

MEMORANDUM**12 July 2002**

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No. of pages: **Fejl! Ukendt argument for parameter.****Job : Horns Rev. Monitoring programme. Hard Bottom Substrate.****Subject : Progress memorandum 3****Contents**

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1. Programme objectives

A monitoring programme to evaluate the environmental consequences of the construction and operation of the up to 150 MW demonstration offshore wind farm at Horns Rev was a condition made in the EIA statement (ELSAM, 2000)

Prior to establishing the wind turbines, a baseline description of the benthic fauna (infauna) of the area was carried out, as the basis for comparison with a subsequent monitoring programme. The baseline study provides sufficient data to evaluate the effects on the composition of species and individuals of the benthic fauna as a result of the establishment of the turbine foundations, in both the construction and operational phases. This study will also assist in evaluating the benthic fauna of the area as a food source for the area's fish species.

The aim of the monitoring programme described (Bio/consult, 2002) is to document possible changes in the composition of the species and individuals of the benthic fauna. In addition the objective is to monitor the colonisation of the fouling communities on the turbine foundations in order to evaluate the reef effect on other fauna of the area.

2. Programme description

The benthos programme for 2001-2002 consists of a baseline description of the benthic fauna conditions in the turbine area, and a description of the benthic fauna conditions in relation to the occurrence of potential food items for fish.

2.1. Baseline programme. Progress January – June 2002

Data evaluation and data processing were performed for the survey in June 2001. Data and results from the programme for food items for fish are incorporated. Elaboration of a data report and a status report were performed and the status report has been approved.

2.2. Food items for fish. Progress January – June 2002

Data evaluation and data processing were performed for the survey in September 2001. Data and results of the survey are incorporated in the status report 2001 together with data and result from the baseline programme.

2.3. Deviation

It was not possible to adhere to the planned time schedule, as delays were experienced in delivery of the data report and the status report.

3. Studies planned for July – December 2002

The following activities are planned for the period July-December 2002.

3.1. Monitoring programme for benthic fauna

The aim of the programme is to evaluate the impact of the construction of the wind farm on the benthic fauna resource.

No studies are planned during the actual construction period in 2002. The planned start for the studies is autumn 2003. Studies on benthic fauna communities will be carried out at 6 selected turbine locations, table 1. The methodology will be in accordance with the description in the Status Report 2001 (Elsam, 2002a).

Location	"WGS84_MIN_Y"	WGS84_MIN_X"
Turbine 26	55°28.596'	07°49.139'
Turbine 51	55°30.106'	07°50.366'
Turbine 55	55°28.910'	07°50.660'
Turbine 58	55°28.013'	07°50.881'
Turbine 73	55°29.518'	07°51.576'
Turbine 95	55°28.930'	07°52.786'

Table 1. Locations for monitoring programme for benthic fauna..

Activities will be co-ordinated into a combined programme for benthos, fouling communities (hard substrates) and food resources for fish.

No requisition has been signed.

3.2. Monitoring programme for fouling communities

The aim of the study is to evaluate the effect of the establishment of artificial hard bottom substrate on fouling communities. The planned starting date is September 2002.

Studies on fouling communities will be carried out at 6 selected turbine locations at each of three depth zones, table 2. Studies will concentrate on both the tower of the turbine and on the scour protection. Methods will generally follow the descriptions given in ELSAM (2002b). The sampling technique will be modified so that three replicates of quantitative sampling will be conducted at each of three stations at the scour protection at each location. Reef block areas will be scraped off as completely as possible within a frame area of 0.2 X 0.2 m. In addition, sampling will cover the turbine tower at three locations (full programme).

The proposed turbine locations are:

Location	"WGS84_MIN_Y"	WGS84_MIN_X"	Depth (app. m)	Programme
Turbine 33	55°29.498'	07°49.450'	11.0	
Turbine 55	55°28.910'	07°50.660'	10.0	Full
Turbine 58	55°28.013'	07°50.881'	8.0	Full
Turbine 91	55°30.126'	07°52.493'	6.0	
Turbine 92	55°29.827'	07°52.566'	6.0	
Turbine 95	55°28.930'	07°52.786'	9.0	Full

Table 2. Locations for monitoring programme for fouling communities.

Studies will consist of sampling, analysis of faunal material and data reporting, in accordance with the time schedule.

ATR has been forwarded 15. Marts 2002. No requisition has been signed.

3.2.1. Time schedule

	2002											
	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Monitoring												
• Field studies												
• Cruise report												
• Data report												

Status report will be elaborated and submitted not later than 15. February 2003.

3.3. Monitoring programme on the food resource for fish

The aim of this study is to supplement the fish studies and to evaluate possible changes in food choice by the existing fish fauna, following construction of the wind farm. Studies are planned to start in the autumn of 2003.

Activities will be co-ordinated into a combined programme for benthos, fouling communities (hard substrates) and food resources for fish.

No requisition has been signed.

4. References

Bio/consult AS 2002. Horns Rev. Control and monitoring programme. Artificial reef. Progress memorandum 2 N003: 1-8.

ELSAM 2002a. Horns Rev Offshore Wind Farm. Introducing Hard Bottom Substrate. Sea Bottom and Marine Biology. Status Report 2001: 1- 86.

ELSAM 2002b. Horns Rev. Introducing hard substrate habitats. Control and monitoring programme for benthos communities, flora and fauna. Memorandum N004: 1–13