Centre for Environment Fisheries & Aquaculture Science

Cefas

MARINE AND COASTAL ACCESS ACT (2009). CONSULTATION BY TEESPORT FOR MID-LICENCE SAMPLING FOR L/2015/00427 AT TEES AND HARTLEPOOL, TEESSIDE.
Reference Number: MLA/2015/00088/4

From: Cefas, Lowestoft Laboratory
Date: 16th October 2019
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To: Luella Williamson - MMO (by MCMS)

1. With reference to the above application and your request for comments, please find my advice below.

Description of the proposed works

2. This consultation is to discharge condition 5.2.3 of licence L/2015/00427, which stipulates that a regime of mid-licence sampling should be conducted in order to ensure that material is acceptable for disposal at sea. The licence permits the licence holder to dredge and dispose of 2,988,700 tonnes of material from dredge areas in the Tees and Hartlepool harbours. Previous Cefas advice has reviewed sample data provided for the Hartlepool area (MLA/2015/00088/2, 14th August 2019), and deemed that licensed disposal activities may continue, whilst this consultation pertains only to the Tees dredge area. The licensed disposal site is Tees Bay A (TY160).

3. Pre-application sampling advice was sought under SAM/2018/00069, which recommended a minimum of 37 sample stations to comply with both the mid-licence sampling condition of L/2015/00427, and to support an application for a capital dredge for the Northern Gateway Container Terminal project. The licence holder/applicant has previously provided data for the upstream section of the licensed Tees dredge area for consideration by Cefas (MLA/2015/00088/2, 14th August 2019), and has now provided data for the remaining section of the licensed dredge area to finalise the discharging of condition 5.2.3.

Sampling and representation

4. Samples were tested for metals, tins, polycyclic aromatic hydrocarbons (PAH), polychlorinated biphenyls (PCBs) and particle size analysis (PSA), as per sample advice SAM/2018/00069. Analyses were conducted by Ocean Ecology for PSA, and SOCOTEC for the remaining analyses: both of these are MMO validated laboratories. Samples are also currently being tested for polybrominated diphenyl ethers (PBDEs), as per sample advice SAM/2018/00069, and so have not been presented in this consultation. However, the licence holder would like Cefas to assess the results presented whilst the PBDE analysis is finalised. The licence holder is aware that no licensing decision can be taken forward until all data are provided for analysis.

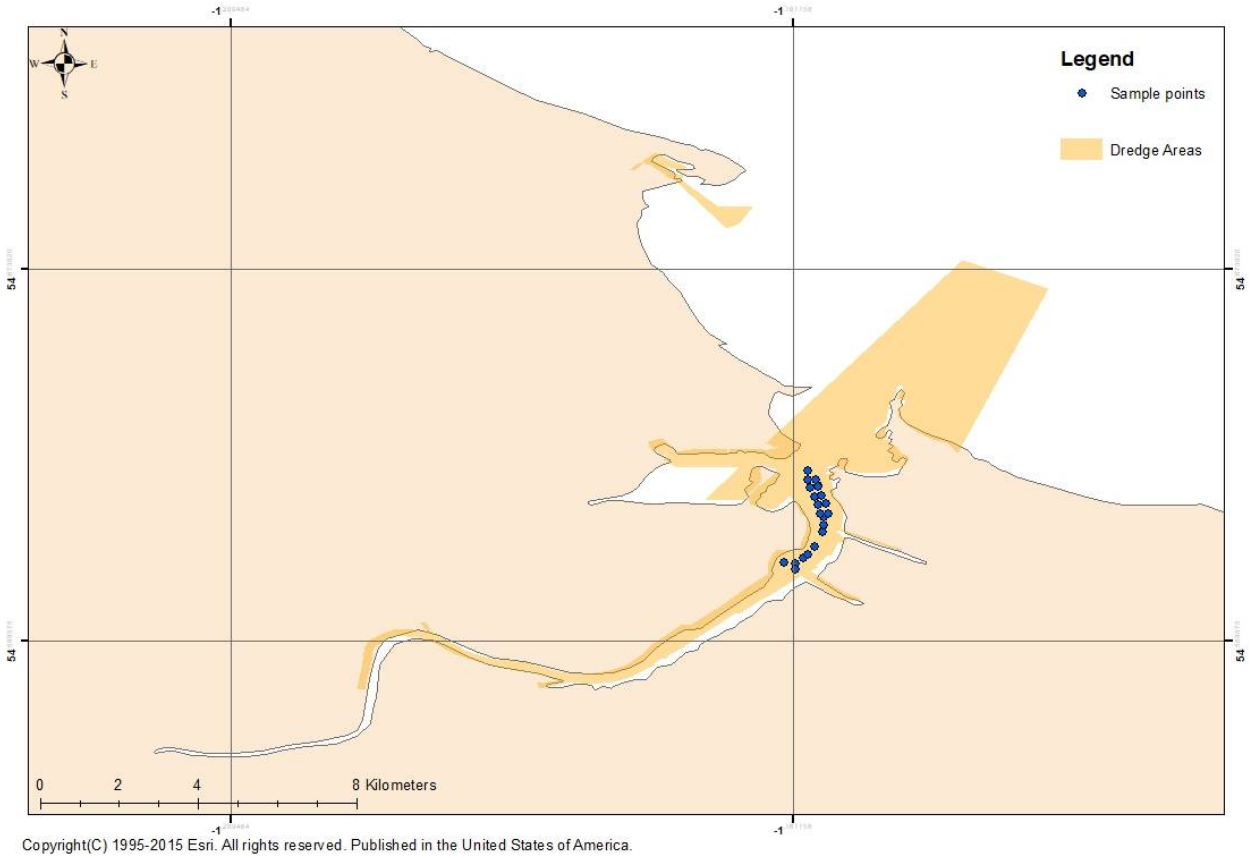

Figure 1. Map detailing the sample locations as representative of the licensed dredge area – 17/10/2019

5. As detailed in Figure 1, the sample data presented in this consultation pertain only to the most downstream section of the dredge area, before the river empties into the approach channel. As stated in points 2 and 3, previous analysis has been conducted on the area further upstream. Figure 2 depicts the upstream sampling conducted for the previous consultation on 14th August 2019. Based on these two datasets, I am content that the riverine section of the dredge area has been sufficiently spatially represented by sampling effort. However, I note that no data have yet been presented for the channel approach area.

6. At the pre-application stage (SAM/2018/00069), the applicant indicated that much of the channel approach area was considered to comprise inert glacial deposits, which Cefas considered not necessary to sample. However, this information was in relation to the NGCT capital dredge. This comprised a channel deepening requiring, subsurface repeat samples, although surface sampling would still be necessary across the dredge area. As such, I would request that the applicant presents surface sampling data from the channel approach area in order for condition 5.2.3 to be discharged. As stated in the Cefas sample plan, samples should be sufficiently representative of the dredge area.

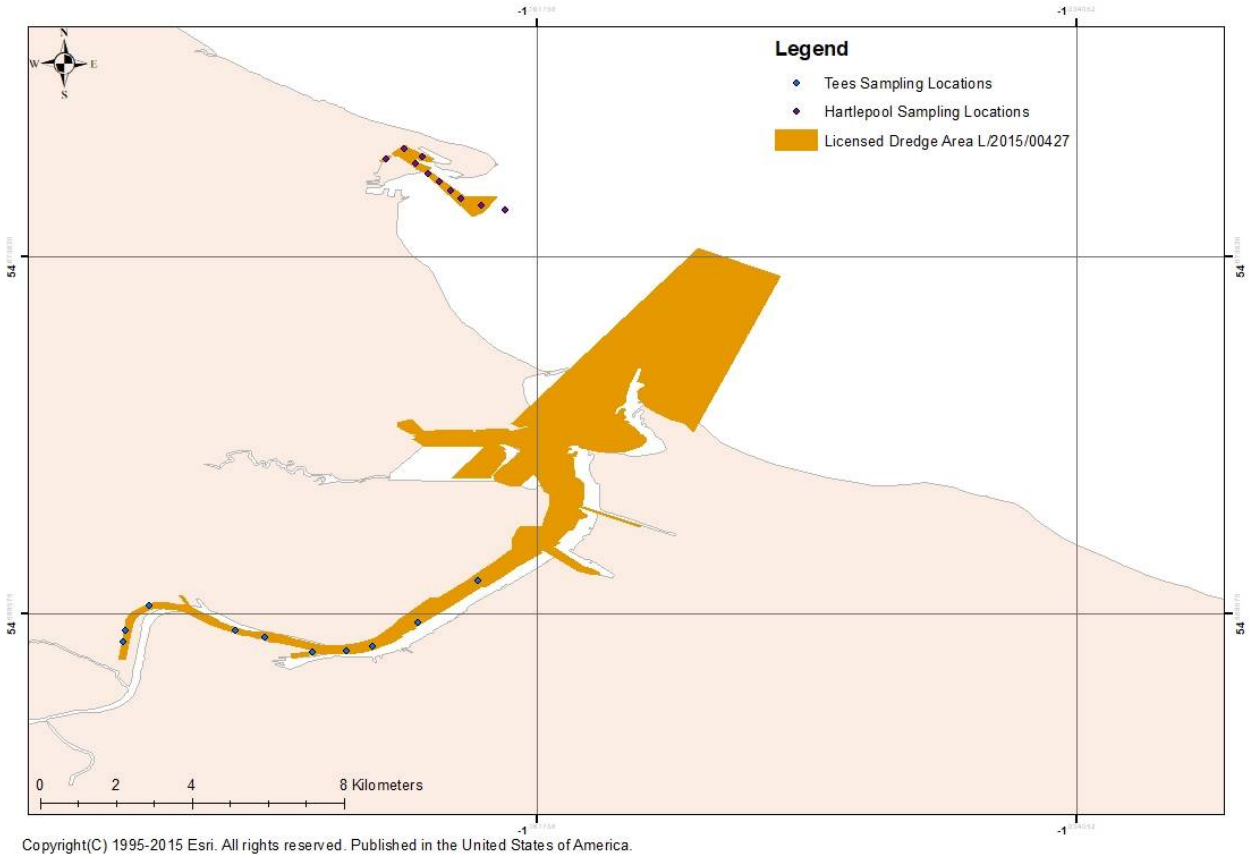

Figure 2. Map depicting sampling locations in respect of the licensed dredge area - 14/08/2019.

Dredged material quality

7. There were no elevations (above Cefas Action Level 1) for organotins for any sample. There were no elevations (above Cefas Action Level 1) for PCBs for any sample. The results for trace metals indicate that the majority of samples contain elevations of each metal analyte. The elevation is somewhat varied across the analytes, in that cadmium (Cd) was marginally elevated above Cefas Action Level 1 (AL1) in one sample, whereas nickel (Ni) and lead (Pb) were elevated above AL1 in all but one sample. There was no elevation above AL2 for any metal analyte, and whilst the results are mostly elevated, they are closer to AL1 than AL2. These results do not present significant cause for concern.

8. Most samples were elevated above AL1 for individual PAH congeners, notably for naphthalene, C-group napthelenes and phenanthrenes, and pyrene. The most elevated analyte – C1-napthalene – returned 3.48 – 5.16 ppm (mean = 4.16 ppm); between 35 and 50 times the level of AL1 (0.1 ppm) for this analyte. North-east England – particularly the Tyne and Tees, are known to generally have elevations of certain contaminants in their riverine sediments and water due to historic industrial activity in the area such as tarpits and other petro-industry. As such, whereas these levels may be considered very high for other parts of the country, they are not significantly dissimilar to what has been observed in this area before.

9. Without a defined AL2 for PAHs, Cefas utilise the Gorham-Test method to measure concentrations of PAHs against observed effects ranges, based on mortality to marine life. This approach categorises each PAH based on its molecular weight range: low (LMW) and high (HMW). The sum total of both LMW PAHs and HMW PAHs is calculated and then

compared to the Gorham-Test effects range thresholds. These thresholds are: effects range low (ERL) and effects range median (ERM). In respect of this advice, the ERL is considered a low risk threshold, whilst the ERM is considered a higher risk threshold.

10. The results for PAHs exceed the ERL for both LMW and HMW PAHs in all samples. This result in itself is not major cause for concern. The ERM was not met or exceeded for HMW PAHs in any sample. However, the ERM was exceeded in all samples for LMW PAHs. The ERM for LMW PAHs is 3100 ppb, whereas the LMW total for each sample ranged between 6900 and 10666 ppb. Whilst the Tees area is known to return higher than average levels of PAHs, these results are between two and three times the ERM threshold.

11. Considering these results alone the disposal activities present too high a risk and are thus not acceptable for disposal at sea. However, Cefas recognises the history of the area, and that the licensed disposal site (TY160) has received material from the area many times before. When analysing data from the pre-application stage using the Gorham-Test method (MLP/2015/00094), we can assess any potential trend. The sum total of LMW PAHs ranged from 4000 to 38000 ppb. The results also exceed the ERM for HMW PAHs in two samples as well. Figure 3 displays a comparison of both datasets – note that this chart is indicative only, as I have not compared the spatial similarities of the sample locations, and the sample numbers on the x axis only correspond to their ranking within their own dataset rather than a like-for-like assessment.

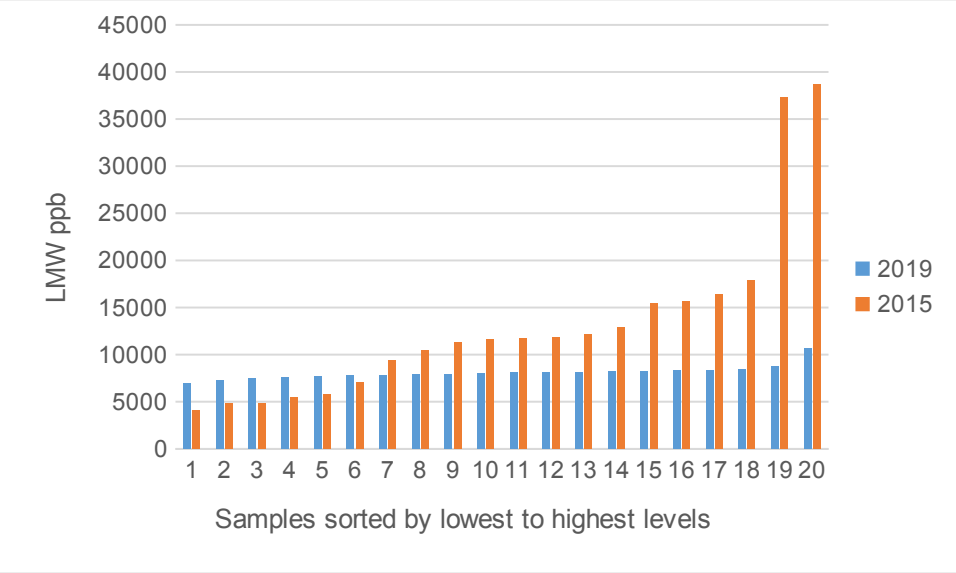

Figure 3. Barchart comparing the low molecular weight PAH content from the pre-application stage to the current dataset presented.

12. Figure 3 shows a larger range of results from 2015, in that the 2015 dataset contains both the lowest and highest values across both datasets. The 2015 dataset begins to exceed the 2019 dataset at approximately 7500 ppb. I have also compared the mean and median values in Table 1 to further analyse any trend:

Table 1. Comparison of the mean and median values of low molecular weight PAH content in 2015 (pre-app) and 2019

	Mean LMW PAH	Median LMW PAH
2019	8078.075	8031.5
2015	13238.11	11956.95

13. Table 1 shows that both the mean and median values of the LMW PAH content have decreased since the pre-application stage. When comparing this with Figure 3, an assumption can be made that there is a declining trend in the LMW PAH content of the sediment. The comparative distance between the mean and median values has also proportionately decreased since the pre-application stage, further indicating that the LMW PAH content is becoming more stable. Given that sediment was deemed acceptable for disposal at the pre-application stage based on these levels, the current values are now also deemed acceptable for continued disposal at sea – noting that no decision should be taken until PBDE data are presented to Cefas via the MMO.

Summary

14. The data presented for this consultation do not present significant cause for concern. I note that the PBDE data are still outstanding, and the applicant has acknowledged this, stating that these will be presented at a later stage. The applicant should clarify the provision of sample data from the channel approach area, which has not yet been represented in the sample data supplied.

Joe Perry
Advisor (Sustainable Marine Management)

Quality Check	***Date***
Karema Randall	17th October 2019