

REPORT

Port of Leith – Outer Berth

Environmental Impact Assessment Report Addendum
(including additional information to support the Habitats
Regulations Appraisal)

Client: Forth Ports Limited

Reference: PC2045-RHD-ZZ-XX-RP-Z-0010

Status: Final/00

Date: 07 September 2022



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Acronyms

Acronym	Acronym description
CEMP	Construction Environmental Management Plan
ECow	Ecological Clerk of Works
EIAR	Environmental Impact Assessment Report
HRA	Habitats Regulations Appraisal
MLA	Marine Licence Application
MS LOT	Marine Scotland Licencing Team
MSS	Marine Scotland Science
NS	NatureScot
SPA	Special Protection Area

1 Introduction

The following marine licence applications (MLAs) were submitted to Marine Scotland Licencing Team (MS LOT) on 12 April 2022 for the proposed Port of Leith – Outer Berth Development (the ‘proposed development’):

- 00009818 - Forth Ports Limited - Construction - Port of Leith Outer Berth; and
- 00009819- Forth Ports Limited - Capital Dredge and Sea Disposal - Port of Leith Outer Berth.

The MLAs were supported by an Environmental Impact Assessment Report (EIAR), Technical Appendices, Non-Technical Summary and Habitats Regulations Appraisal (HRA) (Royal HaskoningDHV, 2022).

Following MS LOT’s review of the MLAs and supporting documents, the consultation responses received and the advice provided by Marine Scotland Science (MSS), the Scottish Ministers have requested that supplementary information is submitted in line with s.21 of the Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017.

The following consultation comments and advice comprise the requirement for the request for supplementary information (see **Appendix A**):

- Letter from MSS to MS LOT, dated 5 July 2022
- Letter from Carolyn Clark of NatureScot (NS) to MS LOT, dated 15 July 2022
- Letter from the Royal Society for the Protection of Birds to MS LOT, dated 15 July 2022
- Letter from MSS to MS LOT, dated 25 July 2022
- E-mail sent from Neil MacLeod of MS LOT to Royal HaskoningDHV, dated 29 July 2022

1.1 Purpose of this document

This document forms an addendum to the EIAR issued in support of the MLAs. Table 2-1 sets out the stakeholder comments and advice received on the MLAs, and the required response to each comment.

Section 4 of this document forms an addendum to the HRA issued in support of the MLAs. That considers the entirety of the information provided in Table 2-1 in the context of compliance with the Conservation (Natural Habitats, &c.) Regulations 1994.

This document should be read alongside the EIAR and HRA submitted in April 2022.


2 Response to Consultation Comments

Responses to the consultation comments and advice received on the MLAs are presented in **Table 2-1**.

Table 2-1 Response to consultation comments and advice received on the MLAs

No.	Consultation Comment	Response
Comments from MSS within e-mail response dated 29 July 2022		
1	The description of the Proposed Development states that the existing structures must be removed as part of 'enabling works'. We request a full description of these enabling works and in particular the methodology for removing the existing structures. This should include a full assessment of the potential environmental impacts these works may have and necessary mitigation measures in light of the impacts identified. The assessment should include but not limited to in air and underwater noise an consider if the mitigation would reduce impact ranges for marine mammals and fish as well as birds.	<p>As stated in Section 3.2.1.1 of the EIAR, the enabling works comprise the removal of the existing dolphins and bridge walkways, and dredging works. The dolphins will be removed by removing any material inside the dolphins to the required depth and then cut from inside and lifted out of the water. The bridge walkways will be lifted off the dolphins using the crane. Further details are provided in Appendix B.</p> <p>These works have already been assessed by the EIAR and HRA. Cutting the dolphins from the inside and lifting out of the water, is not considered to have the potential to result in significant environmental effects. In addition, the release of the very small quantity of the sediment from the inside of the piles would not have a significant effect on water quality. Consequently, additional mitigation is not required.</p>
2	The Scottish Ministers request further information in relation to the impact on bird species at the site of the Proposed Development caused by artificial lighting during both the operational and construction phases of the Proposed Development. This should include a description of the lighting plan during both the construction and operation phases, any potential impacts particularly in relation to bird species, including but not limited to breeding terns, and any required mitigation in light of the impacts identified.	<p>It is not considered appropriate to provide a construction lighting plan given the temporary and localised effects that would occur. Rather best practice measures will be adhered to as described and approved via the required Construction Environmental Management Plan (CEMP).</p> <p>An operational lighting plan has been produced, see Appendix C. The lights are shielded and the design intent is to provide lighting of the work area and not anywhere else. In addition, 3000°K lighting is proposed which, given its warmer output, reduces any impact to light sensitive wildlife that may use the site.</p>
3	The supporting documents state that there will not be a significant increase in vessel traffic during the operation phase, the Scottish Ministers request further information relating to the anticipated vessel traffic during the operation of the Works, including the types of vessels to be serviced.	<p>As stated in Section 3.3.1 of the EIAR, it is anticipated that the berth would be used 2-4 times a month, with a vessel at berth for up to 24hrs. An example vessel is presented in Figure 3.6 of the EIAR.</p> <p>Reference should also be made to comment 20, whereby MSS confirms agreement with NS's response that vessel movements during the operational phase are unlikely to be significant.</p>
4	The Scottish Ministers request that you provide details of anticipated vessel traffic activity during the construction phase of the Proposed Development, in particular relating to the required vessel movements required to transport materials necessary to complete the Proposed Development and vessel movements required to transport dredge material. This should include an assessment of the impacts caused upon marine mammal and bird receptors as a result of increased vessel presence and movements and any mitigation required in light of the impacts identified.	<p>During the construction phase the following vessel movements would occur:</p> <ul style="list-style-type: none"> • 26 barge movements for the delivery of rock to the site • 397 barge movements to the disposal site. Over four months this equates to an average of 3.3 trips per day <p>In 2019, there were 1,215 vessel movements in/out of the Port of Leith, and 3,087 vessel movements over the disposal site (Forth Ports Limited). These numbers do not include recreational nor fishing vessels.</p>

No.	Consultation Comment	Response
		<p>This equates to a 2% and 13% increase respectively. These levels are not considered to be significant, in particular when considering the average number of vessel movements to the disposal site, and are within Forth Ports Limited's existing powers to permit increased vessel movements even if the proposed development were not to proceed.</p> <p>Forth Ports Limited is the statutory authority with regard to vessel management, managing vessel movements in line with strict requirements and will continue to do so. Inward and outward passage plans for the Firth of Forth within the Firth of Forth Pilotage Area are presented in Appendix D. The plans have been produced in accordance with the relevant legislation, procedures and guidelines, as available online at: http://www.forthports.co.uk/marine/. The passage plan to the Port of Leith, which passes over the disposal site, can be seen on page 11 of Appendix D.</p>
5	<p>There is a description of the noise modelling that was carried out at the site prior to the applications being made. It appears that the outcome of this exercise, which is treated as a baseline assessment, is reported in the following document: 'New Acoustics (2019) Western Harbour Development, Edinburgh – Noise Impact Assessment'. A link is supplied in the HRA report to access this document, but it is currently unavailable. We require any data and assessments forming part of the EIA to be incorporated in the EIA report.</p>	<p>A copy of the 'New Acoustics' (2019) Western Harbour Development, Edinburgh – Noise Impact Assessment' report is provided in Appendix E. The noise report relates to existing operational sources within the port which were recorded as part of the recent Western Harbour planning application.</p>
6	<p>We request further clarification as to the levels and variations in baseline noise and visual disturbance across the site is provided as it relates to birds. This should include information regarding predicted levels of activity at the Eastern Breakwater during both the construction and operation phases and comparing this to the current baseline.</p>	<p>The Eastern Breakwater is adjacent to (i.e. less than 100m) the approach channel to the Port of Leith, hence the presence and passage of large vessels is a frequent visual / noise disturbance at this location. Furthermore, and as can be seen from the photo overleaf, current port operations extend to the Breakwater. It must be recognised that water birds using the Eastern Breakwater contend with port related disturbances as a matter of course.</p> <p>In addition, the improved berth would only be used 2-4 times per month, with a vessel berthed up to 24hrs at a time. The proposed use of the berth and current level of port activity around the Eastern Breakwater is not considered to be significantly different to the existing baseline.</p> <p>See also response to comment 35.</p>

No.	Consultation Comment	Response
		
7	<p>The Scottish Ministers request further information relating to the use of the piling shroud including modelling of noise impacts both with and without the shroud in order to provide an assessment of the potential noise abatement against all underwater noise impacts generated by the Works.</p>	<p>The shroud provides mitigation for airborne noise rather than underwater noise. Measures to mitigate underwater noise have been proposed and approved by NS, subject to minor amendments (see Section 3).</p>
8	<p>The information should be supplied to MS LOT either as an addendum to the EIA Report already received or contained within a revised EIA Report. In regard to timelines going forward, once this information has been received, and in accordance with Section 22 of the 2017 EIA Regs, notice of the additional information must be published in the Edinburgh Gazette and in one or more newspapers circulating in the locality in which the works are situated and on the application website. The Scottish Ministers must also carry out consultation on the additional information provided with all public bodies that have an interest in the proposed works in line with s.18(1)(a)(iii) of the 2017 EIA Regs. The 2017 EIA Regs mandate at least a 30 day period from the last date of publication of the public notice and consultation to allow responses to be provided. In addition to this 30 day period, the Scottish Ministers will require a period of at least two weeks to come to a decision on the application once all consultation responses have been received and the 30 day notice period has expired, provided no further issues are raised during consultation. Please note that further time may also be required by</p>	<p>This document comprises the EIAR addendum as required by MS LOT.</p>

No.	Consultation Comment	Response
	the Scottish Ministers depending on the content of the consultation responses.	
9	MS-LOT would also like to direct you to the responses of MSS, NatureScot, RSPB and other stakeholders. While not all aspects require further information, it is the responsibility of the applicant to consider and respond to each objection and issue raised in the consultation responses, including requests for further mitigation, surveys and reporting.	Comments received from NS and the RSPB are considered within this note. No other consultation comments have been received that required additional information.
Comments from MSS dated 5 July 2022 (Comments in bold are from MSS dated 25 July 2022 and are assumed to supersede those made on 5 July)		
10	Lack of information on timings in order to understand the seasonal sensitivities to particular impacts	<p>In order to provide flexibility within the construction programme (mostly to deal with the consenting process timescales), key sensitive periods have been addressed through the EIAR and the information to inform the HRA, including:</p> <ul style="list-style-type: none"> • Breeding and post breeding tern periods; • Occurrence of estuarine birds, considering passing, overwintering and breeding periods; • Densities of marine mammals; and • Migratory fish. <p>Where there are seasonal sensitivities, mitigation has already been suggested that reduced potential impacts to acceptable levels. These measures have been approved by NS, subject to minor amendments (see Section 3).</p>
11	<p>In Table 12-8, Carter <i>et al.</i> (2022) should be used for seal densities, as the updated methodology is more robust for data deficient areas given the use of a habitat preference based prediction rather than <i>null usage</i> (linear decay of usage from a haul-out site). Absolute density estimates, using the scalars and methodology found in the Supplementary Information of Carter <i>et al.</i> (2022), should be used rather than relative density in order to predict the number of individuals which may be impacted.</p> <p>MSS notes that seal usage derived from Russell <i>et al.</i> (2017) is sufficient in this case given the fact that no new telemetry data has been collected for either grey or harbour seals in the Forth and Tay region since 2017. MSS would like to note that in the future, updated usage maps derived from the more robust methodology presented by Carter <i>et al.</i> (2022) is preferable for quantitative assessment. Even in lieu of more current telemetry data, these recent predictions are taking the population trajectory into account which has shown inter-annual fluctuations, particularly in the east coast management unit over the past decade.</p>	No additional information required.

No.	Consultation Comment	Response
12	<p>In section 12.7 it is important to note that Inchkeith, the closest designated haul-out site for grey seals, is also a breeding site. Seasonal considerations should be made to ensure potentially higher local densities during breeding season are taken into account. At-sea distributions of seals during this time may be higher than reflected by averaged density maps from Carter <i>et al.</i> (2022), which primarily uses data collected during spring and summer months.</p>	<p>Given the above response that seal usage data derived from Russell <i>et. al.</i> (2017) is sufficient, it is therefore concluded that the data used for seasonal sensitivities is sufficient. The assessment of potential impacts has considered the seasonal sensitivities of seals and already taken this into account.</p> <p>No additional information required.</p>
13	<p>A quantitative assessment of impacts from tubular piling (impact piling) has been undertaken using underwater noise modelling (Marine Mammal and Fish Technical Report for Underwater Noise Impacts PC2045-RHD-ZZ-XX-RP-EV-0011). MSS are content with the method and application of the noise modelling carried out.</p>	<p>No additional information required.</p>
14	<p>In the pre-application consultation report, there is reference to the steel piled lead-in jetty, which will be cut at seabed level. More information on the anticipated noise profile of this process would be useful.</p> <p>MSS require clarification on the process of cutting the steel lead-in jetty piles and demolition works given the lack of information on anticipated noise levels of this process and potential impacts due to underwater noise. MSS cannot effectively advise on the necessity for mitigation of this process without information on the potential for disturbance.</p>	<p>See response to comment 1.</p>
15	<p>MSS note that the use of a piling shroud is mentioned as mitigation in the ornithology section of the EIAR 11.7.2.3 for airborne noise. MSS request further clarification on this methodology, with respect to the potential of the shroud to minimise underwater noise emissions. If so, this should be included in the relevant mitigation section of the EIAR for marine mammals. As previously advised, pile driving activities and suction dredging should be screened in to the EPS licensing process. These activities will produce noise that is within the hearing range of cetaceans, with the potential to cause disturbance or injury.</p> <p>Regarding the shroud, MSS require further details on if there will be any noise abatement effects to underwater noise and if this would reduce impact ranges for marine mammals and fish as well as birds.</p>	<p>See response to comment 7.</p>
16	<p>The deposition of the dredged material should also be considered with respect to marine mammals in the EIAR. Given the proximity of the dredge deposit site to Inchkeith island, which is a designated grey seal haul-out site, MSS recommend vessel operators follow best practice in relation to marine wildlife, as laid out in the Scottish Marine Wildlife Watching Code: The</p>	<p>Best practice measures will be included, and agreed, via the CEMP.</p> <p>No additional information required.</p>

No.	Consultation Comment	Response
	<p>Scottish Marine Wildlife Watching Code SMWWC NatureScot and ensure there are no marine mammals near the barge prior to dumping.</p> <p>MSS are content with no further information on this however would like to note the absence of detail with regards to dredged deposit impact to marine mammals during disposal.</p>	
17	<p>To mitigate for impacts on breeding birds at this SPA, MSS advise that works likely to cause the highest disturbance (e.g. piling) should ideally be undertaken outside the tern breeding season (May to mid-September, NatureScot 2020).</p>	<p>Works that cause the highest disturbance will be planned to avoid the tern breeding season, where possible; however, potential impacts have been assessed using worst case scenarios and have therefore considered the necessary mitigation should such works occur during this sensitive period. It has been noted that should the activities causing the highest disturbance levels occur during the tern breeding season then additional mitigation will be provided, as per NS's requirements.</p>
18	<p>In addition, in consideration of the noise modelling, other construction activities and the potential for birds to be using the immediate and surrounding areas for breeding, we advise that an Ecological Clerk of Works (ECoW) should be present to monitor disturbance for the duration of the bird breeding season, should works occur at this time.</p>	<p>An ECoW would be employed to monitor the construction works during the bird breeding season. The role of the ECoW will be confirmed via the CEMP.</p>
19	<p>While MSS are content with the approach taken to modelling noise impacts (Section 11.4.3, p. 116), MSS advise that the source level used should be listed and referenced, along with an assessment of how comparable this is to the piling proposed. MSS also recommend that more detail is provided on the piling shroud, including modelling of noise impacts both with and without the shroud to better understand potential noise abatement.</p> <p>MSS request additional details of the shroud in order to clarify if it will be an effective mitigation measure for birds and also potentially for marine mammals and fish. Currently there are scant details on the shroud in the EIA.</p> <p>The assessment of in-air piling noise does not state a source level used, only that with a shroud in place it will be reduced by 7 dB. MSS are therefore unclear whether this reduction in noise level is sufficient. MSS recommend that a source level used in the assessment is provided and referenced to ensure that it is comparable to proposed piling activity being assessed. If the applicant were to provide an assessment of noise levels with and without the shroud this would clarify if the mitigation is appropriate.</p> <p>In line with the NS response, MSS agree that piling works should be undertaken outside of the tern breeding period (May, June, July). However, if piling does occur during breeding then a piling shroud</p>	<p>As stated in Section 11.7.2.3 of the EIAR, during construction, including piling, disturbance to common terns at the breeding colony is predicted to be of minor adverse significance, which is not significant in EIA terms, given the maximum predicted noise levels and the high degree of tolerance and recoverability the colony has when it comes to human-related disturbance within the port. As such, no mitigation was considered necessary.</p> <p>During the post breeding season, a potential impact of moderate adverse significance was predicted to post-breeding roosting / loafing terns given the important roosting locations may be affected. As mitigation, the use of a piling shroud was proposed to increase the amount of alternative habitat within the port estate available to post-breeding terns and thereby increase adaptability.</p> <p>The source noise level used when piling was 142 dB L_{Amax} (sound power level, equating to 114 dB L_{Amax} at 10m). This value was identified by taking a typical worst-case impact piling sound power level from British Standard 5228-1 of 136 dB LWA (based on the L_{Aeq}) and using the Federal Highways Construction Noise Model to identify that, for impact piling, the L_{Amax} is typically 6 dB higher than the L_{Aeq}. This source noise level was used to predict the increase noise levels and to produce the noise contour plots, as presented in the EIAR and HRA.</p> <p>The use of the shroud would reduce noise levels presented in Figure 11.5 of the EIAR by an anticipated 7dB. For clarity, a noise contour plot has been produced for when the shroud is in place (see Figure F.1 in Appendix F).</p>

No.	Consultation Comment	Response
	<p>should be used and an observer employed to monitor disturbance at the Imperial Dock SPA tern colony.</p>	<p>Terns at the colony experience noise levels of between 71-85dB and are considered to be habituated to this level of noise. Taking a conservative noise level of 70dB, it can be seen on Figure F.1 that during a piling event much of the port area is well below this level with the shroud in place The employment of an ECoW will ensure that significant impacts to breeding and terms does not occur, should piling be undertaken during these periods.</p> <p>As noted previously, the shroud provides mitigation for airborne noise rather than underwater noise. Measures to mitigate underwater noise have been proposed and approved by NS, subject to minor amendments (See Section 3).</p>
20	<p>Potential impact pathways affecting ornithological features are identified and listed in Table 11-11 (p. 155) by project phase. This is generally appropriate but does not specifically identify vessel activity during construction, which should be considered. MSS advise that a Vessel Management Plan may be appropriate for the Construction and potentially also Operational phases of the development to mitigate disturbance impacts.</p> <p>MSS agree with the NS response that vessels movements during the operational phase are unlikely to be significant, provided they are following the exact routes through the Forth. Although no specific reference is made to the construction phase in the NS response, MSS consider this response to relate to both construction and operation as the NS response quotes “25 round trips of the installation vessel”.</p>	<p>No additional information required.</p>
21	<p>Artificial lighting is also not considered in Table 11-11 (p. 155). While artificial lighting is likely already present within the development area and surrounding area, MSS advise that consideration is given to impacts from any new proposed lighting specifically with respect to illuminating the area used by breeding terns (during the breeding season) within Imperial Dock SPA (ca. 100 m from the laydown area element of the proposed development), as artificial lighting could lead to disturbance (direct or indirect e.g. via increased predation).</p> <p>MSS remain concerned that the introduction of increased artificial lighting in close proximity to breeding terns could have an impact on the SPA feature. As such MSS suggest the developer clarifies the potential for impacts of lighting in this context to allow consideration as to the magnitude of impact and on the requirement for mitigation. However, MSS do not advise that Additional Information is required.</p>	<p>See response to comment 2.</p> <p>It should be acknowledged that the tern colony breeds in an area that is already subject to a high level of port activities which includes lighting and the potential effects are not expected to be significant or materially different from the existing baseline.</p>
22	<p>MSS also recommend that if construction works do occur during the breeding season then it may be appropriate to appoint an Ecological Clerk of</p>	<p>See response to comment 18.</p>

No.	Consultation Comment	Response
	<p>Works to advise on avoiding disturbance to breeding birds. Where construction activity is planned during the breeding season that could lead to disturbance of nesting birds, MSS advise that breeding bird surveys should be undertaken, and suitable mitigation is identified and implemented where required. MSS would expect this to be considered in a Construction Environmental Management Plan (CEMP).</p> <p>All wild birds, their nests and eggs are protected during breeding under the Wildlife and Countryside act (1981). As such, should works are undertaken during the breeding season, a trained ornithologist should survey the terrestrial site ahead of any construction works to check for breeding birds, which may include ground nesting waders or passerines with unenclosed nests or nests in holes/crevices. Where nests are identified, works should be halted in the immediate vicinity until the young are fledged.</p>	
23	<p>Potential impacts for ornithology by project phase are listed in Section 4.2.2.3 (p. 37). This is generally appropriate but does not specifically identify potential for disturbance from vessel activity (other than noise from impact piling) during construction, which should be considered (<i>see Nature Scot response for detail</i>). The developer considers that there would not be any likelihood for significant effects during the operational phase of the development, as the port already accepts vessels of similar size. However, MSS advise that any significant increase in vessel activity (e.g. associated with increases in infrastructure/components for offshore wind developments) should be considered. As advised above, MSS reiterate our advice to consider whether a Vessel Management Plan is required to cover both the Construction and Operation phases of the Proposed Development, to mitigate disturbance impacts.</p> <p>As stated in item 11 above a response was provided in the MSS response dated 25.07.22 to say: MSS agree with the NS response that vessels movements during the operational phase are unlikely to be significant, provided they are following the exact routes through the Forth. Although no specific reference is made to the construction phase in the NS response, MSS consider this response to relate to both construction and operation as the NS response quotes “25 round trips of the installation vessel”.</p>	<p>There would not be a significant increase in vessel numbers during construction. See response to comment 4.</p> <p>Forth Ports Limited is the statutory authority with regard to vessel management, managing vessel movements in line with strict requirements and will continue to do so.</p>
24	<p>As advised above (for the EIAR), MSS advise that impacts from lighting during the Construction and Operational phases are considered, specifically with respect to disturbance of breeding common terns from Imperial Dock SPA.</p>	<p>See response to comment 2.</p>

No.	Consultation Comment	Response
25	<p>MSS note that the Conservation and Management Advice for the Outer Firth of Forth and St Andrews Bay Complex SPA (NatureScot 2022) was published very recently and thus was likely not considered during the preparation of the HRA report. MSS therefore advise that MS-LOT may wish to clarify with NatureScot whether further consideration is needed for this SPA to reflect the conservation and management advice.</p>	<p>The EIAR and HRA were based on all information available at the time of assessment. This included the conservation and management advice for Firth of Forth SPA and the Forth Islands Special Protection Area (SPA). Many of the features from these sites are the same as for the Outer Firth of Forth and St Andrews Bay Complex SPA although this SPA protects the marine foraging grounds. Potential impacts on foraging areas were considered in the SPA.</p> <p>NS, in their response to the HRA Stage 3, has summarised that the sites, features and Likely Significant Effects identified (which included the Outer Firth of Forth and St Andrews Bay Complex SPA) are fully assessed in the reports, in order to inform the required appropriate assessment (However, see responses to comments 30 and 31 where NS requested further information in relation to this particular site).</p>
26	<p>The Fish and Shellfish Ecology chapter of the EIA focuses mainly on migratory (or diadromous) fish species rather than other marine fish species. Whilst this is understandable due to the estuarine environment of the area of works, Section 10.5.3 notes that the Firth of Forth also supports a diverse range of fish species including spawning and nursery grounds for species, including herring (<i>Clupea harengus</i>), cod (<i>Gadus morhua</i>), whiting (<i>Merlangius merlangus</i>), plaice (<i>Pleuronectes platessa</i>), sprat (<i>Sprattus sprattus</i>), and lemon sole (<i>Microstomus kitt</i>). MSS are content with the identified impacts during construction on fish and shellfish however MSS recommend that other marine fish species are considered for impacts arising from underwater construction noise within the underwater noise assessment. Marine fish species such as herring and cod are sensitive to underwater noise and should be considered in this assessment.</p> <p>MSS have considered whether additional information/further assessment is required in relation to marine fish species. The identified spawning grounds for cod and herring are situated out with the Forth estuary and are therefore thought to be a far enough away from the construction site that underwater construction noise impacts are unlikely to have a significant adverse impact on spawning marine fish. MSS can confirm that additional/information/further assessment is not required in relation to marine fish species.</p>	<p>No additional information required.</p>
27	<p>MSS note that the construction works, including piling, will take place over 5.5 months but does not state a time period for this work. MSS recommend that the applicant provides details on when construction is likely to take place. This information will aid the underwater noise assessment.</p>	<p>See response to comment 10.</p>
28	<p>The dredged material includes fine material which will disperse. MSS consider the failure to consider oxygen demand of the sediment and oxygen</p>	<p>No additional information required but comments are noted for future reference.</p>

No.	Consultation Comment	Response
	<p>levels in the water column by modelling or from sampling data during previous disposals at the site to be a notable omission, as reduced oxygen levels can result in fish mortalities, particularly at high temperatures.</p> <p>Additional information / further assessment is not required before MSS can advise on whether the proposal will have a significant adverse impact on the environment and on mitigation requirements regarding diadromous fish. MSS confirm that the disposal of the dredged material is unlikely to have a significant adverse impact on the environment or require additional mitigation.</p> <p>Nonetheless, the additional information / further assessment would have provided additional reassurance over the safety of the disposal activities, particularly for migrating salmon smolts, which are considered to be at particular risk, as their migration is highly directional and they are therefore unlikely to be easily displaced by adverse conditions. The advice of SEPA would have also been welcome as they have carried out extensive monitoring of water quality and biological response in the Firth, which would be likely be relevant. The responses from NatureScot and the RSPB do not affect MSS's earlier advice with respect to diadromous fish.</p>	
29	<p>MSS advise that there should be a reporting condition within the licence that the sighting of dead, distressed or injured fish which could be connected with the activities must be immediately reported to MS-LOT.</p>	<p>It would be very difficult to determine whether any dead, distressed or injured fish were connected to any of the activities related to the works for this project. However, any sightings of dead, distressed or injured fish would be reported to MS-LOT.</p>
<p>Comments from NatureScot dated 15 July 2022</p>		
30	<p>NatureScot request further detail on the number of additional vessel movements, associated with trips to the spoil site, against the baseline usage to confirm their advice for the potential for disturbance to common terns linked to the Outer Firth of Forth and St Andrews Bay Complex SPA.</p>	<p>See response to comment 4.</p>
31	<p>There is the potential that disturbance to breeding terns at Imperial Dock Lock SPA from piling could reduce the potential for recovery within this site (Outer Firth of Forth and St Andrews Complex SPA), despite their habituation to the day to day operations of the port. This is because this is a novel type of construction, not currently part of the site baseline. Therefore, we could not be fully confident that there would be no adverse effect on site integrity if piling was to be undertaken during the breeding season (May, June, July). We therefore recommend that the piling works are undertaken outside of the breeding period as this would remove any LSE for common tern. However, if the applicant were to undertake the works during the breeding season we would require them to employ an observer to monitor disturbance at the colony, who should be suitably</p>	<p>See response to comment 18.</p>

No.	Consultation Comment	Response
	experienced and have the authority to halt works should there be evidence of disturbance to breeding common tern.	
32	Additionally, it is stated (on p 71) that a piling shroud would be installed on the rig during piling activities if they were to be undertaken during the post-breeding period when terns aren't confined to the colony and are found elsewhere in the dock. We agree that this should be installed but also recommend that the shroud be employed at all times should works be undertaken in the breeding season.	See response to comment 19.
33	Enabling works : <i>Given the existing piles are socketed it would be difficult to extract them and therefore they would be cut off at bed level.</i> We require some clarification of what these enabling works would include, the likely impacts and any mitigation that may be required in addition to that already included, to ensure complete assessment, advice and full identification of all required mitigation.	See response to comment 1.
34	<p>The applicant has suggested that the standard JNCC piling guidance should be amended to reduce the pre-piling search area from the recommended minimum of 500m to 200m. Given the uncertainties within the underwater noise section (see our comments below), and the fact that the piling phase is likely to take 5.5 months we recommend that the mitigation zone remains at the minimum JNCC recommend, i.e. 500m. If for operational reasons this becomes difficult to maintain, then we would be happy to discuss options at that point.</p> <p>MSS adopted a practical approach to guidance on mitigation during piling, agreeing with the proposed 200 m pre-piling monitoring zone; a reduction from the JNCC advised minimum of 500 m. However, in light of NS comments, MSS concur that the recommended minimum of a 500 m pre-piling search area is appropriate unless it can be demonstrated that this is unfeasible due to operational reasons or if the shroud is evidenced to be an effective mitigation measure for underwater noise.</p>	<p>The underwater modelling showed that the impact zones for piling in this location were small (100m distance) and as a precautionary approach the applicant has included for monitoring a search area of 200m.</p> <p>The uncertainties with regards to the underwater modelling have been addressed in comment 36.</p> <p>Given this, and whilst it is understood that 500m would be appropriate for some locations but this would seem to be very over precautionary for this instance. This will be considered further and agreed via the CEMP.</p>
35	<p>For bottlenose dolphins the assessment has used the MU for population numbers and for density used SCANs quadrant R. There is a mismatch here as the SCANs transects will reflect the offshore population of bottlenose dolphins whereas the density of East coast management unit (aka Moray Firth associated) dolphins will be much higher.</p> <p>We do not recommend the use of the entire MU as a reference population (IAMMWG, 2021), instead, we recommend that the UK proportion of the MU reference population be used.</p>	<p>While the SCANs density for block R reflects the offshore population, the worst-case density from across various sources has been applied to the assessment (Block R, 0.0298; Block S (Moray Firth), 0.0037; Waggit <i>et al.</i> (2019), 0.00008).</p> <p>Due to connectivity of marine mammals, the wider MU has been applied except in cases where the population has been defined by a smaller geographical range such as the ECS MU for bottlenose dolphin.</p>

No.	Consultation Comment	Response
	<p>For seals the assessment has used a combination of Carter et al 2020 (predicted relative density) and Russell et al 2017 absolute density estimates. The 'numbers' appear to have come from Russell et al 2017.</p>	<p>As MSS has noted (see comment 11), the seal usage derived from Russell <i>et al.</i> (2017) is appropriate in this case given the fact that no new telemetry data has been collected for either grey or harbour seals in the Forth and Tay region since 2017.</p>
36	<p>Table 4.15 projects with potential for in combination effects, and we are pleased to see this outlined although there may be a couple of projects missing from the list such as Aberdeen Harbour</p>	<p>The list of projects that needed to be considered in-combination with the proposed development was agreed via the consultation on the Screening of Likely Significant Effect report.</p> <p>The main construction works, particularly blasting, associated with the Aberdeen Harbour development have been completed and as such it is not considered necessary to assess it in-combination with the proposed development. We are not aware of any other planned projects that should be considered in-combination with the proposed development, nor were any identified during the consultation on the Screening of Likely Significant Effect report.</p>
37	<p>A simple modelling approach was used to assess dredging and vibropiling. It is not straightforward to convert levels in rms to SEL, unless noise recordings of these activities were available for use. Subacoustec appear to have used adjusted (reduced) source levels for input into the simple model. It is not that clear how the reduction has been calculated, and does not appear to be an accepted/common method. We therefore would need more detail on this method as the reduction in source levels used are not insignificant. Where there is uncertainty, we recommend that a precautionary approach is taken, and in this case our view is that the unweighted levels should have been used. However, we anticipate that even with an unweighted calculation the impact ranges and thus number of animals impacted would still be low.</p>	<p>As the sources under consideration are continuous-type noises, a 1-second SEL (which is used to calculate the extended duration SEL_{cum}) is very close in dB to the SPL_{RMS}. Subacoustec does hold these recordings. For there to be any risk of exceeding the TTS threshold, vibropiling would need to occur for a continuous 12 hour period in a day, and a marine mammal would have to remain less than 220 m from it for the entire duration. Both of these conditions are highly unlikely, and even more so in-combination. The distance is similar for suction dredging, although this source here is also moving. For the PTS threshold to be exceeded, the marine mammal would have to be considerably less than 100 m from the pile or dredger. Any real risk is extremely low.</p> <p>Although the use of unweighted metrics would be "precautionary", there is no need to ignore the known source frequency characteristics and species group sensitivities, especially when it is clear that the majority of the sound energy is in frequency bands to which most of the species are not sensitive.</p>

No.	Consultation Comment	Response
Comments from RSPB dated 15 July 2022		
38	<p>We are concerned that both EIA and HRA documents assess the operational impacts on bird species as if the existing, baseline noise and day-to-day activities are uniform across the Port and thus birds using the area of the proposed development are likely to be habituated to and therefore unaffected by these activities (mentioned for example in Section 11.8.1 of the EIA and Section 4.2.2.3 and 7.1.2.1 of the HRA). We wish to see evidence that this is indeed the case. It seems that currently the eastern breakwater (site of the proposed Outer Berth) may have relatively lower levels of disturbance – in particular activities by workers – and thus act as a quieter, refuge site for some of the bird species, in particular common tern, ringed plover and kittiwake. This appears to be supported by the survey records. If the proposed development leads to a significant increase in operational usage of this area, and in particular foot-traffic from workers, then it may well lead to an increase in disturbance and resulting reduction in value of this area to birds during ongoing operation of the berth, not just for the construction phase.</p>	<p>See response to comment 6.</p>
39	<p>We are also concerned about the construction impacts of the proposed development on post-breeding groups of roosting or loafing common terns. Although we agree with the conclusion that there could be a 'moderate adverse impact' on post-breeding groups of roosting / loafing common terns, connected to Imperial Dock Lock Leith SPA from the construction of the Outer Berth, we do not agree that the proposed mitigation will reduce this to a point that it is not significant.</p> <p>The survey records suggest that post-breeding groups of common terns use the eastern breakwater area in preference to most other areas of the dock. As such, even with mitigation in the form of a piling shroud (as proposed in Section 11.7.23 of the EIA) we do not believe it can confidently be concluded that the common terns can relocate elsewhere in the Port without detrimental impacts. These effects on common tern should also be considered alongside the operational effects described above.</p>	<p>See response to comment 18 and 19.</p>
40	<p>In summary, due to the underestimation of impacts associated with changes to activities on the eastern breakwater site of the proposed Outer Berth to SPA qualifying species (namely kittiwake, ringed plover and common tern) and substantial doubt over the success of the proposed mitigation measures for common tern (a qualifying feature of the Imperial Dock Lock Leith SPA) during construction we object to the proposed development. We do not consider the information provided enables Marine Scotland to conclude beyond reasonable scientific doubt that there will not be an adverse effect on the integrity of the</p>	<p>See response to comment 6.</p> <p>With regards to the bird species mentioned:</p> <ul style="list-style-type: none"> • Kittiwake were seen on only a few occasions over the course of the surveys and were not recorded in significant numbers (i.e. less than 1% of regional/SPA populations) and hence was not considered in detail in the EIAR/HRA, as is standard approach for these assessments. • Ringed plover were recorded regularly around the breakwater area. As discussed in Section 11.7.2.2 the EIAR, this species is robust and becomes habituated to activity rapidly, with disturbances mostly

No.	Consultation Comment	Response
	<p>Firth of Forth SPA, Imperial Dock Lock Leith SPA, the Forth Islands SPA and the OFFSABC SPA. We may be prepared to reconsider our objection following the provision of the following additional information:</p> <ul style="list-style-type: none"> • further mitigation measures for common tern during construction; and • re-assessment of how potential changes from current usage in specific parts of the port, namely the Outer Berth-end of the Port, will affect qualifying species. 	<p>associated with recreational activity (in particular people with dogs). As noted in the Waterbird Mitigation Toolkit (Cutts <i>et al.</i>, 2013¹) (aimed at determining the need for mitigation during coastal development works), the disturbance potential for this species is classified as “Low sensitivity; extremely tolerant with habituation”. The Toolkit suggests that ringed plover have been known to closely approach works, with flushing only likely at a distance of less than 50m. The Toolkit also states that “ringed plover would appear not to be very sensitive to noise stimuli and habituate rapidly, especially in conjunction with visual stimuli”. The Toolkit states that mitigation would only be necessary if birds primarily use areas closer than 50m to works that may cause notable disturbance.</p> <ul style="list-style-type: none"> • Give the foreshore area used by the species extends for approximately 250 m from the outer berth, there is considered sufficient space to move into when the berth is in use. • Further details on the mitigation measures for common terns are presented in the response to comment 19). <p>All potential impacts have been assessed in terms of the worst-case scenarios predicted and using referenced data sources wherever possible. Such data have been gathered during similar events and modelling has been undertaken to take account of site-specific factors. Mitigation has been applied where required, including the additional mitigation required by NS to reduce the impacts to acceptable levels.</p> <p>In addition, an ECoW will be employed during such activities should they occur during the tern breeding period to monitor behavioural responses of the terns (see response to comment 18).</p>
41	<p>Notwithstanding our objection to this application, should Marine Scotland be minded to grant consent without first requesting and considering this additional information, we request that the following elements be secured using conditions:</p> <p>a. Implementation of a programme of pre- and post-construction bird monitoring, to be agreed with NatureScot and RSPB, in order to validate the assumptions of the Environmental Statement.</p> <p>b. Annual reports to be submitted to the planning authority, NatureScot and RSPB Scotland on the monitoring/ surveillance results.</p>	<p>For the reasons set out in the EIAR and HRA, and taking account of the additional clarifications and mitigation measures described in this report, further mitigation measures are not considered necessary; however, the applicant will commit to providing the following enhancements:</p> <ul style="list-style-type: none"> • Implementation of a programme of pre- and post-construction bird monitoring and to provide annual reports for up to five years following construction; and, • Provide enhancements to the West Pier, with nesting platforms, to provide alternative nesting, roosting and loafing areas for common terns.

¹ Cutts, N. Hemmingway, K. and Spencer, J., 2013. *Waterbird Disturbance Mitigation Toolkit Informing Estuarine Planning and Construction Projects (Version 3.2, March 2013)*. University of Hull. [Online]. <http://www.tide-project.eu/>

No.	Consultation Comment	Response
	<p>c. The enhancement of the West Pier, with nesting platforms, to provide alternative nesting, roosting and loafing areas for common terns prior to the commencement of any works, with enhancement works to be agreed with NatureScot and RSPB prior to implementation.</p> <p>d. The installation of permanent screening fencing on the eastern side of the new Outer Berth to reduce disturbance to species using the foreshore, with fencing to be agreed with NatureScot and RSPB prior to implementation.</p>	

3 Summary of Additional Mitigation Measures

In accordance with the consultation comments received on the MLAs, the following mitigation measures will be adhered to in addition to those stated in the EIAR and HRA:

- An ECoW would be employed to monitor disturbance for the duration of the bird breeding season; and,
- The piling shroud would be installed for the tern breeding period (as well as the post-breeding period).

In addition, the requirement for a 500 m mitigation zone for marine mammals will be considered further and agreed via the CEMP.

4 Addendum to the HRA

The Applicant has considered the entirety of the information in **Table 2-1** in the context of the HRA (PC2045-RHD-ZZ-XX-RP-EV-0009) dated 28 March 2022. Taking into account of the information in **Table 2-1** and the additional mitigation measures set out in **Section 3**, the conclusions of the HRA remain valid. In particular, that the Proposed Development would not have an adverse effect on the integrity of any site protected under the Habitats Regulations (whether alone or in-combination effects with other projects).

Appendix A

Consultation Comments that comprise the Request for Information

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05 July 2022

00009818 AND 00009819 - FORTH PORTS LTD (PER ROYAL HASKONING DHV) - CONSTRUCTION AND CAPITAL DREDGE AND SEA DEPOSIT

Marine Scotland Science (MSS) have reviewed the Port of Leith-Outer Berth Environmental Impact Assessment Report (EIAR) Reference: PC2045-RHD-ZZ-XX-RP-EV-0007, the Habitat Regulations Appraisal (HRA) report (Port of Leith – Outer Berth Habitats Regulations Appraisal-Screening for LSE and the Provision of Information to Inform Appropriate Assessment: PC2045-RHD-ZZ-XX-RP-EV-0009).

The following advice relates to two licence applications:

- *00009818 - Forth Ports Ltd (per Royal Haskoning DHV) - Construction - Port of Leith Outer Berth*
- *00009819- Forth Ports Ltd (per Royal Haskoning DHV) - Capital Dredge and Sea Disposal - Port of Leith Outer Berth.*

MSS understand that NatureScot (NS) have been consulted on these applications, together with other consultees (e.g. the Royal Society for the Protection of Birds), however MSS provide the following comments without having sight of other representations, at the request of MS-LOT.

Marine Mammals

MSS note that exact timings of construction works have not been outlined in the EIAR, and this limits our ability to comment on the seasonality of any impacts associated with the development. This also applies to the conclusions of cumulative assessment. The key sensitive period with respect to marine mammals in association with this development is the grey seal breeding season (October to December).

MSS agree with the species listed and broadly agree with data sources used. We note the study area is not defined in section 12.5.1, but instead a list of the relevant Management Units (MUs) is presented. In Table 12-8, Carter *et al.* (2022) should be used for seal densities, as the updated methodology is more robust for data deficient areas given the use of a habitat preference based prediction rather than *null usage* (linear decay of usage from a haul-out site). Absolute density estimates, using the scalars and methodology found in the Supplementary Information of Carter *et al.* (2022), should be used rather than relative density in order to predict the number of individuals which may be impacted.

In section 12.7 it is important to note that Inchkeith, the closest designated haul-out site for grey seals, is also a breeding site. Seasonal considerations should be made to ensure potentially higher local densities during breeding season are taken into account. At-sea distributions of seals during this time may be higher than reflected by averaged density maps from Carter *et al.* (2022), which primarily uses data collected during spring and summer months.

MSS are content that the following impact pathways to marine mammals during construction have been considered: potential for auditory injury and/or behavioural impacts from underwater noise during piling and dredging works, and changes in water quality and prey availability. A quantitative assessment of impacts from tubular piling (impact piling) has been undertaken using underwater noise modelling (Marine Mammal and Fish Technical Report for Underwater Noise Impacts PC2045-RHD-ZZ-XX-RP-EV-0011). MSS are content with the method and application of the noise modelling carried out. In the pre-application consultation report there is reference to the steel piled lead-in jetty, which will be cut at seabed level. More information on the anticipated noise profile of this process would be useful. MSS note that the use of a piling shroud is mentioned as mitigation in the ornithology section of the EIAR 11.7.2.3 for airborne noise. MSS request further clarification on this methodology, with respect to the potential of the shroud to minimise underwater noise emissions. If so, this should be included in the relevant mitigation section of the EIAR for marine mammals. As previously advised, pile driving activities and suction dredging should be screened in to the EPS licensing process. These activities will produce noise that is within the hearing range of cetaceans, with the potential to cause disturbance or injury.

The deposition of the dredged material should also be considered with respect to marine mammals in the EIAR. Given the proximity of the dredge deposit site to Inchkeith island, which is a designated grey seal haul-out site, MSS recommend vessel operators follow best practice in relation to marine wildlife, as laid out in the Scottish Marine Wildlife Watching Code: [The Scottish Marine Wildlife Watching Code SMWWC | NatureScot](#) and ensure there are no marine mammals near the barge prior to dumping.

MSS consider the approach taken to assess the connectivity of the proposed works to Special Areas of Conservation, as outlined in the HRA report, to be appropriate and are content with the list of protected sites included.

Marine Ornithology

MSS are content that the baseline ornithology surveys undertaken (and presented here) provide appropriate baseline data to inform the EIA/HRA.

The EIAR refers to ornithology as "ornithology" and the HRA to "Birds". MSS recommend consistency in terminology within and between application documents to avoid ambiguity.

MSS note that the duration of construction works for the proposed development is 5.5 months, but it is not stated when this will occur. For ornithology, the key period for disturbance of the identified populations is likely to be during the spring and early summer months, when birds are breeding. Of particular concern are common tern breeding at the Imperial Dock SPA, which are constrained to make regular excursions to foraging areas before returning to feed young (known as *central place foraging*) at this time. As such, to mitigate for impacts on breeding birds at this SPA, MSS advise that works likely to cause the highest disturbance (e.g. piling) should ideally be undertaken outside the tern breeding season (May to mid-September, NatureScot 2020). In addition, in consideration of the

noise modelling, other construction activities and the potential for birds to be using the immediate and surrounding areas for breeding, we advise that an Ecological Clerk of Works (ECoW) should be present to monitor disturbance for the duration of the bird breeding season, should works occur at this time.

Port of Leith - Outer Berth: Environmental Impact Assessment Report (Reference: PC2045-RHD-ZZ-XX-RP-EV-0007)

MSS understand that no formal scoping was undertaken for this project but that the developer had liaised with NatureScot in preparing their application. MSS agree with the proposed methodology for bird surveys outlined in Section 6.2.2.1 (p 31), which is in line with the bird survey specification report (Appendix 6-3) issued to and agreed with NatureScot. Specifically: twice-monthly estuarine bird counts, twice-monthly common tern colony counts at Imperial Dock, Leith SPA, and twice-monthly common tern flight behaviour studies at Imperial Dock, Leith SPA.

While MSS are content with the approach taken to modelling noise impacts (Section 11.4.3, p. 116), MSS advise that the source level used should be listed and referenced, along with an assessment of how comparable this is to the piling proposed. MSS also recommend that more detail is provided on the piling shroud, including modelling of noise impacts both with and without the shroud to better understand potential noise abatement.

MSS agree with the sites listed as having potential connectivity to the development (Section 11.5.1, p. 118): Imperial Dock Lock, Leith SPA, Forth Islands SPA, Firth of Forth SPA, Firth of Forth Ramsar Site, Outer Firth of Forth and St Andrews Bay Complex (OFFSABC) SPA (Table 11-3, p. 119).

Potential impact pathways affecting ornithological features are identified and listed in Table 11-11 (p. 155) by project phase. This is generally appropriate but does not specifically identify vessel activity during construction, which should be considered. MSS advise that a Vessel Management Plan may be appropriate for the Construction and potentially also Operational phases of the development to mitigate disturbance impacts.

Artificial lighting is also not considered in Table 11-11 (p. 155). While artificial lighting is likely already present within the development area and surrounding area, MSS advise that consideration is given to impacts from any new proposed lighting specifically with respect to illuminating the area used by breeding terns (during the breeding season) within Imperial Dock SPA (ca. 100 m from the laydown area element of the proposed development), as artificial lighting could lead to disturbance (direct or indirect e.g. via increased predation).

MSS also recommend that if construction works do occur during the breeding season then it may be appropriate to appoint an Ecological Clerk of Works to advise on avoiding disturbance to breeding birds. Where construction activity is planned during the breeding season that could lead to disturbance of nesting birds, MSS advise that breeding bird surveys should be undertaken, and suitable mitigation is identified and implemented where required. MSS would expect this to be considered in a Construction Environmental Management Plan (CEMP).

Port of Leith - Outer Berth: Habitats Regulations Appraisal - Screening for LSE and Provision of Information to Inform Appropriate Assessment (Reference: PC2045-RHD-ZZ-XX-RP-EV-0009)

Potential impacts for ornithology by project phase are listed in Section 4.2.2.3 (p. 37). This is generally appropriate but does not specifically identify potential for disturbance from vessel activity (other than noise from impact piling) during construction, which should be considered. The developer considers that there would not be any likelihood for significant effects during the operational phase of

the development, as the port already accepts vessels of similar size. However, MSS advise that any significant increase in vessel activity (e.g. associated with increases in infrastructure/components for offshore wind developments) should be considered. As advised above, MSS reiterate our advice to consider whether a Vessel Management Plan is required to cover both the Construction and Operation phases of the Proposed Development, to mitigate disturbance impacts.

As advised above (for the EIAR), MSS advise that impacts from lighting during the Construction and Operational phases are considered, specifically with respect to disturbance of breeding common terns from Imperial Dock SPA.

With respect to protected sites with ornithological features, a long-list approach is taken with the use of >1% of the SPA population as the inclusion criteria for the species screened in for Likely Significant Effects on qualifying features (Section 4.2.2.4, p. 37). MSS consider the approach taken and designated sites and ornithological features screened in for Appropriate Assessment to be appropriate (provided in Table 4.13, p. 38). MSS note that the Conservation and Management Advice for the Outer Firth of Forth and St Andrews Bay Complex SPA (NatureScot 2022) was published very recently and thus was likely not considered during the preparation of the HRA report. MSS therefore advise that MS-LOT may wish to clarify with NatureScot whether further consideration is needed for this SPA to reflect the conservation and management advice.

Marine fish ecology

The Fish and Shellfish Ecology chapter of the EIA focuses mainly on migratory (or diadromous) fish species rather than other marine fish species. Whilst this is understandable due to the estuarine environment of the area of works, Section 10.5.3 notes that the Firth of Forth also supports a diverse range of fish species including spawning and nursery grounds for species, including herring (*Clupea harengus*), cod (*Gadus morhua*), whiting (*Merlangius merlangus*), plaice (*Pleuronectes platessa*), sprat (*Sprattus sprattus*), and lemon sole (*Microstomus kitt*). MSS are content with the identified impacts during construction on fish and shellfish however MSS recommend that other marine fish species are considered for impacts arising from underwater construction noise within the underwater noise assessment. Marine fish species such as herring and cod are sensitive to underwater noise and should be considered in this assessment.

MSS note that the construction works, including piling, will take place over 5.5 months but does not state a time period for this work. MSS recommend that the applicant provides details on when construction is likely to take place. This information will aid the underwater noise assessment.

Commercial fisheries

MSS have considered the marine licence applications and have no further comments with regards to commercial fisheries.

Benthic Ecology

We have considered the request and have no advice to provide on benthic ecology.

Diadromous Fish

MSS advise that the species of diadromous fish within the location of the development and dredging have been correctly identified. Diadromous fish are also associated with a number of other rivers within the Firth apart from the Forth, Teith and Allan which are at the head of the Firth (e.g. Almond and Avon).

MSS agree with the conclusions in Table 10-2 of the EIA specifically in relation to diadromous fish. For salmon, and some of the other species, soft start procedures are unlikely to provide mitigation in relation to piling with evidence showing salmon do not respond to the stimulus (Harding *et al.*, 2016)

The dredged material includes fine material which will disperse. MSS consider the failure to consider oxygen demand of the sediment and oxygen levels in the water column by modelling or from sampling data during previous disposals at the site to be a notable omission, as reduced oxygen levels can result in fish mortalities, particularly at high temperatures.

The resilience of the salmon populations to loss of fish is assessed annually by Scottish Government. The latest assessment can be found at [Salmon fishing: proposed river gradings for 2022 season - gov.scot \(www.gov.scot\)](http://www.gov.scot). The salmon population of the River Teith SAC was assessed as Category 2 (it has some resilience to the loss of fish). The salmon populations of the River Forth and Water of Allan were also jointly assessed as Category 2. The salmon populations of all the other rivers discharging into the Firth were assessed as Category 3 (they have no resilience to the loss of fish).

MSS advise that there should be a reporting condition within the licence that the sighting of dead, distressed or injured fish which could be connected with the activities must be immediately reported to MS-LOT

Physical environment / coastal processes

The EIAR appropriately covers coastal processes and, as part of that, modelling of tidal currents and sediment plume dispersal was conducted. The EIA concludes that changes in sea bed level and changes to tidal currents during the construction and operation phase are negligible. The only potential impacts to water quality are of minor adverse significance, as effects will be localised with a rapid rate of dispersion.

The proposed spread of 101,000 m³ of material across an area below 20 m CD at the Narrow Deep (B) site will result in an average deposition depth of 0.122 m. The BPEO concludes that sea disposal is the most practicable method of disposal and all necessary logistics procedures are already understood. MSS advise that we foresee no major issues with the continued use of the spoil site at Narrow Deep (B) as it has routinely been used in recent years. Forth Ports has undertaken maintenance dredging at the Port of Leith and approach channels since 1968 with disposal at sea at the Narrow Deep (B) spoil disposal ground and we consider that the dredging campaigns comprising this development (two campaigns, one year apart) should therefore not pose any problems.

Overall, with respect to physical / coastal processes MSS are content with the information provided in the marine licence applications, covering the construction, capital dredge and sea disposal.

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NatureScot (2022). Conservation and Management Advice. Outer Firth of Forth and St Andrews Bay Complex SPA. Available from: <https://sitelink.nature.scot/site/10478>

Hopefully these comments are helpful to you. If you wish to discuss any matters further, then please contact the REEA Advice inbox at MSS_Advice@gov.scot.

Yours sincerely,

Renewable Energy Environmental Advice group
Marine Scotland Science



Judith Horrill
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15 July 2022

Our ref: CLC167187/A3780536

Dear Judith

MARINE (SCOTLAND) ACT 2010, PART 4 MARINE LICENSING

THE MARINE WORKS (ENVIRONMENTAL IMPACT ASSESSMENT) (SCOTLAND) REGULATIONS 2017
("THE EIA REGULATIONS")

00009818 AND 00009819 - FORTH PORTS LTD (PER ROYAL HASKONING DHV) – HARBOUR
DEVELOPMENT - PORT OF LEITH OUTER BERTH

Thank you for your consultation with the above application and accompanying EIA/HRA reports. We acknowledge the time constraints associated with this project and appreciate the extra time to allow us to complete our response.

Summary

The proposal may have effects upon several European sites (SPAs and SACs). The proposal may also have effects upon European Protected Species (EPS) that are not specifically protected by relevant European sites. Our advice is that these interests will not be adversely affected by the proposal, providing the recommended mitigation is implemented.

Background

We have been engaged in pre-application discussions with the applicant, particularly over the requirement for HRA as well as other protected species considerations. We provided advice at EIA screening stage, concluding that EIA was required due to the Habitat Regulations Assessment (HRA) and appropriate assessment work that were being undertaken for the proposal, as well as European Protected Species (EPS) considerations.

Advice

The proposal lies close to several European sites. A Habitats Regulation Appraisal (HRA) is therefore required.

Our advice is that this proposal is likely to have a significant effect on various European sites. Consequently, Marine Scotland, as competent authority, is required to carry out an appropriate assessment in view of the sites' conservation objectives for their qualifying interests.

To help you do this we advise that based on the information and assessment provided in the document: *Habitats Regulations Appraisal - Screening for LSE and Provision of Information to Inform Appropriate Assessment*, our conclusion is that the proposal **will not adversely affect the integrity of these sites, providing the recommend mitigation is in place, as discussed in the report and within this response.**

The proposal may also have effects upon EPS that are not specifically protected by relevant European sites. The assessment, conclusions, and mitigation measures identified in the HRA report will apply to marine EPS also, as well as being discussed more fully within the EIA. **We are content that there will be no significant impacts on EPS, providing the recommended mitigation is in place.**

The mitigation measures identified with the HRA and EIA reports should therefore be secured by Marine Scotland, although we do recommend some changes to these mitigation measure, as discussed in Annex 1 and 2.

Annex 1 contains full details of HRA requirements and required mitigation measures, as well as some areas for clarification. Annex 2 contains detailed comments on the proposal, focusing on ornithology and marine ecology.

Should you wish to discuss these comments further then please do not hesitate to contact me at my e-mail address.

Yours sincerely,

Carolyn Clark

Area Officer / Forth

Carolyn.clark@nature.scot

Annex 1 – advice on Habitats Regulations Appraisal (HRA) and required mitigation

Several European sites could be affected by these proposals:

- Firth of Forth Special Protection Area (SPA)
- Imperial Dock Lock, Leith Special Protection Area (SPA)
- Forth Islands Special Protection Area (SPA)
- Outer Firth of Forth and St Andrews Bay Complex Special Protection Area (SPA)
- River Teith Special Area of Conservation (SAC)
- Isle of May Special Area of Conservation (SAC)
- Firth of Tay and Eden Estuary Special Area of Conservation (SAC)
- Berwickshire and North Northumberland Special Area of Conservation (SAC)
- Moray Firth Special Area of Conservation (SAC)

Further information about these internationally important sites, the special features they are designated to protect, and their conservation objectives, can be found on NatureScot’s SiteLink website: <https://sitelink.nature.scot/home>

The status of these sites means that the requirements of the Conservation (Natural Habitats, &c.) Regulations 1994 as amended (the “Habitats Regulations”) apply. Consequently, Marine Scotland is required to consider the effect of the proposal on these sites before it can be consented (commonly known as Habitats Regulations Appraisal). Our website has summaries of the legislative requirements and the HRA process:

<https://www.nature.scot/professional-advice/protected-areas-and-species/protected-species/legal-framework/habitats-directive-and-habitats-regulations>

<https://www.nature.scot/professional-advice/planning-and-development/environmental-assessment/habitats-regulations-appraisal-hra>

The above sites may also be notified as Sites of Special Scientific Interest (SSSI) and/or Ramsar sites. However, any issues raised in relation to these designations are fully addressed as part of the following consideration of the respective European sites.

Our advice in relation to the HRA is provided below:

HRA Stage 1 – is the proposal connected with conservation management of the European sites?

No – this proposal is not connected to conservation management of any European site. Hence further consideration is required.

HRA Stage 2 – is the proposal ‘likely to have significant effects’ (LSE) upon the European sites?

In plain English this asks whether there is any connectivity between the proposals and the European sites.

We previously advised that there was connectivity between the proposals and the following European sites and features, and the following document has been prepared to accompany the application: *Habitats Regulations Appraisal - Screening for LSE and Provision of Information to Inform Appropriate Assessment*. This document is comprehensive and identifies the following

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sites, features and impact pathways/LSE, as outlined in Section 4 Stage 1: Screening (for Fish, Ornithology and Marine mammals); and in Section 5 Conclusion of Screening summary:

European Site	Feature	LSE pathways
Firth of Forth SPA	various bird species	disturbance, habitat loss, water quality effects and prey availability
Imperial Dock Lock, Leith SPA	common tern	disturbance, habitat loss, water quality effects and prey availability
Forth Islands SPA	various bird species	disturbance, habitat loss, water quality effects and prey availability
Outer Firth of Forth and St Andrews Bay Complex SPA	various bird species	disturbance, habitat loss, water quality effects
River Teith SAC	sea lamprey, river lamprey & salmon	underwater noise disturbance, water quality changes, habitat quality changes
Isle of May SAC	grey seal	underwater noise impacts, water quality changes, prey availability changes
Firth of Tay and Eden Estuary SAC	harbour seal	underwater noise impacts, water quality changes, prey availability changes
Berwickshire and North Northumberland SAC	grey seal	underwater noise impacts, water quality changes, prey availability changes
Moray Firth SAC	bottlenose dolphin	underwater noise impacts, water quality changes, prey availability changes

HRA Stage 3 – will the proposal have adverse effects on the integrity of the European sites?

The above sites, features and LSE are assessed fully in the above report, in order to inform the required appropriate assessment. Overall, the way the report has presented the screening and the HRA information is good, and is comprehensive. The HRA process has been understood well and many of the key issues and impact pathways have been addressed. Some further detailed comments are provided below and in Annex 2.

The report concludes no adverse effect on site integrity, providing the discussed mitigation is implemented, as summarised in Section 9 (p128) and discussed within each relevant section. We are content with this conclusion, although we recommend some changes to the discussed mitigation.

The mitigation measures identified with the HRA (and EIA for other species) to be secured are as follows. Section 14 (p201) of the EIA contains a useful summary of potential impacts and

mitigation, although we have recommended a couple of changes. Annex 2 discusses the below in more detail:

Summary of required mitigation measures:

- Soft start piling procedure
- JNCC piling guidance - pre-piling search area of 500m
- Use of a piling shroud at all times through the tern breeding season, not just during the post breeding phase
- Recommend that piling works are undertaken outwith the tern breeding season but if this is not possible, then an experienced observer will be required to monitor disturbance at the colony

We have also requested some further information to clarify some areas that we feel have not been as sufficiently addressed as they could be. This information is required to ensure all potential impacts have been considered fully and to ensure no additional mitigation measures are required. We don't expect this information to change our position and overall advice but it is required to ensure the assessment is complete. We believe the required information should be relatively easy to source and provide:

- Number of additional vessel movements to the spoil site and how often that route will be used against the baseline
- Clarification of what the enabling works include, likely impacts and any mitigation in addition to that already included

Annex 2

Fish – River Teith SAC

We are content with the assessment and conclusions in Section 6 of the HRA. To summarise:

- soft start piling techniques will allow these mobile species to move away from underwater noise disturbance
- due to the width of the Forth, underwater noise will not be a barrier to migration.
- water quality changes at the dredging site or disposal site will be localised and temporary
- the Firth of Forth is sufficiently wide here, so there is ample space for migrating lamprey species and salmon to pass by, avoiding both noise disturbance and any water quality changes.

We therefore agree with the conclusion of no adverse effect on site integrity.

Ornithology

In general, the scope of the proposed works do not raise significant concerns. Much of the planned development will take place in the exclusion zone for the port, with a very small proportion of the dredging works to take place within the SPA, in the region of <100m² (image on p17). This part of the SPA (directly by the mouth of the harbour) is likely to be of poorer habitat quality and more disturbed than other parts of the SPA, so it is not expected to have a significant impact.

The planned mitigation for soft-start procedures for piling will also help to mitigate against noise disturbance for mobile wintering species.

We therefore **support the assessment and conclusions for most of the SPAs (no adverse effect on site integrity)**, as discussed in Section 7 of the HRA report and have no further comments on these sites. We do however have some comments on the Outer Firth of Forth and St Andrews Bay Complex SPA where there remains some areas of clarification.

Outer Firth of Forth and St Andrews Bay Complex SPA

In general, any changes to species distribution within the Outer Firth of Forth and St Andrews Bay Complex SPA, as a result of disturbance outside of the site, are likely to be temporary and recoverable. The exception to this is the common tern, see below. There are also some remaining questions over the use of the spoil site within the SPA, particularly in relation to disturbance:

Spoil Site

This is one potential impact that is perhaps not addressed sufficiently within the application. It is stated that the development will use *“the offsite disposal site (Narrow Deep B Spoil Disposal Ground) or disposed of on land, as appropriate”* and this will be used for dredged materials. This is a licensed site within the Outer Firth of Forth and St Andrews Bay Complex SPA, however, the management measures for the SPA advise that while maintenance dredging would constitute the

baseline conditions for the site, pressures associated with capital dredging projects should be reduced or limited.

The report states (on p50 of the HRA document) that *“Total dredging for the Proposed Development would be 47,000 m³ from the pre works and 54,000 m³ from the berth pockets. Out of 101,000 m³ of material, around 85 % of the material would be non-erodible (i.e. glacial till, mudstone and revetment rock). Only c.16,000m³ of soft sediment containing fines would be dredged.”*

- i. Loss of or damage to prey-supporting habitat - This area south of Inchkeith is known to have high levels of activity for foraging common tern (see SPA site selection document). The key supporting processes for terns, red-breasted merganser and red-throated diver at the Outer Firth of Forth and St Andrews Bay Complex SPA are water quality (nutrients and turbidity), tidal cycles, and water flow. Small-scale physical processes are thought to be especially important in directly influencing prey availability and hence foraging areas used. However, the disposal site will be unlikely to host suitable prey species due to its continued use as a disposal ground for maintenance dredging and consequent disturbance/ addition of sediment. Also, because suspended sediment concentration (SSC) is anticipated to return to baseline within 1.5hrs, loss of water quality is expected to be very temporary.
- ii. Disturbance - The report does not state how many trips would be made to the spoil site, or how many disposal events there would be. This will be important to understand in order to come to a firm conclusion on how significant this might be to the conservation objective of ‘no significant disturbance’ of the qualifying species. With respect to disturbance, Red-throated diver, Slavonian grebe, common scoter, velvet scoter, red-breasted merganser and guillemot are sensitive to disturbance associated with vessel movements (Jarret et al. 2018*). Current patterns and levels of vessel movement associated with dredging and disposal activities are not anticipated to pose a risk to the conservation objectives but significant increases in vessel traffic to sites not used very frequently could be disturbing. **Further understanding of the number of additional vessel movements and how often that route will used against the baseline will help us confirm our advice. It is likely that the conservation objective will be met with this additional information, and that consequently we will advise no adverse effect on site integrity.**

Disturbance from piling to breeding terns

Given that the other works (piling & general construction) will take place outside of the Outer Firth of Forth and St Andrews Bay Complex SPA, the relevant conservation objectives to assess impacts on are: (i) maintenance of the population of SPA, (ii) maintenance of the distribution within in the SPA, (iii) no significant disturbance to the qualifying interests within the SPA.

Within the Outer Firth of Forth and St Andrews Bay Complex SPA, common tern are in unfavourable condition and consequently a restore objective is set for common terns at this site. Common terns using the Outer Firth of Forth and St Andrews Bay Complex SPA include those breeding at Imperial Dock Lock SPA. Consequently, this SPA population is considered to be

functionally linked to the Outer Firth of Forth and St Andrews Bay Complex SPA. This means that the plan or project must ensure that it does not prevent or reduce the potential for recovery of common tern.

There is the potential that disturbance to breeding terns at Imperial Dock Lock SPA from piling could reduce the potential for recovery within this site, despite their habituation to the day to day operations of the port. This is because this is a novel type of construction, not currently part of the site baseline. Therefore, we could not be fully confident that there would be no adverse effect on site integrity if piling was to be undertaken during the breeding season (May, June, July). **We therefore recommend that the piling works are undertaken outside of the breeding period as this would remove any LSE for common tern. However, if the applicant were to undertake the works during the breeding season we would require them to employ an observer to monitor disturbance at the colony, who should be suitably experienced and have the authority to halt works should there be evidence of disturbance to breeding common tern.**

Additionally, it is stated (on p 71) that a piling shroud would be installed on the rig during piling activities if they were to be undertaken during the post-breeding period when terns aren't confined to the colony and are found elsewhere in the dock. **We agree that this should be installed but also recommend that the shroud be employed at all times should works be undertaken in the breeding season.**

Vessel traffic during operation

In the report it is stated (p9): *"25 round trips of the installation vessel from the port to the project site over a period of six to 12 months, i.e., on an average, 2 to 4 times per month. The number of vessels currently using the port is, on average, 1,150 per year."* We agree that the vessel movements during operational phase are unlikely to be significant, provided that they are following existing routes through the Forth.

*Jarrett, D., Cook, A. S. C. P., Woodward, I., Ross, K., Horswill, C., Dadam, D., & Humphreys, E. M. (2018). Short-Term Behavioural Responses of Wintering Waterbirds to Marine Activity. *Scottish Marine and Freshwater Science*, 9(7). <https://doi.org/10.7489/12096-1>

Marine Mammals and Marine Ecology – EIA/HRA

The outline construction programme (3.2.5 EIA report) outlines the main aspects of the work including *'Demolition of existing dolphins and associated walkways, and excavation of overburden – four months'*. The other elements such as piling, dredging and operation have specific sections about them and their impacts assessed but there does not appear to be a similar section for the demolition works and what it entails, other than 3.2.1.1. Enabling works : *Given the existing piles are socketed it would be difficult to extract them and therefore they would be cut off at bed level.* **We require some clarification of what these enabling works would include, the likely impacts and any mitigation that may be required in addition to that already included, to ensure complete assessment, advice and full identification of all required mitigation.**

We agree with the conclusion of LSE for all four SAC sites screened in within the HRA document (section 8). The effects pathways being underwater noise, changes in water quality and changes to prey availability. The assessment summaries for these effects are:

- For changes in water quality, this would occur mostly during the dredging phase. The effect is modelled to be very localised and is in an area that is already routinely dredged.
- For changes to prey availability, again likely to be a small and localised displacement effect. In addition the marine mammal species considered under HRA are generalist feeders and thus not reliant on a particular species of prey.
- Underwater noise: the Permanent Threshold Shift (PTS) impact ranges for impact piling, vibro piling and dredging are all within 100m; Temporary Threshold Shift (TTS) - and thus disturbance - impact ranges will be much higher. We have further comments below on the underwater noise modelling. We also recommend amended JNCC piling mitigation, see below.

The HRA concludes that there will be no adverse effect on the integrity of bottlenose dolphin, harbour seal or grey seal, as a designated feature of the Moray Firth, Firth of Tay and Eden Estuary, Isle of May and Berwickshire and North Northumberland Coast SACs respectively. **We agree with this conclusion given the location of the works, distance from seal SACs and with JNCC standard mitigation included:**

The applicant has suggested that the standard JNCC piling guidance should be amended to reduce the pre-piling search area from the recommended minimum of 500m to 200m. Given the uncertainties within the underwater noise section (see our comments below), and the fact that the piling phase is likely to take 5.5 months **we recommend that the mitigation zone remains at the minimum JNCC recommend, i.e. 500m.** If for operational reasons this becomes difficult to maintain, then we would be happy to discuss options at that point.

Comments on the Marine Mammal sections

We are content with the sources of information used for distribution and abundance of species in these sections. Some general comments regarding the assessments are provided below, along with some comments on the Underwater Noise Modelling:

- For bottlenose dolphins the assessment has used the MU for population numbers and for density used SCANS quadrant R. There is a mismatch here as the SCANS transects will reflect the offshore population of bottlenose dolphins whereas the density of East coast management unit (aka Moray Firth associated) dolphins will be much higher.
- We do not recommend the use of the entire MU as a reference population (IAMMWG, 2021), instead, we recommend that the UK proportion of the MU reference population be used.
- For seals the assessment has used a combination of Carter et al 2020 (predicted relative density) and Russell et al 2017 absolute density estimates. The 'numbers' appear to have come from Russell et al 2017.
- Table 4.15 projects with potential for in combination effects, and we are pleased to see this outlined although there may be a couple of projects missing from the list such as Aberdeen Harbour

Underwater Noise: Appendix 10-1 Subacoustic UWN modelling

- Subacoustic have used their proprietary model (INSPIRE) to predict Permanent Threshold Shift (PTS)/Temporary Threshold Shift (TTS) impacts on marine mammals from the impact piling activity. We are content that the model parameters represent the worst case scenario, in terms of location (outermost point) and in the piling parameters, *i.e.*;
 - 1.2m pile diameter
 - Max hammer energy 280kJ
 - 2 hour piling duration
 - Three piles installed in a day
 - Source levels used; 226.2 dB re 1 μ Pa (SPL pk) and 201 dB re 1 μ Pa²s (SELss)
- A simple modelling approach was used to assess dredging and vibropiling. It is not straightforward to convert levels in rms to SEL, unless noise recordings of these activities were available for use. Subacoustic appear to have used adjusted (reduced) source levels for input into the simple model. It is not that clear how the reduction has been calculated, and does not appear to be an accepted/common method. We therefore would need more detail on this method as the reduction in source levels used are not insignificant. Where there is uncertainty, we recommend that a precautionary approach is taken, and in this case our view is that the unweighted levels should have been used. However, we anticipate that even with an unweighted calculation the impact ranges and thus number of animals impacted would still be low.
- Based on these calculations, all marine mammal impact piling PTS impact ranges are less than 100m. The maximum range for TTS impacts was up to 780m.
- The accumulated PTS impact ranges for dredging and vibropiling are also within 100m, with a max of 220m for TTS onset. Had this been calculated without the reduction in source level to mimic weighting, these distances would have been larger.
- There is no attempt to predict area disturbed by the proposed activity.

Marine EPS

An EPS licence for disturbance will be required and we have responded separately to the licence consultation. To summarise here, **our advice is that the proposal will not have a detrimental effect on the favourable conservation status of the European Protected Species concerned.**

Benthic habitats and species

The area of work is a busy harbour that has been routinely dredged for many years and the spoil disposal site is an existing and recently used site. There are no records of any Priority Marine Features or other benthic habitats/species of conservation interest in the construction area. Therefore we agree with the conclusions of Chapter 9 Marine and Coastal Ecology.

Coastal Processes

We are content with conclusions of coastal modelling undertaken in Section 7, as summarised in section 7.8.



Judith Horrill
Marine Scotland – Marine Planning & Policy
By email: MS.MarineRenewables@gov.scot

15th July 2022

Dear Ms Horrill,

Re: Marine Licence Application (00009818 and 00009819) Forth Ports Limited - Harbour Development - Port of Leith Outer Berth

Thank you for consulting RSPB Scotland on the above Marine Licence application.

In 2019, First Minister Nicola Sturgeon confirmed that we are facing an ecological emergency and emphasised the responsibilities of all of us is to look afresh at everything that we are doing to protect Scotland's wildlife.¹

The proposal is within, close to, and/or within foraging range of a number of Special Protection Areas (SPAs) for birds including the Firth of Forth SPA Imperial Dock Lock Leith SPA, the Forth Islands SPA and the Outer Firth of Forth and St Andrews Bay Complex (OFFSABC). SPAs represent the best of Scotland's wildlife, and we encourage Forth Ports to do more to protect and enhance these sites, in line with local and national policy.

To a large extent, we consider the Environmental Impact Assessment (EIA) and Habitats Regulations Appraisal (HRA) give an accurate representation of the likely impacts of the proposed development on the features for which the SPAs are designated. We agree with the conclusion of the HRA that there is a likely significant effect of the proposed Leith Outer Berth on the Firth of Forth SPA, Imperial Dock Lock Leith SPA, the Forth Islands SPA and the OFFSABC SPA. However, we have concerns relating to the assessment of changes to activities on the eastern breakwater site of the proposed Outer Berth (Areas 1-3 Fig.1.1 EIA Report) and concerns over the degree to which construction impacts on post-breeding common terns can be mitigated.

As is noted in the HRA, the development is not directly connected with the management of the SPAs and would have a likely significant effect on the SPAs. Therefore, Marine Scotland, as the competent authority, must not authorise the proposed development unless it can show beyond reasonable scientific doubt – using appropriate assessment – that the plan or project will not adversely affect the integrity of the SPA, in light of the site's conservation objectives. We do not consider this test has been met.

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We are concerned that both EIA and HRA documents assess the operational impacts on bird species as if the existing, baseline noise and day-to-day activities are uniform across the Port and thus birds using the area of the proposed development are likely to be habituated to and therefore unaffected by these activities (mentioned for example in Section 11.8.1 of the EIA and Section 4.2.2.3 and 7.1.2.1 of the HRA). We wish to see evidence that this is indeed the case. It seems that currently the eastern breakwater (site of the proposed Outer Berth) may have relatively lower levels of disturbance – in particular activities by workers – and thus act as a quieter, refuge site for some of the bird species, in particular common tern, ringed plover and kittiwake. This appears to be supported by the survey records. If the proposed development leads to a significant increase in operational usage of this area, and in particular foot-traffic from workers, then it may well lead to an increase in disturbance and resulting reduction in value of this area to birds during ongoing operation of the berth, not just for the construction phase.

We are also concerned about the construction impacts of the proposed development on post-breeding groups of roosting or loafing common terns. Although we agree with the conclusion that there could be a 'moderate adverse impact' on post-breeding groups of roosting / loafing common terns, connected to Imperial Dock Lock Leith SPA from the construction of the Outer Berth, we do not agree that the proposed mitigation will reduce this to a point that it is not significant. The survey records suggest that post-breeding groups of common terns use the eastern breakwater area in preference to most other areas of the dock. As such, even with mitigation in the form of a piling shroud (as proposed in Section 11.7.23 of the EIA) we do not believe it can confidently be concluded that the common terns can relocate elsewhere in the Port without detrimental impacts. These effects on common tern should also be considered alongside the operational effects described above.

In summary, due to the underestimation of impacts associated with changes to activities on the eastern breakwater site of the proposed Outer Berth to SPA qualifying species (namely kittiwake, ringed plover and common tern) and substantial doubt over the success of the proposed mitigation measures for common tern (a qualifying feature of the Imperial Dock Lock Leith SPA) during construction we object to the proposed development. We do not consider the information provided enables Marine Scotland to conclude beyond reasonable scientific doubt that there will not be an adverse effect on the integrity of the Firth of Forth SPA, Imperial Dock Lock Leith SPA, the Forth Islands SPA and the OFFSABC SPA.

We may be prepared to reconsider our objection following the provision of the following additional information:

- further mitigation measures for common tern during construction; and
- re-assessment of how potential changes from current usage in specific parts of the port, namely the Outer Berth-end of the Port, will affect qualifying species.

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Should this re-assessment indicate a potential increase in operational disturbance, it may be possible to mitigate this, for example by installing screened fencing and creating refuge areas at the Outer Berth site. Without further details, it is hard to advise on this.

Notwithstanding our objection to this application, should Marine Scotland be minded to grant consent without first requesting and considering this additional information, we request that the following elements be secured using conditions:

- a. Implementation of a programme of pre- and post-construction bird monitoring, to be agreed with NatureScot and RSPB, in order to validate the assumptions of the Environmental Statement.
- b. Annual reports to be submitted to the planning authority, NatureScot and RSPB Scotland on the monitoring/ surveillance results.
- c. The enhancement of the West Pier, with nesting platforms, to provide alternative nesting, roosting and loafing areas for common terns prior to the commencement of any works, with enhancement works to be agreed with NatureScot and RSPB prior to implementation.
- d. The installation of permanent screening fencing on the eastern side of the new Outer Berth to reduce disturbance to species using the foreshore, with fencing to be agreed with NatureScot and RSPB prior to implementation.

I hope these comments are useful. Please do not hesitate to contact me should you require further information or explanation.

Yours sincerely

A handwritten signature in black ink that reads 'Toby Wilson'.

Toby Wilson
Senior Conservation Officer – Central Scotland

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25 July 2022

00009818 - FORTH PORTS LTD (PER ROYAL HASKONING DHV) - CONSTRUCTION- PORT OF LEITH OUTER BERTH AND 00009819- FORTH PORTS LTD (PER ROYAL ROYAL HASKONING DHV) - CAPITAL DREDGE AND SEA DISPOSAL - PORT OF LEITH OUTER BERTH

Marine Scotland Science (MSS) have reviewed the relevant documentation and have provided the following comments.

**No Comments = "We have considered the request and have no advice to provide."*

Marine Ornithology

MSS mentions the piling shroud in relation to ornithology and state that although happy with the modelling of noise impacts, the source level should be listed and referenced along with an assessment of how comparable this is to the piling proposed and that MSS also recommends more detail is provided on the piling shroud and how noise levels compare with and without this in use. Is MSS able to clarify if Additional Information/further noise assessment as noted above is required before MSS can advise on whether the proposal will have a significant adverse impact on the environment and on mitigation requirements?

In line with the NS response, MSS agree that piling works should be undertaken outside of the tern breeding period (May, June, July). However, if piling does occur during breeding then a piling shroud should be used and an observer employed to monitor disturbance at the Imperial Dock SPA tern colony.

MSS advises that a vessel management plan may be appropriate for the construction and possibly operational phases of the Works as the EIA does not specifically identify vessel activity during construction, which should be considered. Is MSS able to clarify if Additional Information/further assessment as noted above is required before MSS can advise on whether the proposal will have a significant adverse impact on the environment and on mitigation requirements?

MSS agree with the NS response that vessels movements during the operational phase are unlikely to be significant, provided they are following the exact routes through the Forth. Although no specific reference is made to the construction phase in the NS response, MSS consider this response to relate to both construction and operation as the NS response quotes "25 round trips of the installation vessel".

MSS noted that artificial lighting is also not considered and MSS advises that consideration is given to impacts from any new proposed lighting specifically with respect to illuminating the area used by breeding terns (during the breeding season) within Imperial Dock SPA (ca. 100 m from the laydown area element of the proposed development), as artificial lighting could lead to disturbance (direct or indirect e.g. via increased predation). Is MSS able to clarify if Additional Information/further assessment as noted above is required before MSS can advise on whether the proposal will have a significant adverse impact on the environment and on mitigation requirements?

MSS remain concerned that the introduction of increased artificial lighting in close proximity to breeding terns could have an impact on the SPA feature. As such MSS suggest the developer clarifies the potential for impacts of lighting in this context to allow consideration as to the magnitude of impact and on the requirement for mitigation. However, MSS do not advise that Additional Information is required.

MSS notes that: “Where construction activity is planned during the breeding season that could lead to disturbance of nesting birds, MSS advise that breeding bird surveys should be undertaken, and suitable mitigation is identified and implemented where required”. If breeding bird surveys are required, is MSS able to advise on the scope of such surveys?

All wild birds, their nests and eggs are protected during breeding under the Wildlife and Countryside act (1981). As such, should works are undertaken during the breeding season, a trained ornithologist should survey the terrestrial site ahead of any construction works to check for breeding birds, which may include ground nesting waders or passerines with unenclosed nests or nests in holes/crevices. Where nests are identified, works should be halted in the immediate vicinity until the young are fledged.

Marine Mammals

MSS states the following re marine mammals: “We note the study area is not defined in section 12.5.1, but instead a list of the relevant Management Units (MUs) is presented. In Table 12-8, Carter et al. (2022) should be used for seal densities, as the updated methodology is more robust for data deficient areas given the use of a habitat preference based prediction rather than null usage (linear decay of usage from a haul-out site). Absolute density estimates, using the scalars and methodology found in the Supplementary Information of Carter et al. (2022), should be used rather than relative density in order to predict the number of individuals which may be impacted” and “Seasonal considerations should be made to ensure potentially higher local densities during breeding season are taken into account”. Is MSS able to clarify if Additional Information/further assessment using different data as noted above is required before MSS can advise on whether the proposal will have a significant adverse impact on the environment?

MSS notes that seal usage derived from Russell et al (2017) is sufficient in this case given the fact that no new telemetry data has been collected for either grey or harbour seals in the Forth and Tay region since 2017. MSS would like to note that in the future, updated usage maps derived from the more robust methodology presented by Carter et al. (2022) is preferable for quantitative assessment. Even in lieu of more current telemetry data, these recent predictions are taking the population trajectory into account which has shown inter-annual fluctuations, particularly in the east coast management unit over the past decade.

With regards to marine mammals, MSS notes: “In the pre-application consultation report there is reference to the steel piled lead-in jetty, which will be cut at seabed level. More information on the anticipated noise profile of this process would be useful. MSS note that the use of a piling shroud is mentioned as mitigation in the ornithology section of the EIAR 11.7.2.3 for airborne noise. MSS request further clarification on this methodology, with respect to the potential of the shroud to minimise underwater noise emissions. If so, this should be included in the relevant mitigation section of the EIAR for marine mammals”. Is MSS able to clarify if Additional Information/further noise

assessment as noted above is required before MSS can advise on whether the proposal will have a significant adverse impact on the environment and on mitigation requirements?

MSS require clarification on the process of cutting the steel lead-in jetty piles and demolition works given the lack of information on anticipated noise levels of this process and potential impacts due to underwater noise. MSS cannot effectively advise on the necessity for mitigation of this process without information on the potential for disturbance.

Regarding the shroud, MSS require further details on if there will be any noise abatement effects to underwater noise and if this would reduce impact ranges for marine mammals and fish as well as birds.

MSS notes: "The deposition of the dredged material should also be considered with respect to marine mammals in the EIAR". Is MSS able to clarify if Additional Information/further assessment as noted above is required before MSS can advise on whether the proposal will have a significant adverse impact on the environment?

MSS are content with no further information on this however would like to note the absence of detail with regards to dredged deposit impact to marine mammals during disposal.

MSS mentions the piling shroud in relation to ornithology and state that although happy with the modelling of noise impacts, the source level should be listed and referenced along with an assessment of how comparable this is to the piling proposed and that MSS also recommends more detail is provided on the piling shroud and how noise levels compare with and without this in use. Is MSS able to clarify if Additional Information/further noise assessment as noted above is required before MSS can advise on whether the proposal will have a significant adverse impact on the environment and on mitigation requirements?

MSS request additional details of the shroud in order to clarify if it will be an effective mitigation measure for birds and also potentially for marine mammals and fish. Currently there are scant details on the shroud in the EIA.

The assessment of in-air piling noise does not state a source level used, only that with a shroud in place it will be reduced by 7 dB. MSS are therefore unclear whether this reduction in noise level is sufficient. MSS recommend that a source level used in the assessment is provided and referenced to ensure that it is comparable to proposed piling activity being assessed. If the applicant were to provide an assessment of noise levels with and without the shroud this would clarify if the mitigation is appropriate.

Response to NS comments

MSS adopted a practical approach to guidance on mitigation during piling, agreeing with the proposed 200 m pre-piling monitoring zone; a reduction from the JNCC advised minimum of 500 m. However, in light of NS comments, MSS concur that the recommended minimum of a 500 m pre-piling search area is appropriate unless it can be demonstrated that this is unfeasible due to operational reasons or if the shroud is evidenced to be an effective mitigation measure for underwater noise.

All other advice remains unchanged, except those points noted above in response to specific MS-LOT queries.

Marine fish ecology

- Regarding marine fish ecology, MSS advises that it is “*content with the identified impacts during construction on fish and shellfish however MSS recommend that other marine fish species are considered for impacts arising from underwater construction noise within the underwater noise assessment. Marine fish species such as herring and cod are sensitive to underwater noise and should be considered in this assessment. The construction works, including piling, will take place over 5.5 months but does not state a time period for this work. MSS recommend that the applicant provides details on when construction is likely to take place. This information will aid the underwater noise assessment*”. Is MSS able to clarify if Additional Information/further assessment as noted above is required before MSS can advise on whether the proposal will have a significant adverse impact on the environment and on mitigation requirements?

MSS have considered whether additional information/further assessment is required in relation to marine fish species. The identified spawning grounds for cod and herring are situated out with the Forth estuary and are therefore thought to be a far enough away from the construction site that underwater construction noise impacts are unlikely to have a significant adverse impact on spawning marine fish. MSS can confirm that additional/information/further assessment is not required in relation to marine fish species.

Diadromous fish

- With regards to diadromous fish, MSS notes that: “*The dredged material includes fine material which will disperse. MSS consider the failure to consider oxygen demand of the sediment and oxygen levels in the water column by modelling or from sampling data during previous disposals at the site to be a notable omission, as reduced oxygen levels can result in fish mortalities, particularly at high temperatures*”. Is MSS able to clarify if Additional Information/further assessment as noted above is required before MSS can advise on whether the proposal will have a significant adverse impact on the environment and on mitigation requirements?

Additional information / further assessment is not required before MSS can advise on whether the proposal will have a significant adverse impact on the environment and on mitigation requirements regarding diadromous fish. MSS confirm that the disposal of the dredged material is unlikely to have a significant adverse impact on the environment or require additional mitigation.

Nonetheless, the additional information / further assessment would have provided additional reassurance over the safety of the disposal activities, particularly for migrating salmon smolts, which are considered to be at particular risk, as their migration is highly directional and they are therefore unlikely to be easily displaced by adverse conditions. The advice of SEPA would have also been welcome as they have carried out extensive monitoring of water quality and biological response in the Firth, which would be likely be relevant.

The responses from NatureScot and the RSPB do not affect MSS’s earlier advice with respect to diadromous fish.

Hopefully these comments are helpful to you. If you wish to discuss any matters further, then please contact the REEA Advice inbox at MSS_Advice@gov.scot.

Yours sincerely,

Renewable Energy Environmental Advice group

Marine Scotland Science

Marine Laboratory, 375 Victoria Road,
Aberdeen AB11 9DB
www.gov.scot/marinescotland



INVESTORS
IN PEOPLE



Jamie Gardiner

From: Neil.MacLeod3@gov.scot
Sent: 29 July 2022 14:19
To: Jamie Gardiner
Cc: Ian.Kerr@forthports.co.uk
Subject: 00009818 and 00009819 - Forth Ports Ltd (Per Royal Haskoning DHV) - Construction and Capital Dredge and Sea Deposit - Port of Leith Outer Berth- Formal Request for Additional Information - 29 July 2022
Attachments: 2022-05-31- 00009818 and 00009819 - Forth Ports Ltd (Per Royal Haskoning DHV) - Construction and Capital Dredge and Sea Deposit - REEA Response Letter to MS-LOT.pdf; 2022-07-20 - Forth Ports Advice Follow-up - REEA Response Letter to MS-LOT.pdf

Dear Mr Gardiner,

Please find the attached advice we have received from our advisors in Marine Scotland Science regarding the above applications. These documents should be read in conjunction with the consultation responses received from stakeholders during the initial consultation process.

Following our review of the original applications and supporting documents, the consultation responses and the advice provided by Marine Scotland Science, the Scottish Ministers hereby request that in order to ensure the completeness and quality of the EIA report, supplementary information is submitted in relation to your EIA application in line with s.21 of the Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017 ("the 2017 EIA Regs"). The requested Additional Information is directly relevant to reaching a reasoned conclusion on the significant effects of the works on the environment. There are also several points of clarification arising from the consultation responses we have received and we have outlined both the clarifications and Additional Information requested below:

- The description of the Proposed Development states that the existing structures must be removed as part of 'enabling works'. We request a full description of these enabling works and in particular the methodology for removing the existing structures. This should include a full assessment of the potential environmental impacts these works may have and necessary mitigation measures in light of the impacts identified. The assessment should include but not limited to in air and underwater noise and consider if the mitigation would reduce impact ranges for marine mammals and fish as well as birds.
- The Scottish Ministers request further information in relation to the impact on bird species at the site of the Proposed Development caused by artificial lighting during both the operational and construction phases of the Proposed Development. This should include a description of the lighting plan during both the construction and operation phases, any potential impacts particularly in relation to bird species, including but not limited to breeding terns, and any required mitigation in light of the impacts identified.
- The supporting documents state that there will not be a significant increase in vessel traffic during the operation phase, the Scottish Ministers request further information relating to the anticipated vessel traffic during the operation of the Works, including the types of vessels to be serviced.
- The Scottish Ministers request that you provide details of anticipated vessel traffic activity during the construction phase of the Proposed Development, in particular relating to the required vessel movements required to transport materials necessary to complete the Proposed Development and vessel movements required to transport dredge material. This should include an assessment of the impacts caused upon marine mammal and bird receptors as a result of increased vessel presence and movements and any mitigation required in light of the impacts identified.
- There is a description of the noise modelling that was carried out at the site prior to the applications being made. It appears that the outcome of this exercise, which is treated as a baseline assessment, is reported in the following document: 'New Acoustics (2019) Western Harbour Development, Edinburgh – Noise Impact Assessment'. A link is supplied in the HRA report to access this document but it is currently unavailable. We require any data and assessments forming part of the EIA to be incorporated in the EIA report.
- We request further clarification as to the levels and variations in baseline noise and visual disturbance across the site is provided as it relates to birds. This should include information regarding predicted levels of activity at the Eastern Breakwater during both the construction and operation phases, and comparing this to the current baseline.
- The Scottish Ministers request further information relating to the use of the piling shroud including modelling of noise impacts both with and without the shroud in order to provide an assessment of the potential noise abatement against all underwater noise impacts generated by the Works.

The information should be supplied to MS LOT either as an addendum to the EIA Report already received or contained within a revised EIA Report. In regards to timelines going forward, once this information has been received, and in accordance with Section 22 of the 2017 EIA Regs, notice of the additional information must be published in the Edinburgh Gazette and in one or more newspapers circulating in the locality in which the works are situated and on the application website. The Scottish Ministers must also carry out consultation on the additional information provided with all public bodies that have an interest in the proposed works in line with s.18(1)(a)(iii) of the 2017 EIA Regs. The 2017 EIA Regs mandate at least a 30 day period from the last date of publication of the public notice and consultation to allow responses to be provided. In addition to this 30 day period, the Scottish Ministers will require a period of at least two weeks to come to a decision on the application once all consultation responses have been received and the 30 day notice period has expired, provided no further issues are raised during consultation. Please note that further time may also be required by the Scottish Ministers depending on the content of the consultation responses.

MS-LOT would also like to direct you to the responses of MSS, NatureScot, RSPB and other stakeholders. While not all aspects require further information, it is the responsibility of the applicant to consider and respond to each objection and issue raised in the consultation responses, including requests for further mitigation, surveys and reporting.

Should you require clarification on the information being requested, do not hesitate to get in touch.

Kind regards,

Neil Macleod
Marine Licensing Casework Manager

Marine Scotland - Marine Planning & Policy

Scottish Government | Marine Laboratory | 375 Victoria Road | Aberdeen | AB11 9DB
General Email: MS.marinelicensing@gov.scot Mobile: 07787220819

Website: <http://www.gov.scot/Topics/marine/Licensing/marine>

COVID-19: Marine Scotland - Licensing Operations Team (LOT) is working from home and unable to respond to phone enquiries. Please communicate with LOT via email. Email addresses are MS.MarineRenewables@gov.scot for marine renewables correspondence or MS.MarineLicensing@gov.scot for all licensing queries.



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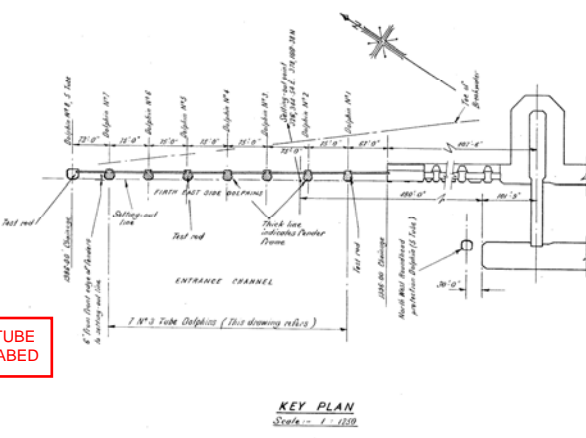
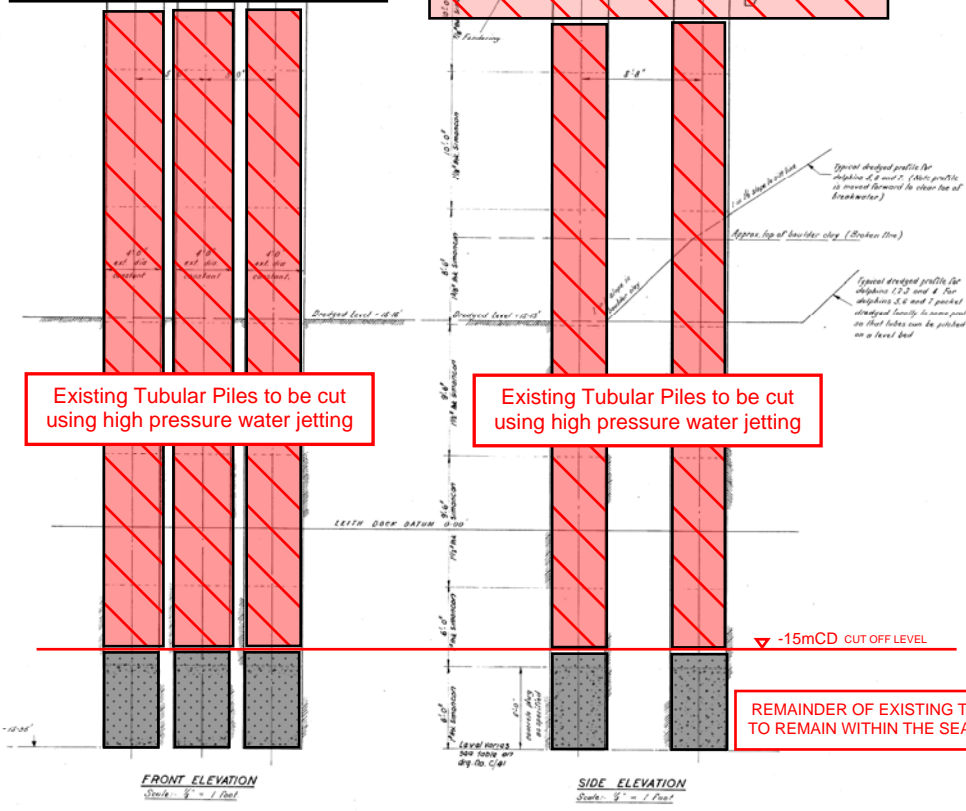
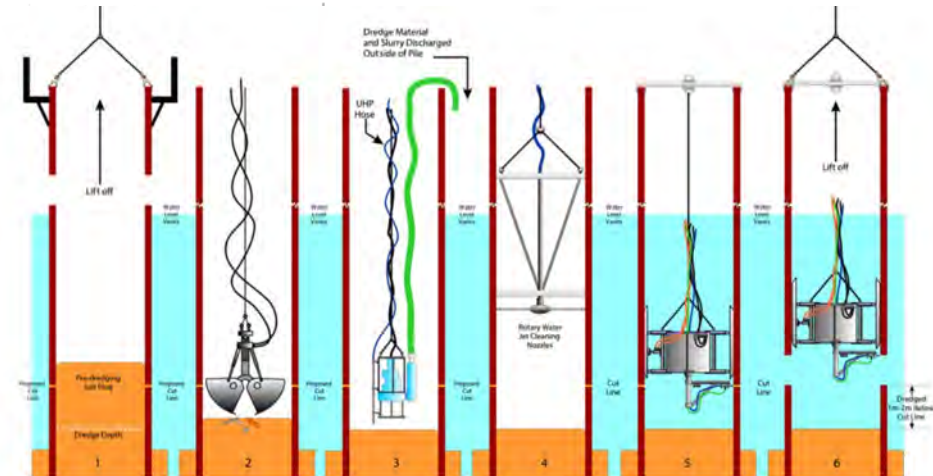
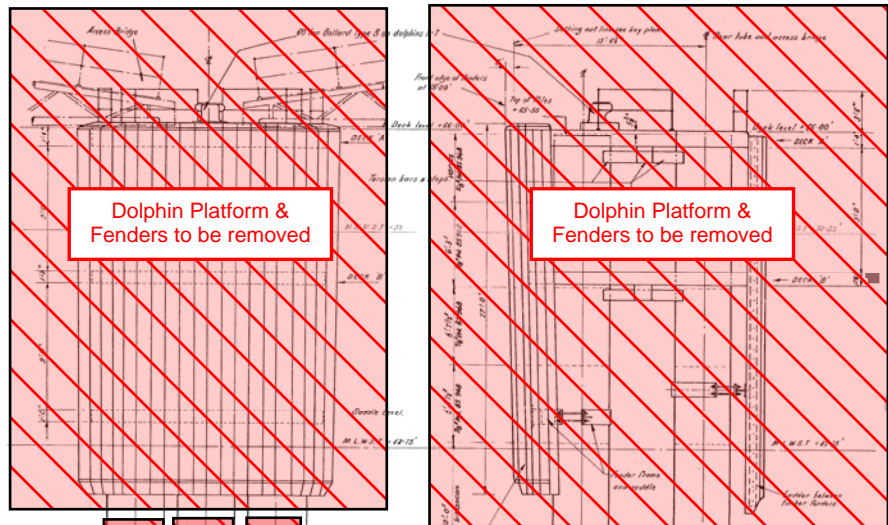
Communications with the Scottish Government may be monitored or recorded in order to secure the effective operation of the system and for other lawful purposes. The views or opinions contained within this e-mail may not necessarily reflect those of the Scottish Government.

Appendix B

Further Details of Enabling Works

OVERMARK LABEL

TITLE: EXISTING DOLPHIN REMOVAL
DRAWING NO: JJ21-SK001
ISSUE: FOR INFORMATION
AUTHOR: BS
DATE: 04.08.22



**FORTH PORTS AUTHORITY
 LEITH HARBOUR DEVELOPMENT**

**LOCK-LEAD-IN JETTY
 FIRTH EAST SIDE
 THREE TUBE DOLPHINS
 GENERAL ARRANGEMENT**

**AS MADE
 DRG. N° C/39**

**W.J. LEAMAN BSC, F.I.C.E.
 CHIEF ENGINEER**

**RENDEL, PALMER & TRITTON,
 CONSULTING ENGINEERS**

FRONT ELEVATION
 Scale: 1/2" = 1' 0"

SIDE ELEVATION
 Scale: 1/2" = 1' 0"

KEY PLAN
 Scale: 1/2" = 1' 0"

Appendix C

Operational Lighting Plan

LIGHTING EQUIPMENT:

- 13 x 30m Masts Carrying the Following Challenger 1 LED Floodlights - 5200K**
 M1, M2..... 2 x AL6102_15752SI_ + FS2 + RS2 (E)
 M3 - M10..... 2 x AL6102_15752SI + RS2 (C)
 M11 - M13..... 2 x AL6102_15752SI + FS2 (D)

- 3 x 3m R/L Masts Carrying the Following Vago LED Floodlights - 4000K**
 B..... 2 x AL6101_2_19W_4000K

- 10 x Handrail Mounted Pathseeker 2 Bulkhead Lantern - 4000K**
 A..... 1 x AL3151_26W_4000K
 Mounted on handrail at 0.9m

ILLUMINANCE LEVELS:

Required Levels:
 Average maintained horizontal illuminance (Eh.ave): 20 lx
 Minimum Maintained horizontal illuminance (Eh.min): 5 lx

Deck
 Average maintained horizontal illuminance (Eh.ave): 18 lx
 Minimum Maintained horizontal illuminance (Eh.min): 8 lx
 Uniformity ratio (Eh.min/Eh.ave): 0.45

Infill
 Average maintained horizontal illuminance (Eh.ave): 21 lx
 Minimum Maintained horizontal illuminance (Eh.min): 6 lx
 Uniformity ratio (Eh.min/Eh.ave): 0.29

Dolphin 1
 Average maintained horizontal illuminance (Eh.ave): 25 lx
 Minimum Maintained horizontal illuminance (Eh.min): 5 lx
 Uniformity ratio (Eh.min/Eh.ave): 0.20

Dolphin 2
 Average maintained horizontal illuminance (Eh.ave): 29 lx
 Minimum Maintained horizontal illuminance (Eh.min): 8 lx
 Uniformity ratio (Eh.min/Eh.ave): 0.27

Dolphin 3
 Average maintained horizontal illuminance (Eh.ave): 30 lx
 Minimum Maintained horizontal illuminance (Eh.min): 6 lx
 Uniformity ratio (Eh.min/Eh.ave): 0.20

Walkway sample
 Average maintained horizontal illuminance (Eh.ave): 105 lx
 Minimum Maintained horizontal illuminance (Eh.min): 12 lx
 Uniformity ratio (Eh.min/Eh.ave): 0.11

Walkway 1
 Average maintained horizontal illuminance (Eh.ave): 61 lx
 Minimum Maintained horizontal illuminance (Eh.min): 10 lx
 Uniformity ratio (Eh.min/Eh.ave): 0.16

Walkway 2
 Average maintained horizontal illuminance (Eh.ave): 124 lx
 Minimum Maintained horizontal illuminance (Eh.min): 27 lx
 Uniformity ratio (Eh.min/Eh.ave): 0.22

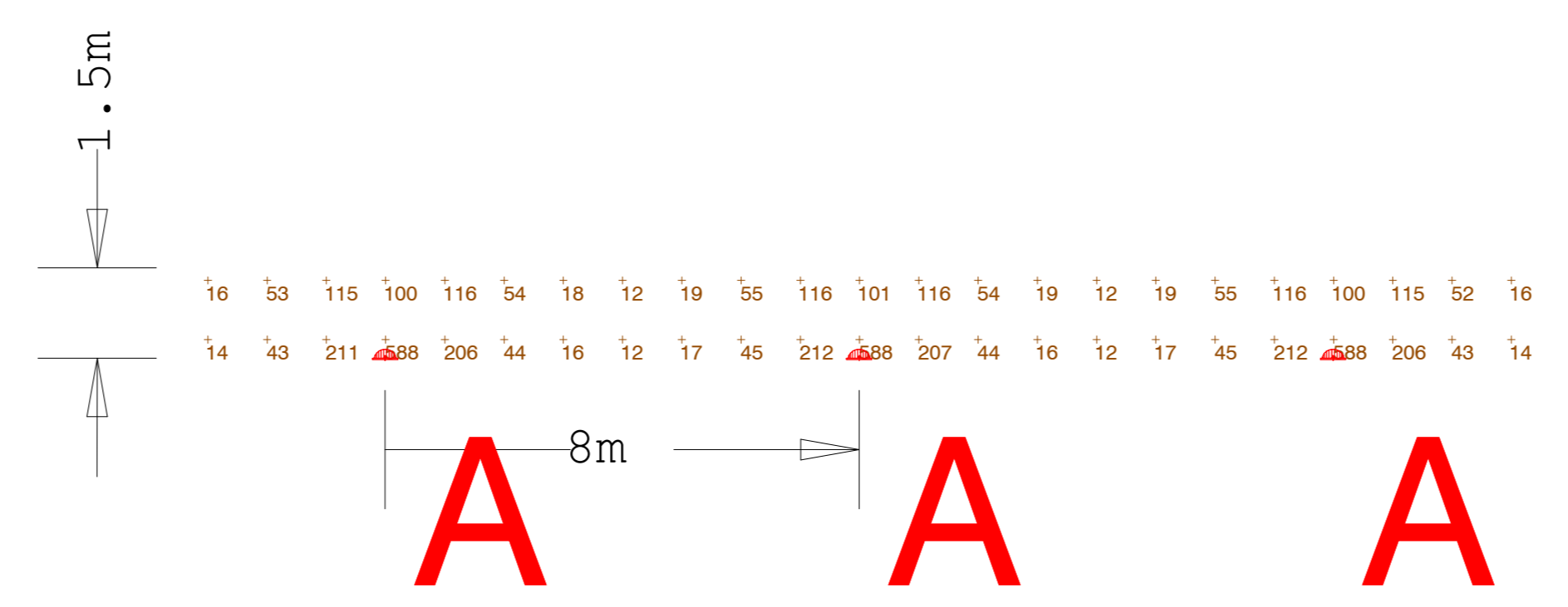
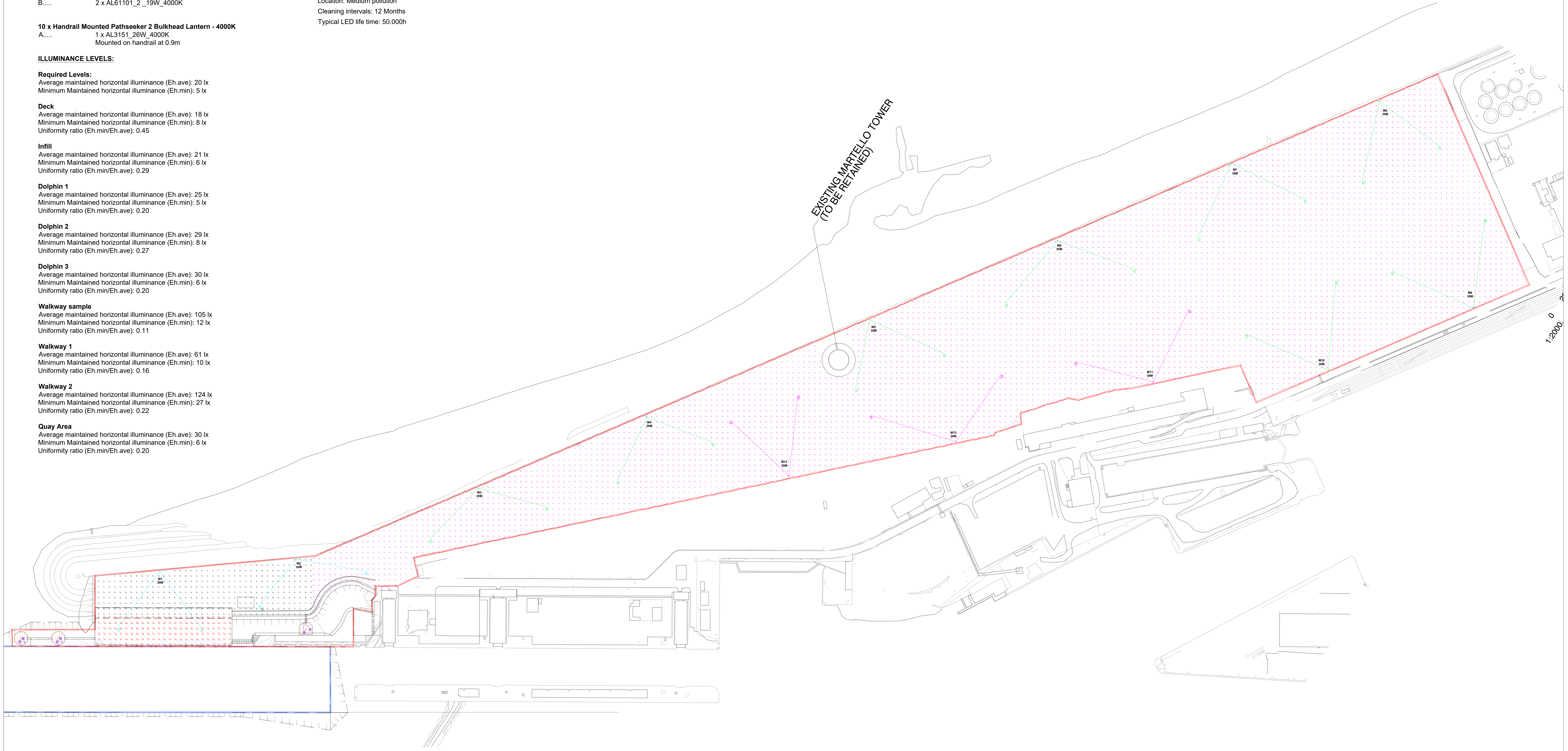
Quay Area
 Average maintained horizontal illuminance (Eh.ave): 30 lx
 Minimum Maintained horizontal illuminance (Eh.min): 6 lx
 Uniformity ratio (Eh.min/Eh.ave): 0.20

NOTES:

- Fitting positions and suitability should be checked prior to placing an order.
- This scheme has been developed based upon a flat and open area, where shadowing from buildings, equipment and vegetation have not been taken into consideration.

Grid values in lux
 Grid intervals: 5m, 2m, 1m

Maintenance factor: 0.9
 Location: Medium pollution
 Cleaning intervals: 12 Months
 Typical LED life time: 50.000h



Pathway sample calculation. Not to scale

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 This Lighting Design / Scheme and results given are based on the specific performance of Abacus Lighting products. This design and supporting documents are the sole property of Abacus Lighting Limited. This design and supporting documents must not be reproduced in any way without the written permission of Abacus Lighting. Any use of this design with non-Abacus luminaires after planning has been submitted may breach planning consent.

ABACUS LIGHTING LTD. Sutton-in-Ashfield, Nottinghamshire NG17 5FT England Tel: (+44) 01623 511111 Fax: (+44) 01623 552133 Email: light@abacuslighting.com Home page: www.abacuslighting.com		Lighting Project: Leith Outer Berth Title: External Lighting Design Ref: LS25617_3a Design By: Anna Whittaker Date: 09/08/2022 Scale: 1:1250@A0	
		Revision(s) From Previous Design: Mast height reduction, Walkway 1 & 2 included, wattage change (B) Challenger shields	
<small>All illuminance values are the result of computer calculations, based upon precisely positioned luminaires in a fixed relationship to each other and to the area under examination. In practice the values may vary due to tolerances on luminaires, luminaire positioning, reflection properties and electrical supply.</small>			



Appendix D

Inward and Outward Passage Plans for the Firth of Forth

FIRTH OF FORTH

PASSAGE PLANS



FIRTH PORTS LIMITED

Inward and Outward Passage Plans For the Firth of Forth within the Firth of Forth Pilotage Area.

This plan has been prepared with the co-operation of personnel from The Association of Forth Pilots and Forth Ports Limited.

Not to be used for navigation.




For compulsory pilotage areas see [Pilotage Direction No.8.](#)

Legislation, Procedures and Guidelines are available online at: <http://www.forthports.co.uk/marine/> this is a general passage plan for routing to from various ports and terminals on the firth of forth.

Contact Information:

 Forth Navigation	VHF Channels 71(working)
 Grangemouth Locks	VHF Channel 14
 Leith Harbour/Leith Locks	VHF Channel 12
 Forth Pilots & Pilot Boat	VHF Channel 72

Telephone:

 Forth and Tay Navigation Service	+44(0)1324 498584
 Leith Harbour Office	+44(0)1315 558900
 Forth Pilots	+44(0)131 552 1420

Address:

Forth & Tay Navigation Service (FTNS)
Grangemouth Port Office Grangemouth
FK3 8UE

The Passage Plan's contained in this booklet are merely a recommendation of the preferred route to be taken by vessels when navigating in the indicated areas. Any Pilot or Master should exercise their own discretion and be prepared to depart from the Passage Plan when circumstances dictate. Forth Ports Ltd shall not be liable for any losses, liabilities or damages arising whether or not due to any form of reliance on or usage of any Passage Plan or deviation thereof.

FORTH PORTS LIMITED	Document ID FP PMSC F16_02	Authorised By MM	Original Date January 2015
Forth Passage Plan	Date Revised August 2020	Revised By MO	Review Due August 2022

NOT FOR NAVIGATIONAL USE.

Report to FTNS at Fairway Buoy(VHF 71)

Strong Tides Between Buoys No.5 and No.6

263°T/083°T 5.1NM

272°T/092°T 3.1 NM

252°T/072°T 2.0 NM

Racon(T)

249°T/068°T 2.6 NM

Report to FTNS Due north of Inchkeith Lighthouse.(VHF71)

Racon(T)

RW

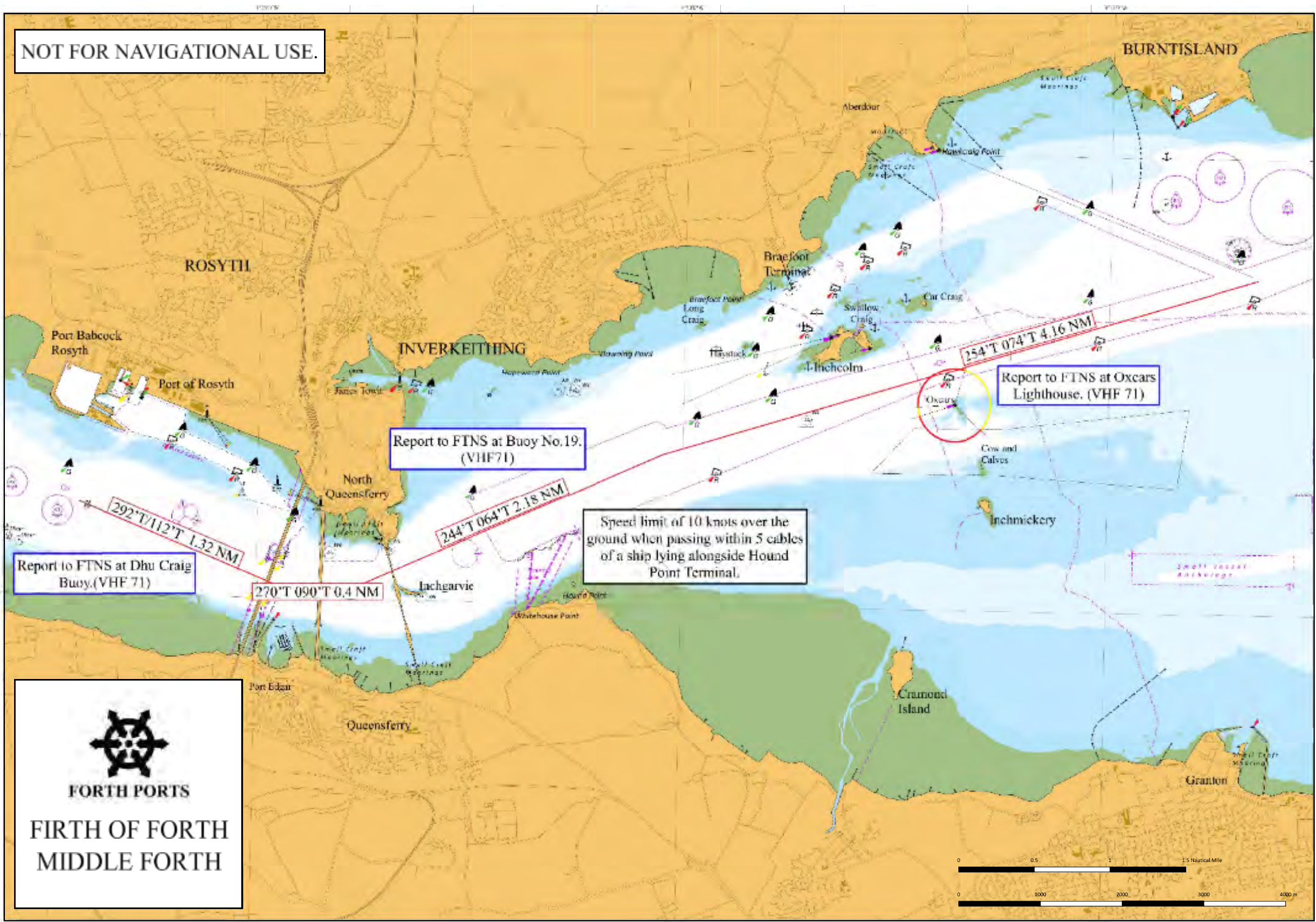


FORTH PORTS

FIRTH OF FORTH
OUTER FORTH

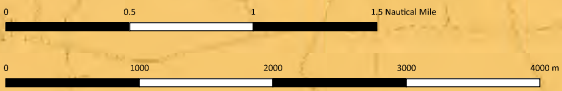


NOT FOR NAVIGATIONAL USE.



FORTH PORTS
FIRTH OF FORTH
MIDDLE FORTH

NOT FOR NAVIGATIONAL USE.



FORTH PORTS
FIRTH OF FORTH
GRANGEMOUTH

Report to Grangemouth Locks at Hen & Chickens Buoy. (VHF 14)

Speed limit of 10 knots over the ground when passing within 5 cables of a ship lying alongside Crombie Pier.

At The Lock Entrance the tide runs 280T on strong floods and 100T on strong ebb tides

270°T/090°T 3.43 NM

Report to FTNS at Crombie Pier. (VHF 71)

288°T/108°T 3.42 NM

304°T/124°T 1.18 NM

GRANGEMOUTH

BONESS

Charlestown

Linskilns

Port Babcock Rosyth

Blackness

BURNTISLAND



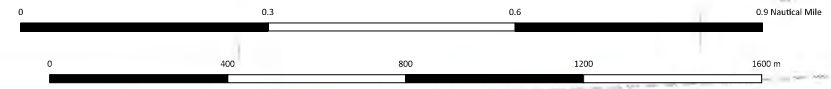
FORTH PORTS
FIRTH OF FORTH
BURNTISLAND

000°T / 180°T 0.55NM

270°T / 090°T 1.88NM

Racon(T)

NOT FOR NAVIGATIONAL USE.





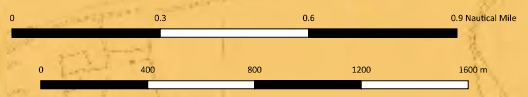
FORTH PORTS
FIRTH OF FORTH
BRAEFOOT
TERMINAL



Braefoot Terminal

NOT FOR NAVIGATIONAL USE.

BURNTISLAND



Strong Tides Between
Buoys No.5 and No.6

247°T /067°T 1.56 NM

292°T /112°T 1.65 NM

243°T /063°T 0.77 NM

Route for West Jetty

030°T /210°T 0.64 NM

246°T /066°T 0.68 NM

Route to be used in
strong westerly winds.

3.83 NM

3.15 NM

252°T /072°T

Report to FTNS at Oxcars
Lighthouse. (VHF 71)

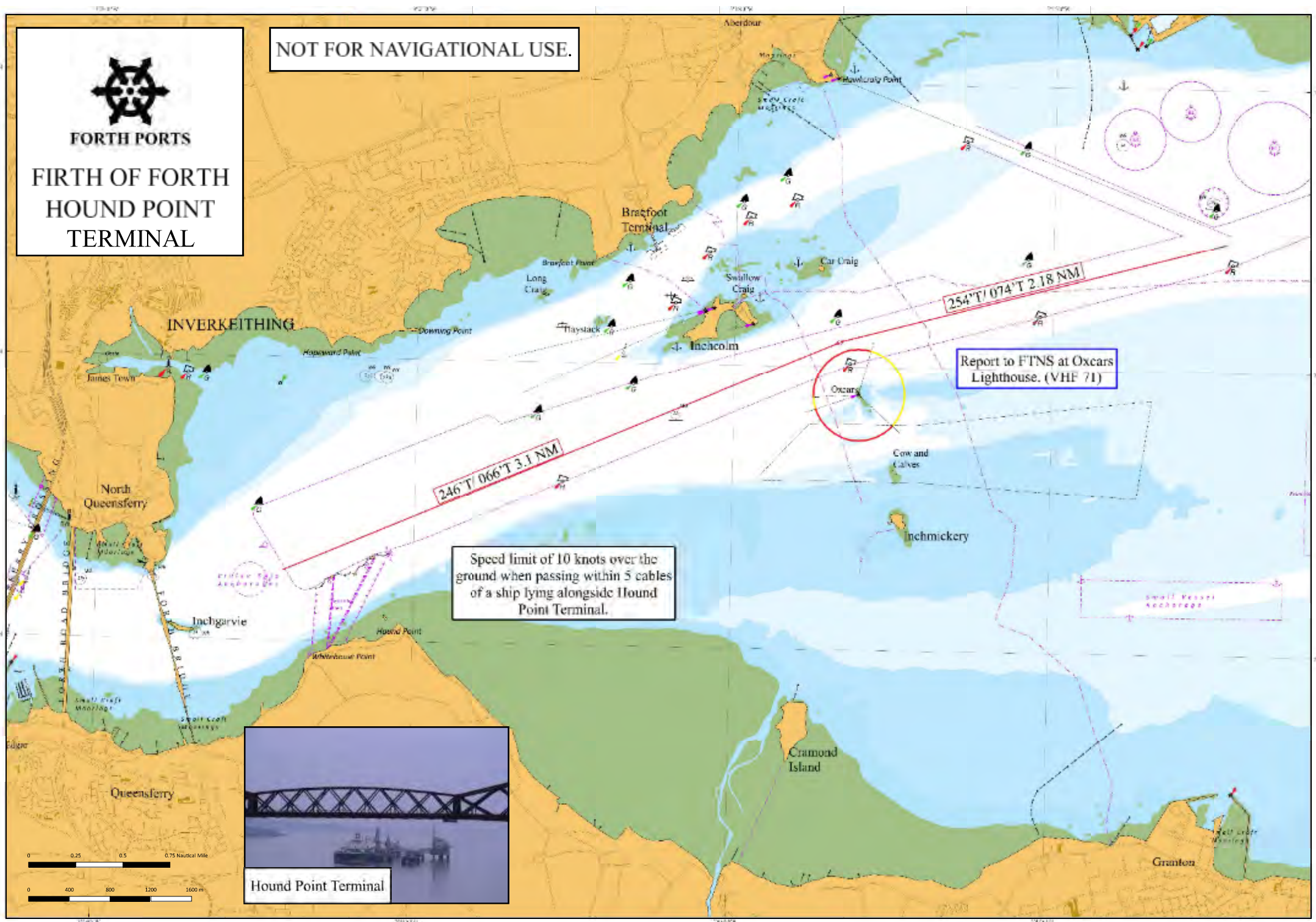


Cow and
Calves



FORTH PORTS
FIRTH OF FORTH
HOUND POINT
TERMINAL

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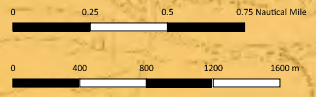


Speed limit of 10 knots over the ground when passing within 5 cables of a ship lying alongside Hound Point Terminal.

Report to FTNS at Oxcar Lighthouse. (VHF 71)



Hound Point Terminal





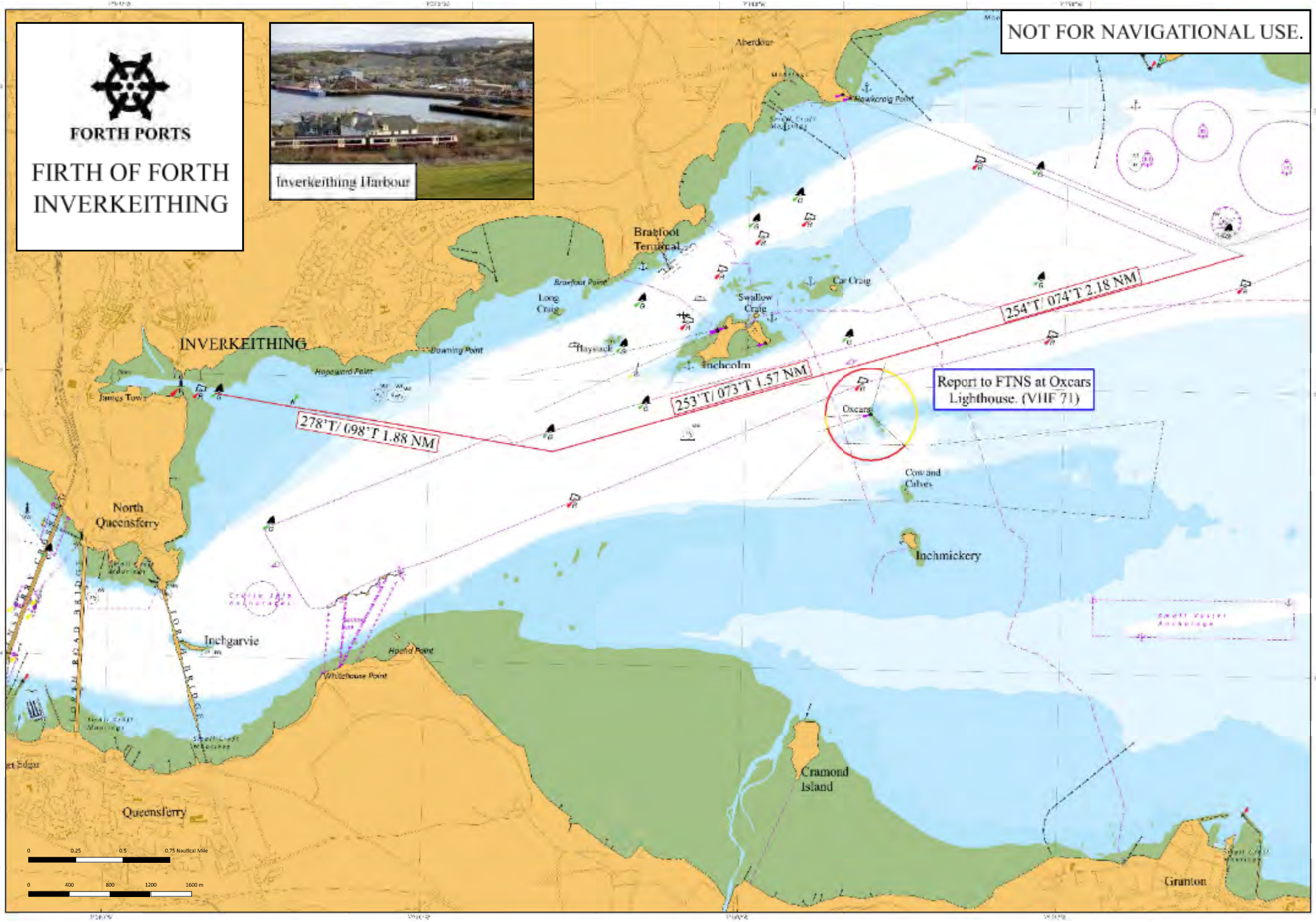
FORTH PORTS

FIRTH OF FORTH
INVERKEITHING



Inverkeithing Harbour

NOT FOR NAVIGATIONAL USE.





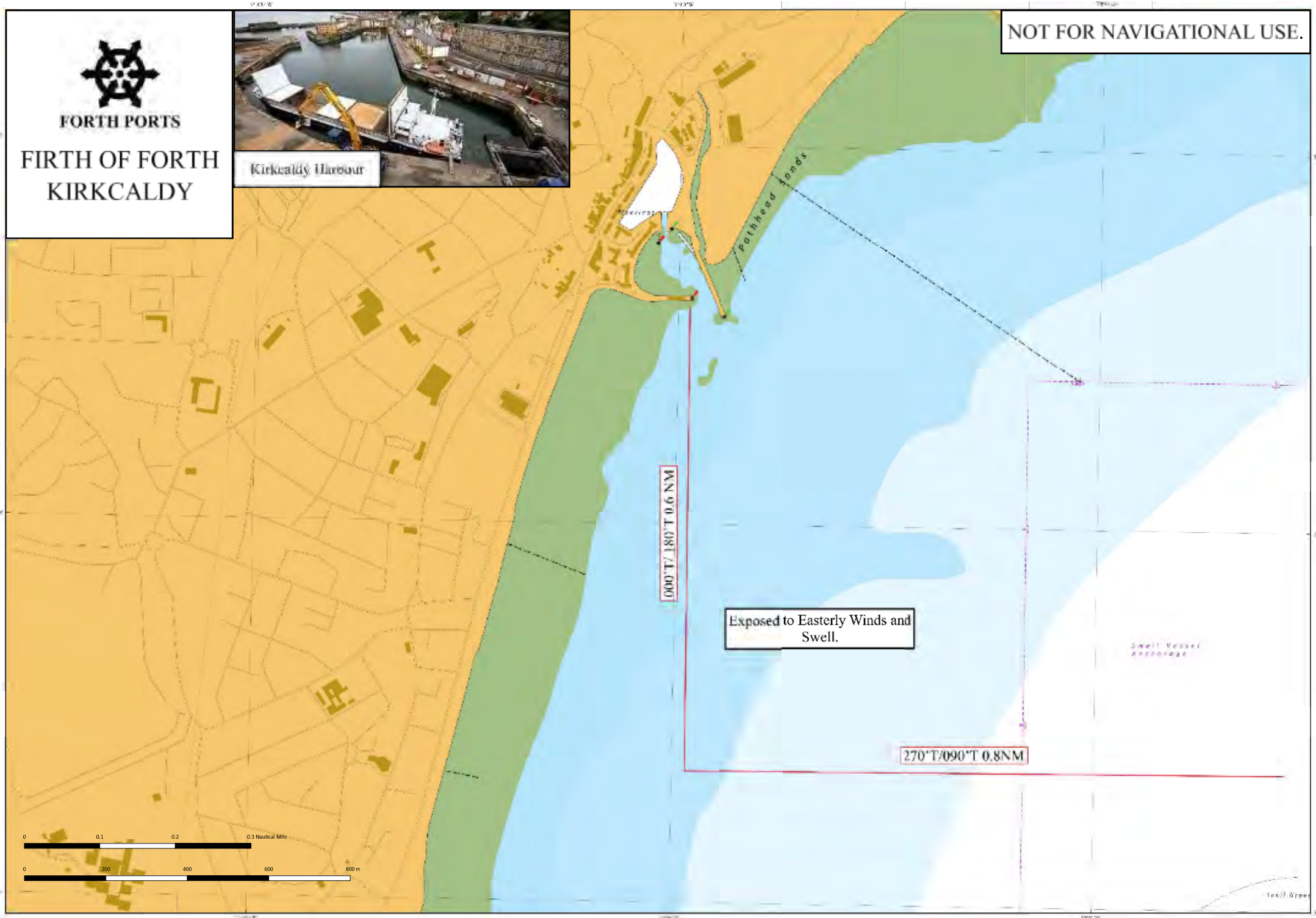
FORTH PORTS

FIRTH OF FORTH
KIRKCALDY



Kirkcaldy Harbour

NOT FOR NAVIGATIONAL USE.



NOT FOR NAVIGATIONAL USE.

Report to FTNS at Fairway Buoy (VHF 71)

Racon(I) 

Racon(T) 

Report to FTNS due south of Incheith Island. (VHF 71)

231°T/051°T 1.85 NM

238°T/058°T 3.3 NM

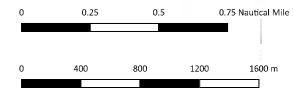
270°T/090°T 2.64 NM

000°T/180°T 0.56 NM


Report to Leith Harbour (VHF 12) & FTNS. (VHF 71)

Be aware of set due to fresh water.

At The Lock Entrance the tide runs 270T on strong floods and 080T on strong ebb tides. Note: Counter water movement on strong flood tide.



Port of Leith



FORTH PORTS
FIRTH OF FORTH
LEITH



FORTH PORTS

FIRTH OF FORTH
METHIL

NOT FOR NAVIGATIONAL USE.

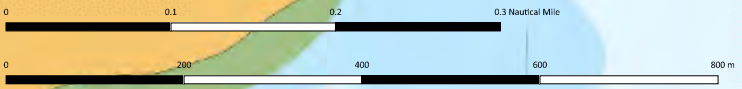
METHIL

000°T/180°T 0.48 NM

298°T/118°T 0.32 NM

270°T/090°T 0.62 NM

Small Vessel
Discharge



NOT FOR NAVIGATIONAL USE.

Port Babcock
Rosyth

Please Refer to Notice to Mariners
No. 02 of 2014. Marine activities,
enquires or requests of information
should be directed to the Port
Babcock (Rosyth) Ltd Harbour
Master.



FORTH PORTS
FIRTH OF FORTH
ROSYTH

Rosyth Small Boat Channel can be
used in south-westerly strong winds
on small cargo vessels on departure
subject to draft and A/W Periods)

Report to FTNS at Dhu Craig
Buoy. (VHF 71)

WHALE BACK

222°T/042°T 0.32 NM

294°T/114°T 0.96 NM

323.5°T/146.5°T 0.8 NM

292°T/112°T 1.32 NM

270°T/090°T 0.52 NM



Appendix E

New Acoustics' (2019) Western Harbour Development, Edinburgh – Noise Impact Assessment' report

To:	Holder Planning
Attn:	Robin Holder
Copies:	Lesley McGrath
Date:	4 th December 2020
Job:	Western Harbour NIA
Our Ref:	6803
No. of pages:	2

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Dear Robin,

RE: NIA for Western Harbour submitted as part of AMSC (19/00986/AMC).

This memo is written to confirm that, to the best of our knowledge, the findings outlined in the following noise impact assessment (NIA) conducted in early 2019 for the proposed residential development at Western Harbour as part of the AMSC (ref. 19/00986/AMC), are still valid, representative and relevant for submission with the Section 42 Application (ref. 20/03225/PPP).

More specifically, the NIA includes assessment of the following predominant noise sources from the surrounding environment;

- A. Road traffic noise from roads adjacent to the development
- B. Noise from the following industrial/commercial & port activities in the surrounding areas;
 - 1. Asda Fixed Plant & Deliveries
 - 2. ADM Milling Fixed Plant
 - 3. Aggregate Industries (Batching Plant and delivery of aggregate)
 - 4. Dales Marine (Ship Maintenance & Ship Decommissioning works)
 - 5. Bredero Shaw Ltd (Pipe Coating Operations, Movement of Pipes and their ship Loading/Unloading)
 - 6. Subsea7 (Welding & Associated Plant, Movement of Pipes and their ship Loading/Unloading)

Noise sources A and B1 – B4 were assessed based on noise survey data collected between December 2018 and February 2019. As noise sources B5 and B6 were not active at the time the assessment was prepared (though both had potential to recommence activities in the future), these were assessed on a worst-case basis using historical measurement data obtained by New Acoustics between 2001 and 2005.

Given that the above noise sources are still understood to be the predominant sources impacting the development site, the following NIA is considered to provide a

representative and/or worst-case assessment of all known relevant existing and potential noise sources within the surrounding environment.

Kind regards,

A handwritten signature in black ink, appearing to read 'M. Wilson'.

Martin Wilson





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WESTERN HARBOUR DEVELOPMENT, EDINBURGH

Noise Impact Assessment – Rev 00

Project No. 6803

21st February 2019

WESTERN HARBOUR DEVELOPMENT, EDINBURGH

Noise Impact Assessment – Rev 00

1 INTRODUCTION

This report is prepared for Edinburgh Forthside Developments Ltd and presents the results of a noise impact assessment (NIA) for the proposed residential and commercial development (Use Classes 1, 2, 3 and 4) and associated infrastructure at Western Harbour, Leith (Application No. 09/00165/OUT).

The purpose of the assessment is to determine the impact of road traffic noise as well as commercial and industrial noise on the proposed development and provide details of necessary noise mitigation where appropriate. This assessment considers all relevant noise sources within the local environment. This includes new noise sources and those assessed within the original NIA for the development site, which was conducted by New Acoustics and approved by the Planning Authority in 2004 (Application number 01/03229/OUT).

Baseline noise surveys have been taken at the proposed development site. These survey results have been used in conjunction with measured noise source levels to generate models of noise impacting the proposed development site in the environmental noise prediction software CadnaA (Datakustik). These levels are then assessed against relevant noise criteria.

New Acoustics is an ANC member company and all staff are required to be members of the Institute of Acoustics. This report is prepared by Martin Wilson B.Sc, M.Sc, Dip IOA, MIOA. Measurements obtained in 2019 discussed in this report were undertaken by Martin Wilson and Gary Lum (AMIOA). For noise sources relevant to this assessment which are not currently operational, source data has been taken from the original NIA produced by Dick Bowdler (FIOA).

2 PROPOSED DEVELOPMENT

The development includes the construction of 938no. residential units, commercial shell & core, and associated infrastructure works at the Western Harbour site, Edinburgh. The development is spread over a total of 8 plots (plots P1, P2, O1, O2, N, K, I and G) which comprise of a total of 26no. 2 – 6 storey blocks. The development site plan and footprint of individual buildings are displayed in Appendix 1.

LOCAL AUTHORITY GUIDANCE

Condition 11 relating to noise as set out in the Conditions Schedule, Consent Ref 09/00165/OUT for mixed use development is as follows:

11. Before determination of any application for the approval of reserved matters, a scheme for protecting any proposed residential development from noise from existing industrial and commercial activities affecting the application site, including those associated with Bredero Price Coaters Limited, Chancelot Mill and Next Generation Sport and Leisure Complex, and the Ocean Liner Terminal shall be submitted to and approved in writing by the Head of Planning. This shall also take into account noise from road traffic in respect of Newhaven Place, Anchorfiled/Lindsay Road as potentially affecting Plots 8, 10 and 11.

Following telephone discussions between Martin Wilson of New Acoustics and City of Edinburgh Council (CEC) Environmental Health Officer Andrew Campbell in January 2019, the following noise criteria have been established as appropriate for the assessment of this residential development (and the development as a whole);

- Noise from road traffic on the adjacent roads to the development is to be assessed against BS8233:2014 guidelines with development windows closed.
- Noise from fixed industrial and commercial plant is to be assessed to Noise Rating Curve NR25 with windows development open.
- Noise from port and industrial activities is to be assessed using BS4142:2014, with consideration also given to BS8233:2014 internal guidelines with development windows open.

These criteria are discussed in detail in Section 4.

3 NOISE SOURCES TO BE CONSIDERED

Following (separate) discussions with the CEC Environmental Health and Forth Ports and observations made whilst on site the following noise sources are considered those relevant for assessment within this NIA;

- Road traffic noise from roads adjacent to the development BS8233:2014 internal criteria with windows open.
- Noise from fixed plant associated with Asda and ADM Milling (formerly Chancelot Mill) to be assessed against NR25 with windows closed.
- Noise from the following industrial/commercial port activities to be assessed to BS4142:2014 with consideration given to BS8233:2014 internal criteria;
 - Asda Fixed Plant & Deliveries

- ADM Milling Fixed Plant
- Aggregate Industries (Batching Plant and delivery of aggregate)
- Dales Marine (Ship Maintenance & Ship Decommissioning works)
- Bredero Shaw Ltd (Pipe Coating Operations, Movement of Pipes and their ship Loading/Unloading)
- Subsea7 (Welding & Associated Plant, Movement of Pipes and their ship Loading/Unloading)

When noise from port activities is low, baseline noise levels onsite are generally dominated by road traffic with a continuous and constant contribution from fixed plant within the ADM Milling facility. It is not possible to shut the plant down and measure background and residual levels in the absence of ADM Milling fixed plant noise. It is also reasonable to suggest that, being constant and continuous, the ADM Milling fixed plant forms part of the background and residual noise level for which all other port activities are to be assessed against in the BS4142 assessment. For these **reasons'** contributions from fixed plant (ADM Milling and potentially Asda fixed plant, though this is not audible at the development site) are included within the BS4142 residual and background noise surveys. As outlined above, all fixed plant is also assessed separately against NR25 with windows open.

It should also be noted that both Bredero Shaw Ltd (BSL) and Subsea7 have ceased their operations within the Port of Leith over the last several years although it is understood that both intend to recommence as previous in the future. It has therefore not been possible to measure associated noise levels for this assessment, and hence noise levels measured by New Acoustics in the initial 2004 assessment are reused here. Specific noise measurements have been conducted for all other noise sources outlined above. The locations of the noise sources considered in this assessment are displayed in Appendix 2.

4 NOISE CRITERIA

Noise criteria relevant to this assessment referred to in Sections 2 & 3 are discussed in detail below.

4.1 BS8233:2014

BS8233:2014 **"Guidance on Sound Insulation and Noise Reduction in Buildings"** provides indoor ambient noise levels (broadband noise) for internal noise conditions in bedrooms, living rooms and dining spaces as shown in Table 4.1.

Criterion	Typical Situations	Noise Levels, $L_{Aeq,T}$ (dB)	
		Day	Night
Reasonable sleeping / resting conditions	Living Rooms	35	---
	Bedrooms	35	30
Dining	Dining Room / Area	40	---

4.2 Assessment of Fixed Plant – NR25

It is common practice for local authorities to adopt the NR25 curve as internal target levels when assessing fixed plant. This criteria requires that each single octave band $L_{Zeq,T}$ level, when measured within the particular NSR in question, does not exceed the levels stipulated in Table 4.2 below.

Octave band (Hz)	63	125	250	500	1000	2000	4000	8000
Noise Rating NR35 (dB)	63	52	45	39	35	32	30	28

4.3 BS4142:2014

"BS4142:2014 – Methods for Rating and Assessing Industrial and Commercial Sound" is used to rate and assess "**sound of an industrial and/or commercial nature**" providing a method of comparing the noise level from identified source(s) with the existing background noise level in the area. It is used to "**assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident**" in order to determine the degree of impact on the residents.

This is done by comparing the average level of the noise source to be assessed (labelled **the 'specific' noise, $L_{Aeq,T}^1$**), rated depending on the acoustic characteristics of the noise, with the background noise level which existed before the noise source was installed (represented by the $L_{A90,T}^2$). All levels used in the assessment are external to the noise sensitive building being assessed.

BS4142:2014 states that the significance of an industrial type noise depends upon both the exceedance over background and the context in which the sound occurs, starting with "**indication of low impact**" when the new noise does not exceed the existing background noise (i.e. the rating level is 0dB above background noise level), with an exceedance of around

¹ $L_{Aeq,T}$ is the logarithmic average noise level over time period T

² $L_{A90,T}$ is the noise level that is exceeded for 90% of the time period T

+5dB above the existing background noise level *"likely to be an indication of an adverse impact, depending on the context"*, and an exceedance of +10dB or more *"likely to be an indication of significant adverse impact, depending on context"*. It goes on to say that, *"when making assessment and arriving at decisions... it is essential to place the sound in context"*. Context can mean a number of things including; the time of day the sound occurs, the frequency of occurrence and the noises already present in the surrounding environment.

On this matter Section 3.2 of the Technical Advice Note to PAN 1/2011 says, *"the Scottish Government consider that impacts commonly do not become sufficiently significant to warrant mitigation until the difference between the Rating level and the background noise levels is more than 10dBA"*.

The BS4142:2014 assessment period for daytime is 1 hour and 15 minutes at night.

5 NOISE MEASUREMENTS

The sections below discuss the baseline and source noise level measurements used within this NIA. All measurements were made using Bruel & Kjaer Type 2250 & 2260 sound level meters fitted with the standard foam windshields Type UA 1650. The meters were calibrated before and after the measurements using a Type 4231 sound level meter calibrator. All measurements were made in third octave bands from 12.5Hz to 20kHz across the normal range of parameters and were attended throughout the measurement periods. Measurements were either tripod mounted at a height of 1.2m from the relative ground level or were hand held at heights of approximately 1 – 3m from the ground.

5.1 Road Traffic Measurements

Road traffic measurements were conducted at 3 positions around the site on the 10th and 28th of January 2019 between hours 11:00 and 16:00. Weather conditions during measurements were clear and dry with wind speeds of less than 5m/s and predominantly westerly direction and temperatures between 8 - 10°C.

Measurements at Position 1, approximately 6m from the road edge of Sandpiper Drive (at the south-east façade line of Plot O1), were taken for a total of three hours as recommended in the shortened measurement procedure in the HMSO document – Calculation of Road Traffic Noise. The $L_{Aeq,T}$, $L_{A90,T}$, $L_{A10,T}$ ³ and L_{Amax} ⁴ (all fast weighted) were logged for each 5-minute period. Additional supplementary measurements were conducted at Position 2, approximately 15m from the road

³ The noise level exceeded for 10% of the measurement period, often used to represent road traffic noise levels and used in CRTN and DMRB to calculate entitlement for noise insulation treatment under the Noise 5 Insulation Regulations when a new road is constructed

⁴ The maximum noise level recorded during the measurement period

edge of Western Harbour Drive (in line with the north façade line of Plot G), and Position 3, approximately 5m from the road edge of Sandpiper Drive (at the south façade line of Plot P2). The supplementary measurements were conducted for 1 hour at each position. All three measurement positions are indicated in Appendix 3.

The noise level at each measurement position was dominated by road traffic noise with low level continuous noise from the ADM Milling site also audible. Noise from Port activities was minimal during measurements and is considered to have had a negligible impact on the measured levels. The average overall noise levels recorded over the measurement periods are shown in Table 5.1.1 below.

Position	Duration	L _{Aeq,T} (dB)	L _{A90,T} (dB)	L _{A10,T} (dB)	L _{AFmax} (dB)
1	03:00:00	64	52	59	85
2	01:00:00	51	44	52	83
3	01:00:00	61	50	65	84

Logged measurement data for the measurements is displayed in Table A4.1 of Appendix A4.

Day and night average noise levels were calculated on the basis that the noise level in any period is proportional to ten times the logarithm of the average hourly traffic flow during that period. In Central Scotland the day time noise level is generally the same as that measured in the middle of the day (at any time between 10:00 and 16:00) and the night time level is 8dBA lower than this. It is therefore reasonable to consider the mean of the measurements as representative of the 16hr L_{Aeq} and the 8hr L_{Aeq} as being 8dB less than this.

The resultant external daytime and night time noise levels at the southern façade line of the proposed development (Noise 1) are shown in Table 5.1.2.

Position	Period	Duration (hours)	Noise Level, L _{Aeq,T} (dB)
1	Day	16	64
	Night	8	56
2	Day	16	51
	Night	8	43
3	Day	16	61
	Night	8	53

5.2 Residual & Background BS4142 Measurements

For the BS4142 assessment of all port activities and Asda deliveries the road traffic measurements at positions 1 and 2 described in Section 5.1 are used to derive daytime residual and background noise levels at Plot O1 and Plot G respectively. These plots are considered the most exposed to noise from the relevant sources and are also located at either end of the site.

Night-time residual & background measurements for plots O1 and G were conducted on 1st of February 2019 between 01:30 and 02:30 at measurement positions 1 and 4 respectively (the measurement positions are indicated in Appendix 3). Weather conditions during measurements were dry and clear with variable wind direction at speeds of less than 5m/s and temperatures of 9 - 11°C.

Measurements were conducted for 30 mins at each location with measurements conducted in 5-minute periods (with the exception of the first 15 mins at position 1 which was logged in 30 second intervals to allow for extraction of ADM Milling fixed plant noise from road traffic levels).

The noise environment at Position 1 was dominated by traffic noise from vehicles coming and going to Asda with continuous noise from the ADM Milling site audible when there was no traffic. The noise environment at Position 4 consisted of distant broadband traffic noise with continuous noise from the ADM Milling site also audible. Occasional noise from aircraft was dominant whilst flying overhead. There was no noise from port activities noted during night measurements. Furthermore, it is understood that none of the port noise sources to be assessed against BS4142 were operational during the measurements.

The average daytime and night-time residual $L_{Aeq,T}$ and background $L_{A90,T}$ noise levels measured at each position are shown in Tables 5.2.1 and 5.2.2 respectively.

Table 5.2.1 – Daytime Background Noise Measurements		
Position	Residual Noise Level, $L_{Aeq,1hr}$ (dB)	Background Noise Level, $L_{A90,1hr}$ (dB)
1 (Plot O1)	64	52
2 (Plot G)	51	44

Table 5.2.2 – Night-time Background Noise Measurements		
Position	Residual Noise Level, $L_{Aeq,15min}$ (dB)	Background Noise Level, $L_{A90,15min}$ (dB)
1 (Plot O1)	49	40
4 (Plot G)	40	37

The logged measurement data for the daytime and night-time periods can be seen in Tables A4.1 and Table A4.2 of Appendix 4 respectively.

The background noise measurements were conducted over one and two visits (two visits for day and one for night). This increases uncertainty in the background noise levels due to the limitation on measurement for different wind conditions and time of day which will influence noise from distant road traffic and other sources. However, given that the wind speeds monitored on site during measurements were below 5m/s (dominant wind direction), the equipment used for measurements is Class 1 and the measurements were attended throughout they are considered of low-medium uncertainty.

5.3 Individual Noise Source Measurements

Individual measurements of the noise sources to be assessed were conducted throughout January and early February 2019. Measurements relating to the following noise sources were conducted;

- Asda fixed Plant & Deliveries
- Aggregate Industries
- ADM Milling Facility
- Cranes 41 & 42
- Dales Marine

The individual results and other relevant details relating to the measurements and related activities are displayed in Appendix 5. As outlined in Section 3, since BSL and Subsea7 have ceased their operations within the Port of Leith over the last several years noise levels measured by New Acoustics in the initial 2004 assessment are reused within this assessment. Relevant noise source details for BSL and Subsea7 activities are also provided in Appendix 5.

6 NOISE MODEL

In order to predict the resultant noise levels from relevant sources at the proposed development an ISO 9613-2 noise model was generated in the environmental noise prediction software CadnaA (Datakustik).

Ground absorption within the models was taken as 0.5 with a temperature of 10°C and a relative humidity of 70% was used. Receiver heights were placed on all storeys of all plots with worst case results displayed in the Section 8.

The following model scenarios have been modelled;

1. The noise impacting the development from existing roads (to be assessed against BS8233:2014 internal guidelines with windows closed)
2. The noise impacting the development from fixed plant, namely plant associated with Asda and ADM Milling (to be assessed against NR25 with windows open)
3. The noise impacting the development from industrial/commercial & port activities which are currently operational (to be assessed against BS4142:2014 and against BS8233:2014 internal guidelines with windows open)
4. The noise impacting the development from industrial/commercial & port activities which are not currently operational but may be in the future (to be assessed against BS4142:2014 and against BS8233:2014 internal guidelines with windows open)

The reasons for splitting the assessment of model iterations 3 and 4 are explained by the following extract from the initial 2004 noise report (for which the full report is included in Appendix 8 of this report);

*"It must be emphasised that, with exceptions described at the end of this paragraph, the worst case of noise from each source is taken – sometimes over periods as brief as one minute. Hence the various noise sources have been assessed individually against the proposed standards. No allowance has been made for the accumulation of sound sources. This is because the main sources at issue – those dealt with in sections 5 and 6 – only the BSL pipe coating area has any significant noise component **which is continuous. The only significant noise at Subsea7's welding plant is that of alarms.** The movement of pipes at both BSL and Subsea7 happens for only parts of the day and the noise itself is intermittent. Not accumulating the noise sources is therefore offset by the averaging of the individual noise sources. The exceptions are the cases of the loading and unloading of ships where I have averaged the noise. I feel this is justified because the activity is far less frequent and even at busy periods is not a daily occurrence."*

In BS4142:2014 activity levels are measured and averaged over a duration of 1 hour for the daytime and a duration of 15 mins for the night-time. If the worst-case short-term BSL and Subsea7 measurements discussed above had been conducted over durations of these lengths the associated noise levels would clearly be lower. Considering this and the fact the associated noise levels for these activities were assessed on an individual basis in the initial 2004 report, it is prudent to once again assess noise levels from BSL and subsea7 individually (with the exception of loading and unloading of ships which are included in within the assessment of model iteration 3 outlined above).

All noise model input parameters for each individual noise source and activity are presented in Appendix 5.

7 BS4142 RATING LEVELS

BS4142:2014 allows provision for character correction penalties to be included for the presence of certain acoustic features within the specific noise to be assessed at the receiver location (penalties of 0 to +6dB for tonality, 0 to +9dB for impulsivity and 0 to +3dB for intermittency).

Rating levels for individual noise sources are presented in Appendix 5. These have been established based on subjective assessments whilst on site as well as the application of the objective method for tonality on measured data.

8 NOISE IMPACT ASSESSMENTS

In the below subsections, measured and modelled noise levels for the sources outlined in the previous sections are assessed against the various criteria outlined in Section 4. Noise levels results displayed in all tables in Section 8 are the highest resultant level on each respective elevation.

8.1 Assessment of Road Traffic Noise Levels to BS8233:2014

Resultant internal levels at the façades most exposed to road traffic within the proposed development are assessed against the BS8233:2014 internal criteria. Internal levels are derived from measured external levels assuming closed windows and installation of Pilkington 6mm/12mm/6mm standard double glazing (or of equal and approved) throughout the development. The worst-case daytime and night-time road traffic noise assessments for the proposed development are displayed in Tables 8.1.1 and 8.1.2 respectively.

NSR	External Noise Level, LAeq,16hr (dB)	Internal Noise Level, LAeq,16hr (dB)	BS8233 Criteria, LAeq,16hr (dB)	Exceedance (dBA)
Plot O1 (Sandpiper Drive)	64	34	35	-1
Plot P2 (Sandpiper Road)	61	34	35	-1
Plot G (Western Harbour Drive)	51	23	35	-12

NSR	External Noise Level, LAeq,8hr (dB)	Internal Noise Level, LAeq,8hr (dB)	BS8233 Criteria, LAeq,8hr (dB)	Exceedance (dBA)
Plot O1 (Sandpiper Drive)	56	26	30	-4
Plot P2 (Sandpiper Road)	53	26	30	-4
Plot G (Western Harbour Drive)	43	15	30	-15

The above tables indicate the worst-case road traffic noise levels at a height of 1.5m from ground level. Glazing attenuation calculations for the above assessments are presented in Appendix 6.

8.2 Assessment of Fixed Plant

Resultant internal levels at the façades of the development most exposed to noise levels from fixed plant associated with ADM Milling and Asda are assessed against NR25 in Table 8.2.1 assuming 12dB attenuation for open windows.

Octave Band (Hz)	63	125	250	500	1K	2K	4K	8K	NR
Plot O1	51	48	43	36	34	31	23	0	34
Open Window Attenuation (dB)	12	12	12	12	12	12	12	12	---
Resultant Internal Level (dB)	39	36	31	24	22	19	11	-12	22
NR25 (dB)	55	44	35	29	25	22	20	18	25
Exceedance (dB)	-16	-7	-5	-5	-3	-3	-8	-30	---
Plot P2	47	47	42	35	33	29	21	-9	33
Open Window Attenuation (dB)	12	12	12	12	12	12	12	12	---
Resultant Internal Level (dB)	35	35	30	23	21	17	9	-21	21
NR25 (dB)	55	44	35	29	25	22	20	18	25
Exceedance (dB)	-21	-9	-5	-6	-4	-5	-10	-38	---

Given the additional distances involved from the relevant noise sources, resultant levels at all other plots will be lower than those outlined in the tables above.

8.3 Daytime BS4142:2014 Assessments

Modelled rating noise levels for the daytime at either end of the development site for all activities currently operating (with the inclusion of BSL & Subsea 7 ship loading/unloading) are assessed against relevant measured background levels in accordance with BS4142:2014 in Table 8.3.1.

NSR	BS4142 Rating Level, $L_{Ar,1hr}$ (dB)	Background Noise Level, $L_{A90,1hr}$ (dB)	Exceedance over Background (dBA)
Plot O1	48	52	-4
Plot G	47	44	3

Modelled rating noise levels for the daytime at either end of the development site for all BSL and Subsea7 activities other than ship loading/unloading which are not currently operating (but are planned to recommence in the future) are displayed in Tables 8.3.2 and 8.3.3 respectively.

Table 8.3.2 – Daytime BS4142 NIA of BSL Activities

NSR	BS4142 Rating Level, $L_{Ar,1hr}$ (dB)	Background Noise Level, $L_{A90,1hr}$ (dB)	Exceedance over Background (dBA)
Plot O1	39	52	-14
Plot G	42	44	-3

Table 8.3.3 – Daytime BS4142 NIA of Subsea7 Activities

NSR	BS4142 Rating Level, $L_{Ar,1hr}$ (dB)	Background Noise Level, $L_{A90,1hr}$ (dB)	Exceedance over Background (dBA)
Plot O1	47	52	-5
Plot G	51	44	7

8.4 Night-time BS4142:2014 Assessments

Modelled rating noise levels for the night-time at either end of the development site for all activities currently operating (with the inclusion of BSL & Subsea 7 ship loading/unloading) are assessed against relevant measured background levels in accordance with BS4142:2014 in Table 8.4.1.

Table 8.4.1 – Night-time BS4142 NIA of Current Activities

NSR	BS4142 Rating Level, $L_{Ar,15min}$ (dB)	Background Noise Level, $L_{A90,15min}$ (dB)	Exceedance over Background (dBA)
Plot O1	42	40	2
Plot G	36	37	-1

Modelled rating noise levels for the night-time at either end of the development site for all BSL activities which are not currently operating (but are planned to recommence in the future) are displayed in Tables 8.4.2.

Table 8.4.2 – Night-time BS4142 NIA of BSL Activities

NSR	BS4142 Rating Level, $L_{Ar,15min}$ (dB)	Background Noise Level, $L_{A90,15min}$ (dB)	Exceedance over Background (dBA)
Plot O1	39	40	-2
Plot G	42	37	5

Modelled rating noise levels for the night-time at either end of the development site for individual Subsea7 activities which are not currently operating (but are planned to recommence in the future) are displayed in Tables 8.4.3 - 8.4.5.

Table 8.4.3 – Night-time BS4142 NIA of Subsea7 Welding & Activities

NSR	BS4142 Rating Level, L _{Ar,15min} (dB)	Background Noise Level, L _{A90,15min} (dB)	Exceedance over Background (dBA)
Plot O1	21	40	-19
Plot G	24	37	-13

Table 8.4.4 – Night-time BS4142 NIA of Subsea7 Moving of Pipes

NSR	BS4142 Rating Level, L _{Ar,15min} (dB)	Background Noise Level, L _{A90,15min} (dB)	Exceedance over Background (dBA)
Plot O1	44	40	4
Plot G	47	37	10

Table 8.4.5 – Night-time BS4142 NIA of Subsea7 Alarms

NSR	BS4142 Rating Level, L _{Ar,15min} (dB)	Background Noise Level, L _{A90,15min} (dB)	Exceedance over Background (dBA)
Plot O1	42	40	2
Plot G	45	37	8

8.5 Assessment of Daytime Rating Levels against BS8233:2014

Modelled rating noise levels for the daytime for all activities currently operating (with the inclusion of BSL & Subsea 7 ship loading/unloading) are assessed at each plot of the development site against BS8233:2014 internal daytime criteria in Table 8.5.1. Note resultant levels for both the most exposed south-east (se) façades and least exposed north-west (nw) façades of each plot are presented.

Table 8.5.1 – Daytime NIA of Current Activities Against BS8233 Criteria

NSR	External Rating Level, L _{Ar,1hr} (dB)	Internal Rating Level, L _{Ar,1hr} (dB)	BS8233 Criteria, L _{Aeq,16hr} (dB)	Exceedance (dBA)
Plot P1 (nw elevation)	40	28*	35	-7
Plot P2 (se elevation)	43	31*	35	-4
Plot O1 (se elevation)	48	36*	35	1
Plot O2 (nw elevation)	25	13*	35	-22
Plot N ((nw elevation)	30	18*	35	-17
Plot N (se elevation)	49	37*	35	2
Plot K (nw elevation)	26	14*	35	-21
Plot K (se elevation)	49	37*	35	2
Plot I (nw elevation)	25	13*	35	-22
Plot I (se elevation)	48	36*	35	1
Plot G (nw elevation)	29	17*	35	-18
Plot G (se elevation)	47	35*	35	0

* Assumes 12dB open window attenuation

Modelled rating noise levels for the daytime for BSL & Subsea 7 activities are assessed at each plot of the development site against BS8233:2014 internal daytime criteria in Tables 8.5.2 and 8.5.3 respectively.

NSR	External Rating Level, L _{Ar,1hr} (dB)	Internal Rating Level, L _{Ar,1hr} (dB)	BS8233 Criteria, L _{Aeq,16hr} (dB)	Exceedance (dBA)
Plot P1 (nw elevation)	31	19*	35	-16
Plot P2 (se elevation)	32	20*	35	-15
Plot O1 (se elevation)	39	27*	35	-9
Plot O2 (nw elevation)	15	3*	35	-32
Plot N ((nw elevation)	17	5*	35	-30
Plot N (se elevation)	40	28*	35	-8
Plot K (nw elevation)	16	4*	35	-31
Plot K (se elevation)	40	28*	35	-7
Plot I (nw elevation)	16	4*	35	-31
Plot I (se elevation)	41	29*	35	-6
Plot G (nw elevation)	19	7*	35	-28
Plot G (se elevation)	42	30*	35	-6

* Assumes 12dB open window attenuation

NSR	External Rating Level, L _{Ar,1hr} (dB)	Internal Rating Level, L _{Ar,1hr} (dB)	BS8233 Criteria, L _{Aeq,16hr} (dB)	Exceedance (dBA)
Plot P1 (nw elevation)	39	27*	35	-8
Plot P2 (se elevation)	43	31*	35	-4
Plot O1 (se elevation)	47	35*	35	0
Plot O2 (nw elevation)	22	10*	35	-25
Plot N ((nw elevation)	25	13*	35	-22
Plot N (se elevation)	46	34*	35	-1
Plot K (nw elevation)	23	11*	35	-24
Plot K (se elevation)	49	37*	35	2
Plot I (nw elevation)	25	13*	35	-22
Plot I (se elevation)	50	38*	35	3
Plot G (nw elevation)	29	17*	35	-18
Plot G (se elevation)	51	39*	35	4

* Assumes 12dB open window attenuation

8.6 Assessment of Night-time Rating Levels against BS8233:2014

Modelled rating noise levels for the night-time for all activities currently operating (with the inclusion of BSL & Subsea 7 ship loading/unloading) are assessed at each plot of the development site against BS8233:2014 internal night-time

criteria in Table 8.6.1. Note as in Section 8.5, resultant levels for both the most exposed south-east (se) façades and least exposed north-west (nw) façades of each plot are presented.

Table 8.6.1 – Night-time NIA of Current Activities Against BS8233 Criteria				
NSR	External Rating Level, L _{Ar,15mins} (dB)	Internal Rating Level, L _{Ar,15mins} (dB)	BS8233 Criteria, L _{Aeq,8hr} (dB)	Exceedance (dBA)
Plot P1 (nw elevation)	27	15*	30	-15
Plot P2 (se elevation)	41	29*	30	-1
Plot O1 (se elevation)	43	31*	30	1
Plot O2 (nw elevation)	20	8*	30	-22
Plot N ((nw elevation)	23	11*	30	-19
Plot N (se elevation)	43	31*	30	1
Plot K (nw elevation)	20	8*	30	-22
Plot K (se elevation)	42	30*	30	0
Plot I (nw elevation)	20	8*	30	-22
Plot I (se elevation)	40	28*	30	-2
Plot G (nw elevation)	27	15*	30	-15
Plot G (se elevation)	37	25*	30	-5

* Assumes 12dB open window attenuation

Modelled rating noise levels for the night-time for BSL & Subsea 7 activities are assessed at each plot of the development site against BS8233:2014 internal night-time criteria in Tables 8.6.2 and 8.6.3 respectively.

Table 8.6.2 – Night-time NIA of BSL Activities Against BS8233 Criteria				
NSR	External Rating Level, L _{Ar,15mins} (dB)	Internal Rating Level, L _{Ar,15mins} (dB)	BS8233 Criteria, L _{Aeq,8hr} (dB)	Exceedance (dBA)
Plot P1 (nw elevation)	31	19*	30	-11
Plot P2 (se elevation)	32	20	30	-10
Plot O1 (se elevation)	39	27	30	-4
Plot O2 (nw elevation)	15	3	30	-27
Plot N ((nw elevation)	17	5	30	-25
Plot N (se elevation)	40	28	30	-3
Plot K (nw elevation)	16	4	30	-26
Plot K (se elevation)	40	28	30	-2
Plot I (nw elevation)	16	4	30	-26
Plot I (se elevation)	41	29	30	-1
Plot G (nw elevation)	19	7	30	-23
Plot G (se elevation)	42	30	30	-1

* Assumes 12dB open window attenuation

NSR	External Rating Level, L _{Ar,15mins} (dB)	Internal Rating Level, L _{Ar,15mins} (dB)	BS8233 Criteria, L _{Aeq,8hr} (dB)	Exceedance (dBA)
Plot P1 (nw elevation)	39	27	30	-3
Plot P2 (se elevation)	43	31	30	1
Plot O1 (se elevation)	47	35	30	5
Plot O2 (nw elevation)	22	10	30	-20
Plot N ((nw elevation)	25	13	30	-17
Plot N (se elevation)	46	34	30	4
Plot K (nw elevation)	23	11	30	-19
Plot K (se elevation)	49	37	30	7
Plot I (nw elevation)	25	13	30	-17
Plot I (se elevation)	50	38	30	8
Plot G (nw elevation)	29	17	30	-13
Plot G (se elevation)	51	39	30	9

* Assumes 12dB open window attenuation

9 DISCUSSION OF RESULTS & PROPOSED MITIGATION

Analysis of the road traffic NIA results presented in Section 8.1 indicate that resultant internal levels are compliant with BS8233:2014 daytime and night-time criteria throughout the development assuming a closed window assessment and installation of Pilkington 6mm/12mm/6mm standard double glazing (or of equal and approved) to all windows across the development.

The results displayed in Section 8.2 highlight that noise levels from fixed plant (namely from sources associated with ADM Milling and Asda) will not exceed NR25 throughout the development, when assessed with windows open for ventilation.

The results of the BS4142 NIAs displayed in sections 8.3 & 8.4 indicate that with the exception of noise from Subsea7 all rating levels are within +5dBA of the associated background noise levels.

BS4142:2014 states that with a rated noise level of +5dB over background, the specific noise is ***“likely to be an indication of adverse impact, depending on context”***. At this level, the impact is not classified by BS4142 as being ***“significant”***. It also states that ***“When making assessment and arriving at decisions... it is essential to place the sound in context.”***

For BS4142:2014 assessments, local authorities regularly request a difference of less than +5dB between the rating noise level and the background noise level. Given the context of the noise environment in question - a built up mixed industrial/residential area, dominated by traffic noise - a difference of less than +5dB is considered a reasonable

indication that the specific sound source does not have a significant impact in this instance.

The Subsea7 BS4142 NIAs indicate that noise levels associated with the movement of pipes can exceed the background noise level at the development site by up to +10dBA with the Subsea7 alarms exceeding the development site background noise level by up to +8dBA. Subsea7 have not conducted these activities within the Port of Leith for several years. It was therefore not possible to measure noise associated with these activities for this NIA and consequently levels outlined in the original 2004 report were used for this assessment. As explained in Section 6 of this report, if the Subsea7 noise sources had been measured over the appropriate time periods outlined in BS4142:2014, the associated noise levels would be lower than those outlined in the 2004 report, and resultant levels at the development site would also be lower. Consequently, when all of these factors are taken into account, it is considered unlikely that noise levels from Subsea7 operations will result in significant adverse impact at the development site. Furthermore, the Technical Advice Note to PAN 1/2011 says, *"the Scottish Government consider that impacts commonly do not become sufficiently significant to warrant mitigation until the difference between the Rating level and the background noise levels is more than +10dBA."*

In Sections 8.5 and 8.6, external BS4142 rating noise levels for all non-traffic related noise sources are assessed against BS8233:2014 internal noise limits for the daytime and the night-time, assuming 12dBA attenuation for open windows. Whilst the results indicate that the majority of the development is compliant with these criteria, there are a number of elevations across the development that do not comply via an open window assessment. It is therefore recommended that all dwellings with windows on façades that do not comply via an open window assessment be provided with an alternative means of ventilation (MVHR or acoustic trickle ventilation) and be assessed on a closed window basis.

Appendix 7 indicates areas of the proposed development that can comply with BS8233:2014 internal criteria via open windows and those that require a closed window assessment with alternative ventilation.

Please note, within the marked-up site plan in Appendix 7, areas that have been identified as requiring a closed window assessment and alternative ventilation, have been specified on a precautionary worst-case basis, where the cumulative noise level from all non-traffic related noise sources (including all currently operational sources as well as BSL and Subsea7 sources which are currently non-operational) exceeds the relevant BS8233:2014 limit with open windows. Tables displaying modelled cumulative rating noise levels for all non-traffic related sources, assessed at each plot of the development site against BS8233:2014 internal criteria, are displayed in Appendix 8. All areas of the development requiring closed windows will comply with relevant BS8233:2014 internal criteria assuming installation of Pilkington 6mm/12mm/6mm standard double glazing (or of equal and approved). Glazing calculations demonstrating this for the most exposed elevations are presented in Appendix 9. These calculations also demonstrate that should acoustic trickle vents be selected as the alternative means of ventilation, vents of

acoustic rating $D_{n,e,w} = 37\text{dBA}$ or greater should be installed so as not to increase resultant internal noise levels.

10 CONCLUSION

Assuming the mitigation measures outlined in Section 9 are implemented, each of the assessments in this report, relating to road traffic noise and noise from industrial/commercial sources, will result in compliance with the relevant noise criteria outlined in Section 4.

APPENDIX 1 – PROPOSED DEVELOPMENT SITE PLAN & INDIVIDUAL BUILDING FOOTPRINT

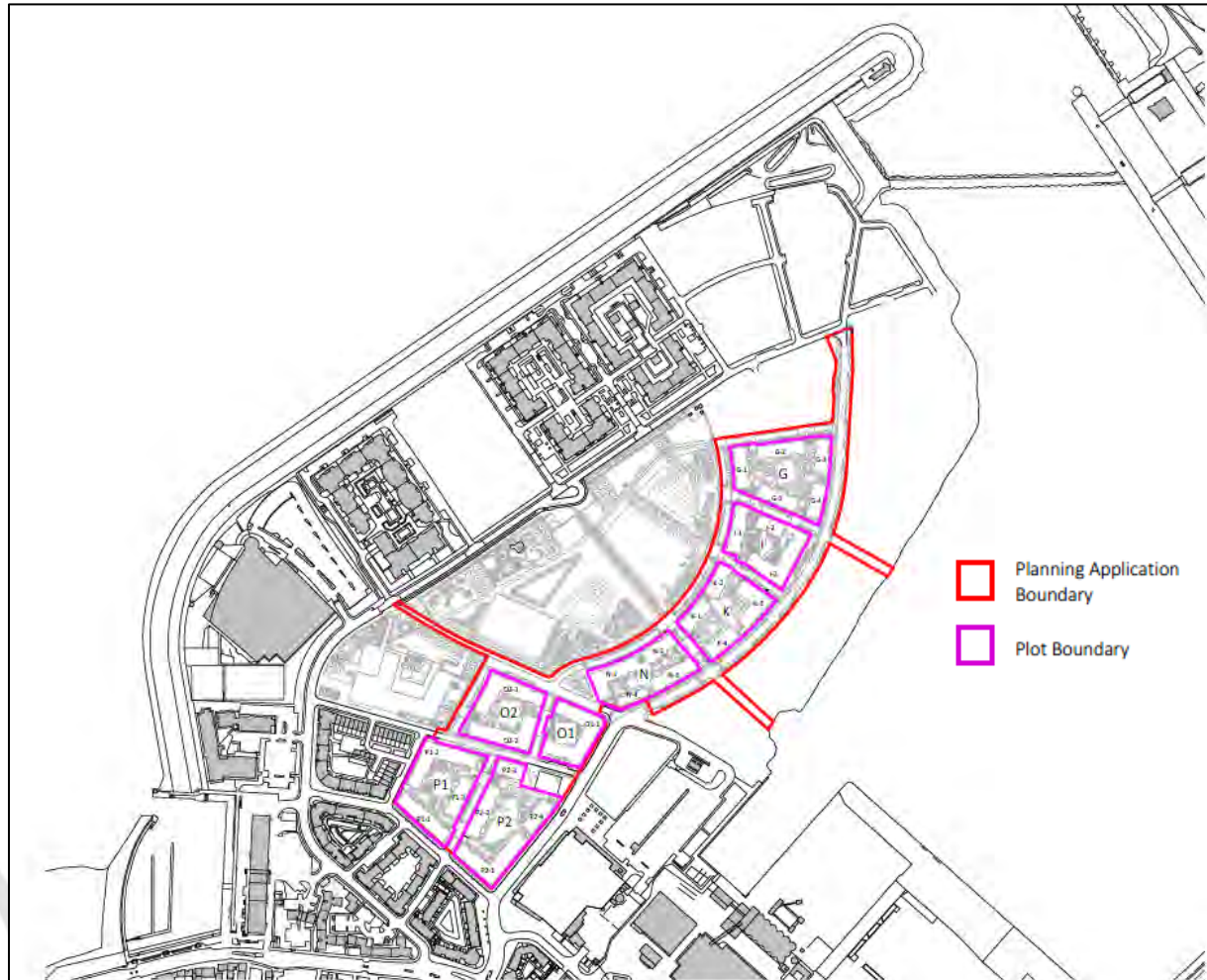


Figure A1.1 – Proposed development site plan

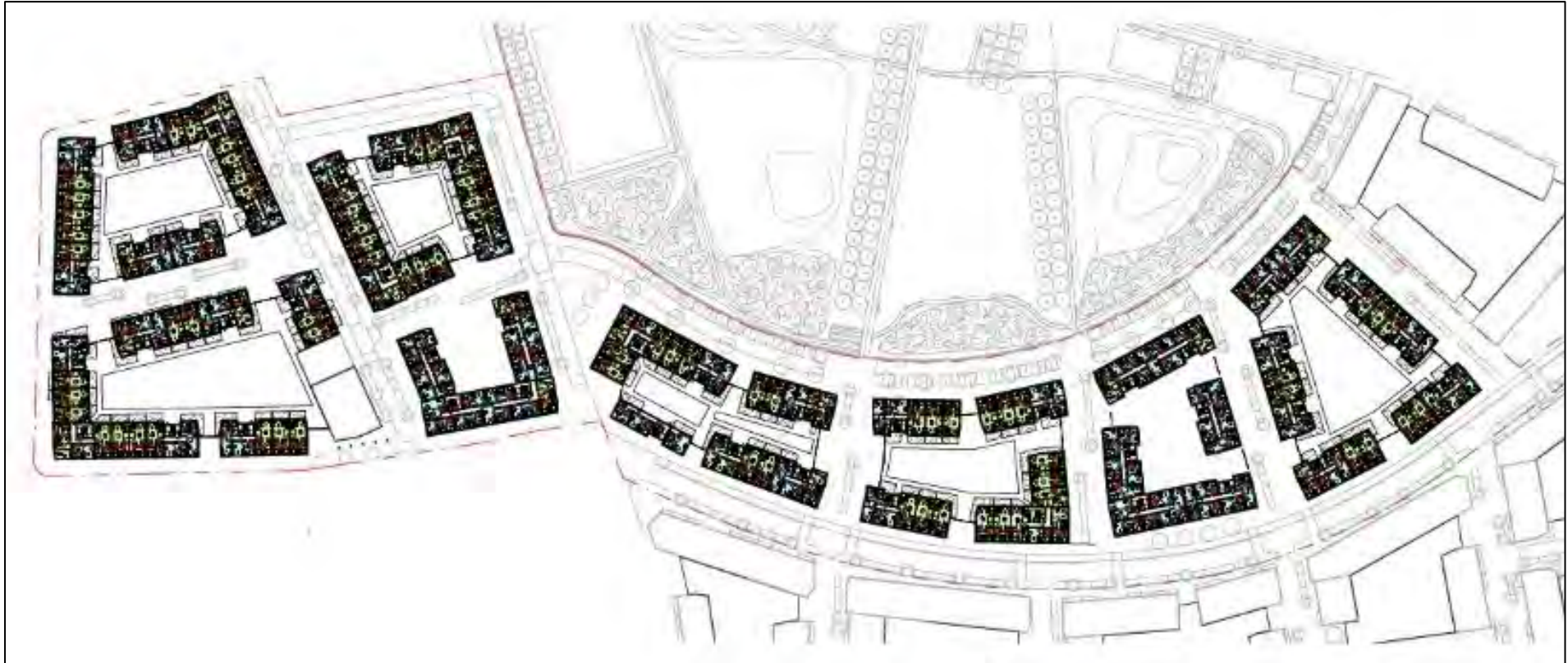


Figure A1.2 – Individual building footprint within each plot of the development site

APPENDIX 2 – LOCATIONS OF NOISE SOURCES RELATIVE TO DEVELOPMENT SITE



Figure A2.1 – Approximate locations of noise sources considered within this assessment

Note: Noise sources considered within this assessment which are; (1) currently operational are outlined in yellow (2) not currently operational are outlined in red. In addition to the sources outlined above noise from traffic on the existing roads surrounding the development site is also assessed.

APPENDIX 3 – LOCATIONS OF ROAD TRAFFIC & BASELINE NOISE MEASUREMENTS



Figure A3.1 – Road traffic and baseline measurement positions within the development site

APPENDIX 4 – LOGGED MEASUREMENT DATA

Table A4.1 – Logged Daytime Road Traffic, Residual & Background Noise Measurement Data							
Measurement Position	Date	Start Time	Elapsed Time	LAeq,T	LAF90	LAF10	LAFmax
1	10/01/2019	11:22 AM	00:05:00	67	53	69	85
1	10/01/2019	11:27 AM	00:05:00	63	54	67	78
1	10/01/2019	11:32 AM	00:05:00	64	55	69	74
1	10/01/2019	11:37 AM	00:05:00	64	51	69	75
1	10/01/2019	11:42 AM	00:05:00	64	53	69	75
1	10/01/2019	11:47 AM	00:05:00	64	54	68	73
1	10/01/2019	11:52 AM	00:05:00	63	54	68	73
1	10/01/2019	11:57 AM	00:05:00	63	51	67	76
1	10/01/2019	12:02 PM	00:05:00	65	54	70	74
1	10/01/2019	12:07 PM	00:05:00	65	52	70	79
1	10/01/2019	12:12 PM	00:05:00	65	55	69	74
1	10/01/2019	12:17 PM	00:05:00	66	54	70	74
Calculated 1hr Averages/Max:				64	53	69	85
1	10/01/2019	3:07 PM	00:05:00	63	53	67	76
1	10/01/2019	3:12 PM	00:05:00	64	54	68	74
1	10/01/2019	3:17 PM	00:05:00	64	53	68	74
1	10/01/2019	3:22 PM	00:05:00	63	53	68	72
1	10/01/2019	3:27 PM	00:05:00	66	53	69	81
1	10/01/2019	3:32 PM	00:05:00	64	54	68	74
1	10/01/2019	3:43 PM	00:05:00	66	53	69	83
1	10/01/2019	3:48 PM	00:05:00	63	53	68	74
1	10/01/2019	3:53 PM	00:05:00	65	53	69	78
1	10/01/2019	3:58 PM	00:05:00	62	49	66	75
1	10/01/2019	4:03 PM	00:05:00	64	53	68	76
1	10/01/2019	4:08 PM	00:05:00	64	49	69	74
Calculated 1hr Averages/Max:				64	53	68	83
1	28/01/2019	2:41 PM	00:05:00	65	47	70	74
1	28/01/2019	2:46 PM	00:05:00	67	58	72	76
1	28/01/2019	2:51 PM	00:05:00	64	50	68	75
1	28/01/2019	2:56 PM	00:05:00	63	47	67	74
1	28/01/2019	3:01 PM	00:05:00	62	49	67	75
1	28/01/2019	3:06 PM	00:05:00	64	49	69	75
1	28/01/2019	3:11 PM	00:05:00	64	49	69	75
1	28/01/2019	3:16 PM	00:05:00	64	50	68	74
1	28/01/2019	3:21 PM	00:05:00	63	46	69	74
1	28/01/2019	3:26 PM	00:05:00	64	50	69	75
1	28/01/2019	3:31 PM	00:05:00	63	48	68	73

1	28/01/2019	3:36 PM	00:05:00	65	53	69	76
Calculated 1hr Averages/Max:				64	51	69	76
Calculated 3hr Averages/Max:				64	52	69	85
2	10/01/2019	12:35 PM	00:05:00	49	44	49	73
2	10/01/2019	12:40 PM	00:05:00	48	44	50	63
2	10/01/2019	12:45 PM	00:05:00	51	45	54	71
2	10/01/2019	12:50 PM	00:05:00	49	44	50	67
2	10/01/2019	12:55 PM	00:05:00	58	46	58	83
2	10/01/2019	1:00 PM	00:05:00	48	44	50	60
2	10/01/2019	1:05 PM	00:05:00	49	43	51	68
2	10/01/2019	1:10 PM	00:05:00	50	44	53	67
2	10/01/2019	1:15 PM	00:05:00	52	44	51	74
2	10/01/2019	1:20 PM	00:05:00	50	45	53	60
2	10/01/2019	1:25 PM	00:05:00	47	43	49	58
2	10/01/2019	1:30 PM	00:05:00	48	44	51	62
Calculated 1hr Averages/Max:				51	44	52	83
3	10/01/2019	2:03 PM	00:05:00	61	49	65	75
3	10/01/2019	2:08 PM	00:05:00	62	47	67	75
3	10/01/2019	2:13 PM	00:05:00	62	48	65	84
3	10/01/2019	2:18 PM	00:05:00	60	50	63	73
3	10/01/2019	2:23 PM	00:05:00	63	50	67	81
3	10/01/2019	2:28 PM	00:05:00	60	50	64	75
3	10/01/2019	2:33 PM	00:05:00	62	51	66	75
3	10/01/2019	2:38 PM	00:05:00	67*	52*	66*	90*
3	10/01/2019	2:43 PM	00:05:00	60	47	64	72
3	10/01/2019	2:48 PM	00:05:00	62	49	66	76
3	10/01/2019	2:53 PM	00:05:00	62	51	66	81
3	10/01/2019	2:58 PM	00:05:00	62	50	66	74
Calculated 1hr Averages/Max:				61	50	65	90

* Denotes period removed from averages due to extraneous noise event

Measurement Position	Date	Start Time	Elapsed Time	LAeq,T	LAF90	LAF10	LAFmax
1	01/02/2019	1:43 AM	00:00:30	43	40	44	58
1	01/02/2019	1:44 AM	00:00:30	42	40	42	53
1	01/02/2019	1:44 AM	00:00:30	41	40	42	47
1	01/02/2019	1:45 AM	00:00:30	42	41	43	46
1	01/02/2019	1:45 AM	00:00:30	42	41	43	46
1	01/02/2019	1:46 AM	00:00:30	42	41	43	48
1	01/02/2019	1:46 AM	00:00:30	43	41	44	50
1	01/02/2019	1:47 AM	00:00:30	48	44	50	55

1	01/02/2019	1:47 AM	00:00:30	47	42	51	56
1	01/02/2019	1:48 AM	00:00:30	42	40	44	44
1	01/02/2019	1:48 AM	00:00:30	58	42	64	69
1	01/02/2019	1:49 AM	00:00:30	43	39	47	49
1	01/02/2019	1:49 AM	00:00:30	40	39	41	45
1	01/02/2019	1:50 AM	00:00:30	40	39	41	44
1	01/02/2019	1:50 AM	00:00:30	41	40	42	43
1	01/02/2019	1:51 AM	00:00:30	40	39	41	43
1	01/02/2019	1:51 AM	00:00:30	43	39	47	50
1	01/02/2019	1:52 AM	00:00:30	56	42	60	67
1	01/02/2019	1:52 AM	00:00:30	44	40	47	49
1	01/02/2019	1:53 AM	00:00:30	43	39	48	50
1	01/02/2019	1:53 AM	00:00:30	39	39	40	47
1	01/02/2019	1:54 AM	00:00:30	40	39	41	48
1	01/02/2019	1:54 AM	00:00:30	39	39	40	45
1	01/02/2019	1:55 AM	00:00:30	40	38	41	45
1	01/02/2019	1:55 AM	00:00:30	40	39	41	43
1	01/02/2019	1:56 AM	00:00:30	40	39	41	51
1	01/02/2019	1:56 AM	00:00:30	45	40	48	50
1	01/02/2019	1:57 AM	00:00:30	55	45	50	73
1	01/02/2019	1:57 AM	00:00:30	44	42	44	55
1	01/02/2019	1:58 AM	00:00:30	44	42	46	58
Calculated Averages/Max:				48	41	52	73
1	01/02/2019	1:59 AM	00:05:00	51	39	52	71
1	01/02/2019	2:04 AM	00:05:00	51	40	54	66
1	01/02/2019	2:09 AM	00:05:00	40	39	41	47
Calculated Averages/Max:				49	39	52	71
4	01/02/2019	1:10 AM	00:05:00	42	38	46	54
4	01/02/2019	1:15 AM	00:05:00	41	38	42	68
4	01/02/2019	1:20 AM	00:05:00	40	38	42	50
Calculated Averages/Max:				41	38	44	68
4	01/02/2019	2:04 AM	00:05:00	39	37	40	45
4	01/02/2019	2:09 AM	00:05:00	37	36	38	42
4	01/02/2019	2:14 AM	00:05:00	38	37	39	42
Calculated Averages/Max:				38	36	39	45



APPENDIX 5 – SOURCE NOISE MEASUREMENTS & MODEL INPUT DATA

The sections below give details of sources measurements (measurement distances and durations) as well as a description of noise generating plant and activities. All measurements were taken for durations considered representative of the source under test. Weather conditions were conducive to environmental noise measurements throughout measurement periods. The uncertainty in the source noise measurements is considered to be low, given that the measurement equipment used was Class 1, measurements were attended throughout, and the weather conditions were suitable for environmental noise measurement.

The below sections also provide the calculated Sound Power Levels (SWLs) for each plant item/activity along with associated noise model input parameters, including the 'rating' SWL and percentage on-time.

BS4142 requires the noise source to be rated at the receiver position (i.e. at the development), and this has been assigned based on the magnitude of the SWL level, **it's character and its distance from the proposed development**. As required by BS4142, all daytime percentage on-times are based over a 1-hour period with night-time percentage on-times being based over a 15-minute period.

Activity descriptions and estimated percentage on times have been provided by either (1) Forth Ports or (2) the business which the noise source relates to or are based on observations made whilst on site. Where it was not possible to obtain percentage on-time information it has been assigned on a precautionary basis.

All noise sources have been "calibrated" within the noise models to ensure they provide appropriate sound pressure level outputs when compared to actual measured levels at particular distances.

Aggregate Industries

Measurements were conducted on 08/01/19. Noise generating activities include;

- AI1. Batching Plant generating and discharging concrete to mixer wagons for despatch (continuous noise from batching plant discharging).
- AI2. Offloading bulk aggregate from ships on quayside using crane.
- AI3. Vehicle moves bulk to storage area to quayside (not measured or modelled as does not generate appreciable levels which differ from road traffic at development site).

Measurements were conducted for AI1 and AI2 with results, measurement distances and durations as well as noise model inputs (rated SWLs and % on-times) displayed in the tables below. Model source heights for both AI1 and AI2 are taken to be 3m relative to ground level.

Batching Plant discharging into concrete mixer @ 30m (Continuous noise from batching plant discharging)

Octave Band (Hz)	63	125	250	500	1000	2000	4000	8000	dBA	Day %	Night %
Batching Plant discharging into concrete mixer @ 30m, L _{zeq,2mins} (dB)	63	63	58	57	55	52	48	40	60		
Calculated SWL (dB)	100	100	96	94	93	90	85	78	98	60	0
Rating SWL (+3dB for intermittency & +2dB for tonality) (dB)	105	105	101	99	98	95	90	83	103		

Crane offloading bulk aggregate from boat on quayside @ 10m (Dominant noise from engine revving)

Octave Band (Hz)	63	125	250	500	1000	2000	4000	8000	dBA	Day %	Night %
Crane offloading aggregate from boat on quayside @ 10m, L _{zeq,1.5mins} (dB)	84	81	69	70	67	65	59	50	73		
Calculated SWL (dB)	112	109	97	98	95	93	87	78	101	50	0
Rating SWL (+3dB for intermittency) (dB)	115	112	100	101	98	96	90	81	104		

Asda Fixed Plant

Measurements were conducted on 28/01/19. Measurements were only permitted to be conducted in service yard (not on raised plant deck) due to health and safety access requirements.

Noise generating plant includes;

AP1. 2no chiller units each with 4no fans in yard

AP2. 4no chiller units each with 4no fans on raised plant deck

AP3. 2no air handling units each with 4no fans on raised plant deck

AP4. 8no fuel pumps

Measurements were conducted for AP1 with results, measurement distance and duration as well as noise model inputs (rated SWLs and % on-times) displayed in the table below. Noise from AP2 and AP3 was inaudible during measurements. A total of 8no chiller units (i.e. 32no fans) have been included in the model to compensate for not being able to measure AP2 and AP3. All service yard and roof deck plant is assumed to operate 100% on-time on a precautionary basis. Fuel pump percentage on-times are estimated based on observations made on site. Model source heights for both AP1, AP2, AP3 and AP4 are taken to be 2m relative to ground & plant deck level. Model source heights for both

ASDA chiller unit (Continuous broadband fan noise dominant)

Octave Band (Hz)	63	125	250	500	1000	2000	4000	8000	dB(A)		
ASDA chiller unit fan @ 1m, L _{Zeq,30secs} (dB)	73	71	71	67	67	64	58	47	71		
Calculated SWL for 1no fan (dB)	81	79	79	75	75	72	66	55	79	Day %	Night %
Calculated SWL for whole unit (4no fans) (dB)	87	85	85	81	81	78	72	62	85	100	100

ASDA fuel pump (Continuous noise from fuel pump dominant)

Octave Band (Hz)	63	125	250	500	1000	2000	4000	8000	dB(A)		
ASDA fuel pump @ 2m, L _{Zeq,1min} (dB)	73	59	60	59	60	59	56	46	65	Day %	Night %
Calculated SWL (dB)	87	73	74	73	74	73	70	60	79	20	10
Rating SWL (+3dB for intermittency) (dB)	90	76	77	76	77	76	73	63	82		

Asda Deliveries

Measurements were conducted on 28/01/19. Measurements were conducted an equal distance (approx. 10m) from the HGV being unloaded and the Asda loading dock. The noise environment consisted of intermittent noise from removing trolleys from HGV, with intermittent bangs and clatters and noise from operatives talking, interspersed with quieter periods. During quieter periods noise from road traffic was also audible. Occasional noise from ADM Milling also audible.

Noise generating plant/activities include;

AD1. ASDA HGV delivery unloading

AD2. ASDA HGV idling at yard gate & then driving off

Measurements were conducted for AD1 and AD2 with results, measurement distance and duration as well as noise model inputs (rated SWLs and % on-times) displayed in the table below. Model source heights for both AD1, AD2 are taken to be 3m from relative ground level.

ASDA HGV delivery unloading

Octave Band (Hz)	63	125	250	500	1000	2000	4000	8000	dBA		
ASDA HGV delivery Unloading @ 10m, L _{Zeq,15min} (dB)	68	66	64	61	58	53	47	40	63	Day %	Night %
Calculated SWL (dB)	96	94	92	89	86	81	75	68	91	50	100
Rating SWL (+3dB for intermittency & +6dB for impulsivity) (dB)	99	97	95	92	89	84	78	71	94		

ASDA HGV idling at yard gate & then driving off

Octave Band (Hz)	63	125	250	500	1000	2000	4000	8000	dBA		
ASDA HGV idling then driving off @ 10m, L _{Zeq,1min} (dB)	68.1	67.8	62.9	62.5	63.1	58.8	53.3	46.3	67	Day %	Night %
Calculated SWL (dB)	96.1	95.8	90.9	90.5	91.1	86.8	81.3	74.3	95	5	10

ADM Milling

Measurements were conducted on 01/02/19. A series of measurements were conducted at various distances from the ADM Milling facility, so as to obtain an accurate noise level for the plant. Measurements were conducted at the ADM Milling site boundary, then approximately 50m, 110m further back within the Asda carpark, and finally at the development site boundary approximately 180m from the ADM facility boundary. During the measurements, the noise environment (when not being interrupted by cars visiting Asda) consisted of continuous and constant 'wurring' sound with a just perceptible tone from the ADM Milling Facility. This continuous and constant nature of the ADM Milling plant noise has been observed throughout all site visits.

Measurement results were input into the noise model so as to derive sound power levels for each of the 3 buildings within the ADM Milling facility, such that the sound pressure level output of the model matched measurements made on site discussed above.

Measurement distance and duration as well as noise model inputs (rated SWLs and % on-times) displayed in the table below. Source heights for ADM Milling Plant are taken to be 20m to relative ground level.

ADM Milling @ 140m average from buildings (Continuous wurring noise)

Octave Band (Hz)	63	125	250	500	1000	2000	4000	8000	dBA		
ADM Milling @ 140m average from plant, L _{Zeq,2mins} (dB)	56	55	49	42	40	38	35	16	47		
Calculated SWL for 3no. Buildings (dB)	106	106	100	93	91	89	86	67	98	Day %	Night %
Calculated SWL for each Building (dB)	102	101	96	88	86	84	81	62	93	100	100
Rating SWL (+2dB for tonality) (dB)	104	103	98	90	88	86	83	64	95		

Dales Marine

Measurements were conducted on 24/01/19. Three 15min measurements were made when both ship decommissioning and ship servicing works were actively ongoing with the dry dock. Each of the 15min measurements resulted in average noise levels of L_{Aeq,15min} 75dB. The dominant noises during these measurements resulted from a large crane moving large pieces of metal from a decommissioned ship into an HGV (@ 30m from the noise meter), and from continuous bursts of noise from a pressure washer cleaning a ship within the dry dock (also @ 30m from the sound level meter). Other noises originated from intermittent use of an angle grinder within the dry dock and low-level noise from multiple operatives burning metal with blow torches.

Individual measurements at short distances from the noise source under test were obtained where health and safety requirements allowed (measurement of blow torch and pressure washer). These were used in conjunction with measurements of

multiple sources to derive individual source levels for all noise sources included within these activities to input into the noise model. Measurement results were input into the noise model so as to derive sound power levels for each source, such that the sound pressure level output of the model matched measurements made on site.

Noise generating plant/activities include;

DM1. Ship Decommissioning Works (Daytime Activity only)

- Several blow torches burning metal (8no. included in model)
- A large crane moving and bashing metal
- An angle grinder being operated within the dry dock

DM2. Ship Servicing Works (Daytime & Night-time Activity)

- Dominated by noise from pressure washer being utilised to clean ship within dry dock.
- 8 blow torches burning metal (3no. included in model at night, 8no. included during the day shared with Ship Decommissioning Works)
- An angle grinder being operated within the dry dock (shared with Ship Decommissioning Works during day)
- Non-noise activities such as painting ship and testing of internal components.

Measurements were conducted for DM1 and DM2 activities with results, measurement distance and duration as well as noise model inputs (rated SWLs and % on-times) displayed in the table below. The bottom of the dry dock is taken to be -10m below relative ground level. Blow torches and angle grinder heights are taken to be 1.5m above dry dock level (i.e. -8.5m relative to ground level). Pressure washer height is taken to be 8m above dry dock (i.e. -2m relative to ground level). The crane is taken to be 2m above relative ground level.

Blow Torch burning metal (Continuous broadband noise)

Octave Band (Hz)	63	125	250	500	1000	2000	4000	8000	dBA		
Blow Torch burning metal @ 1m, L _{Zeq,30secs} (dB)	82	74	70	70	73	77	79	81	85	Day %	Night %
Calculated SWL (dB)	90	82	78	78	81	85	87	89	93	60	60
Rating SWL (+3dB for intermittency) (dB)	93	85	81	81	84	88	90	92	96		

Pressure Washer washing down vessel @ 7m (Continuous broadband noise from pressure washer)

Octave Band (Hz)	63	125	250	500	1000	2000	4000	8000	dBA		
Pressure Washer washing down vessel @ 7m, L _{Zeq,30secs} (dB)	87	79	73	75	75	77	78	74	83	Day %	Night %
Calculated SWL (dB)	113	105	99	101	101	103	104	100	109	80	80
Rating SWL (+3dB for intermittency) (dB)	116	108	102	104	104	106	107	103	112		

Large Crane moving large pieces of broken ship @ 10m (Intermittent impulsive bangs and crashes)

Octave Band (Hz)	63	125	250	500	1000	2000	4000	8000	dBA		
Ship Servicing & Ship Breaking Works, L _{Zeq,15mins} (dB)	78	75	74	71	69	67	66	63	75		
Pressure Washer washing down vessel @ 7m, L _{Zeq,30secs} (dB)	87	79	73	75	75	77	78	74	83		
Pressure Washer washing down vessel @ 30m, L _{Zeq,30secs} (dB)	74	67	61	63	63	64	65	61	71		
Large Crane moving large pieces of broken ship @ 30m (dB)	76	74	73	70	67	64	59	58	73	Day %	Night %
Calculated SWL (dB)	114	112	111	108	105	102	97	96	110	80	0
Rating SWL (+6dB for impulsivity) (dB)	120	118	117	114	111	108	103	102	116		

Angle Grinder @ 10m

Octave Band (Hz)	63	125	250	500	1000	2000	4000	8000	dBA		
Angle Grinder @ 10m, L _{Zeq,30secs} (dB)	82	73	70	69	72	76	78	81	84	Day %	Night %
Calculated SWL (dB)	110	101	98	97	100	104	106	109	112	5	5
Rating SWL (+3dB for intermittency) (dB)	113	104	101	100	103	107	109	112	115		

BSL

Detailed activity descriptions for the below activities/plant are provided in the original 2004 NIA report which is given in Appendix 10. The below noise levels are taken from recommended mitigated limits outlined in the initial report which have been written into the BSL lease agreement (a signed copy of which is provided in Appendix 11 of this report). Noise model inputs (rated SWLs and % on-times) are displayed in the tables below. All source heights are taken to be 2m above relative ground level. It should be noted that the below rating noise levels have been established from the initial report which uses the BS4142:1997 rating level of +5dB correction if the particular plant/activity includes any discernible tonal or impulsive characteristics.

BSL pipe coating - Main Plant

Octave Band (Hz)	63	125	250	500	1000	2000	4000	8000	dBA	Day %	Night %
Calculated SWL (dB)	116	114	112	108	108	102	98	90	111.8	100	100
Rating SWL (dB)	116	114	112	108	108	102	98	90	111.8		

BSL pipe coating - Vehicles moving pipes

Octave Band (Hz)	63	125	250	500	1000	2000	4000	8000	dBA	Day %	Night %
Calculated SWL (dB)	118	115	110	105	101	99	96	89	108.3	100	100
Rating SWL (dB)	118	115	110	105	101	99	96	89	108.3		

BSL & Subsea7 unloading of ships at Crane 41 & Crane 42

Octave Band (Hz)	63	125	250	500	1000	2000	4000	8000	dBA	Day %	Night %
Calculated SWL (dB)	117	110	108	110	109	106	96	91	113.0	25	25
Rating SWL (dB)	123	116	114	116	115	112	102	97	119.0		

BSL loading of ships at Crane 41 & Crane 42

Octave Band (Hz)	63	125	250	500	1000	2000	4000	8000	dBA	Day %	Night %
Calculated SWL (dB)	117	110	108	110	109	106	96	91	113.0	25	0
Rating SWL (dB)	117	110	108	110	109	106	96	91	113.0		

BSL loading of H121 & lorry movement

Octave Band (Hz)	63	125	250	500	1000	2000	4000	8000	dBA	Day %	Night %
Calculated SWL (dB)	120	117	112	107	103	101	98	91	110.3	25	0
Rating SWL (dB)	120	117	112	107	103	101	98	91	110.3		

Subsea7

Detailed activity descriptions for the below activities/plant are provided in the original 2004 NIA report which is given in Appendix 10. Noise model inputs (rated SWLs and % on-times) are displayed in the tables below. All source heights are taken to be 2m above relative ground level. It should be noted that the below rating noise levels have been established from the initial report which uses the BS4142:1997 rating level of +5dB correction if the particular plant/activity includes any discernible tonal or impulsive characteristics.

Subsea7 welding & associated plant

Octave Band (Hz)	63	125	250	500	1000	2000	4000	8000	dBA	Day %	Night %
SWL (dB)	93.0	87.0	87.0	90.0	86.0	86.0	77.0	64.0	91.9	100	100
Rating SWL (dB)	98.0	92.0	92.0	95.0	91.0	91.0	82.0	69.0	96.9		

Subsea7 alarms

Octave Band (Hz)	63	125	250	500	1000	2000	4000	8000	dBA	Day %	Night %
SWL (dB)	23.0	23.0	23.0	23.0	122.0	23.0	23.0	23.0	122.0	10	10
Rating SWL (dB)	28.0	28.0	28.0	28.0	127.0	28.0	28.0	28.0	127.0		

Subsea7 moving of pipes - 2no 360 machines lifting pipes

Octave Band (Hz)	63	125	250	500	1000	2000	4000	8000	dBA	Day %	Night %
SWL (dB)	125.0	122.0	117.0	112.0	108.0	106.0	116.0	96.0	119.1	25	25
Rating SWL (dB)	130.0	127.0	122.0	117.0	113.0	111.0	121.0	101.0	124.1		

APPENDIX 6 – ROAD TRAFFIC GLAZING CALCULATIONS

The below calculations display the resultant internal levels at the façades of the development most exposed to road traffic. Internal levels are derived from measured external levels assuming closed windows and installation of Pilkington 6mm/12mm/6mm standard double glazing (or of equal and approved) throughout the development.

Road Traffic Assessment: Sandpiper Drive (Closed Window)

Octave Band (Hz)	63	125	250	500	1000	2000	4000	8000	dBA
Measured Daytime Level at 6m from ASDA Road Edge, L _{Zeq,3hr} (dB)	66	62	58	58	61	57	50	48	64
6/12/6 Glazing Attenuation (dB)	16	20	19	29	38	36	45	46	
Resultant Daytime Internal Level, L _{Zeq,16hr} (dB)	50	42	39	29	23	21	5	2	34
Resultant Night-time Internal Level, L _{Zeq,8hr} (dB)	42	34	31	21	15	13	-3	-6	26

Road Traffic Assessment: Sandpiper Road (Closed Window)

Octave Band (Hz)	63	125	250	500	1000	2000	4000	8000	dBA
Measured Daytime Level at 5m from Sandpiper Road, L _{Zeq,1hr} (dB)	67	62	59	57	58	54	48	43	61
6/12/6 Glazing Attenuation (dB)	16	20	19	29	38	36	45	46	
Resultant Daytime Internal Level, L _{Zeq,16hr} (dB)	51	42	40	28	20	18	3	-3	34
Resultant Night-time Internal Level, L _{Zeq,8hr} (dB)	43	34	32	20	12	10	-5	-11	26

Road Traffic Assessment: Western Harbour Drive (Closed Window)

Octave Band (Hz)	63	125	250	500	1000	2000	4000	8000	dBA
Measured Daytime Level at 15m from Western Harbour Drive, L _{Zeq,1hr} (dB)	59	52	46	44	48	44	41	31	51
6/12/6 Glazing Attenuation (dB)	16	20	19	29	38	36	45	46	
Resultant Daytime Internal Level, L _{Zeq,16hr} (dB)	43	32	27	15	10	8	-4	-15	23
Resultant Night-time Internal Level, L _{Zeq,8hr} (dB)	35	24	19	7	2	0	-12	-23	15

APPENDIX 7 – LOCATIONS OF FACADES THAT REQUIRE CLOSED WINDOWS & ALTERNATIVE VENTILATION

The site plan below indicates the locations of façades that require a closed window assessment and alternative ventilation as well as those that achieve BS8233:2014 internal levels with windows open (for all non-traffic related noise sources)
 Façades requiring closed windows and alternative ventilation have been specified on a precautionary worst-case basis, where the cumulative noise level from all non-traffic related noise sources (including all currently operational sources as well as BSL and Subsea7 sources which are currently non-operational) exceeds the relevant BS8233:2014 limit with open windows.

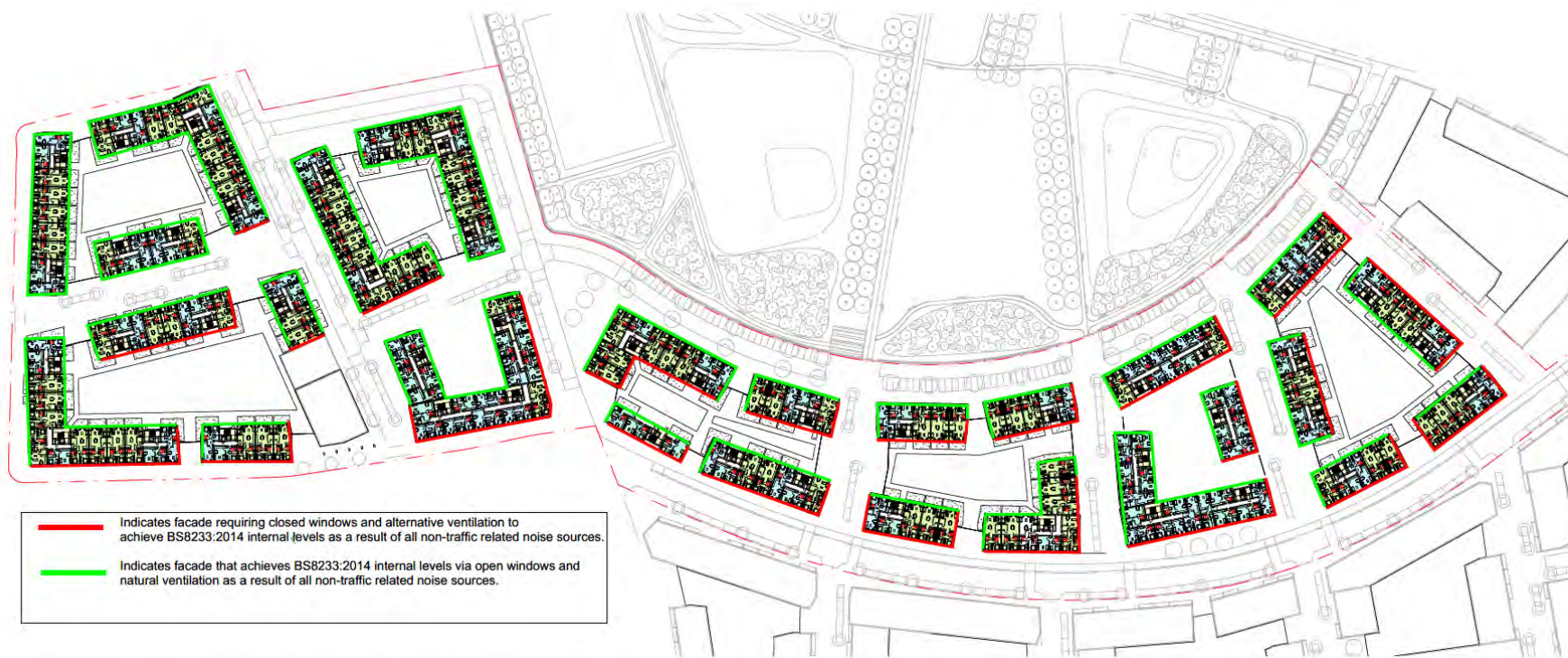


Figure A7.1 – Locations of Facades that require closed windows and alternative ventilation

APPENDIX 8 – ASSESSMENT OF ALL NON-TRAFFIC RELATED NOISE SOURCES
AGAINST BS8233 INTERNAL CRITERIA

Tables A8.1 and A8.2 below display the worst-case modelled cumulative rating noise levels for all non-traffic related sources, which are assessed at each plot of the development site against BS8233:2014 internal criteria for the daytime and night-time respectively.

NSR	External Rating Level, $L_{Ar,1hr}$ (dB)	Internal Rating Level, $L_{Ar,1hr}$ (dB)	BS8233 Criteria, $L_{Aeq,16hr}$ (dB)	Exceedance (dBA)
Plot P1 (nw elevation)	43	31	35	-4
Plot P2 (se elevation)	47	35	35	0
Plot O1 (se elevation)	51	39	35	4
Plot O2 (nw elevation)	27	15	35	-20
Plot N ((nw elevation)	31	19	35	-16
Plot N (se elevation)	51	39	35	4
Plot K (nw elevation)	28	16	35	-19
Plot K (se elevation)	52	40	35	5
Plot I (nw elevation)	28	16	35	-19
Plot I (se elevation)	52	40	35	5
Plot G (nw elevation)	32	20	35	-15
Plot G (se elevation)	53	41	35	6

NSR	External Rating Level, $L_{Ar,1hr}$ (dB)	Internal Rating Level, $L_{Ar,1hr}$ (dB)	BS8233 Criteria, $L_{Aeq,8hr}$ (dB)	Exceedance (dBA)
Plot P1 (nw elevation)	40	28	30	-3
Plot P2 (se elevation)	46	34	30	4
Plot O1 (se elevation)	49	37	30	7
Plot O2 (nw elevation)	25	13	30	-18
Plot N ((nw elevation)	28	16	30	-14
Plot N (se elevation)	48	36	30	6
Plot K (nw elevation)	26	14	30	-17
Plot K (se elevation)	50	38	30	8
Plot I (nw elevation)	26	14	30	-16
Plot I (se elevation)	51	39	30	9
Plot G (nw elevation)	31	19	30	-11
Plot G (se elevation)	51	39	30	9

APPENDIX 9 – GLAZING CALCULATIONS FOR NON-TRAFFIC RELATED NOISE SOURCES

The below glazing calculations demonstrate that all areas of the development requiring closed windows for non-traffic related noise sources will comply with relevant BS8233:2014 internal criteria assuming installation of Pilkington 6mm/12mm/6mm standard double glazing (or of equal and approved).

Glazing Calculation Assessment: Plot O1 Daytime

Octave Band (Hz)	63	125	250	500	1000	2000	4000	8000	dBA
Modelled External Rating Level, LZr,1hr (dB)	63	57	50	47	47	39	28	1	51
6/12/6 Glazing Attenuation (dB)	16	20	19	29	38	36	45	46	
Resultant Internal Rating Level, LZr,1hr (dB)	47	37	31	18	9	3	-17	-45	27

Glazing Calculation Assessment: Plot O1 Night-time

Octave Band (Hz)	63	125	250	500	1000	2000	4000	8000	dBA
Modelled External Rating Level, LZr,1hr (dB)	61	55	49	44	46	35	25	0	49
6/12/6 Glazing Attenuation (dB)	16	20	19	29	38	36	45	46	
Resultant Internal Rating Level, LZr,1hr (dB)	45	35	30	15	8	-2	-20	-46	25

Glazing Calculation Assessment: Plot G Daytime

Octave Band (Hz)	63	125	250	500	1000	2000	4000	8000	dBA
Modelled External Rating Level, LZr,1hr (dB)	65	58	52	49	49	40	32	-25	53
6/12/6 Glazing Attenuation (dB)	16	20	19	29	38	36	45	46	
Resultant Internal Rating Level, LZr,1hr (dB)	49	38	33	20	11	4	-13	-71	28

Glazing Calculation Assessment: Plot G Night-time

Octave Band (Hz)	63	125	250	500	1000	2000	4000	8000	dBA
Modelled External Rating Level, LZr,1hr (dB)	64	57	50	47	48	37	32	-39	51
6/12/6 Glazing Attenuation (dB)	16	20	19	29	38	36	45	46	
Resultant Internal Rating Level, LZr,1hr (dB)	48	37	31	18	10	1	-13	-85	27

The following calculation is based on use of a 1600DN trickle vent, which is supplied by Greenwood Airvac Attenuators and has a $D_{n,e,w} = 37$ dBA. This calculation demonstrates that using this specification of acoustic trickle vent (or of equal and approved), does not increase the resultant internal noise level.

Insulation		63	125	250	500	1k	2k	4k	8k	dBA
External Wall Construction Attenuation (dB)		29	35	41	47	53	59	65	71	
6mm/12mm/6mm Pilkington Glazing Attenuation (dB)		16	20	19	29	38	36	45	46	
DN vent (1600DN) Attenuation when open (dB)		31	48	46	36	36	38	39	40	
Reverberation Time (s), 0.5		0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.3	
Vol (m3)	14.4									
Maximum External Rating Level (Plot G Daytime), LZr,1hr (dB)		65	58	52	49	49	40	32	-25	52
Internal Noise contribution through element:										
External Wall Construction Attenuation (dB)		43	32	20	11	5	-10	-24	-89	20
6mm/12mm/6mm Pilkington Glazing Attenuation (dB)		46	37	32	19	10	3	-14	-74	27
DN vent (1600DN) Attenuation when open (dB)		17	-4	-9	-2	-1	-13	-22	-82	1
Total Internal Reverberant LZr,1hr SPL (dB)		48	38	32	20	12	4	-13	-73	28

The calculation utilises the worst-case non-traffic noise source external spectrum outlined above (Plot G Daytime), and the reverberation time and volume of a typical bedroom. It assumes an average bedroom size of 4*3*2.4m with 2 no. windows of 1.0*0.5m and 2 no. trickle vents of 0.4*0.05m.

APPENDIX 10 – ORIGINAL 2004 NOISE REPORT

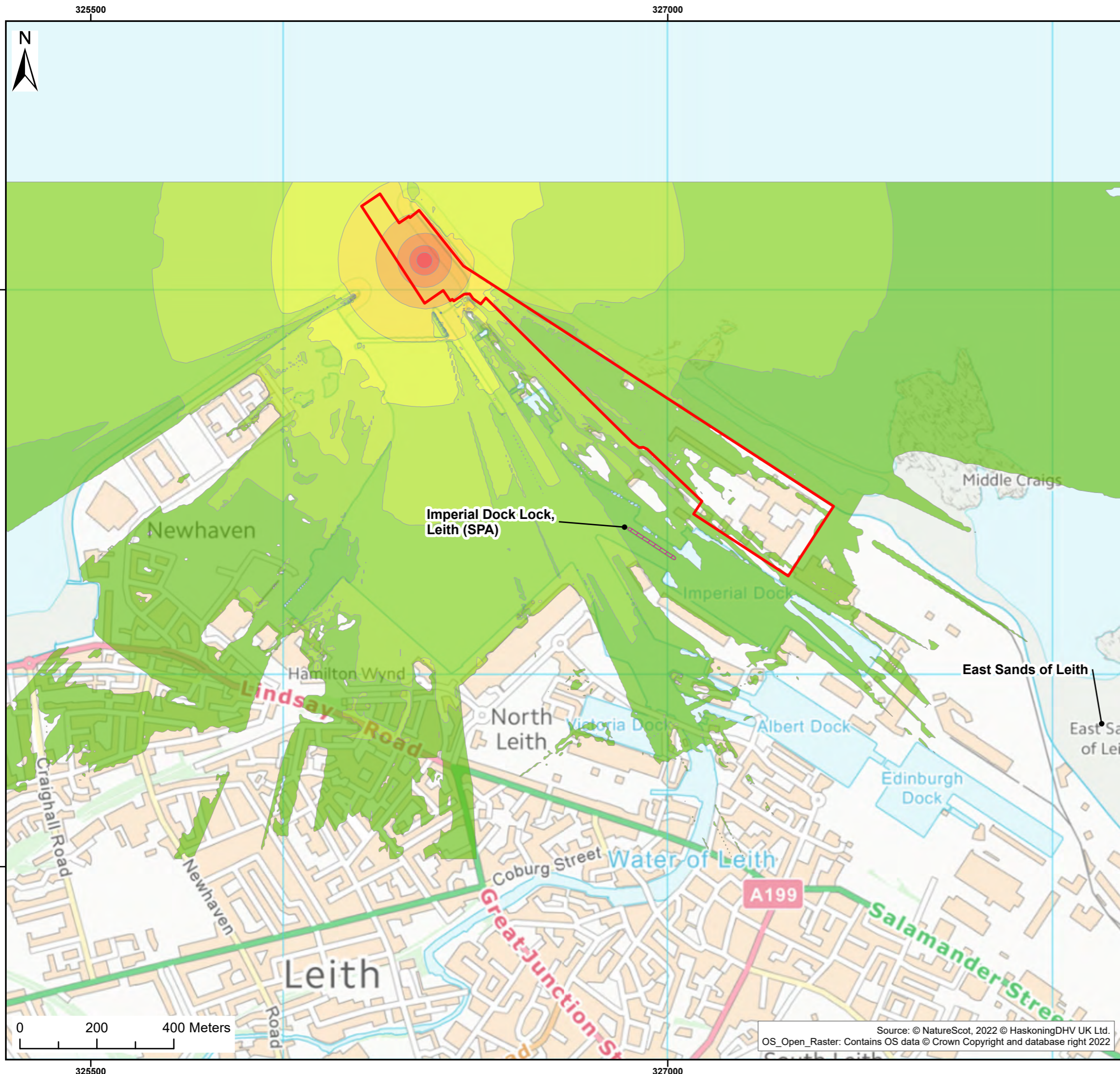


APPENDIX 11 – BSL LEASE AGREEMENT



Appendix F

Noise Contour Plot for Piling with Shroud



Legend:

- Red Line Boundary
- Imperial Dock Lock SPA

Noise level Lr24hr in dB(A)

	<= 60		96 - 100
	61 - 65		> 100
	66 - 70		
	71 - 75		
	76 - 80		
	81 - 85		
	86 - 90		
	91 - 95		

Client:	Project:
Forth Ports Limited	Leith Outer Berth

Title:

Piling with Shroud LAmx Noise Levels

Figure: F.1 Drawing No: PC2045-RHD-ZZ-ZZ-DR-EV-0049

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	30/08/2022	TB	JG	A3	1:10,000

Co-ordinate system: British National Grid

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