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MARINE SCOTLAND - LICENSING OPERATIONS TEAM'S ASSESSMENT OF THE PROJECT'S IMPLICATIONS FOR DESIGNATED SPECIAL AREAS OF CONSERVATION AND SPECIAL PROTECTION AREAS IN VIEW OF THE SITES' CONSERVATION OBJECTIVES.

APPLICATION FOR MARINE LICENCES UNDER THE MARINE (SCOTLAND) ACT 2010 TO CONSTRUCT, ALTER OR IMPROVE WORKS, DEPOSIT AND USE EXPLOSIVE SUBSTANCES OR ARTICLES AND TO CARRY OUT DREDGING AND DEPOSIT DREDGED SUBSTANCES OR OBJECTS ASSOCIATED WITH ABERDEEN HARBOUR EXPANSION PROJECT

SITE DETAILS: NIGG BAY, ABERDEEN

Name	**Assessor or Approver**	**Date**
Jack Versiani Holt	Assessor	June 2020
Louise Msika	Approver	June 2020

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SECTION 1: BACKGROUND

1 Appropriate assessment conclusion

1.1 This appropriate assessment ("AA") concludes that there will be no adverse effect on the site integrity of the Moray Firth Special Area of Conservation ("SAC"), Isle of May SAC, River Dee SAC or the Ythan Estuary, Sands of Forvie and Meikle Loch Special Protection Area ("SPA") from the Aberdeen Harbour Board ("AHB") proposal either in isolation or in combination with other plans or projects, providing that the conditions set out in Section 4 are complied with.

1.2 Marine Scotland – Licensing Operations Team ("MS-LOT") considers that the most up to date and best scientific advice available has been used in reaching the conclusion that the AHB proposal will not adversely affect the integrity of the Moray Firth SAC, Isle of May SAC, River Dee SAC or the Ythan Estuary, Sands of Forvie and Meikle Loch SPA and is satisfied that no reasonable scientific doubt remains.

2 Introduction

2.1 This is a record of the AA undertaken by MS-LOT in regards to the AHB proposal to develop the new harbour facility at Nigg Bay, Aberdeen as required under Regulation 48 of the Conservation (Natural Habitats, &c.) Regulations 1994 ("the 1994 Habitats Regulations"). MS-LOT, as the 'competent authority' under the 1994 Habitats Regulations, has to be satisfied that the project will not adversely affect the integrity of any European site (SAC and SPA, known as Natura sites), either alone or in combination with other plans or projects, before it can grant consent for the project.

2.2 Scottish Natural Heritage ("SNH"), Whale and Dolphin Conservation ("WDC") and Dee District Salmon Fisheries Board ("DDSFB") have been consulted. Advice from Marine Scotland Science ("MSS") was sought.

3 Details of proposed project

3.1 AHB has applied for marine licences for the construction, deposit and use of explosives, and dredging and deposit of dredged substances or objects ("the Works") associated with the Aberdeen Harbour Expansion Project ("AHEP") at Nigg Bay, Aberdeen. The applications were accompanied by an Environmental Impact Assessment report ("EIA Report"). The Scottish Ministers previously granted a construction and use of explosives marine licence ("the 2016 Construction Licence") and a dredging and deposit marine

licence ("the 2016 Dredging Licence") and Environmental Impact Assessment ("EIA") consent for AHEP on 4 November 2016. The 2016 consent was informed by an Environmental Statement dated November 2015 and an Additional Environmental Information Report dated 22 April 2016 (hereinafter collectively referred to as ("the 2016 EIA"). AHEP construction and dredging activities commenced in 2017 with an anticipated duration of three years. In 2018, difficulties encountered in relation to AHEP's blasting programme, including a delayed start, winter storm damage to the double bubble curtain used to mitigate underwater noise levels ("the double bubble curtain") and the frequent presence of seals within the mitigation zone, limited the amount of rock removed by blasting to date. Blasting was last carried out in November 2018 before the programme was suspended. Consequently, the 7 month blasting programme timeframe permitted by the 2016 Construction Licence became unachievable resulting in significant delays to the overall project schedule. The 2016 Dredging Licence expired in February 2020 and the 2016 Construction Licence expires on 30 June 2020. Consequently, the dredging and use of explosives at AHEP are currently on hold.

3.2 To enable the construction of AHEP to be completed, AHB proposes changes to the blasting methodology, including an increase in the duration over which blasting is permitted to take place and an increase in the size of the charges to be used (from 20 kilograms ("kg") up to 80kg). AHB also proposed to extend the overall duration of the construction and dredging programme to 31 December 2021. The location, spatial extent, overall construction methods, boundaries and design of AHEP remain largely unchanged from what was previously licensed.

3.3 AHEP involves dredging Nigg Bay to design depths varying from -9 to -15.24 metres ("m") chart datum ("CD"). The dredge material is comprised of sand, gravel, glacial till/fine silts and rock. The rock, gravel and sand is used as quay backfill, in land reclamation and as breakwater core material. The glacial till and fine silts are deposited at the designated Aberdeen sea deposit site. As of 19 November 2019, approximately 81% of the total volume had been dredged. The Works therefore include dredging of approximately 1,191,980 wet tonnes of material. The remaining material is largely rock that will be removed after blasting and other means of rock removal. The dredge material will be temporarily stockpiled on site before being processed and separated into material suitable for construction and material to be deposited at sea.

3.4 AHEP also includes the completion of two rubble mound breakwaters, one 634m in length situated to the north side of Nigg Bay ("the North Breakwater") and one 640m in length situated to the south side of Nigg Bay ("the South Breakwater") to protect the new harbour. The breakwaters comprise of blasted and dredged rock and other core material, secondary protection of large rocks

and an accropode outer layer. The North Breakwater has already reached its full length and 80m of the South Breakwater has been constructed. The Works therefore include remedial works at limited areas of the North Breakwater and the construction of the South Breakwater.

3.5 AHEP involves construction of approximately 886m of closed and 538m of open quays to provide over 1400m of quayside capable of berthing vessels. The East Quay ties into the North Breakwater and is comprised of concrete caissons that have been prefabricated in Spain and towed to Cromarty for storage before use at AHEP. The open North and West Quays utilise concrete piles and deck slab will be place on top of the piles. Rock revetment will be constructed around the quays. Land reclamation is taking place to provide a paved area to the rear of the quayside installations. The land reclamation utilises dredge material and imported infill. By October 2019, 120 piles had been installed at the open quay and no more marine piling is required. 11 of the 22 caissons have been installed during AHEP and a further 11 caissons remain in Cromarty waiting to be towed to AHEP and installed into place. Caisson infill and backfill as well as and close quay general fill have been completed in areas where caissons have been placed. The Works include installation of the remaining caissons at the closed quay and completion of both open and closed quays, including construction of the rock revetment.

3.6 AHEP's blasting programme was originally anticipated to be undertaken up to 6 days per week over a 7 month period however, due to the difficulties described in paragraph 3.1 above, between August 2018 and March 2019 only 12 days of blasting in total were completed. Since March 2019 some rock removal has been achieved using mechanical means however, as of October 2019, 114,553 cubic metres ("m^3") of rock remained to be removed during the Works.

3.7 AHB proposes the use of explosives, with incrementally increased charge weights up to 80kg, to blast the remaining rock in localised areas around the north and south sides of Nigg Bay. One to two blasts per day are proposed with all blasting being carried out during daylight hours, unless exceptional circumstances necessitate the blasting of loaded charges. The blasted rock will be dredged and used in breakwater core construction. Although a worst case scenario of blasting all remaining rock has been assumed in the EIA Report, it is intended for mechanical rock removal methods, such as ripping, drilling and rock breaker, to be used in conjunction with the blasting. Consequently, it is likely that not all of the remaining rock will necessarily be removed by blasting. Approximately 153,500m^3 of rock has already been removed by drilling and blasting. The Works thus involve the removal of the remaining 114,553m^3 of rock.

3.8 Figure 1 below shows the overall design of AHEP and further information regarding the project can be found here.

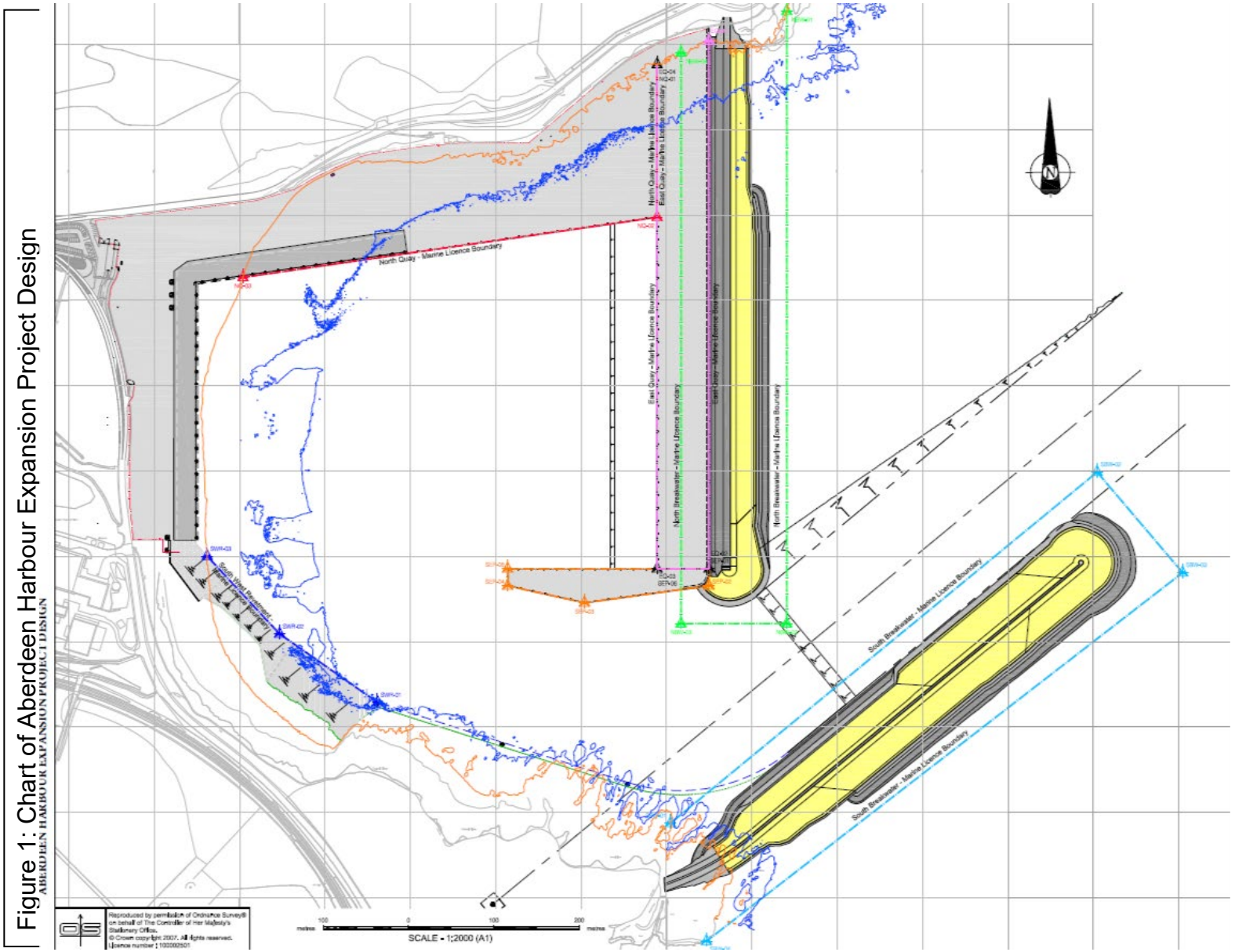

Figure 1: Chart of Aberdeen Harbour Expansion Project Design

4 Consultation

4.1 SNH, WDC and the DDSFB were consulted on the marine licence applications and supporting information, including an EIA Report and a Construction Environmental Management Document ("CEMD") on 10 December 2020.

4.2 SNH, WDC and DDSFB responded to consultation on 14 January 2020.

4.3 Advice from MSS was sought on 10 December and a response was received on 27 January 2020.

5 Main points raised during consultation

5.1 SNH advised that the proposed works would have a likely significant effect on the bottlenose dolphin, grey seal, Atlantic salmon and eider duck qualifying interests of the Moray Firth SAC, Isle of May SAC, River Dee SAC and Ythan Estuary, Sands of Forvie and Meikle Loch SPA, respectively. SNH therefore advised that an AA was required. SNH advised that it objects to the AHB proposal unless it is made subject to the proposed conditions.

5.2 In its consultation response, WDC provided comments in relation to the impacts on bottlenose dolphins. DDSFB provided comments in relation to Atlantic salmon and MSS provided comments in relation to the impacts on marine mammals and eider ducks. These have all been used to inform this assessment.

SECTION 2: INFORMATION ON NATURA SITES

6 Background information and qualifying interests for the relevant Natura sites

6.1 This section provides links to the Scottish Natural Heritage Interactive ("SNHi") website where the background information on the sites being considered in this assessment is available. The qualifying interests for the sites are listed as are the conservation objectives.

Table 1 Name of Natura sites affected and relevant link(s) to SNHi website

Moray Firth SAC https://sitelink.nature.scot/site/8327

River Dee SAC
https://sitelink.nature.scot/site/8357

Isle of May SAC
https://sitelink.nature.scot/site/8278

Ythan Estuary, Sands of Forvie and Meikle Loch SPA
https://sitelink.nature.scot/site/8592

Table 2 European qualifying interests

Moray Firth SAC
Bottlenose dolphin (*Tursiops truncatus*)
Subtidal sandbanks

River Dee SAC
Otter (*Lutra lutra*)
Freshwater pearl mussel (*Margaritifera margaritifera*)
Atlantic salmon (*Salmo salar*)

Isle of May SAC
Grey seal (*Halichoerus grypus*)
Reefs

Ythan Estuary, Sands of Forvie and Meikle Loch SPA
Common tern (*Sterna hirundo*), breeding
Eider (*Somateria mollissima*), non-breeding
Lapwing (*Vanellus vanellus*), non-breeding
Little tern (*Sternula albifrons*), breeding
Pink-footed goose (*Anser brachyrhynchus*), non-breeding
Redshank (*Tringa totanus*), non-breeding
Sandwich tern (*Sterna sandvicensis*), breeding
Waterfowl assemblage, non-breeding

Table 3 Conservation objectives

Moray Firth SAC

To avoid deterioration of the qualifying habitat (listed above) thus ensuring that the integrity of the site is maintained and the site makes an appropriate

contribution to achieving favourable conservation status for each of the qualifying features; and

To ensure for the qualifying habitat that the following are maintained in the long term:

- Extent of the habitat on site
- Distribution of the habitat within site
- Structure and function of the habitat
- Processes supporting the habitat
- Distribution of typical species of the habitat
- Viability of typical species as components of the habitat
- No significant disturbance of typical species of the habitat

To avoid deterioration of the habitats of the qualifying species (listed above) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained and the site makes an appropriate contribution to achieving favourable conservation status for each of the qualifying features; and

To ensure for the qualifying species that the following are established then maintained in the long term:

- Population of the species as a viable component of the site
- Distribution of the species within site
- Distribution and extent of habitats supporting the species
- Structure, function and supporting processes of habitats supporting the species
- No significant disturbance of the species

River Dee SAC

To avoid deterioration of the habitats of the qualifying species (listed above) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained and the site makes an appropriate contribution to achieving favourable conservation status for each of the qualifying features; and

To ensure for the qualifying species that the following are maintained in the long term:

- Population of the species, including range of genetic types for salmon, as a viable component of the site
- Distribution of the species within site
- Distribution and extent of habitats supporting the species
- Structure, function and supporting processes of habitats supporting the species
- No significant disturbance of the species

- Distribution and viability of freshwater pearl mussel host species
- Structure, function and supporting processes of habitats supporting freshwater pearl mussel host species

Isle of May

To avoid deterioration of the qualifying habitat (listed above) thus ensuring that the integrity of the site is maintained and the site makes an appropriate contribution to achieving favourable conservation status for each of the qualifying features; and
To ensure for the qualifying habitat that the following are maintained in the long term:

- Extent of the habitat on site
- Distribution of the habitat within site
- Structure and function of the habitat
- Processes supporting the habitat
- Distribution of typical species of the habitat
- Viability of typical species as components of the habitat
- No significant disturbance of typical species of the habitat

To avoid deterioration of the habitats of the qualifying species (listed above) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained and the site makes an appropriate contribution to achieving favourable conservation status for each of the qualifying features; and
To ensure for the qualifying species that the following are maintained in the long term:

- Population of the species as a viable component of the site
- Distribution of the species within site
- Distribution and extent of habitats supporting the species
- Structure, function and supporting processes of habitats supporting the species
- No significant disturbance of the species

Ythan Estuary, Sands of Forvie and Meikle Loch SPA

To avoid deterioration of the habitats of the qualifying species (listed above) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained; and
To ensure for the qualifying species that the following are maintained in the long term:

- Population of the species as a viable component of the site

- Distribution of the species within site
- Distribution and extent of habitats supporting the species
- Structure, function and supporting processes of habitats supporting the species
- No significant disturbance of the species

SECTION 3: ASSESSMENT IN RELATION TO REGULATION 48 OF THE CONSERVATION (NATURAL HABITATS, &C.) REGULATIONS 1994

7 Requirement for appropriate assessment

7.1 Is the project directly connected with or necessary to the conservation management of the site(s)?

The project is not directly connected with or necessary to the conservation management of the site.

7.2 *Is the project likely to have a significant effect on the qualifying interest(s)?*

7.2.1 In its response dated 14 January 2020, SNH advised that the AHB proposal is likely to have a significant effect on the bottlenose dolphin interest of the Moray Firth SAC, the grey seal interest of the Isle of May SAC, the Atlantic salmon interest of the River Dee SAC and the eider duck interest of the Ythan Estuary, Sands of Forvie and Meikle Loch SPA due to possible injury or disturbance arising from the changes in the blasting programme (direct injury from blasting or associated underwater noise) and the extension of the project duration, including dredging and sea deposit and construction activities and vessel movements.

7.2.2 MS-LOT agrees with SNH's advice and has undertaken an AA for those qualifying interests of the Moray Firth SAC, the Isle of May SAC, the River Dee SAC and the Ythan Estuary, Sands of Forvie and Meikle Loch SPA respectively.

8 Appropriate assessment of the implications for the site in view of the site's conservation objectives.

8.1 MS-LOT has considered the application and supporting documentation including the EIA Report and the CEMD submitted by AHB and the advice provided by SNH, DDSFB, WDC and MSS to support this assessment.

8.2 Moray Firth SAC

8.2.1 The Moray Firth SAC is located 160km from AHEP. The EIA Report noted that the AHB proposal could cause death, injury and behavioural alterations to bottlenose dolphins due to the blasting programme and associated underwater noise. Ongoing marine mammal monitoring during AHEP works completed so far has shown that bottlenose dolphins are frequently found in the vicinity of Nigg Bay despite the ongoing construction activities. Underwater noise modelling was carried out to assess the blasting noise attenuation and determine the threshold levels for permanent hearing damage, or Permanent Threshold Shift ("PTS"), and temporary hearing damage, or Temporary Threshold Shift ("TTS"), following exposure to impulsive and continuous noise. New numerical modelling using the interim Population Consequences of Disturbance ("iPCoD") model v5.0 was also carried out to identify the long term population effects of the blasting on bottlenose dolphins. Proposed mitigation for marine mammals is detailed in chapter 11 of the CEMD and includes use of a double bubble curtain, Passive Acoustic Monitoring ("PAM") and Marine Mammal Observer ("MMO") watches prior to and during blasting, establishment of a cetacean mitigation zone of 1000m and use of acoustic deterrent devices ("ADD"). Blasting will also only take place during good visibility.

The EIA Report noted that the impact ranges for direct mortality as a result of the pressure pulse or shock wave caused by blasting are not well understood, but the use of MMOs and PAM should ensure no bottlenose dolphins are close enough to the blast site to experience mortality as a result. The underwater noise modelling showed that without the double bubble curtain in place, TTS and PTS in bottlenose dolphins could occur 1400m and 350m from the blast site, respectively, with a 100kg charge weight. With the double bubble curtain in place, TTS and PTS zones fall within the 1000m mitigation zone and bottlenose dolphins will not be at any risk of experiencing adverse underwater noise effects when charge weights of up to 80kg are used. During blasting, underwater noise will be monitored using PAM and hydrophones placed both within and outwith the area enclosed by the double bubble curtain which will record the noise levels. The noise level will be measured during each detonation and the noise threshold set at 170 dB re 1µPa rms or 183 dB re 1µPa peak. This level must not be breached at either 400m from the blast site or outside the double bubble curtain, whichever is at greater distance. Additionally, a Precautionary Control Limit ("PCL") has been defined to minimise the chance of reaching the noise threshold. The PCL is set at 167

dB re 1µPa rms or 178 dB re 1µPa peak and if these are reached, the charge weights will not be increased.

8.2.2 The EIA Report states that marine mammal behavioural changes, such as avoidance of Nigg Bay and surrounding areas, are likely. The impact range for behavioural changes spans over several kilometres even with the double bubble curtain in place, but the impacts are considered temporary.

8.2.3 AHB acknowledges that the duration of AHEP will be extended, leading to an increase in the time over which environmental impacts occur. The EIA Report however concludes that the extension will not result in any significant increases in effects over those already assessed in the 2016 EIA. This is because the locations and quantities of seabed material to be dredged and deposited remain as originally planned and so no additional impact is anticipated in this regard. Furthermore, the frequency at which the activities will take place will be less than that originally assessed as the same amount of dredging and sea deposit will take place but over a longer period of time. Impacts of vessel traffic, dredging and sea deposit operations and piling and drilling on marine mammals are not considered different from what was previously assessed, especially as no marine piling is required during the Works. All existing mitigation addressing these concerns has been included in the CEMD.

8.2.4 The results from the iPCoD modelling showed that the AHB proposal alone would not significantly affect the long-term population size of bottlenose dolphins so long as the double bubble curtain is in place. The population effects of the AHB proposal on the Moray Firth SAC are therefore considered insignificant. The EIA Report concludes that as long as the existing mitigation is in place, the proposed changes to the blasting methodology, will not increase the risk to the bottlenose dolphin feature of the Moray Firth SAC.

8.2.5 SNH advised that increasing the charge weight above 20kg raises several concerns in relation to marine mammals like bottlenose dolphins and many uncertainties remain even after the EIA carried out by AHB. These include the lack of validation and benchmarking of the noise modelling, especially as most of the blasting so far has taken place in the north area of Nigg Bay using a different double bubble curtain configuration (400m from the blast site, compared to a proposed 100m in the south area). Furthermore, there are relatively few noise measurements from the area outwith that enclosed by the double bubble curtain to date. SNH thus considers there to be insufficient evidence on the effectiveness of the double bubble curtain. Additionally, the TTS and PTS ranges are reported using a peak noise metric, while using single pulse however, when cumulative Sound Exposure Level (“SEL”) metrics are used, the impact range is larger and the set noise threshold is reached

within the 1000m mitigation zone for charge weights of 40kg and above. Furthermore, increasing the number of charges in one field is unlikely to increase the peak level significantly, but an increasing number of charges in the field will increase the noise duration. SNH advises that for these reasons, charge weight increases should be limited to 5kg during the blasting programme until a sufficient number of blasts have been undertaken to show the effectiveness of the double bubble curtain. SNH recommends that an adaptive management plan robust enough to halt increasing charge weights is implemented. Finally, SNH advised that it is content with the peak underwater noise thresholds presented in the EIA Report, but a 155 dB re 1μPa^{2}s threshold for SEL should be implemented over the duration of the blast noise. SNH also advised that securing the proposed mitigation including that detailed in the Marine Mammal Mitigation Plan and Vessel Management Plan, included in the CEMD, will minimise the risk of injury or disturbance to bottlenose dolphins.

8.2.6 WDC welcomed the continued commitment of AHB to marine mammal mitigation and monitoring. WDC advised that up to date, the maximum charge weight for blasting has been 20kg and all these blasts have taken place in the north area of Nigg Bay. No blasting has taken place in the south area where the proposed double bubble curtain configuration is different. WDC therefore does not consider the 10kg increments to blasting to be sufficiently precautionary, and the increments should be 5kg at all times. WDC also advised that blasting increments should not increase more than once a day to allow MS-LOT to ensure peak noise level threshold is not exceeded. WDC supports the detailed comments provided by SNH.

8.2.7 MSS advised that it broadly agrees with the methodology proposed by AHB and the SNH advice, which would implement a noise threshold of 183 dB re 1 μPa (peak) at 400m distance or just outside the area enclosed by the double bubble curtain (whichever is furthest from the source), and a SEL of 155 dB re 1 μPa^{2}s, measured over the blast duration. However, MSS raised concerns regarding the practicality of implementing the thresholds and advised that full technical specifications of the equipment to be used in underwater noise monitoring are supplied to ensure that they are fit for purpose. MSS also recommended that a protocol for the use of this equipment is provided and that the underwater noise measurements are carried out using hydrophones which are calibrated and are of a suitable sensitivity to detect the blast noise. They should also be capable of providing real time measurements, in order to allow the measurements to be used within the adaptive management framework to stop work from proceeding if the threshold is breached. MSS recommended that MS-LOT request a detailed process document on how the noise measurements will be used to inform the adaptive management plan, the actions to be taken in the event of a breach of the threshold, and the time

scales at which compliance reporting will be made to MS-LOT. This should ensure that there is no delay in using the noise measurements to inform whether to maintain, reduce or increase charge size, which would reduce the risk of the noise threshold being breached. MSS recommended that underwater noise monitoring is carried out for the southern breakwater area at a maximum of 20kg before the increased charge size is implemented as the effectiveness of the double bubble curtain arrangement in this area needs to be established. If it can be demonstrated that the underwater noise monitoring procedure is sufficient to ensure that blast noise is monitored and mitigated to within the noise thresholds, MSS are content that the mitigation proposed is sufficient to avoid the risk of injury to marine mammals.

8.2.8 To address the concerns of SNH, MSS and WDC over blasting monitoring and mitigation, AHB will produce an Adaptive Blasting Management Plan ("ABMP") for the approval of Scottish Ministers prior to any blasting commencing. The plan will include a limitation of the incremental charge weight increase to 5kg at all times as well as a revised programme of incremental charge weight increases, including details of number of blasts per charge weight and the process for when underwater noise levels approach or exceed the agreed noise thresholds. This will also limit the daily blasting increments as per WDC's advice. The ABMP will also include details of a reporting strategy, including timelines to inform the licensing authority of any blasting events and subsequent underwater noise monitoring results, including both raw and calibrated peak and SEL metrics and the number of detonations used. The calibrated peak and SEL metrics will be used to monitor the underwater noise and ensure the PCL and noise threshold are not exceeded. The metrics should be calculated using the latest available guidance. The maximum duration of each blast will be used for these calculations. Furthermore, details of the underwater noise monitoring techniques, protocols and equipment to be used and their proposed locations in Nigg Bay, details of the proposed use of MMOs and fish scarers and details of all monitoring, recording and reporting of the use of Nigg Bay by marine mammals will be included. The provision of and adherence to an approved ABMP will be secured as a condition in the marine licences.

8.2.9 MS-LOT concurs with the view of SNH and MSS that providing the CEMD and ABMP are adhered to, there will be no adverse effect on the site integrity of the Moray Firth SAC.

8.3 Isle of May SAC

8.3.1 The Isle of May SAC is located 110km from AHEP. The EIA Report noted that the AHB proposal could cause death, injury and behavioural alterations to grey seals due to the blasting programme and associated underwater noise.

Ongoing marine mammal monitoring during AHEP has shown that grey seals are frequently found in the vicinity of Nigg Bay despite the ongoing construction activities. Proposed mitigation for grey seals is the same as for bottlenose dolphins, except the exclusion zone for seals is set at 500m.

8.3.2 Similarly to bottlenose dolphins, underwater noise modelling was carried out to assess the blasting noise attenuation and determine the zones for PTS and TTS for grey seals following exposure to impulsive and continuous noise. The modelling showed that without the double bubble curtain in place, TTS and PTS in grey seals could occur 9900m and 3500m from the blast site, respectively, with a 100kg charge weight. With the double bubble curtain and seal exclusion zone in place, TTS and PTS zones fall to <140m, which are within the 500m mitigation zone and grey seals will not be at any risk of experiencing adverse underwater noise effects when charge weights of up to 80kg are used. Underwater noise monitoring prior to and during blasting will take place to ensure the double bubble curtain prevents noise levels outside the curtain breaching the PCL. Ongoing marine mammal monitoring has shown that grey seals appeared not to be significantly affected by previous blasting operations as they were detected within the vicinity of AHEP within a few hours following blasting events.

8.3.3 The iPCoD modelling showed that the AHB proposal alone would not significantly affect the long-term population size of grey seals so long as the double bubble curtain is in place. The EIA Report concludes that population effects of the AHB proposal on the Isle of May SAC will be insignificant.

8.3.4 The advice received from SNH and MSS regarding the impacts of the changes in the blasting programme and project duration on bottlenose dolphins also apply to grey seals. SNH did, however, also advise that the MMO and PAM watches prior to blasting should include checking for the presence of seals inside the double bubble curtain before it is switched on.

8.3.5 MS-LOT concurs with the conclusion of the EIA Report and the view of SNH and MSS that providing the CEMD and ABMP are adhered to and the double bubble curtain is not switched on until seals have left the area inside the curtain, there will be no adverse effect on the site integrity of the Isle of May SAC.

8.4 River Dee SAC

8.4.1 The River Dee SAC is located 0.8km from AHEP. The EIA Report states that the changes in the blasting programme have the potential to disturb, injure or kill fish due to the increased impact zone. Additionally, migrating salmon smolts could be impacted through noise and sediment deposit at the sea

deposit site. Atlantic salmon migrate to and from the River Dee and when the smolts leave the river they may swim towards the direction of Nigg Bay or the Aberdeen designated sea deposit site. A diadromous fish survey was carried out in August-September 2017 in Nigg Bay during which five salmon were caught, suggesting low use of Nigg Bay by the species. Additional diadromous fish tagging studies in the River Dee suggest that the migrating salmon quickly move out of the Nigg Bay area after entering the sea. Furthermore, no salmon have been observed to have died during previous blasting events at AHEP.

8.4.2 The EIA Report identified that without the double bubble curtain, mortality to fish occurs 20-440m from the blast site depending on charge weight. Fish scarers will be used to startle fish away from the blast areas prior to blasting, however any fish remaining within the area enclosed by the double bubble curtain are likely to suffer mortal injury. If a double bubble curtain is placed 100m from the blast site, sufficient noise is removed so that mortality and potential mortal injury do not occur at all outside of the area enclosed by the double bubble curtain. As the use of Nigg Bay by Atlantic salmon is limited, the AHB proposal is unlikely to impact the species.

8.4.3 The EIA Report notes that dredging and deposit of dredge material at the sea deposit site could affect salmon through reduction in foraging due to increased suspended sediment load and subsequent reduced visibility or increased foraging due to reduced predation risk as salmon can prefer slightly turbid conditions when feeding. Salmon smolts could, however, be sensitive to increased sediment loads and noise at the sea deposit site, although salmonids are generally considered tolerant to turbid conditions. Underwater noise modelling shows that the noise generated by the deposit of dredge material at the sea deposit site falls within background levels within tens of meters of the site of deposit. Any adverse noise events will be intermittent, limited to the frequency of dredging occasions, and the small area of effect will be expected to be avoided by highly mobile and wide ranging salmon. Impact significance is thus considered to be minor even if smolts could be present at the time of a deposit operation. Any effects are short lived and limited to 0.5-1.5km from the site of deposit, depending on material type. As smolts are considered capable of avoiding the site during deposit of dredge material, the EIA Report considers that the impacts are minor.

8.4.4 SNH advised that the noise monitoring and marine mammal mitigation measures will also protect the Atlantic salmon interest of the River Dee SAC.

8.4.5 DDSFB raised concerns relating to impacts of the project on Atlantic salmon that utilise the River Dee and the areas in the vicinity of AHEP as feeding areas and migratory pathways. DDSFB advised that the olfactory organs of salmonids are sensitive to pollutants and any disruption to these senses could

compromise their ability to recognise their natal river. Increased water turbidity could result in increased stress response in salmonids. DDSFB advised that in its view, there is insufficient monitoring data to show if Nigg Bay is used by salmonids and how the AHB proposal may impact them. Consequently evaluating the impacts of changes in the blasting programme and dredging on salmonids is difficult. DDSFB is content with the proposed underwater noise monitoring and the noise thresholds presented in the EIA Report. With regards to dredging, DDSFB advised that the suspended sediment monitoring should continue to ensure the levels presented in the EIA Report are not exceeded. If suspended sediment levels approach the agreed threshold, mitigation detailed in chapter 7 of the CEMD will be implemented to ensure that no exceedances occur. If suspended sediment levels cannot be reduced and controlled through the procedures in the CEMD, dredging will be temporarily stopped as other options are explored to provide a solution. If suspended sediment concentrations are exceeded, this must be reported to MS-LOT detailing the levels of exceedance and mitigations implemented.

8.4.6 MS-LOT concurs that AHB must adhere to the mitigation and reporting commitments in the CEMD. MS-LOT concurs with the conclusion of the EIA Report and the view of SNH that providing the CEMD and ABMP are adhered to there will be no adverse effect on the site integrity of the River Dee SAC.

8.5 Ythan Estuary, Sands of Forvie and Meikle Loch SPA

8.5.1 The Ythan Estuary, Sands of Forvie and Meikle Loch SPA is located 20km from AHEP. The EIA Report noted that while seabirds have been largely displaced from Nigg Bay due to AHEP, the wider area supports a range of bird species through provision of habitat for the birds and their prey species (sand eel). Sand eel individuals have been reported in Nigg Bay, however the main sand eel habitat of clean medium and course sand is only found outside of Nigg Bay therefore no impacts on the species and consequent prey availability are anticipated. Eider ducks have been largely displaced by AHEP and now reside in the adjacent Greyhope Bay and Girdle Ness. The overall extension of the project duration is likely to extend the temporal displacement of the bird species from Nigg Bay, although suitable alternative habitat has been adopted by the birds.

8.5.2 The EIA Report also identified that besides displacement, the changes in the blasting programme could impact eider ducks through injury and disturbance. The impacts of blasting are highly localised to AHEP, intermittent and temporary. Distances over which injury to surface swimming birds could occur is likely to be only a few tens of meters and consequently no significant adverse effects to marine birds due to the proposed changes in blasting programme are anticipated. Diving and submerged birds are more vulnerable

to blasting, but pre-blast checks for rafting and diving birds will mitigate for these impacts.

8.5.3 SNH advised that provided the proposed mitigation is secured, the AHB proposal will not have an adverse impact on the site integrity of the Ythan Estuary, Sands of Forvie and Meikle Loch SPA. Furthermore, SNH welcomes the provision in the CEMD chapter 17 (Vessel Management Plan) that an observer looks out for flocks of eider ducks to ensure that vessels slow down and do not unnecessarily disturb the birds. SNH noted that an observer should assess whether seabirds are diving prior to any blasting events and that blasting will be delayed until the birds have surfaced. This has been secured as a marine licence condition. SNH recommended that the annual eider duck report includes examination of the different bird behaviours observed during the surveys to identify if there is a relationship between particular activities and any flushing or disturbance behaviours seen. These monitoring and reporting requirements are included in chapter 9 of the CEMD.

8.5.4 MSS agreed with the assessment of SNH on the impacts of the changes in blasting programme and increased project duration on especially eider ducks.

8.5.5 MS-LOT concurs with the conclusion of the EIA Report and the view of SNH and MSS that providing the CEMD is adhered to and an observer ensures that no birds are diving before blasting, there will be no adverse effect on the site integrity of the Ythan Estuary, Sands of Forvie and Meikle Loch SPA.

9 In combination assessment

9.1 MS-LOT has carried out an in combination assessment to ascertain whether the AHB proposal will have a cumulative effect with other plans or projects which, in combination, would have the potential to affect the qualifying interests of the Moray Firth SAC, Isle of May SAC, River Dee SAC or Ythan Estuary, Sands of Forvie and Meikle Loch SPA.

9.2 The following projects currently have an active marine licence, section 36 consent, European protected species licence or seal licence and associated AA which identified a likely significant effect on the qualifying interests of the Moray Firth SAC, Isle of May SAC, River Dee SAC and/or Ythan Estuary, Sands of Forvie and Meikle Loch SPA.

9.3 Aberdeen Bay Offshore Wind Farm

9.3.1 Installation and operation of a European Offshore Wind Deployment Centre consisting of 11 turbines, inter-array and export cables located 2 to 4.5km east of Blackdog, Aberdeenshire. Construction commenced in November 2017,

beginning with foundations and cabling. All construction works have been completed for this project which is now in the operational stage which is scheduled to continue until 2043.

9.4 Meygen Phase 1

9.4.1 Construction and operation of a tidal array in the Inner Sound of the Pentland Firth. Phase 1a of the project is complete with 4 tidal turbines having been installed. A construction timeline for phases 1b and 1c has not yet been determined. Phase 1b of the project (also known as Project Stroma) will consist of the installation of a further 4 tidal turbines, along with the deployment of a subsea hub. Two tidal turbines will be initially installed and then monitored for a period of time in order to inform decisions on future deployment of the remaining two tidal turbines for Phase 1b and the remaining tidal turbines (53) for deployment during phase 1c.

9.4.2 Further information regarding the project can be found here.

9.5 Beatrice Offshore Wind Farm

9.5.1 Installation and operation of the Beatrice Offshore Windfarm, which is located in the outer Moray Firth 13.5km from the Caithness coast. The total area of the development is 131.5 kilometres squared ("km²"). The development will comprise of 84 turbines. The eastern edge of the development site is adjacent to the proposed Moray Firth Offshore Renewables Limited Eastern Development Area. The operational lifespan of the wind farm is expected to be 25 years. Construction started in April 2017 and the final turbine was installed in May 2019.

9.5.2 Further information regarding the project can be found here.

9.6 Moray Offshore East Development

9.6.1 The current design envelope is for a maximum generating capacity of up to 1,116 MW and for a maximum of 186 wind turbines. The proposals are located on the Smith Bank in the outer Moray Firth (approximately 22km from the Caithness coastline, in water depths of 38 – 57m). The operational lifespan of the wind farms is expected to be 25 years.

9.6.2 The three proposed wind farm sites: the Telford, Stevenson and MacColl wind farms lie within the Eastern Development Area, part of Zone 1 of Round 3 leasing agreements in the UK Renewable Energy Zone. Substructure and foundation design for the wind turbines will consist of either a mixture of, or one design option of:

- concrete gravity base foundation with ballast and a gravel/grout bed, or
- steel lattice jackets with pin piles.

9.6.3 Construction work is currently ongoing with piling works have been completed and all construction is due to be completed in 2021.

9.6.4 Further information regarding the Moray Offshore East Development can be found here.

9.7 Moray Offshore East Development – Modified Offshore Transmission Infrastructure

9.7.1 Modified offshore transmission infrastructure for the consented Moray East Telford, Stevenson and MacColl wind farms in the outer Moray Firth. The works will consist of:
• Up to 2 AC Offshore Substation Platforms ("OSP");
• Substructure and foundations for the OSPs;
• Inter-platform cabling within the 3 consented wind farms; and
• Up to 4 triplecore submarine HVAC export cables between the OSPs and the shore.

9.7.2 Piling works have been completed and construction is scheduled to be completed during 2021.

9.8 Moray West Offshore Windfarm

9.8.1 Marine licences and a s.36 consent were granted for the construction and operation of the Moray West Offshore Wind Farm and associated offshore transmission infrastructure on 14 June 2019. The wind farm is located 22.5km southeast off the Caithness coastline.

9.8.2 The operational lifespan of the project is expected to be 25 years. The project covers a total area of approximately 225km^2 comprised of no more than 85 wind turbines with a maximum generating capacity of around 850 Megawatts (“MW”). Further details of the proposed works can be found here.

9.9 Forth and Tay Windfarm Developments

9.9.1 When considered collectively, the following developments are referred to as the “Forth and Tay Windfarm Developments”;

- Neart na Gaoithe Offshore Windfarm Limited ("NnGOWL"),, approximately 15.5 km to the east of Fife Ness in the outer Firth of Forth.
- Inch Cape Offshore Limited development ("ICOL"), approximately 15km to the east off the Angus coastline.
- Seagreen Alpha Wind Energy Limited development ("SAWEL"), approximately 27km off the Angus coastline.
- Seagreen Bravo Wind Energy Limited development ("SBWEL"), approximately 38km off the Angus coastline.

9.9.2 A full project description for each development can be found here: NNGOWL, ICOL, SAWEL, SBWEL. These projects have not been progressed due to delays associated with a judicial review and all three projects have submitted applications for new consents and licences during 2018. NnGOWL and ICOL have now received new consents and licences, details of which are included in sections 9.12 and 9.14. Although these two projects now have permission for two different proposals, only one proposal for each project will be built out.

9.10 Hywind Scotland Pilot Park

9.10.1 The Hywind Pilot Park is located approximately 25 km off the coast at Peterhead, North East Scotland just outside the 12 nautical miles ("nm") territorial water limit. The project includes construction, installation, operation and maintenance activities. Five 6 MW wind turbine generators have been installed and are expected to produce up to 135 Gigawatt hours ("GWh") per year of electricity. The turbines are positioned between 800 to 1,600m apart and attached to the seabed by a three-point mooring spread and anchoring system. Three anchors are required per turbine and the radius of the mooring system extends between 600 to 1,200m out from each turbine. All construction and installation works are complete and the project is now in the operational phase.

9.10.2 Further information regarding the project can be found here.

9.11 Kincardine Offshore Windfarm Development

9.11.1 Kincardine Offshore Windfarm ("KOWL") is a demonstrator floating offshore windfarm development that is located to the south east of Aberdeen, approximately eight miles from the Scottish coastline in approximately 60 to 80m of water. The development is considered a commercial demonstrator site, which utilises floating semi-submersible technology to install six turbines including a temporary data gathering platform of 2MW. The maximum generating capacity of all six turbines will not exceed 50MW. The proposal also

includes inter-array cabling to the connection point at the onshore Redmoss substation, Altens, Aberdeen.

9.11.2 The 2MW turbine was deployed in September 2018, while the other five turbines (9.5MW each) will be deployed after September 2020. Further information regarding the project can be found here.

9.12 Neart na Gaoithe Offshore Windfarm (Revised Design)

9.12.1 Construction and operation of a wind farm and associated offshore transmission infrastructure located 15.5km east of Fife Ness in the Firth of Forth. Consent has been granted for up to 54 wind turbines with piled jacket foundations. In addition, up to two offshore sub stations and one meteorological mast may be constructed along with two offshore export cables. These will connect to the landfall point at Thorntonloch, south of Torness Power Station in East Lothian. The operational lifespan of the project is expected to be 50 years. Construction activities are scheduled to commence in Quarter 3, 2021 and conclude in late 2022.

9.12.2 Further information regarding this project can be found here.

9.13 Port of Cromarty Firth, Phase 4 – Construction and Dredging

9.13.1 The proposed phase 4 project involves land reclamation to provide an additional 4.5 Hectares ("Ha") of laydown space to the west of the previously completed phase 3 development, including the construction of 215m of quay wall to create a new berth adjacent to the existing berth 5 to create a combined 369m long quay face. Fendering will then be installed along berth 5 and the new berth 6.

9.13.2 A rock armour revetment will be constructed along the north and west sides of the new laydown area with a tubular and sheet piled wall forming the new quay. The existing rock armour will be removed from the western edge of the phase 3 development and re-used on phase 4. The area will then be lined with a geotextile membrane and infilled, before appropriate drainage, bollards and services are installed prior to surfacing.

9.13.3 Dredging will be required along the toe of the new revetment structure and a second campaign will be required to create a finished depth of 12m along the new berth. The total dredge volume is estimated to be 110,000m^3 of material. which will be deposited at the Sutors dredge spoil deposit area.

9.13.4 The works were initially scheduled to take place between 01 November 2018 and 31 March 2020. However, due to delays related to the coronavirus

(COVID-19) pandemic restrictions the works were not completed prior to the expiry of the previous construction licence therefore, PoCF have now been granted a new marine licence to cover the remaining construction works. The original dredging licence has also been extended to cover the remaining dredging required once the construction works are complete.

9.13.5 The remaining construction works are 100m of rock armour revetment, the installation of appropriate drainage, bollards and services, the installation of corrosion protection and 85m of concrete cope beam. These remaining works are anticipated to take 7 months. All piling works have been completed.

9.14 Inch Cape Offshore Windfarm (Revised Design)

9.14.1 Construction and operation of a wind farm and associated offshore transmission infrastructure 15-22km east of the Angus coastline. The development will consist of a maximum of 72 wind turbines and up to two offshore substation platforms. In addition, up to two export cables will connect the development to the landfall at Cockenzie in East Lothian. Construction activities are anticipated to start in 2021 with works taking approximately 24 months over a 3 year period.

9.14.2 Further information regarding the project can be found here.

9.15 BEAR Scotland, bridge maintenance – Kessock Bridge

9.15.1 This licence covers routine maintenance activities to be carried out on the bridge over a period of 5 years. All works will be highly localised and take place within the immediate vicinity of the bridge. With the exception of scour repairs and fender replacement, all maintenance activities will take place above MHWS. In most cases activity duration is likely to be less than three months and for several activities, duration will be less than a few weeks. The exception being the painting of the superstructure which will take approximately 4 years to complete.

9.16 Ardersier Port Development

9.16.1 The Ardersier Port Development is located at the former McDermott Fabrication Yard, which lies approximately 7.5km to the west of Nairn, 3km northeast of the village of Ardersier and is bounded by the Moray Firth to the north. The site extends to 307Ha in total (including marine and terrestrial aspects) and features an existing harbour which is protected by a naturally occurring sand and shingle spit known locally as Whiteness Head.

9.16.2 The works involve port entrance/inner channel dredging, quay wall construction/realignment and quayside (berthing) dredging. The works are scheduled to start in 2019 and take up to 5 years to complete.

9.16.3 A dredge of 2,300,000m^3 of sand will be required to deepen the port entrance to -6.5m chart datum. A cutter suction dredger will be used. An area of the inner channel will be dredged to -3m chart datum by either plough dredging, backhoe dredger or land based equipment. Once dredging has been completed, the new 464m sheet pile wall will be constructed alongside the existing quayside.

9.17 Peterhead Port Authority – Revetment Works, Alexandra Parade, Peterhead

9.17.1 The works are part of a larger project to strengthen the existing, circa 330m long, sea defence revetment at Alexandra Parade, Peterhead. The project will be completed in two phases between April 2020 and December 2022. The project includes re-profiling of the existing revetment, formation of a toe trench and placement of various sizes of rock armour and pre-cast concrete units within the toe trench to create a toe mound. Re-profiling of the existing rock armour revetment will be undertaken by removing existing concrete elements and rock armour in the revetment through the use of a crane or excavator. Remaining sections of the concrete pitched revetment will then be broken up to improve porosity using an excavator mounted rock breaker. Re-profiling of the existing bedrock and remaining revetment toe will be undertaken to facilitate revetment construction and localised toe trench formation/placement of pre-cast concrete armour base units. The toe trench will be formed using a excavator mounted rock breaker or rock wheel. A rock embankment will be constructed using 1-3 Tonne (“T”) rockfill to overlay the existing revetment. The rockfill will be placed using an excavator. Using an excavator with slings and a positioning system, 8m^3 pre-cast concrete armour base units (“Xbloc units”) will then be placed in the newly developed toe trench and overlayed with 10T rock armour to create a toe mound. To construct the revetment, an excavator with slings and a positioning system will be used to place Xbloc units on the rock embankment slope, extending from the toe structure to the crest of the revetment

9.18 Scrabster Harbour Trust – St Ola Pier Redevelopment

9.18.1 The Works involve the redevelopment of the existing St. Ola Pier at Scrabster Harbour, including extending the existing pier by 155m to provide an overall pier length of 280m long and width of 32m. This will be achieved through the partial demolition of both the existing pier and revetment to allow new pier walls and decking to be constructed which will lengthen and widen the pier

and provide straight berthing faces. The Works also include approximately 0.84ha of land reclamation to the north of St. Ola Pier. This will comprise of 0.4ha of compressed dredge material, imported fill or a mixture of both and will be topped with concrete. In addition, rock revetment will be added for protection and will reuse the rock armour from the existing revetment together with a small additional amount of new rock. Dredging will be required along the inner and outer face of the pier. The inner area of the pier is to be dredged to -7.5m CD and the outer area is to be dredged to -9m CD. The total dredge volume is estimated to be 172,000m³ and it is anticipated that 92% of the dredge material will be suitable for re-use within the land reclamation. The excess material together with any material that is found to be unsuitable, up to a maximum of 63,000m³, will be deposited at the Scrabster sea deposit site. The dredging will likely be completed by backhoe dredger given that majority of the dredge material will be reused within the site. New fuel and water lines are also to be constructed and connected to the redeveloped pier. The works are to be completed by December 2021.

9.19 Forthwind Offshore Wind Development – Methil

9.19.1 The Development consists of two, two-bladed lattice structure wind turbine generators ("WTGs"), associated infrastructure and electricity export cables approximately 1.5km off the northern shore of the Firth of Forth at Methil, Fife. The WTGs will be located in waters 10 to 20m deep, have a hub height of 109 to 121m, a maximum tip height of 198.5m and a generating capacity per turbine of up to 9MW. The maximum rotor diameter of the turbines is 155m. Each turbine will have a substructure of steel jackets with pin piles. The turbines will have three main elements i.e. rotor, nacelle and tower. The project footprint for each turbine (includes turbine foundations, trenching for export cables and jack up barge/vessel footprint) will be 37,400m². There will be an export cable for each turbine that will connect to the sub-station and control building at Fife Energy Park. Construction will take place over a 3 to 6 month period (with installation of the turbines and export cable expected to take 8 weeks) followed by testing and commissioning before becoming operational. Construction works have not yet commenced on site and the developer is currently applying to vary the permitted works.

9.20 Granton Harbour Redevelopment

9.20.1 This project forms part of the Granton Harbour Regeneration Development. On the west side of the existing west harbour, 225m of sloping masonry revetment will be reconstructed and this will be extended to the south by the construction of a new quay wall, 110m in length. This will be a sheet piled wall which will be backfilled with material from on site to reclaim land. The existing western breakwater (north mole) will be extended with a 50m concrete wall.

This will have an inclined slope of rock armour on the seaward side and an additional 25m of rock revetment on the end for additional protection.

9.20.2 A 340 berth marina will be created with floating berths and pontoons and will extend to approximately 22,879m².

9.20.3 Capital dredging will be required in the new marina area and also the approach channel. Due to contamination identified in the pre-dredge sediment analysis, all material from below 1.2m and all material from around sample locations 8 and 9 will be taken ashore for land based disposal, 154,385m³. In addition, a small amount of material will be re-used within the land reclamation, 19,322m³. The remainder of the material, 86,980m³, will be taken for sea deposit at a licensed deposit site in the Firth of Forth. Dredging will be carried out using a backhoe dredger. The works are scheduled to start in June 2019 and to be completed by May 2022.

9.21 Seals – Sea Mammal Research Unit ("SMRU") Research

9.21.1 Licence to take seals in Scotland for scientific, research or educational purposes. The proposed activities are to be carried out between 01 February 2020 until 31 January 2021. Seals are normally released after capture, unless a seal is seriously injured or disabled and has no reasonable chance of recovering. If a seal is injured while being taken, appropriate veterinary care is administered

9.22 Aberdeen Harbour West Embankment Replacement

9.22.1 Aberdeen City Council proposal to replace the existing Greyhope Road West embankment at Aberdeen Harbour. The proposal is to replace an approximately 100m long section of deteriorated pitched stone revetment with a rock revetment between the north verge of the Greyhope Road carriageway and the adjacent foreshore.

9.23 Neart na Gaoithe Offshore Wind Farm – Unexploded Ordnance ("UXO") Clearance

9.23.1 The proposal is to remove several UXO across the Neart na Gaoithe Offshore wind farm area and export cable route corridor which is located in the northeast of the Firth of Forth. Geophysical survey work is ongoing to confirm and identify UXO within the area. As this survey has not yet completed NnGOWL has applied for a marine licence and a European protected species licence based on the worst case assumption that the clearance of up to fifty UXO will be required to be detonated by conventional donor charge method (with a maximum explosive charge weight of 500kg for a single detonation).

Detonation of the UXO generates a loud underwater sound which poses a risk to marine wildlife in proximity, NnGOWL has proposed mitigation to minimise these risks including MMOs and PAM, the use of ADDs and soft start charges. NnGOWL may also micro-site to avoid UXO or relocate UXO, if this is possible. NnGOWL propose to begin the UXO clearance works in April 2020 and complete the works in June 2020.

9.24 Cromarty Community Development Trust – Slipway Improvements – Nigg

9.24.1 The works are to replace the concrete on the slipway. If funding allows, the slipway may also be extended by 20m to a total length of 60m while the width will be extended by 4m to 12m. The extension will either be built using blockwork or piles backfilled with concrete and rock fill. Blockwork would be laid on top of concrete matts and any piling would be carried out using vibro-piling.

9.25 Cromarty Community Development Trust – Slipway Improvements – Cromarty

9.25.1 The works are to replace the concrete on the slipway. If funding allows, the slipway may also be extended by 20m to a total length of 60m while the width will be extended from 5.5m to 12m. The extension will either be built using blockwork or piles backfilled with concrete and rock fill. Blockwork would be laid on top of concrete matts and any piling would be carried out using vibro-piling.

9.26 Dredging Operations

9.26.1 There are a number of dredging operations which were identified as having a likely significant effect on the Moray Firth SAC and River Dee SAC designated sites which could also be affected by the AHB proposal. The table below summarises these projects.

Table 4: Dredging operations identified as having a likely significant effect on Moray Firth SAC and River Dee SAC sites also affected by the AHB proposal

Location of Dredge	Licensee	Amount of Dredge Material	Dredge Spoil Deposit Area	Dates of Licence	Designated Site

West Harbour, Cromarty Firth	Port of Cromarty Firth	10,000 wet tonnes	Sutors	24 May 2019 – 23 May 2022	Moray Firth SAC
Cullen, Harbour	Moray Council	9990 wet tonnes	Buckie	7 February 2020 – 6 February 2023	Moray Firth SAC
Portknockie Harbour	Moray Council	9990 wet tonnes	Buckie	7 February 2020 – 6 February 2023	Moray Firth SAC
Findochty Harbour	Moray Council	9990 wet tonnes	Buckie	7 February 2020 – 6 February 2023	Moray Firth SAC
Hopeman Harbour	Moray Council	9990 wet tonnes	Burghead	7 February 2020 – 6 February 2023	Moray Firth SAC
Aberdeen Harbour	Aberdeen Harbour Board	139,500 wet tonnes	Aberdeen	18 November 2019 – 4 March 2021	River Dee SAC, Moray Firth SAC
Montrose Harbour	Montrose Port Authority	246,000 wet tonnes	Lunan Bay or trial deposit sites in Montrose Bay	5 May 2020 – 4 May 2021	Moray Firth SAC

9.27 Assessment of in combination effects on the Moray Firth SAC

9.27.1 The following projects currently have an active marine licence, section 36 consent or European protected species licence and associated AA which identified a likely significant effect on the qualifying interests of the Moray Firth SAC.

- Aberdeen Bay Offshore Wind Farm
- Beatrice Offshore Wind Farm
- Moray Offshore East Development
- Moray Offshore East Development – Modified Offshore Transmission Infrastructure
- Forth and Tay Windfarm Developments
- Hywind Scotland Pilot Park
- Neart na Gaoithe Offshore Windfarm (Revised Design)

- Port of Cromarty Firth, Phase 4
- Inch Cape Offshore Windfarm
- BEAR Scotland, Bridge Maintenance – Kessock Bridge
- Ardersier Port Development
- Moray Offshore West Development
- Peterhead Port Authority, Revetment Works
- Scrabster Harbour Trust – St Ola Pier Redevelopment
- Neart na Gaoithe Offshore Wind Farm – UXO Clearance
- Cromarty Community Development Trust – Slipway Improvements – Nigg
- Cromarty Community Development Trust – Slipway Improvements – Cromarty
- Dredging Operations
    - Aberdeen Harbour
    - Port of Cromarty Firth West Harbour
    - Cullen Harbour
    - Findochty Harbour
    - Hopemen Harbour
    - Portknockie Harbour
    - Montrose Harbour

The EIA Report assessed the in combination effects of AHEP with Beatrice Offshore Wind Farm, Moray Offshore East and West Developments, Port of Cromarty Firth Phase 4 and the Forth and Tay Wind Farm Developments including Neart na Gaoithe Offshore Windfarm and Inch Cape Offshore Windfarm on bottlenose dolphin through the iPCoD model and concluded that with the proposed mitigation in place, the changes in blasting programme and duration of AHEP do not contribute significantly to cumulative effects with other developments. MS-LOT agrees that although there may be in combination effects with these projects, the effects will not have a significant adverse impact on the integrity of the Moray Firth SAC.

9.27.2 There will also be no in combination effects with the Hywind Scotland Pilot Park as this project is in the operational phase. Noisy activities related to likely significant effects on the Moray Firth SAC were only identified during the construction phase of this project. While there might be temporal overlap with AHEP and the other projects listed above, any in combination effects are not likely to be significant providing the conditions in all of the respective AAs are adhered to.

9.27.3 **MS-LOT concludes that the AHB proposal in combination with the other projects listed above will not adversely affect the integrity of the Moray Firth SAC providing the conditions of all AAs are adhered to.**

9.28 Assessment of in combination effects on the Isle of May SAC

9.28.1 The following projects currently have an active marine licence, section 36 consent, European protected species licence or seal licence and associated AA which identified a likely significant effect on the qualifying interests of the Isle of May SAC.

- Aberdeen Bay Offshore Wind Farm
- Forth and Tay Windfarm Developments
- Forthwind Offshore Wind Development – Methil
- Neart na Gaoithe Offshore Windfarm (Revised Design)
- Inch Cape Offshore Windfarm (Revised Design)
- Granton Harbour Redevelopment
- Seals - SMRU Research
- Neart na Gaoithe Offshore Wind Farm – UXO Clearance

9.28.2 The EIA Report assessed the in combination effects of AHEP with Forth and Tay Wind Farm Developments including Neart na Gaoithe Offshore Windfarm and Inch Cape Offshore Windfarm on grey seals through the iPCoD model and concluded that with the proposed mitigation in place, the changes in blasting programme and duration of AHEP do not contribute significantly to cumulative effects with other developments. MS-LOT agrees that although there may be in combination effects with these projects, the effects will not have a significant adverse impact on the integrity of the Isle of May SAC, providing the conditions of all AAs are adhered to.

9.28.3 The Aberdeen Bay wind farm is now in the operational phase so will no longer be generating underwater noise and thus will not contribute to in combination effects. The other projects and activities listed above may overlap temporally with the AHB proposal however, if the conditions in all AAs are adhered to, any in combination effects are not likely to adversely affect the site integrity.

9.28.4 MS-LOT concludes that the AHB proposal in combination with the other projects listed above will not adversely affect the integrity of the Isle of May SAC providing the conditions of all AAs are adhered to.

9.29 Assessment of in combination effects on the River Dee SAC

9.29.1 The following projects currently have an active marine licence, section 36 consent or European protected species licence and associated AA which identified a likely significant effect on the qualifying interests of the River Dee SAC.

- Meygen Phase 1

- Aberdeen Bay Offshore Wind Farm
- Beatrice Offshore Wind Farm
- Moray Offshore East Development
- Forth and Tay Windfarm Developments
- Kincardine Offshore Windfarm Development
- Aberdeen Harbour West Embankment Replacement
- Dredging
    - Aberdeen Harbour

9.29.2 The EIA Report explains that migratory species, such as salmonids, would be expected to be able to avoid adverse turbid conditions due to their mobility, and will be tolerant to raised suspended sediment concentrations to a certain degree due to their presence in turbid estuarine environments through which they pass on their migration. Therefore, considering the low average levels of suspended sediments predicted and the general avoidance and tolerance capability of salmonids, any effects of raised sediment plumes from dredging and deposit activities at AHEP in combination with those from the Aberdeen Harbour maintenance dredging campaigns on migrating smolts will not adversely affect the site integrity of the River Dee SAC. Individual salmon may encounter other projects with noisy activities during their migration. However, it is considered that these projects are sufficiently distant from AHEP, and/or their construction timescales do not overlap, that significant in combination effects would be highly unlikely especially if the conditions of all AAs are adhered to.

9.29.3 There will also be no in combination effects with the Beatrice or Aberdeen Bay wind farms as these projects are in the operational phase. The other projects and activities listed above may overlap temporally with the AHB proposal however, if the conditions in all AAs are adhered to, any in combination effects are not likely to adversely affect the site integrity.

9.29.4 MS-LOT concludes that the AHB proposal in combination with the other projects listed above will not adversely affect the integrity of the River Dee SAC providing the conditions of all AAs are adhered to.

9.30 Assessment of in combination effects on the Ythan Estuary, Sands of Forvie and Meikle Loch SPA

9.30.1 The following project currently has an active marine licence and section 36 consent and associated AA which identified a likely significant effect on the qualifying interests of the Ythan Estuary, Sands of Forvie and Meikle Loch SPA.

- Kincardine Offshore Windfarm Development

9.30.2 There will be overlap in the construction timelines of AHEP and the installation of the remaining turbines at the Kincardine Development however providing the conditions of both AAs are adhered to, any in combination effects will not have an adverse impact on the site integrity of the SPA.

9.30.3 MS-LOT concludes that the AHB proposal in combination with the Kincardine Offshore Windfarm Development will not adversely affect the integrity of the Ythan Estuary, Sands of Forvie and Meikle Loch SPA.

10 MS-LOT Conclusion

10.1 MS-LOT concludes that providing the conditions listed in Section 4 are adhered to, there will be no adverse effect on the site integrity of the Moray Firth SAC, Isle of May SAC, River Dee SAC or Ythan Estuary, Sands of Forvie and Meikle Loch SPA from the AHB proposal either in isolation or in combination with other projects.

SECTION 4: CONDITIONS

11 Requirement for conditions

11.1 The following conditions are required to ensure the project will not adversely affect the site integrity of the Moray Firth SAC, Isle of May SAC, River Dee SAC or Ythan Estuary or Sands of Forvie and Meikle Loch SPA:

11.1.1 The licensee must ensure that all mitigation detailed in the Construction Environmental Management Document (“CEMD”) dated October 2019 is adhered to at all times. In the event that the licensee wishes to update or amend any of the protocols in the CEMD, the licensee must submit, in writing, details of proposed updates or amendments to the licensing authority for their written approval, no later than one month or at such a time as agreed with the licensing authority, prior to the planned implementation of the proposed updates or amendments. It is not permissible for any works associated with the proposed updates or amendments to proceed prior to the granting of such approvals.

11.1.2 The licensee must submit an Adaptive Blasting Management Plan (“ABMP”) to the licensing authority for its written approval at least two months prior to deposit and use of any explosives, or less if agreed by the licensing authority. The ABMP must be consistent with the marine licence application

and supporting documents and must contain, but not be limited to, the following:

a) Limitation of the incremental charge weight increase to 5kg at all times.

b) A programme of incremental charge weight increase, including details of number of blasts per charge weight and the process for when underwater noise levels approach or exceed the agreed noise thresholds.

c) A reporting strategy, including timelines to inform the licensing authority of any blasting events and subsequent underwater noise monitoring results, including both raw and calibrated peak and Sound Exposure Level ("SEL") metrics, and number of detonations used.

d) A Precautionary Control Limit ("PCL") and noise threshold using peak noise metric.

e) A plan for recording and calculating the SEL metric to inform both PCL and threshold based on latest available guidance. The maximum duration of each blast should be used for these calculations.

f) Details of the underwater noise monitoring techniques, protocols and equipment to be used and their proposed locations in Nigg Bay.

g) Details of the proposed use of Marine Mammal Observers ("MMO") and fish scarers.

h) Details of all monitoring, recording and reporting of the use of Nigg Bay by marine mammals.

All works must proceed in accordance with the approved ABMP. Any updates or amendments made to the ABMP must be submitted, in writing, to the licensing authority for its written approval no later than two months or at such a time as agreed with the licensing authority, prior to the planned implementation of the proposed amendments. It is not permissible for any use of explosives to commence prior to approval of the ABMP. In granting such approval, the licensing authority may consult any such other advisors, organisations or stakeholders as may be required at their discretion.

11.1.3 The licensee must ensure that the MMO and passive acoustic monitoring ("PAM") operators check for the presence of seals inside the double bubble curtain before it is switched on prior to blasting. The double bubble curtain must not be switched on until no seals are present inside the double bubble curtain.

11.1.4 The licensee must ensure that prior to any blasting event, no eider ducks are diving within the bubble curtain. Blasting must be delayed until the ducks have surfaced.