

ONEILL, Pat

From: Margot Cronin [margot.cronin@marine.ie]
Sent: 30 November 2009 16:52
To: ONEILL, Pat
Cc: Terry McMahon; Kiely, Bernie
Subject: Arklow Monitoring Programme

Pat,

Attached you'll find details of the monitoring required for the harbour post-dredge survey and the dumpsite monitoring programme. A requirement for monitoring should be included as a condition to the Dumping at Sea permit, in addition to the conditions proposed by Allen Williams. The details provided here should then be incorporated as an appendix or annex to the permit.

If you need clarification on anything, give me a shout.

Best regards,
Margot

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**Arklow Harbour Dredging Operations
Post Dredging and Capping Monitoring Requirements**

1. Dumpsite monitoring

Monitoring at the disposal site is required to ensure that the capping operation has been effective in isolating the contaminated sediment and to ensure that the long-term stability of the cap is maintained.

1.1. Details of the monitoring schedule required for the dumpsite are listed below:

Time after completion of capping	Activity required	Comment
7 – 10 days	<ul style="list-style-type: none"> ▪ Bathymetry (& concurrent tide observations) ▪ Side-scan sonar 	<ul style="list-style-type: none"> ▪ To set baseline; ▪ To capture initial cap morphology
1 month	<ul style="list-style-type: none"> ▪ Bathymetry (& concurrent tide observations) ▪ Side-scan sonar ▪ Granulometry ▪ Grab sampling 	<ul style="list-style-type: none"> ▪ Early comparison to detect cap changes / erosion / consolidation. ▪ To identify sediment type for future verifications. ▪ To set baseline chemistry for future detection for migration of contaminants.
6 months	<ul style="list-style-type: none"> ▪ Bathymetry (& concurrent tide observations) ▪ Sidescan sonar ▪ Granulometry ▪ Grab sampling (at same positions as before) 	<ul style="list-style-type: none"> ▪ Comparison of cap morphology ▪ Verification ▪ To determine cap integrity
1 year	<ul style="list-style-type: none"> ▪ Bathymetry (& concurrent tide observations) ▪ Side-scan sonar ▪ Granulometry ▪ Grab sampling (at same positions as before) 	<ul style="list-style-type: none"> ▪ Comparison of cap morphology ▪ Verification ▪ To assess cap stability

Further long term monitoring requirements will be determined by results of the above surveys and analyses

1.2. Detailed requirements for the monitoring programme are listed below:

- Bathymetry*
 - survey to cover dumpsite area plus area 250 m on all sides. An additional 250 m will be surveyed on the side in the direction of the residual flow.
 - survey lines to be run in a direction perpendicular to that of the residual flow
 - vertical resolution of not less than 20cm
 - horizontal control by DGPS or RTK
 - line interval at 25m
- Side-scan*
 - vertical resolution better than 20cm
 - horizontal resolution better than 15cm
 - data coverage 100%
- Tidal height*
 - measurements to be taken every 15 minutes at levelled benchmark.
- Granulometry*
 - report as % of individual phi units

Chemistry – sampling and analysis to be in line with analytical and quality requirements set out in the revised Modelling and Monitoring Proposal of August 2009, and also in Guidelines for Assessment of Dredged Material (2006). A total of 5 grab samples should be taken of surface sediments at equidistant locations across the surface of the cap. Samples should be analysed for the following parameters:

- Total Organic Carbon
- Aluminium
- Arsenic
- Cadmium
- Copper
- Lead
- Lithium
- Nickel
- Zinc

2. Post dredging monitoring of harbour

The extent of the clean-up or spread of contamination within the harbour resulting from the dredging operation is to be determined.

2.1. One month after dredging, sampling should be carried out in the harbour and dock. Surface sediment grab samples should be obtained at the eight previously used sampling locations (BC 1 – 8).

2.2 Detailed requirements for the monitoring

Sampling and analysis for the purpose of sediment chemistry should be in line with analytical and quality requirements set out in original Sampling and Analysis plan, and also in Guidelines for Assessment of Dredged Material (2006). Samples should be analysed for the following parameters:

- Granulometry (>2mm, <2mm >63um, <63um)
- Total Organic Carbon
- Aluminium
- Arsenic
- Cadmium
- Copper
- Lead
- Lithium
- Nickel
- Zinc

Samples 7 and 8 should also be tested for EPA 16 PAH.

3. Thresholds

Thresholds for assessment of cap stability, recommended by USACE in the event that cap erosion or contaminant migration is detected by monitoring, are intended for use in this instance.

- a. Cap thickness is to be increased in the event that a decrease in cap thickness of 0.5 foot (15cm) is detected in the initial post placement (+ 7 – 10 days) survey.
- b. If cap thickness decrease of 1 foot (30cm) is detected in the follow-up survey (1 month), then cap material is to be replaced.

c. In the event of continued cap erosion (at 6 month survey), then the cap is to be replaced, increased, sediment changed and eventually the dumpsite will be re-dredged and the contaminated material removed.

d. Any increase in contaminant concentrations as indicated by the results of the sediment chemistry testing will indicate cap instability. In this event, immediate remedial action will be required.

4. Reporting

All data to be submitted to the Coastal Management Division of the Department of Agriculture Food and Fisheries and copied to Marine Institute.

A method statement for remediation of the cap, should the monitoring indicate cap erosion, should be in place in advance of the disposal operation. This statement should include the sourcing of the clean material that will be used and the method to be used for the remediation, if necessary.

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