Noeleen Roche

From: margot.cronin@marine.ie
Sent: 01 March 2017 14:14
To: Suzanne Wylde
Cc: Terry McMahon
Attachments: Killybegs sediment chemistry_mfc_feb2017.pdf

Follow Up Flag: Follow up
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Hi Suzanne,

Attached are my comments on the Killybegs application for disposal at sea.

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

Best regards,
Margot

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To: **Suzanne Wylde, EPA**
From: **Margot Cronin, MI**
Re: **S0028-01 Dumping at Sea Permit Application for Killybegs Harbour**

Introduction: The Department of Agriculture, Food and the Marine's proposed pier extension involves an application for disposal at sea of approximately 97 000m^3 of mixed sands, silts and gravels to be dredged from Killybegs harbour. The application states that the top 750mm of seabed (17 600 m^3) is not intended for dumping at sea and will be disposed of on land. Approximately 14000 m^3 of rock will be retained and used in future harbour projects.

It should be noted that the previous dumping at sea permit, granted in 2002, excluded from dredging the material around Smooth Point as it was considered unsuitable for conventional disposal at sea.

Discussion: A sampling and analysis plan was provided to the applicant by MI in 2015, including samples to be taken at depth. Sample locations are shown in Figure 1, below.

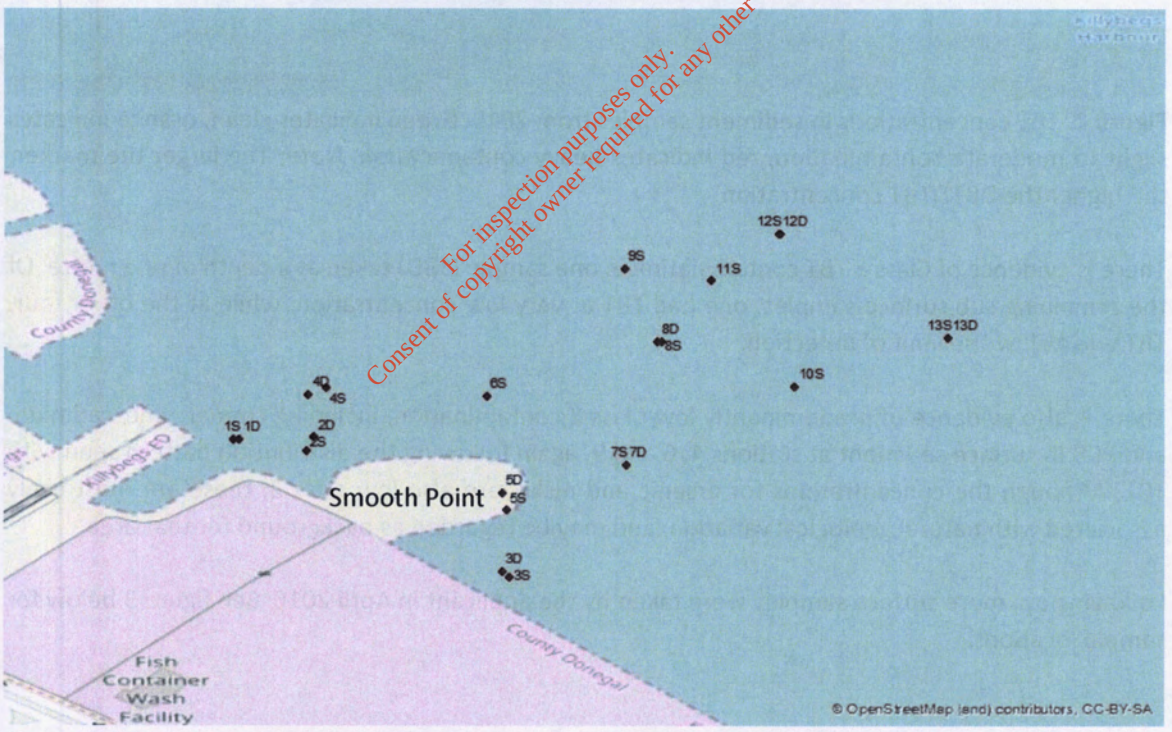

Figure 1. Sample locations, 2015. (S indicates surface sample, D indicates sample taken at depth)

Sediment chemistry of the samples taken at the end of 2015 was reviewed. Quality assurance of chemistry results was found to be satisfactory.

The results of the analyses indicate widespread moderate/heavy TBT and DBT contamination in surface and sub-surface sediment (see Figure 2 below). Sediment along a line running west-north-west around Smooth Point from the synchrolift show highest levels of TBT and DBT contamination. This is to be anticipated owing to historic activity at the synchrolift from which much TBT will have

originated during sandblasting prior to painting and/or refits, and the apparent net outward flow carrying the lighter fractions of sediment in that direction.

Figure 2. TBT concentrations in sediment samples from 2015. Green indicates clean, orange indicates slight to moderate contamination, red indicates heavy contamination. Note: The larger the marker, the higher the DBT&TBT concentration.

There is evidence of Class 3 TBT contamination in one sample (13D) taken at a depth of one metre. Of the remaining sub surface samples, one had TBT at very low concentration, while at the other four, TBT was below the limit of detection.

There is also evidence of predominantly low Class 2 contamination, including copper, zinc, cadmium and PCB in surface sediment at stations 4, 6 and 9, again following the distribution pattern seen with TBT. Although the concentrations for arsenic and nickel are also low class 2, these are most likely associated with natural geological variation, and may be regarded as background for that area.

Following up, more surface samples were taken by the applicant in April 2016. See figure 3 below for sample locations.

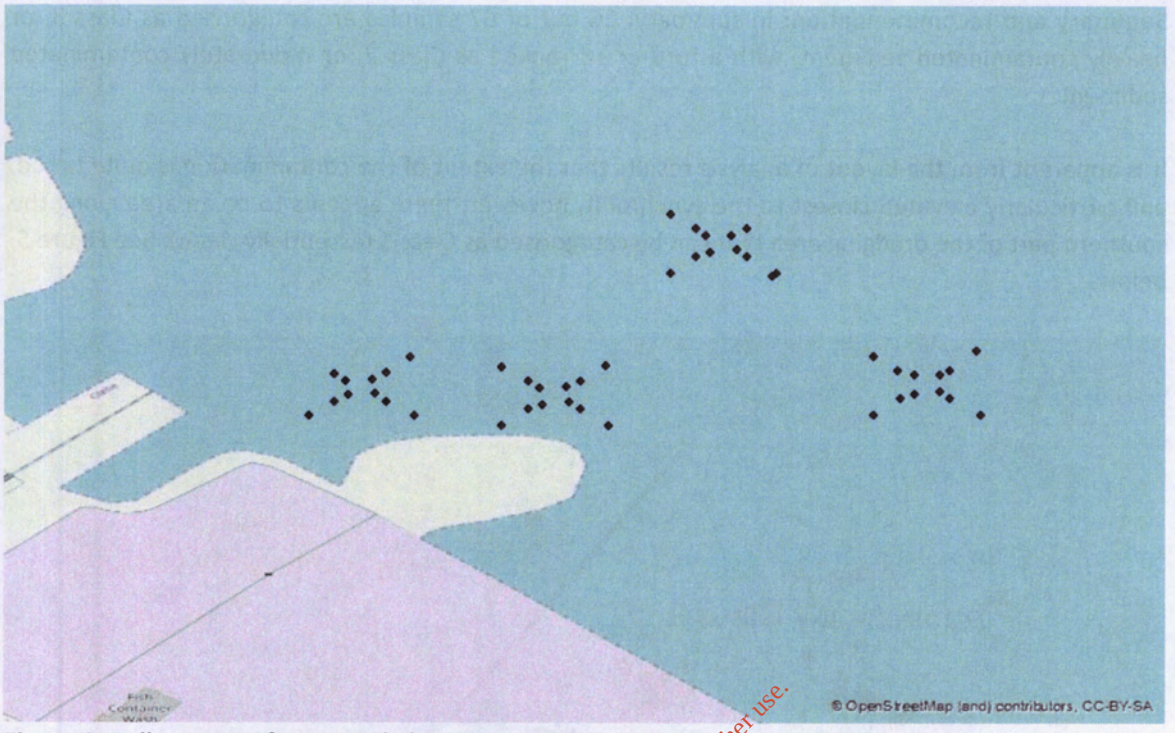

Figure 3. Follow up surface sample locations, 2016

These samples were analysed for TBT & DBT only. Results confirmed widespread surface contamination, with Class 3 levels of contamination in sediment found closer to the synchrolift and Class 2 levels of contamination further out. Figure 4, below, demonstrates the extent of the contamination.

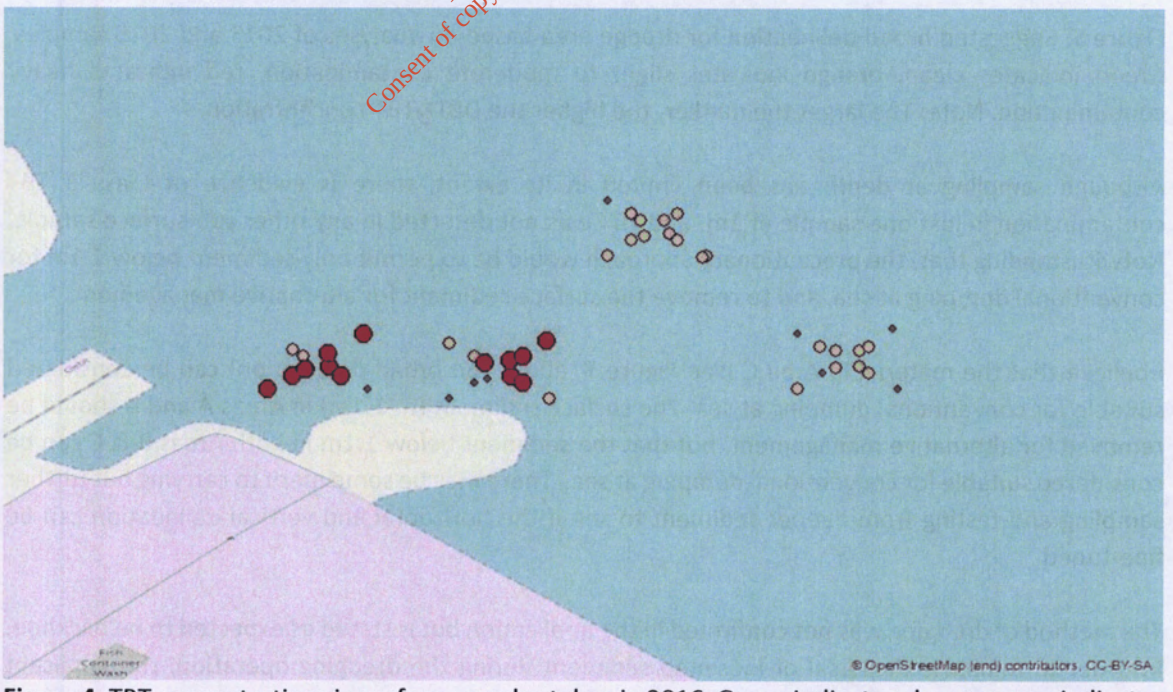

Figure 4. TBT concentrations in surface samples taken in 2016. Green indicates clean, orange indicates slight to moderate contamination, red indicates heavy contamination. Note: The larger the marker, the higher the DBT&TBT concentration.

Summary and recommendation: In summary, 26 out of 67 samples are categorised as Class 3, or heavily contaminated sediment, with a further 18 ranked as Class 2, or moderately contaminated sediment.

It is apparent from the layout of analysis results that the extent of the contamination is quite broad, and particularly elevated closest to the synchrolift, however, there appears to be an area along the southern part of the dredging area that can be categorised as Class 1 (essentially clean). See Figure 5, below.

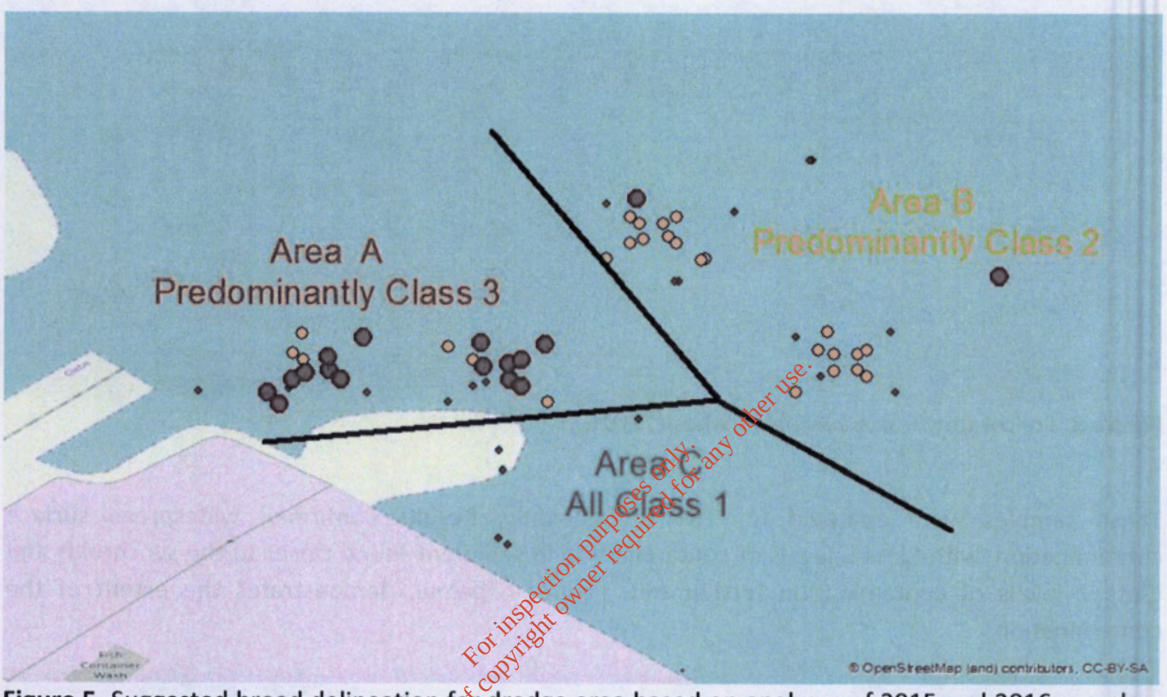

Figure 5. Suggested broad delineation for dredge area based on analyses of 2015 and 2016 samples. Green indicates clean, orange indicates slight to moderate contamination, red indicates heavy contamination. Note: The larger the marker, the higher the DBT&TBT concentration.

Although sampling at depth has been limited in its extent, there is evidence of Class 3 TBT contamination in just one sample at 1m, and TBT was not detected in any other sub-surface sample. Notwithstanding that, the precautionary approach would be to permit only sediment below 1.1m for conventional dumping at sea, and to remove the surface sediment for alternative management.

I believe that the material in Area C (see Figure 5, above, on broad delineation) can be considered suitable for conventional dumping at sea. The surface sediment (to 1.1m) in Areas A and B should be removed for alternative management, but that the sediment below 1.1m in both Areas B & C can be considered suitable for conventional dumping at sea. There may be some merit to carrying out further sampling and testing from deeper sediment to see if the horizontal and vertical delineation can be fine-tuned.

The method of dredging was not confirmed in the application but is stated as expected to be backhoe. In order to minimise dispersal of loosened sediment during the dredging operation, the applicant should be required to use an environmental grab, or some other such containment method, to remove the surface contaminated sediment.