RAMBOLL

ENVIRONMENT
& HEALTH

RAMBOLL RESPONSE TO FALMOUTH HARBOUR AUTHORITY

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Introduction

This note responds to the Marine Management Organisation (MMO) request for further information in relation to three particular comments received from Falmouth Harbour Authority (FHA), summarised by the MMO in their letter dated 03 October 2025 as follows:

- *'Maintenance dredge volumes are significantly lower than the capital dredge volumes stated as 643,000 cubic metres (m3) predicted to be around 8000m3 every five years. No modelling has been conducted on plumes associated with maintenance dredging. Clarification is required to confirm if a backhoe dredger could be used to remove material or would this activity need different methodology?*
- *Chapter 9 does not appear to have assessed the impact of raised levels of copper, zinc, lead, mercury, tributyltin (TBT) etc. on the surrounding flora and fauna. Clarification on this is required. Is it inevitable that these contaminants eventually fall out of solution? If so, how likely are they to pollute sediments below the area of dispersal. Does this add to the contaminant loading of these sediments?*
- *Additional information is required on the expected increased noise levels that will be experienced at the marina and on any planned noise abatement in particular, if any works are carried out after hours or at particularly busy summer season'.*

Fully summarised comments were provided by the MMO in Appendix 1 of their letter dated 03 October 2025. The subsequent sections of this memo provide our response to FHA's comments and the MMO's request for further information.

Response and Further Information

<u>Maintenance Dredge Methodology</u>

Maintenance dredge volumes will be significantly lower than the capital dredge volumes. Within the dredged areas directly associated with the proposed development the volumes of infill are predicted to be 1,600 m^3/year. This small quantity suggests maintenance dredging every year is unlikely to be required. A suitable approach to maintenance dredging would be to dredge up to approximately 8,000 m^3 every 5 years (or depending on operational requirements, up to approximately 16,000 m^3 every 10 years), as required, mostly within the eastern berth pocket (Western Wharf), which is where predicted changes in annual deposition are modelled to occur (see Figure 1 – extract from Technical Appendix 6.2 Sediment Transport Modelling Figure 3.14).

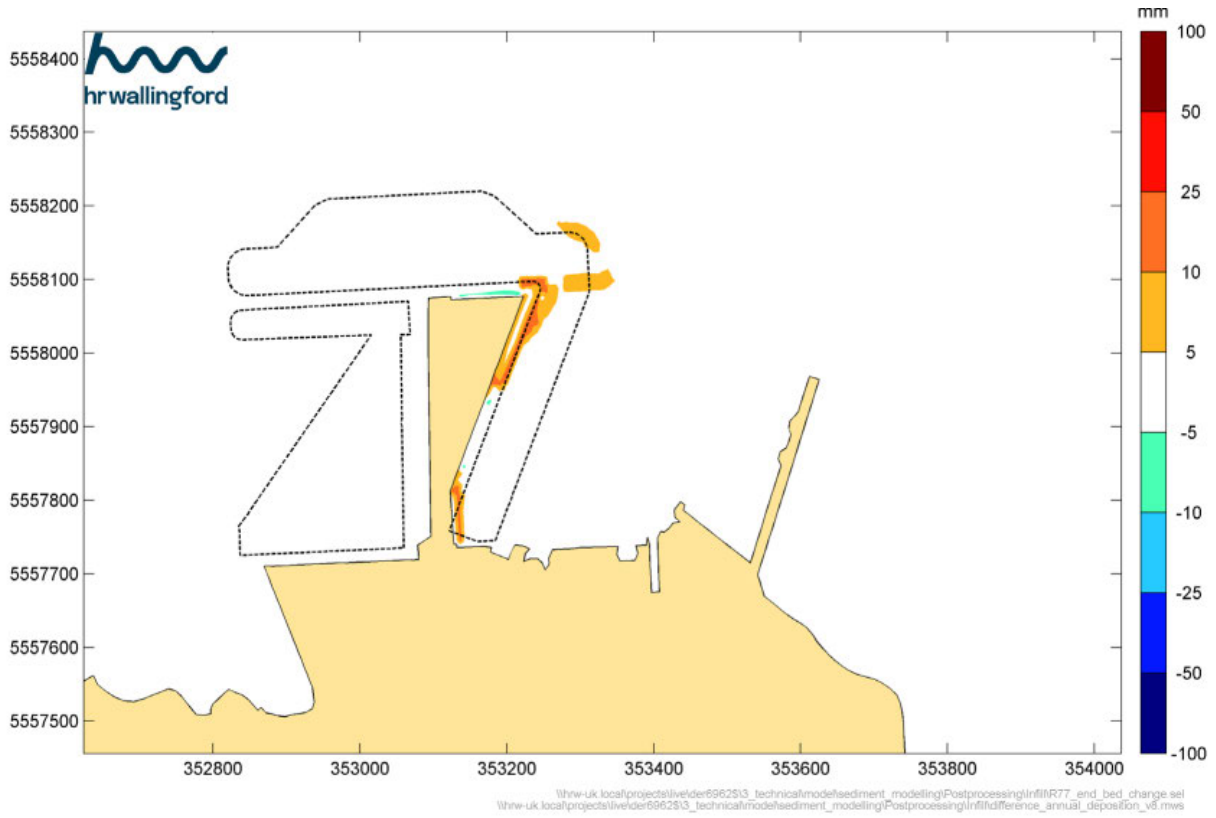


Figure 1 – Predicted change in annual deposition of fine sediment after development

It is proposed that the limited maintenance dredging would be undertaken using a backhoe dredger, and on an adjusted flood tide (amended to 1.75 hours before low water to 1.75 hours before high water), in line with the methods employed for the proposed capital dredge. This would minimise fine sediment deposition in the area and avoid impacts to sensitive habitats in the area.

Raised Contaminant Levels

Technical Appendix 6.3 Sediment Plume Modelling Report provides full details of the contaminant modelling. Table 1 (reproduced from Table 7.3 in Technical Appendix 6.3) summarises the results of the contaminant modelling by noting whether the contaminant in a given zone is predicted to exceed the Annual Average (AA) or Maximum Acceptable Concentration (MAC) outside of the site red line boundary (noting that sensitive ecological receptors are located outside of the site boundary, such as live maerl to the east of the site boundary, and seagrass to the north, off Flushing Headland).

It should be noted that the simulations were for continuous dredging as a worst-case scenario. The sediment results reported with the amended approach to dredging (embedded mitigation, including only dredging on an adjusted flood tide) show that careful consideration of the timing of dredging can bring noticeable benefit in the reduction of the footprint of dispersion, and is likely to roughly half the average concentrations of contaminants within the water column. TBT is therefore the only contaminant that has been considered further, due to the potential exceedance of the EQS outside of the site boundary, albeit to a limited extent. For all other contaminants modelled, no exceedances outside of the site boundary are predicted with mitigation in place (see Table 2).

Table 1 – Summary of contaminant results (worst-case and prediction with mitigation)

Dredging Zone	Contaminant	Worst-case all tide dredging		With mitigation (adjusted flood tide dredging)
		EQS exceeded within the site area?	EQS exceeded outside the site area?	EQS exceeded outside the site area?
East (Western Wharf)	Cu	Yes (AA)	No	No
	Hg	No	No	No
	Pb	No	No	No
	Zn	Yes (AA)	No	No
	TBT	Yes (AA and MAC)	Yes	Only very limited AA exceedance to the east Limited MAC exceedance to the east
North	Cu	No	No	No
	Hg	No	No	No
	Pb	No	No	No
	Zn	No	No	No
	TBT	Yes (AA and MAC)	Yes	Only very limited AA exceedance to the west Limited MAC exceedance to the west and east
West (FLOW Basin)	Cu	Yes (AA)	No	No
	Hg	No	No	No
	Pb	Yes (AA)	Yes, but limited to within 20 m of site area limit	No
	Zn	Yes (AA)	No	No
	TBT	Yes (AA and MAC)	Yes	Only very limited AA exceedance to the west Limited MAC exceedance to the west and east

In terms of TBT, with mitigation in place, particularly dredging on the adjusted flood tide only, the AA for TBT is expected to mostly fall within the site boundary. The MAC value is predicted to be exceeded

outside the site boundary to the west and east, but for a very small plume area. Considering the nature of water movement this is expected to be further diluted.

The dissolution of some contamination into the aqueous phase will reduce levels of contaminants bound within sediments, meaning that the actual concentrations of contaminants within deposited sediments would be lower than they were in the pre-dredged sediment. In addition, the modelling of sediment dispersion and deposition (Technical Appendix 6.3 Sediment Plume Modelling) indicates very limited deposition in more ecologically sensitive areas to the east.

Biotopes (including protected biotopes) identified within the deposition footprint (but outside the dredge pocket) have low sensitivity to incidental spills of hydrocarbon, PAH heavy metal contamination[1]. They are considered to have a low sensitivity/value in relation to this impact pathway.

No subtidal seagrass meadows are within the modelled sediment deposition footprint. Whilst this habitat type is sensitive to heavy metal and organic chemical contamination, there is no pathway for impact and so the overall sensitivity/value rating is low.

Where live maerl is present some contamination may occur but it is expected to be highly localised and reducing due to water movements between dredging campaigns. The evidence on the sensitivities of maerl habitat to contamination is generally limited to assessing the acute impacts of contamination via uncontrolled releases or incidental spills rather than chronic impacts associated with long term exposure to contaminated sediments, and the habitat type is thought to be highly sensitive with low resistance and very low recoverability[2] in relation to acute exposure. On a precautionary basis is it assumed that maerl is sensitive to contamination from a range of pollutants. However, given the low magnitude of impact, the overall significance of effect is considered to be not significant.

A Water Framework Directive (WFD) Assessment has been undertaken to ensure the water environment is adequately protected and that the effects of the proposed development on the water body are considered in terms of physico-chemical, chemical, hydromorphological and ecological aspects. Cefas have reviewed the WFD Assessment and responded to the marine licence consultation and confirmed that:

'The WFD assessment has adequately considered the potential effects from increased suspended sediment concentrations (SSC (Section 4.3.7 of the WFD)), and the mobilisation/disturbance of sediment-bound contaminants (Chapter 8 'Marine and Water and Sediment Quality' (paragraph 10)), which is appropriate.'

In addition, the Environment Agency have reviewed the WFD and in their response to the marine licence consultation, have confirmed that:

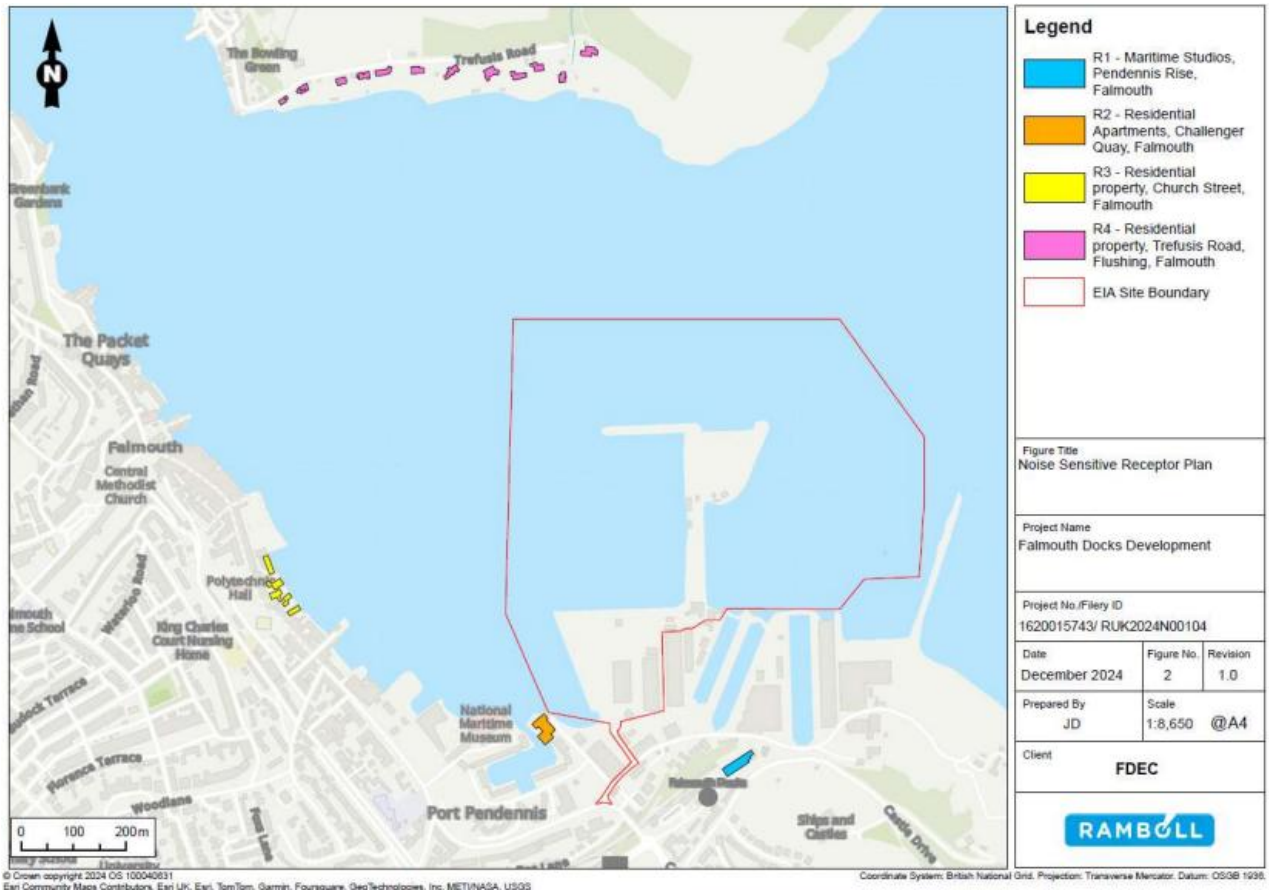
'We have reviewed the WFD assessment and do not have any concerns; it covers everything we would expect to see. The waterbody is at Good Ecological Status, so the focus of the assessment needs to be on no deterioration and mitigating any risks for activities that may cause deterioration. We are satisfied that the assessment considers these adequately.'

Noise Levels at the Marina

Noise sensitive receptors selected for the noise assessment (ES Chapter 14) are shown in Figure 2.

[1] H Tyler-Walters, K.A Lloyd, and A Watson, 'Mediomastus Fragilis and Cirratulids in Infralittoral Mixed Sediment.', in Marine Life Information Network: Biology and Sensitivity Key Information Reviews (Plymouth, UK, 2023), https://www.marlin.ac.uk/habitat/detail/1260.

[2] F Perry, H Tyler-Walters, and H Watson, 'Maerl Beds', Marine Biological Association of the United Kingdom, 2024, https://www.marlin.ac.uk/habitat/detail/255.



Other potential receptors were initially considered as part of the noise assessments. However, it was found that the following receptors are appropriate based on:

- Receptor R1 (Residential Receptors to the South of the Dock known as Maritime Studios, Pendennis Rise Falmouth) represent the worst-case scenario for receptors on Pendennis Rise, Falmouth due to its prominent location to the south of the site.
- Receptor R2 (Residential Apartments, Challenge Quay, Falmouth, TR11 3YL) represent the worst-case scenario for receptors around Bar Road and Falmouth waterfront. It is considered worst case based on its proximity to the site and lack of screening.
- Receptor R3 (Residential properties along Church Street Falmouth) represent the worst-case scenario for receptors to the west of the site due to the façade facing across the Harbour and with little screening in between.
- Receptor R4 (Residential properties along Trefusis Road, Flushing, Falmouth) being the worst-case scenario receptor to the north of the site across the open water to Flushing.

Therefore the results of both the construction noise assessment and operational noise assessment are deemed applicable (and worst-case) for the marina and moorings in the inner harbour.

Construction noise mitigation will be implemented via a Construction Environmental Management Plan and Construction Traffic Management Plan. This will include the following measures:

- Piling, compaction, breaking and demolition would not occur in the evening, weekends and night-time.

- Only one piling rig would be active at a time, with no more than 4 hours of percussive piling per day.
- Avoidance and/or minimisation of the overlap of any noisy activities. Demolition and piling would not occur concurrently.
- Minimisation of vessel and vehicle idling. Shutting down machinery where not in use, or in intermittent use, or throttling down to a minimum, if switching off is not possible.
- Undertaking regular checks of plant and machinery to ensure these are working effectively.
- Vibro-piling would be utilised where reasonably practicable and where appropriate to achieve required pile depths
- Use of the hydraulic breaker would be limited to a total of 1-hour in any 24hrs.
- Soft-start methodology would be utilised for percussive piling.
- Shrouds installed around piling rig hammers and use of 'pre-augering' techniques to reduce the number of piling hammer impacts, where feasible.
- Start-up plant and vehicles sequentially rather than all together and avoid unnecessary revving of engines.
- Adopting quiet working methods, including using plant with lower noise emissions. Selecting electrically driven equipment where possible in preference to internal combustion powered; hydraulic power in preference to pneumatic; and wheeled in lieu of tracked plant. Using 'silenced' plant, e.g. breaker mufflers, and equipment wherever possible.
- Using silenced and well-maintained plant conforming with the relevant UK/EU directives relating to noise.
- Minimising disturbance from reversing bleepers through measures such as site layout, e.g. one-way systems. Use of plant with broadband reversing alarms instead of tonal (providing it is safe to do so), and use of banksman can minimise reversing time.
- Lowering materials whenever practicable rather than dropping. Minimising drop heights when tipping or loading dredged or other materials.
- Planning working hours and locations of noise generating work to take account of the effects of noise upon off-site noise sensitive receptors. Locating plant such a fixed pumps and generators away from noise sensitive receptors, where feasible.
- Operating a 'just-in-time' policy for the delivery and supply of materials to minimise disruption to the local community. Positioning haulage routes to minimise noise levels at noise sensitive receptors and keeping them well maintained.
- Loading and unloading of vehicles, dismantling of equipment such as scaffolding or moving equipment or materials around the site in such a manner as to minimise noise generation and where practical, away from noise sensitive areas.
- Providing briefings for all site-based personnel so that noise issues are understood.

In terms of operational noise, the assessment concluded no significant effects at receptors, and therefore no mitigation is deemed necessary in this respect.