avoid this habitat. This site is located approximately 60m west of the Proposed Project (Figure 26).
- A small area of the non-priority Annex I habitat Transition mire (7140) was recorded in Coolfin Glebe, County Offaly. The surface of the site was extremely wet and quaking comprising a floating mat. This habitat was described as a good example of transition mires with typical species assemblage, a high stable water table and no impacting activities. This Annex I habitat is located approximately 78m from the Proposed Project (Figure 31)
- There was a small area of the non-priority Annex I habitat Alkaline Fens (7230) recorded alongside a small area of the priority habitat Petrifying springs with *tufa* formation (7220) in Raheenduff, County Offaly. These Annex I habitats are located approximately 85m west of the Proposed Project. The spring is located in the east of the site and is surrounded by species comprising a typical *Schoenus* fen community. The fen area is small, however it does correspond to Annex I habitat Alkaline fen (7230), past drainage has impacted the hydrological integrity of the fen and is likely to have caused a loss of fen habitat. This habitat is shown in Figure 38. However, in 2022, it was confirmed that the area of land containing the petrifying springs has since been modified and as such is no longer considered an Annex I habitat (Section 3.5.1)
- The priority Annex I habitat Calcareous fens with *Cladium mariscus* and species of the *Caricon davallianae* (7210) and the non-priority Annex I habitat Alkaline fens (7230) were recorded in Derrinclare Cutover, County Offaly. The 'Indicative 50m Pipeline Corridor' at the time of survey was re-routed to avoid this habitat. These sites are located approximately 220m south-east of the Proposed Project (Figure 19)

- A small area of the priority Annex I habitat Active raised bogs (7110) was recorded at Island Bog, County Offaly. This area of active raised bog (PB1) is approximately 205m from the Proposed Project, separated by a local access road. The bog remnant grades from scrub/marginal bog ecotope along the road, to active peat forming towards the centre of the remnant site. No intact peat occurs to the south of the access road (Figure 41)
- A small area of the priority Annex I habitat Active raised bogs (7110) was recorded at Drumachon Bog, County Kildare. This area of active raised bog (PB1) is located approximately 55m from the Proposed Project at its closest point and is separated by a wooded access track. The bog remnant grades from willow/birch scrub/marginal bog ecotope along the road to active peat forming towards the centre of the remnant site. No intact peat occurs to the east of the access road (Figure 50).

5. References

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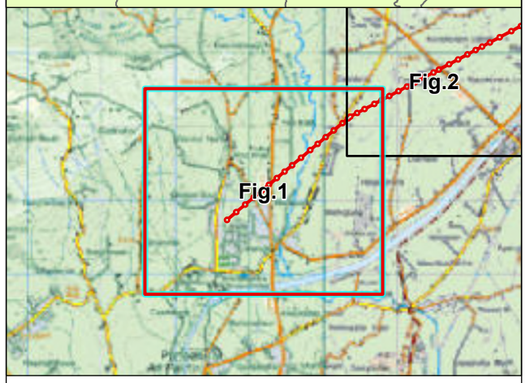
Annex A – Figures



Legend

- Planning Application Boundary
- Indicative Pipeline
- Study Area
- Rivers/Streams

RW-xxx - Raw Water Chainage
TW-xxx - Treated Water Chainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
F03	21/11/25	Final - Planning Application	SP	LK	SN	SW

Jacobs TOBIN

Client: Uisce Éireann Irish Water; Tionscadal Soláthair Uisce Water Supply Project

Project: Water Supply Project
Eastern and Midlands Region

Drawing Title: Appendix 8.4
Figure 1
Target Habitat Surveys
Sheet 1 of 59

Drawing Status: Final - Planning Application

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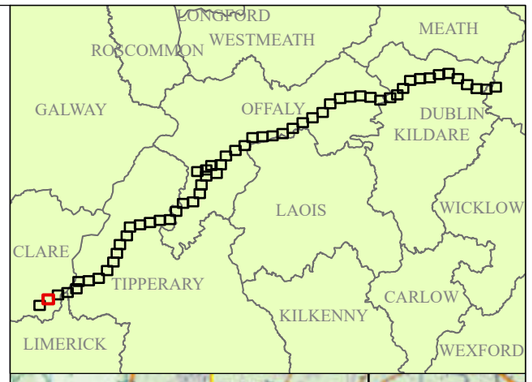

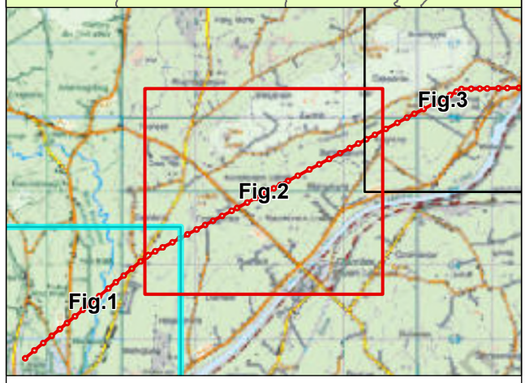

Legend

- Planning Application Boundary
- Indicative Pipeline
- Study Area
- Rivers/Streams

RW-xxx - Raw Water Chainage
TW-xxx - Treated Water Chainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
F03	21/11/25	Final - Planning Application	SP	LK	SN	SW

Jacobs TOBIN

Client: Uisce Éireann Irish Water; Tionscadal Soláthair Uisce Water Supply Project

Project: Water Supply Project
Eastern and Midlands Region

Drawing Title: Appendix 8.4
Figure 2
Target Habitat Surveys
Sheet 2 of 59

Drawing Status: Final - Planning Application

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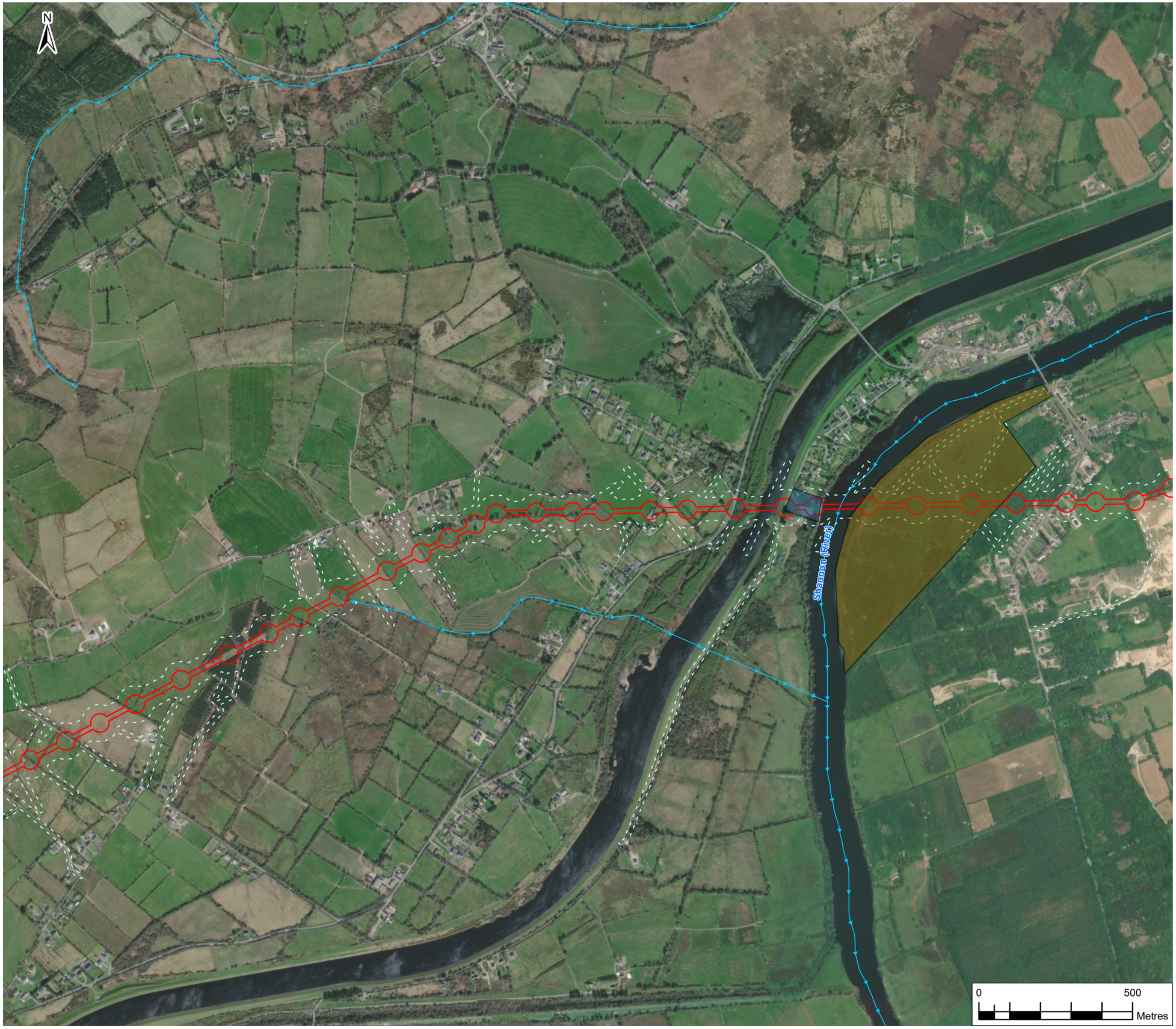

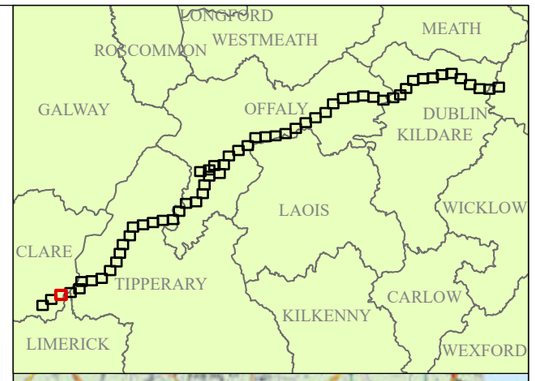

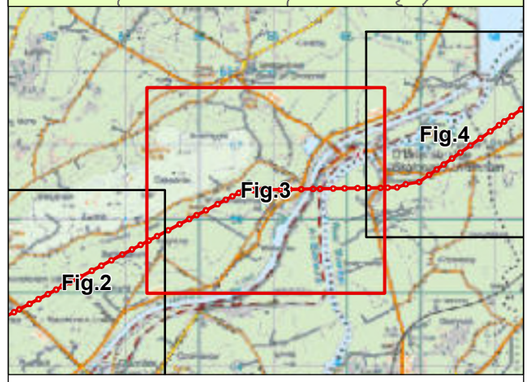

Legend

- Planning Application Boundary
- Indicative Pipeline
- Study Area
- Rivers/Streams

Non-Annex Habitats

- Mountpellier Grassland
- Rowing Club Grasslands

RW-xxx - Raw Water Chainage
TW-xxx - Treated Water Chainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
F03	21/11/25	Final - Planning Application	SP	LK	SN	SW

Jacobs TOBIN

Client: Uisce Éireann Irish Water; Tionscadal Soláthair Uisce Water Supply Project

Project
Water Supply Project
Eastern and Midlands Region

Drawing Title
Appendix 8.4
Figure 3
Target Habitat Surveys
Sheet 3 of 59

Drawing Status: Final - Planning Application

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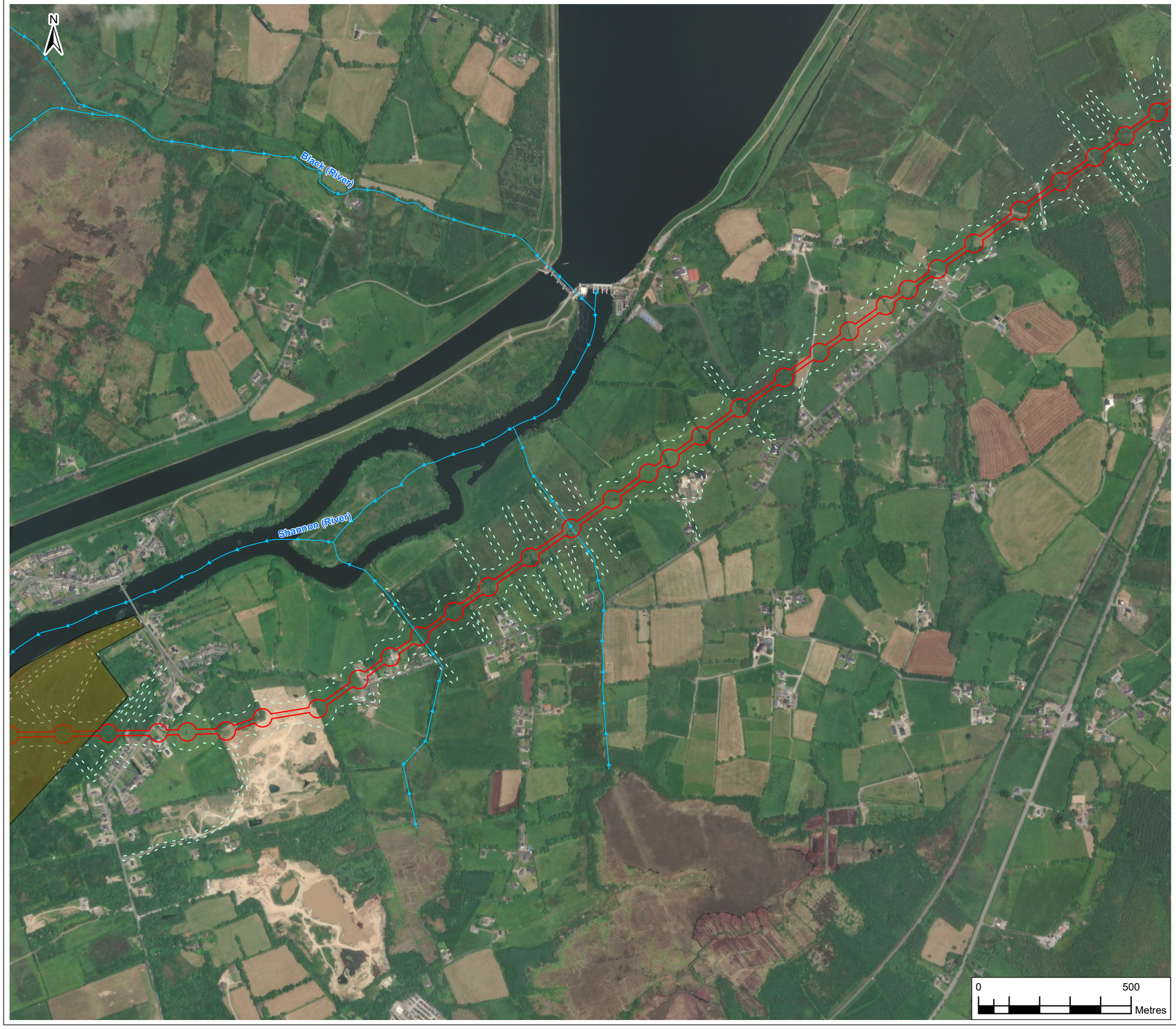

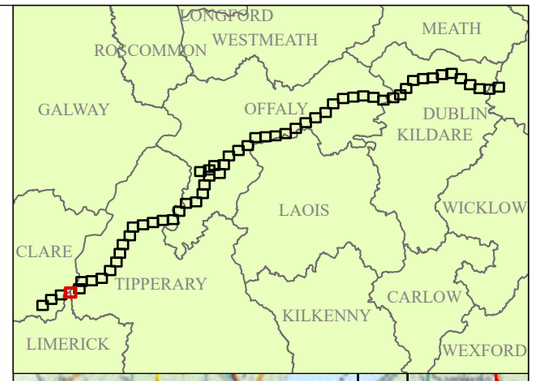

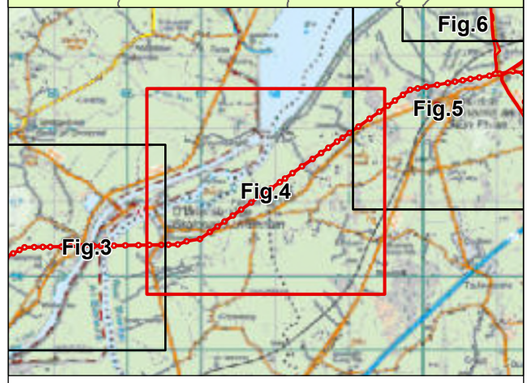

Legend

- Planning Application Boundary
- Indicative Pipeline
- Study Area
- Rivers/Streams

Non-Annex Habitats

- Mountpellier Grassland

RW-xxx - Raw Water Chainage
TW-xxx - Treated Water Chainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
F03	21/11/25	Final - Planning Application	SP	LK	SN	SW

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Client: Uisce Éireann Irish Water; Tionscadal Soláthair Uisce Water Supply Project

Project: Water Supply Project
Eastern and Midlands Region

Drawing Title: Appendix 8.4
Figure 4
Target Habitat Surveys
Sheet 4 of 59

Drawing Status: Final - Planning Application

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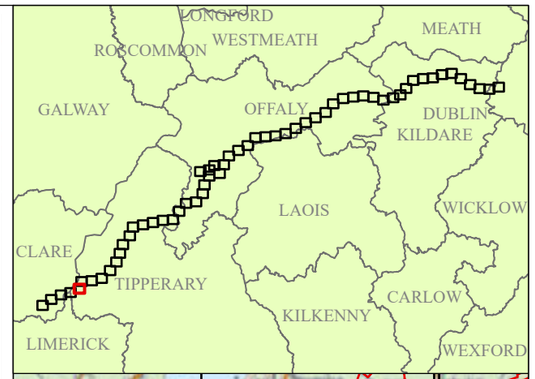

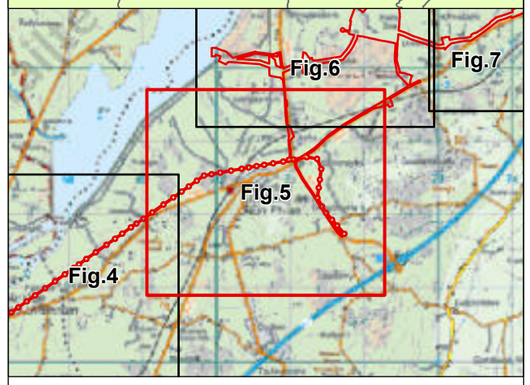

Legend

- Planning Application Boundary
- Indicative Pipeline
- Study Area
- Rivers/Streams

RW-xxx - Raw Water Chainage
TW-xxx - Treated Water Chainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
F03	21/11/25	Final - Planning Application	SP	LK	SN	SW

Jacobs TOBIN

Client: Uisce Éireann Irish Water; Tionscadal Soláthair Uisce Water Supply Project

Project
Water Supply Project
Eastern and Midlands Region

Drawing Title
Appendix 8.4
Figure 5
Target Habitat Surveys
Sheet 5 of 59

Drawing Status: Final - Planning Application

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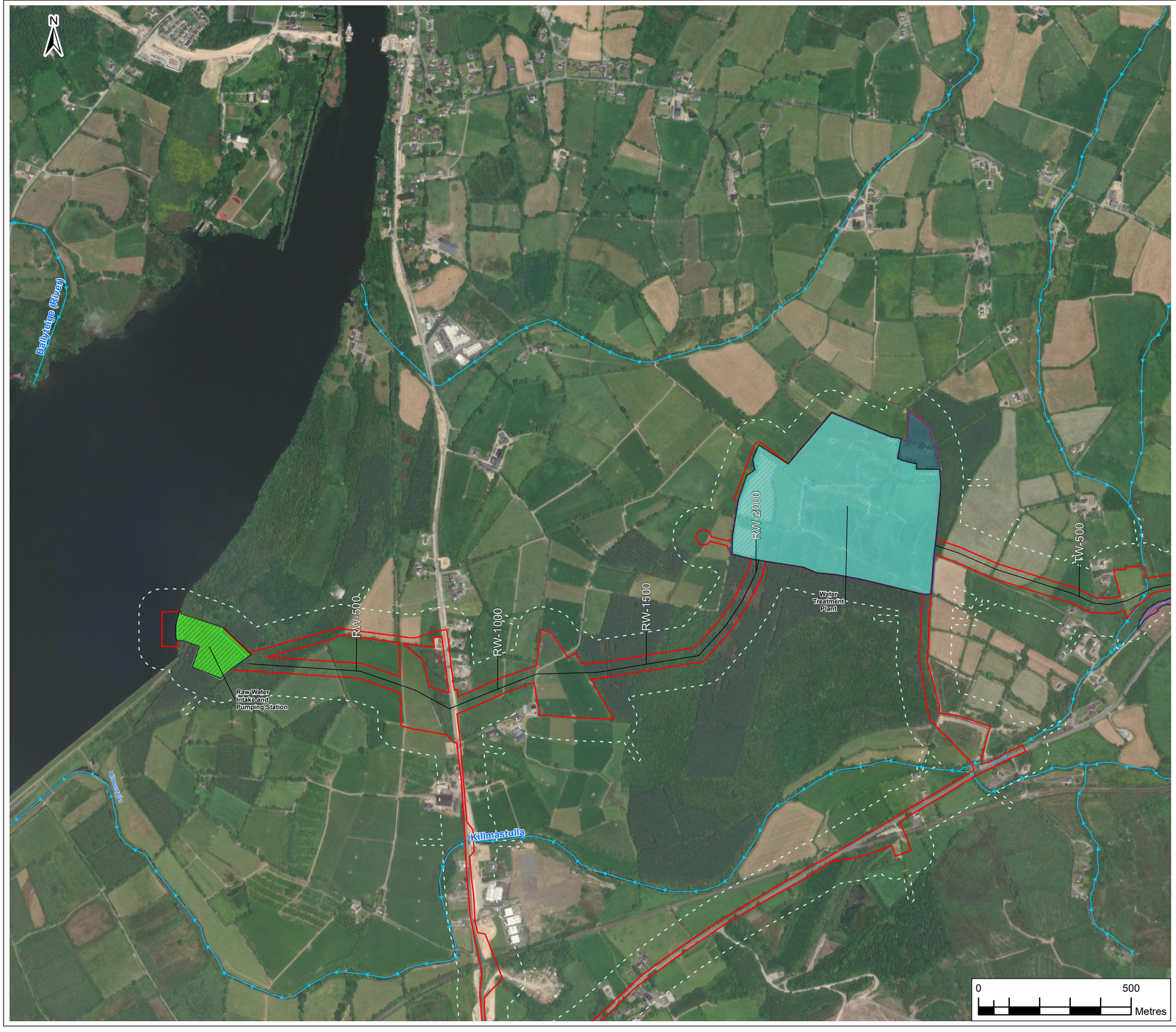

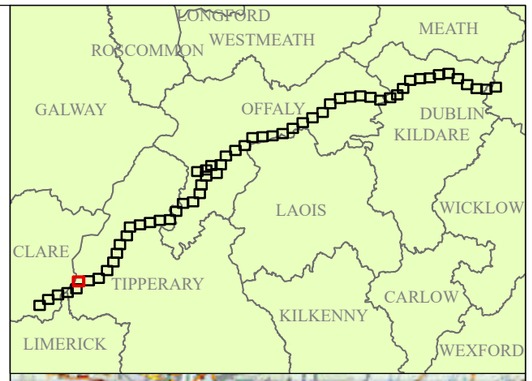

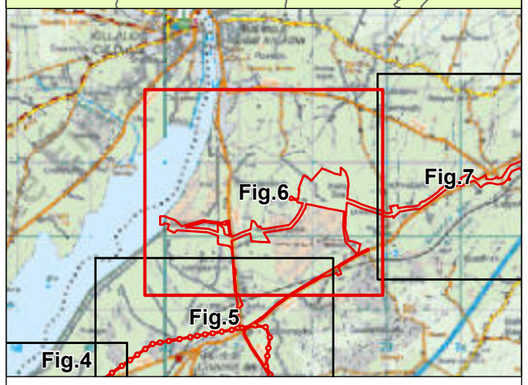

Legend

- Planning Application Boundary
- Indicative Pipeline
- Study Area
- Rivers/Streams

Infrastructure Sites

- Raw Water Intake and Pumping Station
- Water Treatment Plant

Non-Annex Habitats

- Kilmastulla Woodland
- RWI&PS
- WTP

RW-xxx - Raw Water Chainage
TW-xxx - Treated Water Chainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
F03	21/11/25	Final - Planning Application	SP	LK	SN	SW

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Client: Uisce Éireann Irish Water; Tionscadal Soláthair Uisce Water Supply Project

Project: Water Supply Project
Eastern and Midlands Region

Drawing Title: Appendix 8.4
Figure 6
Target Habitat Surveys
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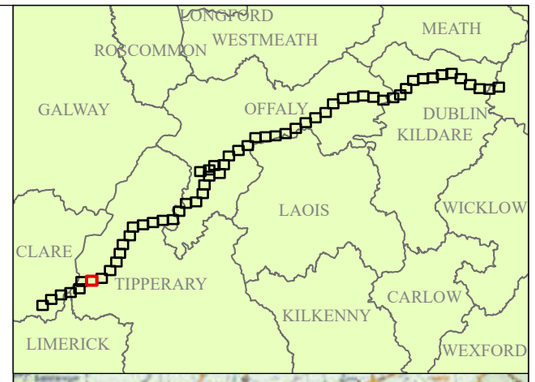

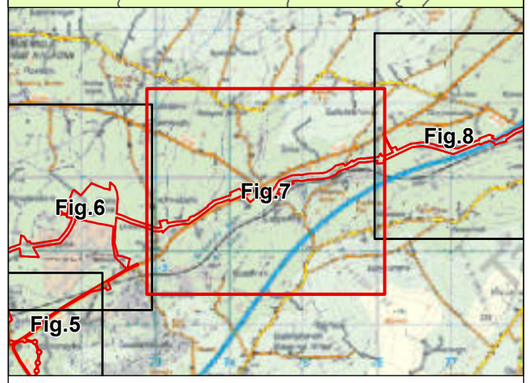

Legend

- Planning Application Boundary
- Indicative Pipeline
- Study Area
- Rivers/Streams

Non-Annex Habitats

- Boher Grassland
- Boher/Ballinteenoew Woodland
- Kilmastulla Woodland

RW-xxx - Raw Water Chainage
TW-xxx - Treated Water Chainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
F03	21/11/25	Final - Planning Application	SP	LK	SN	SW

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Client: Uisce Éireann Irish Water; Tionscadal Soláthair Uisce Water Supply Project

Project
Water Supply Project
Eastern and Midlands Region

Drawing Title
Appendix 8.4
Figure 7
Target Habitat Surveys
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Drawing Status: Final - Planning Application

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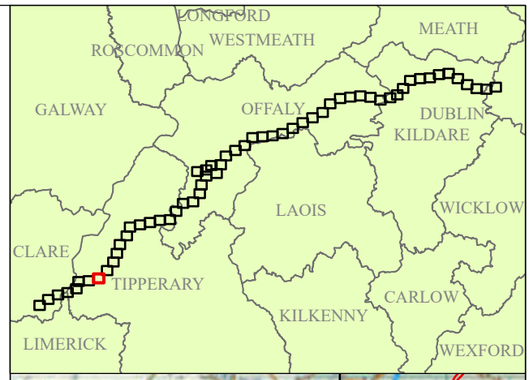

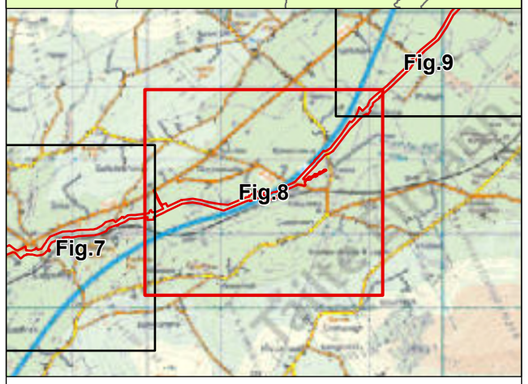

Legend

- Planning Application Boundary
- Indicative Pipeline
- Study Area
- Rivers/Streams

Non-Annex Habitats

- Gortmore Grassland

RW-xxx - Raw Water Chainage
TW-xxx - Treated Water Chainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
F03	21/11/25	Final - Planning Application	SP	LK	SN	SW

Jacobs TOBIN

Client: Uisce Éireann Irish Water; Tionscadal Soláthair Uisce Water Supply Project

Project: Water Supply Project
Eastern and Midlands Region

Drawing Title: Appendix 8.4
Figure 8
Target Habitat Surveys
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Drawing Status: Final - Planning Application

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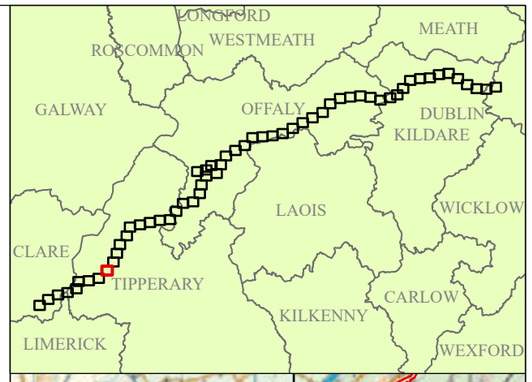

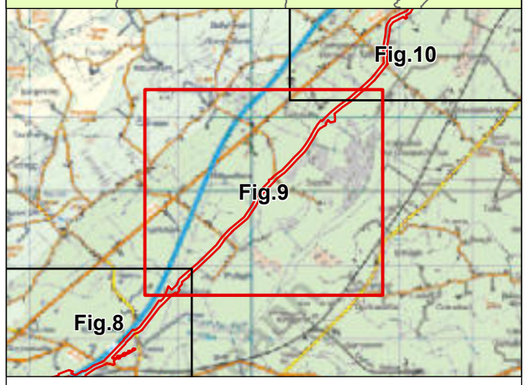

Legend

- Planning Application Boundary
- Indicative Pipeline
- Study Area
- Rivers/Streams

Non-Annex Habitats

- Gortmore Grassland

RW-xxx - Raw Water Chainage
TW-xxx - Treated Water Chainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
F03	21/11/25	Final - Planning Application	SP	LK	SN	SW

Jacobs TOBIN

Client: Uisce Éireann Irish Water; Tionscadal Soláthair Uisce Water Supply Project

Project: Water Supply Project
Eastern and Midlands Region

Drawing Title: Appendix 8.4
Figure 9
Target Habitat Surveys
Sheet 9 of 59

Drawing Status: Final - Planning Application

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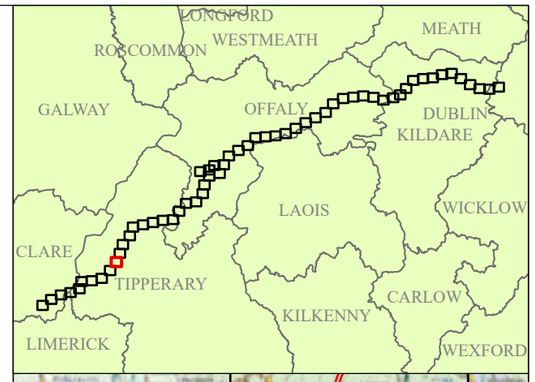

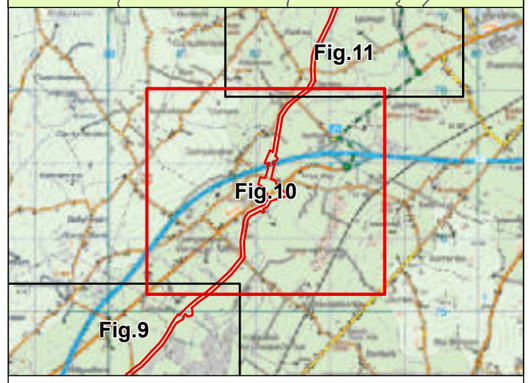

Legend

- Planning Application Boundary
- Indicative Pipeline
- Study Area
- Rivers/Streams

Non-Annex Habitats

- Kilcoman/Clareen Grassland

RW-xxx - Raw Water Chainage
TW-xxx - Treated Water Chainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
F03	21/11/25	Final - Planning Application	SP	LK	SN	SW

Jacobs TOBIN

Client: Uisce Éireann Irish Water; Tionscadal Soláthair Uisce Water Supply Project

Project: Water Supply Project
Eastern and Midlands Region

Drawing Title: Appendix 8.4
Figure 10
Target Habitat Surveys
Sheet 10 of 59

Drawing Status: Final - Planning Application

Scale @ A3	1:12,000	DO NOT SCALE
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Client No.	9318	
Drawing No.	32105801/700/1609	
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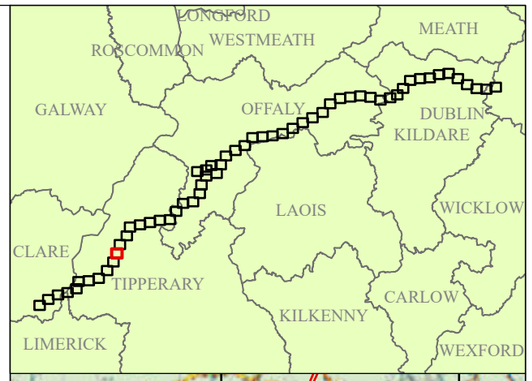

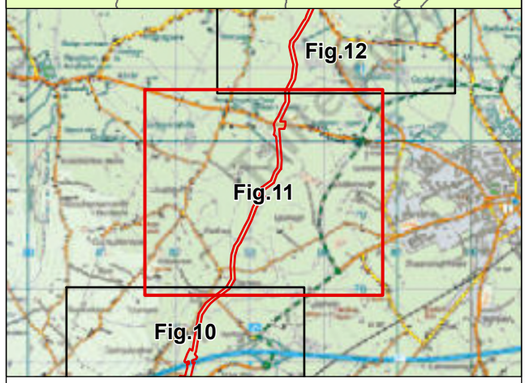

Legend

- Planning Application Boundary
- Indicative Pipeline
- Study Area
- Rivers/Streams

Non-Annex Habitats

- Kilcoman/Clareen Grassland
- Tullamore/Beleen Lower Hedgrow

RW-xxx - Raw Water Chainage
TW-xxx - Treated Water Chainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
F03	21/11/25	Final - Planning Application	SP	LK	SN	SW

Jacobs TOBIN

Client: Uisce Éireann Irish Water; Tionscadal Soláthair Uisce Water Supply Project

Project: Water Supply Project
Eastern and Midlands Region

Drawing Title: Appendix 8.4
Figure 11
Target Habitat Surveys
Sheet 11 of 59

Drawing Status: Final - Planning Application

Scale @ A3	1:12,000	DO NOT SCALE
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Client No.	9318	
Drawing No.	32105801/700/1610	
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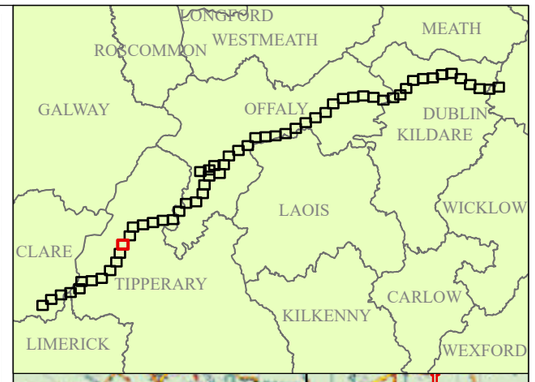

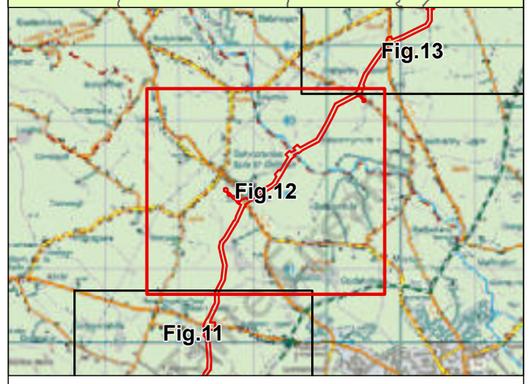

Legend

- Planning Application Boundary
- Indicative Pipeline
- Study Area
- Rivers/Streams

Non-Annex Habitats

- Ballyhimkin Treeline

RW-xxx - Raw Water Chainage
TW-xxx - Treated Water Chainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
F03	21/11/25	Final - Planning Application	SP	LK	SN	SW

Jacobs TOBIN

Client: Uisce Éireann Irish Water; Tionscadal Soláthair Uisce Water Supply Project

Project: Water Supply Project
Eastern and Midlands Region

Drawing Title: Appendix 8.4
Figure 12
Target Habitat Surveys
Sheet 12 of 59

Drawing Status: Final - Planning Application

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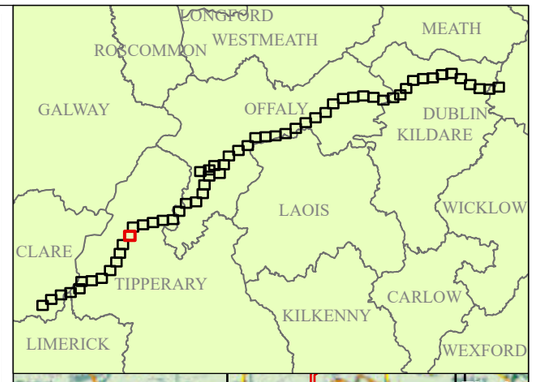

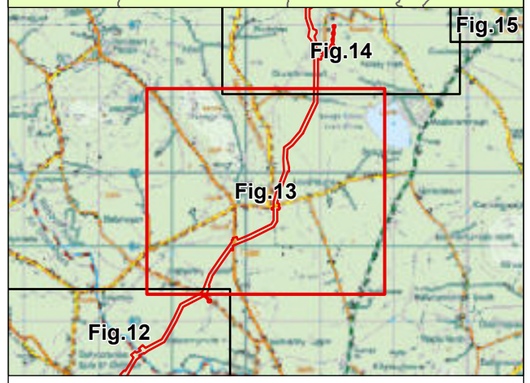

Legend

- Planning Application Boundary
- Indicative Pipeline
- Study Area
- Rivers/Streams

Non-Annex Habitats

- Grassland Near Lough Ourna
- Grassland West of Ashley Park
- Ponds Near Lough Ourna

RW-xxx - Raw Water Chainage
TW-xxx - Treated Water Chainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
F03	21/11/25	Final - Planning Application	SP	LK	SN	SW

Jacobs TOBIN

Client

Uisce Éireann Irish Water

Tionscadal Soláthair Uisce Water Supply Project

Project

Water Supply Project
Eastern and Midlands Region

Drawing Title

Appendix 8.4
Figure 13
Target Habitat Surveys
Sheet 13 of 59

Drawing Status: Final - Planning Application

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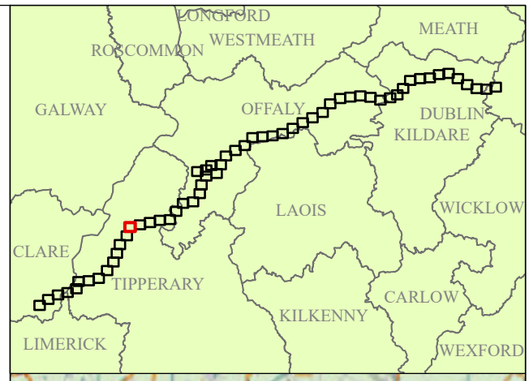

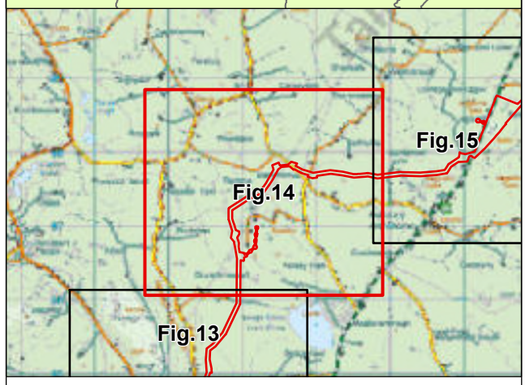

Legend

- Planning Application Boundary
- Indicative Pipeline
- Study Area
- Rivers/Streams

Annex I Habitats

- Ardcroney Turlough
- Ballythomas Turlough

Non-Annex Habitats

- Grassland West of Ashley Park
- Ponds Near Lough Ourna

RW-xxx - Raw Water Chainage
TW-xxx - Treated Water Chainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
F03	21/11/25	Final - Planning Application	SP	LK	SN	SW

Jacobs TOBIN

Client: Uisce Éireann Irish Water; Tionscadal Soláthair Uisce Water Supply Project

Project: Water Supply Project
Eastern and Midlands Region

Drawing Title: Appendix 8.4
Figure 14
Target Habitat Surveys
Sheet 14 of 59

Drawing Status: Final - Planning Application

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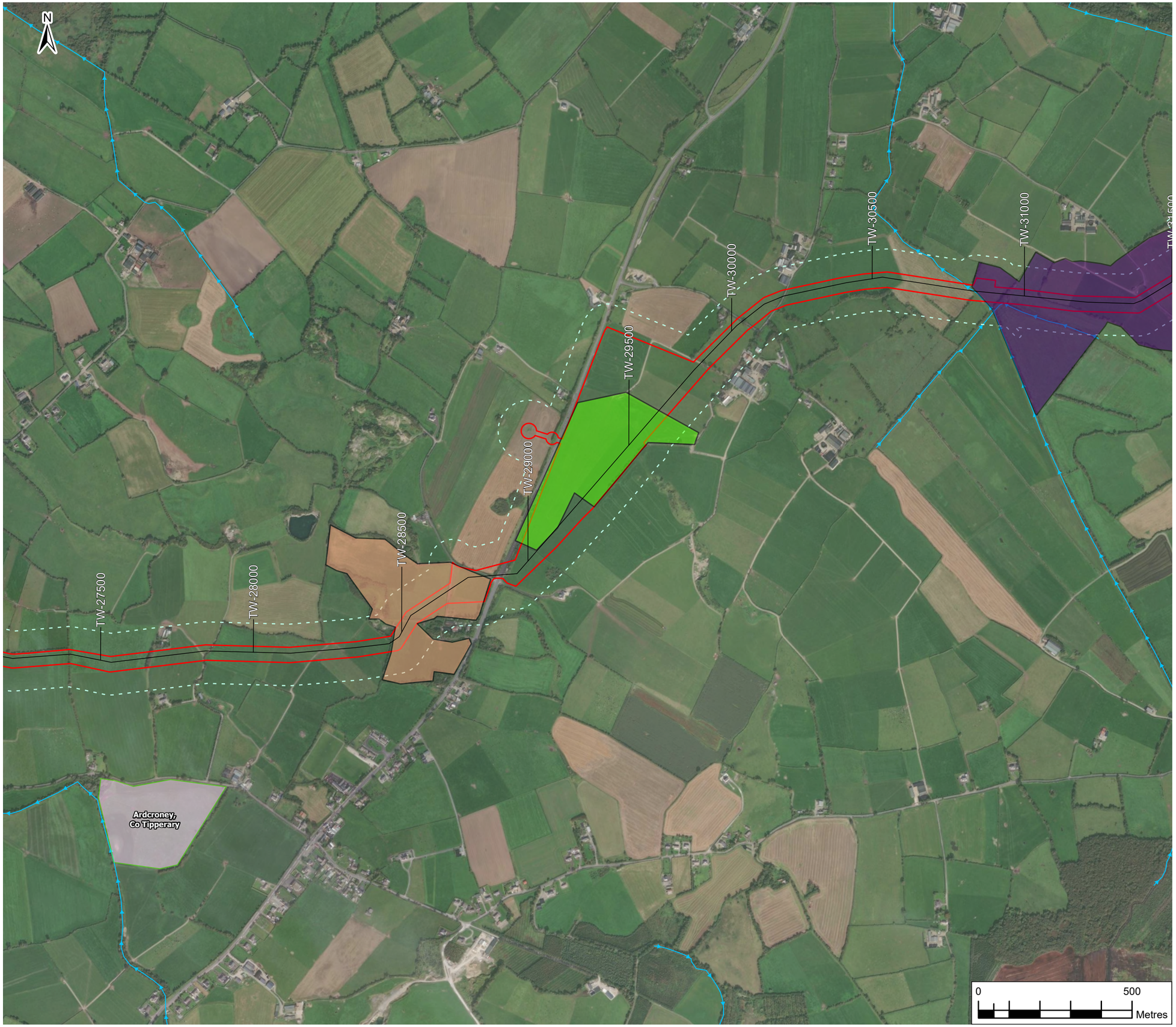

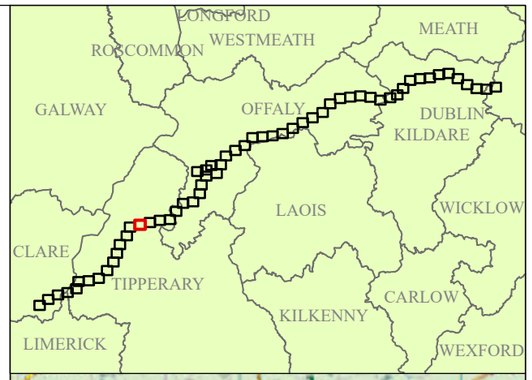

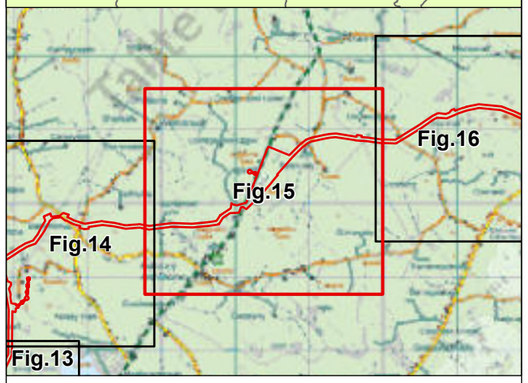

Legend

- Planning Application Boundary
- Indicative Pipeline
- Study Area
- Rivers/Streams

Annex I Habitats

- Ardcroney Turlough

Non-Annex Habitats

- Grassland at the N52 Crossing
- Grasslands at the N52 Crossing
- Grasslands near Coolderry

RW-xxx - Raw Water Chainage
TW-xxx - Treated Water Chainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
F03	21/11/25	Final - Planning Application	SP	LK	SN	SW

Jacobs TOBIN

Client: Uisce Éireann Irish Water; Tionscadal Soláthair Uisce Water Supply Project

Project: Water Supply Project
Eastern and Midlands Region

Drawing Title: Appendix 8.4
Figure 15
Target Habitat Surveys
Sheet 15 of 59

Drawing Status: Final - Planning Application

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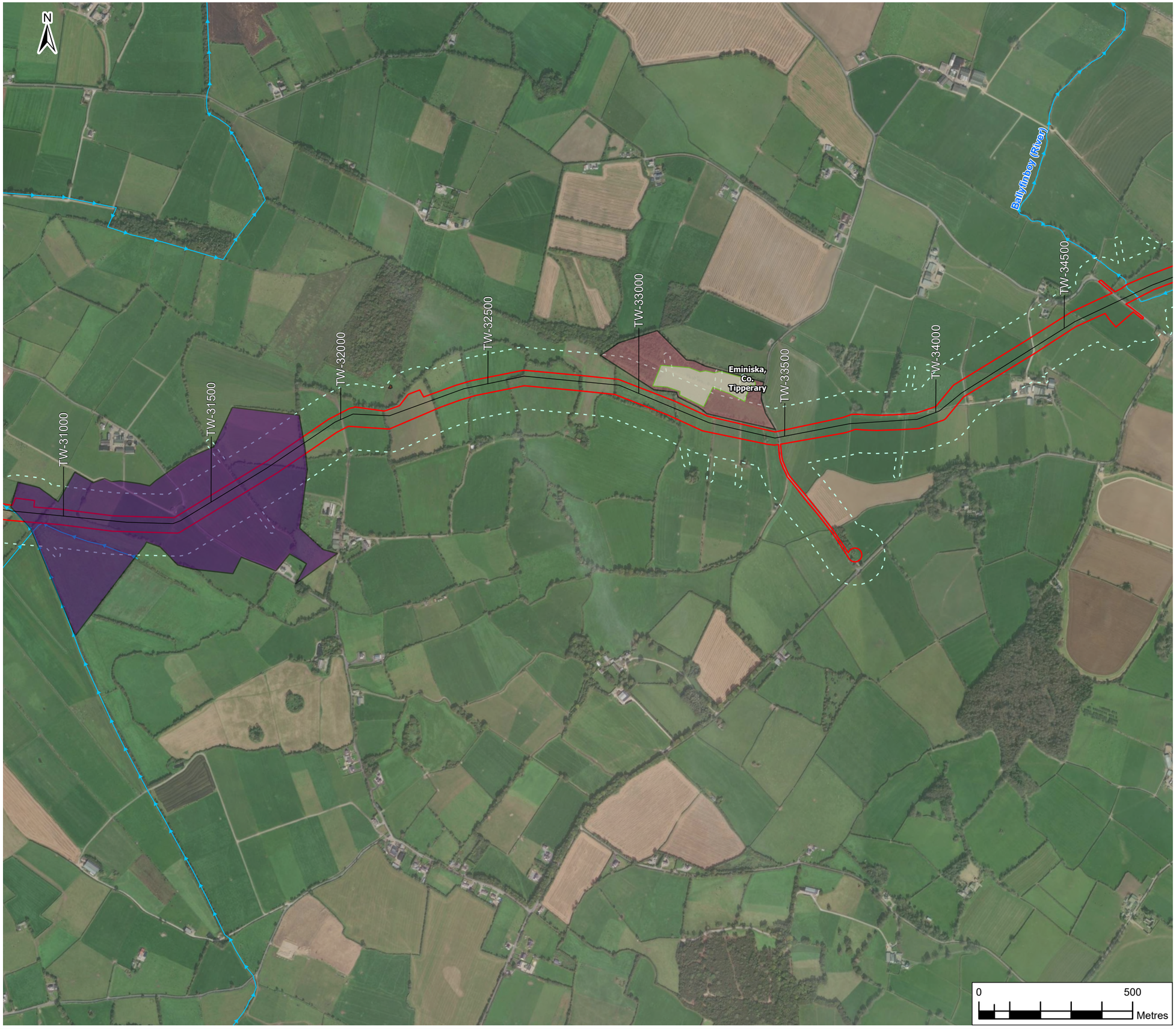

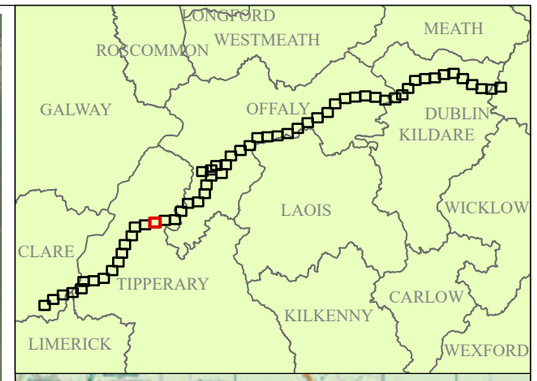

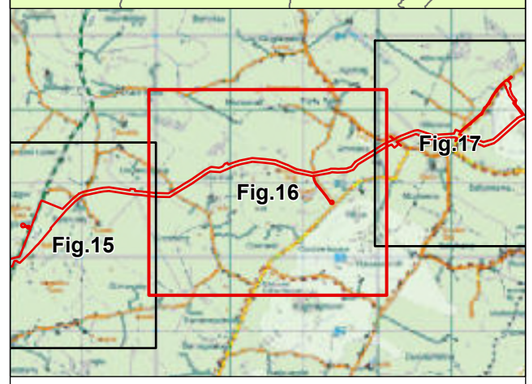

Legend

- Planning Application Boundary
- Indicative Pipeline
- Study Area
- Rivers/Streams

Annex I Habitats

- Mollinia Meadows, Eminiska

Non-Annex Habitats

- Drumroe Spring
- Eminiska Spring and Grassland
- Grasslands near Coolderry

RW-xxx - Raw Water Chainage
TW-xxx - Treated Water Chainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
F03	21/11/25	Final - Planning Application	SP	LK	SN	SW

Jacobs TOBIN

Client

Uisce Éireann Irish Water

Tionscadal Soláthair Uisce Water Supply Project

Project

Water Supply Project
Eastern and Midlands Region

Drawing Title

Appendix 8.4
Figure 16
Target Habitat Surveys
Sheet 16 of 59

Drawing Status

Final - Planning Application

Scale @ A3	1:12,000	DO NOT SCALE
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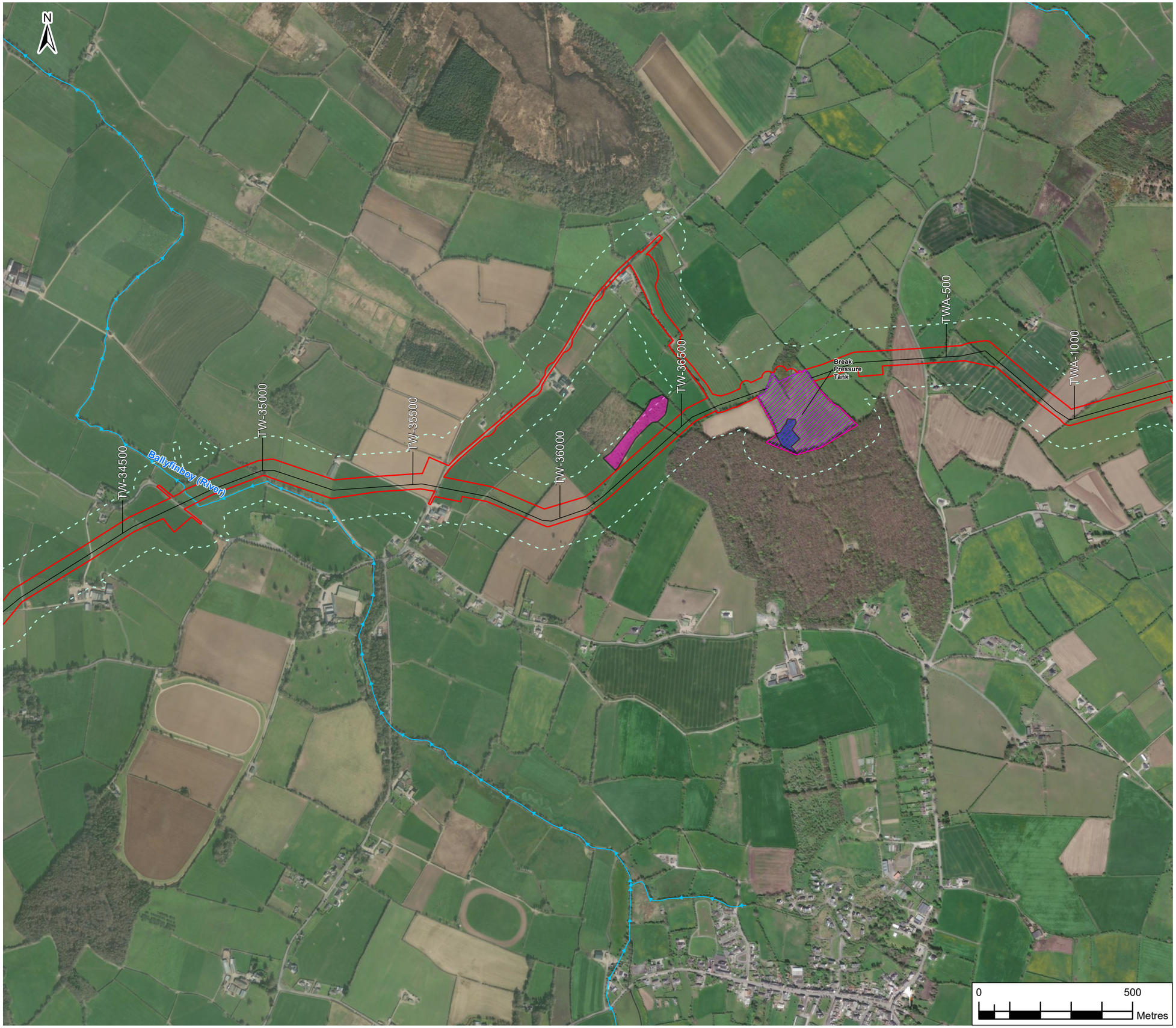

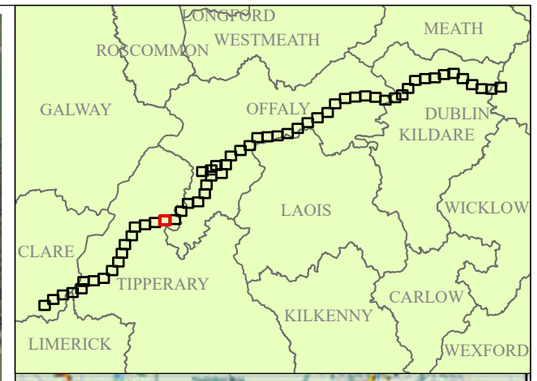

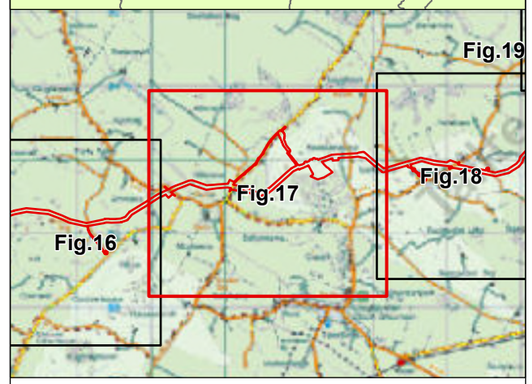

Legend

- Planning Application Boundary
- Indicative Pipeline

Infrastructure Sites

- Break Pressure Tank
- Study Area
- Rivers/Streams

Non-Annex Habitats

- Knockanacree Woodland
- Knocknacree Scrub

RW-xxx - Raw Water Chainage
TW-xxx - Treated Water Chainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
F03	21/11/25	Final - Planning Application	SP	LK	SN	SW

Jacobs TOBIN

Client: Uisce Éireann Irish Water; Tionscadal Soláthair Uisce Water Supply Project

Project: Water Supply Project
Eastern and Midlands Region

Drawing Title: Appendix 8.4
Figure 17
Target Habitat Surveys
Sheet 17 of 59

Drawing Status: Final - Planning Application

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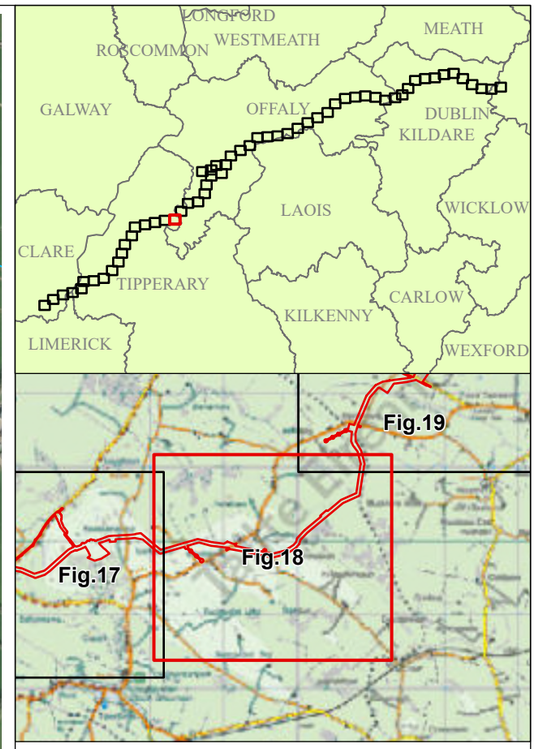

Legend

- Planning Application Boundary
- Indicative Pipeline
- Study Area
- Rivers/Streams

Non-Annex Habitats

- Behamore Woodland
- Newtown Woodland

RW-xxx - Raw Water Chainage
TW-xxx - Treated Water Chainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
F03	21/11/25	Final - Planning Application	SP	LK	SN	SW

Jacobs TOBIN

Client: Uisce Éireann Irish Water; Tionscadal Soláthair Uisce Water Supply Project

Project: Water Supply Project
Eastern and Midlands Region

Drawing Title: Appendix 8.4
Figure 18
Target Habitat Surveys
Sheet 18 of 59

Drawing Status: Final - Planning Application

Scale @ A3	1:12,000	DO NOT SCALE
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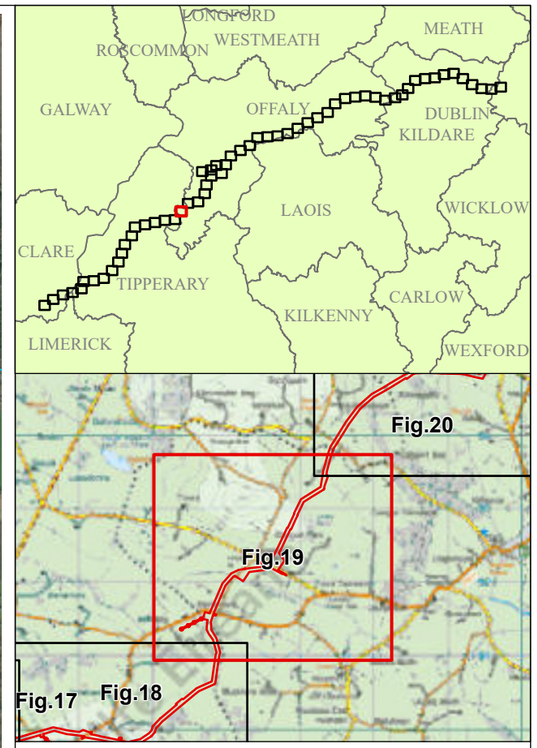

Legend

- Planning Application Boundary
- Indicative Pipeline
- Study Area
- Rivers/Streams

Annex I Habitats

- Derrinclare Cutover

Non-Annex Habitats

- Behamore Woodland
- Toora Grassland
- Valley Pond and Woodland at Cangort Park

RW-xxx - Raw Water Chainage
TW-xxx - Treated Water Chainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
F03	21/11/25	Final - Planning Application	SP	LK	SN	SW

Jacobs TOBIN

Client

Uisce Éireann Irish Water

Tionscadal Soláthair Uisce Water Supply Project

Project

Water Supply Project
Eastern and Midlands Region

Drawing Title

Appendix 8.4
Figure 19
Target Habitat Surveys
Sheet 19 of 59

Drawing Status

Final - Planning Application

Scale @ A3	1:12,000	DO NOT SCALE
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Client No.	9318	
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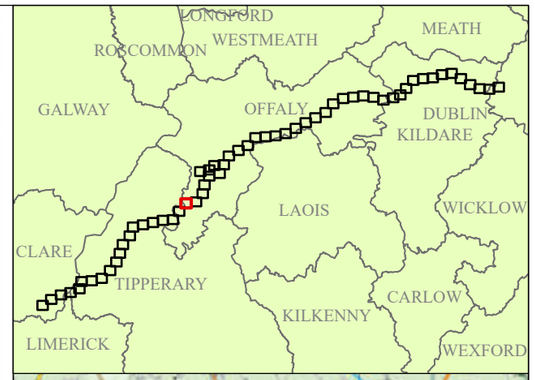

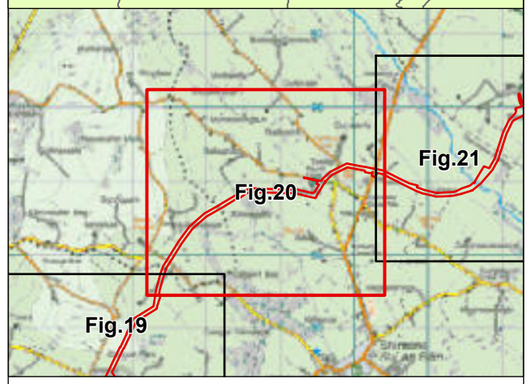

Legend

- Planning Application Boundary
- Indicative Pipeline
- Study Area
- Rivers/Streams

RW-xxx - Raw Water Chainage
TW-xxx - Treated Water Chainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
F03	21/11/25	Final - Planning Application	SP	LK	SN	SW

Jacobs TOBIN

Client: Uisce Éireann Irish Water; Tionscadal Soláthair Uisce Water Supply Project

Project: Water Supply Project
Eastern and Midlands Region

Drawing Title: Appendix 8.4
Figure 20
Target Habitat Surveys
Sheet 20 of 59

Drawing Status: Final - Planning Application

Scale @ A3	1:12,000	DO NOT SCALE
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Client No.	9318	
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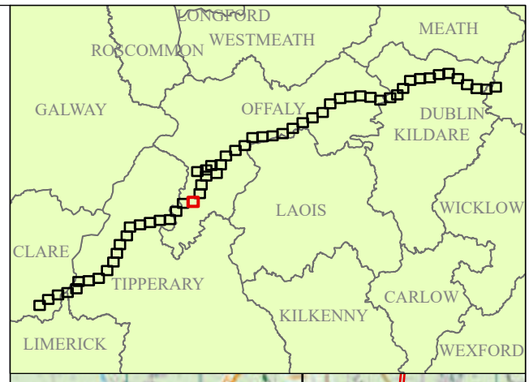

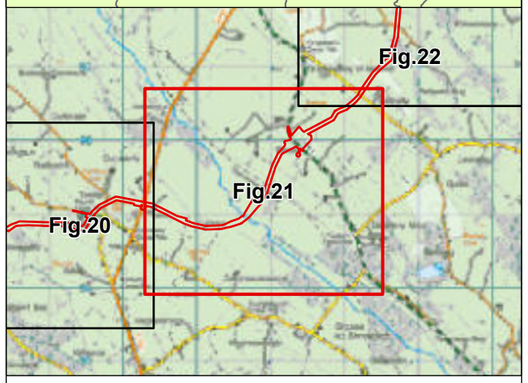

Legend

- Planning Application Boundary
- Indicative Pipeline
- Study Area
- Rivers/Streams

Non-Annex Habitats

- Boveen Grassland

RW-xxx - Raw Water Chainage
TW-xxx - Treated Water Chainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
F03	21/11/25	Final - Planning Application	SP	LK	SN	SW

Jacobs TOBIN

Client: Uisce Éireann Irish Water; Tionscadal Soláthair Uisce Water Supply Project

Project: Water Supply Project
Eastern and Midlands Region

Drawing Title: Appendix 8.4
Figure 21
Target Habitat Surveys
Sheet 21 of 59

Drawing Status: Final - Planning Application

Scale @ A3	1:12,000	DO NOT SCALE
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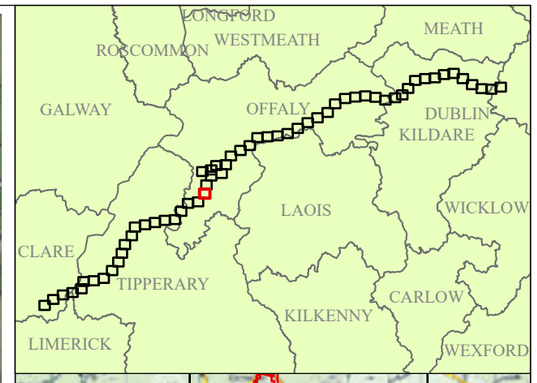

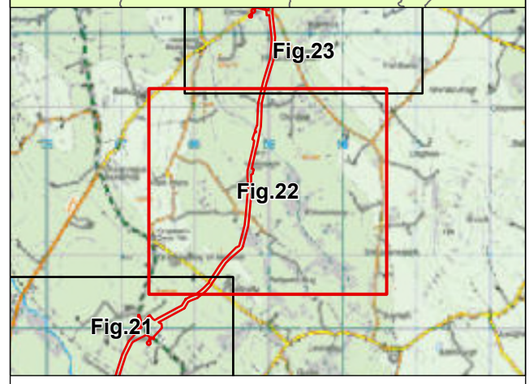

Legend

- Planning Application Boundary
- Indicative Pipeline
- Study Area
- Rivers/Streams

Non-Annex Habitats

- Rathmore Spring

RW-xxx - Raw Water Chainage
TW-xxx - Treated Water Chainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
F03	21/11/25	Final - Planning Application	SP	LK	SN	SW

Jacobs TOBIN

Client: Uisce Éireann Irish Water; Tionscadal Soláthair Uisce Water Supply Project

Project
Water Supply Project
Eastern and Midlands Region

Drawing Title
Appendix 8.4
Figure 22
Target Habitat Surveys
Sheet 22 of 59

Drawing Status: Final - Planning Application

Scale @ A3	1:12,000	DO NOT SCALE
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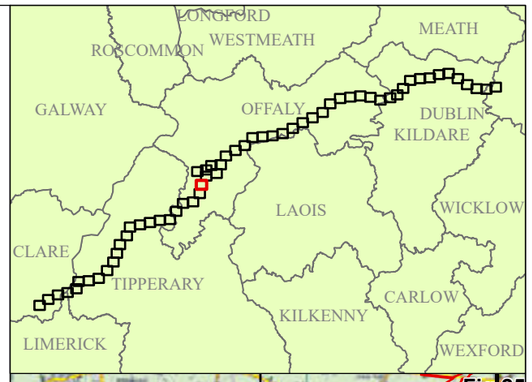

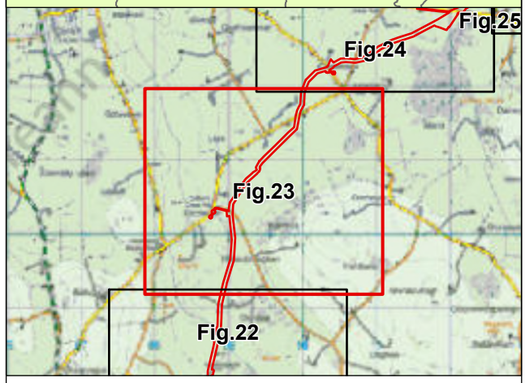

Legend

- Planning Application Boundary
- Indicative Pipeline
- Study Area
- Rivers/Streams

RW-xxx - Raw Water Chainage
TW-xxx - Treated Water Chainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
F03	21/11/25	Final - Planning Application	SP	LK	SN	SW

Jacobs TOBIN

Client: Uisce Éireann Irish Water; Tionscadal Soláthair Uisce Water Supply Project

Project
Water Supply Project
Eastern and Midlands Region

Drawing Title
Appendix 8.4
Figure 23
Target Habitat Surveys
Sheet 23 of 59

Drawing Status: Final - Planning Application

Scale @ A3	1:12,000	DO NOT SCALE
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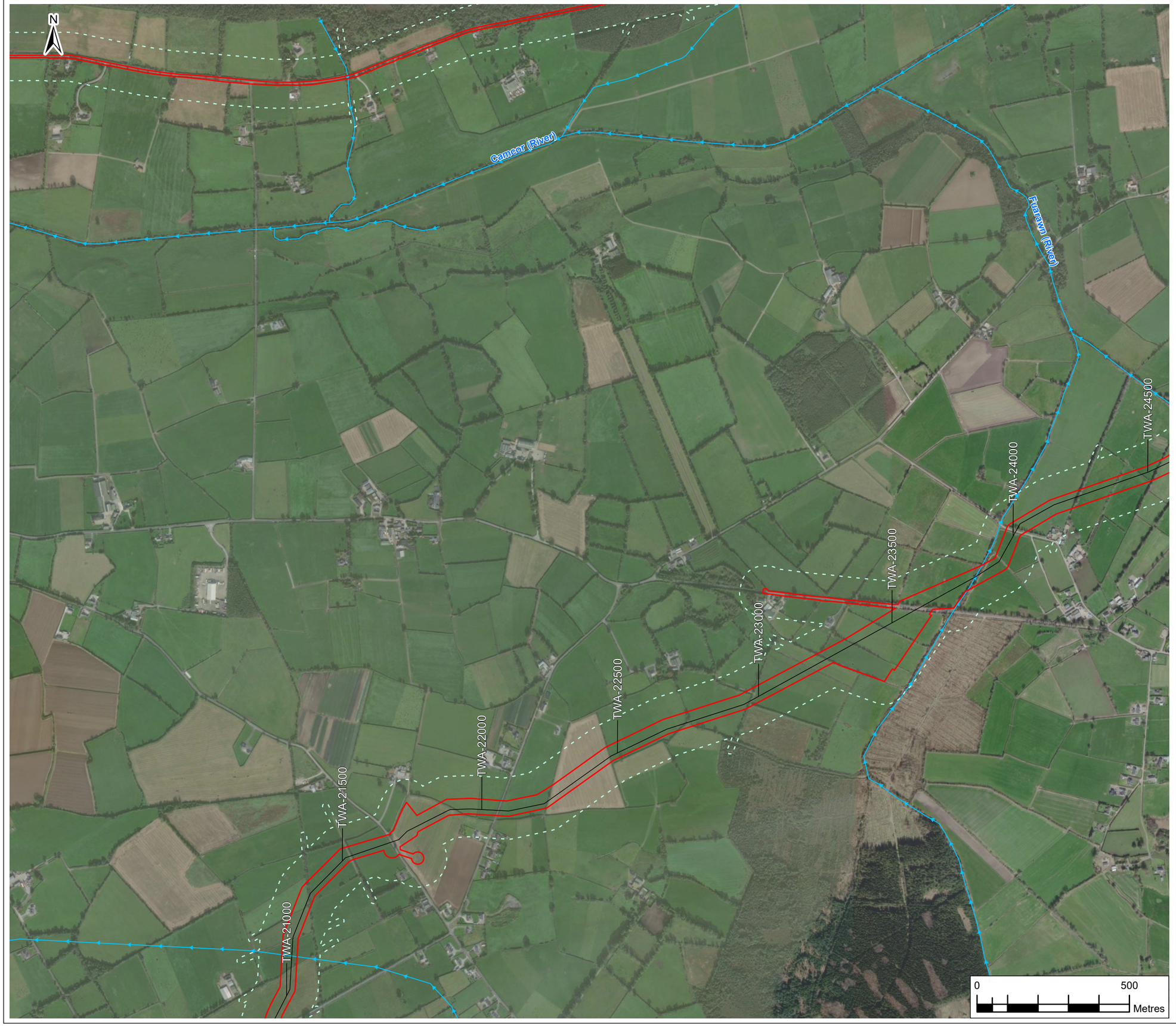

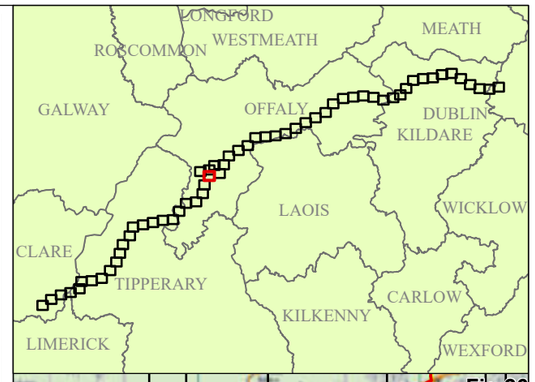

Legend

- Planning Application Boundary
- Indicative Pipeline
- Study Area
- Rivers/Streams

RW-xxx - Raw Water Chainage
TW-xxx - Treated Water Chainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
F03	21/11/25	Final - Planning Application	SP	LK	SN	SW

Jacobs TOBIN

Client: Uisce Éireann Irish Water; Tionscadal Soláthair Uisce Water Supply Project

Project: Water Supply Project
Eastern and Midlands Region

Drawing Title: Appendix 8.4
Figure 24
Target Habitat Surveys
Sheet 24 of 59

Drawing Status: Final - Planning Application

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Client No.	9318	
Drawing No.	32105801/700/1623	
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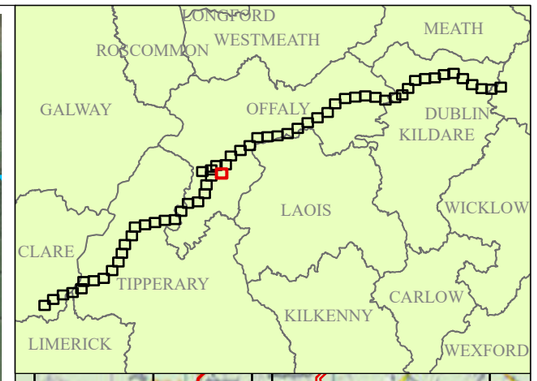

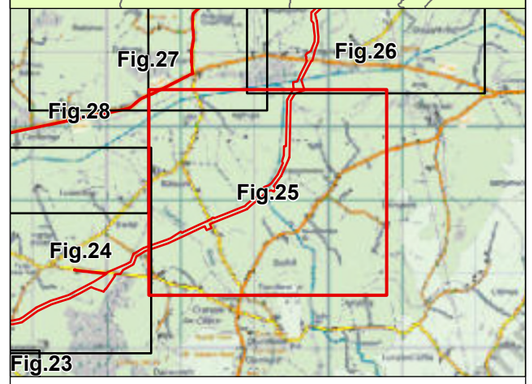

Legend

- Planning Application Boundary
- Indicative Pipeline
- Study Area
- Rivers/Streams

Non-Annex Habitats

- Breaghmore Grassland
- Breaghmore Treeline
- Cloghanmore Woodland
- Kilmaine Grassland

RW-xxx - Raw Water Chainage
TW-xxx - Treated Water Chainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
F03	21/11/25	Final - Planning Application	SP	LK	SN	SW

Jacobs TOBIN

Client: Uisce Éireann Irish Water; Tionscadal Soláthair Uisce Water Supply Project

Project: Water Supply Project
Eastern and Midlands Region

Drawing Title: Appendix 8.4
Figure 25
Target Habitat Surveys
Sheet 25 of 59

Drawing Status: Final - Planning Application

Scale @ A3	1:12,000	DO NOT SCALE
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Client No.	9318	
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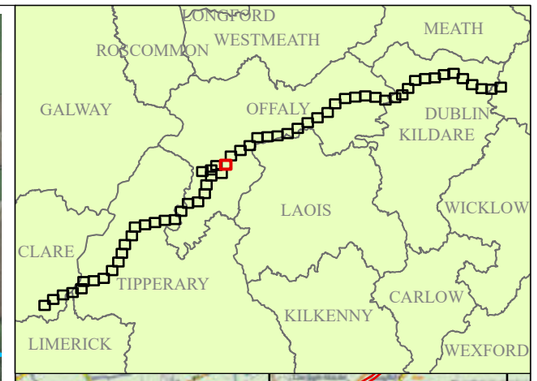

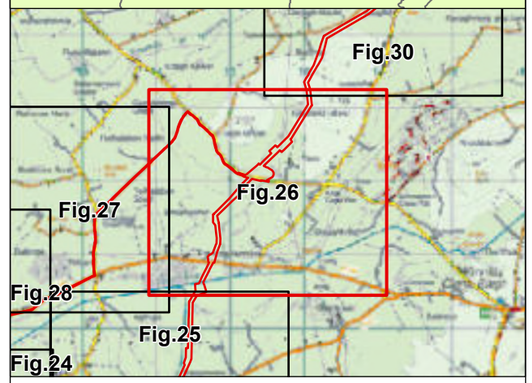

Legend

- Planning Application Boundary
- Indicative Pipeline

Infrastructure Sites

- Booster Pumping Station
- Study Area
- Rivers/Streams

Annex I Habitats

- Coagh Upper Fen

Non-Annex Habitats

- Breaghmore Grassland
- Cloghanmore Woodland

RW-xxx - Raw Water Chainage
TW-xxx - Treated Water Chainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
F03	21/11/25	Final - Planning Application	SP	LK	SN	SW

Jacobs TOBIN

Client: Uisce Éireann Irish Water; Tionscadal Soláthair Uisce Water Supply Project

Project
Water Supply Project
Eastern and Midlands Region

Drawing Title
Appendix 8.4
Figure 26
Target Habitat Surveys
Sheet 26 of 59

Drawing Status: Final - Planning Application

Scale @ A3	1:12,000	DO NOT SCALE
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Client No.	9318	
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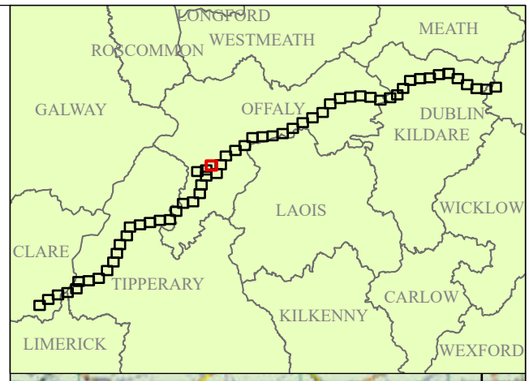

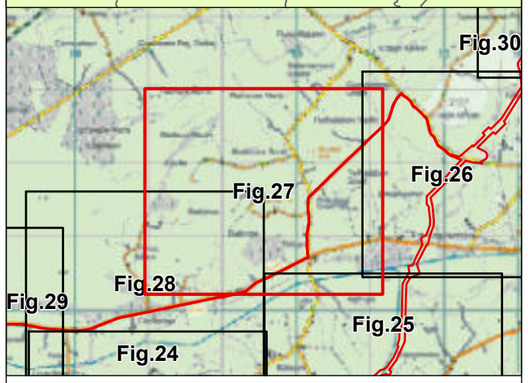

Legend

- Planning Application Boundary
- Indicative Pipeline
- Study Area
- Rivers/Streams

RW-xxx - Raw Water Chainage
TW-xxx - Treated Water Chainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
F03	21/11/25	Final - Planning Application	SP	LK	SN	SW

Jacobs TOBIN

Client: Uisce Éireann Irish Water; Tionscadal Soláthair Uisce Water Supply Project

Project: Water Supply Project
Eastern and Midlands Region

Drawing Title: Appendix 8.4
Figure 27
Target Habitat Surveys
Sheet 27 of 59

Drawing Status: Final - Planning Application

Scale @ A3	1:12,000	DO NOT SCALE
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Client No.	9318	
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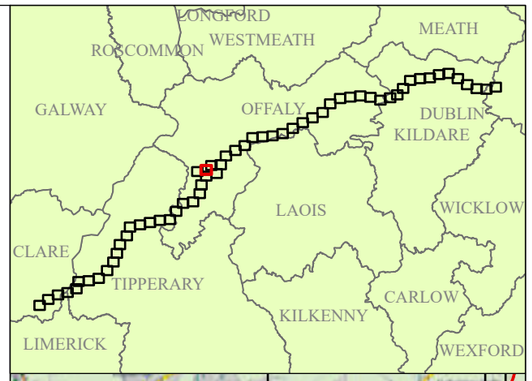

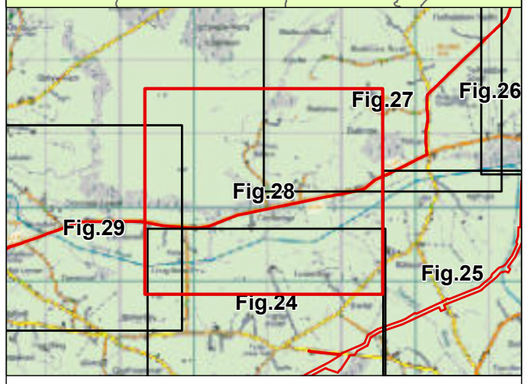

Legend

- Planning Application Boundary
- Indicative Pipeline
- Study Area
- Rivers/Streams

RW-xxx - Raw Water Chainage
TW-xxx - Treated Water Chainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
F03	21/11/25	Final - Planning Application	SP	LK	SN	SW

Jacobs TOBIN

Client: Uisce Éireann Irish Water; Tionscadal Soláthair Uisce Water Supply Project

Project: Water Supply Project
Eastern and Midlands Region

Drawing Title: Appendix 8.4
Figure 28
Target Habitat Surveys
Sheet 28 of 59

Drawing Status: Final - Planning Application

Scale @ A3	1:12,000	DO NOT SCALE
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Client No.	9318	
Drawing No.	32105801/700/1627	
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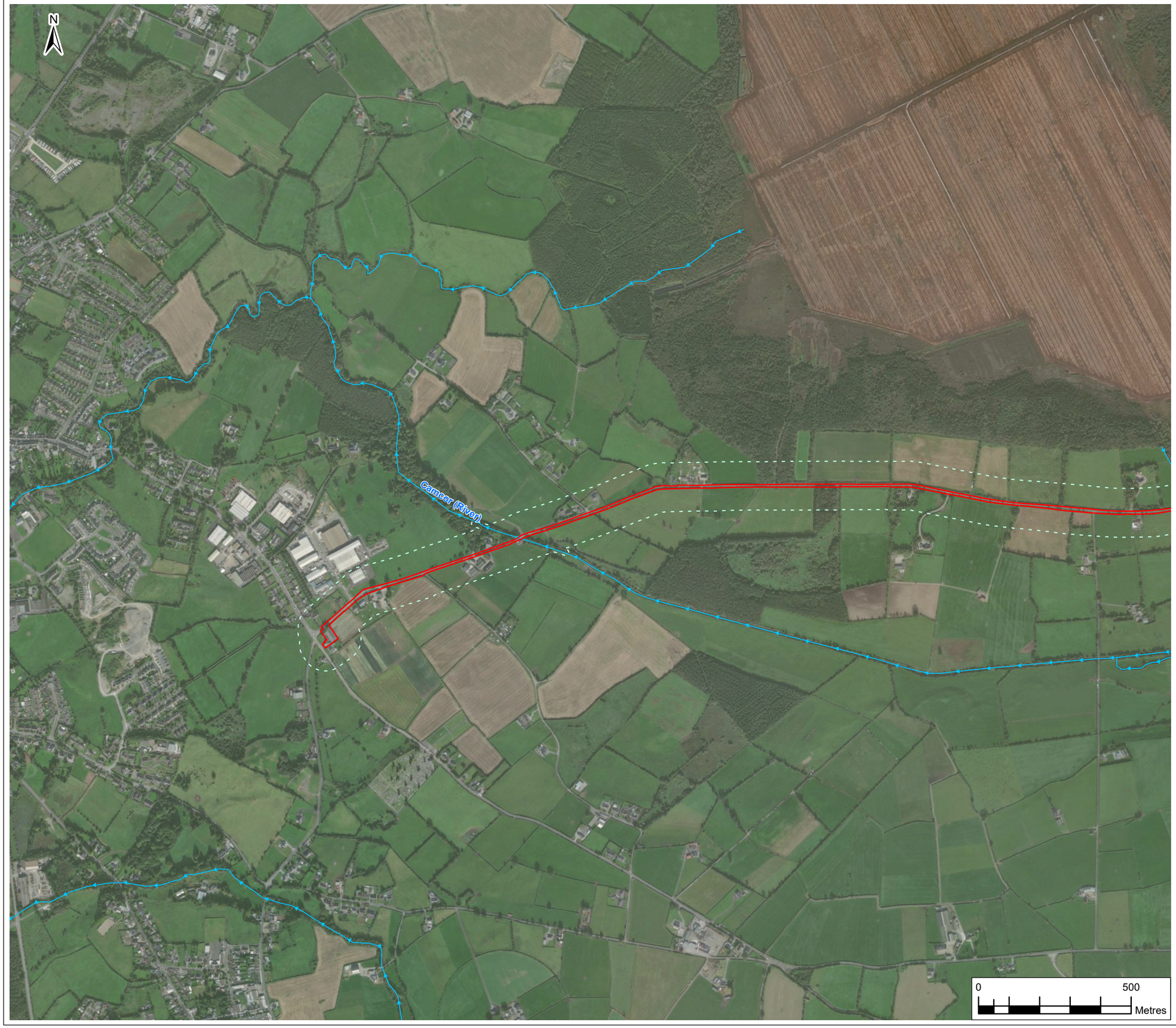

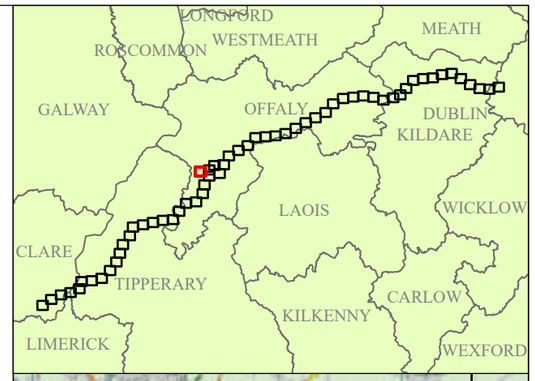

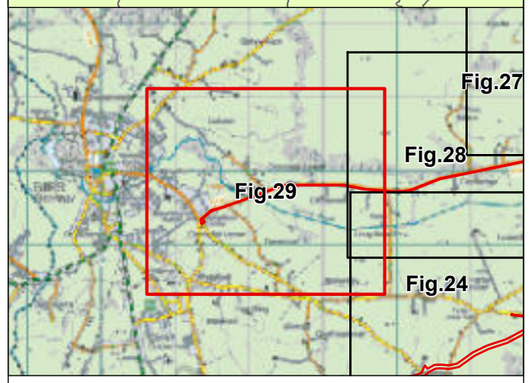

Legend

- Planning Application Boundary
- Indicative Pipeline
- Study Area
- Rivers/Streams

RW-xxx - Raw Water Chainage
TW-xxx - Treated Water Chainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
F03	21/11/25	Final - Planning Application	SP	LK	SN	SW

Jacobs TOBIN

Client: Uisce Éireann Irish Water; Tionscadal Soláthair Uisce Water Supply Project

Project
Water Supply Project
Eastern and Midlands Region

Drawing Title
Appendix 8.4
Figure 29
Target Habitat Surveys
Sheet 29 of 59

Drawing Status: Final - Planning Application

Scale @ A3	1:12,000	DO NOT SCALE
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Client No.	9318	
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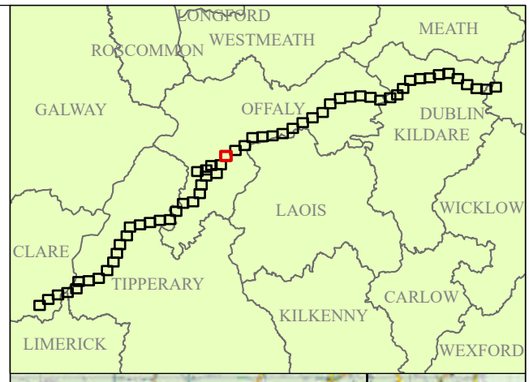

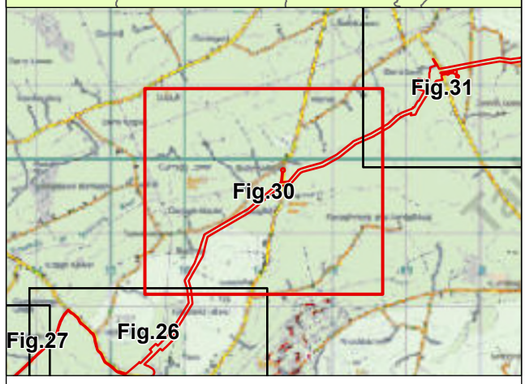

Legend

- Planning Application Boundary
- Indicative Pipeline
- Study Area
- Rivers/Streams

Non-Annex Habitats

- Annamore and Annabeg Bog

RW-xxx - Raw Water Chainage
TW-xxx - Treated Water Chainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
F03	21/11/25	Final - Planning Application	SP	LK	SN	SW

Jacobs TOBIN

Client: Uisce Éireann Irish Water; Tionscadal Soláthair Uisce Water Supply Project

Project: Water Supply Project
Eastern and Midlands Region

Drawing Title: Appendix 8.4
Figure 30
Target Habitat Surveys
Sheet 30 of 59

Drawing Status: Final - Planning Application

Scale @ A3	1:12,000	DO NOT SCALE
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Client No.	9318	
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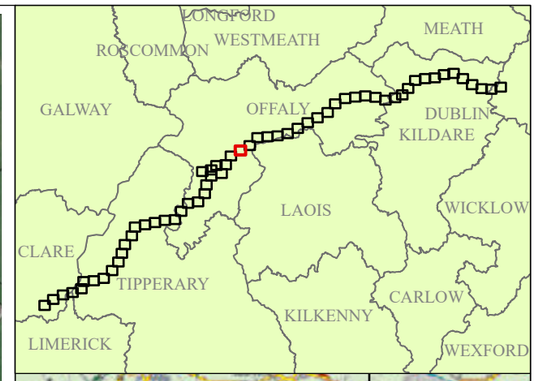

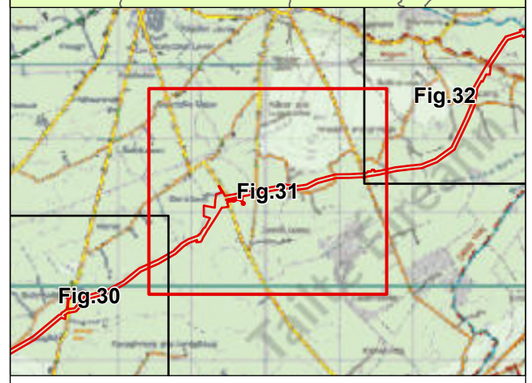

Legend

- Planning Application Boundary
- Indicative Pipeline
- Study Area
- Rivers/Streams

Annex I Habitats

- Coolfin Transition Mire

Non-Annex Habitats

- Annamore and Annabeg Bog

RW-xxx - Raw Water Chainage
TW-xxx - Treated Water Chainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
F03	21/11/25	Final - Planning Application	SP	LK	SN	SW

Jacobs TOBIN

Client: Uisce Éireann Irish Water; Tionscadal Soláthair Uisce Water Supply Project

Project: Water Supply Project
Eastern and Midlands Region

Drawing Title: Appendix 8.4
Figure 31
Target Habitat Surveys
Sheet 31 of 59

Drawing Status: Final - Planning Application

Scale @ A3	1:12,000	DO NOT SCALE
Jacobs No.	32105801	
Client No.	9318	
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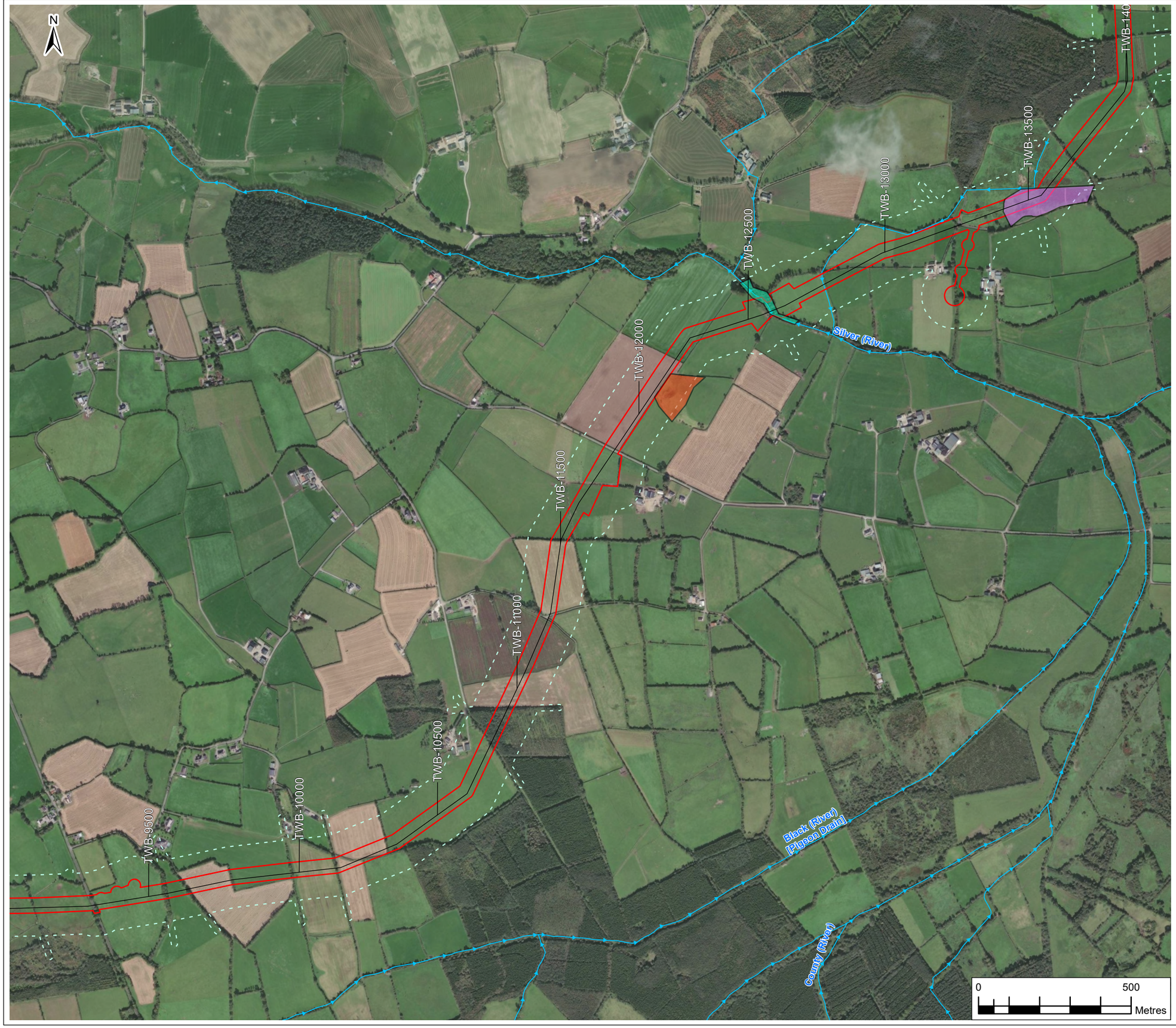

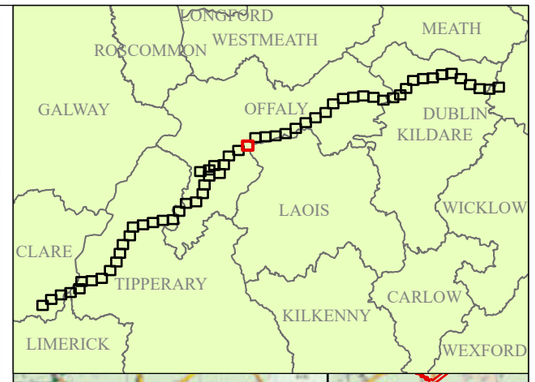

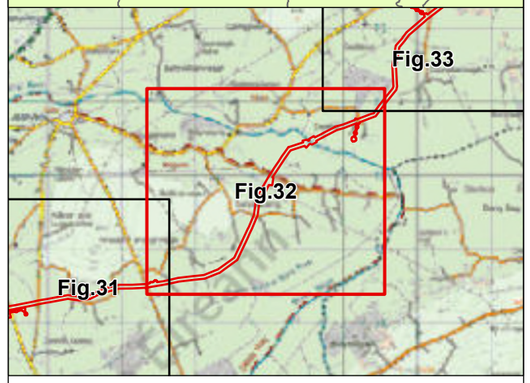

Legend

- Planning Application Boundary
- Indicative Pipeline
- Study Area
- Rivers/Streams

Non-Annex Habitats

- Ballynacarrig Grassland
- Ballynacarrig/Derries Woodland
- Derries Grassland

RW-xxx - Raw Water Chainage
TW-xxx - Treated Water Chainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
F03	21/11/25	Final - Planning Application	SP	LK	SN	SW

Jacobs TOBIN

Client

Uisce Éireann Irish Water

Tionscadal Soláthair Uisce Water Supply Project

Project

Water Supply Project
Eastern and Midlands Region

Drawing Title

Appendix 8.4
Figure 32
Target Habitat Surveys
Sheet 32 of 59

Drawing Status: Final - Planning Application

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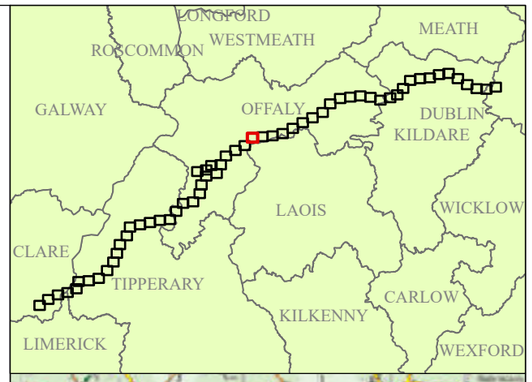

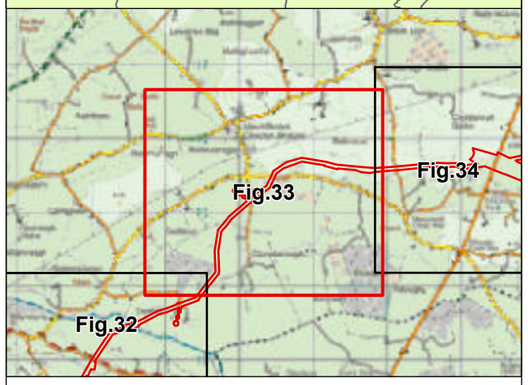

Legend

- Planning Application Boundary
- Indicative Pipeline
- Study Area
- Rivers/Streams

Non-Annex Habitats

- Derries Grassland

RW-xxx - Raw Water Chainage
TW-xxx - Treated Water Chainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
F03	21/11/25	Final - Planning Application	SP	LK	SN	SW

Jacobs TOBIN

Client: Uisce Éireann Irish Water; Tionscadal Soláthair Uisce Water Supply Project

Project: Water Supply Project
Eastern and Midlands Region

Drawing Title: Appendix 8.4
Figure 33
Target Habitat Surveys
Sheet 33 of 59

Drawing Status: Final - Planning Application

Scale @ A3	1:12,000	DO NOT SCALE
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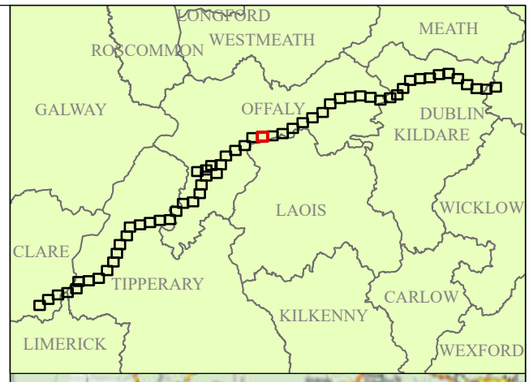

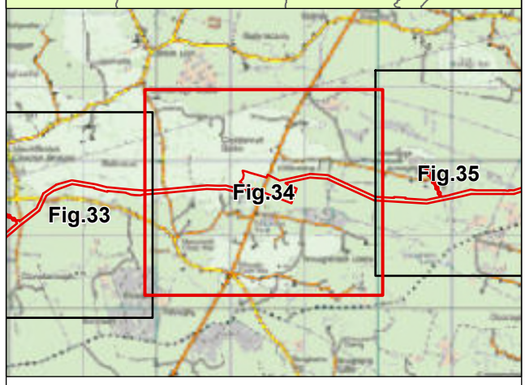

Legend

- Planning Application Boundary
- Indicative Pipeline
- Study Area
- Rivers/Streams

Non-Annex Habitats

- Killananny Bog Woodland

RW-xxx - Raw Water Chainage
TW-xxx - Treated Water Chainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
F03	21/11/25	Final - Planning Application	SP	LK	SN	SW

Jacobs TOBIN

Client

Uisce Éireann Irish Water

Tionscadal Soláthair Uisce Water Supply Project

Project

Water Supply Project
Eastern and Midlands Region

Drawing Title

Appendix 8.4
Figure 34
Target Habitat Surveys
Sheet 34 of 59

Drawing Status

Final - Planning Application

Scale @ A3	1:12,000	DO NOT SCALE
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Client No.	9318	
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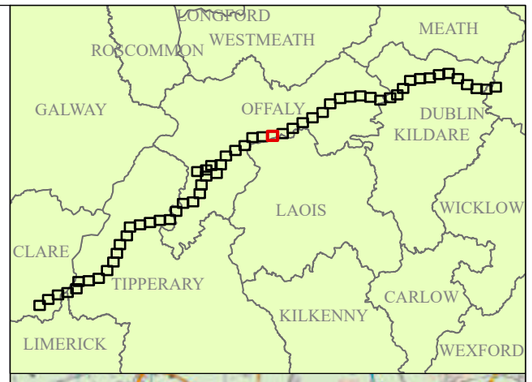

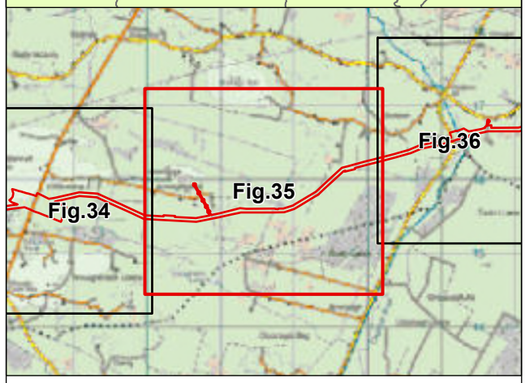

Legend

- Planning Application Boundary
- Indicative Pipeline
- Study Area
- Rivers/Streams

Non-Annex Habitats

- Reask Woodland

RW-xxx - Raw Water Chainage
TW-xxx - Treated Water Chainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
F03	21/11/25	Final - Planning Application	SP	LK	SN	SW

Jacobs TOBIN

Client: Uisce Éireann Irish Water; Tionscadal Soláthair Uisce Water Supply Project

Project: Water Supply Project
Eastern and Midlands Region

Drawing Title: Appendix 8.4
Figure 35
Target Habitat Surveys
Sheet 35 of 59

Drawing Status: Final - Planning Application

Scale @ A3	1:12,000	DO NOT SCALE
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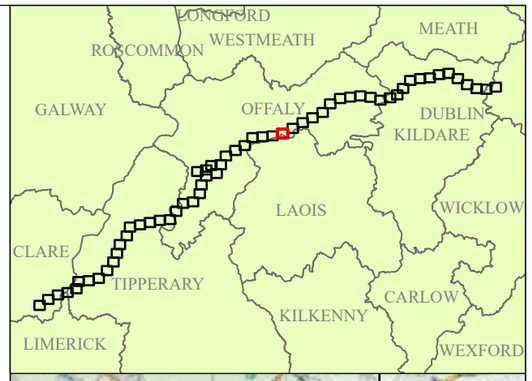

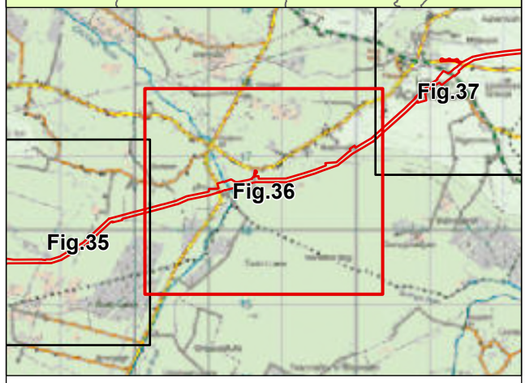

Legend

- Planning Application Boundary
- Indicative Pipeline
- Study Area
- Rivers/Streams

RW-xxx - Raw Water Chainage
TW-xxx - Treated Water Chainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
F03	21/11/25	Final - Planning Application	SP	LK	SN	SW

Jacobs TOBIN

Client: Uisce Éireann Irish Water; Tionscadal Soláthair Uisce Water Supply Project

Project
Water Supply Project
Eastern and Midlands Region

Drawing Title
Appendix 8.4
Figure 36
Target Habitat Surveys
Sheet 36 of 59

Drawing Status: Final - Planning Application

Scale @ A3	1:12,000	DO NOT SCALE
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Client No.	9318	
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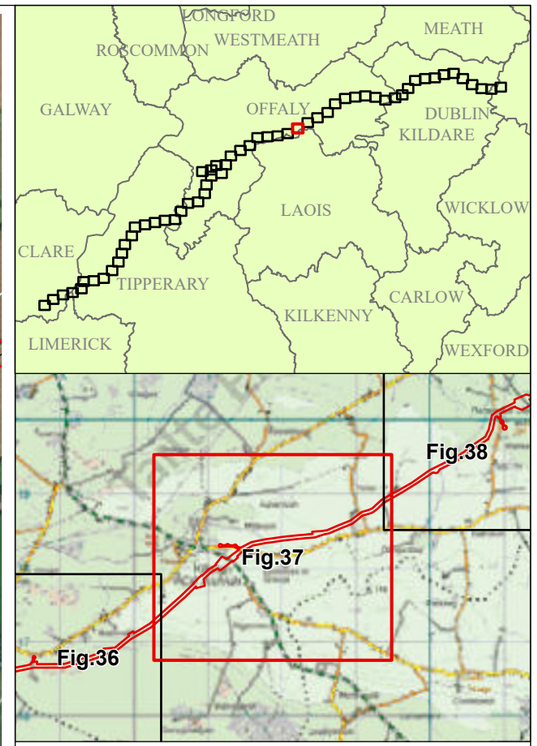

Legend

- Planning Application Boundary
- Indicative Pipeline
- Study Area
- Rivers/Streams

RW-xxx - Raw Water Chainage
TW-xxx - Treated Water Chainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
F03	21/11/25	Final - Planning Application	SP	LK	SN	SW

Jacobs TOBIN

Client: Uisce Éireann Irish Water — Tionscadal Soláthair Uisce Water Supply Project

Project
Water Supply Project
Eastern and Midlands Region

Drawing Title
Appendix 8.4
Figure 37
Target Habitat Surveys
Sheet 37 of 59

Drawing Status: Final - Planning Application

Scale @ A3	1:12,000	DO NOT SCALE
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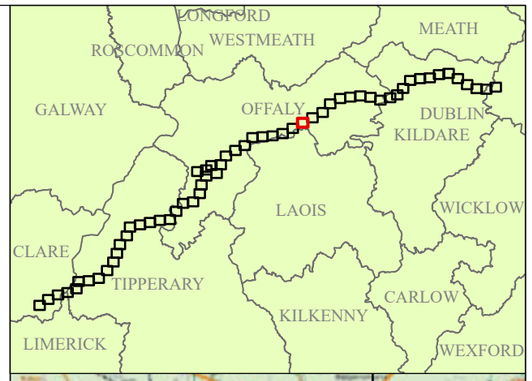

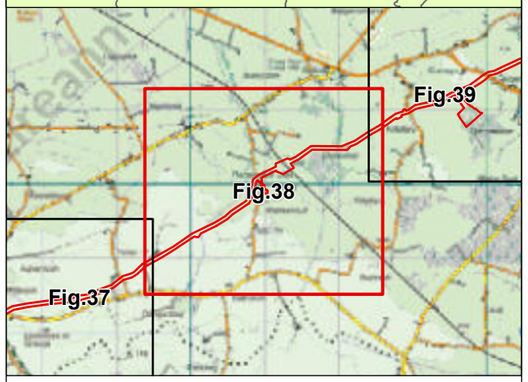

Legend

- Planning Application Boundary
- Indicative Pipeline
- Study Area
- Rivers/Streams

Annex I Habitats

- Raheenduff Fen

RW-xxx - Raw Water Chainage
TW-xxx - Treated Water Chainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
F03	21/11/25	Final - Planning Application	SP	LK	SN	SW

Jacobs TOBIN

Client: Uisce Éireann Irish Water; Tionscadal Soláthair Uisce Water Supply Project

Project: Water Supply Project
Eastern and Midlands Region

Drawing Title: Appendix 8.4
Figure 38
Target Habitat Surveys
Sheet 38 of 59

Drawing Status: Final - Planning Application

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Client No.	9318	
Drawing No.	32105801/700/1637	
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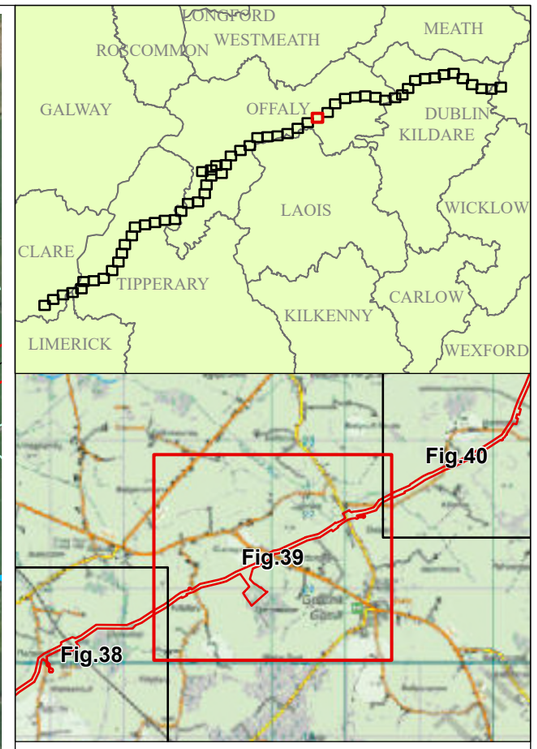

Legend

- Planning Application Boundary
- Indicative Pipeline
- Study Area
- Rivers/Streams

RW-xxx - Raw Water Chainage
TW-xxx - Treated Water Chainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
F03	21/11/25	Final - Planning Application	SP	LK	SN	SW

Jacobs TOBIN

Client: Uisce Éireann Irish Water; Tionscadal Soláthair Uisce Water Supply Project

Project
Water Supply Project
Eastern and Midlands Region

Drawing Title
Appendix 8.4
Figure 39
Target Habitat Surveys
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Drawing Status: Final - Planning Application

Scale @ A3	1:12,000	DO NOT SCALE
Jacobs No.	32105801	
Client No.	9318	
Drawing No.	32105801/700/1638	
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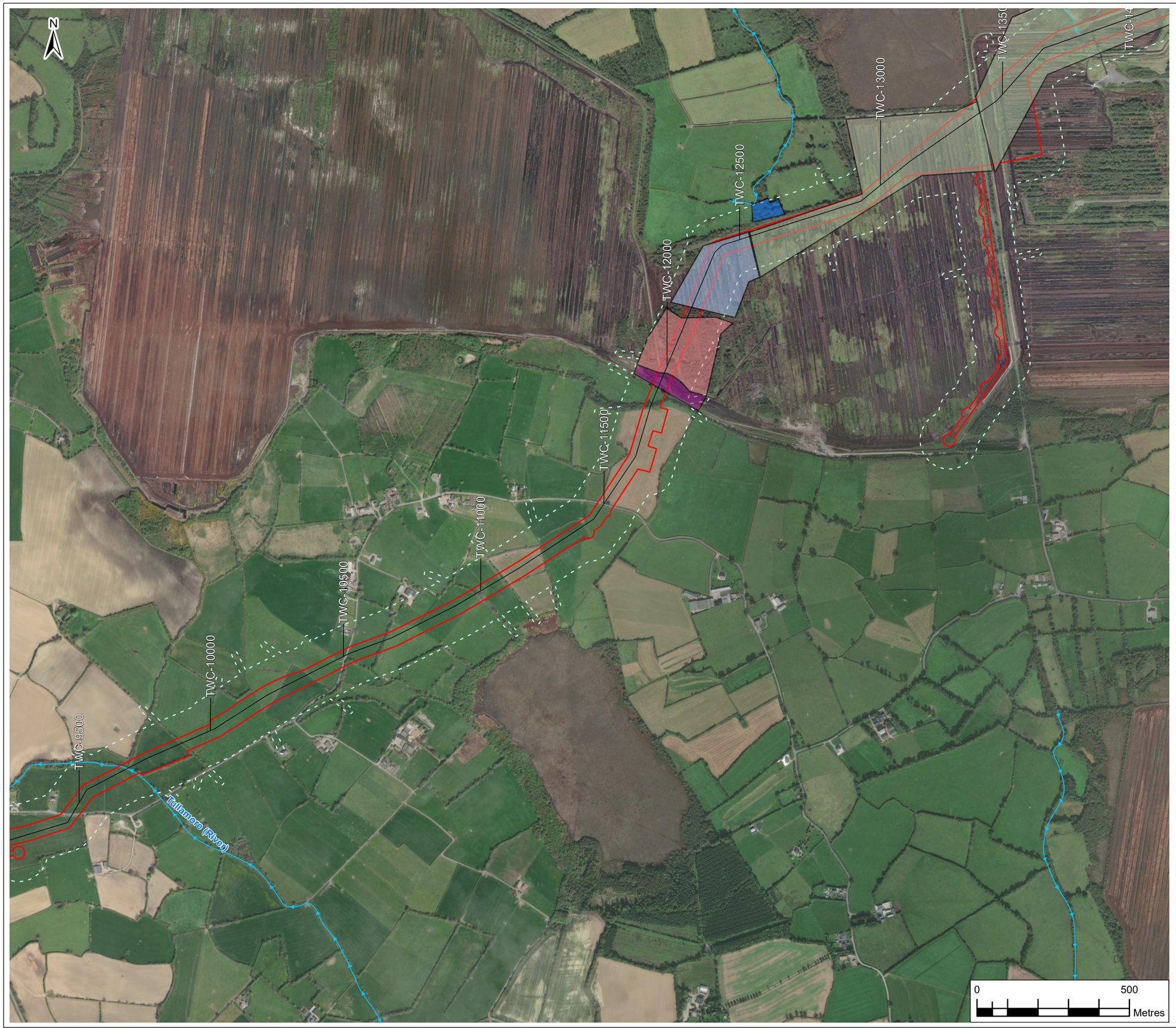

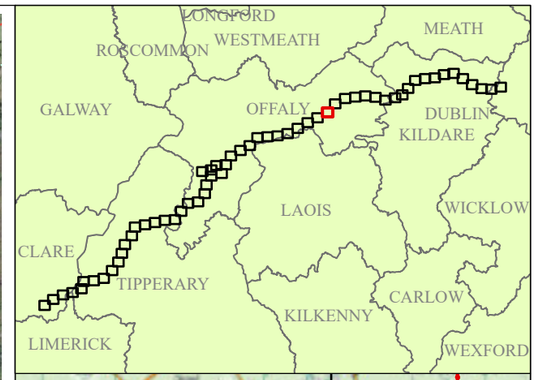

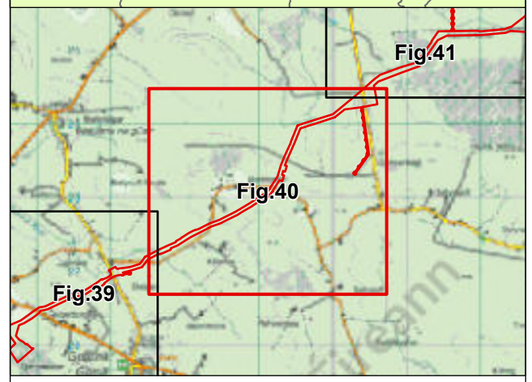

Legend

- Planning Application Boundary
- Indicative Pipeline
- Study Area
- Rivers/Streams

Annex I Habitats

- Island Bog

Non-Annex Habitats

- Clonad Bog Woodland
- Clonad Peatland (a)
- Clonad Peatland (b)
- Rathfeston Bog Woodland
- Rathfeston Peatland

RW-xxx - Raw Water Chainage
TW-xxx - Treated Water Chainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
F03	21/11/25	Final - Planning Application	SP	LK	SN	SW

Jacobs TOBIN

Client: Uisce Éireann Irish Water; Tionscadal Soláthair Uisce Water Supply Project

Project
Water Supply Project
Eastern and Midlands Region

Drawing Title
Appendix 8.4
Figure 40
Target Habitat Surveys
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Drawing Status: Final - Planning Application

Scale @ A3	1:12,000	DO NOT SCALE
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Client No.	9318	
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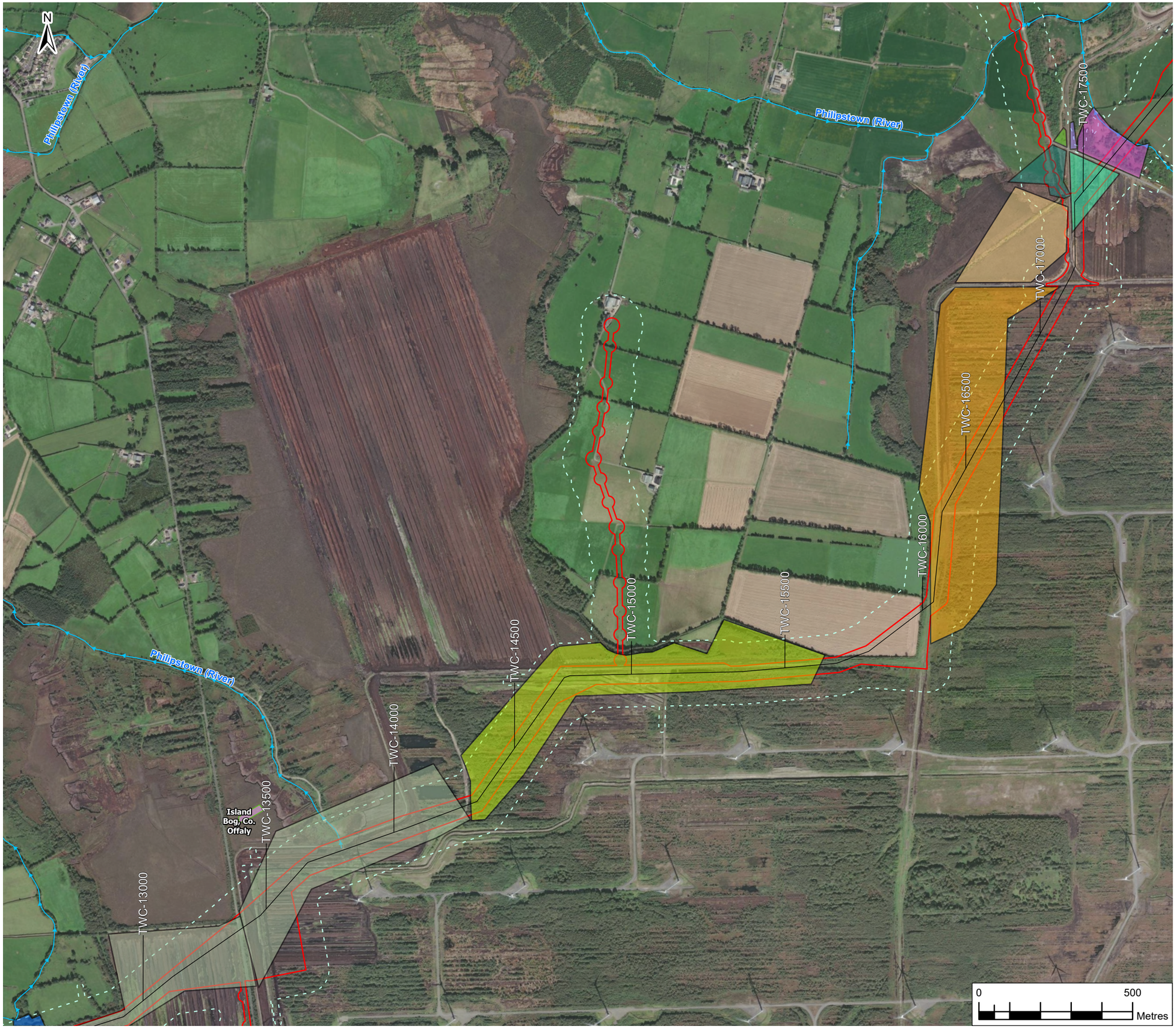

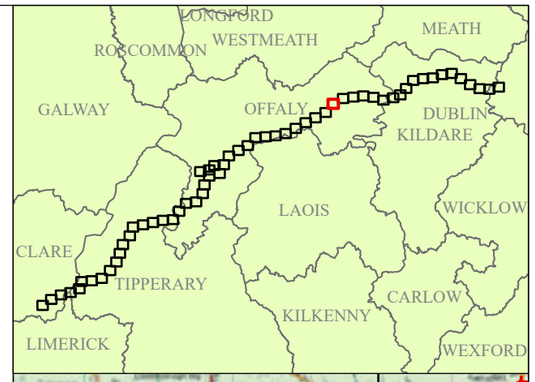

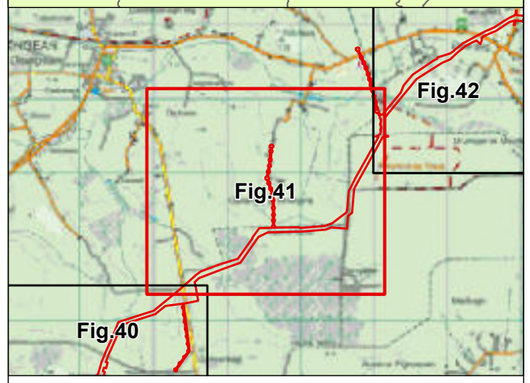

Legend

- Planning Application Boundary
- Indicative Pipeline
- Study Area
- Rivers/Streams

Annex I Habitats

- Island Bog

Non-Annex Habitats

- Clonad Bog Woodland
- Clonad Peatland (b)
- Clonarrow/River Lyons Bog Woodland
- Clonarrow/Riverlyons Grassland and Treeline
- Clonarrow/Riverlyons Peatland (a)
- Clonarrow/Riverlyons Peatland (b)
- Drumcaw/Mount Lucas Peatland (a)
- Drumcaw/Mountlucas Bog Woodland
- Drumcaw/Mountlucas Peatland (a)
- Drumcaw/Mountlucas Peatland (b)

RW-xxx - Raw Water Chainage
TW-xxx - Treated Water Chainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
F03	21/11/25	Final - Planning Application	SP	LK	SN	SW

Jacobs TOBIN

Client: Uisce Éireann Irish Water; Tionscadal Soláthair Uisce Water Supply Project

Project
Water Supply Project
Eastern and Midlands Region

Drawing Title
Appendix 8.4
Figure 41
Target Habitat Surveys
Sheet 41 of 59

Drawing Status: Final - Planning Application

Scale @ A3	1:12,000	DO NOT SCALE
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Client No.	9318	
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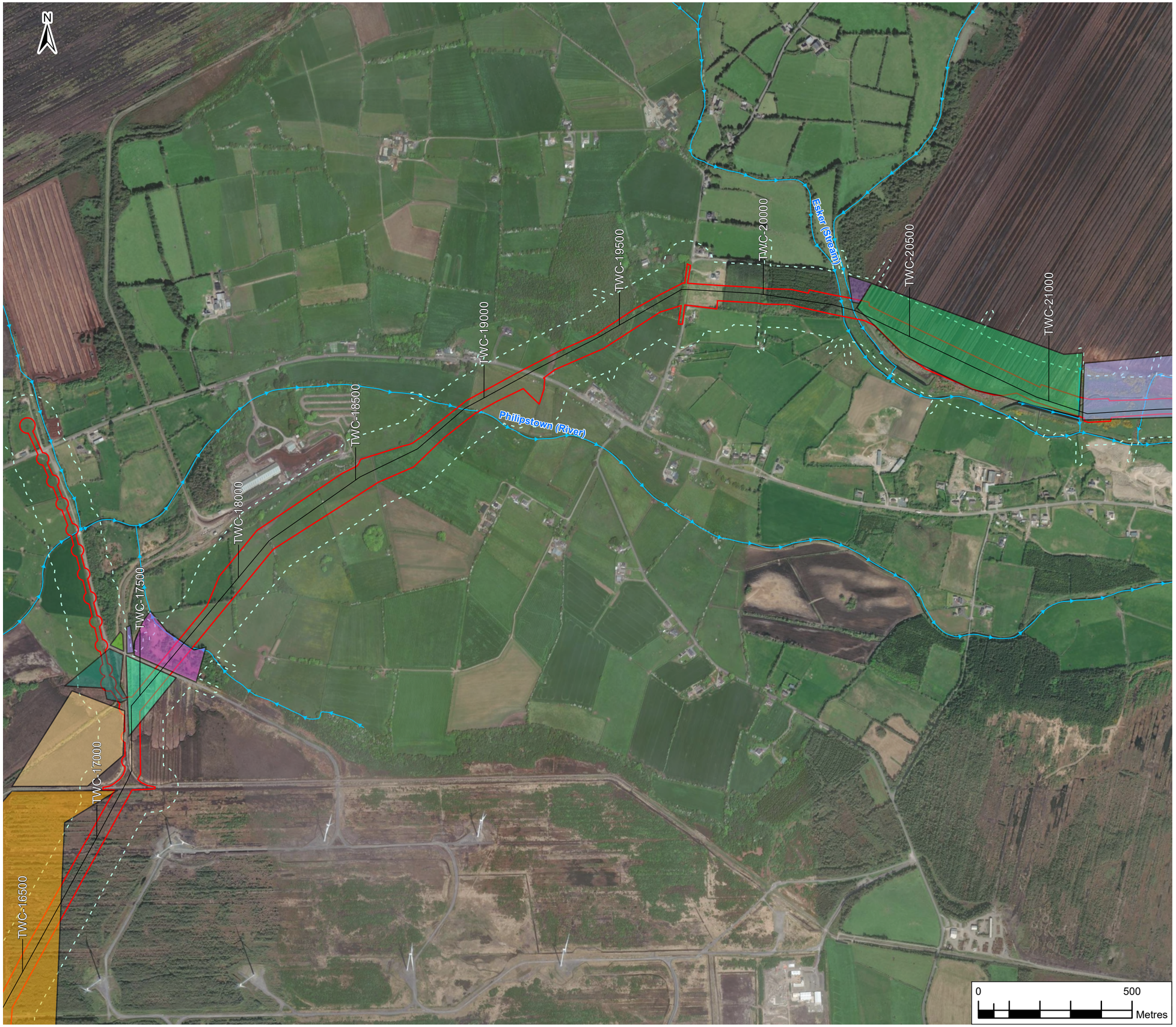

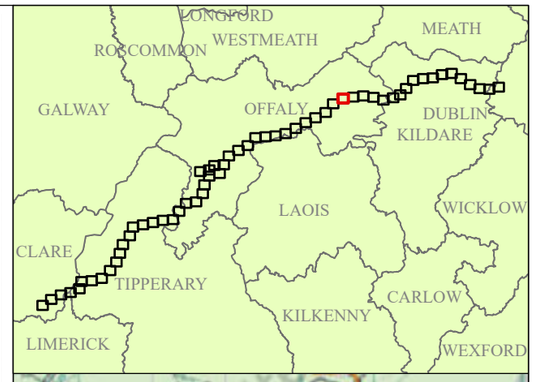

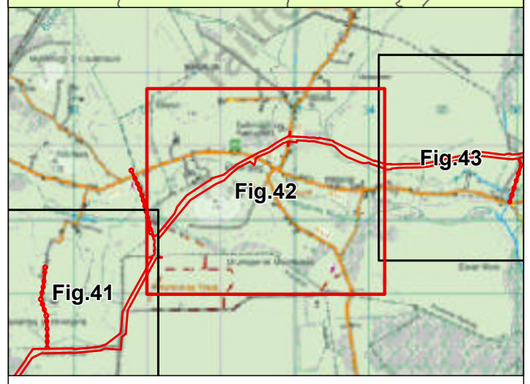

Legend

- Planning Application Boundary
- Indicative Pipeline
- Study Area
- Rivers/Streams

Non-Annex Habitats

- Clonarrow/Riverlyons Grassland and Treeline
- Clonarrow/Riverlyons Peatland (a)
- Clonarrow/Riverlyons Peatland (b)
- Drumcaw/Mount Lucas Peatland (a)
- Drumcaw/Mountlucas Bog Woodland
- Drumcaw/Mountlucas Peatland (a)
- Drumcaw/Mountlucas Peatland (b)
- Newtown Bog Woodland
- Newtown Peatland
- Newtown/Esker More Grassland

RW-xxx - Raw Water Chainage
TW-xxx - Treated Water Chainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
F03	21/11/25	Final - Planning Application	SP	LK	SN	SW

Jacobs TOBIN

Client: Uisce Éireann Irish Water; Tionscadal Soláthair Uisce Water Supply Project

Project: Water Supply Project
Eastern and Midlands Region

Drawing Title: Appendix 8.4
Figure 42
Target Habitat Surveys
Sheet 42 of 59

Drawing Status: Final - Planning Application

Scale @ A3	1:12,000 DO NOT SCALE
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Client No.	9318
Drawing No.	32105801/700/1641
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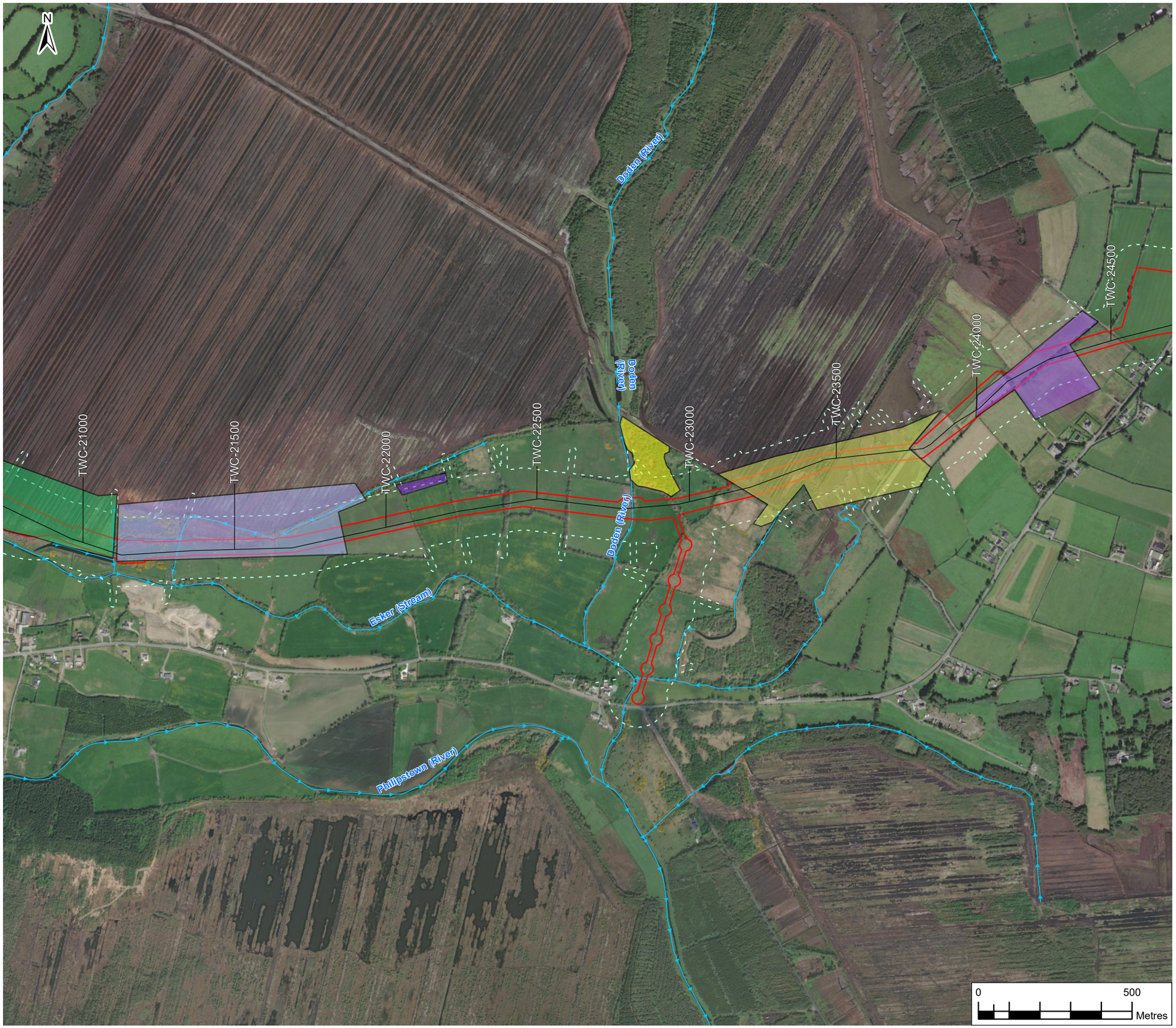

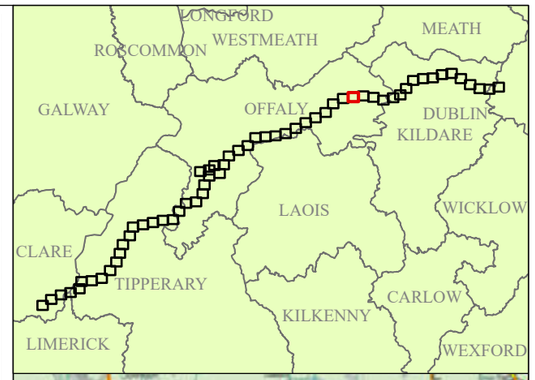

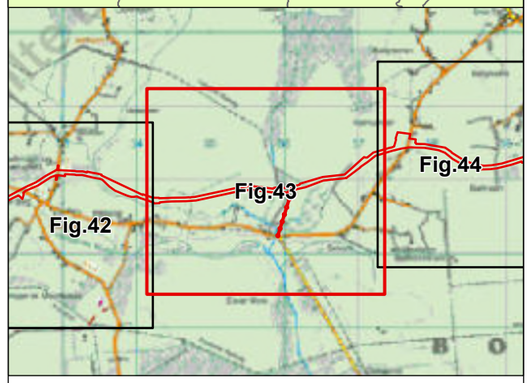

Legend

- Planning Application Boundary
- Indicative Pipeline
- Study Area
- Rivers/Streams

Non-Annex Habitats

- Esker More Bog Woodland
- Esker More/Rathumbler Peatland
- Newtown Peatland
- Newtown/Esker More Grassland
- Rathlumber Woodland
- Rathumbler Grassland

RW-xxx - Raw Water Chainage
TW-xxx - Treated Water Chainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
F03	21/11/25	Final - Planning Application	SP	LK	SN	SW

Jacobs TOBIN

Client

Uisce Éireann Irish Water

Tionscadal Soláthair Uisce Water Supply Project

Project

Water Supply Project
Eastern and Midlands Region

Drawing Title

Appendix 8.4
Figure 43
Target Habitat Surveys
Sheet 43 of 59

Drawing Status

Final - Planning Application

Scale @ A3	1:12,000	DO NOT SCALE
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Client No.	9318	
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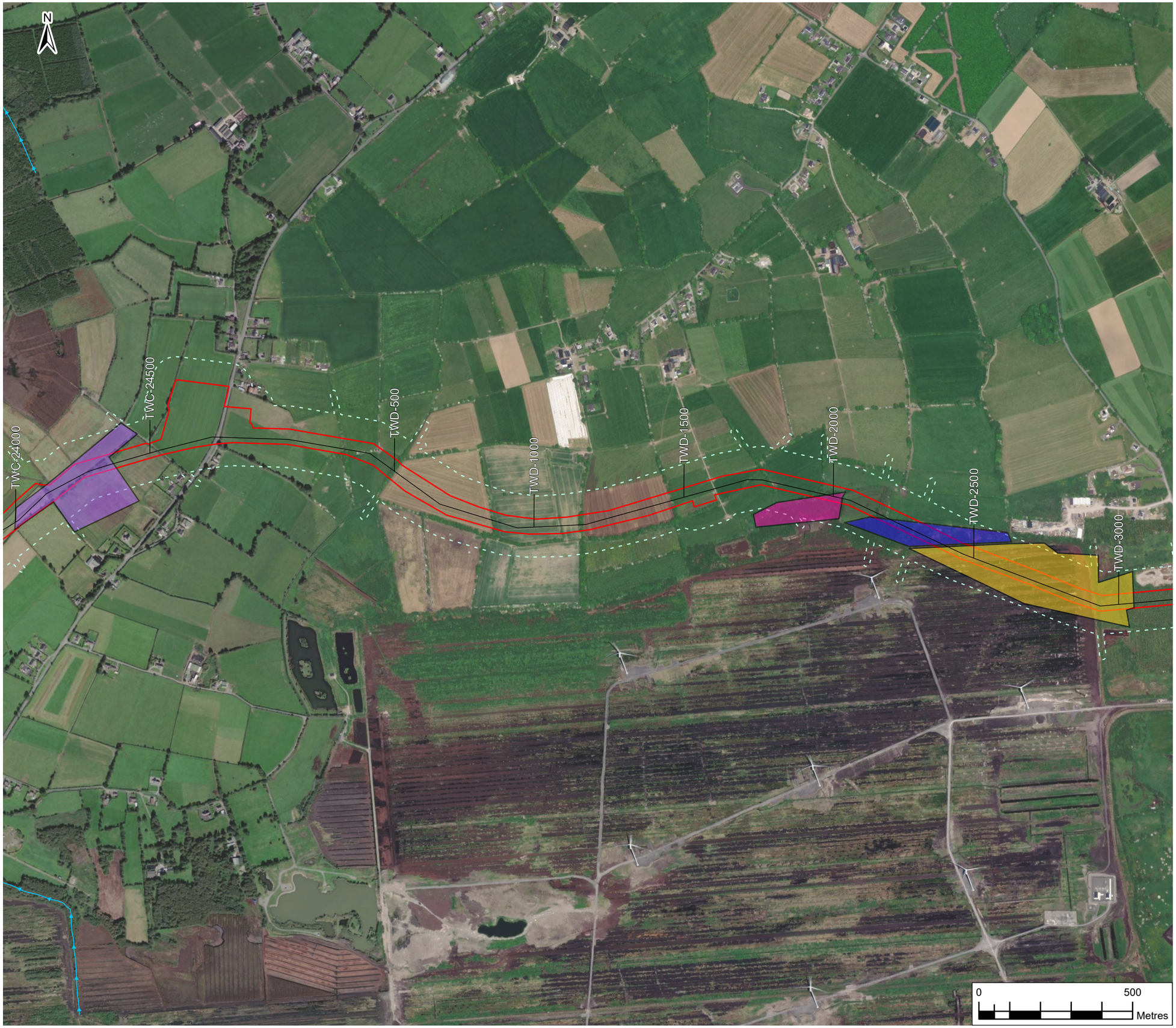

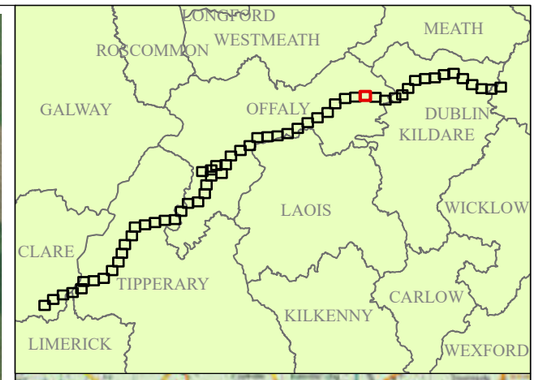

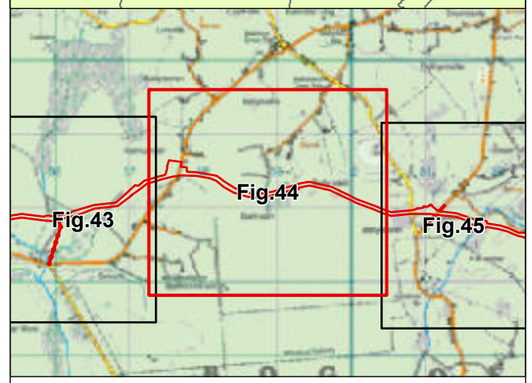

Legend

- Planning Application Boundary
- Indicative Pipeline
- Study Area
- Rivers/Streams

Non-Annex Habitats

- Ballynakill Bog Woodland
- Ballynakill Woodland
- Ballynakill/Ballykileen Peatland
- Rathumbler Grassland

RW-xxx - Raw Water Chainage
TW-xxx - Treated Water Chainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
F03	21/11/25	Final - Planning Application	SP	LK	SN	SW

Jacobs TOBIN

Client: Uisce Éireann Irish Water; Tionscadal Soláthair Uisce Water Supply Project

Project: Water Supply Project
Eastern and Midlands Region

Drawing Title: Appendix 8.4
Figure 44
Target Habitat Surveys
Sheet 44 of 59

Drawing Status: Final - Planning Application

Scale @ A3	1:12,000	DO NOT SCALE
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Client No.	9318	
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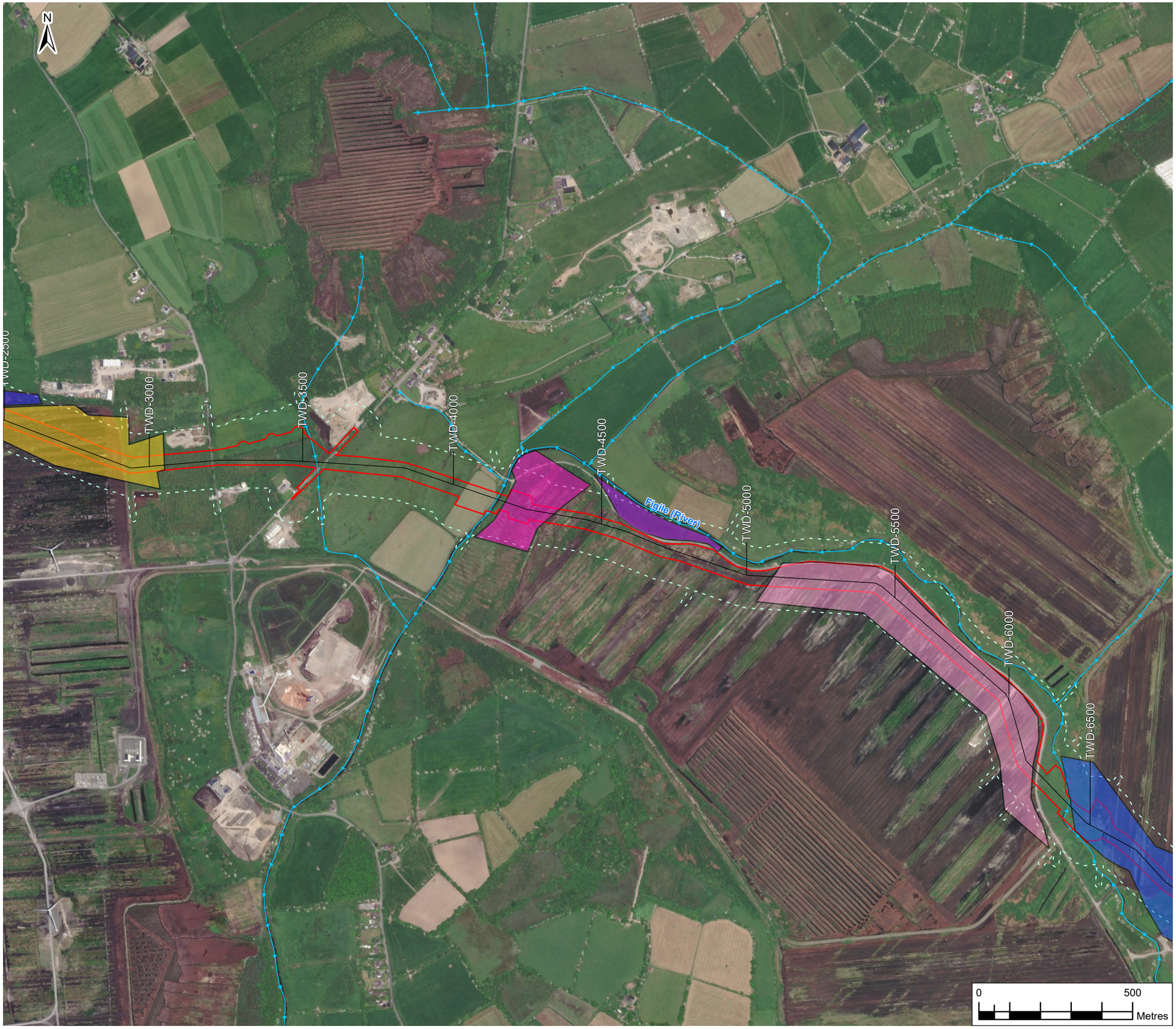

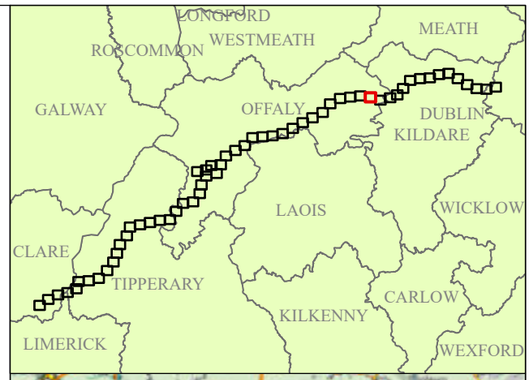

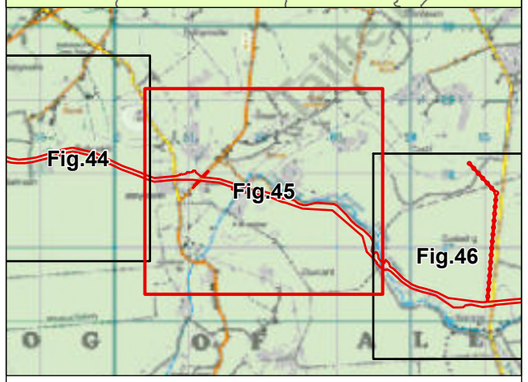

Legend

- Planning Application Boundary
- Indicative Pipeline
- Study Area
- Rivers/Streams

Non-Annex Habitats

- Ballynakill Woodland
- Ballynakill/Ballykileen Peatland
- Cushaling Peatland (a)
- Kilcumber Woodland (a)
- Kilcumber Woodland (b)
- Kilcumber/Cloncant Peatland

RW-xxx - Raw Water Chainage
TW-xxx - Treated Water Chainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
F03	21/11/25	Final - Planning Application	SP	LK	SN	SW

Jacobs TOBIN

Client: Uisce Éireann Irish Water; Tionscadal Soláthair Uisce Water Supply Project

Project: Water Supply Project
Eastern and Midlands Region

Drawing Title: Appendix 8.4
Figure 45
Target Habitat Surveys
Sheet 45 of 59

Drawing Status: Final - Planning Application

Scale @ A3	1:12,000	DO NOT SCALE
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Client No.	9318	
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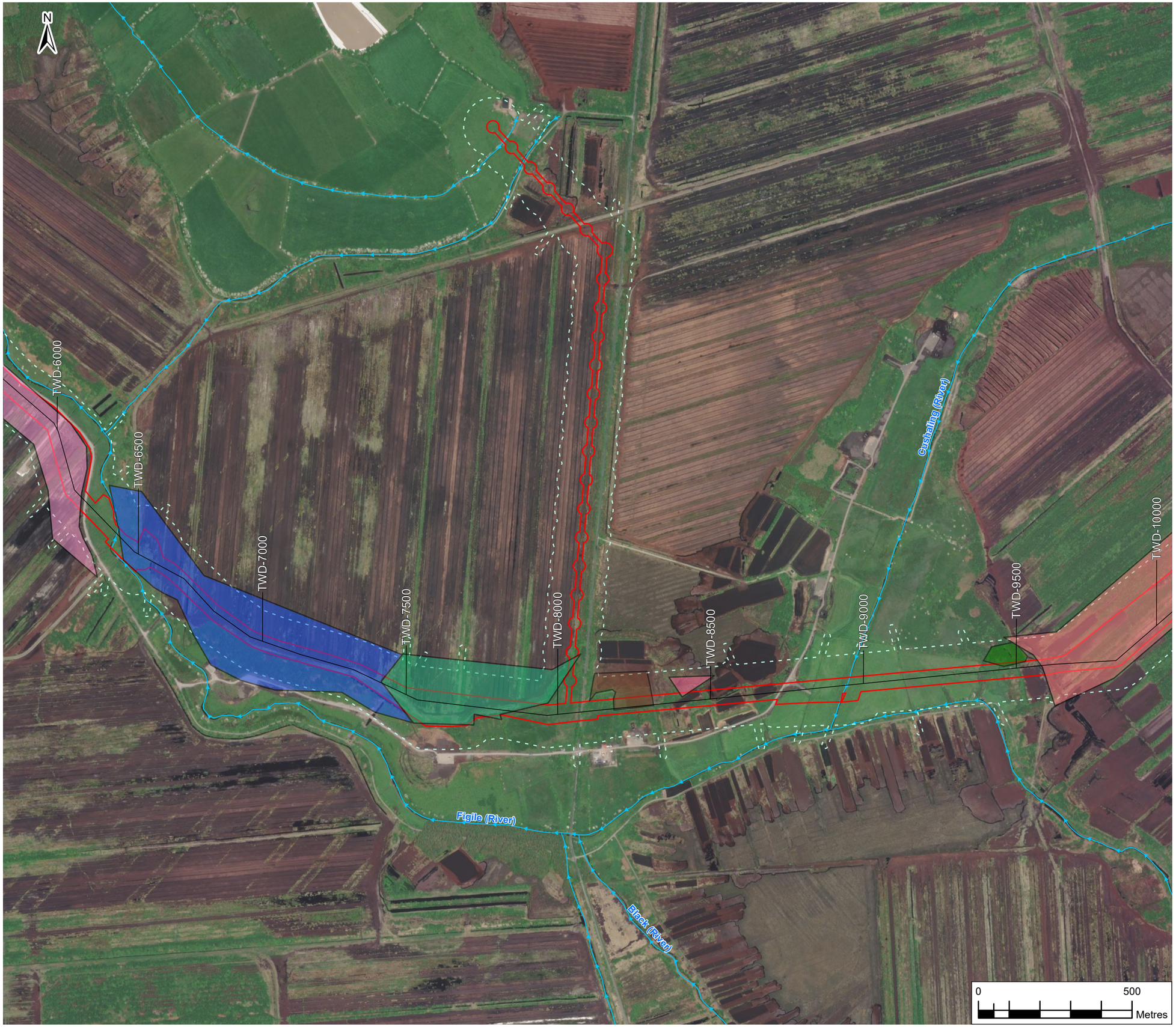

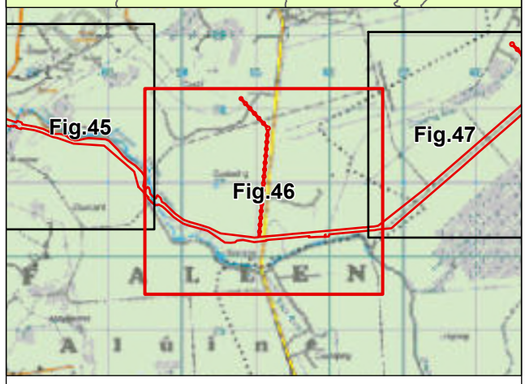

Legend

- Planning Application Boundary
- Indicative Pipeline
- Study Area
- Rivers/Streams

Non-Annex Habitats

- Cushaling Bog Woodland
- Cushaling Grassland
- Cushaling Peatland (a)
- Cushaling Peatland (b)
- Cushaling Peatland (c)
- Kilcumber/Cloncant Peatland
- Ticknevin Peatland (a)

RW-xxx - Raw Water Chainage
TW-xxx - Treated Water Chainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
F03	21/11/25	Final - Planning Application	SP	LK	SN	SW

Jacobs TOBIN

Client

Uisce Éireann Irish Water

Tionscadal Soláthair Uisce Water Supply Project

Project

Water Supply Project
Eastern and Midlands Region

Drawing Title

Appendix 8.4
Figure 46
Target Habitat Surveys
Sheet 46 of 59

Drawing Status

Final - Planning Application

Scale @ A3	1:12,000	DO NOT SCALE
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Client No.	9318	
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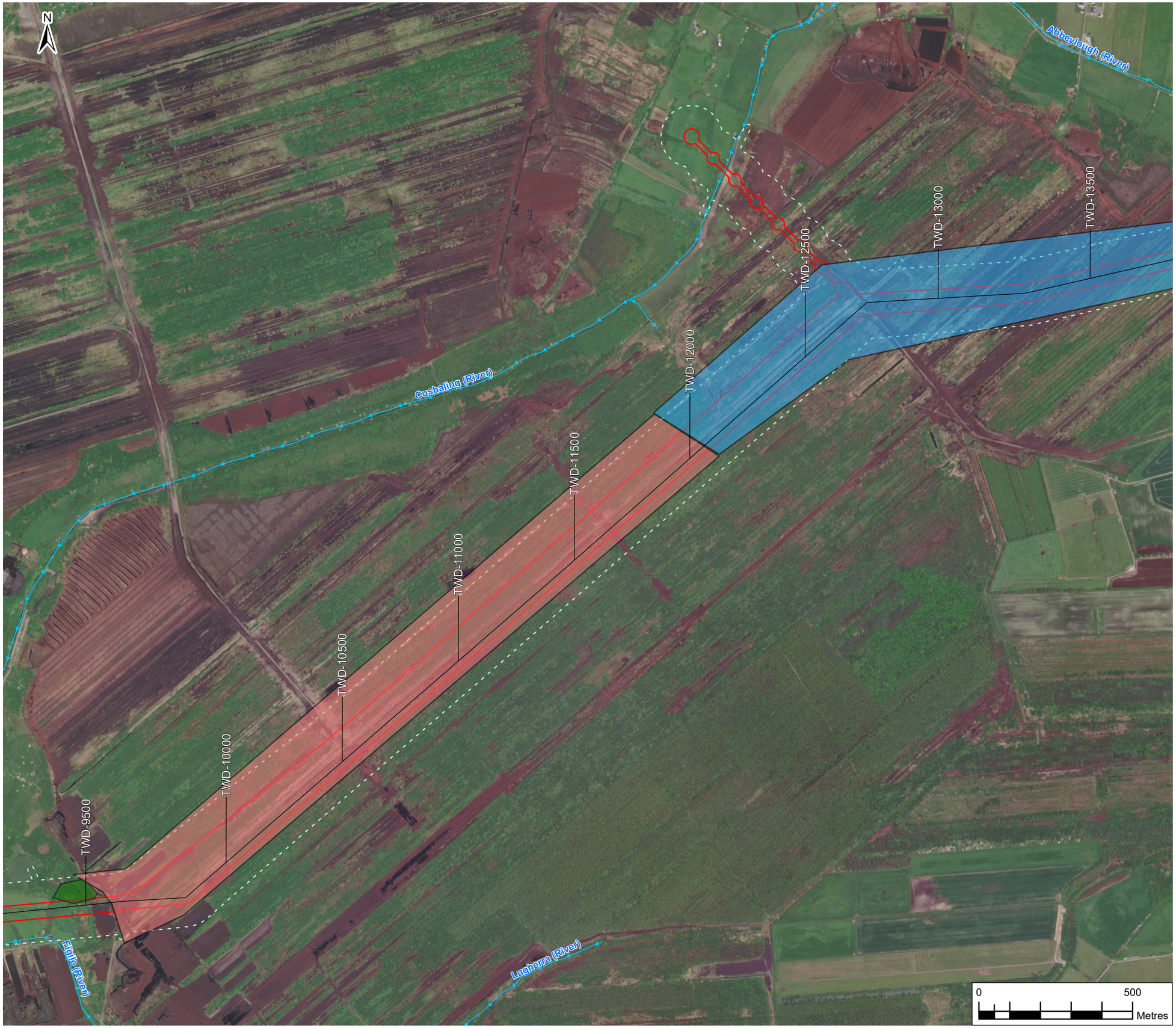

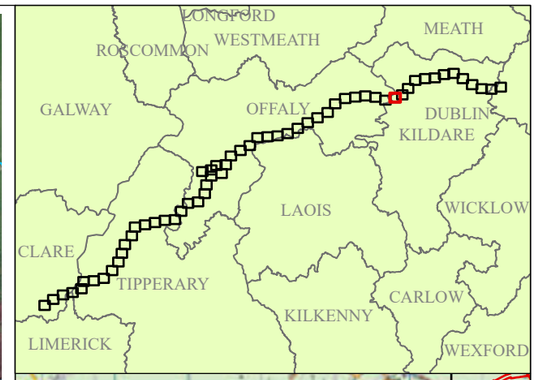

Legend

- Planning Application Boundary
- Indicative Pipeline
- Study Area
- Rivers/Streams

Non-Annex Habitats

- Cushaling Bog Woodland
- Ticknevin Peatland (a)
- Ticknevin Peatland (b)

RW-xxx - Raw Water Chainage
TW-xxx - Treated Water Chainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
F03	21/11/25	Final - Planning Application	SP	LK	SN	SW

Jacobs TOBIN

Client: Uisce Éireann Irish Water; Tionscadal Soláthair Uisce Water Supply Project

Project: Water Supply Project
Eastern and Midlands Region

Drawing Title: Appendix 8.4
Figure 47
Target Habitat Surveys
Sheet 47 of 59

Drawing Status: Final - Planning Application

Scale @ A3	1:12,000	DO NOT SCALE
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Client No.	9318	
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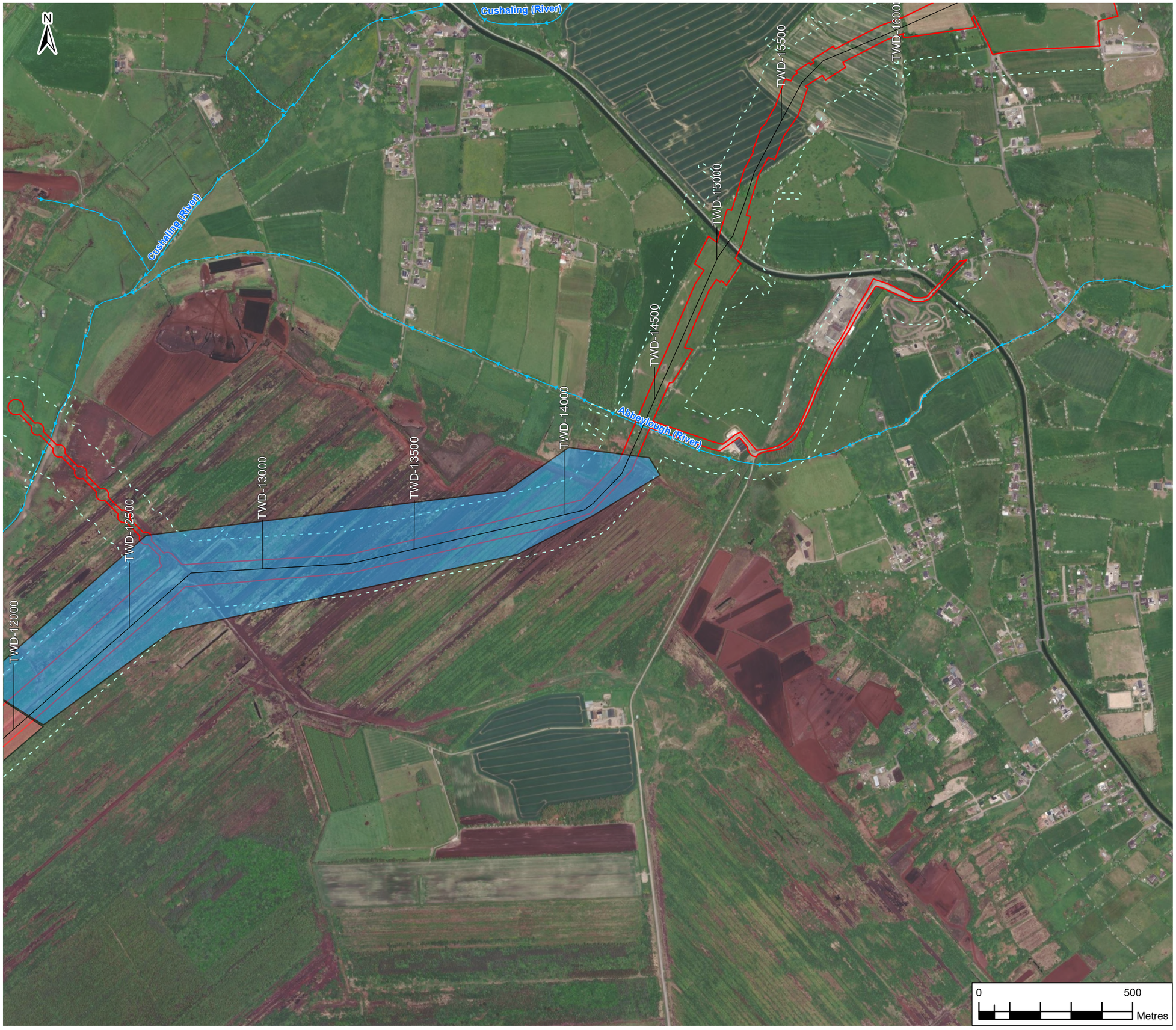

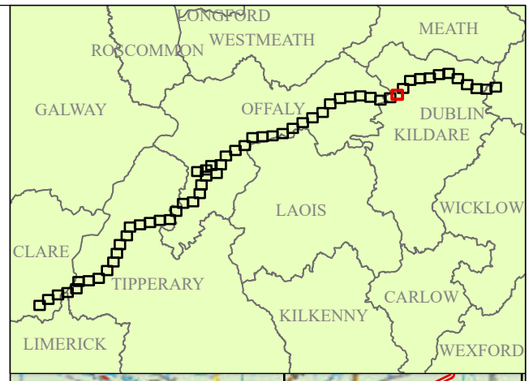

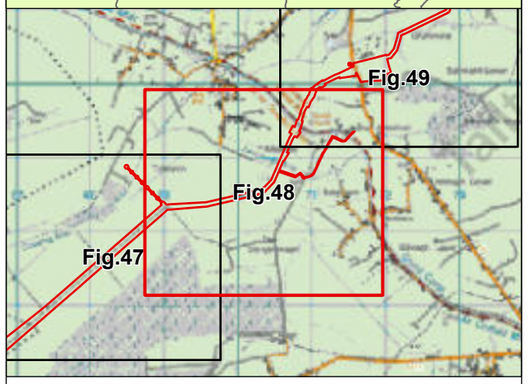

Legend

- Planning Application Boundary
- Indicative Pipeline
- Study Area
- Rivers/Streams

Non-Annex Habitats

- Ticknevin Peatland (a)
- Ticknevin Peatland (b)

RW-xxx - Raw Water Chainage
TW-xxx - Treated Water Chainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
F03	21/11/25	Final - Planning Application	SP	LK	SN	SW

Jacobs TOBIN

Client: Uisce Éireann Irish Water; Tionscadal Soláthair Uisce Water Supply Project

Project
Water Supply Project
Eastern and Midlands Region

Drawing Title
Appendix 8.4
Figure 48
Target Habitat Surveys
Sheet 48 of 59

Drawing Status
Final - Planning Application

Scale @ A3	1:12,000	DO NOT SCALE
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Client No.	9318	
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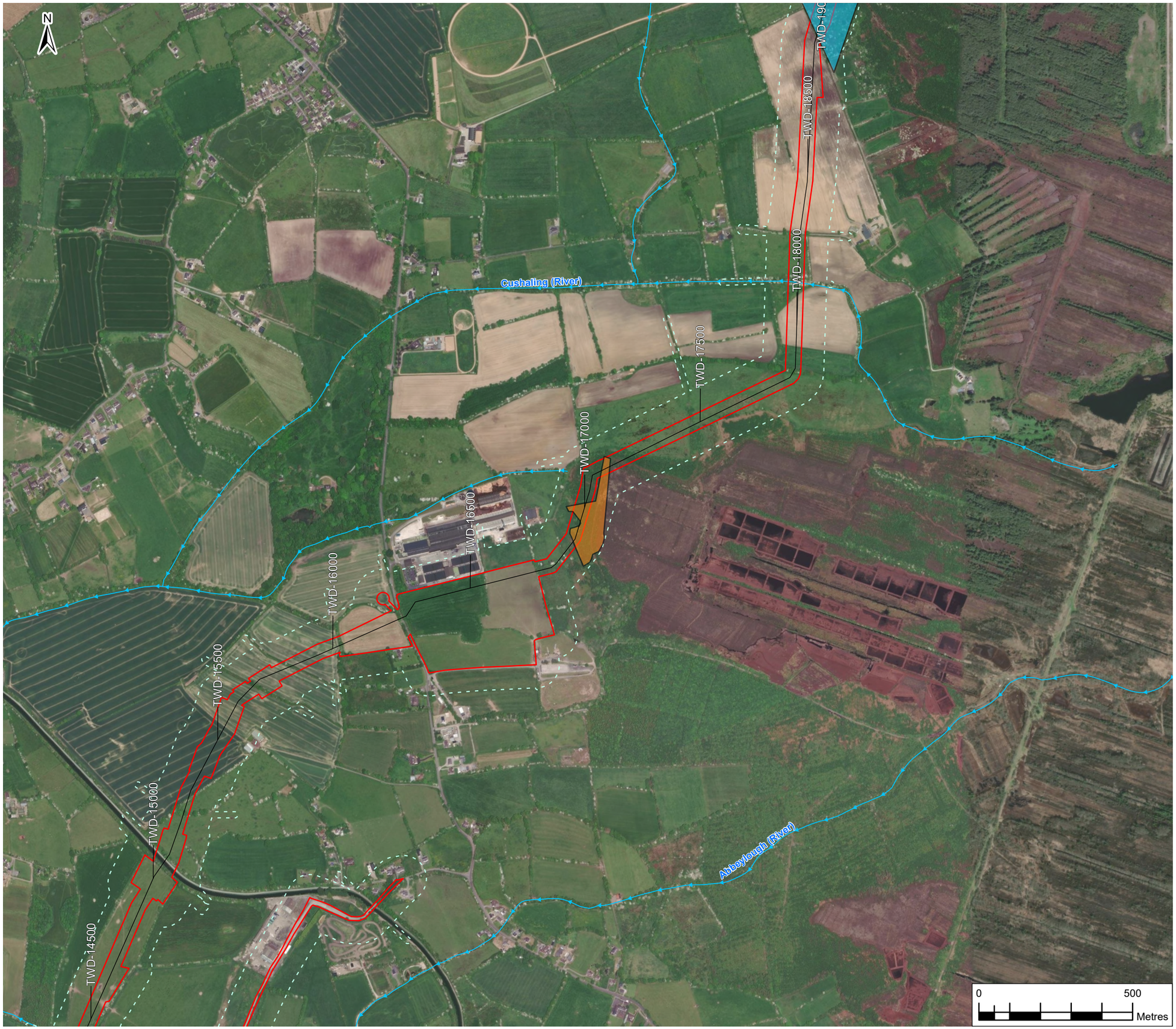

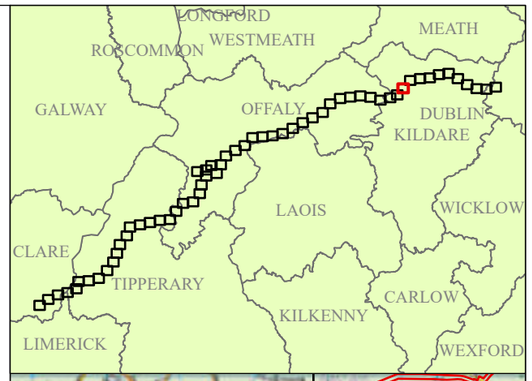

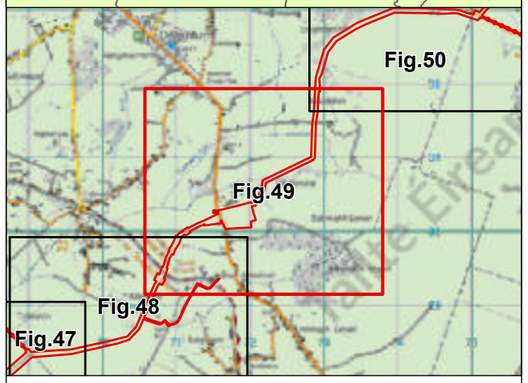

Legend

- Planning Application Boundary
- Indicative Pipeline
- Study Area
- Rivers/Streams

Non-Annex Habitats

- Drummond Woodland
- Kilkeaskin/Drehid Peatland

RW-xxx - Raw Water Chainage
TW-xxx - Treated Water Chainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
F03	21/11/25	Final - Planning Application	SP	LK	SN	SW

Jacobs TOBIN

Client: Uisce Éireann Irish Water; Tionscadal Soláthair Uisce Water Supply Project

Project
Water Supply Project
Eastern and Midlands Region

Drawing Title
Appendix 8.4
Figure 49
Target Habitat Surveys
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Drawing Status: Final - Planning Application

Scale @ A3	1:12,000	DO NOT SCALE
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Client No.	9318	
Drawing No.	32105801/700/1648	
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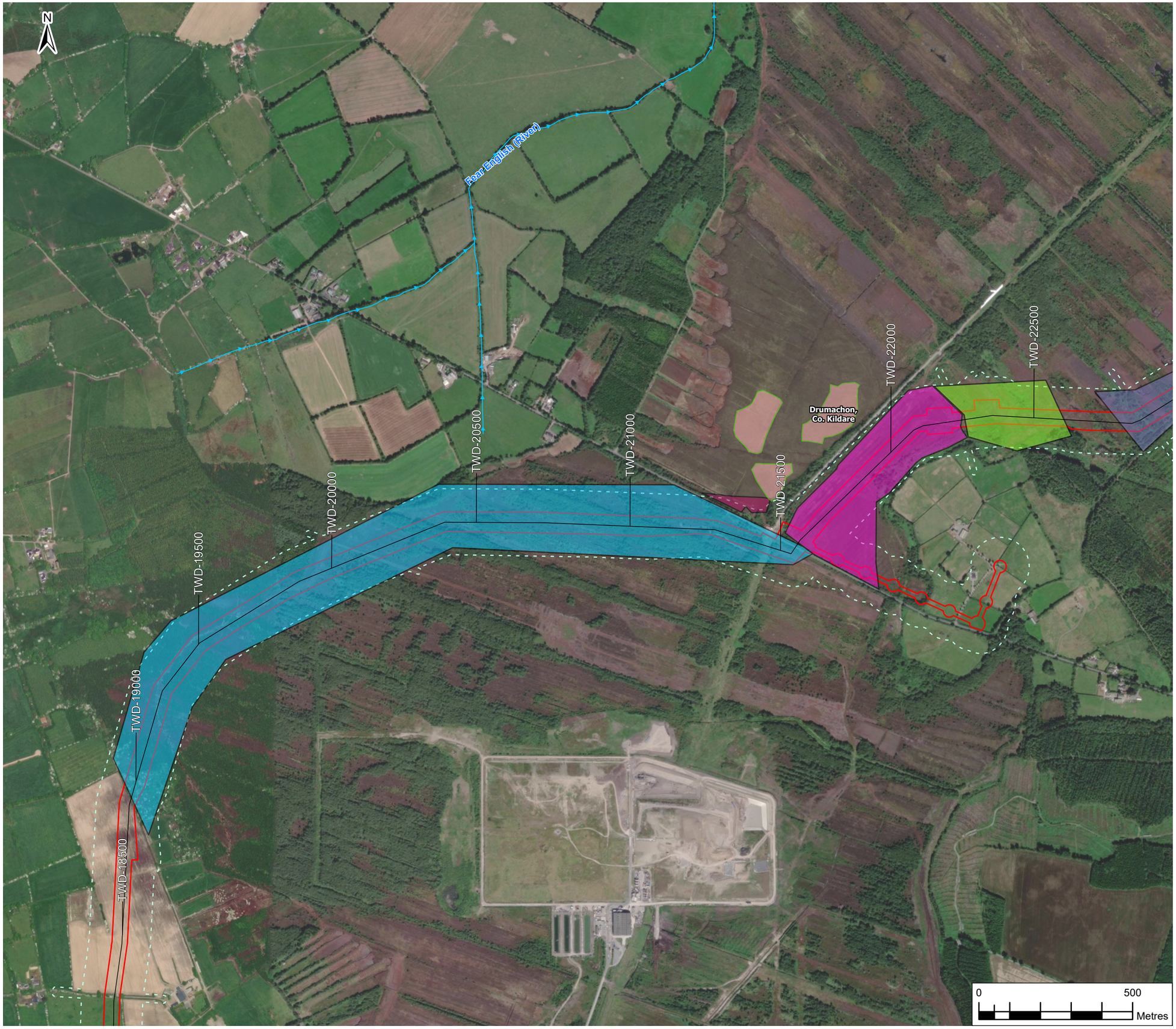

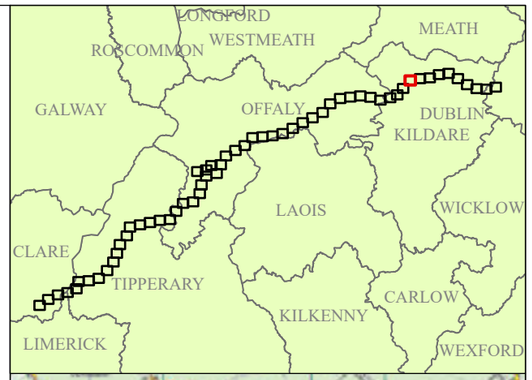

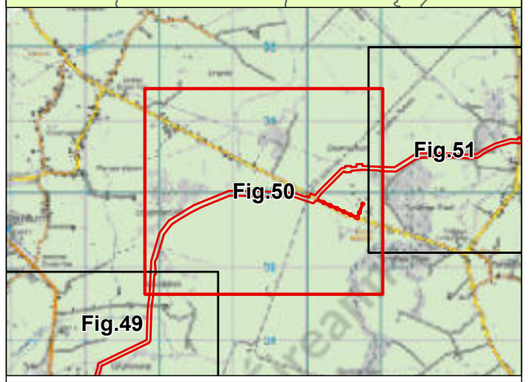

Legend

- Planning Application Boundary
- Indicative Pipeline
- Study Area
- Rivers/Streams

Annex I Habitats

- Drumachon Bog

Non-Annex Habitats

- Kilkeaskin/Drehid Peatland
- Timahoe East Grassland
- Timahoe East Peatland
- Timahoe East Peatland and Grassland (a)
- Timahoe East Peatland and Woodland

RW-xxx - Raw Water Chainage
TW-xxx - Treated Water Chainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
F03	21/11/25	Final - Planning Application	SP	LK	SN	SW

Jacobs TOBIN

Client: Uisce Éireann Irish Water; Tionscadal Soláthair Uisce Water Supply Project

Project: Water Supply Project
Eastern and Midlands Region

Drawing Title: Appendix 8.4
Figure 50
Target Habitat Surveys
Sheet 50 of 59

Drawing Status: Final - Planning Application

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Client No.	9318	
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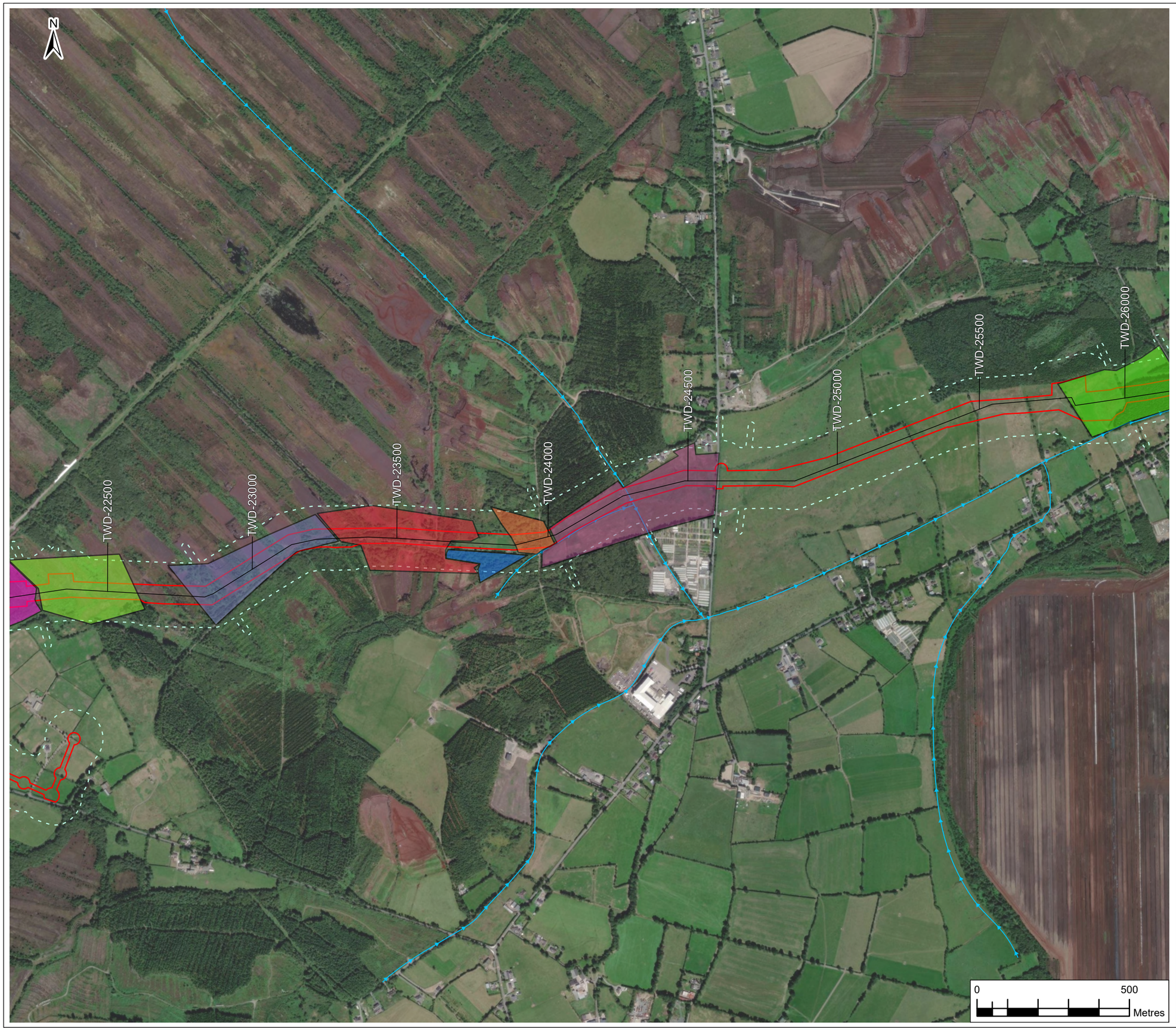

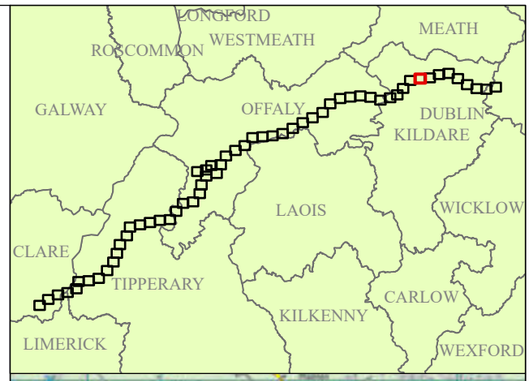

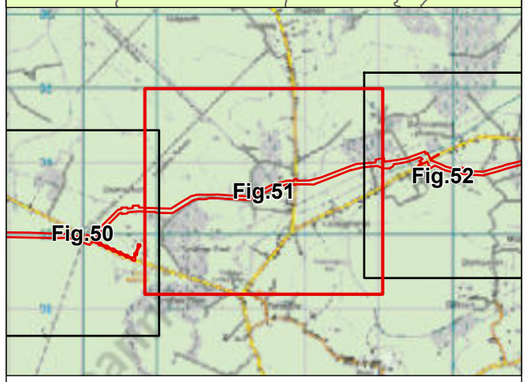

Legend

- Planning Application Boundary
- Indicative Pipeline
- Study Area
- Rivers/Streams

Non-Annex Habitats

- Coologmartin Grasslands
- Derryvarroge Grasslands and Woodland
- Timahoe East Grassland
- Timahoe East Peatland and Grassland (a)
- Timahoe East Peatland and Grassland (b)
- Timahoe East Peatland and Woodland
- Timahoe East Scrubland
- Timahoe East Woodland

RW-xxx - Raw Water Chainage
TW-xxx - Treated Water Chainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
F03	21/11/25	Final - Planning Application	SP	LK	SN	SW

Jacobs TOBIN

Client: Uisce Éireann Irish Water; Tionscadal Soláthair Uisce Water Supply Project

Project
Water Supply Project
Eastern and Midlands Region

Drawing Title
Appendix 8.4
Figure 51
Target Habitat Surveys
Sheet 51 of 59

Drawing Status: Final - Planning Application

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Client No.	9318	
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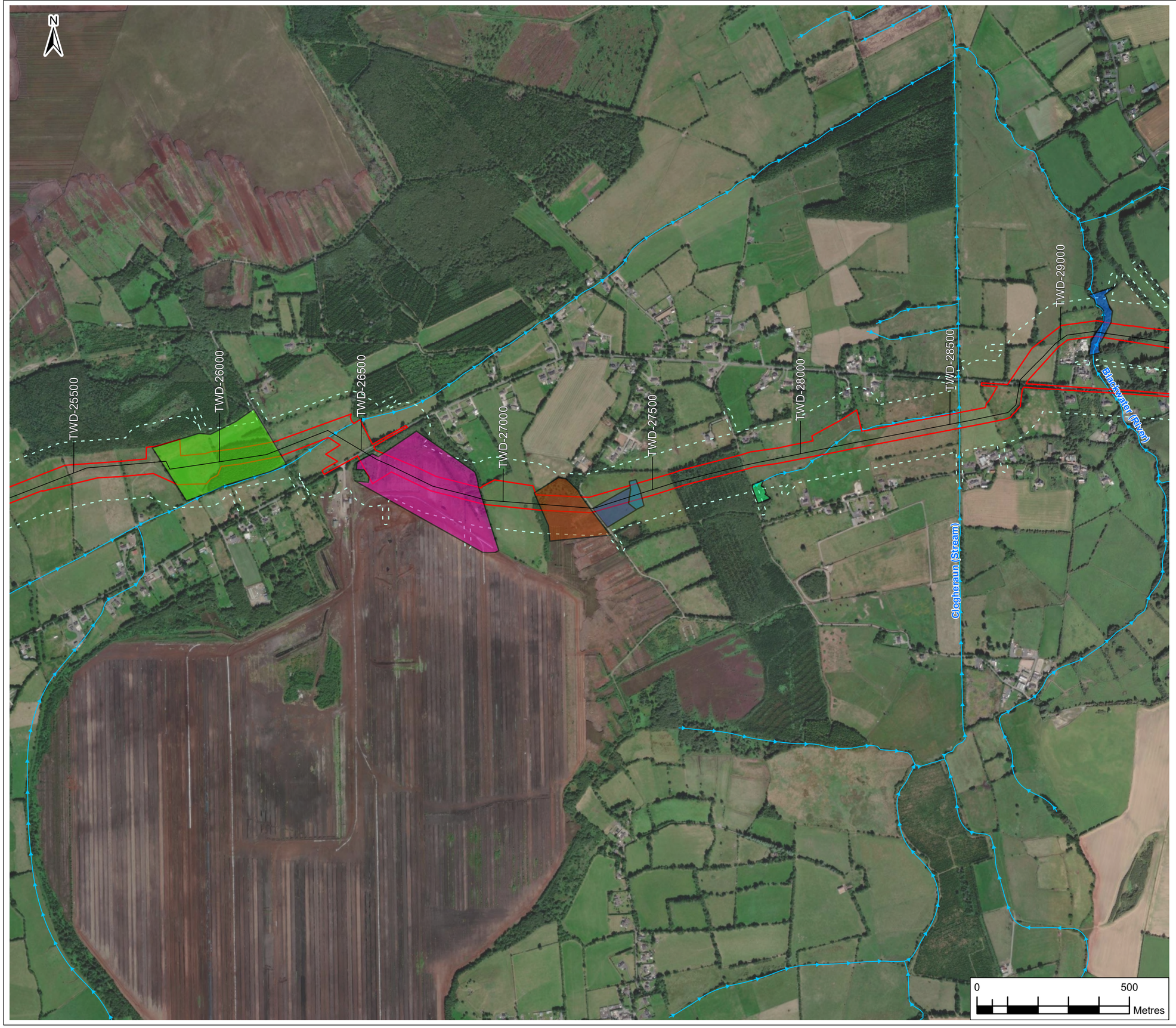

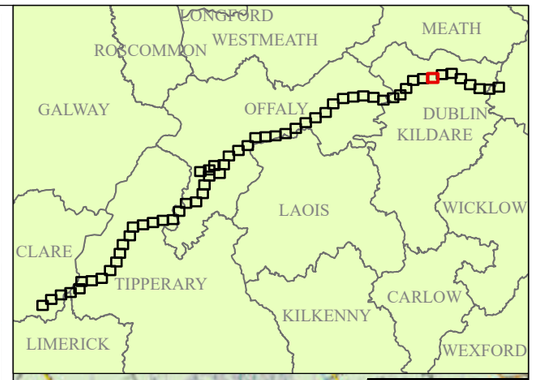

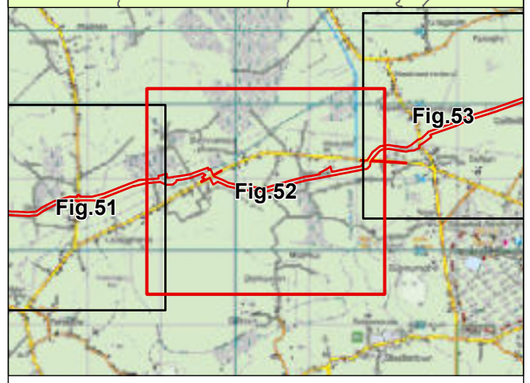

Legend

- Planning Application Boundary
- Indicative Pipeline
- Study Area
- Rivers/Streams

Non-Annex Habitats

- Derrycrib Woodland
- Derryvarroge Dry Grasslands and Fen
- Derryvarroge Grassland
- Derryvarroge Grasslands and Woodland
- Derryvarroge Peatland (a)
- Derryvarroge Peatland (b)
- Newtwonmoneenluggagh Woodland

RW-xxx - Raw Water Chainage
TW-xxx - Treated Water Chainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
F03	21/11/25	Final - Planning Application	SP	LK	SN	SW

Jacobs TOBIN

Client: Uisce Éireann Irish Water; Tionscadal Soláthair Uisce Water Supply Project

Project: Water Supply Project
Eastern and Midlands Region

Drawing Title: Appendix 8.4
Figure 52
Target Habitat Surveys
Sheet 52 of 59

Drawing Status: Final - Planning Application

Scale @ A3	1:12,000	DO NOT SCALE
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Client No.	9318	
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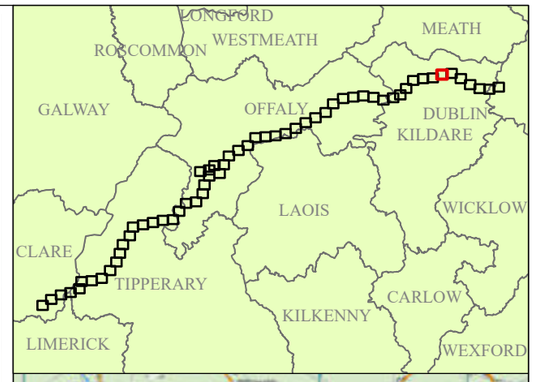

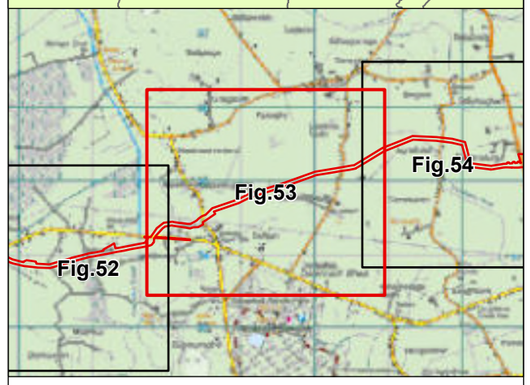

Legend

- Planning Application Boundary
- Indicative Pipeline
- Study Area
- Rivers/Streams

Non-Annex Habitats

- Newtwonmoneenluggagh Woodland

RW-xxx - Raw Water Chainage
TW-xxx - Treated Water Chainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
F03	21/11/25	Final - Planning Application	SP	LK	SN	SW

Jacobs TOBIN

Client: Uisce Éireann Irish Water; Tionscadal Soláthair Uisce Water Supply Project

Project
Water Supply Project
Eastern and Midlands Region

Drawing Title
Appendix 8.4
Figure 53
Target Habitat Surveys
Sheet 53 of 59

Drawing Status: Final - Planning Application

Scale @ A3	1:12,000	DO NOT SCALE
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Client No.	9318	
Drawing No.	32105801/700/1652	
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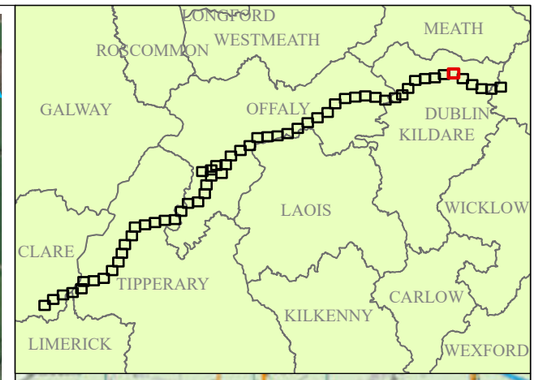

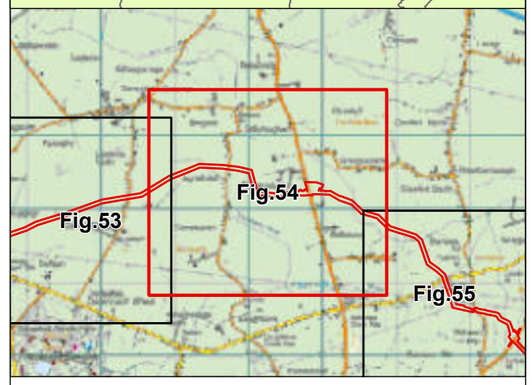

Legend

- Planning Application Boundary
- Indicative Pipeline
- Study Area
- Rivers/Streams

RW-xxx - Raw Water Chainage
TW-xxx - Treated Water Chainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
F03	21/11/25	Final - Planning Application	SP	LK	SN	SW

Jacobs TOBIN

Client: Uisce Éireann Irish Water; Tionscadal Soláthair Uisce Water Supply Project

Project: Water Supply Project
Eastern and Midlands Region

Drawing Title: Appendix 8.4
Figure 54
Target Habitat Surveys
Sheet 54 of 59

Drawing Status: Final - Planning Application

Scale @ A3	1:12,000	DO NOT SCALE
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Drawing No.	32105801/700/1653	
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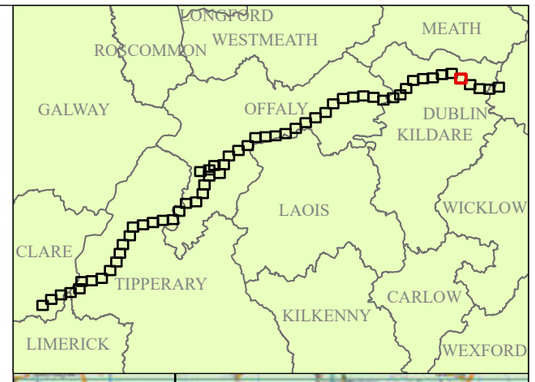

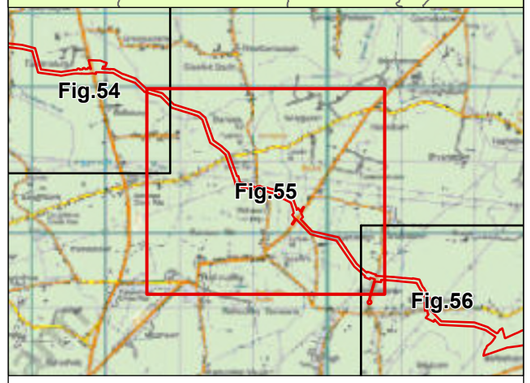

Legend

- Planning Application Boundary
- Indicative Pipeline
- Study Area
- Rivers/Streams

Non-Annex Habitats

- Barreen Woodland

RW-xxx - Raw Water Chainage
TW-xxx - Treated Water Chainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
F03	21/11/25	Final - Planning Application	SP	LK	SN	SW

Jacobs TOBIN

Client: Uisce Éireann Irish Water; Tionscadal Soláthair Uisce Water Supply Project

Project: Water Supply Project
Eastern and Midlands Region

Drawing Title: Appendix 8.4
Figure 55
Target Habitat Surveys
Sheet 55 of 59

Drawing Status: Final - Planning Application

Scale @ A3	1:12,000	DO NOT SCALE
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Client No.	9318	
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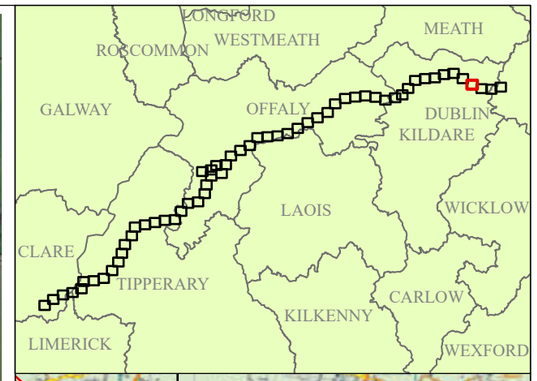

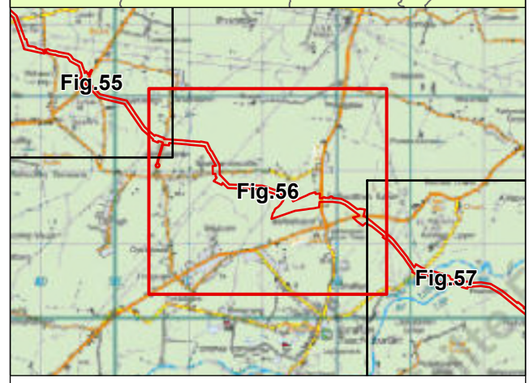

Legend

- Planning Application Boundary
- Indicative Pipeline
- Study Area
- Rivers/Streams

RW-xxx - Raw Water Chainage
TW-xxx - Treated Water Chainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
F03	21/11/25	Final - Planning Application	SP	LK	SN	SW

Jacobs TOBIN

Client: Uisce Éireann Irish Water; Tionscadal Soláthair Uisce Water Supply Project

Project: Water Supply Project
Eastern and Midlands Region

Drawing Title: Appendix 8.4
Figure 56
Target Habitat Surveys
Sheet 56 of 59

Drawing Status: Final - Planning Application

Scale @ A3	1:12,000	DO NOT SCALE
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Client No.	9318	
Drawing No.	32105801/700/1655	
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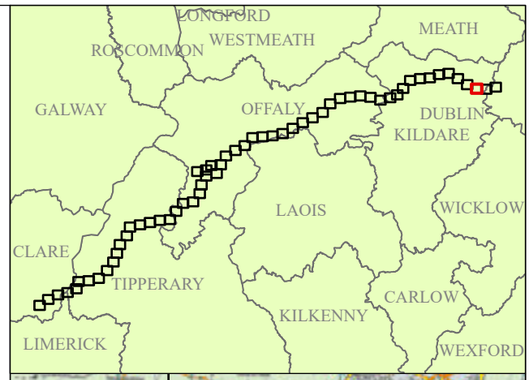

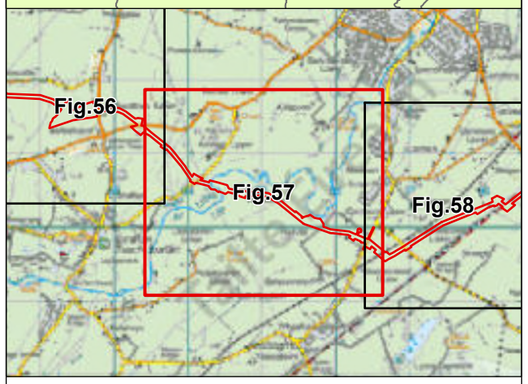

Legend

- Planning Application Boundary
- Indicative Pipeline

Infrastructure Sites

- Flow Control Valve
- Study Area
- Rivers/Streams

RW-xxx - Raw Water Chainage
TW-xxx - Treated Water Chainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
F03	21/11/25	Final - Planning Application	SP	LK	SN	SW

Jacobs TOBIN

Client: Uisce Éireann Irish Water; Tionscadal Soláthair Uisce Water Supply Project

Project: Water Supply Project
Eastern and Midlands Region

Drawing Title: Appendix 8.4
Figure 57
Target Habitat Surveys
Sheet 57 of 59

Drawing Status: Final - Planning Application

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Client No.	9318	
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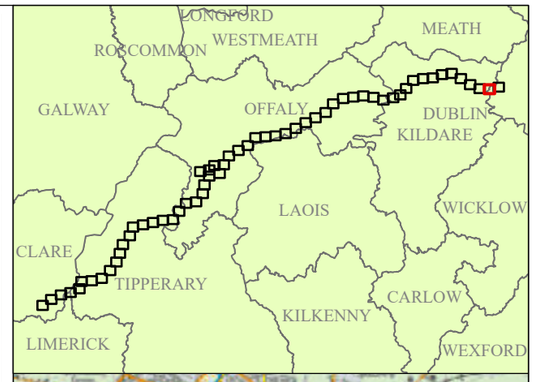

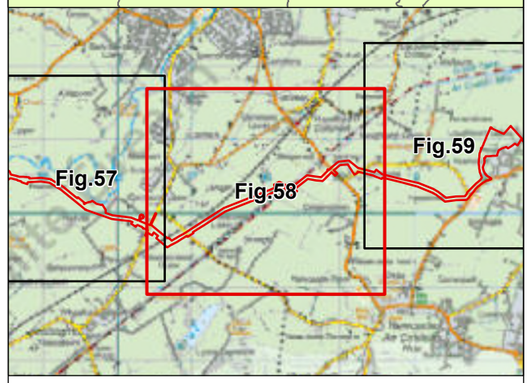

Legend

- Planning Application Boundary
- Indicative Pipeline

Infrastructure Sites

- Flow Control Valve
- Study Area
- Rivers/Streams

RW-xxx - Raw Water Chainage
TW-xxx - Treated Water Chainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
F03	21/11/25	Final - Planning Application	SP	LK	SN	SW

Jacobs TOBIN

Client: Uisce Éireann Irish Water; Tionscadal Soláthair Uisce Water Supply Project

Project
Water Supply Project
Eastern and Midlands Region

Drawing Title
Appendix 8.4
Figure 58
Target Habitat Surveys
Sheet 58 of 59

Drawing Status: Final - Planning Application

Scale @ A3	1:12,000	DO NOT SCALE
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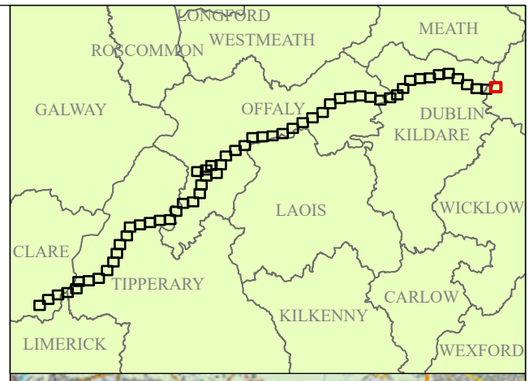

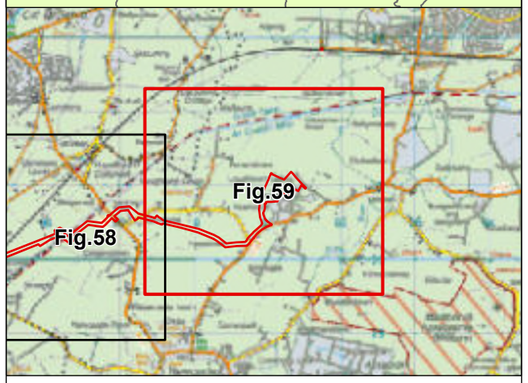

Legend

- Planning Application Boundary
- Indicative Pipeline

Infrastructure Sites

- Termination Point Reservoir
- Study Area
- Rivers/Streams

RW-xxx - Raw Water Chainage
TW-xxx - Treated Water Chainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
F03	21/11/25	Final - Planning Application	SP	LK	SN	SW

Jacobs TOBIN

Client: Uisce Éireann Irish Water; Tionscadal Soláthair Uisce Water Supply Project

Project
Water Supply Project
Eastern and Midlands Region

Drawing Title
Appendix 8.4
Figure 59
Target Habitat Surveys
Sheet 59 of 59

Drawing Status: Final - Planning Application

Scale @ A3	1:12,000	DO NOT SCALE
Jacobs No.	32105801	
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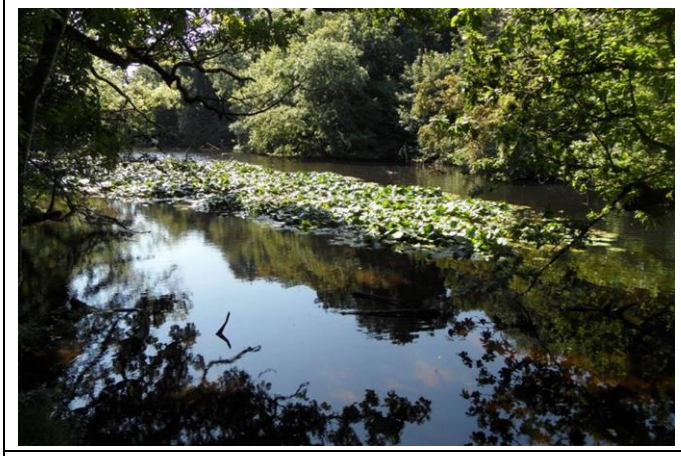
Annex B – Results of Non-Annex I Habitats 2016

Table 5.1: Ponds Near Lough Ourna pNHA

Ponds Near Lough Ourna pNHA			
Survey Date: 15/08/2016 - 18/08/2016	**Surveyors:** PC	**Townland:** Lough Ourna	**Folio Number(s):** TY36478N
Figure: 13		**Grid Reference:** 586994, 685713	
			
Habitats Present: GA1		**Correspondence with Annex I:** None (see comments below)	
Comments: Two ponds with surface water in County Tipperary were surveyed to determine whether they were turloughs (FL6). No vegetation zonation was observed suggesting that there is an absence of significant seasonal flooding. Although the ponds may be hydrologically linked to the nearby Lough Ourna pNHA they are not considered to be turloughs. The area around the ponds was heavily grazed and poached by cattle with the ponds having a marginal zone of exposed muddy substrate (mineral based soil). Examination of past aerial photography indicates that the area is prone to extensive flooding.			
Biodiversity Value: Local importance (lower value)			

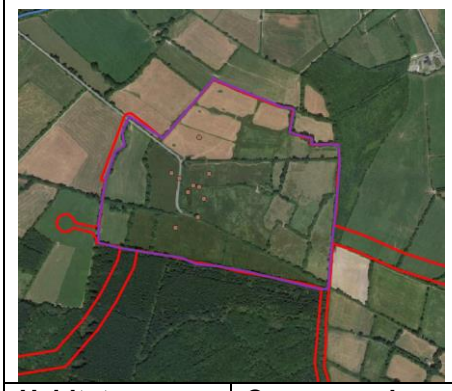
Table 5.2: Valley Pond and Woodland at Cangort Park

<table>
<tr><th colspan="4">Valley Pond and Woodland at Cangort Park</th></tr>
<tr><td>Survey Date: 15/08/2016 - 18/08/2016</td><td>Surveyors: PC and BK</td><td>Townland: Cangort</td><td>Folio Number(s): OY5447N</td></tr>
<tr><td colspan="2">Figure: 19</td><td colspan="2">Grid Reference: 602130, 692482</td></tr>
<tr><td colspan="2">  </td><td colspan="2"> 
</td></tr>
<tr><td colspan="2"></td><td>Habitats Present: WD1, FL8</td><td>Correspondence with Annex I: None (see comments below)</td></tr>
<tr><td colspan="4">Comments:
This woodland site is located at Cangort Park immediately north-east of Derrinclare Cutover in County Offaly. This site contained an area of mature estate beech woodland on a ridge sloping down to an artificial pond. This site was previously recorded in published literature and is included in the Map of Irish Wetlands (Foss & Crushell 2011) under site code OF122 Valley Pond. Only limited site data was available as the site was identified from aerial photography.
Trees within the plantation woodland attain heights of ca 20m. The woodland is dominated by beech and sycamore. Around the edge of the lake ash and occasional oak were recorded with some hawthorn. The invasive species cherry laurel (Prunus laurocerasus) occurs within the woodland. The ground flora was mainly composed of a dense ground layer of ivy with brambles and some nettle, hogweed, Arum maculatum and Circaea lutetiana. There appears to be little tree regeneration.
At the base of wooded ridge there is a eutrophic infilling artificial pond, covered by large patches of water lilies. The lake edge along the eastern side is disturbed (numerous dead and felled trees piled along the lake edge to prevent sheep access. This edge is also heavily grazed by sheep with a bare soil substrate under the trees and few plant species present.</td></tr>
<tr><td colspan="4">Biodiversity Value: Local importance (lower value)</td></tr>
</table>

Annex C – Results of Non-Annex I Habitats 2017

Table 5.3: Water Treatment Plant

WTP			
Survey Date: 19/06/2017	**Surveyors:** PF MCG	**Townland:** Inchabeg	**Folio Number(s):** TY2819N, TY32282N, TY31162N
Figure: 6		**Grid Reference:** 571989, 670666	



Habitats Present: GS4, GS4/GA1	**Correspondence with Annex I:** None (see comments below)

Comments:
Relevé 1: Wet grassland (GS4) relevé in area that was rush topped last year during initial survey of the site. Area has since regenerated. Habitat is rush dominated wet grassland (GS4). Water table below the surface. Heavy clay soil, poached by cattle. No surface water visible (Table 5.4).

Relevé 2: Large wet grassland (GS4) field with a central gappy broken gorse hedgerow. Cattle grazed (Table 5.4).

Relevé 3: Rushes appear to have been topped this year at this location. Semi improved wet grassland field grazed by cattle.

Relevé 4: Triangular field in the south-east of the site. Spruce plantation (WD4) to the south. Entrance to the field very wet and muddy. Heavily poached. Wet grassland field that is grazed by cattle (Table 5.4).

Biodiversity Value: Local importance (lower value)

Table 5.4: WTP Relevé Results

Relevé Data	Relevé Number			
	Relevé 1	Relevé 2	Relevé 3	Relevé 4
Easting (ITM)	571989	572027	572080	572151
Northing (ITM)	670666	670782	670701	670487
Size m^2	4	4	4	4
Slope (degrees)	<5	5-10	<5	<5
Aspect	North-East	North-West	South-West	South-East
Substrate type	Clay	Clay	Clay	Clay
Substrate stability	Firm	Firm	Firm	Firm
Management	Grazing - cattle	Grazing - cattle	Grazing - cattle	Grazing - cattle
Adjacent land use	Grazing - cattle	Grazing - cattle	Grazing - cattle	Grazing - cattle
Grazing evidence (within relevé)	Area grazed by cattle	Area grazed by cattle	Area grazed by cattle	Area grazed by cattle
Height Tree layer cm	0	0	0	0

Relevé Data	Relevé Number			
	Relevé 1	Relevé 2	Relevé 3	Relevé 4
Height Shrub layer cm	0	0	0	0
Height Herb layer cm	80	120	15-65	80
Total Vegetation cover (%)	95	100	95	95
Tree cover (%)	0	0	0	0
Shrub cover (%)	0	0	0	0
Herb Grass cover (%)	85	100	95	95
Bryophyte cover (%)	10	<5	<5	10
Litter cover (%)	0	0	<5	0
Rock cover (%)	0	0	0	0
Bare peat / soil cover (%)	5	0	5	<5
Species Scientific Name	**Species Cover (Domin Scale)**			
Agrostis sp.	-	-	-	3
Agrostis stolonifera	-	5	5	5
Ajuga reptans	-	-	-	3
Anthoxanthum odoratum	4	5	4	4
Calliergonella cuspidata	-	4	-	4
Carex leporina	1	3	-	3
Cerastium fontanum	-	1	1	-
Cirsium palustre	-	2	-	2
Cynosurus cristatus	-	4	3	-
Filipendula ulmaria	-	-	-	2
Galium palustre	2	-	-	2
Holcus lanatus	5	5	6	5
Juncus acutiflorus	4	4	4	5
Juncus conglomeratus	3	3	-	-
Juncus effusus	9	5	4	5
Lolium perenne	-	2	3	-
Lotus pedunculatus	4	-	-	4
Lychnis flos-cuculi	-	3		4
Peltigera canina	-			2
Pleurocarpus moss – unidentified	-	-	3	-
Ranunculus acris	-	4	4	-
Ranunculus flammula	3	-	-	4
Ranunculus repens	5	5	5	6
Rhytidiadelphus squarrosus	6	-	-	4
Rumex acetosa	2	2	4	3
Senecio aquaticus	3	-	1	2
Stellaria sp.	-	-	-	2
Trifolium repens	4	4	4	-

Table 5.5: Grassland West of Ashley Park

Grassland West of Ashley Park			
Survey Date: 20/06/2017	**Surveyors:** PF MCG	**Townland:** Ashley Park	**Folio Number(s):** TY59709F, TY29317F
Figure: 14		**Grid Reference:** 586743, 656644	
			
Habitats Present: GA1		**Correspondence with Annex I:** None (see comments below)	
Comments: **Relevé 5:** Lowest point in landscape adjacent to trackway. Cow pat in quadrat. No vegetation zonation to indicate presence of turlough. Only reason to suspect turlough is that area is in a hollow and on the liable to flooding map. This site is not a turlough (FL6). No turlough features visible during visit. **Relevé 6:** This area is not turlough, no turlough features visible during visit. Semi-improved grassland (GA1) but not as recently seeded or fertilised as relevé 5. Elements of dry meadows and grassy verges (GS2) within the field.			
Biodiversity Value: Local importance (lower value)			

Table 5.6: Grassland West of Ashley Park Relevé Results

Relevé Data	Relevé Number	
	Relevé 5	Relevé 6
Easting (ITM)	586743	586941
Northing (ITM)	686644	686313
Size m^2	4	4
Slope (degrees)	Flat	NA
Aspect	NA	NA
Substrate type	Mineral Soil	Mineral Soil
Substrate stability	Firm	Very Firm
Management	Grazing - cattle	Grazing - cattle
Adjacent land use	Grazing - cattle	Grazing - cattle
Grazing evidence (within relevé)	Area grazed by cattle	Area grazed by cattle
Height Tree layer (cm)	0	0
Height Shrub layer (cm)	0	0
Height Herb layer (cm)	40	80
Total Vegetation cover (%)	100	100
Tree cover (%)	0	0
Shrub cover (%)	0	0

Relevé Data	Relevé Number	
	Relevé 5	Relevé 6
Herb Grass cover (%)	100	100
Bryophyte cover (%)	0	0
Litter cover (%)	0	5
Rock cover (%)	0	0
Bare peat / soil cover (%)	5	0
Species Scientific Name	**Species Cover (Domin Scale)**	
Agrostis stolonifera	-	5
Cirsium arvense	-	5
Dactylis glomerata	-	5
Holcus lanatus	-	6
Lolium perenne	10	6
Phleum sp.	4	-
Plantago major	3	-
Poa annua	5	-
Ranunculus repens	+	6
Rumex crispus	+	-
Rumex sanguineus	-	1
Stellaria media	+	-
Taraxacum agg.	+	-
Trifolium repens	4	-
Urtica dioica	+	-

Table 5.7: Grassland at the N52 Crossing

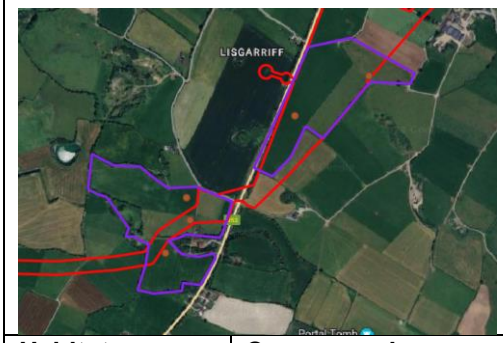
Grasslands at the N52 Crossing			
Survey Date: 20/06/2017	**Surveyors:** PF MCG	**Townland:** Ardcroney	**Folio Number(s):** TY3957F, TY2687N
Figure: 15		**Grid Reference:** 590275, 688316	
			
		Habitats Present: GA1	**Correspondence with Annex I:** None (see comments below)
Comments: This area was noted to have potential pluvial flooding/turlough. **Relevé 7:** This area is not turlough. No turlough features visible during visit. Area recently cut for silage, uniform height some bare soil areas. **Relevé 8:** Hollow in field. Recently cut for silage. Very uniform height and appearance throughout hollow. This area is not turlough (FL6). No turlough features visible during visit.			
Biodiversity Value: Local importance (lower value)			

Table 5.8: Grassland at N52 Crossings Relevé Results

Relevé Data	Relevé Number	
	Relevé 7	Relevé 8
Easting (ITM)	590275	586941
Northing (ITM)	688316	686313
Size m^2	4	4
Slope (degrees)	NA	NA
Aspect	NA	NA
Substrate type	Mineral Soil	Mineral Soil
Substrate stability	Very Firm	Very Firm
Management	Grazing - cattle	Grazing - cattle
Adjacent land use	Grazing - cattle	Grazing - cattle
Grazing evidence (within relevé)	Area grazed by cattle	Area grazed by cattle
Height Tree layer (cm)	0	0
Height Shrub layer (cm)	0	0
Height Herb layer (cm)	25	80
Total Vegetation cover (%)	85	100
Tree cover (%)	0	0
Shrub cover (%)	0	0
Herb Grass cover (%)	90	100

Relevé Data	Relevé Number	
	Relevé 7	Relevé 8
Bryophyte cover (%)	0	0
Litter cover (%)	10	5
Rock cover (%)	0	0
Bare peat / soil cover (%)	10	0
Species Scientific Name	**Species Cover (Domin Scale)**	
Agrostis stolonifera	-	7
Belis perennis	-	1
Cardamine pratensis	-	5
Cerastium fontanum	-	4
Cirsium sp.	-	3
Grass - unidentified	-	2
Lolium perenne	9	7
Ranunculus repens	-	2
Rumex crispus	-	2
Rumex sanguineus	3	-
Taraxacum agg.	4	-
Trifolium repens	5	4
Veronica sp.	-	1

Table 5.9: Killananny Bog Woodland

Killananny Bog Woodland			
Survey Date: 22/06/2017	**Surveyors:** PF MCG	**Townland:** Killananny	**Folio Number(s):** OY6408N, OY6409N
Figure: 34		**Grid Reference:** 629250, 715687	
			
Habitats Present: WN7		**Correspondence with Annex I:** None (see comments below)	
Comments: This area was noted to be a potential EU Habitats Directive Annex I bog woodland (91D0). **Relevé 13**: Cutover bog woodland (WN7) on peat with high willow cover. Scattered birch with alder and ash around edges of woodland. Some adjacent bog areas also planted with conifers. Ivy cover included in herb layer is very high. Not Annex bog woodland.			
Biodiversity Value: Local importance (lower value)			

Table 5.10: Killananny Bog Woodland Qudrat Results

Relevé Data	**Relevé Number**
	Relevé 13
Easting (ITM)	629250
Northing (ITM)	715687
Size m^2	4
Slope (degrees)	Flat
Aspect	NA
Substrate type	Peat
Substrate stability	Firm
Management	Grazing - sheep
Adjacent land use	Grazing - sheep
Grazing evidence (within relevé)	No evidence of grazing
Height Tree layer (cm)	1000
Height Shrub layer (cm)	200
Height Herb layer (cm)	100
Total Vegetation cover (%)	100
Tree cover (%)	90
Shrub cover (%)	25
Herb Grass cover (%)	100
Bryophyte cover (%)	5

Relevé Data	Relevé Number
	Relevé 13
Litter cover (%)	95
Rock cover (%)	0
Bare peat / soil cover (%)	0
Species Scientific Name	**Species Cover (Domin Scale)**
Arum maculatum	3
Betula pubescens	4
Carex remota	3
Corylus avellana	+
Fraxinus excelsior	+
Galium aparine	3
Geranium robertianum	3
Hedera helix	10
Heracleum sphondylium	4
Kindbergia praelonga	4
Rubus fruticosus agg.	5
Salix cinerea subsp. oleifolia	10
Sambucus nigra	3
Sorbus aucuparia	2
Stellaria holostea	4
Ulota sp.	3
Urtica dioica	5
Vicia sativa	3

Table 5.11: Reask Woodland

Reask Woodland			
Survey Date: 22/06/2017	**Surveyors:** PF MCG	**Townland:** Killananny	**Folio Number(s):** OY28317F
Figure: 35		**Grid Reference:** 631755, 715693	

Habitats Present: WN7	**Correspondence with Annex I:** None (see comments below)

Comments:
This area was noted to be a potential EU Habitats Directive Annex I bog woodland (91D0).

Relevé 14: Not priority bog woodland (WN7). Area heavily drained with uniform age stand of birch trees. No bog species present, with extensive bare litter areas. Local landowner indicated that trees appeared after adjacent land improvement and drainage works were undertaken. Scattered bramble and bracken in herb layer.

Biodiversity Value: Local importance (lower value)

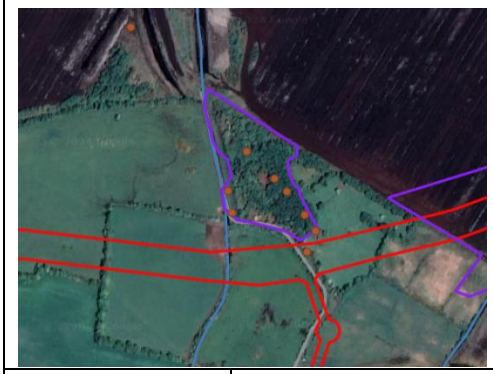
Table 5.12: Reask Woodland Relevé Results

Relevé Data	**Relevé Number**
	Relevé 14
Easting (ITM)	631755
Northing (ITM)	715693
Size m^2	4
Slope (degrees)	Flat
Aspect	NA
Substrate type	Peat
Substrate stability	Very Firm
Management	None
Adjacent land use	Meadow – silage and barely field
Grazing evidence (within relevé)	No evidence of grazing
Height Tree layer (cm)	1000-1200
Height Shrub layer (cm)	0
Height Herb layer (cm)	50
Total Vegetation cover (%)	95
Tree cover (%)	95
Shrub cover (%)	0
Herb Grass cover (%)	20
Bryophyte cover (%)	0

Relevé Data	Relevé Number
	Relevé 14
Litter cover (%)	80
Rock cover (%)	0
Bare peat / soil cover (%)	0
Species Scientific Name	**Species Cover (Domin Scale)**
Alnus gllutinosa	3
Anthoxanthum odoratum	3
Betula pubescens	10
Grass other	3
Hedera helix	3
Ilex aquifolium	3
Pteridium aquilinum	5
Rubus fruticosus agg.	4
Ulex europaeus	3

Table 5.13: Rathlumber Woodland

Rathlumber Woodland			
Survey Date: 23/06/2017	**Surveyors:** PF MCG	**Townland:** Rathlumber	**Folio Number(s):** OY8610N
Figure: 43		**Grid Reference:** 655970, 727990	



Habitats Present: WN7	**Correspondence with Annex I:** None (see comments below)

Comments:
This area was noted to be a potential Annex I bog woodland.

Relevé 15: Bog woodland (WN7) which was also surveyed last year. This site is not Annex Bog Woodland. No *Sphagnum* species, no bog species, no surface water. Herb layer dominated by brambles and honeysuckle and woodland mosses.

Relevé 16: Birch bog woodland (WN7) on peat at edge of large industrial cutover Bord na Móna bog. Large drain 6m wide and 4m deep separates woodland from cutover. This site is not Annex Bog Woodland. Surveyed from distance on opposite side of Bord na Móna drain which was too deep to cross. Herb layer composed of nettles, brambles and bracken.

Biodiversity Value: Local importance (lower value)

Table 5.14: Rathlumber Woodland Relevé Results

Relevé Data	**Relevé Number**	
	Relevé 15	**Relevé 16**
Easting (ITM)	655970	655168
Northing (ITM)	727990	728015
Size m^2	4	4
Slope (degrees)	NA	NA
Aspect	NA	NA
Substrate type	Peat	Peat
Substrate stability	Very Firm	Very Firm
Management	None	None
Adjacent land use	Grazing - cattle	Grazing - cattle
Grazing evidence (within relevé)	No evidence of grazing	No evidence of grazing
Height Tree layer (cm)	1500	1500
Height Shrub layer (cm)	600	300
Height Herb layer (cm)	100	120
Total Vegetation cover (%)	100	100
Tree cover (%)	100	100
Shrub cover (%)	50	5

Relevé Data	Relevé Number	
	Relevé 15	Relevé 16
Herb Grass cover (%)	70	80
Bryophyte cover (%)	85	60
Litter cover (%)	20	50
Rock cover (%)	0	0
Bare peat / soil cover (%)	0	0
Species Scientific Name	**Species Cover (Domin Scale)**	
Betula pubescens	8	10
Crataegus monogyna	4	-
Dryopteris carthusiana	3	-
Fraxinus excelsior	1	-
Grass other	-	-
Hedera helix	-	5
Heracleum sphondylium	-	-
Ilex aquifolium	6	-
Kindbergia praelonga	10	-
Lonicera periclymenum	6	4
Pleurocarpus moss - unidentified	-	5
Pteridium aquilinum	+	8
Ranunculus acris	-	+
Rubus fruticosus agg.	6	5
Rubus idaeus	1	-
Sambucus nigra	-	1
Sorbus aucuparia	6	1
Urtica dioica	-	4

Table 5.15: Ballynakill Bog Woodland

Ballynakill Bog Woodland			
Survey Date: 23/06/2017	**Surveyors:** PF MCG	**Townland:** Ballynakill	**Folio Number(s):** OY8377N, OY15259N
Figure: 44		**Grid Reference:** 655970, 727990	
			
		Habitats Present: WN7	**Correspondence with Annex I:** None (see comments below)
Comments: This area was noted to be a potential Annex I bog woodland. **Relevé 17:** Mature birch woodland on peat. Trees 15m tall. Rich understorey and herb/fern layer. Not Annex I Bog Woodland though the woodland is mature and likely to have developed over a considerable time period since development of the adjacent peat works. Woodland area near the Clonbuloge Power Station in Offaly.			
Biodiversity Value: Local importance (lower value)			

Table 5.16: Ballynakill Bog Woodland Relevé Surveys

Relevé Data	**Relevé Number** **Relevé 17**
Easting (ITM)	659783
Northing (ITM)	728170
Size m^2	4
Slope (degrees)	Flat
Aspect	NA
Substrate type	Peat
Substrate stability	Very Firm
Management	None
Adjacent land use	Peat cutting (mechanical)
Grazing evidence (within relevé)	No evidence of grazing
Height Tree layer (cm)	1800
Height Shrub layer (cm)	500
Height Herb layer (cm)	120
Total Vegetation cover (%)	100
Tree cover (%)	80
Shrub cover (%)	20
Herb Grass cover (%)	75
Bryophyte cover (%)	100

Relevé Data	Relevé Number
	Relevé 17
Litter cover (%)	35
Rock cover (%)	0
Bare peat / soil cover (%)	0
Species Scientific Name	**Species Cover (Domin Scale)**
Betula pubescens	9
Corylus avellana	2
Crataegus monogyna	2
Dryopteris carthusiana	4
Hedera helix	4
Ilex aquifolium	4
Kindbergia praelonga	9
Molinia caerulea	+
Pleurocarpus moss - unidentified	5
Polytrichum commune	4
Pseudoscleropodium purum	4
Pteridium aquilinum	4
Rubus fruticosus agg.	5
Sorbus aucuparia	4
Vaccinium myrtillus	5

Table 5.17: Derryvaroge Peatland (a)

Derryvaroge Peatland (a)			
Survey Date: 26/06/2017	**Surveyors:** PF MCG	**Townland:** Derryvaroge	**Folio Number(s):** KE3960F, KE16790N, KE37399F, UNRKIL4, KE7623F, KE16790N, KE20273F
Figure: 52		**Grid Reference:** 679646, 734013	

Habitats Present: PB1/PB4, WN7/WS1, PB4/GS3, PF2	**Correspondence with Annex I:** None (see comments below)

Comments:
This area was noted to be a potential EU Habitats Directive Annex I raised bog, wet heath and poor fen and flush habitats.

Relevé 18: Area of cutover bog (PB4) with tall heather vegetation with scattered *Molinia* and abundant *pleurocarpus* moss cover.

Relevé 19: Bare peat areas between *Molinia* patches with dry algal material indicating that area is wetter in winter, possibly with surface water running off the adjacent industrial cutover bog (PB4).

Relevé 20: Dry heather dominated cutover peat bog (PB4). Small raised bog/cutover remnant. Face bank ecotope community throughout with scattered bracken.

Relevé 21: Small wet hollow area beside raised high, where there is secondary raised bog regeneration with *Sphagna*. Area is only 15x20m in extent. Regeneration is occurring on cutover bog (PB4). Remainder of area is degraded dry heather dominated cutover with little *Sphagnum* cover.

Relevé 22: Dry humid acid grassland community on reclaimed peat field. Substrate dry and firm. Horse grazed.

Relevé 23: Small wet grassland / fen depression in centre of larger field. Horse grazed, light grazing, with a few droppings near quadrat. Area is wet grassland in wet peaty depressions with some elements of wetter aquatic vegetation. Small disturbed poor fen area.

Biodiversity Value: Local importance (lower value)

Table 5.18: Derryvaroge Peatland Relevé Results

Relevé Data	Relevé Number					
	Relevé 18	Relevé 19	Relevé 20	Relevé 21	Relevé 22	Relevé 23
Easting (ITM)	679646	679928	680336	680318	680468	680446
Northing (ITM)	734013	733973	733860	733828	733880	733873
Size m^2	4	4	4	4	4	4
Slope (degrees)	Flat	Flat	Flat	Flat	Flat	None
Aspect	NA	NA	NA	NA	NA	NA
Substrate type	Peat	Peat	Peat	Peat	Peat	Peat
Substrate stability	Very Firm	Firm	Very Firm	Firm	Very Firm	Firm

Relevé Data	Relevé Number					
	Relevé 18	Relevé 19	Relevé 20	Relevé 21	Relevé 22	Relevé 23
Management	No evidence of grazing	No evidence of grazing	No evidence of grazing	No evidence of grazing	No evidence of grazing	Meadow – use unknown
Adjacent land use	Peat cutting (mechanical)	Peat cutting (mechanical)	Peat cutting (mechanical)	Peat cutting (mechanical)	Peat cutting (mechanical)	Peat cutting (mechanical)
Grazing evidence (within relevé)	None	None	None	None	None	Area grazed by horses
Height Tree layer cm	0	60	0	0	0	0
Height Shrub layer cm	95	60	100	35	0	0
Height Herb layer cm	75	60	100	40	35	75
Total Vegetation cover (%)	100	65	100	90	100	90
Tree cover (%)	0	<5	0	0	0	0
Shrub cover (%)	80	65	80	35	0	0
Herb Grass cover (%)	50	<5	5	60	100	90
Bryophyte cover (%)	90	5	95	65	80	60
Litter cover (%)	75	<5	10	30	0	0
Rock cover (%)	0	0	0	0	0	0
Algae Cover (%)	0	25	0	10	0	0
Bare peat / soil cover (%)	0	35	0	<5	0	10
Species Scientific Name	**Species Cover (Domin Scale)**					
Agrostis canina	-	-	-	-	5	-
Agrostis stolonifera	-	-	-	-	-	4
Alopecurus geniculatus	-	-	-	-	-	4
Anthoxanthum odoratum	-	-	-	-	5	-
Betula pubescens	1	3	-	-	-	
Calliergonella cuspidata	-	-	-	-	-	8
Calluna vulgaris	8	7	9	5	3	-
Campylopus introflexus	-	4	-	-	-	-
Carex demissa	-	-	-	-	-	2
Carex flacca	-	-	-	-	5	-
Carex nigra	-	-	-	-	-	4
Cerastium fontanum	-	-	-	-	-	-
Cirsium palustre	-	-	-	-	-	-
Cirsium sp.	-	-	-	-	3	-
Cladonia portentosa	3	4	4	4	-	-
Cynosurus cristatus	-	-	-	-	3	-
Dactylorhiza fuchsii	-	-	-	-	+	-
Dicranum scoparium	4	4	4	-	-	-
Dicranum sp,	-	-	-	3	-	-
Erica tetralix	4	3	2	4	-	1
Eriophorum angustifolium	+	4	-	4	-	-
Eriophorum vaginatum	-	3	-	6	-	-
Euphrasia sp.	-	-	-	-	4	-
Glyceria fluitans	-	-	-	-	-	3
Filipendula ulmaria	-	-	-	-	-	-
Festuca rubra	-	-	-	-	4	-
Galium palustre	-	-	-	-	-	-
Herbaceous sp. (possibly Veronica)	-	-	-	-	-	2
Holcus lanatus	-	-	-	-	3	1
Hydrocotyle vulgaris	-	-	-	-	-	6

Relevé Data	Relevé Number					
	Relevé 18	Relevé 19	Relevé 20	Relevé 21	Relevé 22	Relevé 23
Hypochaeris radicata	-	-	-	-	4	-
Hypnum jutlandicum	8	4	10	4	-	-
Juncus acutiflorus	-	-	-	-	-	-
Juncus bubosus	-	-	-	-	-	8
Juncus conglomeratus	-	-	-	-	-	-
Juncus effusus	-	-	-	-	-	5
Linum catharticum	-	-	-	-	3	-
Lolium perenne	-	-	-	-	-	-
Lotus corniculatus	-	-	-	-	5	-
Luzula multiflora	-	-	-	-	4	-
Lychnis flos-cuculi	-	-	-	-	-	-
Molinia caerulea	7	3	3	-	-	-
Odontoschisma sphagni	-	-	-	5	-	-
Pedicularis sylvatica	-	-	-	-	3	-
Peltigera canina	-	-	-	-	-	-
Plantago lanceolata	-	-	-	-	4	-
Platanthera chlorantha	-	-	-	-	+	-
Pleurocarpus moss – unidentified	-	-	-	-	-	-
Potentilla erecta	4	-	3	-	+	2
Prunella vulgaris	-	-	-	-	4	3
Pseudoscleropodium purum	7	-	-	-	-	-
Pteridium aquilinum	4	-	3	-	-	-
Ranunculus acris	-	-	-	-	-	-
Ranunculus flammula	-	-	-	-	-	5
Ranunculus repens	-	-	-	-	4	4
Rhynchospora alba	-	+	-	3	-	-
Rhytidiadelphus squarrosus	-	-	-	-	9	-
Rumex acetosa	-	-	-	-	-	-
Scorzoneroides autumnalis	-	-	-	-	3	4
Senecio aquaticus	-	-	-	-	-	-
Senecio jacobaea	-	-	-	-	3	-
Sphagnum capillifolium	-	-	-	4	-	-
Sphagnum cuspidatum	-	-	-	4	-	-
Sphagnum palustre	-	3	-	-	-	-
Sphagnum papillosum	-	3	-	6	-	-
Sphagnum subnitens	-	-	-	3	-	-
Stellaria sp.	-	-	-	-	-	-
Thuidium tamariscinum	-	-	1	-	-	-
Trichophorum cespitosum	+	+	-	2	-	-
Trifolium pratense	-	-	-	-	3	-
Trifolium repens	-	-	-	-	3	-

Table 5.19: Cushaling Peatland (a)

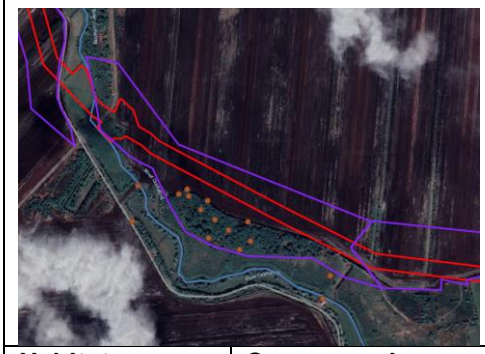
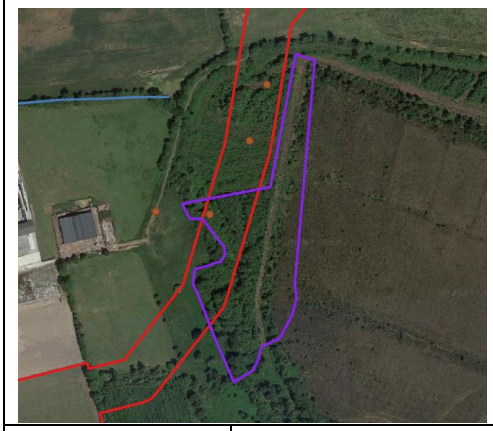
Cushaling Peatland (a)			
Survey Date: 27/06/2017	**Surveyors:** PF MCG	**Townland:** Cushaling	**Folio Number(s):** OY7769F, OY4020F, OY6795N, OY6901F, OY6320F
Figure: 46		**Grid Reference:** 679646, 734013	
			
Habitats Present: WN7		**Correspondence with Annex I:** None (see comments below)	
Comments: This area was noted to be a potential EU Habitats Directive Annex I bog woodland. **Relevé 24:** Bog woodland (WN7) on peat at edge of Bord na Móna industrial works. Ground with drainage features but peat not cut. Not Annex I bog woodland. Birch maximum diameter at breast height (dbh) of 25cm. Herb layer mainly brambles, ivy and bracken.			
Biodiversity Value: Local importance (lower value)			

Table 5.20: Cushaling Peatland (a) Relevé Results

Relevé Data	**Relevé Number**
	Relevé 24
Easting (ITM)	663945
Northing (ITM)	726469
Size m^2	4
Slope (degrees)	Flat
Aspect	NA
Substrate type	Peat
Substrate stability	Very Firm
Management	None
Adjacent land use	Peat cutting (mechanical)
Grazing evidence (within relevé)	No evidence of grazing
Height Tree layer (cm)	20
Height Shrub layer (cm)	800
Height Herb layer (cm)	150
Total Vegetation cover (%)	100
Tree cover (%)	80
Shrub cover (%)	35
Herb Grass cover (%)	85
Bryophyte cover (%)	85

Relevé Data	Relevé Number
	Relevé 24
Litter cover (%)	15
Rock cover (%)	0
Bare peat / soil cover (%)	0
Species Scientific Name	**Species Cover (Domin Scale)**
Alnus glutinosa	1
Betula pubescens	9
Crataegus monogyna	1
Dryopteris carthusiana	3
Fraxinus excelsior	1
Geranium robertianum	3
Hedera helix	8
Ilex aquifolium	5
Kindbergia praelonga	9
Lonicera periclymenum	3
Oxalis acetosella	3
Pteridium aquilinum	8
Rubus fruticosus agg.	8
Rubus idaeus	2
Salix cinerea subsp. oleifolia	1
Sambucus nigra	1
Sorbus aucuparia	3
Urtica dioica	3

Table 5.21: Drummond Woodland

<table>
<tr><th colspan="4">Drummond Woodland</th></tr>
<tr><td>Survey Date: 27/06/2017</td><td>Surveyors: PF MCG</td><td>Townland: Drummond</td><td>Folio Number(s): KE16790N, KE1901N</td></tr>
<tr><td colspan="2">Figure: 49</td><td colspan="2">Grid Reference: 672086, 730597</td></tr>
<tr><td colspan="2" rowspan="2">  </td><td colspan="2">  </td></tr>
<tr><td>Habitats Present: WN7</td><td>Correspondence with Annex I: None (see comments below)</td></tr>
<tr><td colspan="4">Comments:
This area was noted to be a potential EU Habitats Directive Annex I bog woodland habitat.

Relevé 25: Bog woodland (WN7) east of Monaghan Mushrooms factory. Birch to 9m, not Annex I bog woodland. Birch woodland appears to have developed on area that was formerly planted with conifers (Pinus sp.). Numerous standing dead conifers exists with birch woodland. Herb layer mainly Dryopteris and Pteridium.</td></tr>
<tr><td colspan="4">Biodiversity Value: Local importance (lower value)</td></tr>
</table>

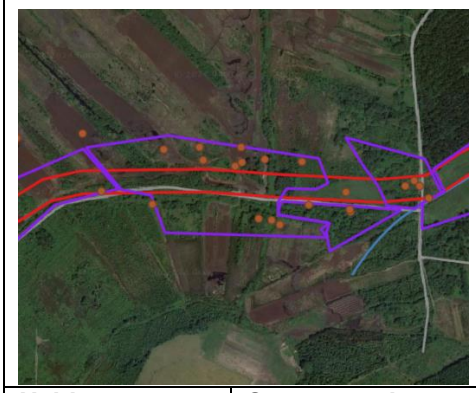
Table 5.22: Drummond Woodland Relevé Results

Relevé Data	Relevé Number Relevé 25
Easting (ITM)	672086
Northing (ITM)	730597
Size m^2	4
Slope (degrees)	Flat
Aspect	NA
Substrate type	Peat
Substrate stability	Very Firm
Management	None
Adjacent land use	Grazing - sheep
Grazing evidence (within relevé)	No evidence of grazing
Height Tree layer (cm)	800
Height Shrub layer (cm)	0
Height Herb layer (cm)	80
Total Vegetation cover (%)	100
Tree cover (%)	85
Shrub cover (%)	0

Relevé Data	Relevé Number
	Relevé 25
Herb Grass cover (%)	85
Bryophyte cover (%)	25
Litter cover (%)	100
Rock cover (%)	0
Bare peat / soil cover (%)	0
Species Scientific Name	**Species Cover (Domin Scale)**
Betula pubescens	9
Dryopteris affinis	1
Dryopteris carthusiana	9
Kindbergia praelonga	6
Pinus cordata	+
Pteridium aquilinum	6
Rubus fruticosus agg.	1

Table 5.23: Timahoe East Scrub, Timahoe East Woodland and Timahoe East Peatland and Grassland (b)

Timahoe East Scrub, Timahoe East Woodland and Timahoe East Peatland and Grassland (b)			
Survey Date: 28/06/2017	**Surveyors:** PF MCG	**Townland:** Timahoe East	**Folio Number(s):** KE10599N, KE12360N, KE8392N, KE4566F, KE4050F, KE9681N, KE3960F, KE7742N, KE16790N
Figure: 51		**Grid Reference:** 677478, 733431	



Habitats Present: WN7, PB4	**Correspondence with Annex I:** None (see comments below)

Comments:
This area was noted to be a potential EU Habitats Directive Annex I bog woodland habitat.

Relevé 27 (Timahoe East Scrub): Regenerating woodland on reclaimed cutover which was probably covered by rough grassland in the past. Due to lack of grazing the area is reverting to birch scrub/woodland.

Relevé 28 (Timahoe East Woodland): Hazel woodland on ridge beside large drain/channel. Linear woodland patch on mineral soil ridge beside 8m deep, 15m wide channel. Soil mound possibly created when this drain created in the past. Herb layer mainly composed of ivy.

Relevé 29 (Timahoe East Peatland and Grassland (b)): Birch bog woodland (WN7) area on drained peat at edge of bog. Not Annex I bog woodland. Herb layer mainly brambles, ivy and bracken.

The habitat present on site does not correspond to EU habitat type.

Biodiversity Value: Local importance (lower value)

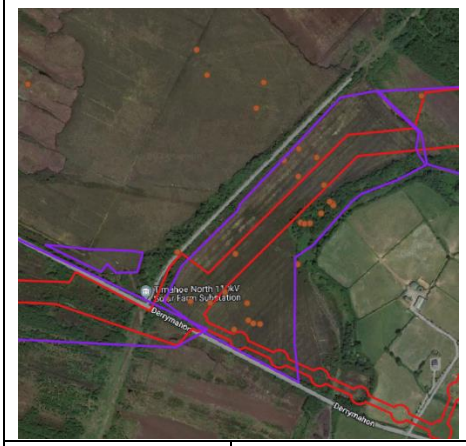
Table 5.24: Timahoe East Scrub, Timahoe East Woodland and Timahoe East Peatland and Grassland (b) Relevé Results

Relevé Data	Relevé Number		
	Relevé 27	Relevé 28	Relevé 29
Easting (ITM)	677212	677070	676865
Northing (ITM)	733560	733498	733474
Size m^2	4	4	4
Slope (degrees)	Flat	5	NA
Aspect	NA	South	NA
Substrate type	Peat	Peat	Peat
Substrate stability	Firm	Very Firm	Very Firm
Management	No evidence of grazing	No evidence of grazing	No evidence of grazing
Adjacent land use	Grazing - Cattle	Grazing - Cattle	Peat cutting - mechanical
Grazing evidence (within relevé)	None	None	None
Height Tree layer cm	800	800	1200
Height Shrub layer cm	0	200	400

Relevé Data	Relevé Number		
	Relevé 27	Relevé 28	Relevé 29
Height Herb layer cm	150	10	100
Total Vegetation cover (%)	100	100	100
Tree cover (%)	75	95	95
Shrub cover (%)	0	25	15
Herb Grass cover (%)	100	100	75
Bryophyte cover (%)	5	20	20
Litter cover (%)	5	50	100
Rock cover (%)	0	0	0
Algae Cover (%)	0	0	0
Bare peat / soil cover (%)	0	0	0
Species Scientific Name	**Species Cover (Domin Scale)**		
Asplenium scolopendrium	-	1	-
Agrostis stolonifera	5	-	-
Angelica sylvestris	1	-	-
Anthoxanthum odoratum	4	-	-
Betula pubescens	8	-	10
Brachythecium sp.	-	4	-
Calluna vulgaris	1	-	-
Corylus avellana	-	10	-
Crataegus monogyna	-	2	-
Dryopteris affinis	-	1	-
Dryopteris carthusiana	-	-	4
Filipendula ulmaria	-	2	-
Fraxinus excelsior	-	+	-
Galium saxatile	1	-	-
Grass unidentified	-	1	-
Hedera helix	-	10	7
Heracleum sphondylium	-	1	-
Holcus lanatus	5	-	-
Juncus effusus	6	-	-
Kindbergia praelonga	-	5	-
Lonicera periclymenum	-	-	5
Molinia caerulea	4	-	4
Pleurocarpus moss – unidentified	-	-	5
Potentilla erecta	6	-	-
Prunus spinosa	-	2	-
Pteridium aquilinum	6	-	5
Rubus fruticosus agg.	5	2	7
Salix cinerea subsp. oleifolia	5	-	4
Sambucus nigra	-	3	-
Stellaria holostea	3	-	-
Vaccinium myrtillus	-	-	4
Valeriana officinalis	2	-	-
Viola riviniana	-	1	-

Table 5.25: Timahoe East Peatland and Woodland

Timahoe East Peatland and Woodland			
Survey Date: 29/06/2017	**Surveyors:** PF MCG	**Townland:** Timahoe East	**Folio Number(s):**
Figure: 50		**Grid Reference:** 675379, 733230	



Habitats Present: PB1, WN7	**Correspondence with Annex I:** None (see comments below)

Comments:
This area was noted to be a potential EU Habitats Directive Annex I bog woodland habitat.

Relevé 31: Drained intact bog at Timahoe North, previously surveyed in 2016. This is within the pipeline route. The bog is all marginal ecotope. Not Annex I raised bog habitat. Many eroded bare peat areas with *Campylopus introflexus* present. Area burned 5 years ago approximately Bog shows distinct slope towards south-east.

Relevé 32: Pre-drained degraded raised bog (PB1) in east of site which remained unburned in fire that affected the western part of bog.

Relevé 33: Mature birch woodland on peat at edge of degraded raised bog, and adjacent to GA1. Dry under foot. Not Annex I bog woodland. Herb layer mainly brambles, bracken and *Dryopteris*.

The habitat present on site does not correspond to EU habitat type.

Biodiversity Value: Local importance (lower value)

Table 5.26: Timahoe East Peatland and Woodland Relevé Results

Relevé Data	Relevé Number		
	Relevé 31	Relevé 32	Relevé 33
Easting (ITM)	675055	675219	675379
Northing (ITM)	733003	732944	733230
Size m^2	4	4	4
Slope (degrees)	<5	<5	Flat
Aspect	South-east	South-east	NA
Substrate type	Peat	Peat	Peat
Substrate stability	Very Firm	Firm	Firm
Management	No evidence of grazing	No evidence of grazing	No evidence of grazing
Adjacent land use	Peat cutting - mechanical	Peat cutting - mechanical	None

Relevé Data	Relevé Number		
	Relevé 31	Relevé 32	Relevé 33
Grazing evidence (within relevé)	No evidence of grazing	None	None
Height Tree layer cm	0	0	10000
Height Shrub layer cm	30	45	4000-5000
Height Herb layer cm	35	40	80
Total Vegetation cover (%)	80	95	100
Tree cover (%)	0	0	90
Shrub cover (%)	70	95	10
Herb Grass cover (%)	50	5	70
Bryophyte cover (%)	45	75	80
Litter cover (%)	0	5	60
Rock cover (%)	0	0	0
Algae Cover (%)	0	0	0
Bare peat / soil cover (%)	20	5	0
Species Scientific Name	**Species Cover (Domin Scale)**		
Betula pubescens	-	-	9
Brachythecium rutabulum	-	-	4
Calluna vulgaris	6	10	-
Campylopus introflexus	7	4	-
Cladonia portentosa	1	1	-
Climacium dendroides	-	-	4
Drosera rotundifolia	1	-	-
Dryopteris carthusiana	-	-	4
Erica tetralix	6	5	-
Eriophorum angustifolium	4	4	-
Eriophorum vaginatum	4	4	-
Foliose lichens	1	-	-
Hedera helix	-	-	3
Hypnum jutlandicum	4	5	-
Hypnum sp.	-	-	3
Liverwort sp	-	-	3
Lonicera periclymenum	-	-	4
Luzula pilosa	-	-	+
Narthecium ossifragum	1	-	-
Odontoschisma sphagni	-	3	-
Prunus spinosa	-	-	+
Pteridium aquilinum	-	-	5
Rubus fruticosus agg.	-	-	6
Sorbus aucuparia	-	-	4
Sphagnum capillifolium	2	4	-
Sphagnum subnitens	-	3	-
Thuidium tamariscinum	-	-	7
Trichophorum cespitosum	7	1	-

Table 5.27: Cushaling Bog Woodland

Cushaling Bog Woodland			
Survey Date: 27/06/2017	**Surveyors:** PF MCG	**Townland:** Cushaling	**Folio Number(s):** OY18096N
Figure: 46		**Grid Reference:** 666447, 726577	

Habitats Present: WN7	**Correspondence with Annex I:** None (see comments below)

Comments:
This area was noted to be a potential EU Habitats Directive Annex I bog woodland habitat.

There was no available access into this site due to the presence of a bull in the folio to the south and a deep drainage ditch along the western boundary. Birch woodland beyond marginal drainage ditch with bracken and bramble understory. Trees standing at 12m, occasional rowan and holly throughout. Not Annex I habitat.

Biodiversity Value: Local importance (lower value)

Annex D – Results of Non-Annex I Habitats 2018

Table 5.28: Kilmastulla Woodland

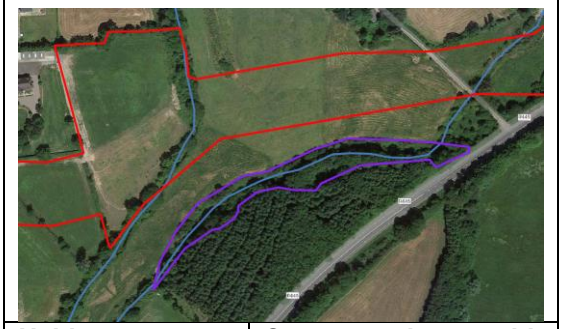
<table>
<tr><th colspan="4">Kilmastulla Woodland</th></tr>
<tr><td>Survey Date: 13/08/2018</td><td>Surveyors: PF and MCG</td><td>Townland: Kilmastulla</td><td>Folio Number(s): TY36770F, TY31145N</td></tr>
<tr><td colspan="2">Figure: 7</td><td colspan="2">Grid Reference: 573235, 670339</td></tr>
<tr><td colspan="2" rowspan="2">  </td><td colspan="2">  </td></tr>
<tr><td>Habitats Present: WS1, WD4, WD1</td><td>Correspondence with Annex I: None (see comments below)</td></tr>
<tr><td colspan="4">Comments:
Narrow band of mixed broadleaved woodland (WD1) bordering conifer plantation (WD4). Mixed deciduous woodland is on a steep bank, sloping northwards towards riverbank. Species present are Ash (Fraxinus excelsior), Lime (Tillia sp.), and Grey Willow (Salix cinerea). Given the slope, dry ground conditions, and species composition, this habitat is not alluvial woodland and has no link to Annex I habitats. On the northern bank of the river there is a 2-5m wide area of scrub (WS1) demarcated by electric fencing. This area of scrub is dominated by Gorse and Willow to maximum height of 4m.</td></tr>
<tr><td colspan="4">Biodiversity Value: Local importance (lower value)</td></tr>
</table>

Table 5.29: Boher Grassland

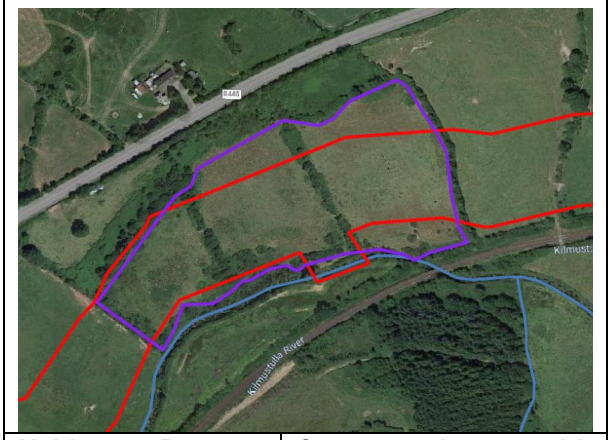
Boher Grassland			
Survey Date: 13/08/2018	**Surveyors:** PF and MCG	**Townland:** Boher	**Folio Number(s):** TY32422N
Figure: 7		**Grid Reference:** 574786, 671005	
			
Habitats Present: GA1, GS1, GS4		**Correspondence with Annex I:** None (see comments below)	
Comments: The majority of this parcel is comprised of grazed GA1 going over to GS1 in places. There is a small area of species poor GS4 present in the south-west of the site on a flat area of land between two sloping sections. The common species present in this area of GS4 include soft rush (*Juncus effusus*), silverweed (*Potentilla anserina*), yorkshire fog (*Holcus lanatus*), yellow iris (*Iris pseudacorus)*, and bent grass (*Agrostis stolonifera*). The poor species diversity and absence of *cirsium dissectum* and other *Molinia* grassland indicator species confirm no links to Annex habitats.			
Biodiversity Value: Local importance (lower value)			

Table 5.30: Boher/Ballinteenoe Woodland

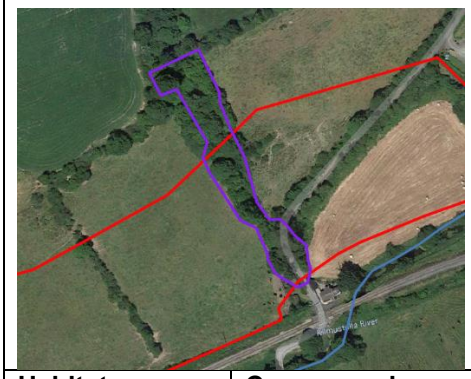
Boher/Ballinteenoe Woodland			
Survey Date: 13/08/2018	**Surveyors:** PF and MCG	**Townland:** Boher/Ballinteenoe	**Folio Number(s):** TY31161N
Figure: 7		**Grid Reference:** 575391, 671167	
			
Habitats Present: WD1, WL2		**Correspondence with Annex I:** None (see comments below)	
Comments: The northern part of the parcel is comprised of WD1 with tree height >10m. Species present include sycamore (*Acer pseudoplatanus*) and ash (*Fraxinus excelsior*), with a lower understory comprising hazel (*Corylus avellana*), grey willow (*Salix cinerea*), and hawthorn (*Crataegus monogyna).* A treeline (WL1) overhanging the river makes up the southern part of the parcel. Trees present include hazel (8m) and sycamore (8m), ash saplings and hawthorn. Given the species composition and habitat conditions present, there are no links with Annex I habitats.			
Biodiversity Value: Local importance (lower value)			

Table 5.31: Gortmore Grassland

<table>
<tr><th colspan="4">Gortmore Grassland</th></tr>
<tr><td>Survey Date: 13/08/2018</td><td>Surveyors: PF and MCG</td><td>Townland: Gortmore</td><td>Folio Number(s): TY15847F</td></tr>
<tr><td colspan="2">Figure: 9</td><td colspan="2">Grid Reference: 579432, 673222</td></tr>
<tr><td colspan="2">  </td><td colspan="2">  </td></tr>
<tr><td colspan="2"></td><td>Habitats Present: GA1</td><td>Correspondence with Annex I: None (see comments below)</td></tr>
<tr><td colspan="4">Comments:
This parcel comprises a GA1 field dominated by perennial rye grass (Lolium perenne) that has recently been cut for silage. There are no links with Annex I habitats.</td></tr>
<tr><td colspan="4">Biodiversity Value: Local importance (lower value)</td></tr>
</table>

Table 5.32: Kilcoman/Clareen Grassland

Kilcoman/Clareen Grassland			
Survey Date: 13/08/2018	**Surveyors:** PF and MCG	**Townland:** Kilcoman/Clareen	**Folio Number(s):** TY9123N
Figure: 11		**Grid Reference:** 582674, 678060	

Habitats Present: GA1, GS4, GS1, WL1, WL2, WS1	**Correspondence with Annex I:** None (see comments below)

Comments:
The northern field comprises GA1 which is dominated by perennial rye grass (*Lolium perenne*). Hedgerows (WL1) of low ecological value border this field and are comprised of hawthorn (*Crataegus monogyna*), blackthorn (*Prunus spinosa*), and ash (*Fraxinus excelsior*). The middle field is cattle grazed and dominated by species poor GS4, with commonly occurring soft rush (*Juncus effusus*). There is a small area of GS1 present where *Juncus* becomes infrequent. There are mature treelines (WL2) bordering this field comprising ash (*Fraxinus excelsior*), sycamore (*Acer pseudoplatanus*), beech (*Fagus sylvatica*) and birch (*Betula pubescens*). The southern-most field is comprised of a mosaic of GA1 and GS1 to the west, while the eastern section is comprised solely of GS1 with invading gorse (*Ulex europaeus*) scrub (WS1). This section appears to have been abandoned for some time. The very southern section of the field is comprised of rank GS4, which is unmanaged and ungrazed. Species present include meadowsweet (*Filipendula ulmaria*), bindweed (*Calystegia* sp.), bramble (*Rubus fruticosus* agg.), wild angelica (*Angelica sylvestris*), great willowherb (*Epilobium hirsutum*), false oat grass (*Arrhenatherum elatius*), hard rush (*Juncus inflexus*), bracken (*Pteridium aquilinum*) tufted vetch (*Vicia cracca*). Given the species composition and the habitats present there are no potential links to Annex I habitats.

Biodiversity Value: Local importance (higher value)

Table 5.33: Tullamore/Beleen Lower Hedgerow

Tullamore/Beleen Lower Hedgerow			
Survey Date: 13/08/2018	**Surveyors:** PF and MCG	**Townland:** Tullamore/Beleen Lower	**Folio Number(s):** TY26076N
Figure: 11		**Grid Reference:** 583390, 680007	

Habitats Present: WL1	**Correspondence with Annex I:** None (see comments below)

Comments:
This area is comprised of a mature hedgerow, with no gaps, on an earthbank which slopes dramatically down to Ardgregane river. The hedgerow is of moderate to high biodiversity value. Species present include oak (*Quercus* sp.), hawthorn (*Crataegus monogyna*), blackthorn (*Prunus spinosa*), dog rose (*Rosa canina*), gorse (*Ulex europaeus*), holly (*Ilex aquifolium*), ivy (*Hedera helix*), hazel (*Corylus avellana*), beech (*Fagus sylvatica*), guelder rose (*Viburnum opulus*), and spindle (*Euonymus europaeus*). There are oak, beech and birch (*Betula pubescens*) standards present at 18-20m high. Both banks are similar in structure and species composition. In is extremely unlikely that this hedgerow floods. The tree species present, in addition to the composition of the ground layer, indicate no links to Annex I habitats.

Biodiversity Value: Local importance (higher value)

Table 5.34: Ballyhimkin Treeline

Ballyhimkin Treeline			
Survey Date: 14/08/2018	**Surveyors:** PF and MCG	**Townland:** Ballyhimkin	**Folio Number(s):** TY10871N
Figure: 12		**Grid Reference:** 584695,682438	

Habitats Present: WL2	**Correspondence with Annex I:** None (see comments below)

Comments:
This parcel comprises a single line of trees along the Nenagh river bank and a small pocket of planted WD1 in the east. The WD1 area is comprised of oak (*Quercus* sp.), alder (*Alnus glutinosa*), and crack willow (*Salix fragilis*). Grassland species are present in the ground layer, with occasional common reeds (*Phalaris australis*) in a slightly wet hollow. Standards are present with intervening hedgerow vegetation. Species present in the treeline (WL2) along the riverbank are ash (*Fraxinus excelsior*), alder (*Alnus glutinosa*), sycamore (*Acer pseudoplatanus*), crack willow, goat willow (*Salix caprea*), ivy (*Hedera helix*), hawthorn (*Crataegus monogyna*), dog rose (*Rosa canina*), and blackthorn (*Prunus spinosa*). The ground layer is dominated by bramble (*Rubus fruticosus* agg.), with great willowherb (*Epilobium hirsutum*), occasional Common Reed, and Hemlock Water Dropwort (*Oenanthe crocata*). This area is comprised of a treeline on a riverbank approximately 2m above the river, with intervening hedgerow vegetation and does not constitute Annex I riparian woodland.

Biodiversity Value: Local importance (lower value)

Table 5.35: Grasslands Near Lough Ourna

Grasslands Near Lough Ourna			
Survey Date: NA	**Surveyors:** NA	**Townland:** Loughourna	**Folio Number(s):** TY18417N
Figure: 13		**Grid Reference:** 586426, 684766	
			
Habitats Present: NA		**Correspondence with Annex I:** NA	
Comments: No access possible, not surveyed in 2018.			
Biodiversity Value: Not assessed			

Table 5.36: Drumroe Spring

Drumroe Spring			
Survey Date: 14/08/2018	**Surveyors:** PF and MCG	**Townland:** Drumroe	**Folio Number(s):** TY10327N
Figure: 16		**Grid Reference:** 592846, 689342	
			
		Habitats Present: FP1	**Correspondence with Annex I:** None (see comments below)
Comments: This spring was previously surveyed by Patrick Crushell in 2017. It comprises a calcareous spring rising in a pool which is approximately 1.5m deep and 4m in diameter. The water is clear and there is a stony substrate, with a continuous discharge of water bubbling from the base of the pool and discharging via a watercourse to the west. There is 30% cover of watercress (*Narsturtium officinale*). This spring is not *Tufa* forming and therefore does not correspond to any Annex I habitats.			
Biodiversity Value: Local importance (higher value)			

Table 5.37: Eminiska Spring

Eminiska Spring			
Survey Date: 14/08/2018	**Surveyors:** PF and MCG	**Townland:** Eminiska	**Folio Number(s):** TY22863N
Figure: 16		**Grid Reference:** 594023, 689328	

Habitats Present: FP1	**Correspondence with Annex I:** None (see comments below)

Comments:
Calcareous spring area, but not *Tufa* forming. The spring was dry at the time of the 2018 survey. Dominant species present were water mint (*Mentha aquatica*), creeping bent (*Agrostis stolonifera*), creeping buttercup (*Ranunculus repens*), water cress (*Nasturtium officinale*), brooklime (*Veronica beccabunga*), and great willowherb (*Epilobium hirsutum*). This is a calcareous spring area, but not *Tufa* forming. No links to Annex I habitats.

Biodiversity Value: Local importance (higher value)

Table 5.38: Knockanacree Woodland

Knockanacree Woodland			
Survey Date: NA	**Surveyors:** NA	**Townland:** Knockanacree	**Folio Number(s):** TY29103N
Figure: 17		**Grid Reference:** 596690, 689854	

Habitats Present: WD1, WD2 (based on previously collected data)	**Correspondence with Annex I:** None (see comments below)
Comments: No access TY29103N. Not possible to access via TY20044N, so not possible to survey polygon. Based on previously collected data and aerial imagery interpretation this area is likely to comprise mixed broadleaved woodland (WD1) and mixed broadleaved conifer woodland (WD2). Neither of these habitats have any potential links to Annex I habitats.	
Biodiversity Value: Likely to be Local importance (lower value) (*based on review of available data and analysis of aerial imagery*)	

Table 5.39: Knockanacree Scrub

Knockanacree Scrub			
Survey Date: 14/08/2018	**Surveyors:** PF and MCG	**Townland:** Knockanacree	**Folio Number(s):** TY20048N
Figure: 17		**Grid Reference:** 597200, 689842	
			
		Habitats Present: WS1, WD1	**Correspondence with Annex I:** None (see comments below)
Comments: The smaller parcel in the north is comprised entirely of dense WS1 and is as described in the 2017 survey. The larger parcel in the south is mostly comprised of scrub (WS1), but there are five or six taller trees over 5m high present. These trees are ash (*Fraxinus excelsior*) and birch (*Betula pubescens*), indicating the development of WD1. Scrub comprises 70% of this parcel. No links to Annex I habitats.			
Biodiversity Value: Local importance (higher value)			

Table 5.40: Newtown Woodland

Newtown Woodland			
Survey Date: 14/08/2018	**Surveyors:** PF and MCG	**Townland:** Newtown (Guest)	**Folio Number(s):** TY24359N
Figure: 18		**Grid Reference:** 600241, 690212	
			
Habitats Present: WD1, WL2		**Correspondence with Annex I:** None (see comments below)	
Comments: This parcel comprises an area of WD1 surrounded by a treeline (WL2) containing ash (*Fraxinus excelsior*), hawthorn (*Crataegus monogyna*), and elderberry (*Sambucus nigra*). The understory of the WD1 area is dominated by bramble (*Rubus fruticosus* agg.), with ash saplings, occasional lords and ladies (*Arum maculatum*), ground ivy (*Glechoma hederacea*) and hogweed (*Heracleum sphondylium*). All oak trees present are planted in rows. They are 6-7 m high, and the majority have creeping ivy (*Hedera helix*) growing on them. The fact that this woodland has been planted, in addition to the lack of any developed native ground flora indicate that this is WD1, with no correspondence to Annex I habitats.			
Biodiversity Value: Local importance (lower value)			

Table 5.41: Behamore Woodland

Behamore Woodland			
Survey Date: 14/08/2018	**Surveyors:** PF and MCG	**Townland:** Behamore (Hawkshaw)	**Folio Number(s):** TY27130N
Figure: 18		**Grid Reference:** 600676, 690712	

Habitats Present:	**Correspondence with Annex I:**
WN7	None (see comments below)

Comments:
This is an area of birch (*Betula pubescens*) woodland on peat. There are no beech (*Fagus sylvatica*) trees present. The understory is dominated by bramble (*Rubus fruticosus* agg.) at the edge and bracken (*Pteridium aquilinum*) in the central area. Other species centre in the central part of the parcel include holly (*Ilex aquifolium*), wood fern (*Dryopteris* sp.), honeysuckle (*Lonicera periclymenum)*, fern moss (*Thuidium* sp.), dog rose (*Rosa canina*), grey willow (*Salix cinerea*), and elderberry (*Sambucus nigra*). There is no *Sphagnum* moss present in the understory. This absence of *Sphagnum* and the floral species composition present in the area confirm that this is not Annex I bog woodland.

Biodiversity Value: Local importance (higher value)

Table 5.42: Toora Grassland

Toora Grassland			
Survey Date: 14/08/2018	**Surveyors:** PF and MCG	**Townland:** Toora	**Folio Number(s):** OY27516F
Figure: 19		**Grid Reference:** 601352, 692206	
			
Habitats Present: GA1, FW4		**Correspondence with Annex I:** None (see comments below)	
Comments: This parcel comprises improved grassland fields (GA1) dominated by perennial rye grass (*Lolium perenne*). There are no rushes or any wet grassland species present at this site. A drainage ditch runs along the south-western boundary of the parcel and has abundant common reed (*Phragmites australis),* branched bur-reed (*Sparganium erectum*), and great willowherb (*Epilobium hirsutum*). No links to Annex I habitats.			
Biodiversity Value: Local importance (lower value)			

Table 5.43: Booveen Grassland

Boveen Grassland			
Survey Date: 15/08/2018	**Surveyors:** PF and MCG	**Townland:** Boveen	**Folio Number(s):** OY14423N
Figure: 21		**Grid Reference:** 607479, 696171	
			
		Habitats Present: GS2	**Correspondence with Annex I:** None (see comments below)
Comments: This parcel is a dried-out farm pond which is now dominated by dry meadow and grassy verges (GS2) vegetation. Commonly occurring species are creeping buttercup (*Ranunculus repens*), creeping bent grass (*Agrostis stolonifera*), great willowherb (*Epilobium hirsutum*), hard rush (*Juncus inflexus*), soft rush (*Juncus effusus*), curled dock (*Rumex crispus*), silverweed (*Potentilla anserina*), yorkshire fog (*Holcus lanatus*), common mouse-ear (*Cerastium fontanum*) and scattered rusty willow (*Salix cinerea* subsp. *oleifolia*) saplings to 1.5m. This area of GS2 is of limited biodiversity value. The area has dried out considerably. The dry nature of the site and the species composition present mean that there is no correspondence to Annex I habitats.			
Biodiversity Value: Local importance (higher value)			

Table 5.44: Rathmore Spring

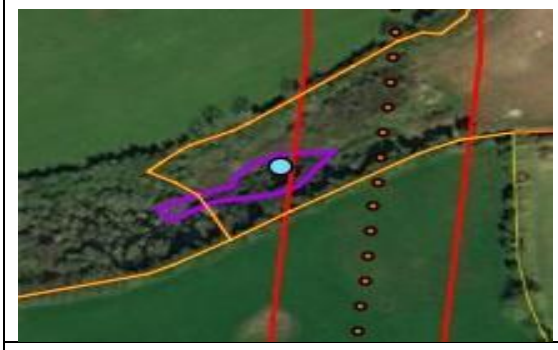
Rathmore Spring			
Survey Date: NA	**Surveyors:** NA	**Townland:** Rathmore	**Folio Number(s):** OY7549F
Figure: 22		**Grid Reference:** 608665, 697789	
			
		Habitats Present: FL8	**Correspondence with Annex I:** None (see comments below)
Comments: Not possible to survey. Folio missing from access sheets and maps. According to previously collected survey data a small stream (FL8) enters a natural depression with no outflow. John Cross has confirmed that this is not a turlough and so there are no links to Annex I habitats.			
Biodiversity Value: Not assessed			

Table 5.45: Kilmaine Grassland

Kilmaine Grassland			
Survey Date: 15/08/2018	**Surveyors:** PF and MCG	**Townland:** Kilmaine	**Folio Number(s):** OY12042F
Figure: 25		**Grid Reference:** 613226, 703665	
			
Habitats Present: GA1		**Correspondence with Annex I:** None (see comments below)	
Comments: This area comprises an improved grassland (GA1) field with scattered docks (*Rumex* sp.) and one or two patches of rushes (*Juncus* sp.). This field has been improved and is dominated by perennial rye grass (*Lolium perenne*). Access permission was not obtained for this parcel so it was viewed from the road. No links to Annex I habitats.			
Biodiversity Value: Local importance (lower value)			

Table 5.46: Breaghmore Treeline

Breaghmore Treeline			
Survey Date: 15/08/2018	**Surveyors:** PF and MCG	**Townland:** Breaghmore	**Folio Number(s):** OY12042F
Figure: 25		**Grid Reference:** 614200, 704353	

Habitats Present: WL2	**Correspondence with Annex I:** None (see comments below)

Comments:
This area comprises a treeline (WL2) on either side of the riverbank. Species present closest to the river are alder (*Alnus glutinosa*), sycamore (*Acer pseudoplatanus*), ash (*Fraxinus excelsior*), hogweed (*Heracleum sphondylium*), ivy (*Hedera helix*), hart's-tongue fern (*Phyllitis scolopendrium*), wood false-brome (*Brachypodium sylvaticum*). At the top of the bank, the key species present are hawthorn (*Crataegus monogyna*), blackthorn (*Prunus spinosa*), ivy, lords and ladies (*Arum maculatum*), cocksfoot (*Dactylis glomerata*), holly (*Ilex aquilinum*), ash (*Fraxinus excelsior*), bramble (*Rubus fruticosus* agg.), and sycamore. The species composition does not indicate riparian woodland. These trees are not regularly flooded and do not comprise the correct species composition for Alluvial woodland, 91EO. No links to Annex I habitats.

Biodiversity Value: Local importance (higher value)

Table 5.47: Breaghmore Grassland

Breaghmore Grassland			
Survey Date: NA	**Surveyors:** NA	**Townland:** Breaghmore	**Folio Number(s):** OY24666F
Figure: 25		**Grid Reference:** 614556, 705241	
			
Habitats Present: GA1, GS4		**Correspondence with Annex I:** None (see comments below)	
Comments: It was not possible to access this site as there was no access to OY16384F and not possible to access from the south or from the north. From the aerial imagery it appears that the northern part of the polygon is GS4 as described, while the southern part appears to be improved GA1. Site unlikely to have links to Annex I habitats.			
Biodiversity Value: Not assessed			

Table 5.48: Cloghanmore Woodland

Cloghanmore Woodland			
Survey Date: 15/08/2018	**Surveyors:** PF and MCG	**Townland:** Cloghanmore	**Folio Number(s):** OY12042F
Figure: 25		**Grid Reference:** 614602, 705662	

Habitats Present: WL1/WN2	**Correspondence with Annex I:** None (see comments below)

Comments:
This area most closely corresponds to WL1 transitioning to ash (*Fraxinus excelsior*) woodland WN2. The raised bank on either side of the river includes numerous hedgerow species with frequent ash (5-15m). The most commonly occurring species are hawthorn (*Crataegus monogyna*), gorse (*Ulex europaeus*), sycamore (*Acer pseudoplatanus*), holly (*Ilex aquilinum*), elderberry (*Sambucus nigra*), rusty willow (*Salix cinerea* subsp. *oleifolia*), ivy (*Hedera helix*), and traveller's joy (*Clematis vitalba*). Alder (*Alnus glutinosa*) is present (to 8m), but confined to the immediate river bank. The ground layer includes brambles (*Rubus fruticosus* agg.), greater willowherb (*Epilobium hirsutum*), pendulous sedge (*Carex pendula*), wood avens (*Geum urbanum*), dog rose (*Rosa canina*), hogweed (*Heracleum sphondylium),* and wood false-brome (*Brachypodium sylvaticum*). This area is missing a typical riparian woodland understory with species that are associated with flooding, and due to the height of the bank above the river it is highly unlikely that this area floods. This area should be classified as WN2/WL1. The species composition and lack of flooding mean that there is no correspondence with Annex I Alluvial woodland, 91EO.

Biodiversity Value: Local importance (higher value)

Table 5.49: Annamore and Annabeg Bog

Annamore and Annabeg Bog			
Survey Date: NA	**Surveyors:** NA	**Townland:** Money/Annaghmore and Annabeg	**Folio Number(s):** OY1329N
Figure: 31		**Grid Reference:** 618775, 710467	
			
Habitats Present: PB4		**Correspondence with Annex I:** None (see comments below)	
Comments: No access, not possible to survey. Large machinery actively working on this industrial peatland site during the 2018 survey. Site unlikely to have links to Annex I habitats, due to peat extraction activity and associated functional industrial drainage network.			
Biodiversity Value: Not assessed			

Table 5.50: Ballynacarrig Grassland

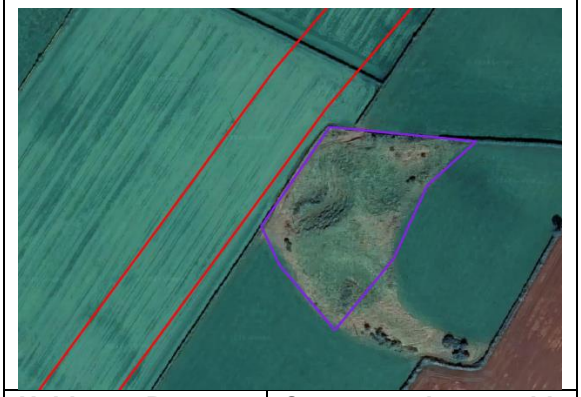
Ballynacarrig Grassland			
Survey Date: 16/08/2018	**Surveyors:** PF and MCG	**Townland:** Ballynacarrig	**Folio Number(s):** OY5136N
Figure: 32		**Grid Reference:** 623185, 713208	
			
Habitats Present: GS1		**Correspondence with Annex I:** None (see comments below)	
Comments: This parcel comprises GS1 on a sandy mound that appears to have been fertilised, as there is a high abundance of nettles and other species which indicate enrichment. There is a lack of species diversity and no orchids were recorded. Species that were present are yarrow (*Achillea millefolium*), cocksfoot (*Dactylis glomerata*), sweet vernal-grass (*Anthoxanthum odoratum*), yorkshire fog (*Holcus lanatus),* red fescue (*Festuca rubra*), lady's bedstraw (*Gallium verum*), common bent (*Agrostis capillaris*), wall speedwell (*Veronica chamaedrys*), white clover (*Trifolium repens*), red clover (*Trifolium pratense*), and ribwort plantain (*Plantago lanceolata*). This area is of low to moderate biodiversity value, with no correspondence to Annex I habitats.			
Biodiversity Value: Local importance (lower value)			

Table 5.51: Ballynacarrig/Derries Woodland

Ballynacarrig/Derries Woodland			
Survey Date: 16/08/2018	**Surveyors:** PF and MCG	**Townland:** Ballynacarrig/Derries	**Folio Number(s):** OY5136N
Figure: 32		**Grid Reference:** 623493, 713504	
			
Habitats Present: WD1		**Correspondence with Annex I:** None (see comments below)	
Comments: This area comprises a 5-10m wide zone of mixed broadleaved woodland (WD1) present on either side of a riverbank. There are no conifers present, so this area is not WD2. Tree species recorded are sycamore (*Acer pseudoplatanus*), ash (*Fraxinus excelsior*), hawthorn (*Crataegus monogyna*), grey willow (*Salix caprea*), Hazel (*Corylus avellana*), Birch (*Betula pubescens*), Ivy (*Hedera helix*), Brambles (*Rubus fruticosus* agg.), alder (*Alnus glutinosa*), elder (*Sambucus nigra*), elm (*Ulmus procera*). There is a very steep bank sloping down towards the river, and there is a limited woodland understory present, comprising hogweed (*Heracleum sphondylium*), bramble, false-brome (*Brachypodium sylvaticum*), wood avens (*Geum urbanum*), ivy, nipplewort (*Lapsana communis*), and hedge woundwort (*Stachys sylvatica*). This area does not comprise semi-natural woodland and so there are no links to Annex I habitats.			
Biodiversity Value: Local importance (higher value)			

Table 5.52: Derries Grassland

Derries Grassland			
Survey Date: 16/08/2018	**Surveyors:** PF and MCG	**Townland:** Derries	**Folio Number(s):** OY7827N
Figure: 32		**Grid Reference:** 624416, 713832	
			
Habitats Present: GS4		**Correspondence with Annex I:** None (see comments below)	
Comments: This parcel comprises wet grassland (GS4) on a peaty substrate which is dominated by rushes (*Juncus* sp.). Other species present include perennial rye grass (*Lolium perenne*), white clover (*Trifolium repens*), yorkshire fog (*Holcus lanatus*), common sorrel (*Rumex acetosa*), dandelion (*Taraxacum* agg.), common mouse-ear (*Cerastium fontanum*), dock (*Rumex* sp.), birch (*Betula pubescens*), greater willowherb (*Epilobium hirsutum*), gorse (*Ulex europaeus*), common chickweed (*Stellaria media*), and bramble (*Rubus fruticosus* agg.). Creeping Thistle (*Cirsium arvense*) is scattered throughout the field. It is likely that the area was once reseeded and is now reverting back to GS4. It is of low biodiversity value with no correspondence to Annex I habitats.			
Biodiversity Value: Local importance (lower value)			

Table 5.53: Rathfeston Peatland

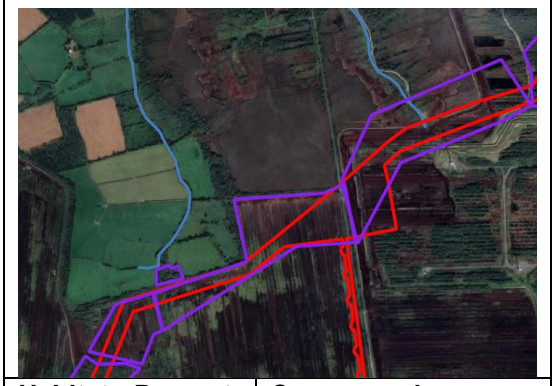
Rathfeston Peatland			
Survey Date: 16/08/2018	**Surveyors:** PF and MCG	**Townland:** Rathfeston	**Folio Number(s):** OY8610N
Figure: 40		**Grid Reference:** 647348, 723547	
			
		Habitats Present: PB4	**Correspondence with Annex I:** None (see comments below)
Comments: This parcel is comprised of bare peat (PB4) which is used as a machinery access track. This area has affinities to recolonising bare ground, with scattered recolonisation of bare peat with pioneer species present including soft rush (*Juncus effusus*), brambles (*Rubus fruticosus* agg.), silverweed (*Potentilla anserina*), dandelion (*Taraxacum* agg.), purple moor-grass (*Molinia caerulea*), and carnation sedge (*Carex panicea*). The current land use, species present and lack of any significant vegetation mean that there are no links to any Annex I habitats.			
Biodiversity Value: Local importance (lower value)			

Table 5.54: Rathfeston Bog Woodland

<table>
<tr><th colspan="4">Rathfeston Bog Woodland</th></tr>
<tr><td>Survey Date: 16/08/2018</td><td>Surveyors: PF and MCG</td><td>Townland: Rathfeston</td><td>Folio Number(s): OY8610N</td></tr>
<tr><td colspan="2">Figure: 40</td><td colspan="2">Grid Reference: 647390, 723652</td></tr>
<tr><td colspan="2" rowspan="2">  </td><td colspan="2">  </td></tr>
<tr><td>Habitats Present: WS1/WN7</td><td>Correspondence with Annex I: None (see comments below)</td></tr>
<tr><td colspan="4">Comments:
This is an area of recolonising cut over, dominated by birch (Betula pubescens) and willow (Salix sp.) scrub (WS1) grading into bog woodland (WN7) where the birch exceeds 5m in height. The ground layer is dominated by brambles (Rubus fruticosus agg.), bracken (Pteridium aquilinum), and yorkshire fog (Holcus lanatus). The complete absence of any Sphagnum moss in the ground layer and extensive drainage network which surround the area means that this dry area does not qualify as Annex I quality bog woodland.</td></tr>
<tr><td colspan="4">Biodiversity Value: Local importance (higher value)</td></tr>
</table>

Table 5.55: Clonad Peatland (a) and (b)

Clonad Peatland (a) and (b)			
Survey Date: 16/08/2018	**Surveyors:** PF and MCG	**Townland:** Clonad	**Folio Number(s):** OY10896N
Figure: 40		**Grid Reference:** 647506, 723902	



Habitats Present: PB4	**Correspondence with Annex I:** None (see comments below)

Comments:

Clonad Peatland (a): This area comprises a series of bare peat fields being recolonised by ling heather (*Calluna vulgaris*). The drainage ditches are revegetating with birch (*Betula pubescens*), willows (*Salix* sp.), purple moor-grass (*Molinia caerulea*) and meadowsweet (*Filipendula ulmaria*). Some of the more recently cleared drains contain bulrush (*Typha latifolia*), bulbous rush (*Juncus bulbosus*), and common cottongrass (*Eriophorum angustifolium*). This is industrially cut PB4, with no links to Annex I habitats.

Clonad Peatland (b): This area comprises PB4 and is a continuation of bare peat fields, with revegetating drainage ditches as described for Clonad Peatlands (a). The eastern part of the polygon comprises actively cut PB4. The majority of drains are being maintained, with no vegetation present. Occasional peat fields have been abandoned are being recolonised by ruderal species. The species composition of these recolonising bare peat fields and the inability of the area to develop an active peat forming community within 30 years mean that there is no link to Annex I habitats.

Biodiversity Value: Local importance (lower value)

Table 5.56: Clonad Bog Woodland

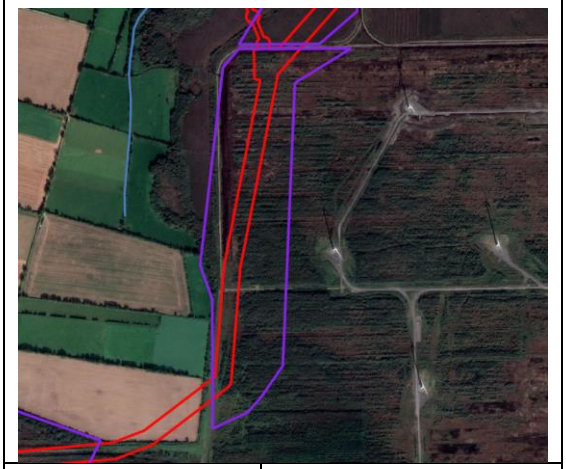
Site 27: Clonad Bog Woodland			
Survey Date: 16/08/2018	**Surveyors:** PF and MCG	**Townland:** Clonad	**Folio Number(s):** OY2927N
Figure: 40		**Grid Reference:** 647656, 724119	
			
		Habitats Present: WN7	**Correspondence with Annex I:** None (see comments below)
Comments: The species composition of this area is as previously described in 2017 (Annex C), with the addition of two species: blackthorn (*Prunus spinosa*) and hawthorn (*Crataegus monogyna*). The understory is dominated by ivy (*Hedera helix*), lords and ladies (*Arum maculatum*), brambles (*Rubus fruticosus* agg.). There is abundant leaf litter and areas of bare ground present. There is no *Sphagnum* moss present in the ground layer. The species composition and location next to a large industrial peat drain (approximately 3m deep) means that this area does not qualify as Annex I bog woodland.			
Biodiversity Value: Local importance (higher value)			

Table 5.57: Clonarrow/Riverlyons Bog Woodland

<table>
<tr><th colspan="4">Clonarrow/Riverlyons Bog Woodland</th></tr>
<tr><td>Survey Date: 16/08/2018</td><td>Surveyors: PF and MCG</td><td>Townland: Clonarrow/Riverlyons</td><td>Folio Number(s): OY23553F</td></tr>
<tr><td colspan="2">Figure: 41</td><td colspan="2">Grid Reference: 649591, 725216</td></tr>
<tr><td colspan="2" rowspan="2">  </td><td colspan="2">  </td></tr>
<tr><td>Habitats Present: WN7</td><td>Correspondence with Annex I: None (see comments below)</td></tr>
<tr><td colspan="4">Comments:
This parcel is comprised of birch dominated bog woodland (WN7) on peat, grading into scrub (WS1) towards the east. The entire area is extensively drained, and so is not wet enough to create conditions required for Annex I quality bog woodland.</td></tr>
<tr><td colspan="4">Biodiversity Value: Local importance (higher value)</td></tr>
</table>

Table 5.58: Clonarrow/Riverlyons Peatland (a)

Clonarrow/Riverlyons Peatland (a)			
Survey Date: 17/08/2018	**Surveyors:** PF and MCG	**Townland:** Clonarrow/Riverlyons	**Folio Number(s):** OY23553F
Figure: 41		**Grid Reference:** 650680, 726061	



Habitats Present: PB4, WN7, WS1	**Correspondence with Annex I:** Yes, presence of Marsh Fritillary webs (Annex II species)

Comments:
The majority of this area is comprised of cut away bog fields which have recolonised. It includes small wetland areas within drains, dominated by bulrush (*Typha latifolia*). The remaining area is being encroached by birch (*Betula pubescens*) scrub (WS1) which grades into bog woodland (WN7) in parts. Once the birch canopy closes, the understory is be dominated by bramble (*Rubus fruticosus* agg.) and bracken (*Pteridium aquilinum*). The extensive drainage and lack of *Sphagnum* moss in the understory mean that the bog woodland is not of Annex I quality. The extensive drainage of the recolonising area of cut over bog and the species composition in these areas, also means that there is no link to any Annex I habitats.

Large marsh fritillary (*Euphydryas aurinia*) webs (Annex II species) found on devils-bit scabious (*Succisa pratensis*) plants between railway line and drainage ditch. There is an abundance of *Succisa* throughout area, providing marsh fritillary habitat. A dedicated marsh fritillary survey was recommended for this site and was subsequently carried out over a number of years between 2016 and 2022 (EIAR Chapter 8: Biodiversity).

Biodiversity Value: Local importance (higher value)

Table 5.59: Clonarrow/Riverlyons Peatland (b)

Clonarrow/Riverlyons Peatland (b)			
Survey Date: 17/08/2018	**Surveyors:** PF and MCG	**Townland:** Clonarrow/Riverlyons	**Folio Number(s):** OY23553F
Figure: 41		**Grid Reference:** 650887, 726683	
			
		Habitats Present: PB4	**Correspondence with Annex I:** None (see comments below)
Comments: This area is as described in the 2017 survey and consists of sub-marginal raised bog ecotope. The presence of sub-marginal ecotope (non-peat forming), the extensive drainage of the area, and sloped nature of the bog mean that there are no possible links with Annex I habitats and there is no potential for future regeneration of an active peat forming community. The access track running diagonally across this area from south-west to north-east has abundant marsh fritillary (*Euphydryas aurinia*) habitat present, however no webs were found at this location during the 2018 survey.			
Biodiversity Value: Local importance (higher value)			

Table 5.60: Clonarrow/Riverlyons Grassland and Treeline

<table>
<tr><th colspan="4">Clonarrow/Riverlyons Grassland and Treeline</th></tr>
<tr><td>Survey Date: 17/08/2018</td><td>Surveyors: PF and MCG</td><td>Townland: Clonarrow/Riverlyons</td><td>Folio Number(s): OY1179N, OY18096N</td></tr>
<tr><td colspan="2">Figure: 41</td><td colspan="2">Grid Reference: 650972, 726888</td></tr>
<tr><td colspan="2" rowspan="2">  </td><td colspan="2">  </td></tr>
<tr><td>Habitats Present: GA1, WL1</td><td>Correspondence with Annex I: None (see comments below)</td></tr>
<tr><td colspan="4">Comments:
The western polygon comprises an improved agricultural grassland field (GA1). The eastern polygon contains a treeline (WL2) along the edge of a hardcore track. The treeline is dominated by ash (Fraxinus excelsior), birch (Betula pubescens), and rowan (Sorbus aucuparia), with a single pine tree (Pinus sp.) present. The understory is comprised of bracken (Pteridium aquilinum) and brambles (Rubus fruticosus agg.). There is a drainage ditch running along the hardcore track. This drainage in addition to the species composition mean that there are no links with any Annex I habitats.</td></tr>
<tr><td colspan="4">Biodiversity Value: Local importance (lower value)</td></tr>
</table>

Table 5.61: Drumcaw/Mountlucas Peatland (a)

Drumcaw/Mountlucas Peatland (a)			
Survey Date: 17/08/2018	**Surveyors:** PF and MCG	**Townland:** Drumcaw/Mountlucas	**Folio Number(s):** OY17460F
Figure: 41		**Grid Reference:** 651034, 726989	
			
Habitats Present: HD1, GS2, WS1		**Correspondence with Annex I:** None (see comments below)	
Comments: The western polygon comprises a mosaic of dense bracken (HD1), dry meadows and grassy verge vegetation (GS2) and scrub (WS1). Bracken (*Pteridium aquilinum*) is dominant, with invading birch (*Betula pubescens*) and willow (*Salix* sp.) scrub. Species composition and dry ground conditions mean no links to Annex I habitats. The eastern polygon comprises an area of peat bounded by two large Bord na Mona drains. The area is similar in species composition to that described for the polygon to the west, however, Bracken is dominant here. The presence of the large well maintained functional drainage ditches, in addition to the species composition mean that there are no potential links with Annex I habitats.			
Biodiversity Value: Local importance (lower value)			

Table 5.62: Drumcaw/Mountlucas Peatland (b)

Drumcaw/Mountlucas Peatland (b)			
Survey Date: 17/08/2018	**Surveyors:** PF and MCG	**Townland:** Drumcaw/Mountlucas	**Folio Number(s):** OY23553F
Figure: 41		**Grid Reference:** 651103, 726910	
			
Habitats Present: PB4, GS2		**Correspondence with Annex I:** None (see comments below)	
Comments: This polygon comprises an area of cut over bog (PB4) used as drying field. The bare peat is being recolonised and marginal areas have dry meadow and grassy verge vegetation (GS2) present, along with some birch (*Betula pubescens*) and gorse (*Ulex europaeus*) scrub. The species composition and the extensive drainage network in this area means that there is no possible link to Annex I habitats or potential for future regeneration of active raised bog.			
Biodiversity Value: Local importance (lower value)			

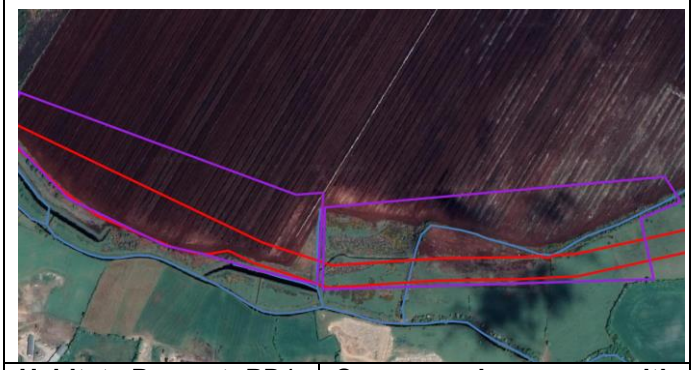
Table 5.63: Drumcaw/Mountlucas Bog Woodland

Drumcaw/Mountlucas Bog Woodland			
Survey Date: 17/08/2018	**Surveyors:** PF and MCG	**Townland:** Drumcaw/Mountlucas	**Folio Number(s):** OY1536F
Figure: 41		**Grid Reference:** 651165, 726994	
			
		Habitats Present: WN7	**Correspondence with Annex I:** None (see comments below)
Comments: This polygon contains birch dominated bog woodland (WN7) on peat. Additional species present include oak (*Quercus* sp.), holly (*Ilex aquifolium*), beech (*Fagus sylvatica*), rowan (*Sorbus aucuparia*) and pines (*Pinus* sp.). Trees are up to 10m in height and the woodland area is bounded by 3m deep drainage ditch. The understory is dominated by ivy (*Hedera helix*) and brambles (*Rubus fruticosus* agg.). The extensive drainage of this area and the absence of *Sphagnum* moss in the ground layer mean that this woodland does not qualify as Annex I quality bog woodland.			
Biodiversity Value: Local importance (higher value)			

Table 5.64: Newtown Bog Woodland

Newtown Bog Woodland			
Survey Date: 17/08/2018	**Surveyors:** PF and MCG	**Townland:** Newtown	**Folio Number(s):** OY8610N
Figure: 42		**Grid Reference:** 653426, 728155	
			
Habitats Present: WN7		**Correspondence with Annex I:** None (see comments below)	
Comments: The northern part of this polygon is comprised of bog woodland (WN7) with a bramble (*Rubus fruticosus* agg.) and bracken (*Pteridium aquilinum*) understory. Extensive drainage has resulted in the absence of hydrological conditions required for Annex I quality bog woodland and there is a notable absence of *Sphagnum* moss in the ground layer. Moving to the south of the polygon there is a mosaic of dense bracken (HD1), gorse (*Ulex europaeus*) scrub (WS1) and larger isolated birch (*Betula pubescens*) trees. The area is dry and firm underfoot. It is bounded by a large functional drain adjacent to the Bord na Mona works area and a second drain to the west. Over time this area will likely transition to WN7 birch woodland but will never be of Annex I quality due to the drainage works that has been carried out.			
Biodiversity Value: Local importance (higher value)			

Table 5.65: Newtown Peatland and Newtown/Esker More Grassland

<table>
<tr><th colspan="4">Newtown Peatland and Newtown/Esker More Grassland</th></tr>
<tr><td>Survey Date: 17/08/2018</td><td>Surveyors: PF and MCG</td><td>Townland: Newtown</td><td>Folio Number(s): OY8610N</td></tr>
<tr><td colspan="2">Figure: 42</td><td colspan="2">Grid Reference: 653822, 727959</td></tr>
<tr><td colspan="2">  </td><td colspan="2">  </td></tr>
<tr><td colspan="2"></td><td>Habitats Present: PB4</td><td>Correspondence with Annex I: None (see comments below)</td></tr>
<tr><td colspan="4">Comments:
Newtown Peatland: This polygon comprises industrially cut peat (PB4). The area has been extensively drained, and there is no vegetation present. There are no links to Annex I habitat, nor is there any potential for future restoration to an active peat forming community. Extensively drained, no vegetation. Not Annex I habitat. No potential for active raised bog restoration.

Newtown/Esker More Grassland: Moving from east to west, this polygon is comprised of arable crops (BC1), poor quality improved agricultural grassland (GA1), and dense gorse (Ulex europaeus), none of which have any correspondence to Annex I habitats.</td></tr>
<tr><td colspan="4">Biodiversity Value: Local importance (lower value)</td></tr>
</table>

Table 5.66: Esker More Bog Woodland

Esker More Bog Woodland			
Survey Date: 17/08/2018	**Surveyors:** PF and MCG	**Townland:** Esker More	**Folio Number(s):** OY4271N
Figure: 43		**Grid Reference:** 655149, 727985	

Habitats Present: WN7	**Correspondence with Annex I:** None (see comments below)

Comments:
This area of bog woodland (WN7) is as described in the 2017 survey. It is not of Annex I quality due to the absence of any *Sphagnum* moss in the ground layer and the presence of a large functional drainage ditch associated with industrial Bord na Mona peat works adjacent to the woodland. This drainage has resulted in the absence of hydrological conditions required for Annex I quality bog woodland to occur.

Biodiversity Value: Local importance (higher value)

Table 5.67: Esker More/Rathlumber Peatland

Esker More/Rathlumber Peatland			
Survey Date: 17/08/2018	**Surveyors:** PF and MCG	**Townland:** Esker More/Rathlumber	**Folio Number(s):** UNROFF19, OY17769N, OY17767N, OY17772N, OY17983N, OY7233N
Figure: 43		**Grid Reference:** 656615, 728042	
			
Habitats Present: PB4		**Correspondence with Annex I:** None (see comments below)	
Comments: These polygons comprise areas of peat (PB4) that are being actively cut together with abandoned peat fields, some of which are currently used for peat drying. The peat fields have revegetated, with rushes (*Juncus* sp.) and purple moor-grass (*Molinia caerulea*) dominant. These peat fields are completely dry underfoot. The extensive drainage that has been carried out means that there is no correspondence with Annex I habitats.			
Biodiversity Value: Local importance (lower value)			

Table 5.68: Rathlumber Grassland

<table>
<tr><th colspan="4">Rathlumber Grassland</th></tr>
<tr><td>Survey Date: 17/08/2018</td><td>Surveyors: PF and MCG</td><td>Townland: Rathlumber</td><td>Folio Number(s): OY17985N</td></tr>
<tr><td colspan="2">Figure: 43</td><td colspan="2">Grid Reference: 657009, 728240</td></tr>
<tr><td colspan="2" rowspan="2">  </td><td colspan="2">  </td></tr>
<tr><td>Habitats Present: BC1, WL2, ED3</td><td>Correspondence with Annex I: None (see comments below)</td></tr>
<tr><td colspan="4">Comments:
Moving from west to east these polygons comprise a beet crop field (BC1), a gappy willow (Salix sp.) and hawthorn (Crataegus monogyna) hedgerow (WL1), an arable crop field and a recolonising grassy field (ED3) on peat soil that is currently used for peat drying. There is no correspondence with Annex I habitats.</td></tr>
<tr><td colspan="4">Biodiversity Value: Local importance (lower value)</td></tr>
</table>

Table 5.69: Ballynakill Bog Woodland

<table>
<tr><th colspan="4">Ballynakill Bog Woodland</th></tr>
<tr><td>Survey Date:
20/08/2018</td><td>Surveyors:
PF and BK</td><td>Townland:
Ballynakill</td><td>Folio Number(s): OY15259N</td></tr>
<tr><td colspan="2">Figure: 44</td><td colspan="2">Grid Reference: 659477, 728264</td></tr>
<tr><td colspan="2">  </td><td colspan="2">  </td></tr>
<tr><td colspan="2">Habitats Present:
WN7</td><td colspan="2">Correspondence with Annex I: None (see comments below)</td></tr>
<tr><td colspan="4">Comments:
This area of bog woodland (WN7) is as previously described in the 2017 survey. There is an absence of Sphagnum moss in the ground layer, meaning that there is no link to Annex I habitat.</td></tr>
<tr><td colspan="4">Biodiversity Value: Local importance (higher value)</td></tr>
</table>

Table 5.70: Ballynakill Woodland

Ballynakill Woodland			
Survey Date: 20/08/2018	**Surveyors:** PF and BK	**Townland:** Ballynakill	**Folio Number(s):** OY8610N
Figure: 44		**Grid Reference:** 659960, 728195	
			
		Habitats Present: WD2, WS1	**Correspondence with Annex I:** None (see comments below)
Comments: Mosaic of mixed broadleaved/conifer woodland (WD2), bracken (*Pteridium aquilinum*), and gorse (*Ulex europaeus*) scrub. The woodland is dominated by sitka spruce (*Picea sitchensis*), lodgepole pine (*Pinus contorta*) and birch (*Betula pubescens*), with occasional grey willow (*Salix cinerea*). Trees are approximately 6-8m high. A drainage channel ca 1.5m wide and 1m deep occurs within woodland. The ground layer is dominated by purple moor-grass (*Molinia caerulea*), bramble (*Rubus fruticosus* agg.) and ling heather (*Calluna vulgaris*), with *Pleurocarpus* moss present. There is an absence of *Sphagnum* moss in the ground and so this area has no links with Annex I habitats.			
Biodiversity Value: Local importance (higher value)			

Table 5.71: Ballynakill/Ballykileen Peatland

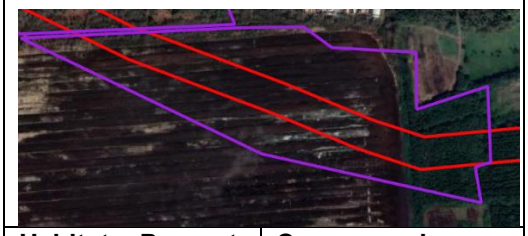
<table>
<tr><th colspan="4">Ballynakill/Ballykileen Peatland</th></tr>
<tr><td>Survey Date: 20/08/2018</td><td>Surveyors: PF and BK</td><td>Townland: Ballynakill/Ballykileen</td><td>Folio Number(s): OY8610N, UNROFF20</td></tr>
<tr><td colspan="2">Figure: 44</td><td colspan="2">Grid Reference: 660354, 728029</td></tr>
<tr><td colspan="2" rowspan="2">  </td><td colspan="2">  </td></tr>
<tr><td>Habitats Present: PB4, WD4, WN7</td><td>Correspondence with Annex I: None (see comments below)</td></tr>
<tr><td colspan="4">Comments:
The majority of this polygon comprises an industrially cut peat field (PB4) used to produce milled peat. There is no surface vegetation present. Drains (FW4) (1.5m wide and 1.5m deep) are vegetated with soft rush (Juncus effusus), water mint (Mentha aquatica), rosebay willowherb (Chamerion angustifolium), and common cottongrass (Eriophorum angustifolium). The extensive drainage and lack of vegetation means that this area does not have any links to Annex I habitats and there is no potential for future restoration of active peat forming habitat.
The woodland in the eastern part of the polygon contains sitka spruce conifer forestry (WD4) approximately 6-7m high in the east and bog woodland (WN7) in the western part. Dense bracken (Pteridium aquilinum), gorse (Ulex europaeus), and ling heather (Calluna vulgaris) occur in the ground layer. The birch trees (Betula pubescens) present in the area of bog woodland are approximately 5-7m high. A large drainage channel approximately 2m wide occurs within the birch woodland. This drainage in addition to the absence of Sphagnum in the ground layer means that there are no links to Annex I habitat.</td></tr>
<tr><td colspan="4">Biodiversity Value: Western part of site; Local importance (lower value); Eastern part of site: Local importance (higher value)</td></tr>
</table>

Table 5.72: Kilcumber Woodland (a) and (b)

<table>
<tr><th colspan="4">Kilcumber Woodland (a) and (b)</th></tr>
<tr><td>Survey Date: 20/08/2018</td><td>Surveyors: PF and BK</td><td>Townland: Kilcumber</td><td>Folio Number(s): OY9255N, OY15337N</td></tr>
<tr><td colspan="2">Figure: 45</td><td colspan="2">Grid Reference: 661750, 727842</td></tr>
<tr><td colspan="2" rowspan="2">  </td><td colspan="2">  </td></tr>
<tr><td>Habitats Present: GS2, FS1, WD4, WS5, FW4</td><td>Correspondence with Annex I: None (see comments below)</td></tr>
<tr><td colspan="4">Comments:
Kilcumber Woodland (a) (West): The north-western part of this polygon, along the riverbank comprises dry meadow and grassy verge vegetation (GS2) grading into a narrow band of reed and large sedge swamp (FS1) immediately adjoining the river bank. Species present include nettle (Urtica dioica), greater willowherb (Epilobium hirsutum), reed canary grass (Phalaris arundinacea), cocksfoot (Dactylus glomerata), bindweed (Calystegia sp.), and other rank grasses. There are no links to Annex habitats.

Immediately adjoining this area to the east there is an area of conifer forestry (WD4), approximately 5m high, with nettles and bindweed present in the understory. The remainder of the targeted areas are comprised of recently felled forestry (WS5), with limited vegetation present. There are no links to Annex I habitats at this location.

Kilcumber Woodland (b) (East): This area contains sitka spruce (Picea sitchensis) conifer forestry (WD4) approximately 6-8m high. The ground layer is dominated by bramble (Rubus fruticosus agg.), hedge bindweed (Calystegia sepium), sow thistle (Sonchus spp.), and occasional common knapweed (Centaurea nigra). Scattered Willows (Salix sp.) occur along the roadside verge at the edge of the conifer forestry. The three blocks of conifer forestry are separated by drainage ditches (FW4) associated with the peat works area to the south. Reed and large sedge swamp vegetation (FS1) is present in the drainage ditches, dominated by reed sweet-grass (Glyceria maxima). Dry meadow and grassy verge vegetation (GS2) occurs at the edge of the drains with rank grasses and thistles (Cirscium sp.) present. None of the habitats or species occurring in this area correspond to Annex I habitats.</td></tr>
<tr><td colspan="4">Biodiversity Value: Local importance (lower value)</td></tr>
</table>

Table 5.73: Kilcumber/Cloncant Peatland

Site 48: Kilcumber/Cloncant Peatland			
Survey Date: 20/08/2018	**Surveyors:** PF and BK	**Townland:** Kilcumber/Cloncant	**Folio Number(s):** OY15337N, OY1812L
Figure: 45		**Grid Reference:** 662999, 727383	

Habitats Present: PB4, GS4, HD1, WS1	**Correspondence with Annex I:** None (see comments below)

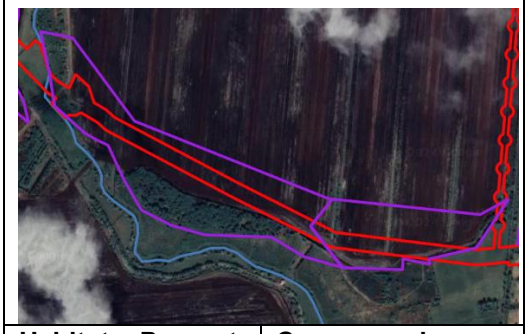
Comments:
There are a series of peat fields which are no longer being harvested by Bord na Mona present in the western part of this polygon. These abandoned peat fields have reverted to wet grassland (GS4) dominated by purple moor-grass (*Molinia caerulea*) and soft rush (*Juncus effusus*). Dense bracken (HD1) and scrub (WS1) are invading the fields from the edge of the drains. This area is likely to revert to scrub and non-Annex bog woodland over time.

The remainder of the polygon is comprised of actively cut peat fields (PB4). The only vegetation present is occasional plants occurring in drains and on peat fields where extraction has ceased. The extensive drainage of this area means that there is no current link to Annex I habitats, nor is there any potential for future restoration of the area to an active peat forming community.

Biodiversity Value: Local importance (lower value)

Table 5.74: Cushaling Peatland (a) and (b)

Site 49: Cushaling Peatland (a) and (b)			
Survey Date: 20/08/2018	**Surveyors:** PF and BK	**Townland:** Cushaling	**Folio Number(s):** OY7769F, OY6795N, OY4020F
Figure: 46		**Grid Reference:** 664276, 726472	



Habitats Present: GS2, WS1, PB4, HD1, WN7	**Correspondence with Annex I:** None (see comments below)

Comments:
Cushaling Peatland (a) (western polygon): The northern part of this polygon is comprised of an industrially drained and actively cut Bord na Mona works area (PB4). There is little vegetation present on the bare peat fields, with the exception of some plants occurring in drains. The southern part of the polygon is comprised of bog woodland (WN7) that is not of Annex I quality. The ground layer is dominated by bracken (*Pteridium aquilinum*) and bramble (*Rubus fruticosus* agg.), with no *Sphagnum* moss present. Holly (*Ilex aquifolium*) and rowan (*Sorbus aucuparia*) are present in the ground layer. The area is extensively drained to the north by a large functional Bord na Mona drain. The extensive drainage and absence of *Sphagnum* in the ground layer mean that there are no links to Annex I habitats.

Cushaling Peatland (b) (eastern polygon): This polygon comprises an industrially drained and actively cut Bord na Mona works area (PB4). There is little vegetation present on the bare peat fields, with the exception of occasional plants occurring in drains. Occasional intervening abandoned peat fields are being colonized by *Juncus* grassland (GS4) and birch (*Betula pubescens*) scrub (WS1).
The embankment along the works area in the south of the polygon is covered by dry meadow and grassy verge vegetation (GS2), dominated by rank grasses, with scattered willows (*Salix* sp.) present. The extensive drainage of this area and the species present mean that there are no links to Annex I habitats and there is no potential for future restoration of an active peat forming community.

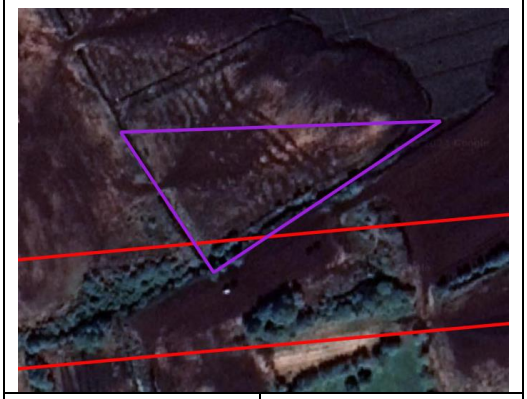
Biodiversity Value: Local importance (higher value)

Table 5.75: Cushaling Grassland

Cushaling Grassland			
Survey Date: 20/08/2018	**Surveyors:** PF and BK	**Townland:** Cushaling	**Folio Number(s):** OY4155N
Figure: 46		**Grid Reference:** 665167, 726347	
			
		Habitats Present: GS4	**Correspondence with Annex I:** None (see comments below)
Comments: This polygon comprises wet grassland area (GS4) on reclaimed peat. This area was used to dry peat in the past. Species present include soft rush (*Juncus effusus*), creeping thistle (*Cirsium arvense*), silverweed (*Potentilla anserina*), meadowsweet (*Filipendula ulmaria*), yorkshire fog (*Holcus lanatus*), purple-loosestrife (*Lythrum salicaria*), and knotweed (*Polygonum* sp.). The grassland runs all the way from the road to the high bog facebank in the east. The area nearest to the bog is used to dry turf, with area of bare peat common, especially towards the high bog and northern area of field. The species composition means that this area of wet grassland is not of Annex I quality. Not Annex I quality wet grassland.			
Biodiversity Value: Local importance (lower value)			

Table 5.76: Cushaling Peatland (c)

Cushaling Peatland (c)			
Survey Date: 21/08/2018	**Surveyors:** PF and BK	**Townland:** Cushaling	**Folio Number(s):** OY11579F, OY18096N
Figure: 46		**Grid Reference:** 665479, 726408	



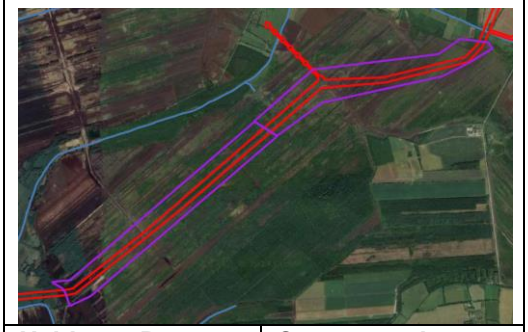
Habitats Present: GS4	**Correspondence with Annex I:** None (see comments below)

Comments:
This polygon is covered by degraded high bog, comprising facebank vegetation dominated by ling heather (*Calluna vulgaris*), with occasional common cotton-grass (*Eriophorum angustifolium*). *Sphagnum* mosses cover less than 2% of the area. This area has been extensively pre-drained with drains occurring approximately every 15m. The area is very dry and firm underfoot and occurs adjacent to an actively cut peat field. There are no pools present. The extensive drainage means that this area cannot be restored to an active peat forming community and therefore has no correspondence to Annex I habitats.

Biodiversity Value: Local importance (higher value)

Table 5.77: Ticknevin Peatland (a) and (b)

Ticknevin Peatland (a) and (b)			
Survey Date: 21/08/2018	**Surveyors:** PF and BK	**Townland:** Ticknevin	**Folio Number(s):** OY24521F, OY18096N, OY18096N, KE59062F
Figure: 47		**Grid Reference:** 667983, 727508	



Habitats Present: WN7, GS4, WS1, PB4	**Correspondence with Annex I:** Yes, presence of Marsh Fritillary webs (Annex II species)

Comments:
Ticknevin Peatland (a) (western polygon): The western part of the polygon is comprised of birch (*Betula pubescens*) woodland (WN7) with willow (*Salix* sp.), sycamore (*Acer pseudoplatanus*), and rowan (*Sorbus aucuparia*), as previously described in the 2017 survey. This area was surveyed from a distance as it was inaccessible. The woodland is surrounded by extensive functional drains and the ground layer is dominated by bramble (*Rubus fruticosus* agg.) and bracken (*Pteridium aquilinum*), with an absence of *Sphagnum* mosses. Trees are approximately 16-18m tall. The absence of *Sphagnum* moss and extensive drainage mean that this woodland does not correspond to Annex I quality Bog Woodland.

The remainder of the polygon comprises a mosaic of abandoned peat fields (PB4) dominated by rush (*Juncus* sp.) and cotton-grass (*Eriophorum* sp.) and wet grassland (GS4) in the centre of the abandoned peat fields. The peat fields are being invaded by birch (*Betula pubescens)* scrub (WS1) which is extending out from former drainage ditches. The birch scrub ranges from 1m to 4m in height, and there are occasional pines (*Pinus* sp.) and willows (*Salix* sp.) present. Under the birch scrub there is a lack of surface vegetation and an abundance of leaf litter. The surface is firm and dry underfoot and there are no *Sphagnum* mosses present. The entire area is likely to develop into non annex birch woodland overtime. The dry ground conditions, extensive drainage and lack of Sphagnum mosses mean that this area does not correspond to Annex I habitat.

A railway line runs through this polygon and numerous marsh fritillary (*Euphydryas aurinia*) webs (Annex II species) were recorded in vegetation occurring along the edge of the railway line during the 2018 survey.

Ticknevin Peatland (a) (eastern polygon): This polygon comprises abandoned peat fields with soft rush (*Juncus effusus*) dominated wet grassland (GS4) recolonising on bare peat (PB4). The area is well drained with bulrush (*Typha latifolia*) occurring within the drains. Birch scrub (WS1) is encroaching the abandoned peat fields. Extensive drainage and species composition mean no links to Annex I habitats.
This area was searched for marsh fritillary webs (Annex II species) and four webs with caterpillar were recorded. The webs were found in an area with a high density of devil's-bit scabious (*Succisa pratensis*).

Biodiversity Value: Local importance (higher value)

Table 5.78: Drummond Woodland

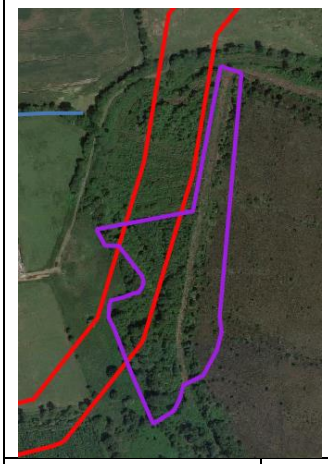
Site 54: Drummond Woodland			
Survey Date: 21/08/2018	**Surveyors:** PF and BK	**Townland:** Drummond	**Folio Number(s):** KE1901N, KE16790N
Figure: 49		**Grid Reference:** 672116, 730538	
			
		Habitats Present: WN7, WS1, PB4	**Correspondence with Annex I:** None (see comments below)
Comments: Based on extensive survey in 2017 and aerial photography interpretation the western part of this polygon comprises an area of birch (*Betula pubescens*) scrub (WS1) and woodland (WN7) on peat. The area has been extensively drained and there is an absence of *Sphagnum* moss in the ground layer. Therefore, this woodland does not qualify as Annex I quality bog woodland. The eastern part of the polygon is dominated by birch scrub (WS1). The area has been extensively drained and is adjacent to Coillte conifer forestry. The invasion of Birch indicates that this is degraded raised bog habitat. The remnant area of raised bog includes an extensive drainage network with trees invading the bog surface. This area is not Annex I quality habitat and there is no potential for future restoration of an active peat forming community.			
Biodiversity Value: Local importance (higher value)			

Table 5.79: Kilkeaskin/Drehid Peatland

<table>
<tr><th colspan="4">Kilkeaskin/Drehid Peatland</th></tr>
<tr><td>Survey Date: 22/08/2018</td><td>Surveyors: PF and BK</td><td>Townland: Kilkeaskin/Drehid</td><td>Folio Number(s): KE7742N</td></tr>
<tr><td colspan="2">Figure: 50</td><td colspan="2">Grid Reference: 674053, 733028</td></tr>
<tr><td colspan="2" rowspan="2">  </td><td colspan="2">  </td></tr>
<tr><td>Habitats Present: WN7, PB4</td><td>Correspondence with Annex I: None (see comments below)</td></tr>
<tr><td colspan="4">Comments:
This area is covered by old cutover bog (PB4) which is being recolonised by birch woodland (WN7) and rank heather vegetation. Ling heather (Calluna vulgaris) is dominant with common cotton-grass (Eriophorum angustifolium) also present. There are occasional birch (Betula pubescens) and lodgepole pine (Pinus contorta) saplings. The ground is firm and cover of Sphagnum moss is < 2%. There are no current links to Annex I habitats, nor is there any potential for future restoration of an active peat forming community.
In the areas of birch woodland, trees range from 2-6m in height. The ground layer is dominated by ling heather, bramble (Rubus fruticosus agg.) and leaf litter. As with the rest of this area, extensive drainage and the absence of Sphagnum mosses mean that there is no correspondence with Annex I habitats.</td></tr>
<tr><td colspan="4">Biodiversity Value: Local importance (higher value)</td></tr>
</table>

Table 5.80: Timahoe East Peatland

Timahoe East Peatland			
Survey Date: 22/08/2018	**Surveyors:** PF and BK	**Townland:** Timahoe East	**Folio Number(s):** KE7742N
Figure: 50		**Grid Reference:** 674874, 733096	
			
		Habitats Present: PB1	**Correspondence with Annex I:** None (see comments below)
Comments: This polygon covers an area of raised bog (PB1) dominated by marginal ecotope vegetation with ling heather (*Calluna vulgaris*), cross-leaved heath (*Erica tetralix*), bog asphodel (*Narthecium ossifragum*), deergrass (*Tricophorum cespitosum*), with occasional hare's-tail cottongrass (*Eriophorum vaginatum*), reindeer lichen (*Cladonia portentosa*), red bogmoss (*Sphagnum capillifolium*) and heath plait-moss (*Hypnum jutlandicum*). This area of raised bog is not actively peat forming and there is an absence of pools. While this area qualifies as degraded raised bog it is not of Annex I quality. This area could only be considered as Annex I quality degraded raised bog if restoration of the hydrology of the entire site, including areas to the north and west, were to be undertaken.			
Biodiversity Value: Local importance (higher value)			

Table 5.81: Timahoe East Peatland and Woodland

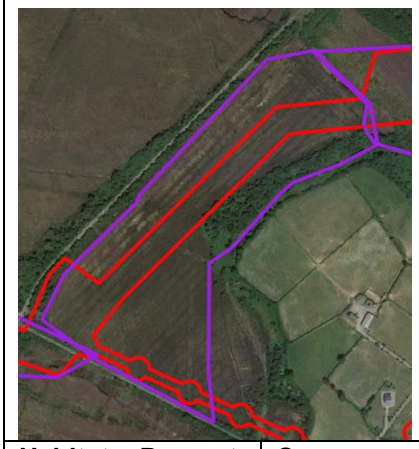
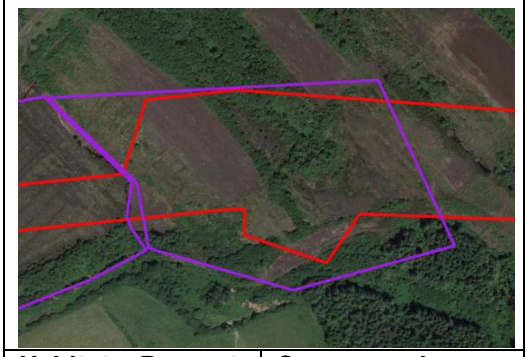
Timahoe East Peatland and Woodland			
Survey Date: 22/08/2018	**Surveyors:** PF and BK	**Townland:** Timahoe East	**Folio Number(s):** KE7742N
Figure: 50		**Grid Reference:** 675275, 733221	
			
		Habitats Present: PB1, WS1	**Correspondence with Annex I:** None (see comments below)
Comments: This area comprises peat drying fields with an abundance of bare peat, purple moor-grass (*Molinia caerulea*), common cottongrass (*Eriophorum angustifolium*), ling heather (*Calluna vulgaris*), and cross leaved-heath (*Erica tetralix*). No *Sphagnum* mosses were recorded. The area is very firm and dry underfoot, with birch (*Betula pubescens*) and gorse (*Ulex europaeus*) scrub (WS1) encroaching. No links to Annex I habitats. Marginal raised bog also occurs in this area. There are extensive areas of bare peat and some older drying fields are dominated by white beak-sedge (*Rhynchospora alba*). Scattered birch trees are invading. Face bank community is present on higher raised areas and along drain edges. The drains are deep, with little *Sphagnum* moss infilling. This area is not actively peat forming raised bog (PB1) but is degraded raised bog. The extent of drainage, burning damage, slope, and small size preclude the area being designated as Annex I quality degraded raised bog.			
Biodiversity Value: Local importance (higher value)			

Table 5.82: Timahoe East Grassland

Timahoe East Grassland			
Survey Date: 22/08/2018	**Surveyors:** PF and BK	**Townland:** Timahoe East	**Folio Number(s):** KE7742N
Figure: 50		**Grid Reference:** 675622, 733390	

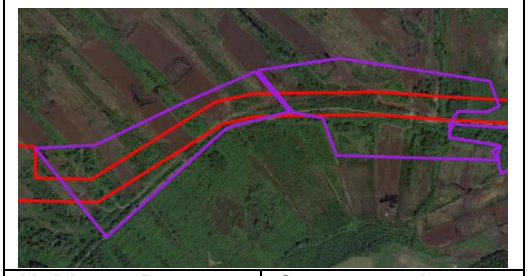


Habitats Present: PB4, GS4, WS1	**Correspondence with Annex I:** None (see comments below)

Comments:
The southern part of the polygon is comprised of cut over bog (PB4) now dominated by gorse (*Ulex europaeus*), birch (*Betula pubescens*), bracken (*Pteridium aquilinum*), and grey willow (*Salix cinerea*) to 2m. A few smaller grassland areas occur which are dominated by soft rush (*Juncus effusus*), purple moor-grass (*Molinia caerulea*), sweet vernal-grass (*Anthoxanthum odoratum*), cat's-ear (*Hypochaeris radicata*), ling heather (*Calluna vulgaris*), water horsetail (*Equisetum fluviatile*), and tormentil (*Potentilla erecta*). Scrub (WS1) and wet grassland (GS4) dominate the area at present, and it is likely that it will develop into birch scrub/woodland in future.
In the northern part of the polygon there are peat drying fields with an abundance of bare peat, purple moor-grass, common cotton-grass (*Eriophorum angustifolium*), ling heather, and cross-leaved heath (*Erica tetralix*).
The entire polygon is very dry and firm underfoot, this in addition to the lack of *Sphagnum* moss means that the area does not correspond to Annex I habitats.

Biodiversity Value: Local importance (higher value)

Table 5.83: Timahoe East Peatland and Grassland (a) and (b)

<table>
<tr><th colspan="4">Timahoe East Peatland and Grassland (a) and (b)</th></tr>
<tr><td>Survey Date: 23/08/2018</td><td>Surveyors: PF and BK</td><td>Townland: Timahoe East</td><td>Folio Number(s): KE3960F, KE7742N</td></tr>
<tr><td colspan="2">Figure: 51</td><td colspan="2">Grid Reference: 676267, 733474</td></tr>
<tr><td colspan="2" rowspan="2">  </td><td colspan="2">  </td></tr>
<tr><td>Habitats Present: PB4, WS1</td><td>Correspondence with Annex I: None (see comments below)</td></tr>
<tr><td colspan="4">Comments:
Timahoe East Peatland and Grassland (a) (western polygon): These polygons comprise a series of peat drying fields (PB4) interspersed with birch (Betula pubescens) and gorse (Ulex europaeus) scrub (WS1) on raised ridges between the drying fields. The peat drying fields are in active use, and dominated by bare peat, with very little vegetation present. Some of the areas have been used this year with piles of peat present. A large drainage channel occurs along the southern part of the site.
The birch and gorse scrub (WS1) present on raised ridges also has occasional pines (Pinus sp.) present. Some of these areas have an increased cover of ling heather (Calluna vulgaris).
The extensive drainage of this area and the species composition means that none of the habitats recorded in this area correspond to Annex I habitats.

Timahoe East Peatland and Grassland (b) (eastern polygon): These polygons comprise peat drying fields, areas dominated by scrub vegetation (WS1), and bog woodland (WN7) that has no links to Annex I bog woodland. The presence of drainage ditches, absence of surface water and Sphagnum moss means that there is no correspondence with Annex I habitats at this location.</td></tr>
<tr><td colspan="4">Biodiversity Value: Local importance (lower value)</td></tr>
</table>

Table 5.84: Derryvarroge Peatland (a)

Derryvarroge Peatland (a)			
Survey Date: 23/08/2018	**Surveyors:** PF and BK	**Townland:** Derryvarroge	**Folio Number(s):** KE4050F, KE8392N, KE4566F, KE16790N, KE9681N, KE8393N
Figure: 52		**Grid Reference:** 679890, 733899	
			
		Habitats Present: PB1, PB4, WS1	**Correspondence with Annex I:** None (see comments below)
Comments: There is a small remnant of high bog present in the west of this site, as previously described in the 2017 survey. The area has been extensively drained and is significantly degraded. There were no pools and no *Sphagnum* mosses recorded. The area is being invaded by birch (*Betula pubescens*) scrub (WS1). In the east of this area there is a small area of degraded raised bog (PB1), which has dried out due to extensive drainage from adjacent Bord na Mona peat works and the functional drains throughout the area. There are extensive areas of bare peat areas present. The central area is comprised of areas of bare peat created by industrial peat extraction (PB4). There is an extensive drainage network present and little to no vegetation cover. This entire area has significant areas of bare peat and areas that are vegetated and dry with no significant *Sphagnum* cover. The area has been extensively drained and there is no restoration potential for this area, and therefore no link to Annex I habitats.			
Biodiversity Value: Local importance (lower value)			

Table 5.85: Derryvarroge Peatland (b)

Derryvarroge Peatland (b)			
Survey Date: 23/08/2018	**Surveyors:** PF and BK	**Townland:** Derryvarroge	**Folio Number(s):** KE3960F, KE7623F, KE16790N
Figure: 52		**Grid Reference:** 680263, 733890	

Habitats Present: PB4, WS1	**Correspondence with Annex I:** None (see comments below)

Comments:
This area comprises remnant peat hags and an area of cutover bog (PB4) used as peat drying fields.

The remnant peat hags are colonised by facebank vegetation, dominated by tall ling heather (*Calluna vulgaris*), which is being invaded by birch (*Betula pubescens*) scrub (WS1) to 2m. These peat hags are heavily drained and are dry and firm underfoot. Heath star moss (*Campylopus introflexus*) is common on the peat hags, with scattered deergrass (*Tricophorum cespitosum*) also present. *Sphagnum* mosses are present (*Sphagnum capillifolium*, *S. papillosum*, and *S. cuspidatum*), but restricted to drainage ditches.

The area used as a peat drying field has significant areas of bare peat with other parts being colonised by purple moor-grass (*Molinia caerulea*), common cottongrass (*Eriophorum angustifolium),* hare's-tail cottongrass (*Eriophorum vaginatum*) and low amounts of ling heather.

The extensive drainage, dry ground conditions, and absence of Sphagnum mosses mean that this area does not correspond to any Annex I habitats.

Biodiversity Value: Local importance (higher value)

Table 5.86: Derryvarroge Grassland

Derryvarroge Grassland			
Survey Date: 23/08/2018	**Surveyors:** PF and BK	**Townland:** Derryvarroge	**Folio Number(s):** KE20273F
Figure: 52		**Grid Reference:** 680511, 733901	
			
		Habitats Present: GS4	**Correspondence with Annex I:** None (see comments below)
Comments: This polygon comprises a slight depression in a reclaimed cutover peat field. There is a drainage channel running through the field, dominated by grassland vegetation which was dry during the field visit. The grassland is poached and heavily grazed by horses. The centre of the depression comprises approximately 50% bare peat. Species present include soft rush (*Juncus effusus*), creeping buttercup (*Ranunculus repens*), marsh pennywort (*Hydrocotyle vulgaris*), ragwort (*Senecio jacobaea*), cat's-ear (*Hypochaeris radicata*), and self-heal (*Prunella vulgaris*). No fen indicator species were recorded during the survey. This polygon does not comprise a fen habitat and has no links to Annex I habitats.			
Biodiversity Value: Local importance (lower value)			

Table 5.87: Derrycrib Woodland

Derrycrib Woodland			
Survey Date: 23/08/2018	**Surveyors:** PF and BK	**Townland:** Derrycrib	**Folio Number(s):** KE8249N
Figure: 52		**Grid Reference:** 680915, 733916	

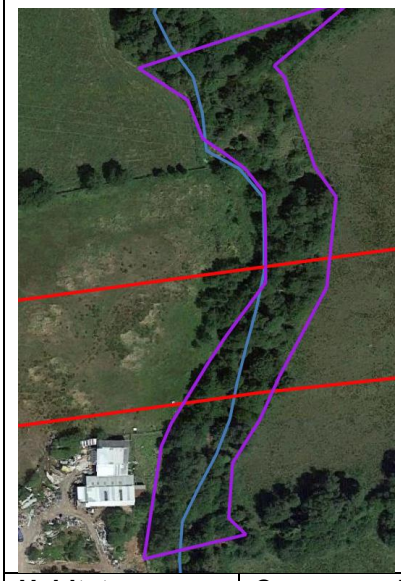
Habitats Present: WN7	**Correspondence with Annex I:** None (see comments below)

Comments:
Area of birch (*Betula pubescens*) woodland (WN7) with trees to 8m. Willow (*Salix* sp.) are present in the understory on mineral soil. The ground layer is dominated by grass species and bracken (*Pteridium aquilinum*). Additional tree species present include elder (*Sorbus aucuparia*), hawthorn (*Crataegus monogyna*), and grey willow (*Salix cinerea*). Ivy (*Hedera helix*) is present growing on trees. The area is dry underfoot and there is an absence of *Sphagnum* moss, indicating that this area does not correspond to Annex I quality bog woodland.

Biodiversity Value: Local importance (lower value)

Table 5.88: Newtownmoneenluggagh Woodland

Newtownmoneenluggagh Woodland			
Survey Date: 24/08/2018	**Surveyors:** PF and BK	**Townland:** Newtownmoneenluggagh	**Folio Number(s):** KE8901N
Figure: 53		**Grid Reference:** 682040, 734482	



Habitats Present: WD1/WN6	**Correspondence with Annex I:** None (see comments below)

Comments:
This is a small area of mixed deciduous woodland (WD1) occurring along the river. Species present include alder (*Alnus glutinosa*), grey willow (*Salix cinerea*), Scots pine (*Pinus sylvestris*), beech (*Fagus sylvatica*), hawthorn (Crataegus monogyna), elder (*Sambucus nigra*), ivy (*Hedera helix*), ash (*Fraxinus excelsior*) and birch (*Betula pubescens*). The ground layer is dominated by ivy, nettle (*Urtica dioica*), hedge bindweed (*Calystegia sepium*), brambles (*Rubus fruticosus* agg.) and greater willowherb (*Epilobium hirsutum*). The river channel is 3m wide and 2.5m deep, with very steep banks. There are no wetland indicator species present, with the exception of a few reed canary grass plants (*Phalaris arundinacea*) and watercress (*Narsturtium officinale*). This area does not appear to be subject to regular flooding and should be classified as WN6/WD1. This area has no correspondence to Annex I quality alluvial woodland. No links to Annex I alluvial woodland.

Biodiversity Value: Local importance (higher value)

Table 5.89: Barreen Woodland

<table>
<tr><th colspan="4">Barreen Woodland</th></tr>
<tr><td>Survey Date: 24/08/2018</td><td>Surveyors: PF and BK</td><td>Townland: Barreen</td><td>Folio Number(s): KE3088F</td></tr>
<tr><td colspan="2">Figure: 55</td><td colspan="2">Grid Reference: 688621, 734115</td></tr>
<tr><td colspan="2">  </td><td colspan="2">  </td></tr>
<tr><td colspan="2"></td><td>Habitats Present: WD2</td><td>Correspondence with Annex I: None (see comments below)</td></tr>
<tr><td colspan="4">Comments:
Narrow band of mixed broadleaved/conifer woodland (WD2) along edge of road, and on either side of a small stream / drainage ditch. Trees are up to 20m high. Main tree species present include Cypress (Cypress sp.), Scots pine (Pinus sylvestris), ash (Fraxinus excelsior), with hawthorn (Crataegus monogyna), ivy (Hedera helix), hazel (Corylus avellana), and elm (Ulmus sp.). The ground layer is comprised of ivy, brambles (Rubus fruticosus agg.), hogweed (Heracleum sphondylium), honeysuckle (Lonicera periclymenum), lords and ladies (Arum maculatum), nettles (Urtica dioica), herb robert (Geranium robertianum) and hart’s tongue fern (Asplenium scolopendrium). This area should classified as WL2 or a very narrow area of WD2.</td></tr>
<tr><td colspan="4">Biodiversity Value: Local importance (higher value)</td></tr>
</table>

Annex E – Results of Non-Annex Habitats 2019

Table 5.90: Breaghmore Grassland

Breaghmore Grassland			
Survey Date: 02/09/2019	**Surveyors:** MCG and BK	**Townland:** Breaghmore, Cloghanmore	**Folio Number(s):** OY24666F
Figure: 25		**Grid Reference (ITM):** 614556, 705241	
			
		Habitats Present: GS4 / GA1	**Correspondence with Annex I:** None (see comments below)
Comments: This area appears to have been previously improved and typical species of improved agricultural grasslands (GA1) are still present, including perennial rye grass (*Lolium perenne*), white clover (*Trifolium repens*), and creeping buttercup (*Ranunculus repens*). Cattle poaching visible, but cattle only seem to pass through this area. Water visible at the surface in many locations throughout the polygon. Dominant species are Meadowsweet (*Filipendula ulmaria*), Purple Loosestrife (*Lythrum salicaria*), Yellow Iris (*Iris pseudacorus*), Water mint (*Menthe aquatica*), Soft Rush (*Juncus effusus*), and hard rush (*Juncus inflexus*). Other species present include Water forget-me-not (*Myosotis scorpioides*), brooklime (*Veronica beccabunga*), Curled Dock (*Rumex crispus*), and Marsh Bed-straw (*Galium palustre*). Young Grey Willow (*Salix cinerea*), Alder (*Alnus glutinosa*) and Hawthorn (*Crataegus monogyna)* scattered throughout the area. There is a small area of Bramble (*Rubus fruticosus* agg.) scrub, with some Dog Rose (*Rosa canina*) present, but the majority of the polygon is open grassland. A drainage ditch is present along the eastern boundary with Bulrush (*Typha latifolia*) and bindweed (*Calystegia* sp.). Towards the southern end of the polygon a stream runs through and there is a cattle crossing point. The field across the stream is improved GA1. There was one small area of open water at base of Willow tree with Horsetail (*Equisetum* sp.) and Water Mint present. A clump of Common Fleabane (*Pulicaria dysenterica*) was noted at the eastern field boundary to the south of the wet grassland area.			
Biodiversity Value: Local importance (higher value)			
Potential Occurrence of Annex II species: None			

Table 5.91: Rathmore Spring

Rathmore Spring			
Survey Date: 02/09/2019	**Surveyors:** MCG (JD also present)	**Townland:** Rath More	**Folio Number(s):** OY7549F
Figure: 22		**Grid Reference (ITM):** 608665, 697789	

Habitats Present: GS4 / GA1	**Correspondence with Annex I:** None (see comments below)

Comments:
This area is not a spring. A stream enters this polygon but does not exit. The area is wet, with water visible at the surface in the lower lying parts of the polygon. Water from surrounding drainage ditches are received in this area which is dominated by Amphibious Bistort (*Persicaria amphibia*) and Water Mint (*Menthe aquatica*). The edges are dominated by Bramble (*Rubus fruticosus* agg.) and Purple Loosestrife (*Lythrum salicaria*). Clumps of moss were visible hanging from the branches of Willow (*Salix* sp.) trees at the western extent of the polygon, indicating that this area floods in winter.

Biodiversity Value: Local importance (lower value)

Potential Occurrence of Annex II species: None

Annex F – Results of Non-Annex Habitats 2020

Table 5.92: Raw Water Intake and Pumping Station

RWI&PS			
Survey Date: 10/08/2020 and 11/08/2020	**Surveyors:** PC MCG	**Townland:** Garrynatineel	**Folio Number(s):** TY56782F, TY29677N, TY30727N, TY3049N
Figure: 6		**Grid Reference:** 570018, 670249	

Habitats Present: WD2 (western part of the site), WD4 (eastern part of the site)	**Correspondence with Annex I:** None (see comments below)

Comments:
The western part of the site is comprised of mixed broadleaved conifer woodland (WD2), while the eastern section is covered by mature conifer plantation (WD4). Regular shallow drains run through the area of conifer plantation and the understory is virtually absent, with the exception of common tamarisk-moss (*Thuidium tamariscinum*) and ivy (*Hedera helix*). A row of mature oak (*Quercus* sp.*)* occurs along the western edge of the conifer plantation.
The canopy of the mixed woodland is dominated by rusty willow (*Salix cinerea subsp. olefolia*), hazel (*Corylus avellana*), and Sitka Spruce (*Picea sitchensis*). There is a high level of Ivy cover on the mature trees, with honeysuckle (*Lonicera periclymenum*) also present on trees and in the ground layer. The ground layer is dominated by enchanter's-nightshade (*Circaea lutetiana*), wood-sorrel (*Oxalis acetosella*), scaly male-fern (*Dryopteris affinis*), broad buckler-fern (*Dryopteris dilatata*), and soft shield Fern (*Polystitchum setiferum*). Other species present included Herb Robert (*Geranium robertianum*), Ash (*Fraxinus excelsior*) saplings, false-brome (*Brachypodium sylvaticaum*), bramble (*Rubus fruticosus agg.*), common tamarisk-moss, and yellow pimpernel (*Lysmachia nemorum*). Relevé data collected at this site is presented in Table 5.93.
The habitat is similar to that described following a previous survey by WSI in June 2016. There have been no notable changes in land-use in the area and the species composition remains very similar.

Biodiversity Value: Local importance (lower value)

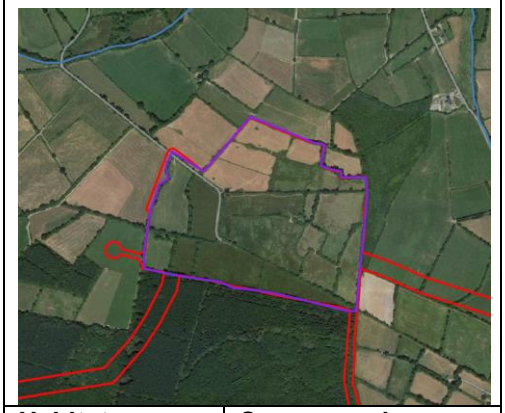
Table 5.93: RWI&PS Site Relevé Data

Relevé Data	**Relevé Number**
	Relevé 1
Easting (ITM)	570018
Northing (ITM)	670249
Size m^2	100
Slope (degrees)	<5
Aspect	North
Substrate type	Alluvial deposit

Relevé Data	Relevé Number
	Relevé 1
Substrate stability	Very Firm
Management	Forestry
Adjacent land use	Forestry
Grazing evidence (within relevé)	No evidence of grazing
Number of Plant Species in Quadrat	22
Height Tree layer (cm)	25000
Height Shrub layer (cm)	10000-12000
Height Herb layer (cm)	50
Total Vegetation cover (%)	90
Tree cover (%)	60
Shrub cover (%)	0
Herb Grass cover (%)	75
Bryophyte cover (%)	70
Litter cover (%)	0
Rock cover (%)	0
Bare peat / soil cover (%)	0
Species Scientific Name	**Species Cover (Domin Scale)**
Brachypodium sylvaticum	3
Circaea lutetiana	4
Climacium dendroides	4
Corylus avellana	5
Crataegus monogyna	1
Dryopteris affinis	4
Dryopteris dilatata	6
Fraxinus excelsior	2
Geranium robertianum	+
Geum urbanum	2
Hedera helix	5
Hypericum adrosaemum	+
Lathyris sp.	+
Lonicera periclymenum	4
Lysimachia nemorum	2
Oxalis acetosella	5
Picea sitchensis	6
Polystitchum setiferum	3
Quercus robur	2
Rubus fruticosus agg	3
Salix cinerea subsp. *oleifolia*	7
Thuidium tamarscinum	8

Table 5.94: Water Treatment Plant

WTP			
Survey Date: 10/08/2020	**Surveyors:** PC MCG	**Townland:** Inchabeg	**Folio Number(s):** TY32282N, TY2819N, TY31162N
Figure: 6		**Grid Reference:** 572217, 670679	



Habitats Present: GS4/WL2	**Correspondence with Annex I:** None (see comments below)

Comments:
This site is comprised of species poor wet grassland (GS4), with treelines (WL2) present along field boundaries.
The entire site is grazed by cattle. Soft rush (*Juncus effusus*) is abundant throughout the site, with yorkshire fog (*Holcus lanatus*), white clover (*Trifolium repens*), creeping buttercup (*Ranunculus repens*) ragwort (*Senecio jacobea*), and marsh thistle (*Cirsium palustre*) also present. The treelines at this site are generally comprised of willow (*Salix sp.*), hawthorn (*Crataegus monogyna*), and blackthorn (*Prunus spinosa*). The understory is overgrown by bramble (*Rubus fruticosus agg.)* and gorse (*Ulex europeaus*) in sections. An abandoned dwelling in the centre of the site was identified as a potential bat roost.
Targeted bat surveys were also carried out at this site in 2020 and 2022, the results of which determined that this building is used as a night-time bat roost (EIAR Appendix A8.9: Bat Surveys Report). Details of a relevé recorded in the centre of the site are provided in Table 5.95. There has been no change in the habitat or land use at this site since it was previously surveyed by WSI in 2017.

Biodiversity Value: Local importance (lower value)

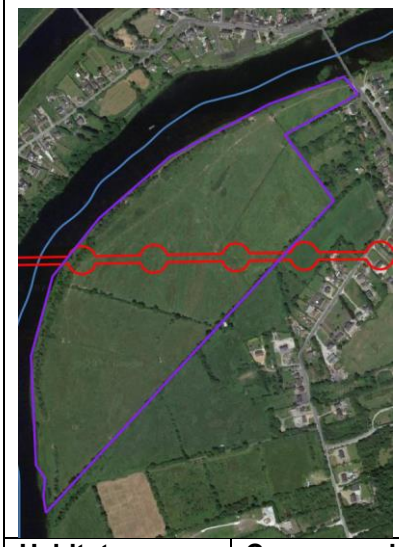
Table 5.95: WTP Relevé Data

Relevé Data	**Relevé Number**
	Relevé 1
Easting (ITM)	572217
Northing (ITM)	670679
Size m^2	4
Slope (degrees)	5
Aspect	West
Substrate type	Mineral Soil
Substrate stability	Firm
Management	Grazing – Cattle
Adjacent land use	Forestry
Grazing evidence (within relevé)	Grazing - Cattle
Number of Plant Species in Quadrat	7
Height Tree layer (cm)	0
Height Shrub layer (cm)	0

Relevé Data	Relevé Number
	Relevé 1
Height Herb layer (cm)	20
Total Vegetation cover (%)	100
Tree cover (%)	0
Shrub cover (%)	0
Herb Grass cover (%)	100
Bryophyte cover (%)	0
Litter cover (%)	0
Rock cover (%)	0
Bare peat / soil cover (%)	0
Species Scientific Name	**Species Cover (Domin Scale)**
Agrostis stolonifera	3
Holcus lanatus	8
Juncus articulatus	3
Juncus effusus	5
Lotus pedunculatus	4
Ranunculus repens	3
Trifolium repens	4

Table 5.96: Mountpellier Grassland (38 kV Uprate)

Mountpellier Grassland (38 kV Uprate)			
Survey Date: 31/08/2020	**Surveyors:** PC MCG	**Townland:** Mountpellier	**Folio Number(s):** LK5775F
Figure: 3		**Grid Reference:** 566050, 666615	



Habitats Present: GA1/GS4	**Correspondence with Annex I:** None (see comments below)

Comments:
This site is comprised of improved agricultural grassland (GA1) with pockets of species poor wet grassland (GS4) present in hollows. There is a raised access track present from the field gate running parallel to the northern part of the site. The grassland field grades into the river along a small section of
the northern site boundary. The vegetation present along the river margin in this area includes yellow flag iris (*Iris pseudocarus*), common club-rush (*Schoenoplectus lacustris*), hairy willowherb (*Epilobium hirsutum),* silverweed (*Potentilla anserina*), and water mint (*Mentha aquatica*).
Most of the northern site boundary, which adjoins the River Shannon, is comprised of a hawthorn (*Crataegus monogyna*) hedgerow on an embankment, with encroaching gorse (*Ulex europaeus*) scrub along the base. The majority of the site is cattle grazed, however a small section in the east is fenced off and is grazed by horses. This area is also separated from the main field by a drainage ditch (FW4), which is approximately 1.5m wide, with standing water. This ditch is vegetated with purple loosestrife (*Lythrum salicaria*), willow (*Salix sp.*), yellow-flag iris, meadowsweet (*Fillipendula ulmaria*), and tufted hair grass (*Deschampsia cespitosa*), and branched bur-reed (*Sparganium erectum*).
Poleset 67 occurs within an area of scrub (WS1) (up to 3m high) which occurs along the same embankment as
the hedgerow. Species present include blackthorn (*Prunus spinosa*), holly (*Ilex aquifolium*), hawthorn, ivy (*Hedera helix*), and bramble (*Rubus fruticosus agg.*). Full details of the relevé collected at this location is presented in Table 5.97.
Polesets 67B, 68B and 69B occur within this grassland. The site is undulating, with pockets of iris and Yorkshire fog (*Holcus lanatus*) present in the hollows. The areas of improved agricultural grassland (GA1) are dominated by perennial rye-grass (*Lolium perenne*), bent grass (*Agrostis sp.),* creeping buttercup (*Ranunculus repens*), white clover (*Trifolium repens*), and soft rush (*Juncus effusus*). Details of relevés collected in an area of improved grassland and a wet grassland hollow in proximity to existing overhead line structures are presented in Table 5.97.
This site has not been previously surveyed by WSI.

Biodiversity Value: Local importance (lower value)

Table 5.97: Mountpellier (38 kV Uprate) Relevé Results

Relevé Data	Relevé Number		
	Relevé 1	**Relevé 2**	**Relevé 3**
Easting (ITM)	565795	565851	
Northing (ITM)	666461	666470	
Size m^2	4	4	4
Slope (degrees)	Flat	Flat	Flat
Aspect	NA	NA	NA
Substrate type	Mineral Soil	Mineral Soil	Mineral Soil
Substrate stability	Firm	Firm	Firm
Management	Grazing – Cattle	Grazing – Cattle	Grazing – Cattle
Adjacent land use	Forestry	Grazing – Cattle	Grazing – Cattle
Grazing evidence (within relevé)	No Evidence of Grazing	Yes – Cattle Grazed	Yes – Cattle Grazed
Number of Plant Species in Quadrat	7	5	5
Height Tree layer (cm)	6	0	0
Height Shrub layer (cm)	3	0	0
Height Herb layer (cm)	NA	30	20
Total Vegetation cover (%)	100	100	100
Tree cover (%)	15	0	0
Shrub cover (%)	95	0	0
Herb Grass cover (%)	0	100	95
Bryophyte cover (%)	0	0	0
Litter cover (%)	10	0	5
Rock cover (%)	0	0	0
Bare peat / soil cover (%)	90	0	0
Species Scientific Name	**Species Cover (Domin Scale)**		
Agrostis sp.	-	-	3
Crataegus monogyna	4	-	-
Holcus lanatus	-	9	-
Ilex aquifolium	4	-	-
Iris pseudacorus	1	5	-
Galium palustre	-	1	-
Lolium perenne	-	-	9
Prunus spinosa	5	-	-
Ranunculus acris	-	1	-
Ranunculus repens	-	1	5
Rubus fruticosus agg	7	-	-
Salix cinerea subsp. cinerea	4	-	-
Trifolium repens	-	-	4
Urtica dioica	4	-	-

Table 5.98: Grassland Near Lough Ourna

Grassland Near Lough Ourna			
Survey Date: August 2020	**Surveyors:** NA	**Townland:** Loughourna	**Folio Number(s):** TY18417N
Figure: 13		**Grid Reference:** 586426, 684766	
			
Habitats Present: GS2		**Correspondence with Annex I:** None (see comments below)	
Comments: This area was only surveyed from a distance as land access was not permitted. The site has been identified as a potential wetland / semi-natural grassland site. From a distance, an area of dry meadow and grassy verge vegetation (GS2) on disturbed ground was observed. Species that could be identified were Ragwort (*Senecio jacobea),* Willow (*Salix sp.),* and European Gorse (*Ulex europeaus*). No wetland indicators were observed. From aerial imagery it appears that there is a pond present at the site, however this could not be viewed from the roadside. This site was also assessed from the roadside in 2021 (Annex G).			
Biodiversity Value: NA			

Annex G – Results of Non-Annex I Habitats 2021

Table 5.99: Rowing Club Grassland

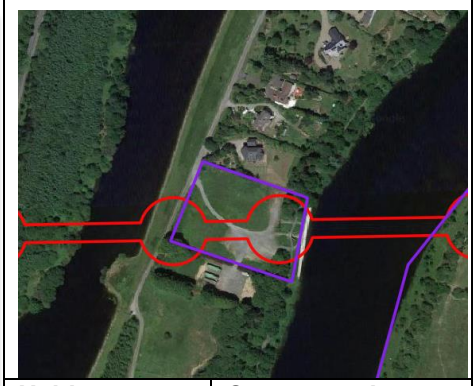
Rowing Club Grassland			
Survey Date: 17/09/2021	**Surveyors:** JC	**Townland:** Ardataggle	**Folio Number(s):** CE49781F
Figure: 3		**Grid Reference:** 565503, 666449	
			
		Habitats Present: GS2	**Correspondence with Annex I:** None (see comments below)
Comments: Although these lands were not accessed, a visual inspection from the road to the west reveals that the area is dominated by a species-poor and semi-improved meadow grassland (GS2) vegetation with a high cover of cocks foot. Other frequent species include ribwort plantain, dandelion, broadleaved dock, tufted vetch, perennial rye grass and Yorkshire fog. The vegetation does have a locally high cover of perennial rye-grass, creeping thistle and dandelion which does suggest a degree of nutrient enrichment/improvement. There was no grazing evident on the day of survey. A small gravel car parking area also occurs within the site.			
Biodiversity Value: Local importance (lower value)			

Table 5.100: Rowing Club Grasslands Species List

Scientific name	English name	Relative abundance
Anthoxanthum odoratum	Sweet vernal-grass	Frequent
Cirsium arvense	Creeping thistle	Frequent
Dactylis glomerata	Cocks foot	Dominant
Holcus lanatus	Yorkshire fog	Abundant
Juncus inflexus	Hard rush	Frequent
Lolium perenne	Perennial rye-grass	Abundant
Lolium perenne	Perennial rye-grass	Occasional
Plantago lanceolata	Ribwort plantain	Abundant
Plantago major	Greater plantain	Frequent
Poa annua	Annual meadow-grass	Frequent
Poa pratensis	Common meadow-grass	Frequent
Potentilla anserina	Silverweed	Occasional
Ranunculus acris	Meadow buttercup	Occasional
Ranunculus repens	Creeping buttercup	Frequent
Rumex acetosa	Common sorrel	Frequent
Rumex obtusifolius	Broadleaved dock	Frequent
Senecio jacobea	Ragwort	Occasional
Taraxacum officinale	Dandelion	Frequent

Scientific name	English name	Relative abundance
Trifolium pratense	Red clover	Occasional
Trifolium repens	White clover	Frequent
Urtica dioica	Common nettle	Occasional
Vicia cracca	Tufted vetch	Rare

Table 5.101: Grassland Near Lough Ourna

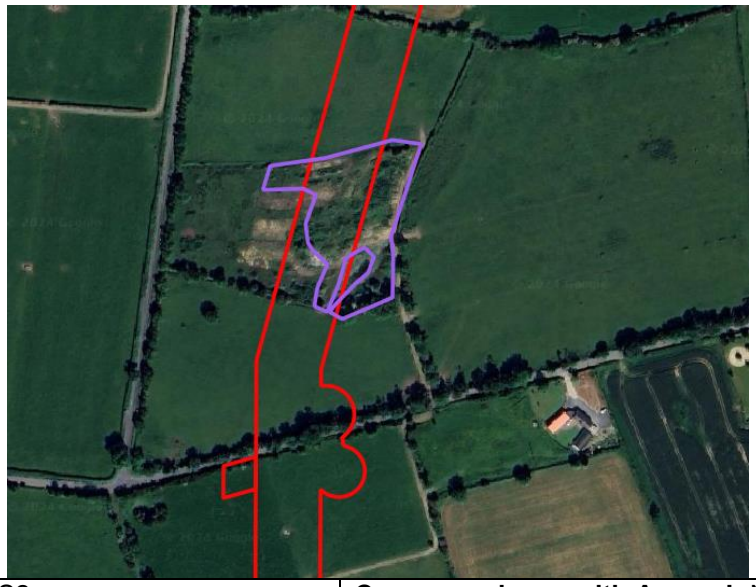
Grassland Near Lough Ourna			
Survey Date: 18/09/2021	**Surveyors:** JC	**Townland:** Loughourna	**Folio Number(s):** TY18417N
Figure: 13		**Grid Reference:** 586399, 684770	
			
Habitats Present: GS2		**Correspondence with Annex I:** None (see comments below)	
Comments: Plot dominated by typical improved grassland (GA1). The proposed route passes through an area dominated by topsoil and a small pond which is visible on aerial photographs. The area was not accessed on the day due to land access issues, however a visual check from the public road to the north reveals that the area is now dominated by piles of deposited topsoil/stone partly colonised by a weedy/ruderal vegetation which includes common nettle (*Urtica dioica*), creeping thistle (*Cirsium arvense*), Yorkshire fog (*Holcus lanatus*) and ragwort (*Senecio jacobea*). A small pond feature occurs within the survey area however the current status/condition of this pond is not known. This pond appears on the OS maps of the early 1800s.			
Biodiversity Value: Local importance (lower value)			

Table 5.102: Derryvaroge Grassland and Woodland

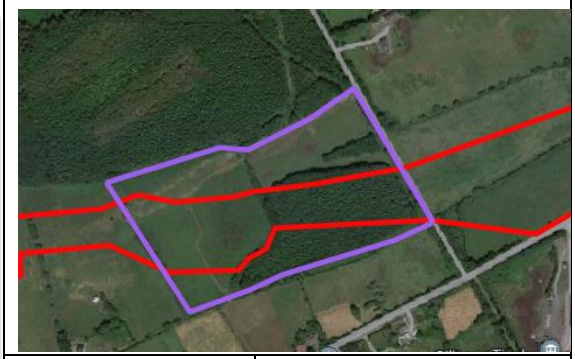
Derryvaroge Grasslands and Woodland			
Survey Date: 24/09/2021	**Surveyors:** JC	**Townland:** Derryvaroge	**Folio Number(s):** KE14637F, KE43525F
Figure: 52		**Grid Reference:** 679057, 733978	
			
Habitats Present: GA1, WD4, GS2, GM1		**Correspondence with Annex I:** None (see comments below)	
Comments: The eastern area of this survey site is a small field which is dominated by improved grassland vegetation (GA1) with a typical flora which was seen to be heavily grazed by horses on the day of survey. An area of young conifer plantation (WD4) dominated by Sitka spruce lies to the south. The western area is ungrazed and dominated by GS2 meadow grassland and GM1 marsh vegetation. The marsh dominates the eastern half of the area and is characterised by a high cover of meadowsweet (50 to 80%) with abundant Yorkshire fog and buttercup. The areas of meadow grassland which occur tend to be relatively species-poor and dominated by cocks foot with frequent creeping buttercup, meadow buttercup, false oat-grass and red clover.			
Biodiversity Value: Local importance (lower value)			

Table 5.103: Derryvaroge Grasslands and Woodland Species List for GA1 Habitat

Scientific name	English name	Relative abundance
Achillea millefolium	Yarrow	Abundant
Arrhenatherum elatius	False oat-grass	Frequent
Capsella bursa-pastoris	Shepherd's purse	Occasional
Cerastium fontanum	Common mouse-ear	Occasional
Dactylis glomerata	Cocks foot	Abundant
Holcus lanatus	Yorkshire fog	Abundant
Lolium perenne	Perennial rye-grass	Abundant
Odontities vernus	Red bartsia	Frequent
Plantago lanceolata	Ribwort plantain	Frequent
Plantago major	Greater plantain	Frequent
Potentilla reptans	Creeping cinquefoil	Frequent
Ranunculus acris	Meadow buttercup	Frequent
Ranunculus repens	Creeping buttercup	Frequent
Rumex obtusifolius	Broadleaved dock	Abundant
Senecio jacobea	Ragwort	Occasional
Sherardia arvensis	Field madder	Occasional
Taraxacum officinale	Dandelion	Frequent
Trifolium repens	White clover	Abundant

Scientific name	English name	Relative abundance
Urtica dioica	Common nettle	Occasional
Vicia cracca	Tufted vetch	Occasional

Table 5.104: Derryvaroge Grasslands and Woodland Species List for GS2 Habitat

Scientific name	English name	Relative abundance
Achillea millefolium	Yarrow	Frequent
Arrhenatherum elatius	False oat-grass	Abundant
Cerastium fontanum	Common mouse-ear	Rare
Cirsium arvense	Creeping thistle	Occasional
Dactylis glomerata	Cocks foot	Dominant
Holcus lanatus	Yorkshire fog	Abundant
Lathyrus pratensis	Meadow vetchling	Occasional
Plantago lanceolata	Ribwort plantain	Frequent
Ranunculus acris	Meadow buttercup	Frequent
Ranunculus repens	Creeping buttercup	Abundant
Rumex crispus	Curled dock	Occasional
Senecio jacobea	Ragwort	Occasional
Trifolium pratense	Red clover	Abundant
Trifolium repens	White clover	Frequent
Urtica dioica	Common nettle	Occasional
Vicia cracca	Tufted vetch	Occasional

Table 5.105: Derryvaroge Grasslands and Woodland Species List for GM1 Habitat

Scientific name	English name	Relative abundance
Agrostis stolonifera	Creeping bent	Frequent
Anthoxanthum odoratum	Sweet vernal-grass	Frequent
Carex hirta	Hairy sedge	Occasional
Cirsium palustre	Marsh thistle	Occasional
Filipendula ulmaria	Meadowsweet	Dominant
Holcus lanatus	Yorkshire fog	Abundant
Juncus effusus	Soft rush	Rare
Lathyrus pratensis	Meadow vetchling	Frequent
Potentilla anserina	Silverweed	Occasional
Potentilla erecta	Tormentil	Frequent
Ranunculus repens	Creeping buttercup	Frequent
Rumex acetosa	Common sorrel	Occasional
Senecio jacobea	Ragwort	Rare
Stellaria graminea	Common stitchwort	Rare
Trifolium repens	White clover	Occasional
Vicia cracca	Tufted vetch	Frequent

Table 5.106: Coologmartin Grasslands

Coologmartin Grasslands			
Survey Date: 24/09/2021	**Surveyors:** JC	**Townland:** Coologmartin	**Folio Number(s):** KE11115N, KE6878N, KE58576F
Figure: 51		**Grid Reference:** 677432, 733581	

Habitats Present: GA1, GS4, GM1	**Correspondence with Annex I:** None (see comments below)

Comments:
Most of this extensive, flat area corresponds to improved grassland (GA1) dominated by species such as Yorkshire fog, perennial ryegrass, ribwort plantain and white clover, with occasional smaller areas of semi-improved wet grassland (GS4) (Table 5.107) which have a high cover of silverweed and creeping buttercup. The majority of the area is moderately grazed by horses.
A shallow drain occurs in the middle of the area and contains a range of common wetland plant species such as fools watercress, purple loosestrife, creeping bent, speedwell and watercress.
A small area of marsh (GM1) vegetation dominated by saft rush, meadow sweet and silverweed occurs at the western end of the survey area, all species recorded in this habitat are listed in Table 5.108.

Biodiversity Value: Local importance (lower value)

Table 5.107: Coologmartin Grasslands Species List

Scientific name	English name	Relative abundance
Achillea millefolium	Yarrow	Occasional
Agrostis capillaris	Common bent grass	Frequent
Agrostis stolonifera	Creeping bent	Frequent
Capsella bursa-pastoris	Shepherd's purse	Rare
Carex disticha	Brown sedge	Rare
Cerastium fontanum	Common mouse-ear	Occasional
Dactylis glomerata	Cocks foot	Frequent
Festuca rubra	Red fescue	Frequent
Filipendula ulmaria	Meadowsweet	Rare
Holcus lanatus	Yorkshire fog	Abundant
Hypochoeris radicata	Cat's ear	Occasional
Juncus effusus	Soft rush	Rare
Lolium perenne	Perennial rye-grass	Abundant
Odontities vernus	Red bartsia	Occasional
Plantago lanceolata	Ribwort plantain	Abundant
Plantago major	Greater plantain	Occasional
Poa annua	Annual meadow grass	Occasional
Potentilla anserina	Silverweed	Abundant
Prunella vulgaris	Self heal	Rare
Ranunculus repens	Creeping buttercup	Abundant
Rhinanthus minor	Yellow rattle	Rare
Rumex acetosa	Common sorrel	Frequent

Scientific name	English name	Relative abundance
Rumex acetosella	Sheep's sorrel	Occasional
Rumex obtusifolius	Broadleaved dock	Occasional
Scorzonerioides autumnalis	Autumn hawkbit	Frequent
Senecio jacobea	Ragwort	Occasional
Stellaria gramineae	Common stitchwort	Occasional
Taraxacum officinale	Dandelion	Frequent
Trifolium pratense	Red clover	Frequent
Trifolium repens	White clover	Abundant
Urtica dioica	Common nettle	Occasional

Table 5.108: Coologmartin Marsh Species List

Scientific name	English name	Relative abundance
Agrostis stolonifera	Creeping bent	Frequent
Anthoxanthum odoratum	Sweet vernal-grass	Frequent
Arrhenatherum elatius	False oat-grass	Frequent
Centaurea nigra	Knapweed	Occasional
Dactylis glomerata	Cocks foot	Frequent
Festuca rubra	Red fescue	Abundant
Filipendula ulmaria	Meadowsweet	Abundant
Holcus lanatus	Yorkshire fog	Abundant
Juncus effusus	Soft rush	Abundant
Lythrum salicaria	Purple loosestrife	Rare
Plantago lanceolata	Ribwort plantain	Abundant
Potentilla anserina	Silverweed	Frequent
Potentilla erecta	Tormentil	Occasional
Ranunculus repens	Creeping buttercup	Frequent
Rumex acetosa	Common sorrel	Frequent
Stachys palustris	Marsh woundwort	Occasional
Stellaria gramineae	Common stitchwort	Rare
Succisa pratensis	Devil's bit scabious	Occasional