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# Robin Rigg Monitoring Cable Route Benthic Macro-Invertebrate Survey Data Report, May 2007

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## 1. Introduction

In order to comply with Marine Environment Monitoring Programme (MEMP) and FEPA licence requirements for the construction of the Robin Rigg Offshore Wind Farm a benthic survey and along the proposed cable route of the wind farm was undertaken on 20th May 2008.

This survey was the second benthic survey of the proposed cable route out of a biannual (twice per year) survey programme.

This technical note summarises the methodology and results of this survey. No data interpretation has been undertaken.

## 2. Method

A benthic survey of the Robin Rigg windfarm site for macro invertebrates was conducted using the fisheries patrol vessel *Solway Protector*. Eight sampling stations were identified along the length of the cable route (**Figure 1**).

Samples were recovered using a 0.1m<sup>2</sup> Day grab. At each sampling station duplicate grab samples were collected. The exact time and location the grab was dropped was recorded using the vessel's Global Positioning System (GPS), while depth was measured using the vessel's sounder. Surface water salinity and temperature were measured using a portable probe<sup>1</sup> and turbidity was measured using a secchi disc.

After a visual assessment of sediment type was made each sample was sieved using a 1mm mesh and the material retained in the sieve was transferred to labelled sample bottles and preserved in 5% formaldehyde. A sediment sub-sample was taken for particle size (PSA) and Total Organic Carbon (TOC) analysis.

Taxonomic identification of the macro-faunal species found in the samples was undertaken by Identechaete, while the PSA and TOC analysis on the sediment samples was undertaken by AES Laboratories<sup>2</sup>. Although duplicate grab samples were taken at each sampling station, in accordance with the approved methodology invertebrate identification, PSA and TOC was only performed on the first sample taken, with the second sample being preserved for reference.

## 3. Results

The physical and environmental data from the survey are recorded in **Table 1.1**.

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<sup>1</sup> Using a WTW Multi 340i pH/Dissolved Oxygen/Conductivity measuring instrument

<sup>2</sup> United Kingdom Accreditation Service (UKAS) accredited laboratory

**Table 1.1 – Sampling station locations and physical data**

Sampling station	Date	Lat	Long	Depth (m)	Salinity (‰)	Water Temp (°C)	Secchi Depth (m)	Visual Sediment Type	Time (GMT)
1	20.5.08	N54°44.8490'	W003°41.5540'	6.92	31.2	11.4	4.0	Fine sand	10.56
2	20.5.08	N54°44.4880'	W003°40.6900'	14.45	30.1	11.4	3.0	Fine sand	11.07
3	20.5.08	N54°44.1530'	W003°39.8940'	20.12	31.5	11.4	3.0	Fine sand	11.14
4	20.5.08	N54°43.8370'	W003°39.1910'	9.75	31.3	11.4	3.0	Fine sand	11.25
5	20.5.08	N54°43.5370'	W003°38.4710'	15.73	31.1	11.4	3.0	Fine sand	11.33
6	20.5.08	N54°43.2280'	W003°37.7350'	10.97	32.3	11.4	3.0	Fine sand	11.41
7	20.5.08	N54°42.5580'	W003°36.1850'	22.34	31.9	11.4	2.5	Fine sand	11.50
8	20.5.08	N54°42.3870'	W003°35.7800'	21.00	31.2	11.4	2.5	Fine sand	12.07

Particle size distributions agree with the visual assessment that sediments in this area are largely comprised of fine sand (Table 1.2). The exceptions to this were sample 3 which contained a larger component of coarse to medium sands; and samples 7 and 8 which contained a larger component of very fine sands (i.e. the sediments from the two most inshore sampling stations contained finer sediment).

Although no statistical analysis has been undertaken it can be seen that generally the invertebrate samples were more diverse (i.e. a larger number of species) and more productive (a larger number of individuals) the closer inshore they were taken (Table 1.3). Samples taken from sampling stations 7 and 8 contained a greater variety of species and larger total number of animals, with bivalves (in particular *Fabulina fibula*, *Abra alba* and *Nucula nitidosa*) being more abundant. The invertebrate found in the other samples appears to be more consistent with an impoverished sand community including fauna such as the amphipod *Bathyporeia* spp. and the polychaete *Nephtys cirrosa*.

**Table 1.2 – Sediment Particle Size (PSA) and Total Organic Carbon (TOC) Analysis**

Sampling station	>4000 $\mu\text{m}$ (%)	4000-2000 $\mu\text{m}$ (%)	2000-1000 $\mu\text{m}$ (%)	1000-500 $\mu\text{m}$ (%)	500-250 $\mu\text{m}$ (%)	250-125 $\mu\text{m}$ (%)	125-63 $\mu\text{m}$ (%)	<63 $\mu\text{m}$ (%)	TOC (g/kg)
1	<0.1	<0.1	0.3	0.8	27.6	48.8	8.5	14.0	4.7
2	<0.1	<0.1	<0.1	<0.1	9.4	87.5	2.0	1.1	1.4
3	1.8	2.7	13.2	55.7	15.2	9.0	1.5	0.9	2.7
4	<0.1	<0.1	<0.1	<0.1	1.6	80.7	15.1	2.6	<1.0
5	<0.1	<0.1	0.1	0.5	31.3	54.0	8.5	5.6	1.2
6	<0.1	<0.1	<0.1	<0.1	11.6	85.6	1.7	1.1	<1.0
7	<0.1	<0.1	<0.1	<0.1	0.2	20.1	66.8	12.9	<1.0
8	<0.1	<0.1	<0.1	<0.1	0.4	23.5	54.9	21.1	3.4

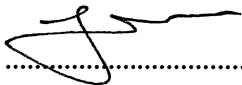
**Table 1.3 – Macro-invertebrate counts from Robin Rigg Windfarm cable route sampling stations**

Sampling Station and Species Counts								
Species	1	2	3	4	5	6	7	8
<i>Nemertea indet.*</i>				1				
<i>Sigalion mathildae</i>							1	2
<i>Eteone flava/longa</i>			1					
<i>Glycera tridactyla</i>				1			4	
<i>Podarkeopsis capensis</i>								1
<i>Nephtys juv. indet.</i>							1	
<i>Nephtys assimilis</i>							1	
<i>Nephtys cirrosa</i>		5		6	10	2		
<i>Nephtys hombergii</i>								7
<i>Spio martinensis</i>								2
<i>Magelona johnstoni</i>							6	
<i>Ophelia borealis</i>			1		3			
<i>Lagis koreni</i>							2	1
<i>Gastrosaccus spinifer</i>						1		
<i>Perioculodes longimanus</i>								1
<i>Bathyporeia indet.</i>				2				
<i>Bathyporeia elegans</i>	3	5	2	8	5	4	3	
<i>Bathyporeia nana</i>		1						
<i>Nucula nitidosa</i>							1	11
<i>Tellimya ferruginosa</i>		3		1			6	
<i>Mysella bidentata</i>								6
<i>Pharus legumen</i>							1	
<i>Fabulina fabula</i>				1	1		7	14
<i>Abra alba</i>			1				9	13
<i>Echinocardium cordatum</i>		2					1	
<i>Eteone picta</i>		1						
<i>Microphthalmus similis</i>			3	1				
<i>Scalibregma inflatum</i>					1		3	1
<i>Pariambus typicus</i>								10
<i>Crangon crangon</i>		1						
<i>Hydrobia ulvae</i>				1				
<i>Asterias rubens</i>								1

\* Indeterminate = not identifiable to species due to whole individual not being present.

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*Author: Jane Lancaster*



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*Reviewer: Paul Salmon*



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