

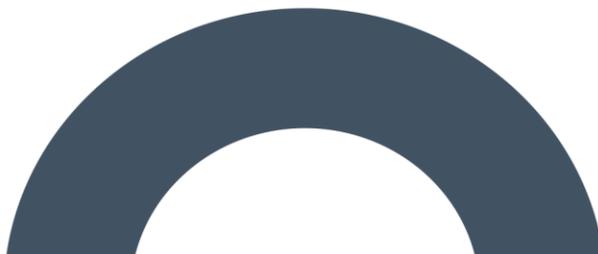


APPENDIX 6-3

AQUATIC MACROINVERTEBRATE SAMPLING REPORT

Appendix 6-3 - Aquatic Macroinvertebrate Sampling Report

Seven Hills Wind Farm, Co.
Roscommon





DOCUMENT DETAILS

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1. INTRODUCTION

MKO were commissioned to conduct a biological assessment of water quality within the rivers and streams located downstream of the site of the proposed Seven Hills Wind Farm. The ecological survey work was conducted during March 2021 by Patrick Ellison (B.Sc., MSc. ACIEEM) and Katie Pender (B.Sc.) of MKO.

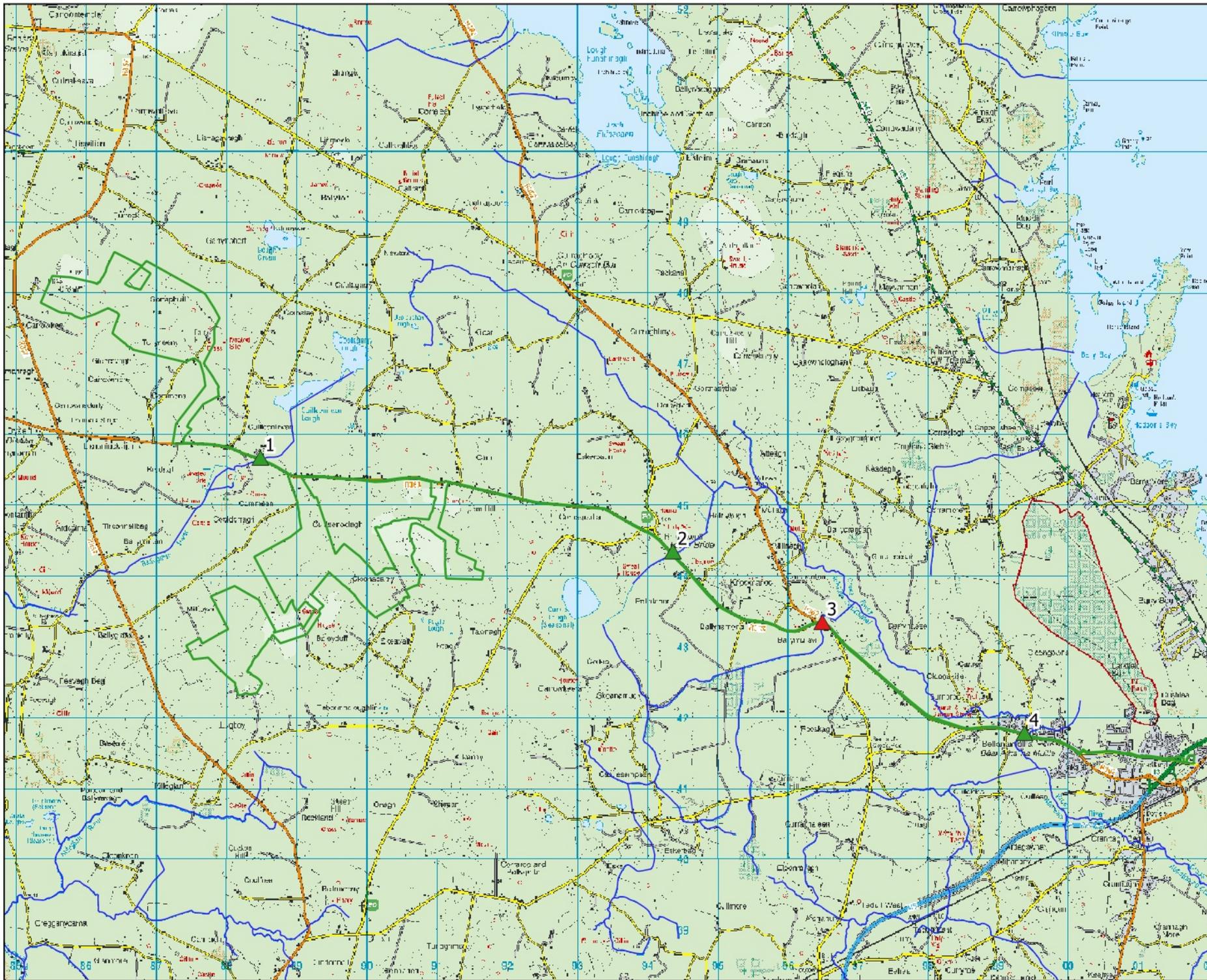
Macro-invertebrate sampling methodology was used to carry out water quality assessment; this work was carried out downstream of the EIAR Site Boundary at 4 identified locations on the 30th March 2021. Watercourses were assessed where these were accessible via the R363 and were located downstream of the Proposed Development. The locations of each watercourse surveyed are provided in Figure 1-1 of this report.

Biological water quality was assessed through kick-sampling of each of these watercourses. All riverine samples were taken with a standard kick sampling hand net (250mm width, 500µm mesh size) from areas of riffle/glides (where present) utilising a two-minute period of sampling effort, as per ISO standards for water quality sampling (ISO 10870:2012). Large cobble was also washed at each site where present. Macro-invertebrate samples were subsequently converted to Q-ratings as per Toner et al. (2005)¹. The applied Q ratings followed the EPA water quality classes and Water Framework Directive status categories. The results of the surveys at the 4 identified locations are provided below.

1.1 Statement of Authority

Field surveys were undertaken by Patrick Ellison (B.Sc., M.Sc. ACIEEM) and Katie Pender (B.Sc.) of MKO on 30th March 2021. Patrick is an experienced ecologist who has over 6 years' experience working in ecological consultancy. This report has been reviewed by John Hynes (B.Sc., M.Sc., MCIEEM). John is a highly experienced ecologist who has over 10 years' professional experience in environmental management and ecological assessment and is a full member of the Institute of Ecology and Environmental Management (CIEEM).

¹ Toner, P., Bowman, J., Clabby, K., Lucey, J., McGarrigle, M., Concannon, C., & MacGarthaigh, M. (2005). *Water quality in Ireland 2001-2003*. Environmental Protection Agency, Co. Wexford, Ireland.



Map Legend

Kick Sampling Stations (30.03.2021):

- ▲ Sampled
- ▲ Not sampled (unsafe)
- River Waterbodies (Water Framework Directive)
- EIAR Site Boundary



Macroinvertebrate Sample Station Locations

Seven Hills Wind Farm

Drawn By	Checked By
PE	JH
Project No.	Figure No.
190907	1-1
Scale	Date
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2. RESULTS

The following sections outline the findings of the water quality assessments for each of the sampling locations.

2.1 Sample Station 1

Sample Station 1 is located approximately 0.5km north-west of the EIAR Site Boundary at its closest point and is within the Ballyglass_10 waterbody [ID Code: IE_SH_26B150840] which is within the Upper Shannon catchment (WFD catchment ID: 26D) and the Suck_SC_090 sub-catchment (WFD sub-catchment ID: 26D_05).

The river was bordered by agricultural grassland and housing with steep banks on both sides of the waterway. The river was moderately fast flowing and approximately 0.5m in depth. The substrate comprised mainly silt, with larger stones and occasional boulders. No riffle sections were present. No in-stream or emergent macrophytes were recorded at the sample point.

The Q rating assigned to the channel at Sample Station 1 was Q3. It was assigned this value as Group A taxa were absent; the sample consisted mainly of Group B and C taxa with *Gammarus* species (Group B) being most abundant. No Group D invertebrates were recorded; however, Group E invertebrates (in the form of oligochaete worms) made up approximately 15% of the sample. The macro invertebrates recorded at this location are provided in Table 2-1.

Table 2-1 Invertebrate Sample Station 1 Results

Indicator Group	Taxon	Approximate abundance count (% of sample)
Group A - Very Pollution Sensitive	None	-
Group B - Moderately Pollution Sensitive	Gammaridae (<i>Gammarus sp.</i>)	30 (54%)
	Trichoptera - Glossosomatidae	2 (4%)
Group C - Moderately Pollution Tolerant	Trichoptera (Uncased)	2 (4%)
	Asellidae (<i>Asellus sp.</i>)	15 (27%)
Group D - Very Pollution Tolerant	None	-
Group E - Most Pollution Tolerant	<i>Lumbriculidae</i>	7 (13%)



Plate 2-1 Sample Station 1, located at E: 188488 N: 245625

2.2

Sample Station 2

Sample Station 2 is located approximately 2.3km east of the EIAR Site Boundary at its closest point and is within the Cross (Roscommon)_020 waterbody [EPA ID code: IE_SH_26C100200]. This sample point occurs within the Upper Shannon catchment (WFD catchment ID: 26G) and the Shannon [Upper]_SC_100 sub-catchment (WFD sub-catchment ID: 26G_2).

The stream was heavily vegetated and choked with water-cress *Nasturtium officinale* in-stream at the sample point. The watercourse was shallow and moderately fast flowing and clear. It had a stony substrate with occasional boulders. Just upstream of the sample station there was a road crossing. There was some evidence of sheep poaching on the southern bank with thick bramble (*Rubus fruticosus agg.*) scrub dominating the steeper bank on the northern side.

Evidence of otter *Lutra lutra* (spraint) was recorded immediately downstream of the road bridge at this location.

The Q rating assigned to the channel at Sample Station 2 was Q3. It was assigned this value as Group A taxa were absent; the sample consisted of Group B and C taxa, with *Asellus* and *Gammarus* species being most abundant. No Group D or Group E invertebrates were recorded. The macro invertebrates recorded at this location are presented in Table 2-2.

Table 2-2 Invertebrate Sample Station 2 Results

Indicator Group	Taxon	Approximate abundance count (% of sample)
Group A - Very Pollution Sensitive	None	-
Group B - Moderately Pollution Sensitive	Gammaridae (<i>Gammarus</i> sp.)	20 (43%)
Group C - Moderately Pollution Tolerant	<i>Asellidae</i> (<i>Asellus</i> sp.)	20 (43%)
	<i>Lymnaeidae</i> (<i>Lymnaea</i>)	2 (4%)
	<i>Dytiscidae</i> (<i>Agabus</i> sp.)	1 (2%)
	<i>Planorbidae</i> (<i>Planorbis</i>)	3 (6%)
Group D - Very Pollution Tolerant	None	-
Group E - Most Pollution Tolerant	None	-



Plate 2-2 Sample Station 2, located at E: 194368 N: 244306.

2.3 Sample Station 3

Sample Station 3 is located approximately 4.4km east of the EIAR Site Boundary at its closest point and, as Sample Station 2, is within the Cross (Roscommon)_020 waterbody [EPA ID code: IE_SH_26C100200]. This sample point occurs within the Upper Shannon catchment (WFD catchment ID: 26G) and the Shannon [Upper]_SC_100 sub-catchment (WFD sub-catchment ID: 26G_2).

The sampling site is bordered by steep banks with riparian vegetation cover including willow *Salix* sp. bramble and nettle (*Urtica dioica*) amongst other species; it is situated beside a road and crossed by a

road bridge just upstream of the sampling location. The river was over 1m in depth here, and fast flowing, and the river-bed appeared to comprise largely of silty substrate.

Due to recent heavy rains and the resulting depth and flow rate of the river at this location, it was not possible to carry out kick sampling at this location, or within 30m up and downstream. No macro invertebrate data was therefore obtained for this Sample Station.



Plate 2-3 Sample Station 3, located at E: 196499 N: 243307.

2.4

Sample Station 4

Sample Station 4 is located approximately 7.5km to the east of the EIAR Site Boundary at its closest point and is on the Cross (Roscommon)_030 [EPA ID Code: IE_SH_26C100300] within the Upper Shannon catchment {WFD Catchment ID: 26G} and the Shannon[Upper]_SC_100 sub-catchment (WFD sub-catchment ID: 26G_2).

No instream or emergent macrophytes were recorded at the sample point. The river was fast flowing, moderately turbid and had a substrate of boulder, cobble and gravel. The river was bordered by agricultural grassland and a road bridge was located immediately upstream of the sample point. Bankside vegetation consisted of dense bramble (*Rubus fruticosus agg.*), with willow (*Salix sp.*) and ash (*Fraxinus excelsior*).

The Q rating assigned to the channel was Q3. It was assigned this value as Group A taxa were absent; the sample consisted of Group B and C taxons with *Asellidae* and *Gammaridae* being most abundant. No Group D or Group E invertebrates were recorded. The macro invertebrates recorded at this location are provided in Table 2-3.

Table 2-3 Invertebrate Sample Station 4 Results

Indicator Group	Taxon	Abundance
Group A - Very Pollution Sensitive	None	-
Group B - Moderately Pollution Sensitive	Gammaridae (<i>Gammarus sp.</i>)	18 (33%)
	Trichoptera (cased) – Glossosomatidae	8 (15%)
	Ephemeroptera - Leptophlebiidae	2 (4%)
Group C - Moderately Pollution Tolerant	<i>Asellidae</i> (<i>Asellus sp.</i>)	20 (36%)
	Gastropoda - Planorbidae	4 (8%)
	Coleoptera (<i>Hydroporus</i>)	3 (5%)
Group D - Very Pollution Tolerant	None	-
Group E - Most Pollution Tolerant	None	-



Plate 2-4 Sample Station 4, located at E: 199387 N: 241737.

3.

CONCLUSION

The surveys summarised within this report included a general habitat assessment in addition to biological water quality assessment using macro-invertebrate sampling methodology at four Sampling Stations where flowing water was present and easily accessible downstream of the Grid Connection route of the proposed Seven Hills Wind Farm development.

One of the specified Sampling Stations could not be sampled as part of this survey, due to due to steep banks, fast water flows and consequently access to the watercourse not being safe. The three sample locations that could be assessed were categorised as being a Q value of Q3 'Moderately polluted'.