JACOBS

Memorandum

Subject	**Kyleakin Fish Feed Plant - HRA concerning proposals for a long sea outfall and temporary jetty**
From	Marine Harvest
Date	8 March 2017

1. Introduction

Marine Harvest (Scotland) Ltd (Marine Harvest) (the applicant) is proposing to construct and operate a fish feed plant at Kyleakin on the Isle of Skye (the proposed development). Under the Habitats Regulations, Scottish Natural Heritage (SNH) is the Competent Authority responsible for ensuring that development decisions do not adversely affect the integrity of European sites.

This memorandum is a supplement to the Report to Inform an Appropriate Assessment (RIAA) produced by the applicant to support the Habitats Regulations Appraisal (HRA) for the proposed development. It has been prepared by the applicant to capture within the HRA two additional requirements within the proposals, as listed below.

The following amendments have been made to the proposals since the submission of the RIAA to SNH in December 2016:

1. operational discharges from the proposed facility are now proposed to be released via a long sea outfall; and
2. a temporary jetty is now proposed to be used during dredging operations to land dredged material from hopper barges into lorries.

The purpose of this document is two-fold:

1. to provide SNH with the information it may require with respect to the new proposals as part of determination of the proposals; and
2. to demonstrate Marine Harvest's satisfaction of the requirements of the Habitats Regulations.

2. Background

The RIAA considered the likely interactions between the proposed development and the following marine mammal interests within the following European sites:

- Inner Hebrides and Minches Candidate Special Area of Conservation (cSAC) – Harbour porpoise (*Phocoena phocoena*); and
- Ascrib, Isay and Dunvegan SAC – Harbour seal (*Phoca vitulina*).

The RIAA concluded there was sufficient information available to rule out the potential for Adverse Effects on Integrity (AEoI) with respect to both sites. There was an acknowledgement of some temporary and short-term effects due to underwater noise from piling activities.

These conclusions were based on an assumption that effluent from the plant would be discharged over the intertidal area adjacent to the proposed development and that dredge

material would be pumped via a pipe into a former quarry. With respect to both operations (operational discharges and dredge disposal), it was considered that there were no source-receptor pathways to the marine mammal features of the two European sites under consideration.

There is now a requirement for the construction and operation of a long sea outfall pipe and for a temporary jetty. The potential effects associated with both the outfall and jetty are not currently considered within the RIAA. This document seeks to determine whether the proposals for both the outfall and jetty are likely to have significant effects on the above named SACs, either alone or in combination, such that it is necessary to alter the conclusions of the Appropriate Assessment made within the RIAA.

In light of the changes to the methodology described here, potential source-receptor pathways to the reef feature of Lochs Duich, Long and Alsh Reefs SAC were also revisited. The conclusions of the RIAA remain unchanged; it is considered there are no pathways to significant effects on the reef feature of the SAC.

3. Long sea outfall

3.1. Description

To maintain the operation of the fish feed plant, fresh water would be abstracted from the adjacent Allt Anavig burn and used to process feed. Following wastewater treatment, the discharge from this operation would go directly into the marine environment. A long sea outfall pipe would be constructed to carry the discharge effluent over the intertidal. The pipe would extend seaward of the Mean Low Water Spring (MLWS) mark to a subtidal discharge point 300m offshore.

The intertidal section of pipework would be 80m in length and approximately 20cm in diameter. This section of the pipe would run from Mean High Water Springs (MHWS) to MLWS. With the concrete mattresses protecting the pipework in the intertidal zone, a working area 20m wide would be required. The subtidal pipework would be approximately 300m in length and run from the MLWS mark to the point of subtidal discharge.

The location of the proposed outfall is illustrated in Figure 1 in the Appendix.

3.2. Construction method

Stringing and welding of the pipes would take place above MHWS. Once constructed, the intertidal pipework would be protected by concrete mattresses using an open cut method. The subtidal pipework would be floated out and pulled into position by a small vessel, potentially with diver support. The subtidal pipe would then be sunk into place with anchor blocks. Construction and placement of the long sea outfall would take approximately 3 weeks.

3.3. Operation

A single point of discharge is anticipated by way of a Tideflex type non-return valve. It is assumed that there would be a continuous operational discharge from the facility, reaching a maximum flow rate of 8.3l/s (30m^3/hr) for a maximum time of 2 hours in any 24 hour period, with an average flow rate of 5.6l/s (20m^3/hr) for the remaining 22 hours.

4. Temporary jetty

4.1. Description

A temporary jetty for landing dredge material would be constructed on the shore line at the location of the western reclamation (see Figure 1 in Appendix). The coordinates denoting the corner points of the rectangular area that would encompass the footprint of the proposed temporary jetty are:

1. 57°16.4420 N 5°45.2915 W
2. 57°16.4359 N 5°45.3124 W
3. 57°16.3901 N 5°45.2493 W
4. 57°16.3884 N 5°45.2556 W

The temporary jetty would comprise a causeway of fill (this would be local natural material from the former quarry which matches that on the seabed), with rock armour on its outer faces. The jetty would extend from the western reclamation area to the minus 1.5m or minus 2m Chart Datum contour. The end face of the jetty would be formed using steel shipping containers filled with stones and/or sheet piles to form a berthing face for barges. The sides of the causeway would be armoured with 0.35t armour stone (using long reach excavators) to protect the structure from damage from wave action.

The location of the proposed jetty is illustrated in Figure 1 in the Appendix.

4.2. Construction method

Construction is expected to be undertaken in the first 5 weeks of the contract. Granular material dug from the quarry (sands and gravel) would be tipped to form the causeway. The quantities to go in the marine licence as a temporary deposit would include the following:

- Concrete scour mats – 16m^3
- Steel shipping containers – 55.2t
- Granular fill – 7500m^3
- Rock armour – 1500m^3

Concrete scour mats would be placed on the seabed by a crane positioned on the causeway. The seabed would be levelled and the crane used to lift into place open topped steel shipping containers to form a jetty head/berthing points. The containers would then be backfilled with granular material from the quarry and another layer of containers added and

backfilled until the three container high structure is constructed. Granular fill and armour would then be laid up to the jetty head.

4.3. Operation

The jetty would be used during dredging operations to land dredged material from hopper barges into lorries. The barges would berth and moor against the end face of the jetty and an excavator or grab located on the jetty head would unload the barges. Lorries would reverse down the causeway to be loaded by the excavator, and then travel back to shore through the landside site up to the dredge disposal site on land in the former quarry. The lorries would then return to the temporary jetty.

The unloading operation would continue until the barge is empty. Another barge would then take its place to be discharged of its dredge material. The operation at the temporary jetty would continue 24 hours a day, seven days a week and is expected to continue for 14 weeks.

4.4. Removal

The temporary jetty would be removed in its entirety at the completion of dredging activities. The steel containers forming the jetty head would be emptied of granular fill by grab, lifted out by crane, placed onto trailers, and taken to shore. The scour mats would then be removed by crane and taken back to land for re-use in the permanent works. The temporary jetty fill and armour would be removed and incorporated into the western reclamation fill and armour. The seabed would be cleared and left at the same level as it was before the operation commenced. Diving inspection would confirm clearance of the seabed.

5. Consideration of potential effects

5.1. Noise and vibration

Given the short-term nature of the operation to construct and position the outfall pipework (3 weeks) and that the majority of the construction work would take place above MHWS, no significant contribution to noise and/or vibration levels across marine mammal foraging areas are predicted as a result of the proposals.

With respect to the temporary jetty, there is no requirement for any additional piling or dredging. Construction activities related to the jetty would also be short-term (anticipated to be completed within 5 weeks). The loudest underwater noise generated from the activities (beyond that already considered previously) would be the dumping of the granular material and armouring which would be within the background construction noise on the site.

Therefore, with respect to effects due to changes in visual or acoustic stimuli, the alterations to the construction methodology are not considered to alter the conclusion in the RIAA of no AEoI for either European site.

5.2. Water quality

No water quality issues are anticipated with respect to the temporary jetty. However, with respect to the outfall, changes to marine water quality through toxic contamination from the discharge entering the marine environment do have the potential to affect habitat quality, prey availability and marine mammal distribution. As apex predators, marine mammals are exposed to contaminants through the consumption of prey, especially those that bio-accumulate through the food chain. The potential exists for contamination to enter the water column from operational discharge through the outfall.

The potential for Likely Significant Effects due to changes in marine water quality could not be ruled out without further investigation. Information to inform an Appropriate Assessment of the potential effects of marine water quality due to discharges to sea is therefore provided below.

5.3. Physico-chemical content of discharge

For the HRA, it is assumed that compliance with the Environmental Quality Standards (EQS) set in the Environmental standards for Scottish waterbodies (The Scotland River Basin District (Standards) Directions 2014) will support a finding of no AEoI.

To ensure a concentration at final point of discharge that is within the environmental standards applicable to transitional waters, a similar process to that utilised by Marine Harvest at their Valsneset site (Norway) utilising Salsnes filters and the Adoxpol dissolved air flotation process is proposed for the preliminary treatment of operational discharge from the Kyleakin facility.

Initial dilution modelling (see Appendix 17.1 and Chapter 17 of the Environmental Statement to support the planning permission and marine licence for the proposed development) has indicated that the strong tidal flows would significantly reduce discharge concentrations within a short distance from the outfall. However, secondary treatment for nutrient removal would be carried out to ensure compliance with the marine EQSs (Scottish Standards).

The exact method of treatment would not be confirmed until a contractor is appointed. However, the process described herein is considered to be the most likely treatment works. After the appointment of a contractor, it is envisaged that further consultation would be carried out to ensure that the process would comply with the marine EQSs at the point of discharge.

The expected range of physico-chemical quality parameters of the discharge following wastewater treatment is provided in Table.1.

Table.1 : Expected typical or indicative ranges of physico-chemical content of discharge following primary treatment.

pH	Suspended solids (mg/l)	Phosphorous (mg/l)	Total nitrogen (mg/l)	COD (mg/l)	BOD (mg/l)	Fats, oils and grease (mg/l)
6 - 7	50 - 300	1 - 50	50 - 150	300 - 1000	300 - 700	30 40

The maximum value of ammonia at the point of discharge to comply with the marine EQSs is an annual average 21µg/l (see Table C4.5 in The Scotland River basin District (Standards) Directions 2014) (The Scottish Government, 2014). With secondary treatment via an aerated fixed film or suspended growth process, the discharge would undergo further reductions in suspended solids and organic matter and nitrification to reduce ammonia to the required levels for compliance with the marine EQSs. Initial estimates suggest that reduction of ammoniacal nitrogen will drive the level of treatment required, with potential ammoniacal nitrogen levels up to 150mg/l requiring a reduction to 10mg/l on an annual average basis in order to meet the marine EQS.

In light of the values in Table.1 and the anticipated rate of dilution after discharge, the physico-chemical content of the discharge is not anticipated to fail the Environmental standards set for Scottish waterbodies.

6. Discussion

Within the RIAA, it is established that an AEoI would result where it cannot be excluded on the basis of objective information, that an adverse effect(s) could compromise the Conservation Objectives for a European site.

The necessary components of 'favourable conservation status' for the harbour porpoise interest within the Inner Hebrides and Minches cSAC and grey seal interest within Ascrib, Isay and Dunvegan SAC are set out in full in Sections 5.7 and 6.1 of the RIAA, respectively.

In light of the proposed outfall structure, consideration has again been given to potential effects on the range, population (distribution and abundance), pressures and threats, habitat and future prospects for the Annex II interest feature species of both sites. The potential effects of the proposed long sea outfall have been considered, acting both alone and in combination with the other aspects of the proposals (as discussed in the RIAA).

In view of the relatively low and highly localised discharge volumes in question and given the applicant's commitment to ensure compliance with Scottish EQS for transitional waterbodies, the overall likelihood of adverse effects on marine mammals, or the ability of the habitat to support marine (prey) species from changes to marine water quality is considered to be very low.

The significance of any potential effects on the foraging or breeding behaviour of marine mammals would be limited by the comparably vast foraging area available to them. Even in combination with the effects of underwater noise associated with the piling operations of the proposed development, effects at the population level are considered unlikely.

It is not anticipated that the achievement of any Conservation Objectives with respect to contaminants, or any other potential effects, would be compromised as a result of the outfall and there will be no adverse effect on the European sites' integrity.

With respect to the proposed temporary jetty, no Likely Significant Effects to the marine mammal features of either European site are anticipated, either alone or in-combination with other effects.

7. Conclusion

In conclusion, the addition of the long sea outfall and proposed construction of a temporary jetty to the proposal does not alter the conclusion in the RIAA of no AEoI for either of the European sites under consideration.

8. References

The Scottish Government. August 2014. *Environmental Protection. The Scotland River Basin District (Standards) Directions 2014*

Appendix – Figure 1: Location of intertidal and subtidal sections of the proposed outfall and temporary jetty location.