Kyleakin Fish Feed Factory

Marine Harvest

Environmental Impact Assessment - Volume 2 of 4: Main Report

Chapter 20: Cumulative Impacts

Final

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Contents

20. Cumulative Impacts

20.1 Introduction

This chapter of the ES considers the potential impacts that could arise on environmental receptors as a result of either:

- **Type 1**: Multiple impacts from the Proposed Development affecting the same receptor(s); or
- **Type 2**: Impacts from the Proposed Development and other development(s) together affecting the same receptor(s).

There is recognition that the land and marine based activities of the Proposed Development may run concurrently and therefore careful consideration has been given to all activities proposed at the initial stage of this assessment. The cumulative impact assessment takes into account the residual impacts of the Proposed Development only; these being the impacts that have been assessed as having more than a **negligible** effect after the application of mitigation, whether the effect is adverse or beneficial (see **section 20.5**).

20.2 Legislation, Policy and Guidance

Schedule 3 of the Marine Works (Environmental Impact Assessment) (Amendment) Regulations 2017 states that the ES must include consideration of the cumulation of effects. The phrase 'cumulative impact' has been defined as '*impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project*' (Walker and Johnston, 1999) (Ref 20-1).

In Scotland's National Marine Plan (Marine Scotland, 2015) (Ref 20-2) specific recognition is given to cumulative impacts under GEN 21 (Chapter 4) which states '*cumulative impacts affecting the ecosystem of the marine plan area should be addressed in decision making and plan implementation*.' It goes on to add '*at a project level, such consideration will be given through Environmental Impact Assessment and Habitat Regulation Appraisal*.'

Following consultation with the relevant consultees during the Scoping Opinion (2016) (**Appendix 1.1**), Marine Scotland Science (MSS) advised that cumulative impacts be discussed. Further to this, within a meeting facilitated by SNH on 26th July 2016, the regulator MS-LOT confirmed that consideration of cumulative impacts should form a standalone chapter within the ES, supporting the Marine Licence Application.

20.3 Methodology

A cumulative impact assessment looks to establish whether the total effect upon a given environmental receptor would potentially lead to a significant impact and, if so, require further consideration and/or mitigation. In doing so consideration is given to whether an effect can manifest as additive, offsetting or synergistic. These are summarised below:

- Additive effects are the simple sum of all the residual impacts contributing toward the cumulative impact.
- Offsetting effects are where impacts interact to counteract each other to reduce the overall impact of the Proposed Development upon the environment. An example could be the offsetting of greater traffic volumes by the provision of better transport infrastructure and traffic management measures.
- Synergistic effects occur where multiple effects interact to produce a total effect that is qualitatively or quantitatively different to the sum of the individual effects. Negative synergistic effects often occur as habitats and environmental resources get close to capacity: for instance, a wildlife habitat can become progressively fragmented with limited effects on a particular species until the last fragmentation makes the area too small to support all the species.

As previously noted, only the residual impacts of the Proposed Development are considered within this chapter. Subsequently, as it is acknowledged that a number of topics within the ES did not identify any significant residual effects on environmental receptors i.e. cultural heritage, geology, air quality and odour, noise (and vibration), traffic and transport, terrestrial ecology; these topics are not considered further.

It has also been concluded that there are no developments either under construction or proposed, that would have the potential to cause a significant Type 2 impact on the land-based receptors. Consequently, only the marine based activities are considered further for their potential cumulative impacts with other developments (Type 2).

20.4 Baseline

The environmental baseline conditions in the study area for the Proposed Development are described in **Chapters 5** to **19** and are not repeated here. Each of the technical chapters considers different study areas for the specific receptors concerned. This section, therefore, provides details of other projects and considers their relevance to the assessment of Type 2 impacts.

The information on significant developments in the surrounding area was identified through examining Marine Licence Applications received by Marine Scotland and available on their website. Furthermore, following a meeting with MS-LOT in July 2016 a list of ongoing and proposed marine works was supplied by MS-LOT for consideration in the cumulative impact assessment. A list of all marine works in the vicinity of the Proposed Development with potential for a cumulative impact on a marine receptor is provided **Table 20.1**. Although the Ministry of Defence (MOD) acoustic testing range is an ongoing activity, cognisance is given to the potential cumulative effect this could have on fish and marine mammal populations, if coincident with piling works at Kyleakin.

Table 20.1 : Marine developments and activities considered for the cumulative impacts assessment

Applicant / Permission holder	Description of works	Approximate distance from the Proposed Development	Marine licence application/licence ref.	Programme update
Kishorn Port Ltd.	Regeneration of Kishorn Yard, Dry Dock and Quays, Wester Ross	15 km to the north-west	Construction licence - 05003/13/0 Mooring licence - 05074/14/0	Works not yet commenced. Construction licence valid from 1st June 2014 until 31st May 2019 Mooring licence valid until 2020
Marine Harvest	Installation of a raft, Loch Na Beiste, Loch Alsh	2 km to the east	Application - 05529	These works are now complete and are not considered further.
Kyle and Lochalsh Community Trust	Installation of 10 moorings on trots, Kyle of Lochalsh	1 km to the north	Mooring licence - 05436/15/0	These works are now complete and are not considered further.
Ministry of Defence (MOD)	BUTEC[1] underwater acoustic testing range (Inner Sound)	Approximately 20 km to the north-west		Intermittent testing periods already permitted.

As it is anticipated that construction of the Proposed Development could commence in summer 2017 there is potential for the marine works to overlap with the works at Kishorn Port, approximately 15 km away. Similarly, there is potential for the marine works (specifically piling activity) to coincide with underwater acoustic testing carried out within the Inner Sound, the nearest point of the testing range being approximately 20 km from the Proposed Development.

The works of the remaining developments identified (see **Table 20.1**) have now been completed and are not considered further in the context of cumulative impacts.

[1] The British Underwater Test and Evaluation Centre (BUTEC)

20.5 Potential Impacts

20.5.1 Type 1

A summary of residual impacts associated with the Proposed Development is provided for the construction phase (**Table 20.2**) and operation phase (**Table 20.3**). This provides details of the impact significance on receptors following the implementation of mitigation measures. It should be acknowledged that the term used to describe impact significance varies depending on the topic under consideration; however, all those impacts assessed as greater than **negligible** have been provided. Descriptions of the topic-specific terms can be found in the relevant chapters (**Chapter 5** to **19**).

Within **Chapter 18: Coastal Processes and Geomorphology**, a small magnitude of change was identified against sediment dispersion (from the sediment plume in the construction phase); and also the potential effects on geomorphology from changes to tidal flow, wave regime, sediment transport and propeller wash (during the operation phase). No impact significance was assigned to this topic (see **Chapter 18** for details) and therefore a residual impact is not defined; however, there is no potential for any significant Type 1 cumulative effect on coastal processes and geomorphology other than that already defined in the chapter.

Significant adverse residual impacts were identified on: groundwater flow (within bedrock and superficial deposits) and quality; contaminated land; landscape and visual; fluvial geomorphology; hydrology and flood risk (during construction); water quality / supply (freshwater); water quality (marine); marine ecology; and navigation. The magnitude of residual impacts varied from low / slight to moderate adverse. Significant beneficial residual impacts from the construction and operation of the Proposed Development were identified on socio-economics; and, during the operation phase only, on hydrology and flood risk.

Considering land and marine based activities, there is no potential for in-combination effects from socio-economics, landscape and visual, navigation, hydrology and flood risk, fluvial geomorphology, and groundwater flow (within bedrock and superficial deposits) over the lifetime of the Proposed Development (construction and operation). Although it is acknowledged that the capital dredging activity has the potential to affect seascape (i.e. visual), in the context of the project lifetime this small period of works (up to 14 weeks) will not have a significant cumulative impact with those activities already identified in **Chapter 14: Landscape and Visual**.

It is recognised that a number of the residual effects are in relation to the potential for contamination of a receptor i.e. land contamination, groundwater, freshwater and marine water quality (**Table 20.2** and **Table 20.3)**. However, given all the mitigation measures proposed and the adoption of good practice management measures, it is not anticipated that there would be a pathway for impact interactions to result in a new, or more significant, impact than those assigned for the individual assessment.

Several significant residual impacts listed in **Table 20.2** and **Table 20.3** relate to effects, direct or indirect, on subtidal habitats. These include habitat loss, fragmentation and degradation (from sediment dispersion) during the construction phase as well as possible habitat modification during operation of the Proposed Development, due to small changes to coastal processes. However, it is acknowledged that the increases in sediment dispersion occur predominantly over a subtidal area that will be lost during the dredging works and it is not anticipated that the impacts from sediment dispersion and habitat loss/fragmentation would result in a new, or more significant, impact on subtidal habitats than that already identified. Furthermore, it is not considered that the effects on subtidal habitats arising from the small changes in coastal processes in the operation phase would lead to an additive or synergistic effect on this feature.

Table 20.2 : Residual impacts from the construction phase of the Proposed Development

Topic/Receptor	Residual impacts
Groundwater flow and quality	
Groundwater flow within superficial deposits	Moderate significance
Groundwater flow within bedrock deposits	Slight / moderate significance
Groundwater quality	Slight significance
Contaminated land	Low significance
Landscape and visual	Significant (from the north-east only)
Fluvial geomorphology	Slight adverse
Hydrology and Flood Risk	Slight adverse
Water quality / supply (freshwater)	Slight adverse
Water quality (marine)	
Increased suspended solid load	Minor adverse
Marine ecology	
Subtidal habitats (smothering from sediment dispersion due to capital dredging)	Minor adverse
Subtidal habitats (habitat loss and fragmentation from capital dredging and general marine works)	Minor adverse
Navigation	
Recreational / fishing vessel allision with temporary jetty	Minor adverse
Dredge / construction plant allision with marine works	Minor adverse
Dredger grounding whilst engaged in operations	Minor adverse
Vessel damage due to weather conditions	Minor adverse
Socio-economic	
Enhanced local employment opportunities	Beneficial

Table 20.3 : Residual impacts from the operation phase of the Proposed Development

Topic/Receptor	Residual impacts
Groundwater flow and quality	
Groundwater flow within superficial deposits	Moderate significance
Groundwater flow within bedrock deposits	Slight / moderate significance
Groundwater quality	Slight significance
Contaminated land	Low significance
Landscape and visual	Significant (from the north east only)
Fluvial geomorphology	Moderate adverse
Hydrology and flood risk	Moderate beneficial
Water quality / supply (freshwater)	Slight adverse
Marine ecology	
Subtidal habitats (changes to coastal processes due to the presence of dredged area, pier extension)	Minor adverse
Navigation	
Allision with pier structure	Minor adverse
Allision with navigational buoy	Minor adverse
Allision with outfall marker buoy	Minor adverse
Allision with Skye Bridge	Minor adverse
Socio-economic	
Enhanced local employment opportunities	Beneficial

20.5.2 Type 2

As previously mentioned, there are no developments either under construction or proposed, that would have the potential to cause a significant Type 2 impact on the land-based receptors. Consequently, consideration is given to the potential for cumulative interactions, from the construction of proposed and ongoing marine developments, with the Proposed Development. The potential for these interactions is summarised in **Table 20.4**.

Given that there are no developments, either proposed or ongoing (see **Table 20.1**), in the vicinity of the Proposed Development that have been identified as having an adverse residual effect on coastal processes (**Chapter 18 and Appendix 18.1**), there is no potential for cumulative interactions with coastal processes and geomorphology receptors.

In terms of water quality (marine), the distance between Kishorn Yard and the Proposed Development (approximately 15 km) and the presence of strong tidal currents facilitating dispersion and dilution, leads to the

conclusion that there is no potential for these two marine developments to have a cumulative impact on water quality (marine).

Similarly, there is no potential for the marine developments identified to have a cumulative impact on navigation in the construction or operation phase of the Proposed Development.

The only topic identified for further consideration is marine ecology. All subtidal habitats that will be lost during regeneration and construction of Kishorn Yard, are of limited foraging value and whilst they provide habitat diversity, they are generally considered to be of limited conservation value (Kishorn Port Ltd., 2013) (Ref 20-3). Disturbance to a small area of burrowed mud, a Priority Marine Feature (PMF), may occur in an area of anchorage; however, this habitat is not recorded within the immediate vicinity of the Proposed Development and although this feature is found in Loch Alsh, no effects will occur on this feature as result of the construction or operation activities. Similarly, subtidal habitats which are predicted to be lost or fragmented due to construction of the Proposed Development (kelp biotopes) were not recorded within the footprint of the Kishorn Yard development.

Give the above, there is no potential for the construction of Kishorn Yard to result in a new, or more significant, impact that those assigned for the individual assessment on subtidal habitats.

Table 20.4 : Potential for cumulative impacts resulting from the construction of proposed and ongoing marine projects

Project	Potential for cumulative impacts during construction of the Development	Potential for cumulative impacts during operation of the Development
Kishorn Port Ltd.	Marine Ecology	None
Ministry of Defence (MOD)	None	Marine Ecology

It should be acknowledged that no residual impacts from the Proposed Development were identified on marine mammals or fish (non-migratory, migratory) populations following the application of specific mitigation measures in relation to noise and vibration (piling) (see **Chapter 19**). In addition, no residual effects on marine mammals and fish populations were identified from construction of Kishorn Yard. The MOD acoustic testing range is an ongoing activity. Although no formal assessment of effect is available from this range, it is likely to be a source of significant noise and vibration disturbance when in use. Cognisance is therefore given to the potential cumulative effect that this could have on fish and marine mammal populations, if coincident with piling works at Kyleakin.

The MOD have requested that pile driving works be coordinated with the MOD BUTEC range in such a manner as to reduce the coincidence of piling works with range operations (**Appendix 1.1**). It is also recognised that the piling works are a short-term activity and acknowledging the mitigation measures (see **Chapter 19)** will not lead to a significant impact on marine mammals and fish.

Given the above conclusions, leads to the assessment that the operation of the MOD testing range will not manifest in a new, or more significant, impact on marine mammal and fish populations than that already assessed from the Proposed Development. However, as already identified in **Chapter 19**, there is potential for disturbance to cetaceans during the construction phase; hence, an EPS licence application will be made following consent (**section 19.5.1.1** and **19.6.1.2**, **Chapter 19**).

20.6 Overview

No significant Type 1 impacts were identified from the Proposed Development. Moreover, no significant Type 2 impacts were identified in relation to proposed and ongoing marine developments, with the Proposed Development.

20.7 References

Ref 20-1: Walker, L. and Johnston, J. (1999). *Guidelines for the assessment of indirect and cumulative impacts as well as impact interactions.* European Commission, Luxembourg. [Online] Available from: http://ec.europa.eu/environment/archives/eia/eiastudies-and-reports/pdf/guidel.pdf. [Accessed 27.01.17].

Ref 20-2: Marine Scotland. (2015). Scotland's National Marine Plan. A Single Framework for Managing Our Seas. Report to the Scottish Government, Edinburgh. [Online] Available from: http://www.gov.scot/Resource/0047/00475466.pdf. [Accessed 27.01.17].

Ref 20-3: Kishorn Port Ltd. (2013). Planning and Environmental Statement. Regeneration of Kishorn Yard, Dry Dock and Quays, Wester Ross. [Online] Available from: http://www.gov.scot/resource/0042/00425634.pdf. [Accessed 27.01.2017].