

Summary of evidence in the matter of an Application for Marine Dumping Consent by Coastal Resources Limited

Daniel Leduc, EPA Hearing 29 November 2018

- I identified key methodological and analytical shortcomings in the information provided on the biological community at the Northern Disposal Area, particularly pertaining to benthic communities. These shortcomings limit the conclusions that can be drawn regarding impacts of past sediment dumping activity and assessment of future impacts if the same methodology continues to be used.
- Gravity corers such as the one used for obtaining benthic biota samples in the NDA are rarely used in monitoring studies because they are not deemed capable of consistently retrieving undisturbed core samples. I recommend testing the adequacy of a gravity corer by doing a pilot study using both a gravity corer and multicorer (which is considered best practice).
- There was little consistency in the dimensions of the cores, the nature of the replicates, or the core processing methods used during the six benthic biota surveys conducted from 2013 to 2016. As a result, it is not possible to draw firm conclusions about any sediment disposal effects on the benthic biota beyond the disposal centre site. Having said this, the impact of sediment dumping to date is likely to be limited to within 500 m of the NDA centre, based on estimate of the sediment mound dimensions. Future surveys need to use consistent methods to ensure comparability.
- Foraminiferans dominated the benthic biota at the NDA. It is best practice to use a stain to differentiate live from dead specimens. A stain was used during only one of the six surveys conducted. I therefore have serious reservations about the quality and reliability of the foraminifera data obtained to date. The appropriate use of staining protocols, or alternative stains, should be investigated.
- It seems likely that small patches of hard substrate (such as boulders or cobble) with epifaunal communities, which could include protected taxa such as stony corals, are present within the NDA. This type of community can only be effectively monitored using camera transects, which have not been conducted to date but need to be included in future surveys.
- Bathymetry maps obtained during past and future surveys of the NDA should be provided to the EPA to help evaluate the efficacy of the method in describing the growth of the dredge sediment mound, and any conclusions based on bathymetry data.
- It is likely that sediment fauna will be affected by the accumulation of sediment in the order of 2 cm or less per year. Due to bioturbation by sediment fauna, the minimum thickness of dredge spoil sediment that can be detected using sediment cores is about 5 cm or more. Therefore, impacts of sediment disposal should be apparent in the benthic biota before they are detected by visual inspection and chemical analyses of the cores.
- In order to provide more robust analyses, we recommend that additional control sites be sampled.
- All practical means should be used to resolve the issue of statistical power, because designs with low statistical power may result in not detecting impacts until biological communities have been more severely affected than intended.
- Defining ecologically significant impact is not formulaic and should be a scientific judgement call, preferably by more than one scientist, always based on knowledge of the species involved and the role they play in undisturbed ecosystem.