Infrastructure & Environment

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Our Ref: WIE12464-100-190109-GS-MMO
Your Ref:

Date: 10th January 2019

Craig Loughlin
Marine Management Organisation

BY EMAIL ONLY

Dear Craig

RE: Liverpool Cruise Terminal
Liverpool Cruise Terminal Scoping Code: DC10147

We refer to the Mersey Docks and Harbour Company's ("MDHC") application for a Harbour Revision Order ("HRO") in respect of the above-named project dated 1 August 2018. As you are aware, whilst MDHC is applying for the HRO, the project is to be constructed, operated and maintained by Liverpool City Council ("LCC").

The statutory representation/objection period ran from 10 August 2018 to 21 September 2018 and substantive comments in relation to the application were received, via the Marine Management Organisation ("MMO") from the following bodies and persons:

- MMO, email dated 25 September 2018;
- Natural England, letter dated 20 September 2018;
- Centre for Environment Fisheries & Aquatic Science ("Cefas"), various letters of advice dated 19 - 21 September 2018;
- Environment Agency, letter dated 1 October; and
- Charter Boat Operators carrying out fishing activity in the River Mersey, email representations (various dates).

This letter sets out the nature of the comments received and our responses to them. Responses to the comments received are made by Waterman and by its specialist sub-consultants, APEM and HR Wallingford, where appropriate.

This letter concludes with a summary of the contents of the ES Addendum (second issue), including a summary of changes to the basis of some of the assessments undertaken and to earlier ES conclusions, which we are submitting to the MMO alongside this letter and which is enclosed (hereafter referred to as "the ES Addendum (second issue)"). Please note that the ES Addendum (second issue) supersedes and therefore replaces, in its entirety, the ES Addendum (first issue) submitted with the HRO application.

We now address comments received from statutory consultees and other persons and organisations during the objection/representation period in respect of the application.

MMO, email dated 25 September 2018

MMO comments**:**

- *"… would like the applicant to speak directly with the MMO in regards to commercial fishing within the area. The applicant would then be able to obtain fish landing data for the area and get an understanding of the commercial fishing fleet that use and fish the River Mersey."*
- *"… would like to see the applicant conduct a fish survey and use the various gears that are used in the area by the fishing industry. Information around fishing gear in this area can be obtained directly through the MMO."*

Waterman Response:

LCC has commissioned a report into commercial fishing to be produced and has been in discussions with the MMO in this respect. LCC intends to share this report with the MMO in due course.

Natural England, letter dated 20 September 2018

Natural England comments:

- "*… Natural England advises that there is likely significant effect, therefore a requirement for appropriate assessment, and as it stands insufficient information within the application documents to conclude that the proposed works, as described in the Harbour Revision Order, will not have an adverse effect on the internationally designated sites*."
- "*… sufficient detail and commitment is required [in relation to mitigation] to justify and support conclusions of an appropriate assessment to demonstrate that there will be no adverse effect on site integrity and therefore no further progression through the Habitats Regulations tests will be required*."
- *"The updated HRA screening report should replace the November 2017 version."*
- "*Uncertainties remain relating to effects that may become significant when considered in combination with other plans or projects. When your authority undertakes the necessary Habitats Regulations Assessment, consideration also needs to be given to the in combination effects with other plans and projects (if it can be determined that the project itself would not result in likely significant effect)*."
- "*… it is unclear whether an assessment of impact on [starlet sea anemone] from the overall proposed works has been carried out … We advise that the thorough consideration of impact of the development (including demolition, construction and operational impacts) on the species is made*…"
- "*A succinct overarching table highlighting the revisions of documentation and their purpose should be provided …*"

Waterman response:

An updated HRA Screening report addressing comments received by Natural England (including the requirement for an appropriate assessment), is included at Appendix 13.7a of the ES Addendum (second issue).

A succinct table summarising revisions to documents is also included in the ES Addendum (second issue).

Cefas, letter of advice pertaining to underwater noise dated 20 September 2018

Cefas major comment:

- Paras 15 and 29: "*I recommend periods of downtime when no piling (neither impact or vibropiling) is taking place per 24 hours to minimise the risk of potential impact during key months/sensitive periods for fish migration*."

APEM response:

It is proposed that works would be predominantly limited to 0700-1900 Monday to Saturday. Due to some works being tidal dependent, flexibility of working Sunday 0700-1900, evenings (1900-2300) and at night time (2300 – 0700) is also proposed, subject to advance notification and agreement with LCC. However, only 'low-noise' generating works are proposed to be undertaken after 1900 and during night time hours (2300 – 0700). No piling works are proposed during those hours, thus providing a non-piling window of at least 12 hours (between 1900 and 0700) each day.

It should also be noted that no impact/percussive or vibro-piling is now proposed for pile installation. Some vibro-extraction associated with the removal of piles which support the existing Princes Jetty is proposed, however vibro-extraction is only expected to be used to extract 50% or less of those existing piles.

During the demolition phase of the works, it is expected that no more than approximately 25% of the day (during daytime hours (i.e. 0700 to 1900)) would involve active pile extraction (and associated noise). During the pile installation phase, it is expected that approximately 40% of the day (again, during daytime hours (i.e. 0700 to 1900)) would involve active pile installation (and associated noise). It is anticipated that works generating low levels of noise and vibration will be required outside these hours in preparation for demolition works and piling works the following day.

Cefas minor comment:

- Para 9: "*for marine mammals, it would have been more appropriate to refer to the recent NMFS (2016) guidance rather than Southall et al. (2007*)."

APEM response:

This is noted, and we are aware of the NMFS piling spreadsheet tool released in 2018 to facilitate assessments for marine mammals. Acknowledging this, it is our view that consideration of the NMFS (2016) guidance would not have changed the level of significance determined for the effect of underwater noise and vibration on marine mammals.

Cefas minor comment:

- Para 14: "…*there are uncertainties regarding the potential effects of vibro-piling on sensitive fish receptors/fish behaviour. Graham et al. (2017) observed an unexpectedly high source level for vibration piling in their study, compared to impact piling. Furthermore, the pulsed sound signature of the vibration piling was more comparable to impact piling than previously thought. The study, which focused on cetaceans, found that displacement by impact piling was more limited than expected and vibration piling had greater impacts than anticipated*."

APEM response:

As set out below, it is now proposed that the installation of any new piles will be by rotary method as opposed to percussive or vibro-piling methods. The rotary method of pile installation is anticipated to generate lower noise and vibration impacts. Please refer to the updated ES Chapters 8 and 13

contained within the ES addendum (second issue), which confirms the anticipated environmental impacts associated with this revised piling methodology.

Cefas, letter of advice pertaining to coastal processes dated 19th September 2018

Cefas major comment:

- Para 14: "*The applicant proposes the use of scour protection assets (e.g., concrete mattresses or rock placement)* in *order to reduce scour of sediments within the development site and surrounding area as a result of vessel operations (e.g., prop wash). Whilst this is considered to be suitable mitigation in line with common practice, further design details are required (E.g., type and extent*)."

HR Wallingford response:

In reassessing the project, the proposal to use scour protection techniques has been removed.

The berthing location for the vessels would be unchanged from the present case and therefore the estuary bed already experiences propeller and thruster forces. However, future changes to the operation of the vessels and the power of the manoeuvring thrusters over the lifetime of the project may result in some change to the sedimentation/erosion regime in and around the berth area.

Once the site has undergone any scouring as a result of changes to vessel operations, the sediment would be redistributed throughout the Mersey Estuary. Natural levels of accretion are the only method of replenishing the sediment, and the level of accretion under the jetty (and inshore) is not expected to fully replenish the amount of disturbed sediment. A minor adverse effect is predicted which is not considered to be significant and does not require mitigation measures to be implemented.

Cefas minor comment:

- Para 15: "*No monitoring has been proposed. However, if not already being undertaken as part of on-going management of the site (E.g., maintenance dredging), due to the potential changes to local erosion and accretion described in the ES and the proposed developments dependency on sufficient water depths for safe navigation, I recommend that the applicant undertakes regular bathymetric surveys of the site and the surrounding area; prior to the commencement of the proposed works (baseline), during the works and post-construction. This will; allow the monitoring and quantification of erosion and accretion rates, comparison of actual erosion and accretion with those predicted within the ES, provide an indication of the potential release of contaminated sediments (by proxy) and will provide the applicant with important bathymetric data to support the safe delivery of the project and subsequent use of the Liverpool Cruise Terminal.*"

HR Wallingford response:

Currently the Ports Authority / Mersey Docks & Harbour Company carry out regular maintenance dredging of the main shipping channel and monitoring of the sea bed depth / bathymetric surveys at the location of the existing berth to ensure adequate depth is maintained for cruise ships. This maintenance dredging activity and sea bed depth monitoring will continue after the new cruise terminal is in operation.

The approaches, departures, mooring and slipping of vessels are not expected to change once the new terminal is in operation. The LCC cruise operations management team do not expect the size and type of vessels currently visiting the new cruise terminal to change in the near future.

Further surveys would only be justified if there is a significant alteration to the nature of berthing operations. If future changes to the operation of the vessels and/or the power of the manoeuvring thrusters over the lifetime of the project occur, this could result in some change to the sedimentation/erosion regime in and around the berth area. In this event, surveys would verify the

nature of localised scour, and if necessary intervention could be made if this effect is materially greater than at present. The frequency and duration of the bathymetric surveys, if necessary, would be proportionate to the risks arising, and their scope would be agreed with the MMO.

Cefas minor comment:

- Para 25: "*Paragraph 14.57 states that "*Bathymetric changes within the Mersey have been subject to detailed monitoring for many years in relation to navigation. The effort has focussed on the major estuary channel and associated banks, with less attention given to the intertidal areas*". However, I would expect to see summary details of the bathymetric data used to give confidence that this data is suitable (E.g., date of survey, surveyor, equipment used etc.).*"

HR Wallingford response:

Section 3.2.3 of the technical report (Appendix 14.1a of the ES Addendum (second issue) describes the bathymetric data sources. Bathymetry data came from TruDepth grid data from the SeaZone Ltd. data sources, accessed in 2016. These data represented the most up-to-date survey information that was available at the time.

Cefas minor comment:

- Para 26: "*Model calibration for tidal flows and sediment fluxes are based on "*ADCP transect measurements during a spring tide in October 1995 and validated for a neap tide during January 1996*" (Paragraph 14.8) and a report by HR Wallingford (2014, Report DDR5376-RT002[1]). I would expect to see some form of justification or comparison to ensure the use of this data is suitable. Please also see my answer to Question 13. Additionally, I do not have access to the report referenced and so cannot comment on its validity*."

HR Wallingford response:

The ADCP measurements are described in Wither et al. A reference is provided in Chapter 14 of the ES Addendum (second issue).

Cefas major comment:

- Para 28: "*Paragraph 14.11 states that "*Due to the expected negligible nature of water level changes as a result of climate change within the Mersey, the numerical modelling parameters have not included any assessment of climate change*". However, no reference is provided to justify this assumption. I recommend that future climate scenarios are modelled*."

HR Wallingford response:

The mean sea level is anticipated to rise in the Mersey Estuary over the lifetime of the Development due to climate change effects. The sensitivity of the predicted effects to increased mean sea level has been tested in the tidal model and is reported in Chapter 14 of the updated ES Addendum (second issue).

Cefas minor comment:

- Para 31: "*A comparison of modelled and observed tidal discharge and sediment fluxes under spring tide conditions has been provided (Figures 14.4 and 14.5). However, no unbiased statistical accuracy assessment of the model has been provided. I recommend a targeted assessment be undertaken and reported to give confidence to the model outputs*."

HR Wallingford response:

Section 3.3.1 of the technical report (Appendix 14.1a of the ES Addendum (second issue)) describes the objective statistical comparison for total discharge. Section 4.3.1 describes the objective statistical comparison for total sediment flux.

Mean Absolute Error was used as an objective statistical measure of model accuracy, being an overall measure of the 'goodness of fit' of the simulated tidal discharge and sediment flux when compared to the observations. The calculated MAE was within 11% of the maximum tidal discharge for both spring and neap tide conditions. The calculated MAE of the total sediment flux was within 12% of the maximum observed sediment flux for both spring and neap tide conditions.

Cefas, letter of advice pertaining to dredging, disposal and sediment contamination dated 21st September 2018

Cefas minor comment:

- Para 9: "*Sediment contamination data was acquired in the APEM Marine Ecology survey … [we] would expect the name of the processing laboratory and a methods statement to be included. Specifically, the test(s) without UKAS accreditation should be noted*."

APEM response:

Particle size analysis was conducted by KPAL (Ken Pye Associates Ltd) which is MMO approved for Particle Size analysis. Sediment chemical analysis was conducted by SOCOTEC which is MMO approved for all chemical analyses apart from brominated flame retardants with DBT, TBT, MBT, the PBDE Suite and Diuron sub-contracted to RPS (MMO approved for organotins). Some methods information is provided in **Annex 1** to this letter.

Cefas minor comment:

- Para 15: "*The units of tables 14.16/14.17 (PAHs) ad 14.8 (PCBs) are incorrectly stated as mg.kg^{-1}. These should be µg.kg^{-1}*."

Noted. This was a typographical error and has been corrected in Chapter 13 of the ES Addendum (second issue).

Cefas, letter of advice pertaining to benthic ecology dated 21st September 2018

Cefas minor comment:

- Para 10: regarding sections 13.105 – 108 of the ES "… *a clarification of how the impact was determined to be of minor, not moderate, significance would be helpful*."

APEM response:

As noted by the reviewer, a high value receptor combined with minor magnitude can be allocated either moderate or minor significance of impact. When determining if the impact was moderate or minor, professional judgement was applied. The area of subtidal habitat to be lost is very small in relation to the availability of similar habitat in the wider estuary and the integrity of populations of species within subtidal habitats in the vicinity of the works and the wider estuary is not expected to be adversely affected by the loss of habitat. Overall, impacts are considered to be minor with no mitigation required.

Cefas minor comment:

- Para 11: "*There doesn't appear to be any conclusions regarding impacts on designated sights* [sic] *and associated benthic features in the ES*." [Note that Cefas don't expect there to be any impacts, but it can be inferred that they wish to see an express conclusion to that effect in the ES.]

APEM response:

The potential impact on designated sites with benthic features was screened out of the assessment as the closest designated site that protects benthic features is 4.2km away (Dee Estuary SAC) (benthic features include intertidal mud and sandflats, and saltmarsh habitat). None of the potential effects were assessed to have a Zone of Influence that would extend to this area and potentially influence benthic features of this site. Certain protected sites were screened out of the assessment for this reason. Effects screened in for designated sites are covered in Appendix 13.7a: Information to inform a Habitat Regulations Assessment (HRA) Appropriate Assessment of the ES addendum (second issue).

Cefas minor comment:

- Para 15: "*It's not clear why the value of [subtidal species and habitats] is recorded as medium in Table 13.10*."

APEM response:

This text could be clarified further by indicating the receptor in Table 13.4 as 'subtidal species and habitats (excluding *N. vectensis*)'. When *N. vectensis* has been considered as well (as is the case for most of the subtidal species and habitat assessments) the value has been elevated to High. The value for *N. vectensis* is provided separately in Table 13.4 as High. As a receptor, subtidal species and habitats (excluding *N. vectensis*) was considered to be of moderate biodiversity value and it is a WFD biological element and was allocated a medium value following consideration of Table 13.4.

Environment Agency letter, 1st October 2018

EA comment:

Make the following change to ES Addendum Para 13.99: If any piling is to be conducted between these dates it is proposed that piling would be restricted ~~to the ebb tide~~ between the dates ~~13th~~ 1st September to 30th November.

Remove text in brackets stating salmonids are unlikely to be present early September. This is a misunderstanding.

APEM response:

As noted below, it is now proposed that the installation of any new piles will be by rotary method, rather than percussive or vibro-piling. The changes made to the proposed piling methodology, particularly the removal of percussive or vibro-piling for pile installation, has resulted in a reduction of potential impacts to marine ecology in general, as reported in Chapter 13 of the ES Addendum (second issue). As a result, it is no longer considered necessary for a restriction on piling activities between 1 September and 30 November to be imposed.

MMO local office, advice dated 25 September 2018

Comment:

Request to speak directly with the MMO with regards to commercial fishing (to obtain fish landing data and understand the commercial fleet that use and fish the Mersey).

Request to conduct a fish survey and use the various gears that are used in the area by the fishing industry (information about fishing gear in this area can be obtained from the MMO).

Waterman Response:

As noted, these issues are to be addressed in a separate report to be issued to the MMO in due course.

Charter Boat Operators email representations

General comments:

Concerns that fishing activities /business will be affected due to piling works, as the underwater noise generated by piling will affect the number of fish that will be migrating into the River Mersey.

Waterman Response

In order to address concerns raised, the piling methodology has been changed to rotary drilling and socketing the piles into the river bed, which is likely to avoid any significant levels of vibration. Rotary drilling is a less vibration-inducing operation than either impact piling or vibro-piling (which were assessed as possible methodologies in the November 2017 ES and the First Issue of the ES Addendum in July 2018).

As explained above, it should also be noted that during the demolition phase of the works, it is expected that approximately 25% of the day (during daytime hours (i.e. 0700 to 1900)) would involve active pile extraction (and associated noise). During the pile installation phase, it is expected that approximately 40% of the day (again, during daytime hours (i.e. 0700 to 1900)) would involve active pile installation (and associated noise).

A full assessment of potential effects on migrating fish species (and marine ecology more generally) associated with the piling methodology now proposed is presented in Chapter 13 of the ES Addendum (second issue).

Potential socio-economics effects on commercial fisheries will be dealt with in a separate report to be issued to the MMO in due course.

Key Changes to ES Conclusions

Noise and Vibration

The assessment of airborne noise and vibration effects associated with the demolition and construction phases of the project has been updated since the November 2017 ES and the ES addendum (first issue). This reflects two significant changes to the proposed demolition and construction methodology.

First, it is now proposed to undertake some low-level noise activities during evening and night-time hours. These activities would be restricted to 'low-noise' logistical activities (such as relocating the floating barges depending on tidal conditions) and would not include, for example, piling activities during these hours. These revised working hours have been assessed in the ES (please see Chapters 8 and 13 of the ES Addendum (second issue)) and are not expected to give rise to any impacts which are greater in significance than those reported in the November 2017 ES or the ES addendum (first issue).

Second, and as noted, it is no longer proposed to use either percussive or vibro-piling in connection with the installation of any new piles associated with the construction of the concrete suspended deck. Rotary drilling is to be used instead, which is anticipated to generate lower levels of noise and vibration.

As a result of these changes, the conclusions of some of the assessments reached in the ES are changed from those reported in the November 2017 ES and the ES addendum (first issue). In particular,

there would be fewer significant adverse noise effects at Alexandra Tower (albeit some temporary moderate adverse effects would remain) and vibration effects would be reduced to negligible.

Ecology

The changes made to the proposed piling methodology, particularly the removal of percussive or vibro-piling for pile installation, has resulted in less significant potential impacts to marine ecology in general. Please refer to Chapter 13 of the ES Addendum (second issue).

Coastal Processes

Some minor changes to the methodologies used in Chapter 14: Coastal Processes, Sediment Transport and Sediment Contamination have occurred as a result of addressing the consultation comments summarised above. In particular, consideration of likely effects of climate change have been incorporated. In general, however, the overall conclusions of the chapter are unchanged.

We trust that the above is a clear summary of the information now provided to the MMO and we look forward to hearing from you.

Yours sincerely

Gavin Spowage
Associate Director
Waterman Infrastructure & Environment Ltd

Annex 1: Sediment Contamination Analysis Methodology

Test	Method (method code in bold)	Accreditation U=UKAS M=MCERTS	Method Reporting Limit, ppm unless stated otherwise
Moisture content	Documented in-house method, oven drying @ 105°C, **TMSS**	U	0.2%
Dry Matter	calculation 100 minus moisture	U	0.2%
Metals Suite: *As(0.5), Cd(0.04), Cr(0.5), Co(0.5),* *Cu(0.5), Pb(0.5), Hg(0.015), Mn(0.5), Ni(0.5), Zn(2)*	Documented in-house method using aqua regia extraction and ICPMS, **ICPMSS**	U & MMO Approved	Detection Limits in brackets (mg/kg)
Ti(6) ***expressed as TiO2***	Documented in-house method using aqua regia extraction and ICP-OES, **ICPSED**		Detection Limits in brackets
PAHs: 2 to 6 ring aromatics by GC-MS and/or + 16 USEPA (as required)	Documented in-house method using DTI specification by GC-MS, **PAHSED**	U (16 USEPA + Dibenzthiophene & Benzo(e)pyrene only)	0.001
PCBs, ICES 7 Congeners (PCB: 28, 52, 101, 118, 138, 153, 180)	Documented in-house method using solvent extraction and determination by GCECD, **PCBSED**		0.08µg/kg
Speciated organotin:DBT (5 ug/kg), TBT (2 ug/kg) ,MBT (2 ug/kg)	Subcontracted to RPS Mountainheath REF: 170504/06		Detection Limits in brackets
CFAS MMO PBDE Suite	Subcontracted to RPS Mountainheath REF: 170504/06		0.001 -0.1mg/kg
Diuron	Subcontracted to RPS Mountainheath Ref: 170504/08		0.1 mg/kg