

**Eve O'Sullivan**

---

**Subject:** FW: Malahide review  
**Attachments:** Notes on Malahide sediment chemistry.pdf

**From:** [margot.cronin@marine.ie](mailto:margot.cronin@marine.ie)  
**Sent:** 21 June 2018 14:40  
**To:** Ciara Maxwell <[c.maxwell@epa.ie](mailto:c.maxwell@epa.ie)>  
**Cc:** Terry McMahon <[terry.mcmahon@marine.ie](mailto:terry.mcmahon@marine.ie)>  
**Subject:** Malahide review

Hi Ciara,

Attached is my review of the sediment chemistry at Malahide as part of the application for a permit for WID.

If you need clarification on anything, just let me know.

All the best,  
Margot

---

Margot Cronin | Marine Institute  
Rinville, Oranmore, Galway, Ireland

Tel: +353 91 387200 | +353 91 387251 | +353 83 844 3280  
[www.marine.ie](http://www.marine.ie)



For inspection purposes only.  
Consent of copyright owner required for any other use.

---

This email has been scanned by the Symantec Email Security.cloud service.  
For more information please visit <http://www.symanteccloud.com>

---

**To: Clara Maxwell, EPA**  
**From: Margot Cronin, MI**  
**RE: Malahide Marina, Dumping at Sea application, 2018**  
**Date: 14 June 2018**

**Background:**

Malahide Marina has submitted an application to dredge and dump at sea up to 99 000 tonnes over a seven year period. Three separate campaigns are planned, indicating a maximum of 33 000 tonnes (approx. 20 000m<sup>3</sup>) in each campaign. The method of dredging proposed is Water Injection Dredging (WID).

The marina was last dredged in 2006. Sediment was sampled and tested in 2005 for the previous DaS application. Particle size distribution was broadly similar in 2005 to the most recent results, however in 2005 trace metal results were considerably lower, as were PCB and OCP results. All results were classed as Category 1 (clean), at that time.

**Discussion:** Summary sediment concentrations, 2017, are summarised in Table 1 below.

| Sample | Metals           | Organics                       | Notes   |
|--------|------------------|--------------------------------|---|
| MH1    | Class 1*         | PCB028 – low<br>Class 2        |   |
| MH2    | Hg – mid Class 2 | Not required                   |   |
| MH3    | Class 1*         | Not required                   |   |
| MH4    | Class 1*         | Not required                   |   |
| MH5    | Class 1*         | HCB – Class 3<br>Σ DDT - > ERM | <ul style="list-style-type: none"> <li>HCB is rarely detected in Irish sediment.</li> <li>Ireland has no upper action level for DDT but using established ecotoxicological measurements from elsewhere, this reading would be equivalent to Class 3.</li> </ul> |

\* Note, concentrations of arsenic in all samples narrowly exceeded the lower action level. In addition, concentrations of nickel in all samples also exceeded the lower action level. This is quite a common occurrence with Irish coastal sediment, as the arsenic and nickel action levels were set using guidance from other jurisdictions in the absence of sufficient data at the time, and not taking local geology into account. For that reason, these test results are not considered to give cause for concern at this time.

Sample MH5 indicates a concentration of hexachlorobenzene (HCB) above the upper action level. This is a very rare occurrence. In previous DaS application data from EPA and earlier, HCB has seldom been

found above the limit of detection, and rarely exceeding the upper action level in the sediment chemistry, although QA data are not available to confirm those results. The lower action level was originally set at the 99 percentile of Irish results, i.e., 0.3 ug/kg. Nonetheless, the QA data provided with this application support the results.

Sample MH5 also indicates an elevated concentration of DDT metabolites. Although Ireland, along with most OSPAR countries, does not have an upper action level set for the sum of DDT and its metabolites, the concentrations found here would exceed the established ecotoxicological standards used in the Effects Range Median (ERM) of 45 ug/kg, above which biological effects would be expected in susceptible species.

**Conclusion/opinion:** Of the five samples analysed in 2017, three exhibit some degree of contamination. These results are quite unanticipated when compared to the previous tests and when considering the location and level of industry. Nonetheless, the QA data provided indicate that these results are correct.

While natural geological variation may account for the seemingly elevated levels of nickel and arsenic, there is still reason to question the remaining elevated results, given the absence of an obvious source for the pesticides or mercury, and the fact that although the samples were taken relatively close to each other, the contamination appears to be very localised.

Given the level of dispersion of sediment with WID, and taking into account the current chemistry results for this application, the MI cannot support the use of this technique, or of conventional open water dumping, without further investigation of the sediment quality. Prior to a final decision on this application, the MI recommends further confirmatory testing at sample stations MH1, MH2 and MH5, using the requirements for PCB, mercury and pesticides as in the original Sampling and Analysis Plan.