



LURIGNISH FISH FARM

SCOPING REQUEST

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EXECUTIVE SUMMARY

Loch Long Salmon Limited (the Applicant) intends to submit an application (the Application) to Argyll and Bute Council (the Council) in terms of the Town and Planning (Scotland) Act (1997)¹, for permission to install and operate Lurignish Fish Farm and associated infrastructure (the Development).

The Development would involve the construction and operation of a semi-closed containment fish farm located approximately 0.5 km north of Lurignish Farm from Site centre, or 58 m from closest point of Site boundary, adjacent to the eastern bank of the upper reaches of Loch Linnhe in the Firth of Lorn (the Site). The location of the Site is shown on Figure 1.1.

The Development will constitute a Schedule 2 Development as provided by the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017² (The EIA Regulations), it is the intention of the Applicant to submit an Environmental Impact Assessment Report (EIA Report) along with the application for planning permission. This Scoping Report has been prepared in support of a request for a scoping opinion from the Council in terms of regulation 17 of the EIA Regulations.

This document has been prepared following a number of preliminary exercises including pre-application consultation with key consultees, desk-based assessments and site visits. This document summarises the preliminary work undertaken to date, and in line with the EIA Regulations, aims to focus the assessment solely on those environmental effects resulting from the Development that are likely to be assessed as significant. This report seeks to identify those topics and / or receptors which the Applicant considers can be scoped out of the EIA, as it is considered that they are not likely to give rise to any significant effects on the environment.

Table A provides a summary of matters that the Applicant considers can be scoped out and that do not require to be considered further within the EIA Report for the Development. The evidence, on which these decisions have been based, is described within each technical section of this document.

Table A: Technical Aspects and Assessments to be Scoped Out

Technical Area	Elements to be Scoped out of EIA
Landscape and Visual (Section 4)	<ul style="list-style-type: none"> Seascape / Landscape Character and designations outwith 10km of the Development; Those LCTs outwith the ZTV, and within 10km of the Development; Those landscape designations which have limited / fragmented visibility of the Development, which would result in non-significant indirect landscape effects on the designated landscape; Effects on visual receptors with limited or no visibility of the Development.
Benthic Ecology (Section 5)	Installation, and Operational and Decommissioning Effects on Statutory Designated Sites.
Wild Salmonids (Section 6)	Installation, Operational, and Decommissioning effects on statutory designated sites and associated Atlantic salmon populations.

¹ Town and Country Planning (1997) Town and Country Planning (Scotland) Act 1997 [Online] Available at: <https://www.legislation.gov.uk/ukpga/1997/8/contents> (Accessed 12/01/2022)

² Town and Country Planning (2017) Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 [Online] Available at: http://www.legislation.gov.uk/ssi/2017/102/pdfs/ssi_20170102_en.pdf (Accessed 02/04/2019)

Technical Area	Elements to be Scoped out of EIA
Marine Mammals (Section 7)	Disturbance, displacement and injury through the use of Acoustic Deterrent Devices (ADD)
Non-Avian Ecology – Terrestrial and Coastal (Section 8)	<ul style="list-style-type: none"> • Eileanan agus Sgeiran Lios mor SAC; • Glen Creran Woods SSSI; • Sunart SSSI; and • Woodland listed on the Ancient Woodland Inventory (Scotland).
Ornithology - Terrestrial, Coastal and Marine (Section 9)	<ul style="list-style-type: none"> • Moidart and Ardgour SPA; • Glen Etive and Glen Fyne SPA; • Inner Clyde SSSI; • Rum SPA; • Northern Colonsay and Western Cliffs SPA; and • Moray Firth SPA.
Geology, Hydrology and Hydrogeology (Section 10)	<ul style="list-style-type: none"> • Soil and geological receptors; • Designated receptors not hydrologically connected to the Development; • Public and Private Water Supplies; • Statutory Designated Sites; • GWDTEs.
Marine Water Quality (Section 11)	<ul style="list-style-type: none"> • Reduction in marine water quality due to surface and foul water discharges associated with operation of the Terrestrial Equipment; and • Sea lice bath medicine discharges to the water column.
Cultural Heritage and Archaeology (Section 12)	<ul style="list-style-type: none"> • All direct and indirect impacts to any marine heritage assets; and • All direct and indirect impacts to any onshore heritage assets.
Traffic and Transport (Section 13)	<ul style="list-style-type: none"> • Operational traffic; • Traffic associated with decommissioning; • The movements of HGVs; • Noise and vibrations.
Noise (Section 14)	<ul style="list-style-type: none"> • Vibration associated with construction or operation of the terrestrial equipment; • Noise from treatment and maintenance well boat visits and operations; • Traffic movements during the operational phase of the Development.
Land Use and Maritime Activities(Section 15)	<ul style="list-style-type: none"> • Disruption to utility infrastructure and services during construction and installation works associated with the Development; • Impacts on land use and maritime activities during decommissioning.
Socio-Economics, Tourism and Recreation (Section 16)	<ul style="list-style-type: none"> • Disruption to recreational sea users due to the construction phase of the Development.
Miscellaneous Issues (Forestry, Climate Change and Odour) (Section 17)	<ul style="list-style-type: none"> • The Development’s vulnerabilities and resilience to climate change; • Odour receptors beyond 2 km from the Site.

1 INTRODUCTION

1.1 Introduction

This Scoping Report (the Report) has been prepared by Arcus Consultancy Services Ltd (Arcus) on behalf of Loch Long Salmon Limited (the Applicant). The Applicant is proposed to submit an application (the Application) to Argyll and Bute Council (the Council) under the Town and Planning (Scotland) Act 1997³ for planning permission to install and operate Lurignish Fish Farm and associated infrastructure (the Development).

The Development would involve the construction and operation of a fish farm located approximately 0.5 km north of Lurignish Farm from Site centre, or 58 m from closest point of Site boundary, adjacent to the eastern bank of the upper reaches of Loch Linnhe in the Firth of Lorn (the Site). The location of the Site is shown on Figure 1.1, Appendix A, and is described in Section 2 of the Report. As the Site consists of two components, the Marine Equipment and the Terrestrial Equipment, for ease of reference throughout the EIA Report, the Site is divided into separate extents, as detailed on Figure 1.2: Site Boundary Plan:

- The Marine Area; and
- The Terrestrial Area;

Collectively, these areas will be referred to as 'the Site'.

It is intended that the Report will provide the required information to allow the Council, following consultation with key consultees, to provide a Scoping Opinion on the scope of the Environmental Impact Assessment (EIA) to be undertaken for the Development. Further detail on the Scoping process can be found in Section 1.4.1 of the Report.

1.2 The Applicant

The Application will be submitted on behalf of the Applicant who are a salmon farming company based in Scotland, established in 2019 to farm Atlantic salmon using semi-closed containment technology. The primary objective of using this technology is to significantly improve environmental and fish welfare outcomes associated with marine salmon farming by capturing farm waste (including uneaten feed and faeces), eliminating breeding populations of sea lice, eliminating marine mammal interactions, and controlling the farmed environment water quality.

1.3 The Development

The Development would involve the construction and operation of a fish farm on the Site, with the offshore marine area centred approximately on National Grid Reference (NGR) NM 93947 51384.

The Development would consist broadly of two components: the marine fish farm; and the shorebase, housing the fish farm support systems. The marine component of the project will include the following:

- Up to 8 semi-closed containment marine farming enclosures (the Marine Farming Enclosures);
- A square shaped semi-closed harvesting facility (the Harvesting Facility);
- Up to 2 High Density Poly Ethylene (HDPE) rings for holding freshwater supplies (the Freshwater Storage Rings);
- A mooring system and workboat moorings (the Mooring System);
- A floating pontoon for marine / shore access (the Floating Pontoon);
- A slipway (the Slipway);

³ Town and Country Planning (1997) Town and Country Planning (Scotland) Act 1997 [Online] Available at: <https://www.legislation.gov.uk/ukpga/1997/8/contents> (Accessed 12/01/2022)

- Floating feed, oxygen, data, power and wastewater pipes to supply and service the marine farm (The Floating Umbilical);
- Submerged back-up pipes (the Back-up Umbilical); and
- Underwater and navigational lighting (the Lighting).

For ease of reference, collectively, the marine components listed above will be referred to as 'the Marine Equipment' throughout this Report.

The terrestrial component of the project will include the following:

- A building containing office, workshop, sleeping quarters and storage areas and car parking for staff cars (the Office Building) and associated wastewater arrangements (which will be determined during the EIA process in discussion with SEPA);
- A new access road and junction from the A828 (the Access Track);
- Up to 8 oxygen storage vessels with a maximum height of 15 m (the Oxygen Vessels);
- Up to 8 feed silos with a maximum height of 10 m (the Feed Silos);
- Feeding equipment/air blowers etc. (or water based feeding equipment (the Feeding Equipment));
- A water treatment plant including wastewater storage tank with a maximum, height of 13 m (the Wastewater Treatment Plant) and a discharge pipe from shore extending beyond the intertidal zone into the loch (the Discharge Pipe);
- Pyrolysis Treatment System (PTS);
- De-salination Plant (the Desalination Plant);
- Mortality handling station incl. ensilage and/or incineration (the Mortality Handling Station);
- A grid connection, including electrical infrastructure and underground cables (the Grid Connection);
- Diesel driven electrical generators to provide independent back-up power and diesel storage tanks (the Back-up Generators); and
- An underground freshwater connection supply pipe (the Freshwater Supply Connection).

Some elements of the above mentioned equipment will be housed in containers.

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For ease of reference, collectively, the terrestrial components listed above will be referred to as 'the Terrestrial Equipment' throughout this Report.

Given the iterative nature of the EIA process, the layout of the Development is still being refined, and this will continue throughout the EIA process. The Development is therefore being scoped on a preliminary layout which would represent the likely geographical spread of infrastructure across the Site; the preliminary site layout is shown in Figure 1.3. Feedback received through the Scoping process will feed into the iterative design of the Development.

1.4 Environmental Impact Assessment & Scoping

The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations (2017)⁴ (EIA Regulations) implement European Union (EU) Directive 2014/52/EU⁵ which amended Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment. The EIA Regulations outline the process of an EIA and the criteria that would determine if an EIA is necessary or not, the information to be included within the Environmental Impact Assessment Report (EIA

⁴ Scottish Government (2017) Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 [Online] Available at: <http://www.legislation.gov.uk/ssi/2017/102/contents/made> (Accessed 12/01/2022)

⁵ European Commission (2014) Directive 2014/52/EU [Online] Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32014L0052> (Accessed 12/01/2022)

Report) and how an application relating to EIA development is processed by the planning authority.

Section 2(1) of the EIA Regulations defines "EIA development" as either:

- Schedule 1 Development: development of a type listed in Schedule 1 of the EIA Regulations always requires EIA; or
- Schedule 2 Development: development of a type listed in Schedule 2 of the EIA Regulations requires EIA if it is likely to have significant effects on the environment by virtue of factors such as its nature, size or location.

The Development would meet the thresholds for fish farm development contained within Schedule 2 of the EIA Regulations. It is considered that the Development would fall within the definition of EIA development and therefore require an EIA Report to be submitted with the application for planning permission.

1.4.1 Scoping Request

As per Section 17(2) of Part 4 of the EIA Regulations, the Applicant is seeking to confirm the scope of the required assessment which is to be provided in the EIA via a "Scoping Opinion" from the Council. To aid this process, this Report includes the following:

- A description of the location of the Development including figures identifying the Site and the parameters of Development;
- Figures identifying the designated and sensitive environmental receptors surrounding the Site; and
- A brief description of the nature and purpose of the Development and its potential resultant effects.

This Report has considered the different aspects of the environment likely to be significantly affected by the Development and has identified those topics which require consideration as part of the EIA, with a view to inviting comments on the approach to the EIA and the content of the Environmental Impact Assessment Report EIA Report.

1.4.2 Consultation

The process of identifying environmental effects is both iterative and cyclical, running in tandem with the iterative design process. This has already begun with pre-application consultation undertaken with the Council, community council's (incl. Appin Community Council, Duror and Kentallen Community Council) and numerous key consultees (incl. SEPA, Marine Scotland and NatureScot) since early 2021.

As the design and EIA progresses, consultation will form an integral part of the process. Throughout the EIA, public exhibitions will be held in locations near the Site providing members of the public the opportunity to learn more about the Development and give feedback and comments to the project team. Consultation on specific technical issues will also be undertaken with relevant consultees, where appropriate, as part of the EIA process. A list of consultees which Arcus would suggest the Council provide with this Report is contained in Appendix B.

2 EIA METHODOLOGY

2.1 Introduction

EIA is an iterative assessment process with the aim of avoiding or reducing the potential effects resulting from the Development through the continual refinement of the design of the Development. These effects can occur throughout all phases of the Development from construction, through operation and during decommissioning. Any potential effects will be mitigated utilising the mitigation hierarchy of avoid, reduce, offset and compensate.

The results of the EIA will be presented in an EIA Report, which as prescribed in the EIA Regulations, is required to include a "*description of the likely significant effects*" of the Development. It is therefore necessary for the scope of the EIA to be appropriately defined to ensure all significant effects are covered, whilst scoping out matters that are not considered likely to give rise to significant effects so that the EIA Report remains proportionate. Schedule 4 of the EIA Regulations details what information is required to be included within the EIA Report and states:

- *"A description of development, including location, characteristics, operational process, and estimate of residues and emissions;*
- *A description of reasonable alternatives (location, design etc.) with an indication of reasons for the chosen option;*
- *A description of the relevant aspects of the current state of the environment (the "baseline scenario") and an outline of the likely evolution without implementation of the project on the basis of available and relevant information;*
- *A description of the factors likely to be significantly affected by the development e.g. population, human health, biodiversity, water (for example hydromorphological changes, quantity and quality), cultural heritage, and landscape;*
- *The description of the likely significant effects including both direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the development.*
- *A description of the forecasting methods or evidence, used to identify and assess the significant effects on the environment, including details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information and the main uncertainties involved.*
- *A description of the measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment and, where appropriate, of any proposed monitoring arrangements.*
- *A description of the expected significant adverse effects of the development on the environment deriving from the vulnerability of the development to risks of major accidents and/or disasters which are relevant to the project concerned".*

Whilst the EIA Regulations focus on significant adverse impacts, this should not detract from those beneficial effects which can arise from such a development. Where beneficial effects arise these will also be highlighted within the EIA Report.

2.2 Scope of EIA

The aim of the Scoping process is to identify key environmental issues at an early stage, to determine which elements of the Development are likely to result in significant effects on the environment and to establish the extent of survey and assessment required for the EIA.

This Report therefore provides details of the assessment areas which will be included within the EIA Report to meet the information requirements as set out in Schedule 4 of the EIA

Regulations. These assessment areas are detailed in Sections 5 to 17 of this Report, and comprise of the following:

- Section 4: Landscape and Visual;
- Section 5: Benthic Ecology;
- Section 6: Wild Salmonids;
- Section 7: Marine Mammals;
- Section 8: Non-Avian Ecology - Terrestrial and Coastal Ecology;
- Section 9: Ornithology - Terrestrial, Coastal and Marine;
- Section 10: Geology, Hydrology and Hydrogeology;
- Section 11: Marine Water Quality;
- Section 12: Cultural Heritage and Archaeology;
- Section 13: Traffic and Transport;
- Section 14: Noise;
- Section 15: Land Use and Maritime Activities
- Section 16: Socio-Economics, Tourism and Recreation; and
- Section 17: Miscellaneous Issues (Forestry, Climate Change and Odour).

Throughout the EIA process, effects arising during the construction, operation and decommissioning phases will be assessed and mitigation measures will be considered for each assessment area, where appropriate. These considerations will also be detailed within the EIA Report.

2.3 Approach to EIA

As stated previously, EIA is an iterative process aimed at identifying and assessing the potential effects arising as a result of a proposed development. Any effects identified will be used to inform and refine the design of the Development. Where adverse effects are identified that cannot be avoided through embedded mitigation, suitable mitigation measures to reduce or offset effects will be proposed. In addition, the EIA will be used to identify potential enhancement measures that could be applied to maximise beneficial effects.

The main steps of the EIA process are broadly summarised as follows:

- **Scoping (Current Stage):** The Scoping Opinion from the Council will be used to inform and focus the scope of the EIA on likely significant effects that could be anticipated to occur as a result of the Development;
- **Baseline studies:** Desk-based assessment (DBA), baseline surveys and site visits will be undertaken, where appropriate, in order to determine the baseline conditions of the environment and area that may be affected by the Development. For the purposes of the Development, preliminary baseline studies have been undertaken to inform this Report. Desk-based assessments will be complimented by engagement with local record holders (such as the Argyll Biological Records Centre) and local community members to ensure appropriate local knowledge is integrated into the baseline, where available;
- **Predicting and assessing effects:** Potential interactions between the Development and the baseline conditions will be considered. The nature of the effects, e.g. direct or indirect; positive or negative; long, medium or short term; temporary or permanent, will be predicted and assessed. Potential cumulative effects arising from Development in conjunction with other proposed or consented developments will also be considered;
- **Mitigation and assessment of residual effects:** Potential effects will be avoided or reduced wherever possible through embedded mitigation. Where this is not possible, operational mitigation or other measures to reduce and/or offset significant effects will be proposed. The residual effects will then be assessed to determine any

effects predicted to remain following implementation of the recommended mitigation measures; and

- **Production of the EIA Report:** The results of the EIA will be set out in the EIA Report.

2.3.1 Assessment Methodology

In order to assess the potential effects arising from the Development, the significance of such effects will be determined, in accordance with the requirements of the EIA Regulations. The determination of significance is based on professional judgement; however, fundamentally, the overall effect on a receptor relates to the sensitivity of the resource or receptor being affected and the magnitude of change as a result of the effect.

The assessment of effects will combine professional judgement together with consideration of the following:

- The sensitivity of the resource or receptor under consideration;
- The magnitude of the potential effect in relation to the degree of change which occurs as a result of the Development;
- The type of effect, i.e. adverse, beneficial, neutral or uncertain;
- The probability of the effect occurring, i.e. certain, likely or unlikely; and
- Whether the effect is temporary, permanent and/or reversible.

A generalised methodology for assessing significant effects is detailed below; however, each individual technical area will have a specific assessment methodology which may vary from that detailed in the following Sections.

2.3.1.1 Sensitivity of Receptors

The sensitivity of the baseline conditions, including the importance of environmental features on or near the Site or the sensitivity of potentially affected receptors, will be assessed in line with best practice guidance, legislation, statutory designations and/or professional judgement.

Each technical assessment will specify their own appropriate sensitivity criteria that will be applied during the EIA and details will be provided in the relevant EIA Report Chapter. However, the general principles for determining the sensitivity of receptors are outlined in Table 2.1.

Table 2.1: Principle Approach for Determining Sensitivity of Receptors

Sensitivity of Receptor	Definition
Very High	The receptor has little or no ability to absorb change without fundamentally altering its present character, is of very high environmental value, or of international importance.
High	The receptor has low ability to absorb change without fundamentally altering its present character, is of high environmental value, or of national importance.
Medium	The receptor has moderate capacity to absorb change without significantly altering its present character, has some environmental value, or is of regional importance.
Low	The receptor is tolerant of change without detriment to its character, is low environmental value, or is of regional importance.
Negligible	The receptor is resistant to change and is of little environmental value.

2.3.1.2 Magnitude of Effect

The magnitude of potential effects will be identified through consideration of the Development, the degree of change to baseline conditions predicted as a result of the Development, the duration and reversibility of an effect and professional judgement, best practice guidance and legislation.

Each technical assessment will apply their own appropriate magnitude of effects criteria during the EIA, with the details provided in the relevant EIA Report Chapter. However, the general principles for assessing the magnitude of an effect are presented in Table 2.2.

Table 2.2: Principle Approach for Determining Magnitude of Effects

Magnitude of Effects	Definition
High	A fundamental change to the baseline condition of the receptor, leading to total loss or major alteration of character.
Medium	A material, partial loss or alteration of character.
Low	A slight, detectable, alteration of the baseline condition of the receptor.
Negligible	A barely distinguishable change from baseline conditions.

If effects of zero magnitude (i.e. none / no change) are identified, this will be made clear in the assessment.

2.3.1.3 Significance of Effect

The sensitivity of the receptor and the magnitude of the predicted effects will be used as a guide, in addition to professional judgement, to identify whether an effect is considered to be "significant". Table 2.3 summarises guideline criteria for assessing effects and whether these would be considered to be significant.

Table 2.3: Framework Matrix for Assessment of Effects

Magnitude of Effect	Sensitivity of Receptor				
	Very High	High	Medium	Low	Negligible
High	Major	Major	Moderate	Moderate	Minor
Medium	Major	Moderate	Moderate	Minor	Negligible
Low	Moderate	Moderate	Minor	Negligible	Negligible
Negligible	Minor	Minor	Negligible	Negligible	Negligible

Effects predicted to be of major or moderate significance are considered to be 'significant' in the context of the EIA Regulations and are shaded in light grey in Table 2.3.

Zero magnitude effects upon a receptor will result in no effect, regardless of sensitivity.

The above matrix approach will be applied to the majority of EIA chapters with the exception of those undertaken in accordance with guidance for Ecological Impact Assessment (EcIA) published by the Chartered Institute of Ecology and Environmental Management (CIEEM)⁶, which will be: Chapter 5: Benthic Ecology; Chapter 6: Wild Salmonids; Chapter 7: Marine Mammals; Chapter 8: Non-avian Ecology and; Chapter 9: Ornithology. In addition, the Seascape, Landscape and Visual Assessment will be undertaken in accordance with the Landscape Institute / Institute of Environmental

⁶ CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine [Online] Available: <https://cieem.net/wp-content/uploads/2018/08/ECIA-Guidelines-Sept-2019.pdf> [Accessed: 17/01/2022]

Management and Assessment (2013), 'Guidelines for Landscape and Visual Impact Assessment', 3rd Edition ('GLVIA3')⁷.

2.3.2 Mitigation

Where the EIA identifies significant adverse environmental effects, mitigation measures will be proposed in order to avoid, reduce, offset or compensate those effects. These mitigation measures will likely include the movement or loss of infrastructure such as the number of Marine Farming Enclosures (*i.e.* embedded mitigation); or the provision of specific measures during construction and operation phases of the Development.

The extent to which mitigation or other measures are taken into account will depend on the facts of each case. In some cases, the measures may form part of the proposal, be modest in scope or so plainly and easily achievable that it will be possible to reach a conclusion that there is no likelihood of significant environmental effects. The planning authority must have regard to the information provided by the Applicant and should interpret this both in light of the precautionary principle and taking into account the degree of uncertainty in relation to the environmental impact, bearing in mind that there may be cases where the uncertainties are such that they need to be examined in the EIA.

In addition, enhancement measures may be incorporated into design of the Development to maximise environmental benefits.

2.3.3 Residual Effects

Taking cognisance of the suggested mitigation (and enhancement) measures, the predicted effects will be assessed to determine whether any residual effects remain.

2.3.4 Cumulative

In accordance with the EIA Regulations, the assessment has considered 'cumulative effects'. By definition, these are effects that result from changes caused by present or reasonably foreseeable developments together with the Development being assessed.

At the time of writing this Report, it is known that there are operational fish farms in the vicinity of the Site, including Shuna Island Fish Farm located approximately 2 km south west of the Site centre, or 900 m from the closest point of the Site boundary.

For cumulative assessment, two types of effects will be considered:

- The combined effects of individual effects, for example benthic and water column effects or a single receptor; and
- The combined effects of several developments that may on an individual basis be insignificant but, cumulatively, may have a significant effect.

The extent of any cumulative assessment relative to each technical assessment will be agreed during the consultation process and can include both existing and proposed fish farm developments as well as other forms of development.

2.3.5 Site Selection, Alternatives and Design

Schedule 4, paragraph 2 of the EIA Regulations requires an outline of reasonable alternatives (such as technology, location, size and scale) considered and the main reasons why the Development was chosen, taking into account the environmental effects. Details of this will be provided within the EIA Report.

Consideration of alternative designs has already begun. When identifying potential sites for a new fish farm, the Applicant screened the entire west coast of Scotland against the

⁷ Landscape Institute and Institute of Environmental Management and Assessment, 2013, *Guidelines for Landscape and Visual Impact Assessment*, 3rd Edition, Routledge, London.

following criteria: depth of water; shelter from waves; proximity to power and road; Marine Scotland's locational guidelines for marine fish farms; avoidance of designated protected areas or priority marine features; distance from other marine farms; and suitability for shorebase development.

From this study, it was determined that a site in Loch Linnhe was a key leading option for development of a low-impact, semi-closed containment salmon farm. There was detailed benthic data available from the application and approval issued by SEPA under the Water Environment (Controlled Activities) (Scotland) Regulations 2011 for the Shuna Island Fish Farm located approximately 2 km south west of the Site centre. Hydrographic data was also utilised to determine the approximate local hydrological regime of Loch Linnhe.

The Site is also well served by road and grid as well as aquaculture supply chain being near equidistant to both Oban and Fort William.

Loch Linnhe has a fjordic nature where seabed topography (with shallow sills), freshwater input and meteorological forcing drive circulation⁸ Semi-closed containment technology, however, is designed to pump waste to shore for disposal and, therefore, the complex hydrological profile is less of a determining factor in site suitability. This provides an opportunity for sustainable salmon farming in sheltered areas at an economically viable biomass.

The Development design strategy will be set out, identifying the specific design principles, which design iterations will seek to meet. The final layout of the Development will be based on a range of technical criteria, such as:

- Economic viability;
- Buildability;
- A suitable depth of water;
- Shelter from waves;
- Proximity to power supply and road access;
- Corresponds with Marine Scotland's location guidelines for fish farms;
- Avoids environmental designations;
- Avoiding harm to ornithological/ecological features;
- Minimising landscape and visual impacts from relevant receptors;
- Minimising other environmental effects as far as practicable; and
- Suitable onshore conditions for a shorebase.

Consultee feedback will also inform the final design alongside the technical criteria. The design process will involve a series of iterations to improve the fit of the design to the design principles. The EIA Report Chapter will set out the changes made at each iteration, and the reasons for these changes, with reference to the design principles and input from the consultation process.

The EIA Report Chapter will contain a description of the process of site selection that led to the proposal to develop a fish farm at the Site, setting out the economic and environmental reasons for selecting this Site.

2.4 Structure and Content of the EIA Report

The content of the EIA Report will broadly follow the specifications detailed within Schedule 4 of the EIA Regulations. The EIA Report will consist of three volumes and a Non-Technical Summary (NTS).

- Volume I - Main EIA Report text;
- Volume II – EIA Report Figures, including landscape visualisations; and

⁸ Scottish Government (2015). Loch Linnhe and Firth of Lorn MASTS Case Study Workshop Report [Online] Available from: https://www.researchgate.net/publication/321229245_Loch_Linnhe_and_Firth_of_Lorn_MASTS_Case_Study_Workshop_Report

- Volume III – EIA Report Technical appendices.

The main EIA Report text will include:

- An introduction, including a summary of the EIA process and methodology;
- Description of the Site and its surroundings;
- Details of alternative considered and description of the Development;
- A summary of the relevant planning policy and environmental context; and
- Technical chapters.

The technical chapters of the EIA Report will present details of the assessments undertaken, including any cumulative effects, required mitigation and residual effects.

3 THE SITE AND DEVELOPMENT

3.1 Introduction

As detailed in Section 1.3, the Development would involve the construction and operation of a fish farm on the Site, with the offshore marine equipment centred approximately on National Grid Reference (NGR) NM 93947 51384.

The Development would consist broadly of two components: the marine fish farm; and the shorebase, housing the fish farm support systems.

The Marine Equipment of the project will include the following:

- Up to 8 semi-closed containment marine farming enclosures (the Marine Farming Enclosures);
- A square shaped semi-closed harvesting facility (the Harvesting Facility);
- Up to 2 HDPE rings for holding freshwater supplies (the Freshwater Storage Rings);
- A mooring system and workboat moorings (the Mooring System);
- A floating pontoon for marine/shore access (the Floating Pontoon);
- A slipway (the Slipway);
- Floating feed, oxygen, data, power and wastewater pipes to supply and service the marine farm (The Floating Umbilical);
- Submerged back-up pipes (the Back-up Umbilical);
- Underwater and navigational lighting (the Lighting); and

The Terrestrial Equipment of the project will include the following:

- A building(s) containing office, workshop, sleeping quarters, storage areas and car parking for staff (the Office Building) and associated wastewater arrangements (which will be determined during the EIA process in discussion with SEPA);
- A new access road and junction from the A828 (the Access Track);
- Up to 8 oxygen storage vessels with a maximum height of 15 m (the Oxygen Vessels);
- Up to 8 feed silos with a maximum height of 10 m (The Feed Silos);
- Feeding equipment/air blowers or water-based feeding equipment (the Feeding Equipment);
- A water treatment plant including wastewater storage tank with a maximum, height of 13 m (the Wastewater Treatment Plant) and a discharge pipe from shore extending beyond the intertidal zone into the loch (the Discharge Pipe);
- Pyrolysis Treatment System (PTS);
- De-salination plant (the De-salination Plant);
- Mortality handling station incl. ensilage and/or incineration (the Mortality Handling Station);
- A grid connection, including electrical infrastructure and underground cables (the Grid Connection); and
- Diesel driven electrical generators to provide independent back-up power and diesel storage tanks (the Back-up Generators); and
- An underground freshwater connection supply pipe (the Freshwater Connection).

Some elements of the above mentioned equipment will be housed in containers.

Given the iterative nature of the EIA process, the layout of the Development is still being refined, and this will continue throughout the EIA process until all baseline surveys are completed. The Development is therefore being scoped on a preliminary layout which would represent the likely geographical spread of infrastructure across the Site; the preliminary site layout is shown in Figure 1.3. The results of the Scoping process will feed into the iterative design of the Development.

The following sections provide an overview of the elements considered likely to be included in the final design of the Development.

3.2 Development Infrastructure Outline

3.2.1 Marine Equipment

3.2.1.1 Marine Farming Enclosures

The Marine Farming Enclosures will consist of semi-closed farming technology which has a salmon-rearing enclosure suspended from a surface float collar. Semi-closed systems have a number of additional components designed to provide environmental and fish welfare benefits.

The Marine Farming Enclosure's wall is a flexible, opaque and impermeable material suspended from the float collar and tapering to a point (Figure 3.1). The Marine Farming Enclosure wall is constructed from a marine fabric that is opaque and impermeable. This is attached to the float collar and prevents water from entering the Marine Farming Enclosure. Inside the bag is a small mesh net, typically seen in salmon farms; this functions in fish handling and management and provides an additional barrier between the fish and the open water. The net will aid stock handling for harvesting, grading or transfer. This net also acts as a double barrier to prevent escapees. The salmon will be fed pellets during the day and any pellets which are not eaten will sink to the bottom of the Marine Farming Enclosure and will be collected in the sump.

There will be pipes which will house the submersible low-head pumps which hang from the float collar to a depth of 20 m to 30 m and provide sea water to the system. The inlet pump rate maintains an overpressure inside the bag which keeps the bag in tension and maintains the bag's shape and rigidity.

Water is pumped through the Marine Farming Enclosures by submersible pumps located inside riser pipes that are suspended from the float collar. These pumps continually draw water from at least 20 m deep of the water column zone into the system. The water will be pulled from below the top 20 m of the water column (the planktonic life stage of sea lice typically lives to a maximum depth 5 m to 8 m) which will greatly reduce or completely prevent sea lice entering the system and will prevent a breeding population becoming established in the Marine Farming Enclosure. Similar established systems used in Norway have never had to treat for sea lice (over multiple years of operation in multiple locations), while neighbouring traditional net pens co-located on the same licence have required sea lice treatments⁹.

Feed and faecal waste settles and collects at the bottom of the system and is pumped out via an external discharge hose which sends the waste stream to the shore for treatment. Water exits the Marine Farming Enclosure through a series of ports; some light fractions of faeces are lost with this water but the majority of the waste, particularly the heavier fractions are captured in the sump at the bottom of the system. The waste is pumped from the sump and transported back to the Terrestrial Area for treatment via a low-pressure surface pipe which forms part of the Floating Umbilical. Further detail on the Floating Umbilical can be found in Section 3.2.1.3 of this Report.

There will be a back-up submerged umbilical containing additional power and oxygen lines. This secondary back-up umbilical will provide power and oxygen in the event of a failure in the primary umbilical. This back-up umbilical can be powered directly from the grid or via the back-up generators. In the event of a grid power failure, there will be at least two

⁹ Nilsen et al (2017) Effective protection against sea lice during the production of Atlantic salmon in floating enclosures, 446 41-50.

separate back-up generator systems, and with either one of these back-up power systems, running waste will continue to be pumped ashore and treated.

Feed is supplied to the salmon from the Feed Silos on the shorebase to the Marine Enclosures via floating feed lines by an automated feeding system that is monitored by underwater cameras. The feed is carried along the feed lines by water (waterborne feed delivery) or air (airborne feeding). Oxygen is provided to the Marine Farming Enclosure's water through a number of drop-in oxygenation units that are supplied with oxygen from Oxygen Vessels. Sensors & cameras in the system continually feedback various water quality readings to the Office Building, including oxygen saturation, pH and temperature.

As detailed above, each of the Marine Farming Enclosures have a near-circular collar which is approximately 2 m wide and sits up to 1.5 m above the water line. This float collar provides buoyancy to allow the rest of the structure to hang beneath. Each float collar holds a number of items such as control cabinets, pipes, handrails, a splash board and bird net (up to 5 m above the collar). Control panels and supply lines are fixed to the surface walkway.

Electrical systems may be housed in containers stationed on one or all of the collars depending on the equipment supplier that is selected. The final design of the electrical system containers will be subject to the engineers' and Marine Farming Enclosure supplier's specifications and the final design will be agreed with the Council.

There are up to 8 Marine Farming Enclosures proposed as part of the Development either in a 4x4 geometric grid formation with a symmetrical layout of enclosures set out in linear pairs, or in a single formation. Given the iterative nature of the EIA process, the layout of the Marine Farming Enclosures is still being refined; however, for illustrative purposes only, the semi-closed marine enclosure is depicted in the graphic below.



Plate 3.1: Indicative diagram of the semi-closed marine enclosure.

3.2.1.2 *Harvesting Facility*

There are two farming models currently being considered: a complete entry to harvest farming model; and a post-smolt model.

Entry to Harvest Model

When adopting the entry to harvest farming model, there will be up to eight circular shaped semi-closed containment Marine Farming Enclosures on the farm. Fish will be introduced to these Marine Farming Enclosures sequentially, with one system being stocked each month over a period of four months. Once stocked into the farm the fish will be reared for approximately 11 or 12 months before the first harvest is undertaken. The largest fish will be removed from the first Marine Farming Enclosure and transferred into the Harvesting Facility, via a well boat. This stock will then be harvested over a period of one to eight days.

This process will be repeated sequentially, as the fish reach an appropriate size until the final harvests that will result in the rearing enclosure being completely emptied.

The Harvesting Facility will also adopt a semi-closed system. This square semi-closed containment Harvesting Facility will have a maximum side length of 50 m and as per the Marine Farming Enclosures, will have a floating collar which is approximately 2 m wide and sits up to 1.5 m above the water line.

The Harvesting Facility will be divided up into four sub-enclosures to allow for a staged harvest.

Post-smolt Model

This model will have salmon reared from smolt size (50g to 100g) for up to ten months to 0.7-1.5 kilograms (kg) before transporting them live to another site for on-growing. In this model, fish would be entered into the Marine Farming Enclosures over a period of weeks. The rearing process would be completed within five to 10 months. The 'post-smolt' would then be taken directly from the Marine Farming Enclosures on well boats to other farming sites to complete their growth to 5 kg+ average weight.

3.2.1.3 *Freshwater Storage at sea*

Freshwater can be used to improve gill health in farmed salmon. This needs to be readily available in large quantities. Up to 2 floating plastic rings with a maximum diameter of 40m will be used for this purpose. These plastic rings will have an impermeable and opaque tarpaulin bag that will be used to store freshwater on site. Water in these enclosures would be supplied by well boat or pumped from the shore. When required this water would be pumped into the farming enclosures or treatment vessel. These enclosures would never hold any fish or chemicals.

3.2.1.4 *Floating Umbilical*

The pipes which supply the Marine Farming Enclosures with feed, power and oxygen as well as providing the route for waste removal and data transmission, will extend from a central point in the Marine Farming Enclosures and back to the Terrestrial Equipment. The Floating Umbilical will be floating, bundled, marked and secured appropriately. The Floating Umbilical will consist of high-density polyethylene (HDPE) pipes from the Terrestrial Area to the Marine Farming Enclosures; these pipes will float on the surface of the water as part of the primary Floating Umbilical. Where possible and practical, the pipes required to supply the Marine Farming Enclosures from the Terrestrial Equipment will come as one piece, restricting the need for additional joins. The Floating Umbilical pipes will be black and the bundle will total an approximate width of up to 2 m.

As detailed in Section 4.3.1.1, the Floating Umbilical will include a back-up submerged umbilical containing additional power and oxygen lines. This secondary back-up umbilical will provide power and oxygen in the event of a failure in the primary umbilical. Power and oxygen supply are sufficient to maintain critical life support for the farmed salmon while the primary umbilical is repaired. Feeding would be suspended if there was a primary umbilical failure. With no feeding there will be no solid waste and therefore no requirement for a waste transfer capability in the secondary back-up systems.

3.2.1.5 Mooring System

The Mooring System will have a footprint which is not dissimilar to existing, more exposed, locations on the west coast of Scotland extending in a rectangular box measuring up to 250 m outwards from the grid containing the Marine Farming Enclosures and Harvesting Facility. A comprehensive mooring analysis, in accordance with the Technical Standard for Scottish Finfish Aquaculture¹⁰, will be undertaken later in project development after planning permission has been granted, which will determine the detailed design of the Mooring System based on the wind and wave climate and tidal flow at the site with the recommended and appropriate safety factors applied. The final design of the Mooring System will be agreed with the Council and relevant stakeholders prior to deployment.

Up to four additional moorings will be installed for workboats between the Marine Farming Enclosures and Terrestrial Area. These will be marked as per the advice of the NLB, typically for marine farms requires yellow Special Mark poles or buoys¹¹.

3.2.1.6 Floating Pontoon and Slipway

A flexible 'T' or 'L' shaped Floating Pontoon will run from the Terrestrial Area, extending out into the loch. The Floating Pontoon will be approximately 2.5 m in width and up to 1 m in height from the water's surface. It will be marked appropriately as required by the Northern Lighthouse Board. The Floating Pontoon will be used to moor small boats, used to transfer crew to and from the Marine Farming Enclosures, and the larger workboats. The Floating Pontoon walkway will be black or grey and will be lit with safety lighting along the length of the Floating Pontoon extending out to each terminus when working in poor visibility and/or darkness; these lights will be switched off when staff are not present.

The Slipway, which will be used for launching and recovering watercraft. To allow for a safe road gradient, the Slipway will be designed along the shorefront where the gradient is suitable for vehicular access.

3.2.1.7 Lighting

All navigation lighting or other marking will be compliant with any requirement from the NLB, Harbour Authority or Marine and Coastguard Agency.

The Development will use underwater lights for part of the growing cycle to reduce and eliminate early stock maturation. The exact timing of light use will be dependent on the requirements, as advised by the latest scientific advice, and on the following period.

3.2.2 Terrestrial Equipment

¹⁰ Marine Scotland (2015). A Technical Standard for Scottish Finfish Aquaculture [Online]. Available from: <https://www.gov.scot/publications/technical-standard-scottish-fish-farming-aquaculture/> (Accessed: 07/09/2022)

¹¹ Northern Lighthouse Board (2021) Inspection Audit of Local Aids to Navigation, Offshore Structures & Aquaculture Sites – 2020/21 Report [Online] Available from: <https://www.nlb.org.uk/wp-content/uploads/2020-21-NLB-LLA-Offshore-Annual-Report.pdf> [Accessed 28/06/2022].

3.2.2.1 The Office Building

The Terrestrial Equipment includes the Office Building which will consist of a single storey building which will be of simple construction and will be composed of insulated composite panel construction, powder coated in a suitable colour to match the surroundings. The Office Building will contain offices, workshop space, storage space, a small laboratory, a dry room, a pantry, bathrooms and a small sleeping quarter for on-call staff throughout the night. Only limited quantities of water will be required to provide water for the human welfare facilities and the necessary licences will be applied for through Scottish Environment Protection Agency (SEPA) for these features.

Car parking spaces will be located outside the Office Building; the yard will be used as an outdoor working space for maintenance works and receipt of deliveries etc. The yard will be floodlit when working in poor visibility and in darkness. There will be a security light positioned by the site entrance and at the main door and workshop entrances of the Office Building.

3.2.2.2 The Oxygen Vessels

Up to eight Oxygen Vessels with a maximum height of 15 m be located at the Terrestrial Area. These tanks will hold liquid oxygen and will release a regulator-controlled supply of oxygen to the vaporiser, where it will transform from liquid to gas. If the storage capacity of liquid oxygen exceeds 200T a Hazardous Substances Consent will be secured.

3.2.2.3 The Feed Silos

A feed delivery system will be used and will be located onshore as part of the Terrestrial Equipment. Feed will be transported in air or water via the Floating Umbilical as described in Section 3.2.1.3.

There will be bulk Feed Silos on land and associated feed blower/water pump equipment i.e. the Feeding Equipment. Feed consumption will be monitored by staff on land in the Office Building via a camera system mounted above and within the Marine Farming Enclosures linked to monitors in the Office Building.

3.2.2.4 Waste and Water Management

The Wastewater Treatment Plant will be within self-contained units which consist of a screen, coagulation and dissolved air flotation units (commonly known as DAF) as well as various other pieces of water treatment equipment. The Wastewater Treatment Plant will receive the dilute water stream pumped from the individual Marine Farming Enclosures and will dewater the waste to a usable slurry or cake with high carbon, nitrogen and phosphate content. The waste may be pyrolyzed on site, to reduce water content down further producing a very dry and high carbon form of charcoal.

The system will be designed to treat the waste without the use of hazardous chemicals. The dewatering equipment has been specified to be at least 95% efficient and all the water removed from the waste stream is safely pumped back into the loch via a discharge pipe on site. An additional licence under the Water Environment (Controlled Activities) (Scotland) Regulations 2011 (a "CAR licence") will be applied for, for the outfall of the discharge pipe. The discharge pipe will be positioned between the Wastewater Treatment Plant and the Marine Farming Enclosures and run out into the loch well beyond the depth of mean low water springs; the entire on land Wastewater Treatment Plant, including the storage tank, will be bunded to prevent spillage in the event of a storage tank failure.

The waste will be collected on a near-daily basis by a waste management specialist operator. The waste will be in the form of a slurry or cake and will be removed from the Site by tanker or truck and will be suitable to be used a fertiliser ingredient or an anaerobic

digester feedstock. The best circular economy options for utilising waste will be continually reviewed and if suitable adopted throughout the life of the Development.

Although the primary preference is to supply the Site with feed and remove waste from the Site via road, in future this may be undertaken via sea, particularly in instances when the road is blocked.

3.2.2.5 Pyrolysis Treatment System

A Pyrolysis Treatment System (PTS) may be utilised to treat the organic biomass waste from the fish farm including faecal matter and food waste. The purpose of the PTS is to transform the waste slurry into a dry biochar which has numerous applications in the circular economy and reduces cost and emissions from the freight associated with the utilisation of the waste.

3.2.2.6 The Mortality Handling Station

There will be an automatic air-lift mortality removal system within each of the Marine Farming Enclosures; mortality removal will take place at least three days a week. The mortalities will be collected at the surface of the Marine Farming Enclosures by staff and then will be assessed for cause of death; they will then be stored in containers and transferred to Terrestrial Area. Dead fish will either be incinerated on Site, put into the Mortality Handling Station onsite, or transferred into a sealed container for removal.

Mortality handling and disposal will also be covered in the Waste Management Plan.

3.2.2.7 Grid Connection

The Site will be connected to the electricity grid by power cable from a suitable location at the closest grid terminus. This cable will terminate at the Terrestrial Area at an 11kV Ring Main Unit which is a closed unit. A short section of the cable may require laying across the A828. The local distribution company may need to make other upgrades along the power route, which will be determined at a later date and not form part of this application.

3.2.2.8 Back-up Generators

There will be up to four backup generators included as part of the Terrestrial Equipment which will each be contained within a soundproof canopy. The generators will only be operated for short periods each month for testing and maintenance and will be fuelled by diesel (stored on site) and used for extended periods in the event of a grid failure.

3.2.2.9 Freshwater Connection

A new underground freshwater connection supply pipe will be installed to supply the Terrestrial Equipment. The Freshwater Connection pipe is anticipated to be installed under the A828 and the connection will come from an existing freshwater supply line.

3.2.2.10 Desalination Plant

A desalination plant may be installed on the shorebase to produce fresh water for gill health treatments. This plant would run as required to fill the freshwater storage rings that would store water until it was required. The freshwater would be pumped from the desalination plant to the Freshwater Storage Rings via a floating pipe that would be incorporated into the Floating Umbilical.

3.2.3 Husbandry

In addition to the innovative engineering designs outlined in Section 3.2, the Development will also ensure good husbandry and enhanced welfare by using expert veterinary services where appropriate. A site-specific Farm Management Plan (FMP) will be implemented during operation as will an Environmental Management Plan (EMP). These incorporate the key environmental measures, an Escapes Prevention Strategy (EPS) and also the Predator Exclusion Plan (PEP). A draft FMP & EMP for the Development will be submitted with the EIA Report.

3.2.4 Production Cycle

A proposed production cycle of up to 8,000 tonnes maximum standing biomass is expected.

An application will be made by the Applicant to SEPA for CAR licences covering the Development. The pre-application CAR license proposal was submitted to SEPA in February 2022 and was published on SEPA's website in June 2022. The maximum weight of fish held at any time at the Development shall not exceed the total biomass granted in the CAR license. It is expected that no sea lice medications will be applied through the CAR licence.

3.2.5 Fish Health and Welfare

The Applicant will have a dedicated team of farmers and fish health experts who are responsible for regular health checks, and monitoring and managing biosecurity issues throughout the company's operations. The Applicant's focus is on the prevention of disease and maintaining good fish health and welfare through the design process. Rather than conventional open net pens, semi-closed containment farming systems pump water from the surrounding waterbody into an enclosure surrounded by an impermeable and opaque bag which contains an internal net. This isolates the farmed environment from the external environment and brings the following key environmental and fish health and welfare benefits:

- The barrier prevents sea lice from entering the enclosures, preventing parasitic burden on farmed fish and transmittal back to wild populations;
- With no sea lice outbreaks, chemical treatments for sea lice, usually applied indirectly to the fish via the pen water or directly in the feed, are not required. This brings benefits in terms of fish welfare, as well as reduced impacts on water quality and benthic ecology;
- With no physical or chemical sea lice treatments required, fish are less susceptible to other bacterial and viral pathogens;
- The semi-closed containment technology allows for waste to be collected in a sump at the bottom of the enclosure, to be removed from the site, rather than dispersed across the seabed, reducing benthic impact per kilo of salmon farmed. Treated waste is likely to have several circular economy uses, such as fertiliser ingredient and anaerobic digester feedstock for energy;
- The semi-closed containment technology allows greater control of the water quality within it, by improving flow rate, oxygen saturation and temperature regulation, allowing for healthy fish to be grown with a reduced marine footprint. Fish stocks grown in these systems in Norway, the Faroes and Canada have demonstrated lower mortalities and faster growth rates, both proxy metrics for improved welfare;
- The impermeable and opaque barrier reduces interest and interference from marine predators by removing visual cues of farmed stock from predators e.g. seals. This eliminates the requirement for underwater acoustic deterrent devices; and
- The double barrier combination of impermeable bag and internal net reduces the risk of salmon escaping from the marine farming enclosures, therefore, reducing the risk of escapees interacting with wild salmon stocks. With increased stocking

density the technology requires less enclosures than open net pens for a given biomass. This reduces the visual impact and the area of seabed required when compared with open net pen sites.

The Applicant will submit details regarding fish health and welfare to Marine Scotland as part of the Aquaculture Production Business licencing process. This will be reviewed after the Planning Permission decision has been made as this does not form part of the formal planning assessment. The Applicant anticipates this to be the subject of a planning condition associated with the Development. A draft FMP and EMP will be submitted as part of the Application process.

3.2.6 Sea Lice

The salmon louse is the most common parasite on farmed salmon, and is one of the challenges facing the aquaculture industry. The primary objective of the Development design will be to eliminate sea lice in the farmed environment and capture the majority of the farm waste, uneaten feed and faeces. As detailed in above, the Marine Farming Enclosures will pull water from at least 20 m deep. This is below the zone where the planktonic life stage of sea lice lives and this will almost eliminate the ingress of sea lice to the farmed environment and will prevent a breeding population becoming established in the Marine Farming Enclosure. Similar established systems used in Norway have never had to treat for sea lice (over multiple years of operation in multiple locations), while neighbouring conventional open net enclosures co-located on the same licence have required sea lice treatments.

A Sea Lice Management Strategy will be included in a Draft Farm Management Plan submitted as part of the EIA Report and will include a suite of preventative, management and monitoring measures to prevent the introduction of farm-derived sea lice in wild salmonids. The Applicant is not applying for sea lice medicines, but, after consultation with Marine Scotland, will have sea lice management protocols in place in the unlikely event that sea lice treatment is required. This will include physical removal with theromlicer, hydrolicer, hydrogen peroxide, or freshwater.

Weekly sea lice counts will be undertaken as part of a suite of fish health monitoring activities at the marine farm.

The risk of infection by other pathogens will be managed through the prioritisation of fish welfare. Fish husbandry will be carried out in accordance with best practices recommended in the Scottish Salmon Producers Organisation (SSPO) Code of Good Practice (CoGP)¹² as well as any further practices required by Marine Scotland Science.

3.3 Site Access

Staff access to the Terrestrial Area will be by vehicle and then by boat to the Marine Farming Enclosures and Harvesting Facility.

The Terrestrial Area will be accessed via a new track from the existing A828 road. The entrance junction and location of the site access will be determined by the final location of the Terrestrial Equipment and to ensure safe entry/egress from the site onto the A828.

3.3.1 Development Phases

It is expected that the construction phase of the Development will take approximately 18 months, depending on the final design. This period is weather dependant and could be affected by onsite conditions.

¹² Scottish Salmon Producers Organisation (SSPO) (2015) Code of Good Practice [Online] Available at: <https://www.scottishsalmon.co.uk/code-of-good-practice> (Accessed 12/01/2022)

At the end of its operational life, the Development will be decommissioned or renewed. For the purposes of the EIA, it has been assumed that the Development will be decommissioned, as renewing and upgrading will involve an additional application for planning permission and a further EIA.

4 SEASCAPE, LANDSCAPE & VISUAL ASSESSMENT

4.1 Introduction

This Section sets out the proposed methodology and approach to be applied in the production of the Seascape, Landscape and Visual Impact Assessment (SLVIA) to accompany the application for the Development and presents the suggested scope of the SLVIA in terms of those seascape, landscape and visual receptors to be scoped in and scoped out of the assessment process based on a preliminary assessment of relevant receptors to the Development.

The purpose of the LVIA is to identify and record the potential significant effects that the Development may have on physical elements of the seascape and landscape; seascape / landscape character; areas that have been designated for their scenic or landscape-related qualities; and views from various locations such as settlements, routes, hilltops and other sensitive locations. The potential cumulative effects that may arise from the addition of the Development to other aquaculture developments are also considered.

The SLVIA will consider the potential effects of the Development during the following development stages:

- Construction of the Development; and
- Operation of the Development; and
- Decommissioning of the Development

4.2 Study Area

The Study Area covers a 10 km radius from the marine and terrestrial areas, and includes the central area of the sea loch of Loch Linnhe. The eastern side of the loch is subject to more development, with settlements and a road corridor north of Oban, to Portnacroish and Kentallen within the Study Area, and on to Fort William at the north of the loch. Port Appin and Lismore Island are also located within the Study Area.

"The area has a distinctive topography with a strong southwest-northeast alignment. A series of low, rocky ridges separate narrow, linear glens. The ridges form low, narrow coastal peninsulas, ending in rocky off-shore islands, which enclose small, horseshoe-shaped coves. The ridges become lower and less pronounced to the south, where the landform flattens to form extensive areas of peaty moss."¹³

On the western side of the loch, the steep valley sides of the loch restrict road access and residential properties to the loch edge.

Commercial forestry areas are located to the north east and east of the Study Area, and west of the loch, the steep rough rocky land cover, grassy ridges.

Beyond 10 km, the Development is unlikely to be perceptible within the landscape due to its limited scale, and low profile.

The 10km radius wider Study Area has been defined based on the ZTV (Figure 4.4), site assessment and following guidance within the NatureScot (2018) Visualisations for Aquaculture guidance which states:

"where a proposal is sited in an open or expansive coast, the ZTV radius will be greater, e.g. 7km or up to 10km; other factors such as complex seaways or straits, or the presence of ferry routes, or sensitive viewpoints may require a larger ZTV radius to ensure they are appropriately considered..."

¹³ Scottish Landscape Character Types Map & Descriptions. Available online at: <https://www.nature.scot/professional-advice/landscape/landscape-character-assessment/scottish-landscape-character-types-map-and-descriptions>. (Accessed 07.02.22) LCT 51- Lowland Ridges & Moss

Following the site assessment, a smaller, Detailed Study Area (DSA) within 5 km may be adopted, to focus on the areas where the greatest seascape, landscape and visual impacts may occur. A 2 km radius will be used for the assessment of residential properties, given the lightly settled nature of the location, and the potential visibility along the loch edge north and south of the Development.

4.3 Assessment Methodology

The methodology for the SLVIA is based on current best practice guidance, namely:

- Landscape Institute/ Institute of Environmental Management and Assessment (2013), 'Guidelines for Landscape and Visual Impact Assessment', 3rd Edition ('GLVIA3')¹⁴;
- Landscape Institute (2013), GLVIA3 Statement of Clarification 1/13¹⁵;
- Landscape Institute (2019), 'Visual Representation of Development Proposals', Technical Guidance Note¹⁶;
- Landscape Institute (2019), Residential Visual Amenity Assessment TGN 2/19¹⁷;
- NatureScot (formerly Scottish Natural Heritage (SNH)) and The Countryside Agency (2002) Landscape Character Assessment Guidance for Scotland and England;
- NatureScot (2018) Visualisations for Aquaculture¹⁸;
- NatureScot (2011) The siting and design of aquaculture in the landscape: visual and landscape considerations¹⁹; and
- NatureScot (2008) Guidance on Landscape/Seascape Capacity for Aquaculture²⁰.

The two components of SLVIA referred to throughout this Report are based on the following definitions:

- 'Assessment of seascape / landscape effects: assessing effects on the seascape / landscape as a resource in its own right'²¹; and
- 'Assessment of visual effects: assessing effects on specific views and on the general visual amenity experienced by people.'²²

The Development may have a direct (physical) effect on the seascape and landscape in which it is located as well as an indirect or perceived effect from landscape character areas surrounding it. The potential landscape effects, occurring during the installation and operation of the Development may therefore include, but are not restricted to, the following:

¹⁴ Landscape Institute and Institute of Environmental Management and Assessment, 2013, *Guidelines for Landscape and Visual Impact Assessment*, 3rd Edition, Routledge, London.

¹⁵ The Landscape Institute (2015) GLVIA3 – Statements of Clarification. Available online at: <https://www.landscapeinstitute.org/technical-resource/glvia3-clarifications/> (Accessed 07/02/2022)

¹⁶ The Landscape Institute, *Visual Representation of Development Proposals, Technical Guidance Note 06/19*, 17th September 2019.

¹⁷ Landscape Institute, *Residential Visual Amenity Assessment (RVAA) Technical Guidance Note 02/19* 15th March 2019. Available online at: <https://landscapewpstorage01.blob.core.windows.net/www-landscapeinstitute-org/2019/03/tgn-02-2019-ryaa.pdf>

¹⁸ Nature Scot (February 2018) Visualisations for Aquaculture - Guidance Note. Available online at: <https://www.nature.scot/sites/default/files/2018-02/Visualisations%20for%20Aquaculture%20-%20Guidance%20%20Note.pdf> (Accessed 07/02/2022)¹⁹ NatureScot (November 2011) The siting and design of aquaculture in the landscape: visual and landscape considerations. Prepared by Alison Grant, Landscape Architect. Available online at:

<https://www.nature.scot/sites/default/files/2017-07/Publication%202011%20-%20The%20siting%20and%20design%20of%20aquaculture%20in%20the%20landscape%20-%20visual%20and%20landscape%20considerations.pdf> (Accessed 07/02/2022)

¹⁹ NatureScot (November 2011) The siting and design of aquaculture in the landscape: visual and landscape considerations. Prepared by Alison Grant, Landscape Architect. Available online at: <https://www.nature.scot/sites/default/files/2017-07/Publication%202011%20-%20The%20siting%20and%20design%20of%20aquaculture%20in%20the%20landscape%20-%20visual%20and%20landscape%20considerations.pdf> (Accessed 07/02/2022)

²⁰ NatureScot (2008) Guidance on Landscape / Seascape Capacity for Aquaculture. Available on line at: [SNH1683 \(nature.scot\)](https://www.nature.scot/sites/default/files/2008-02/SNH1683%20-%20Guidance%20on%20Landscape%20-%20Seascape%20Capacity%20for%20Aquaculture.pdf) (Accessed 07/02/2022)

²¹ Landscape Institute and Institute of Environmental Management and Assessment, 2013, *Guidelines for Landscape and Visual Impact Assessment*, 3rd Edition, Routledge, London. Paragraph. 2.21, page 21. (Accessed 07/02/2022)

²² Ibid. 16, page 21.

- Changes to landscape and seascape elements: the addition / revision of new elements and other characteristic elements of the landscape character type;
- Changes to landscape and seascape qualities: degradation, erosion, or reinforcement of landscape elements and patterns, and perceptual characteristics, particularly those that form key characteristic elements of landscape character types;
- Changes to landscape and seascape character: landscape and seascape character may be affected through the effect on characteristic elements (including perceptual characteristics), landscape patterns and attributes and the cumulative addition of new features, the magnitude and presence of which is sufficient to alter a notable part of the overall landscape character type of a particular area; and
- Cumulative landscape effects: where more than one development may lead to a potential landscape effect.

Visual effects are concerned wholly with the effect of development on visual receptors and general visual amenity. Visual effects are identified for different receptors (people) who would experience the view such as at their places of residence, during recreational activities, at work, or when travelling through the area. Visual effects may include the following:

- Visual effect: change in the appearance of the landscape as a result of development. This may include changes to the quality of the view, ability of the visual receptor to appreciate the view, or changes to the characteristic elements within the view. These changes can be positive (i.e. beneficial or an improvement) or negative (i.e. adverse or a detraction); and
- Cumulative visual effects: the cumulative or incremental visibility of similar types of development may combine to have a cumulative visual effect.

Particular attention is dedicated to the Development's impact on local residents as they would experience the Development from different locations, at different times of the day, usually for longer periods of time, and in different seasons.

4.3.1.1 Level of Effect and Criteria

Essentially, the level of seascape, landscape and visual effect (and whether this is significant) is determined through consideration of the 'sensitivity' of:

- The seascape, landscape element, assemblage of elements, key characteristics or character type or area under consideration bearing in mind quality and value; or
- The visual receptor; and the 'magnitude of change' posed by the Development, in this case the construction of a fish farm and associated onshore infrastructure, the operational life of a fish farm and its associated infrastructure, and subsequent decommissioning.

The process involves design and re-assessment of any remaining, residual significant adverse effects that could not otherwise be mitigated or 'designed out'. Landscape or visual sensitivity is ranked from high, medium, low to negligible and the magnitude of change is similarly ranked from large, medium, small to negligible as indicated in Table 4.1. The type of effect is also considered and may be direct or indirect, temporary or permanent, cumulative, and positive, neutral or negative. The seascape, landscape and visual assessment involves a combination of both quantitative and subjective assessment and wherever possible has sought to gain a consensus of professional opinion through consultation, peer review and the adoption of a systematic, impartial, and professional approach.

In accordance with EIA Regulations, it is essential to determine whether the predicted effects are likely to be 'significant'. Significant seascape, landscape and visual effects, in the assessor's opinion, resulting from the Development would be all those effects that

normally result in a 'major', a 'moderate – major', or 'moderate' effect with any exceptions being clearly explained (refer to Table 4.1 below). The seascape, landscape and visual assessment unavoidably involves a combination of both quantitative and qualitative assessment and wherever possible a consensus of professional opinion has been sought through consultation, internal peer review, and the adoption of a systematic, impartial, and professional approach.

Effects predicted to be of major or moderate significance are considered to be 'significant' in the context of the EIA Regulations, and are shaded in light grey in Table 4.1.

Table 4.1: Evaluation of Landscape and Visual Effects

		Sensitivity (value / importance)			
		High	Medium	Low	Negligible
Magnitude of change	Large	Major	Moderate – Major	Minor – Moderate	Negligible
	Medium	Moderate – Major	Moderate	Minor	Negligible
	Small	Minor – Moderate	Minor	Negligible – Minor	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible

4.3.2 Cumulative Assessment

In addition to assessing the Development as a standalone scheme, the SLVIA also considers the additional effects on seascape character, landscape character and visual amenity of the Development in conjunction with other fish farms in the vicinity.

An assessment of the cumulative effects of the Development with existing fish farms will be undertaken in line with NatureScot guidance and GLVIA3, and according to the following definitions:

- Cumulative effects are defined as the additional changes caused by the Development in conjunction with other similar developments or as the combined effect of a set of developments, taken together (NatureScot, 2012:4);
- Cumulative seascape effects are defined as effects that 'can impact on either the physical fabric or character of the landscape or any special values attached to it' (NatureScot, 2012:10); and
- Cumulative visual effects are defined as effects that can be caused by combined visibility, which 'occurs where the observer is able to see two or more developments from one viewpoint' and/or sequential effects which 'occur when the observer has to move to another viewpoint to see different developments' (NatureScot, 2012:11).

4.3.3 Information Sources

A number of different sources of information will be used to help understand the site and its surrounding context as follows:

- NatureScot (2019) SNH National Landscape Character Assessment – landscape character type descriptions;
- Argyll and Bute Local Development Plan (March 2015);
- Argyll & Bute Council Local Development Plan – Supplementary Guidance (Adopted March 2016 and updated with Policy 9 in June 2016);
- Argyll & Bute Council Local Development Plan 2 – Proposals Maps, Oban, Lorn and the Isles and the Written Statement (November 2019);

- OS mapping at 1:50,000, 1:25,000 and 1:10,000;
- Aerial Photography; and
- Google Earth, Street View and Maps.

4.4 Baseline Conditions / Key Sensitivities

4.4.1 Site Context

The Development is located approximately 0.5 km north of Lurignish Farm from Site centre, or 58 m from closest point of Site boundary, adjacent to the eastern bank of the upper reaches of Loch Linnhe in the Firth of Lorn (the Site).

4.4.2 Seascape & Landscape Character

An appraisal of the baseline landscape character will be considered at three levels:

- National and regional landscape character, in relation to landscape character type profiles produced by NatureScot²³;
- Regional / local landscape character, in relation to Local Landscape Character Areas (LLCAs) identified in the Argyll & Bute and Highlands Council regional Landscape Character Assessments; and
- Seascape Character Types – descriptions of the seascape character types within the NatureScot Commissioned Report 103: An Assessment of the Sensitivity and Capacity of the Scottish Seascape in relation to windfarms²⁴; and
- Character of the Site and its immediate context, based on field observations.

Within the Study Area there are a number of Landscape Character Types (LCTs) (Figure 4.2), however, given the rising topography on the western and eastern slopes of Loch Linnhe, and the inaccessibility of some areas of the western coastline of the loch, there would be limited opportunity for intervisibility of the Development within large areas of the landscape of the study area. The ZTV (Figure 4.4) illustrates a north east – south west pattern visibility within the Study Area across the loch and loch shoreline. Therefore, the following landscape receptors would be included within an SLVIA assessment:

- LCT 40 Craggy Upland – Argyll;
- LCT 51 Lowland Ridges and Moss – Argyll;
- LCT 238 Rugged Massif – Lochaber;
- LCT 239 Interlocking Sweeping Peaks – Lochaber; and
- LCT 243 Lowland Ridges & Moss – Lochaber.

The following landscape receptors would be scoped out of this assessment, due to lack of potential visibility, and predicted fragmented visibility identified within the ZTV:

- LCT 245 Plateau Moorland – Lochaber;
- LCT 233 Mountain Massif – Lochaber;
- LCT 244 Craggy Upland – Lochaber;
- LCT 35 Rugged Mountains; and
- LCT 37 Upland Glens – Argyll.

The 'host' LCT for the Terrestrial Equipment would be LCT 51 Lowland Ridges and Moss – Argyll. The key landscape characteristics of this LCT are:

- *Coastal lowland with low ridges separating narrow, linear glens or flat areas of moss.*

²³ NatureScot (2019) Scottish Landscape Character Types Map & Descriptions. Available online at: <https://www.nature.scot/professional-advice/landscape/landscape-character-assessment/scottish-landscape-character-types-map-and-descriptions>. (Accessed 07.02.2022)

²⁴ SNH Commissioned Report 103: An Assessment of the Sensitivity and Capacity of the Scottish Seascape in relation to windfarms. Available online at: <https://www.nature.scot/sites/default/files/2017-07/Publication%202005%20-%20SNH%20Commissioned%20Report%20103%20-> (Accessed 07.02.2022)

- *Ridges form low, narrow peninsulas enclosing small, horseshoe-shaped bays.*
- *Rocky ridges are densely wooded and linear glens are a patchwork of marginal pastures.*
- *Shoreline and off-shore islands have a more undulating landform and a more open character.*
- *Landform becomes lower and ridges less pronounced towards the south, where there are extensive areas of flat, peaty moss.*
- *Some relatively large houses in sheltered coves, with scattered, more recent development elsewhere.²⁵*

Seascape character assessment comprises three elements of hinterland, coastal and marine seascape character types within the NatureScot Commissioned Report No. 103 – An assessment of the sensitivity and capacity of the Scottish Seascape in relation to wind farms (NatureScot, 2005)²⁶. Whilst this seascape character assessment was focussed on the sensitivity of the seascape in relation to wind farms rather than fish farm developments, the description of the seascape character is a helpful resource, and applies to baseline description for this SLVIA. This report is used for descriptive purposes only, and the conclusions therein are not used for determining seascape sensitivity.

Within the study area, and the 'host' seascape character type (SCT), the coastline of Loch Linnhe lies within Seascape Character Type 9: Sounds, Narrows and Islands, and specifically the Sound of Mull, Firth of Lorn and Sound of Jura Seascape Character Type 13.

The key landscape characteristics of this SCT are:

- *A deeply indented and fragmented coastline, with islands and mainland enclosing narrows and sounds to form a strong articulated coast. The coastline is generally low and rocky and is often an 'incidental' feature, the focus being the narrow elongated stretches of open water which act as a visual foil to the often diverse landform of mountains and craggy islands;*
- *Settlement occurs along the narrow coastal edge of sheltered sea lochs;*
- *This SCT is backed occasionally by crofting land but mainly comprises moorland hills;*
- *Forestry occurs in places against the coast with ancient woodlands found in more inaccessible narrows and fjords. High mountain massif occurs close to the coast and dramatically features in views;*
- *Fish farming occurs in sheltered bays and the Sounds are important ferry routes between islands and the Mainland; and*
- *This type forms a highly scenic seascape due to the variety of landforms seen in views against the sea. Key ferry routes cross the sands and give changing views of islands, mainland and sea. Sandy beaches although rare, are magnets for recreation, and climbing and walking are all popular pursuits within this type due to the presence of mountains close to the shore. The sheltered waters of the sounds also attract sailors and scenic coastal road and rail routes, e.g. Fort William to Mallaig.²⁷*

4.4.3 Landscape Designations

4.4.3.1 National Scenic Areas

The Development is situated 1.2 km north of the northern boundary of the Lynn of Lorn National Scenic Area (NSA), north of Shuna Island and the Sound of Shuna, as detailed on Figure 4.1.

²⁵ Ibid 20

²⁶ Ibid 21

²⁷ Ibid 21, pages 9 -10

The Ben Nevis and Glen Coe NSA is located 9 km north east of the Development, as illustrated on Figure 4.1. The ZTV indicates limited levels of theoretical visibility from the boundary of the NSA of the Marine Equipment, and significant landscape effects would be unlikely. Therefore, it is proposed this NSA is scoped out of the SLVIA.

The likely effects of the Development on the special qualities of the Lynn of Lorn NSA will be carried out with reference to SNH Commissioned Report No. 374 'The Special Qualities of the National Scenic Areas'²⁸ and the draft 'Guidance for Assessing the Effects on Special Landscape Qualities'²⁹ published by SNH in 2018.

4.4.3.2 *Wild Land Areas*

The Development is situated 8.57 km south of the southern boundary of the Moidart – Ardgour Wild Land Area (WLA 13). The ZTV indicates limited levels of theoretical visibility within the Moidart - Ardgour WLA, at this distance significant landscape effects on the WLA are unlikely, and therefore it is proposed that the WLA is scoped out of the SLVIA.

The Loch Etive Mountains WLA 9 are located 10 kms south east of the Development, and there would be no predicted views of the Development from the WLA. Therefore, it is proposed this WLA is scoped out of the SLVIA.

4.4.3.3 *Areas of Panoramic Quality & Special Landscape Areas*

The Terrestrial Equipment would be situated within the North Argyll Area of Panoramic Quality (APQ). The Ardgour Special Landscape Area (SLA) is situated approximately 3.85 km north west of the Development on the western shore of Loch Linnhe. This designation includes an area of 300 – 500 m offshore, along the loch edge, within the SLA designation.

The potential for direct significant landscape effects within the APQ is considered to be limited in extent and would not occur beyond approximately 5 km. It is proposed that the assessment of the effects on landscape character and designations should focus on the landscape and seascape within a Detailed Study Area 5 km of the Development, beyond which significant indirect landscape and seascape effects are unlikely. This would be clarified after a site investigation.

4.4.3.4 *Gardens & Designed Landscapes*

There are no Gardens & Designed Landscapes within the Study Area.

4.4.4 *Visual Receptors & Visual Amenity*

The visual assessment will draw from the ZTV, site visits and viewpoint analysis and assesses the potential visual effects on views and visual amenity likely to be experienced by receptors (people) within the landscape as follows:

- Views from residential properties and settlements;
- Views from designated / valued landscapes;
- Views experienced while travelling through the landscape (recreational road users, walkers, horse riders, cyclists for example); and
- Views from tourist and recreational destinations.

Visual effects would be experienced by the people who live and work in the area, along with those enjoying recreational activities in this area or simply passing through. Whilst it

²⁸ NatureScot (2010) NatureScot Commissioned Report 374: The Special Qualities of the National Scenic Areas. Available online at: <https://www.nature.scot/doc/naturescot-commissioned-report-374-special-qualities-national-scenic-areas> (Accessed 07.02.22)

²⁹ NatureScot (2018) National Scenic Areas - Guidance for identifying special qualities of NSAs. Available online at: <https://www.nature.scot/doc/national-scenic-areas-guidance-identifying-special-qualities-nsas> (Accessed 07.02.22)

is people who are the actual receptors of visual effects, it is the places they may occupy, and from which the Development may be seen, that are listed below.

4.4.4.1 Residential Receptors

The landscape of the Study Area is lightly settled. Particular attention is dedicated to the Development's impact on local residents because they would experience the Development from different locations, at different times of the day, usually for longer periods of time, and in different seasons.

The visual assessment would consider views from individual residential properties within 1 km of the Development. From a desk-based assessment, the SLVIA would include an assessment of fewer than ten properties within a 2 km radius of the Development.

The closest settlement of Portnacroish is located within a 4 km radius south west of the Development.

4.4.4.2 Recreational Receptors

Visual impacts on tourists, or those participating in recreation activities, may be brief in nature by passing through the area on boat, ferry, horse, foot, bike or kayak, their sensitivity to landscape and visual change is high because their purpose/activity is to appreciate landscape and surroundings.

The visual assessment will consider views from recreational receptors within 10 km of the Development, and focusing on those within 5 km radius of the Development. Nearby recreation receptors within the wider study area of the Development include the National Cycle Route NCN 78.

There are a number of Core Paths within the Study Area, however, many are outwith the ZTV. The following have been identified within the ZTV and would require site assessment for potential views of the Development (as detailed on Figure 4.3):

- C151 – Link path, Barcladine;
- C152 (a - f) – Oban to Appin (National Cycle Network);
- C153(a) – Lismore Island;
- C169 (a - e) – Portnacroish to Port Appin;
- C180 – Glasdrum Nature Reserve, Loch Creran;
- C181 – Glen Creran, Elleric pine martin trail;
- C182 (a - e) – Sutherlands Grove, Barcladine;
- C432 – South Shian woodland SNH reserve;
- C506 – Sutherlands Grove, Circular addition;
- C529 – Lismore museum;
- C541 – Appin Terrace Link to Cycle Path; and
- C542 – Strathlea Appin Link to Cycle Path.

There are a small number of recreational jetties around the loch, used for launching recreational craft, located at:

- Loch Linhhe Marina at North Dallens within the Sound of Shuna;
- Shuna Island (SE); and
- Appin House jetty.

Hill top locations and promoted estate walks within the Study Area include the following which are within the ZTV and will be included within the SLVIA:

- Creach Bheinn and Fuar Bheinn Galmadale Round. This classic horseshoe follows the ridges enclosing Glen Galmadale, including the two Corbetts, Fuar Bheinn and Creach Bheinn and the Graham Beinn na Cille. Rough ridgewalking on mostly grassy ridges. The route is pathless and the initial climb is steep and often impeded

- by vegetation. This may not be a well promoted route, and with a steep ascent / descent, may not be as well walked as other routes within the study area; and
- Garbh Bheinn of Ardgour on the southern boundary of the Moidart and Ardgour WLA 13.

The following hilltop locations and promoted routes are outwith the ZTV and are proposed to be scoped out the SLVIA:

- Isle of Eriska circuit, near Benderloch - Mix of informal paths, very boggy in places, and very rough near the end though this part could be omitted;
- Port Appin circuit;
- Jubilee Bridge and Stalker Castle, near Port Appin;
- Glen Duror forest - Forest tracks and waymarked paths throughout;
- Sutherland's Grove forest walks, Barcaldine;
- Creach Bheinn, from Druimavuic;
- Glasdrum Wood, Loch Creran;
- Fas na Cloiche; and
- the Fairy Bridge, Glen Creran.

4.4.4.3 *Transport Routes*

It is important to take account of how the Development would be experienced from the surrounding road network. The visual assessment will consider the potential visual effects likely to be experienced by people travelling through the landscape on main roads and the local road network. Views will vary depending on proximity to the road, the mode of transport, the angle of view, and intervening landscape features.

Routes which pass within 10 km of the Development are (as detailed on Figure 4.3):

- A828;
- B8043;
- B8045; and
- A861.

In addition, views from the local Port Ramsay (Lismore ferry slip) – Port Appin Passenger Ferry are assessed.

4.4.5 *Visualisations*

Baseline photographs, wirelines and photomontage visualisations will be prepared in accordance with NatureScot guidance, as established in NatureScot (2018) Visualisations for Aquaculture – Guidance Note.³⁰ Visualisations will be presented for all viewpoints within the SLVIA, within the 10 km radius Study Area.

4.4.6 *Viewpoint Selection*

A preliminary viewpoint list is shown in Table 4.2 below. The locations of the viewpoints are shown on Figure 4.4. The final list will be established through fieldwork and the scoping process and in agreement with the Argyll & Bute Council and NatureScot in consultation with The Highland Council as the neighbouring authority.

The preliminary viewpoints were selected to represent sensitive visual receptors with the potential to undergo significant effects. They were also selected to represent seascape and landscape receptors and with consideration of the potential for cumulative effects to arise.

³⁰ NatureScot, 2018, Visualisations for Aquaculture – Guidance Note. Available online at: <https://www.nature.scot/doc/visualisations-aquaculture-guidance-note>

Two waterbased viewpoint locations have been suggested. Although, these would be confirmed in discussion with the Argyll & Bute Council and NatureScot in consultation with The Highland Council as the neighbouring authority, if they are required.

In addition, a mountain top location within the Moidart – Ardgour WLA 13, Garbh Bheinn of Ardgour, has also been identified. However, at a distance of over 10 km north of the Development, significant visual effects on the views from the summit, and visual effects on the views from the WLA, are unlikely given the distance to the proposed development.

Table 4.2: Preliminary Viewpoint Locations

VP No.	Viewpoint name	Grid Reference		Distance (km)	Seascape & Landscape and Visual Receptors
1	Lurignish / Core Path C152a	194162	750858	0.17	The viewpoint is representative of the views available for recreational receptors along Core Path (C152a) and NCR 78, at loch side elevation within the Lowland Ridges & Moss LCT 51, and the Sounds, Narrows and Islands Seascape Character Area 9.
2	A828 (south) / NCR 78 / Core Path C152a	193600	750030	0.79	The viewpoint is representative of the views available for recreational receptors along NCR 78, Core Path (C152a) and road users of the A828 road, at loch side elevation within the Lowland Ridges & Moss LCT 51, and the Sounds, Narrows and Islands Seascape Character Area 9.
3	A828 picnic / parking area, Loch Linnhe shoreline / NCR 78 / Core Path C152a	192938	749248	1.80	The viewpoint is representative of the views available for recreational receptors along NCR 78 & Core path (C152a), and road users of the A828 road, at a parking / picnic spot, at a loch side elevation within the Lowland Ridges & Moss LCT 51, and the Sounds, Narrows and Islands Seascape Character Area 9.
4	A828 (north) / NCR 78 / Core Path C152a	196198	752668	2.42	The viewpoint is representative of the views available for recreational receptors along NCR 78 & Core Path (C152a), and road users of the A828 road, at loch side elevation within the Craggy Upland - Lochaber LCT 244, and the Sounds, Narrows and Islands Seascape Character Area 9.
5	Cuil Bay	197842	755306	5.36	The viewpoint is representative of the views available for recreational receptors at Cuil Bay, at a loch side location within the Lowland Ridges & Moss – Lochaber LCT 243, and the Sounds, Narrows and Islands Seascape Character Area 9.
6	Kilmalieu (B8043)	189998	755742	5.83	The viewpoint is representative of the views available for residential receptors, and visitors to the Outdoor Centre, at Kilmalieu, on a local road, B8043) within the Interlocking Sweeping Peaks – Lochaber LCT 239, and the Sounds, Narrows and Islands Seascape Character Area 9.

VP No.	Viewpoint name	Grid Reference		Distance (km)	Seascape & Landscape and Visual Receptors
7	Dallens Bay near Linnhe Marina, Sound of Shuna	192341	748025	3.15	The viewpoint is representative of the views available for recreational receptors at a beach / bay location south of Linnhe Marina, within the Lowland Ridges & Moss LCT 51, and the Sounds, Narrows and Islands Seascape Character Area 9.
8	Port Appin	190378	745492	6.34	The viewpoint is representative of the views available for recreational receptors along the core path C169c (the Port Appin Circuit), and visitors to the Port Appin jetty for the Isle of Lismore ferry., at a loch side elevation within the Lowland Ridges & Moss LCT 51, and the Sounds, Narrows and Islands Seascape Character Area 9.
For consideration:					
9	Garbh Bheim of Ardgour	190757	761725	10.71	The viewpoint is representative of the views available for recreational receptors at a mountain top location within the Moidart – Ardgour WLA 13, and the Interlocking Sweeping Peaks – Lochaber LCT 239.
10	Water based viewpoint – Sound of Shauna	192975	750003	1.19	This viewpoint is representative of the views available for loch vessels (recreational sailing / kayaks etc), south west of the Development within the Sound of Shuna, Loch Linnhe, north of the Loch Linnhe Marina.
11	Water based viewpoint	194002	752522	0.99	This viewpoint is representative of the views available for loch vessels (recreational sailing / kayaks etc), north east of the Development within Loch Linnhe.

4.4.7 Key Sensitivities

At this stage, the key sensitivities are considered to be:

- Potential effects on local landscape character, including cumulative effects, particularly on the host landscape character type and seascape character area;
- Potential effects on the North Argyll Special Landscape Area SLA;
- Potential effects on the special qualities of the Lynn of Lorn National Scenic Area NSA;
- Potential effects on the wild land qualities within the Moidart – Ardgour Wild Land Area (WLA 13);
- Views from key visual receptors including from key routes and settlements around Loch Linnhe and nearby individual properties;
- Views from recreational routes / hill top locations around the loch; and
- Sequential cumulative effects on users of the A828 and B8043.

4.5 Summary of Scoped In and Out Surveys and Effects

Table 4.3: Summary of aspects scoped in and out of the EIA process.

Receptor Type	Scoped In	Scoped Out
Seascape & Landscape character	Landscape Character and designations within 10 km of the Development. A preliminary assessment will accompany the SLVIA to ascertain which seascape / landscape character receptors are assessed in detail.	Seascape / Landscape Character and designations outwith 10km of the Development. Those LCTs outwith the ZTV, and within 10km of the Development. Those Special Landscape Areas and Areas of Panoramic Quality outwith the ZTV, and within 10 km of the Development. Those landscape designations which have limited / fragmented visibility of the Development, which would result in non-significant in direct landscape effects on the designated landscape.
Visual	Effects on representative viewpoints selected to illustrate the view from recreational routes / locations and residential areas. Effects on properties and settlements. Sequential effects on the A828 and B8043.	Effects on visual receptors with limited or no visibility of the Development. A preliminary assessment will accompany the LVIA to ascertain which visual receptors are assessed in detail.

4.6 Key Questions for the Council / Consultees

The following questions have been designed to ensure that the proposed methodologies and assessment are carried out in a robust manner and to the satisfaction of the determining authority:

- Do you have any comments on the proposed SLVIA methodology?
- Do you consider there are any relevant policies or guidance documents not specifically mentioned in this section of the Report that should be taken into account into preparing the EIA Report?
- Do you agree with the proposed Study Area within a 10 km radius, and a Detailed Study Area of 5 km radius?
- Do you agree with the aspects to be scoped in, and out, of the assessment?
- Are Consultees in agreement with the proposed Viewpoint Locations shown in Table 4.2 and illustrated on Figure 4.4? Are there any additional viewpoints we could consider, within the designated landscapes, or from specific recreational locations, within the proposed study area?
- Do you have any comments or suggestions on the approach to cumulative landscape and visual assessment?

5 BENTHIC ECOLOGY

5.1 Introduction

This Section describes the seabed environment within and in the vicinity of the Marine Area of the Site and benthic features of nature conservation importance. A high-level description of potential impacts on protected seabed features that may be affected by the Development in the construction and operational phases is provided to determine the requirements for the assessment that will be included within the EIA Report.

Potential impacts of operational discharges to the marine water column and effects on marine water quality are addressed in Section 11: Marine Water Quality.

5.2 Baseline Conditions

5.2.1 Designated Sites

An initial search of protected areas using NatureScot's Sitelink³¹ identified no natural heritage designations with benthic ecology features within 5 km of the Marine Area.

5.2.2 Biological Records

A review of Marine Science Scotland (MSS) data³² indicated the presence of five benthic Priority Marine Features (PMFs) within 5 km of the Development, these are detailed in Table 5.1 below.

Table 5.1: PMFs recorded within 5 km of the Development

PMF Name	Number of Records	Closest proximity to Marine Area
Tall sea pen (<i>Funiculina quadrangularis</i>)	32 records	0.4 km north-west
Kelp and seaweed communities on sublittoral sediment	2 records	0.9 km north-east
Ocean quahog (<i>Arctica islandica</i>)	9 records	0.9 km north-east
Burrowed mud	2 records	1.4 km north-east
Northern feather star (<i>Leptometra celtica</i>)	2 records	3.4 km south-west

5.2.3 Benthic ROV Survey

5.2.3.1 Methodology

A baseline benthic visual survey was conducted on 27th – 28th September and 6th October 2021 to investigate seabed species and habitats around the Marine Area of the Site.

During the survey, high-definition seabed imagery was then collected along 7 pre-determined transects using a Drop-down Camera system as a means of confirming the seabed habitats present and assessing for the presence/absence of PMFs. Transects were selected to allow for the optimum vessel and camera use while covering as many varied depths and potential habitats as possible

Video footage was then analysed to provide a description of the seabed characteristics in terms of physical structure (i.e. main substrate, sediment composition) and species assemblages in the area. Where possible, species were identified to the highest taxonomic

³¹ NatureScot. Sitelink. Available at: <https://sitelink.nature.scot/home>

³² Marine Scotland: National Marine Plan Interactive Map [Online] Available at: <https://marinescotland.atkinsgeospatial.com/nmpi/> (Accessed 08/02/2022)

level and quantified using the Marine Nature Conservation Review (MNCR) SACFOR1 abundance scale.

Descriptions of physical and biological attributes of the seabed were compared to biotope complex and biotope classifications as listed in the Joint Nature Conservation Committee (JNCC) Marine Habitat Classification for Britain and Ireland. Observed habitats and species were noted for their conservation status, including whether they are a Priority Marine Feature (PMF) designated as nature conservation priorities in Scotland/

A report of the findings is presented in Appendix C, however a summary is provided in Section 5.2.3.2, below.

5.2.3.2 Results Summary

The surveyed habitats were dominated by the PMF burrowed mud, which comprised of the biotopes SS.SMu.CFiMu.SpMg and the sub biotope SS.SMu.CFiMu.SpMg.Fun. Three characteristic/determining species of this PMF were observed: tall seapen, fireworks anemone (*Pachycerianthus multiplicatus*) and northern featherstar (*Leptometra celtica*). Tall seapen was recorded as being particularly abundant and widespread across the survey area.

Although the Development could impact this habitat by introducing nutrients and reducing oxygen levels, Hiscock et al, 2016/Marine Life Information Network (MarLIN)³³ states that the scale of this threat on burrowed mud habitats is generally low, with the PMFs showing high resilience to most of the potential impacts of fish farms, such as; changes in suspended solids, smothering and shading. It is acknowledged that the PMF has some sensitivity to physical impacts, which could occur during installation phase.

The impacts of the Development on PMF species will be considered further in the EIA Report.

5.3 Proposed Approach to EIA

5.3.1 Assessment Approach

The approach taken to the impact assessment follows guidance for Ecological Impact Assessment (EcIA) published by the Chartered Institute of Ecology and Environmental Management (CIEEM)³⁴, which sets out the process for assessment broadly through the following stages:

- Determining importance of baseline ecological features, including identification of Important Ecological Features (IEFs);
- Identification, assessment and characterisation of ecological effects;
- Incorporation of measures to mitigate identified effects;
- Assessment of significance of residual effects following mitigation;
- Identification of appropriate compensation to offset significant residual effects; and
- Identification of opportunities for ecological enhancement.

5.3.1.1 Determining Importance

One of the key challenges in EcIA is to decide which ecological features are important and should be subject to detailed assessment. Such ecological features will be those that are considered to be most important and potentially affected by the project. In EcIA,

³³ Hiscock, Keith & Tyler-Walters, Harvey. (2006). Assessing the Sensitivity of Seabed Species and Biotopes – The Marine Life Information Network (MarLIN). 10.1007/1-4020-4697-9_27.

³⁴ CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine [Online] Available: <https://cieem.net/wp-content/uploads/2018/08/ECIA-Guidelines-Sept-2019.pdf> [Accessed: 17/01/2022]

'importance' of an ecological feature is a synonymous with 'sensitivity', and is defined within a geographical context.

Upon the identification of the potential direct and indirect effects from the Development, it is necessary to undertake a systematic assessment of importance to determine the IEFs. IEFs are ecological features that could be 'significantly' affected by the Development, both negatively and positively. In the EcIA, only ecological features with regional importance and above will be considered sufficiently important to be determined as IEFs, and in accordance with guidance published by CIEEM³⁴, only these IEFs required assessment for potential significant effects.

When determining IEFs, expert judgement will be applied to baseline and contextual information to determine the level of importance and to identify IEFs. Additionally, in accordance with CIEEM guidance³⁴, where a legally protected species was present within the zone of influence and there is potential for a breach of legislation, such species was considered to be an IEF.

5.3.1.2 Characterisation of Potential Effects

In line with the CIEEM EcIA guidance where possible, consideration is given to the following characteristics when identifying potential effects of the Development on IEFs:

- Nature of effect: whether it is positive (beneficial) to IEFs, e.g. by increasing species diversity or extending habitat, or negative (detrimental), e.g. by loss of, or displacement from, suitable habitat;
- Extent: the spatial or geographical area over which the effect may occur;
- Duration: the duration of an effect;
- Frequency: the number of times an activity occurs may influence the resulting effect; and
- Timing: this may result in an impact on an ecological feature if it coincides with critical life stages or seasons.

5.3.1.3 Magnitude of Effect

The magnitude of potential effects will be identified through consideration of the previously described effect characteristics, to determine the degree of change to baseline conditions predicted as a result of the Development.

5.3.1.4 Significance of Effect

Significance is a concept related to the weight that should be attached to effects when decisions are made. A significant effect is simply an effect that is sufficiently important to require that the decision maker is adequately informed of the environmental consequences of permitting a project.

To determine significance in other chapters within the EIA Report a matrix approach has been used, as outlined above. However, as CIEEM guidance discourages the use of the matrix approach, it will not be used within the EcIA Chapter.

For the purposes of the EcIA chapter, the significance of effect will be defined as an effect that either supports or undermines biodiversity conservation objectives for IEFs, or for biodiversity in general. Conservation objectives may be specific, broad or wide-ranging; therefore, so effects can be considered as significant at a wide range of geographic scales.

Significance of the potential effects on each identified IEF is determined through professional judgement, by considering both the nature conservation importance of each feature and the degree to which it may be affected (the effect magnitude) by the Development. Where identified, the significant effects will be qualified with reference to an appropriate geographic scale.

5.3.1.5 Cumulative Effects

As some effects can individually be insignificant, but collectively, taking place over a period of time or concentrated in a location, can be significant, a cumulative assessment will be carried out within the EcIA chapter. Cumulative effects are particularly important as many ecological features are exposed to background levels of threat or pressure and may be close to reaching critical thresholds where further impact could cause irreversible decline.

5.3.1.6 Residual Impacts

Following the assessment of effects, including incorporation of embedded mitigation, all attempts will be made to avoid and mitigate significant effects. Where significant or detrimental effects are predicted, further specific, applied mitigation will be detailed as necessary. Following the application of this mitigation, an assessment of residual effects will be undertaken to determine the final significance of effects.

Where residual effects remain significant or require application of compensatory measures, these will be considered against the relevant policy and legal objectives to determine the outcome of the application.

5.3.2 Data Collection Approach

5.3.2.1 Desk Study

A detailed desk study will be undertaken as part of the EcIA for the Development to identify nature conservation features in both the local and wider environment by searching for records of statutory and non-statutory sites of nature conservation designated for benthic ecology features.

Information will be obtained from publicly available online sources, such as the National Biodiversity Network (NBN) database³⁵ and NatureScot (NS) Sitelink³¹, as well as via data requests to local biological recording groups, such as the Argyll Biological Records Centre.

A radius of 5 km from the Site will be used to search for internationally and nationally designated sites for nature conservation designated for benthic ecology features.

Any features beyond the above distances are considered out with the Zone of Influence of the Marine Area of the Development and are therefore scoped out of the assessment.

Consultation

The Desk Study will also involve consultation with relevant statutory and specialist bodies through the data collection and assessment period. Consultation will be carried out to ensure the approach to assessment is considered appropriate, and to agree mitigation measures. Additionally, the Desk Study will be, complimented by engagement with the local community to ensure appropriate local knowledge is integrated into the baseline, where available.

5.3.2.2 Baseline Survey & Modelling

As outlined above, a Baseline Benthic Visual Survey was conducted on 27th – 28th September and 6th October 2021 to investigate seabed species and habitats around the Marine Area of the Site. However, it is anticipated that further baseline survey and modelling will be required to inform the EIA chapter.

5.3.2.3 Benthic Baseline Survey

A Benthic Baseline Survey (BBS) of the Marine Area will be carried out in accordance with the Scottish Environmental Protection Agency (SEPA) Measurement Assurance and

³⁵ NBN. NBN Atlas. Available at: <https://nbnatlas.org/>

Certification Scotland Finfish Aquaculture Sector 01 performance standards³⁶. It is proposed that at each sampling station, samples will be taken using a Van Veen grab, and subsequently undergo Particle Size Distribution (PSD), macro-benthic and Total Organic Carbon (TOC) analysis.

The survey will be carried out to provide a sufficiently robust dataset of the benthic baseline condition to inform assessment and future operational phase monitoring.

5.3.2.4 *Computational Flow Dynamic modelling*

Computational Flow Dynamic (CFD) modelling will be undertaken to demonstrate the particulate capture rate of the proposed waste capture technology to be installed at the Development. This recapture rate will then be used to inform NewDEPOMOD modelling, required to ensure the regulatory compliance of the Development under the SEPA regulations³⁷.

5.3.2.5 *Benthic Depositional Modelling*

As described above, NewDEPOMOD Modelling will be undertaken to ascertain the potential regulatory environmental capacity of the Development under SEPA regulations³⁷, based on the maximum biomass that could be farmed using the Development's proposed semi-closed system within the Site.

This modelling which subsequently inform the assessment of effects by helping to establish the likely extent of benthic effects.

5.4 **Key Sensitivities**

Potential Important Ecological Features are anticipated to be:

- PMF habitat 'Burrowed mud' (biotopes SS.SMu.CFiMu.SpNMeg and the sub biotope SS.SMu.CFiMu.SpNMeg.Fun);
- Reefs;
- Kelp and seaweed communities on sublittoral sediment;
- Tall seapen;
- Fireworks anemone;
- Ocean quahog; and
- Northern featherstar.

5.5 **Potential Effects Assessment**

Installation of the marine fish farm mooring has the potential to result in localised disturbance and loss of the seabed, which could affect benthic ecology through direct loss or damage to benthic features, or the movement and suspension of sediment and substrate materials, which could result smothering or siltation of benthic features.

In addition, during the production cycle of marine salmon farms, organic waste from uneaten feed and faeces, as well as waste from in-feed medicinal treatments can be deposited on the seabed immediately around fish farm enclosures, and this has the potential to impact local benthic ecology.

³⁶ SEPA (2019) Measurement Assurance and Certification Scotland INTERIM PERFORMANCE STANDARD MACS-FFA-01 Finfish Aquaculture Sector Baseline survey & seabed and water quality monitoring plan design. V0.1. 9

³⁷ SEPA (2020) NewDEPOMOD User Guide. August 2020

5.5.1 Scoped In Effects

A key potential effect on IEFs that will require assessment is anticipated to be:

- Disturbance, damage or degradation of benthic communities through Development installation (construction);
- Effect of Deposition of Operational Organic Waste (faeces and food waste) on benthic communities; and
- Effects of Operational Chemical Treatment Deposition through Medicinal Treatment.

5.5.2 Scoped Out Effects

The following has been scoped out due to the improbability of significant effects:

- Installation, Operational and Decommissioning Effects on Statutory Designated Sites as there are no designated sites within 5km

5.6 Key Questions for the Council / Consultees

The following questions have been designed to ensure that the proposed methodologies and assessment are carried out in a robust manner and to the satisfaction of the determining authority:

- Do you consider there are any other relevant consultees who should be contacted, or other sources of information that should be referenced with respect to the benthic ecology assessment?
- Do you agree with the baseline survey and assessment approach?
- Do you agree that the scale of the threat on burrowed mud habitats is generally low, with the PMFs showing high resilience to most of the potential impacts of fish farms, such as; changes in suspended solids, smothering and shading.
- Do you agree with the aspects to be scoped in, and out, of the assessment?
- Do you agree with the proposed study area (5km radius of Site)?

6 WILD SALMONIDS

6.1 Introduction

This Section of the Report considers wild salmonid populations, namely Atlantic salmon (*Salmo salar*) and sea trout (*Salmo trutta*), as well as any sites locally, nationally or internationally designated for their protection. Relevant species are identified and a high-level description of potential impacts on salmonids that may be affected by the Development is provided to determine the requirements for the assessment that will be included within the EIA Report.

6.2 Baseline Conditions

Atlantic salmon and sea trout are migratory fish species that are of conservation importance in Scottish waters and also indicators of water quality and overall ecosystem health. Atlantic salmon are an anadromous species that live in freshwater as juveniles, migrate to sea as smolts before returning as adults to their natal river to spawn³⁸. Atlantic salmon is listed as an Annex II species under the Conservation (Natural Habitats, &c.) Regulations 1994 ("Habitats Directive"; Council Directive 92/43/EEC) and is a qualifying interest for the selection of Special Areas of Conservation (SACs).

While sea and brown trout are the same species (*S. trutta*), sea trout is the anadromous form which migrates to sea as an adult before returning to freshwater to spawn. Sea trout are more restricted to coastal areas, generally near their natal rivers, than Atlantic salmon, which travel to feeding grounds further offshore³⁹. Sea and brown trout are UK Biodiversity Action Plan (BAP) species and are on the Scottish Biodiversity List as requiring conservation action. The Scottish Government identifies that wild salmonid populations are at critically low levels, however the complex reasons for this decline are not yet fully understood⁴⁰.

A search of protected areas using NatureScot's Sitelink³¹ resource indicates that the Marine Area, located within Loch Linnhe, is currently not within any sites designated for conservation of wild salmonids. There are no SACs designated for salmonid interests within perceptible connectivity to the Development (i.e. through direct proximity or through potential salmonid migration routes).

A search of Marine Scotland's National Marine Plan Interactive⁴¹ indicates the nearest salmonid rivers to the Marine Area include the Salachan Burn and the River Duror, approximately 3.8 km and 5.5 km north-east respectively, and Glenstockdale Burn approximately 5.4 km to the south (see Figure 6.1). There are many more salmon rivers that feed into Loch Linnhe as can be seen on Figure 6.1.

6.3 Proposed Approach to EIA

6.3.1 Assessment Approach

The approach taken to the impact assessment follows guidance for EcIA published by CIEEM⁶. This methodology is fully detailed in Section 5.3.1, above.

³⁸ NatureScot (2021). *Atlantic salmon*. [Online] Available at: <https://www.nature.scot/plants-animals-and-fungi/fish/freshwater-fish/atlantic-salmon> (Accessed 02/02/2022).

³⁹ NatureScot (2021). *Brown trout*. [Online] Available at: <https://www.nature.scot/plants-animals-and-fungi/fish/freshwater-fish/brown-trout> (Accessed 02/02/2022).

⁴⁰ Scottish, Government (2020) *Report of the Salmon Interactions Working Group*. [Online] Available at: <https://www.gov.scot/publications/report-salmon-interactions-working-group/pages/3> (Accessed 02/02/2022).

⁴¹ Marine Scotland. *National Marine Plan Interactive (NMPI)*. [Online] Available at: <https://marinescotland.atkinsgeospatial.com/nmpi> (Accessed: 02/02/2022).

6.3.2 Data Collection Approach

6.3.2.1 Desk Study

A detailed desk study will be undertaken as part of the EcIA for the Development to identify nature conservation features in both the local and wider environment by searching for records of statutory and non-statutory sites of nature conservation designated for wild salmonids.

Information will be obtained from publicly available online sources, such as the National Biodiversity Network (NBN) database³⁵ and NatureScot (NS) Sitelink³¹, as well as via data requests to local biological recording groups.

A connectivity radius of 15 km from the Site will be used to search for internationally and nationally designated sites for nature conservation designated for wild salmonids. This will include designated sites within this radius, as well as waters within this radius that may support populations associated with designated sites (for example, via likely coast migratory routes).

Any features beyond the above distances are considered out with the Zone of Influence of the Marine Area of the Development.

Consultation

The Desk Study will also involve consultation with relevant statutory and specialist bodies through the data collection and assessment period. Consultation will be carried out to ensure the approach to assessment is considered appropriate, and to agree mitigation measures. Additionally, the Desk Study will be complimented by engagement with the local community to ensure appropriate local knowledge is integrated into the baseline, where available.

6.4 Key Sensitivities

Potential Important Ecological Receptors are anticipated to be;

- Atlantic salmon; and
- Sea trout

6.5 Potential Effects Assessment

As outlined in the Scottish Government's 'Summary of Science' publication^{Error! Bookmark not defined.} the body of scientific information suggests that conventional open net salmon farms are the most important contributor to sea lice numbers in Scotland, and that there is a risk that sea lice from these facilities could negatively affect populations of salmon and sea trout in Scotland.

Sea lice are a naturally occurring parasite on many wild fish species, however as salmon farms involve a large number of potential hosts being held in one place, an untreated outbreak at a fish farm can potentially increase local sea lice populations above typical background levels, increasing the potential risk to wild salmonid populations in the local area. The most crucial factors that determine the potential for interactions of salmon farm derived with salmonid populations are considered to be salmonid migration and sea lice dispersion, as well as fish farm management.

Farmed fish escapees can also pose a risk to wild salmonid populations in the form of the reduction in survivability (such as reduced fitness and susceptibility to disease) through genetic dilution of wild populations, via interbreeding between escapees and wild salmon populations, or increased competition over resources with escapees. Escape events at fish farms generally result from operational accidents, predator interaction, equipment failure or adverse weather events, and although they are rare, they have the potential to involve large numbers of farmed fish.

6.5.1 Scoped In Effects

Key potential effects on IEFs that will require assessment are anticipated to be:

- Transmission of farm-derived sea lice to wild salmonids;
- Transmission of other parasites and diseases from farmed salmon to wild salmonids; and
- Competition or interbreeding between wild salmonids and escapee farmed salmon.

6.5.2 Scoped Out Effects

The following has been scoped out due to the improbability of significant effects:

- Installation, Operational, and Decommissioning effects on statutory designated sites and their associated Atlantic salmon populations as there are no designated sites within, or within perceptible connectivity, to the Development;

6.6 Key Questions for the Council / Consultees

The following questions have been designed to ensure that the proposed methodologies and assessment are carried out in a robust manner and to the satisfaction of the determining authority:

- Are there any other relevant consultees who should be contacted, or other sources of information that should be referenced with respect to the wild salmonid assessment?
- Do Consultees agree with the baseline survey and assessment approach?
- Do you agree with the proposed study area (15km radius of Site)?
- Do consultees agree with the potential effects that have been scoped in and out of the EIA assessment?

7 MARINE MAMMALS

7.1 Introduction

This Section describes the marine mammal interests (pinnipeds and cetaceans) within the Marine Area of the Site and surrounding area, and any locally, nationally or internationally designated sites with marine mammal interests that could potentially be affected by the Development. A high-level description of potential impacts on marine mammal receptors arising from the construction, operational and decommissioning phases of the Development is provided to determine the requirements for the assessment that will be included within the EIA Report.

This section does not include otter (*Lutra lutra*), which is covered in Section 8: Non-Avian Ecology - Terrestrial and Coastal.

7.2 Baseline Conditions

7.2.1 Designated Sites

An initial search of protected areas using NatureScot's Sitelink³¹ and Marine Scotland's National Marine Plan Interactive Map³² identified three statutory designated sites with marine mammal features, including Seal Haul Outs (SHOs), within a maritime distance of 30 km of the Marine Area. These are detailed in Table 7.1 and shown in Figure 7.1. The Development is outwith any sites designated for marine mammal features. There are two Special Areas of Conservation (SACs) and one SHO with marine mammal features within 30 km.

Table 7.1: Designated Sites with Marine Mammal Interests within 30 km of the Development⁴².

Name	Designation	Development Proximity (km)	Reason for Designation
Eileanan agus Sgeiran Lios mor	SAC	4.2 south-west	Harbour seal (<i>Phoca vitulina</i>)
Inner Hebrides and the Minches	SAC	9.9 km south-west	Harbour porpoise (<i>Phocoena phocoena</i>)
East End of Sound of Mull	SHO	23.0 km south-west	Harbour seal

7.2.2 Pinnipeds

Both grey seal (*Halichoerus grypus*) and harbour seal are present in Scottish waters. Harbour seal is widespread in the northern hemisphere, with about 30% of the European population of 100,000 harbour seals found in UK waters and, of these, 80% are in Scottish waters⁴³. The grey seal has a population worldwide of 400,000 individuals and is only found in the North Atlantic, Baltic Sea and Barents Sea. Approximately 40% of all grey seals live in UK waters, with 90% of these animals breeding at Scottish colonies⁴³.

Harbour seal and grey seal are Scottish Priority Marine Features and are listed on Annex II in the Habitats Directive.

⁴² Measurements are taken from closest point of Site boundary – closest point of designation boundary.

⁴³ NatureScot (2021). Seals. [Online] Available at: <https://www.nature.scot/plants-animals-and-fungi/mammals/marine-mammals/seals> (Accessed 02/02/2022).

7.2.3 Cetaceans

Cetaceans include whales, dolphins and porpoises. Some 21 species of cetacean have been recorded within 60 km of the coast of Western Scotland since 1980⁴⁴, with 11 of those present year-round or visiting seasonally every year. Estimates of cetacean abundance in European Atlantic waters are available for a number of species⁴⁵. The Marine Area falls into an area encompassing the waters off the north coast of Northern Ireland, Kintyre, Mull, Islay and the Firth of Clyde. Abundance and density estimates for this area based on the aerial survey data are available for three species: harbour porpoise, bottlenose dolphin (*Tursiops truncatus*) and minke whale (*Balaenoptera acutorostrata*). The most common species found in this area is harbour porpoise with an estimate of 5,087 harbour porpoises which is a density of 0.336 animals per km². Bottlenose dolphin is the next most frequently recorded species in the area with an estimate of 1,824 animals present which is a density of 0.121/km². The estimated abundance of minke whale in the area is 410 minke whales which is a density of 0.027/km².

All cetacean species found in Scottish territorial waters are classed as European Protected Species (EPS) and given protection under the Conservation (Natural Habitats &c.) Regulations 1994, making it an offence to:

- Kill, injure, or capture a cetacean;
- Disturb or harass a cetacean;
- Damage or destroy a breeding site or resting place of such an animal; and
- Keep, transport, sell, or exchange, or offer for sale or exchange any cetacean (or any part or derivative of one) obtained after June 1994.

7.2.4 Biological Records

A review of publicly available official and verified biological records data identified the presence of four marine mammal species within 10 km of the Marine Area: two seal species and two cetacean species. These official and verified biological records found are summarised in Table 7.2, below.

Table 7.2: Recent Marine Mammal Records Within 10 km of the Marine Area

Species	Scientific Name	Number of Records	Date Range
Grey seal	<i>Halichoerus grypus</i>	7	2007 - 2019
Northern bottlenose whale	<i>Hyperoodon ampullatus</i>	1	2019
Harbour porpoise	<i>Phocoena phocoena</i>	39	2005-2020
Harbour seal	<i>Phoca vitulina</i>	38	2005-2019

It is recognised that the actual numbers of these animals may differ than those recorded in the official and verified statistics, however this is the accepted methodology for assessing baseline levels and relies on these formal data.

⁴⁴ Seawatch Foundation. *Cetaceans of Western Scotland – Regional Factsheet*. [Online] Available at: <https://seawatchfoundation.org.uk/wp-content/uploads/2012/07/WesternScotland.pdf> (Accessed 02/02/2022).

⁴⁵ Hammond, P.S., Lacey, C., Gilles, A., Viquerat, S., Börjesson, P., Herr, H., Macleod, K., Ridoux, V., Santos, M.B., Scheidat, M., Teilmann, J., Vingada, J. and Øien, N. (2017). *Estimates of cetacean abundance in European Atlantic waters in summer 2016 from the SCANS-III aerial and shipboard surveys*. [Online] Available at: <https://synergy.st-andrews.ac.uk/scans3/files/2017/05/SCANS-III-design-based-estimates-2017-05-12-final-revised.pdf> (Accessed 02/02/2022).

7.3 Proposed Approach to EIA

7.3.1 Assessment Approach

The approach taken to the impact assessment follows guidance for EcIA published by CIEEM⁶. This methodology is fully detailed in Section 5.3.1, above.

7.3.2 Data Collection Approach

7.3.2.1 Desk Study

A detailed desk study will be undertaken as part of the EcIA for the Development to will identify nature conservation features in both the local and wider environment by searching for records of statutory and non-statutory sites of nature conservation, protected species and priority habitats and species.

Information will be obtained from publicly available online sources, such as the National Biodiversity Network (NBN) database³⁵, NatureScot (NS) Sitelink³¹, Marine Scotland 's National Marine Plan Interactive Map³², as well as via data requests to local biological recording groups.

In addition, a review of cetacean and grey and harbour seals distribution and abundance data^{46,47,48} which included datasets from Joint Nature Conservation Committee (JNCC), the Sea Watch Foundation and Sea Mammal Research Unit at the University of St Andrews, was carried out to inform the baseline condition.

A radius of 30 km from the Site will be used to search for internationally and nationally designated sites for nature conservation, including SHOs. The collection of biological records and non-statutory sites data will be carried out within a radius of 30 km from the Site (inclusive). The 30km radius is based on the acknowledged average foraging distance for harbour seal.

Any features beyond the above distances are considered out with the Zone of Influence of the Marine Area of the Development.

Consultation

The Desk Study will also involve consultation with relevant statutory and specialist bodies through the data collection and assessment period. Additionally, the Desk Study will be, complimented by engagement with the local community to ensure appropriate local knowledge is integrated into the baseline, where available. Consultation will be carried out to ensure the approach to assessment is considered appropriate, and to agree mitigation measures, and any requirement for licencing, as necessary.

7.4 Key Sensitivities

Potential Important Ecological Receptors are anticipated to be;

- Seal species;
- Harbour porpoise;
- Eileanan agus Sgeiran Lios mor SAC (designated for harbour seal); and
- Inner Hebrides and the Minches SAC (designated for harbour porpoise)

⁴⁶ JNCC Cetacean Annual and monthly distribution and relative abundance (1979-1997) [Online] Available at: <https://marinescotland.atkinsgeospatial.com/> [Accessed 10/02/2022]

⁴⁷ James B. Reid, Peter G.H. Evans and Simon P. Northridge (2003) Atlas of Cetacean Distribution in North-west European Waters

⁴⁸ Seals - SMRU coordinated summer counts/distribution of Grey seals and Harbour seals (2011 to 2015). [Online] Available at: <http://marine.gov.scot/node/15562> [Accessed 10/02/2022]

7.5 Potential Effects Assessment

The primary sensitivity for marine mammals from marine fish farm operations is the use of Acoustic Deterrent Devices (ADD). ADD can be used to reduce rogue seal predation by creating a sudden underwater noise which is perceived unfavourably by immediately local seals leading to the abandoning of a predatory attempt on farm stock.

The use of ADD has the potential to result in auditory injury to seals, however the greatest risk is to non-target species such as cetaceans (European protected species), who may be disturbed and displaced by their use, and at a considerably greater distance due to greater auditory perception and sensitivity possessed by these species. However, as ADD will not be used, these impacts are not considered relevant to the Development.

Net entanglement is another key risk to marine mammal species associated with fish farm operations, however at the Development will not use underwater predator nets and the fish handling net is protected by an opaque and impermeable barrier, this impact is not considered relevant to the Development. Marine fish farms also have the potential to impact marine mammals during the production cycle phase by collision with, and disturbance from increased marine vehicle usage associated with the Development

7.5.1 Scoped In Effects

Key potential effects on IEFs that will require assessment are anticipated to be:

- Disturbance and collision risk to marine mammals from Marine Vessel Usage;
- Installation, Operational, and Decommissioning phase displacement and disturbance effects on the Eileanan agus Sgeiran Lios mor SAC ; and
- Installation, Operational, and Decommissioning displacement and disturbance effects on the Inner Hebrides and the Minches SAC harbour porpoise population; and
- Installation Operational, and Decommissioning displacement and disturbance effects on the East End of Sound of Mull SHO harbour seal population.

7.5.2 Scoped Out Effects

The following has been scoped out due to the improbability of significant effects:

- The Operational Effects of ADD associated underwater noise on marine mammals; and
- The Operational Effects of underwater net entanglement

7.6 Key Questions for the Council / Consultees

The following questions have been designed to ensure that the proposed methodologies and assessment are carried out in a robust manner and to the satisfaction of the determining authority:

- Do you consider there are any other relevant consultees who should be contacted, or other sources of information that should be referenced with respect to the marine mammal assessment?
- Do Consultees agree with the baseline survey and assessment approach?
- Do consultees agree with the potential effects that have been scoping in and out of the EIA assessment
- Do you agree with the proposed study area (30km radius of Site)?

8 NON-AVIAN ECOLOGY - TERRESTRIAL AND COASTAL

8.1 Introduction

This Section describes the non-avian terrestrial and coastal ecological interests within the Terrestrial Area of the Site and surrounding area, including any locally, nationally or internationally designated sites and protected habitats and species. A high-level description of potential impacts on ecological receptors arising from the construction, operational and decommissioning phases of the Development is provided to determine the requirements for the assessment that will be included within the EIA Report.

This section does not include terrestrial or coastal ornithological interests, which are addressed in Section 9: Ornithology - Terrestrial, Coastal and Marine.

8.2 Baseline Conditions

8.2.1 Designated Sites

An initial search of protected areas using NatureScot’s Sitelink³¹ identified five natural heritage designations with terrestrial ecological interests within 10 km of the Development. This distance was selected using professional judgement as the maximum distance that a mobile terrestrial (non-avian) species may be significantly affected by a development of this type and scale. These are detailed in Table 8.1 and shown in Figure 8.1. The Development is outwith any sites designated for terrestrial ecological interests. There are two Special Areas of Conservation (SACs) and two Sites of Special Scientific Interest (SSSIs) with terrestrial ecological interests within 10 km.

Table 8.1: Designated Sites with Terrestrial Ecological Interests within 10 km of the Development⁴⁹.

Name	Designation	Development Proximity (km)	Reason for Designation
N/A	Ancient Woodland	0.1 km east	<ul style="list-style-type: none"> Several areas of woodland listed on the Ancient Woodland Inventory (Scotland)⁵⁰ are present within 10 km of the Development, with the nearest located across two roads to the east and within the Lurignich Plantation.
Glen Creran Woods	SAC	7.0 south-east	<ul style="list-style-type: none"> Western acidic oak woodland; Mixed woodland on base-rich soils associated with rocky slopes; and Otter
Glen Creran Woods	SSSI	7.0 south-east	<ul style="list-style-type: none"> Ash-alder woodland
Sunart	SSSI	9.9 north-west	<ul style="list-style-type: none"> Upland oak woodland; Saltmarsh; Chequered skipper (<i>Carterocephalus palaemon</i>); Dragonfly assemblage; and Otter

⁴⁹ Measurements are taken from closest point of Site boundary – closest point of designation boundary.

⁵⁰ Scottish Government (2022) Ancient Woodland Inventory (Scotland) [Online]. Available from: <https://www.data.gov.uk/dataset/c2f57ed9-5601-4864-af5f-a6e73e977f54/ancient-woodland-inventory-scotland> [Accessed: 22/07/2022]

8.2.2 Protected and Priority Species Records

An initial search of publicly available record using the NBN Atlas records including NBN Atlas³⁵ shows that a number of protected species have been recorded within the vicinity (i.e. within 2 km) of the Development and therefore there is the potential for these interests to be affected by the Development. A brief summary of each species is provided below:

8.2.2.1 Otter

There are several records of otter around the shorelines of Loch Linnhe, within the vicinity of the Development. Otters are found throughout Scotland, anywhere close to water including watercourses, wetland, coastline or estuary⁵¹. Otter is a European Protected Species (EPS) and as such is specially protected under the Conservation (Natural Habitats, &c.) Regulations 1994. Otter is also listed under Annex II of the Habitats Directive and Schedule 5 of the Wildlife and Countryside Act 1981.

8.2.2.2 Bats

There are two historic (1998) records of common pipistrelle (*Pipistrellus pipistrellus*) recorded within the vicinity of the Development. All bat species found in Scotland are EPS. This protection also covers bat roosts, the structures or places that bats use for shelter or protection.

The habitat present where the Terrestrial Area of the Development will be located is not likely to be of notable value for bats, however, all trees and structures present will be surveyed to establish if they have any suitability for bat roosts.

8.2.2.3 Red squirrel

There are three records of red squirrel within the vicinity of the Development. Red squirrels and their dreys (resting places) receive full protection under Schedule 5 and 6 of the Wildlife and Countryside Act 1981. Red squirrels can occur in various types of woodland however dreys are usually found only in trees that are 15 years or older⁵².

It is likely that the red squirrel records are associated with the conifer plantation across the road from the Terrestrial Area of the Development.

8.2.2.4 Badger

There is a single record of a badger recorded within the vicinity of the Terrestrial Area of the Development. Both badgers and their setts are protected under the Protection of Badgers Act 1992. Badgers are found throughout most of mainland Scotland and badger setts are often located in woodland⁵³. It is likely that the badger record is associated with the conifer plantation and agricultural land across the road from the Terrestrial Area of the Development.

8.2.2.5 Pine marten

There is a single record of a pine marten recorded within the vicinity of the Development. Pine martens receive full protection under Schedule 5 of the Wildlife and Countryside Act 1981. Pine martens are mainly found in woodlands, including conifer plantations. Their dens are usually within hollow trees, among rocks, or in disused bird nests or squirrel

⁵¹ NatureScot. *Standing Advice for Planning Consultations - Otters*. [Online] Available at: <https://www.nature.scot/doc/standing-advice-planning-consultations-otters/> (Accessed 31/01/2021).

⁵² NatureScot. *Standing Advice for Planning Consultations – Red Squirrels* [Online] Available at: <https://www.nature.scot/doc/standing-advice-planning-consultations-red-squirrels/> (Accessed 31/01/2021).

⁵³ NatureScot. *Standing Advice for Planning Consultations – Badgers* [Online] Available at: <https://www.nature.scot/doc/standing-advice-planning-consultations-badgers/> (Accessed 31/01/2021).

dreys⁵⁴. It is likely that the pine marten record is associated with the conifer plantation across the road from the Terrestrial Area of the Development.

8.2.2.6 Reptiles

There are no records of reptiles on the NBN Atlas within the immediate vicinity of the Development, however three nationally important species are known to occur throughout mainland Scotland; adder (*Vipera berus*), slow-worm (*Anguis fragilis*) and common lizard (*Zootoca vivipara*), all of which are protected from intentional and reckless harm under Schedule 5 of the Wildlife and Countryside Act 1981. Given the coastal nature of the Terrestrial Area, and the separation from surrounding habitat by the adjacent main road, it is unlikely that the Terrestrial Area will provide high value habitat for reptiles.

8.2.3 Habitats

The Terrestrial Area is located along a stretch of coastal habitat on the eastern shore of Loch Linnhe. Habitat present appears to include rocky and stony shore habitats, grassland habitats, scrub and broadleaved woodland habitats. There is no connectivity between local Designated Sites (including woodland listed on the Ancient Woodland Inventory (Scotland)Error! Bookmark not defined.) and the habitats likely to be present within the Terrestrial Area.

8.3 Proposed Approach to EIA

8.3.1 Assessment Approach

The approach taken to the impact assessment follows guidance for EcIA published by CIEEM⁶. This methodology is fully detailed in Section 5.3.1, above.

8.3.2 Data Collection Approach

8.3.2.1 Desk Study

A detailed desk study will be undertaken as part of the EcIA for the Development to will identify nature conservation features in both the local and wider environment by searching for records of statutory and non-statutory sites of nature conservation, protected species and priority habitats and species.

Information will be obtained from publicly available online sources, such as the National Biodiversity Network (NBN) database³⁵ and NatureScot (NS) Sitelink³¹, as well as via data requests to local biological recording groups.

A radius of 10 km from the Site will be used to search for internationally and nationally designated sites for nature conservation, and biological records and non-statutory sites data. Local sites of nature conservation interest, including woodland listed on the Ancient Woodland Inventory (AWI)Error! Bookmark not defined. will be carried out within a radius of 2 km from the Site (inclusive).

Any features beyond the above distances are considered out with the Zone of Influence of the Terrestrial Areas of the Development.

Consultation

The Desk Study will also involve consultation with relevant statutory and specialist bodies through the data collection and assessment period. Additionally, the Desk Study will be, complimented by engagement with the local community to ensure appropriate local knowledge is integrated into the baseline, where available. Consultation will be carried out

⁵⁴ NatureScot. *Standing Advice for Planning Consultations – Pine Martens* [Online] Available at: <https://www.nature.scot/doc/standing-advice-planning-consultations-pine-martens/> (Accessed 31/01/2021).

to ensure the approach to assessment is considered appropriate, and to agree mitigation measures, and any requirement for an EPS licencing, as necessary.

8.3.2.2 *Baseline Survey*

Phase 1 Habitats Survey

A Phase 1 Habitat Survey will be undertaken following standard methods (JNCC, 2010) within up to 100 m of the Terrestrial Area of the Development, where access is possible. The survey will identify and map all natural and semi-natural habitats within the Survey Area. Should potential sensitive or protected habitats be recorded, such as Annex 1 habitats and potential Ground Water Dependent Terrestrial Ecosystems (GWDTEs), further surveys (such as National Vegetation Classification Surveys) will be carried out, as necessary.

Protected Species Surveys

Protected Mammal Surveys will be undertaken in April to September to records signs of the presence of protected species, namely; otter water vole, badger, red squirrel and pine martin. Surveys will be carried out in accordance with established NS guidance (NS, 2021) within suitable habitats up to 250 m of the Terrestrial Area of the Development by experienced Arcus ecologists.

As the Development is located within suitable roost habitat, a preliminary roost appraisal survey will be carried out to establish if suitable habitats for roosting bats could be present within 50m of the Development.

Although no specific surveys are required for reptile and amphibians, a watching brief will be undertaken during the other ecological surveys undertaken for the Development.

8.4 Key Sensitivities

Potential Important Ecological Receptors are anticipated to be;

- Otter;
- Other European/nationally protected mammal species; and
- Sensitive or priority terrestrial habitats, including GWDTEs and Ancient woodland.

8.5 Potential Effects Assessment

The construction of the Shore-base will involve the short term use of heavy plant, increased vehicular traffic and increase human presence, which may temporarily lead to increased noise and vibration, which could cause increased disturbance or displacement of faunal species, as well as an increased potential for injury or mortality to faunal species. In addition, construction works may lead to long term and short term habitat loss with the potential to directly or indirectly impact habitats, floral and faunal species.

During the operational phase, the Development has the potential to lead to disturbance, displacement, injury or mortality of otter through increased marine vessel usage, as well as disturbance of protected mammal species through increased human activity.

Decommissioning effects are anticipated to be similar to construction phase effects, but of lower magnitude.

8.5.1 *Scoped In Effects*

Key potential effects on IEFs that will require assessment are anticipated to be;

- Adverse effects on the Glen Creran Woods SAC otter population;
- Disturbance, displacement, injury or mortality of otter, from the construction of the Shorebase;

- Disturbance, displacement, injury or mortality of other protected mammal species from the construction of the Shorebase.
- Loss or degradation of habitat use by otter or protected mammal species through the construction of the Shorebase;
- Loss or degradation of sensitive terrestrial habitats through the construction of the Shorebase;
- Disturbance, displacement, injury or mortality of otter through marine vessel usage
- Disturbance to protected mammal species through terrestrial operational activities; and,
- Disturbance, displacement, injury or mortality of otter, or other protected mammal species from the decommissioning of the Shorebase.

8.5.2 Scoped Out Effects

Likely significant effects on the following designated sites, have been scoped out due to their remote proximity to the Site and thus lack of perceptible ecological connectivity;

- Glen Creran Woods SSSI;
- Sunart SSSI; and
- Woodland listed on the Ancient Woodland Inventory (Scotland).

In addition to the above, the following effects on terrestrial ecology have been scoped out;

- Disturbance, displacement, injury or mortality of reptiles and amphibians as a result of with the construction, operation and decommissioning of the Shorebase; and
- Any effects resulting from the construction, operation and decommissioning of the Marine Area, with the exception of operational effects on otter.

8.6 Key Questions for the Council / Consultees

The following questions have been designed to ensure that the proposed methodologies and assessment are carried out in a robust manner and to the satisfaction of the determining authority:

- Do you agree with the baseline survey and assessment approach?
- Are there any other relevant consultees who should be contacted, or other sources of information that should be referenced with respect to the terrestrial and coastal ecology assessment?
- Do you agree that there is no potential for connectivity between the Development and the two SSSIs, and that consequently effects related to all designated sites can be scoped out of the assessment?
- Do you agree with the aspects to be scoped in, and out, of the assessment?
- Do you agree with the proposed study areas?

Do you agree that there is no potential for connectivity between the Development and woodland listed on the Ancient Woodland Inventory (Scotland) and that consequently effects relating to Ancient Woodland can be scoped out of the assessment?

9 ORNITHOLOGY - TERRESTRIAL, COASTAL AND MARINE

9.1 Introduction

This section describes the ornithological interests present in the terrestrial, coastal and marine environments including any locally, nationally or internationally designated sites with ornithological interests and protected species of the wider countryside that could potentially be affected by the Development. A high-level description of the potential impacts on ornithological receptors arising from the construction, operational and decommissioning phases of the Development is provided to determine the requirements for the assessment that will be included within the EIA Report.

All other terrestrial and coastal ecological interests are covered in Section 8: Non-Avian Ecology - Terrestrial and Coastal.

9.2 Baseline Conditions

9.2.1 Designated Sites

An initial search of protected areas using NatureScot’s Sitelink³¹ identified a number of natural heritage designations with ornithological interests within the following parameters:

- A radius of 120 km² from the Marine Area was searched for Special Protection Areas (SPAs) designated for seabird species with the potential to predate marine finfish farms⁵⁵, and within SPA connectivity distance⁵⁶, as shown in Table 9.1; and
- A radius of 20 km from the Terrestrial Area was searched for other SPAs, (i.e. for terrestrial bird species), Nature Conservation Marine Protection Areas (NC MPA) and Sites of Special Scientific Interest (SSSI) designated for bird species, as shown in Table 9.2 and Figure 9.1.

Table 9.1: Designated Sites with Marine Ornithological Interests within 120 km of the Development⁵⁷.

Name	Designation	Development Proximity (km)	Reason for Designation
Rum	SPA	61 km north-west	Breeding populations of; <ul style="list-style-type: none"> • golden eagle (<i>Aquila chrysaetos</i>); • guillemot (<i>Uria aalge</i>); • kittiwake (<i>Rissa tridactyla</i>); • manx shearwater (<i>Puffinus puffinus</i>); • red-throated diver; and • seabird assemblage
North Colonsay and Western Cliffs	SPA	71 km south-west	Breeding populations of: <ul style="list-style-type: none"> • guillemot; • kittiwake; and • breeding seabird assemblage.
Inner Clyde	SSSI	78 km south-east	Non-breeding populations of; <ul style="list-style-type: none"> • cormorant (<i>Phalacrocorax carbo</i>);

⁵⁵ 120km was selected to comply with NatureScot (2021) Interim Technical Briefing Note - Pole-mounted top nets and birds at finfish farms [online] Available at: <https://www.nature.scot/doc/interim-technical-briefing-note-pole-mounted-top-nets-and-birds-finish-farms> (Accessed: 11/09/2022).

⁵⁶ NatureScot (2016). Assessing Connectivity with Special Protection Areas (SPAs) [Online] Available at: <https://www.nature.scot/sites/default/files/2018-08/Assessing%20connectivity%20with%20special%20protection%20areas.pdf> (Accessed: 10/02/2022).

⁵⁷ Measurements are taken from closest point of Site boundary – closest point of designation boundary.

			<ul style="list-style-type: none"> • eider (<i>Somateria mollissima</i>) • goldeneye (<i>Bucephala clangula</i>) • oystercatcher (<i>Haematopus ostralegus</i>) • red-breasted merganser (<i>Mergus serrator</i>) • red-throated diver (<i>Gavia stellata</i>); and redshank (<i>Tringa tetanus</i>)
Moray Firth	SPA	112 km north-east	<p>Non breeding populations of:</p> <ul style="list-style-type: none"> • bar-tailed godwit (<i>Limosa lapponica</i>); • cormorant; • curlew (<i>Numenius arquata</i>); • goldeneye; • goosander (<i>Mergus merganser</i>); • greylag goose (<i>Anser anser</i>); • oystercatcher; • red-breasted merganser; • redshank; • scaup (<i>Aythya marila</i>); • teal (<i>Anas crecca</i>); • wigeon (<i>Anas Penelope</i>); • waterfowl assemblage <p>Breeding populations of:</p> <ul style="list-style-type: none"> • common tern (<i>Sterna hirundo</i>); and • osprey (<i>Pandion haliaetus</i>)

Table 9.2: Designated Sites with Terrestrial Ornithological Interests within 20 km of the Development^{58,59}

Name	Designation	Development Proximity (km)	Reason for Designation
Moidart and Ardgour	SPA	5.8 north-west	Breeding golden eagle
Glen Etive and Glen Fyne	SPA	5 north	Breeding golden eagle

9.2.2 Marine Bird Species Records

The Development is located on the eastern shore of Loch Linnhe. Ornithological interests present in the marine environment in Loch Linnhe include a variety of species that may use the area for foraging or other essential behaviours such as preening, displaying, bathing and loafing/resting at sea. Based on an initial search of available records including NBN Atlas³⁵ and BTO Bird Atlas 2007 – 2011 Mapstore⁵⁹, a number of species have been commonly recorded within 5 km of the Marine Area; these are listed in Table 9.3 along with the seasons in which they were recorded.

⁵⁸ Measurements are taken from closest point of Site boundary the closest point of designation boundary.

⁵⁹ BTO. Bird Atlas Mapstore. Available at: <https://www.bto.org/our-science/projects/birdatlas/results/mapstore/>

Table 9.3: Marine Species Recorded Within the Marine Environment in the Wider Vicinity of the Development

Species	Scientific Name	Season Recorded	
		Breeding Season	Winter Season
Seabirds			
Common guillemot	<i>Uria aalge</i>	Yes	Yes
Black guillemot	<i>Cepphus grylle</i>	Yes	Yes
Cormorant	<i>Phalacrocorax carbo</i>	Yes	Yes
Shag	<i>Phalacrocorax aristotelis</i>	Yes	Yes
Grebes			
Little Grebe	<i>Tachybaptus ruficollis</i>	No	Yes
Slavonian grebe	<i>Podiceps auritus</i>	No	Yes
Ducks and Divers			
Shelduck	<i>Tadorna tadorna</i>	Yes	Yes
Eider	<i>Somateria mollissima</i>	Yes	Yes
Goldeneye	<i>Bucephala clangula</i>	No	Yes
Goosander	<i>Mergus merganser</i>	No	Yes
Red-breasted merganser	<i>Mergus serrator</i>	Yes	Yes
Red-throated diver	<i>Gavia stellata</i>	Yes	Yes
Great northern diver	<i>Gavia immer</i>	No	Yes
Gulls			
Common gull	<i>Larus canus</i>	Yes	Yes
Great black-backed gull	<i>Larus marinus</i>	Yes	Yes
Herring gull	<i>Larus argentatus</i>	Yes	Yes
Lesser Black-backed gull	<i>Larus fuscus</i>	Yes	Yes
Terns			
Common tern	<i>Sterna hirundo</i>	Yes	No
Arctic tern	<i>Sterna paradisaea</i>	Yes	No

During the breeding season, seabirds such as shag, cormorant and auk species including common guillemot and black guillemot may forage within the area. Gulls such as great black-backed gull, lesser black-backed gull, herring gull and common gull are all likely to be present year-round. During the winter months, a number of wintering species have been recorded in the area including Slavonian grebe, goldeneye, great northern diver and red-throated diver.

9.2.3 Terrestrial Bird Species Records

Ornithological interests include coastal and terrestrial bird species that may breed, roost or forage within the area. Based on an initial search of available records including NBN Atlas³⁵ and BTO Bird Atlas 2007 – 2011 Mapstore⁵⁹, a number of protected species have been recorded within 5 km of the Terrestrial Area; these are listed in Table 9.4 along with the seasons in which they were recorded.

Table 9.4: Notable Species Present in the Terrestrial and Coastal Environment Recorded Within the Wider Vicinity of the Development.

Species	Scientific Name	Season Recorded	
		Breeding Season	Winter Season
Raptors and owls			
White-tailed eagle	<i>Haliaeetus albicilla</i>	Yes	Yes
Peregrine	<i>Falco peregrinus</i>	Yes	Yes
Waders			
Oystercatcher	<i>Haematopus ostralegus</i>	Yes	Yes
Ringed plover	<i>Charadrius hiaticula</i>	Yes	Yes
Curlew	<i>Numenius arquata</i>	Yes	Yes
Redshank	<i>Tringa tetanus</i>	Yes	Yes
Greenshank	<i>Tringa nebularia</i>	Yes	Yes

The land where the Terrestrial Area of the Development is located may provide breeding habitat for a number of bird species including ducks (e.g. eider or red-breasted merganser) and woodland species such as lesser redpoll (*Acanthis cabaret*). The surrounding shoreline habitat may also provide suitable foraging and roosting habitat for waders (such as oystercatcher, ringed plover, curlew, redshank and greenshank) and gulls.

9.3 Proposed Approach to EIA

9.3.1 Assessment Approach

The approach taken to the impact assessment follows guidance for EcIA published by CIEEM⁶. This methodology is fully detailed in Section 5.3.1, above.

9.3.2 Data Collection Approach

9.3.2.1 Desk Study

A detailed desk study will be undertaken as part of the EcIA for the Development to will identify nature conservation features in both the local and wider environment by searching for records of statutory and non-statutory sites of nature conservation, and protected or notable bird species.

Information will be obtained from publicly available online sources, such as the National Biodiversity Network (NBN) database³⁵ and NatureScot (NS) Sitelink³¹, as well as via data requests to the Royal Society for the Protection of Birds (RSPB) and/or local biological recording groups.

A radius of 120 km² from the Marine Area will be searched for SPAs designated for seabird species with the potential to predate marine finfish farms, and within SPA connectivity distance⁵⁶.

Additionally, a radius of 20 km from the Terrestrial Area will be searched for other SPAs, (i.e. for terrestrial bird species), NC MPAs and SSSIs designated for bird species.

Any features beyond the above distances are considered out with the Zone of Influence of the Development.

Consultation

The Desk Study will also involve consultation with relevant statutory and specialist bodies through the data collection and assessment period. Additionally, the Desk Study will be complimented by engagement with the local community to ensure appropriate local knowledge is integrated into the baseline, where available. Consultation will be carried out to ensure the approach to assessment is considered appropriate, and to agree mitigation measures as necessary.

9.3.2.2 Breeding Bird Survey

A survey to record the use of the Site and surrounds by breeding birds will be undertaken, with a focus on targeting birds using the shoreline and surrounding coastal habitat for nesting. The survey will cover suitable habitats up to 50 m of the Terrestrial Area of the Development and will be undertaken by experienced Arcus ornithologists. Although standard BBS surveys⁶⁰ typically implement a 500m buffer of any a Site, the survey area was reduced for the Development due to the small spatial scale of the Shorebase. A total of four surveys will be undertaken between April and July, with each visit being undertaken at least seven days apart.

9.4 Key Sensitivities

Potential Important Ornithological Features are anticipated to be;

- Seabird species, including northern gannet;
- Ground and tree nesting terrestrial breeding birds; and
- White-tailed eagle

9.5 Potential Effects Assessment

Marine fish farm impacts on ornithological features are typically limited to net entanglement resulting from predatory interactions with farm stock. These entanglements, which can take place within underwater nets or top net, have the potential to lead to injury, stress or mortality. As no underwater nets will be used, the potential for entanglement is limited to top net entanglement.

In addition to the above the construction, operation and decommissioning of the Shorebase has the potential to lead to disturbance, displacement or breeding, foraging and roosting bird species, and well as nest destruction.

9.5.1 Scoped In Effects

Key potential effects on IOFs that will require assessment are anticipated to be;

- Direct loss of habitat due to placement of Development infrastructure;
- Disturbance (noise and visual) to breeding, foraging and roosting birds due to construction (and decommissioning) activities including general vessel movements;
- Stress, injury or mortality via net interaction;
- Injury or mortality to breeding birds and their nests via Shorebase construction; and
- Barrier effects due to the physical presence of project infrastructure and operation and maintenance activities

9.5.2 Scoped Out Effects

As they lie out with NS stated connectivity distances^{55,56} likely significant effects on the following IOFs have been scoped out;

- Moidart and Ardgour SPA;
- Glen Etive and Glen Fyne SPA;
- Inner Clyde SSSI;

⁶⁰ Brown, A. F. & Shepherd, K. B. (1993) A method for censusing upland breeding waders. *Bird Study*, 40: 189-195.

- Rum SPA;
- Northern Colonsay and Western Cliffs SPA; and
- Moray Firth SPA.

9.6 Key Questions for the Council / Consultees

The following questions have been designed to ensure that the proposed methodologies and assessment are carried out in a robust manner and to the satisfaction of the determining authority:

- Do you consider there are there any other relevant consultees who should be contacted, or other sources of information that should be referenced with respect to the ornithology assessment?
- Do you agree with the baseline survey and assessment approach?
- Do you agree with the aspects to be scoped in, and out, of the assessment?
- Do you agree with the proposed study areas?
- Do you agree that there is no potential for connectivity between the Development and the five SPAs and single SSSI identified above, and that consequently effects related to all designated sites can be scoped out of the assessment?

10 GEOLOGY, HYDROLOGY AND HYDROGEOLOGY

10.1 Introduction

A hydrological and geological assessment will establish the potential hydrological and hydrogeological constraints associated with the Development at the Site and determine the baseline hydrological conditions and the inclusion/exclusion of geology, hydrology and hydrogeology within the EIA. The assessment will be informed by publicly available resources, our knowledge of the Site and of existing fish farm developments in the local area.

Any impacts associated with the Marine area will be covered under Section 11: Marine Water Quality.

10.2 Relevant Guidance and Legislation

The following legislation, policy and guidance is relevant to hydrology and hydrogeology from the construction and operation fish farms;

- The Water Framework Directive (WFD) (2000/60/EC)⁶¹;
- The Salmon and Freshwater Fisheries (Consolidation) (Scotland) Act 2003⁶²;
- Scottish Government, Flood Risk Management Act 2009⁶³;
- The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (CAR)⁶⁴;
- The Water Quality (Scotland) Regulations 2010⁶⁵;
- Groundwater Protection Policy for Scotland Version 3 (2009)⁶⁶;
- Guidance for Pollution Prevention GPP1: Understanding your environmental responsibilities⁶⁷;
- Planning Advice Note (PAN) 61 – Planning and Sustainable Urban Drainage Systems⁶⁸;
- SEPA (2010) Land Use Planning System Guidance Note 2, Version 8 (LUPS-GU2)⁶⁹;
- SEPA (2010) Engineering in the water environment: good practice guide: River crossings⁷⁰;
- SEPA (2019), CAR - A Practical Guide, Version 8.4⁷¹;

⁶¹ European Commission (2000) The Water Framework Directive (2000/60/EC) [Online] Available at: https://ec.europa.eu/environment/water/water-framework/index_en.html [Accessed 19/08/2021].

⁶² Scottish Government (2003) Salmon and Freshwater Fisheries (Consolidation) (Scotland) Act 2003 [Online] Available at: http://www.opsi.gov.uk/legislation/scotland/acts2003/asp_20030015_en_1 [Accessed 19/08/2021].

⁶³ Scottish Government (2017) The Flood Risk Management (Scotland) Act 2009 [Online] Available at: <https://www.gov.scot/binaries/content/documents/govscot/publications/advice-and-guidance/2017/09/flood-risk-management-scotland-act-2009-guidance-duties-local-authority/documents/00524165-pdf/00524165-pdf/govscot%3Adocument/00524165.pdf> [Accessed 24/09/2021]

⁶⁴ UK Government (2011) The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended) [Online] Available at: <http://www.legislation.gov.uk/ssi/2011/209/contents/made> (Accessed 21/01/2022)

⁶⁵ The Scottish Government (2010) The Water Quality (Scotland) Regulations 2010 [Online] Available at: <http://www.legislation.gov.uk/ssi/2010/95/contents/made> (Accessed 21/01/2022)

⁶⁶ SEPA (2009) *Groundwater protection policy for Scotland Version 3* [Online] Available at: https://www.sepa.org.uk/media/60033/policy-19_groundwaternov09.pdf (Accessed: 21/01/2022)

⁶⁷ NetRegs (2020) GPP1: Understanding your environmental responsibilities – good environmental practices [Online] Available at: <https://www.netregs.org.uk/environmental-topics/pollution-prevention-guidelines-ppgs-and-replacement-series/guidance-for-pollution-prevention-gpps-full-list/> (Accessed: 21/01/2022)

⁶⁸ Scottish Government (2001) Planning Advice Note 61: Planning and Sustainable Urban Drainage Systems [Online] Available at: <https://www.gov.scot/publications/pan-61-sustainable-urban-drainage-systems/> (Accessed: 21/01/2022)

⁶⁹ SEPA (2010) Land Use Planning System Guidance Note 2, Planning advice on Sustainable Drainage Systems (SUDS), Version 8 [Online] Available at: <https://www.sepa.org.uk/media/143195/lups-gu2-planning-guidance-on-sustainable-drainage-systems-suds.pdf> [Accessed: 21/01/2022].

⁷⁰ SEPA (2010) Engineering in the water environment good practice guide: River Crossings, WAT-SG-25 [Online] Available at: <http://www.sepa.org.uk/regulations/water/engineering/engineering-guidance/> [Accessed: 21/01/2022].

⁷¹ SEPA (2019) Controlled Activities Regulations - A Practical Guide, Version 8.4 [Online] Available at: https://www.sepa.org.uk/media/34761/car_a_practical_guide.pdf (Accessed 23/09/2021)

- SEPA (2014) Marine development and marine aquaculture planning guidance (LUPS-GU17)⁷²;
- SEPA (2015) Culverting of watercourses: position statement and supporting guidance⁷³;
- SEPA (2019) Climate change allowances for flood risk assessment in land use planning (LUPS-CC1)⁷⁴;
- SEPA Technical Flood Risk Guidance for Stakeholders (2018)⁷⁵;
- SEPA (2002), Managing River Habitats for Fisheries⁷⁶;
- SEPA (2009), River Basin Management Plan⁷⁷;
- The Water Environment (Drinking Water Protected Areas) (Scotland) Order 2013⁷⁸;
- The Construction Industry Research and Information Association (CIRIA) (2015), Environmental Good Practice on Site (C741)⁷⁹;
- CIRIA (2001), Control of Water Pollution from Construction Sites (C532)⁸⁰; and
- CIRIA (2015), The SuDS Manual (C753)⁸¹.

10.3 Assessment Methodology

Desk studies and data requests will be undertaken to inform the baseline and assessment. Arcus will undertake the following activities to inform the geological, hydrological and hydrogeological impact assessment associated with the Terrestrial Area of the Development:

- Review of published data and maps;
- Consultation with the Scottish Environmental Protection Agency (SEPA) and the Council in relation to any flood risk and culverting requirements;
- Review of Pollution Prevention Guidelines and Guidance for Pollution Prevention documents (GPPs) to inform mitigation included within the CEMP;
- Identification of surface water features, catchments and Groundwater Dependent Terrestrial Ecosystems (GWDTEs);
- Collation of coastal flood plain information.

Arcus will provide an EIA chapter assessing potential effects on geology, hydrology and hydrogeology resources. The assessment and chapter will describe the potential effects of the Proposed Development including:

- Details of consultation undertaken;
- Assessment methodologies for construction and decommissioning phases;

⁷² SEPA (2014) Land Use Planning System Guidance Note 17. Marine development and marine aquaculture planning guidance, LUPS-GU17 [Online] Available at: https://www.sepa.org.uk/media/144034/lups-qu17_-_marine_development_and_marine_aquaculture_planning_guidance.pdf [Accessed: 21/01/2022].

⁷³ SEPA (2015) Culverting of watercourses: position statement and supporting guidance WAT-PS-06-02, Version 2.0 [Online] Available at: https://www.sepa.org.uk/media/150919/wat_ps_06_02.pdf [Accessed: 21/01/2022].

⁷⁴ SEPA (2019) Climate Change Allowances for Flood Risk Assessment in Land Use Planning (LUPS-CC1) [Online] Available: https://www.sepa.org.uk/media/426913/lups_cc1.pdf [Accessed: 21/01/2022].

⁷⁵ SEPA (2018). Technical Flood Risk Guidance for Stakeholders SEPA. [Online]. Available at: <https://www.sepa.org.uk/media/162602/ss-nfr-p-002-technical-flood-risk-guidance-for-stakeholders.pdf>.

⁷⁶ SEPA (2002) Managing River Habitats for Fisheries: a guide to best practice [Online] Available at: https://www.sepa.org.uk/media/151323/managing_river_habitats_fisheries.pdf [Accessed: 21/01/2022].

⁷⁷ SEPA (2009) River Basin Management Plan [Online] Available at: http://www.sepa.org.uk/water/river_basin_planning.aspx [Accessed: 19/07/2021].

⁷⁸ Scottish Government (2013) The Water Environment (Drinking Water Protected Areas) (Scotland) Order 2013 [Online] Available at: <http://www.legislation.gov.uk/ssi/2013/29/introduction/made> [Accessed: 21/01/2022].

⁷⁹ CIRIA (2015) Environmental Good Practice on Site [Online] Available at: https://www.ciria.org/Training/Training_courses/Environmental_good_practice_on_site.aspx [Accessed: 19/07/2021].

⁸⁰ CIRIA (2001), Control of Water Pollution from Construction Sites (C532) [Online] Available at: <https://www.ciria.org/ItemDetail?iProductCode=C649&Category=BOOK&WebsiteKey=3f18c87a-d62b-4eca-8ef4-9b09309c1c91> [Accessed: 21/01/2022].

⁸¹ CIRIA (2015) The SuDS Manual (C753) [Online] Available at: <https://www.ciria.org/ItemDetail?iProductCode=C753&Category=BOOK&WebsiteKey=3f18c87a-d62b-4eca-8ef4-9b09309c1c91> [Accessed: 21/01/2022].

- Assessment of the operational and decommissioning phases of the project to establish the effect on the hydrological resource;
- Identify mitigation measures, where necessary;
- Identify any residual effects following mitigation;
- Statement of significance in accordance with EIA Regulations.

10.3.1 Study Area

The Core Study Area will be outlined by the Site boundary.

Due to the location of the Development on Loch Linnhe and the potential for dilution and dispersion within the loch itself, there is unlikely to be significant effects on receptors outside of the site boundary. As such, there is no requirement for a wider buffer to be applied to the study area to include consideration of private water supplies or designated sites outwith the Site boundary .

10.4 Baseline Conditions

An initial review of the hydrological and ground conditions of the Site has been undertaken. This section outlines the potential hydrological, hydrogeological and geological receptors which have been identified within the Site and the wider area.

10.4.1 Surface Hydrology

The Marine Area lies within the Sound of Shuna on the south-eastern side of Loch Linnhe. Loch Linnhe (South) is a coastal waterbody and has an overall SEPA water quality classification of 'Good' under the Water Framework Directive (WFD).

The Terrestrial Area of the Site is located on the eastern shores of Loch Linnhe. An unnamed modified drain exists in the southern section of the Site's Terrestrial Area, which crosses under the A828 and drains into Loch Linnhe. The Terrestrial Area does not lie within a river catchment classified under the WFD.

10.4.2 Hydrogeology

The groundwater unit underlying the Development Site is identified as the Lismore and Port Appin (Argyll Sub Basin District) groundwater body. The Lismore and Port Appin groundwater body has an overall SEPA classification of 'Good'⁸².

An assessment the potential effects on the groundwater resource will be undertaken in the EIA. These may include potential impacts from erosion, sedimentation, chemical pollution on hydrological receptors and changes to groundwater interflow patterns.

10.4.3 Geology and Soils

10.4.3.1 Soils and peat

The National Soil Map of Scotland indicates that the Terrestrial Area is underlain primarily by Brown Soils, with areas of brown earths with humus-iron podzols. The southern extent of the Terrestrial Area is underlain by Mineral podzols, with humus-iron podzols with peaty gleyed podzols. This is supported by soil carbon mapping which suggests the site is underlain by Mineral (class 0) soil.

Due to the lack of peaty soils and limited soil cover, significant effects are unlikely, and therefore impacts to soils will be scoped out from further assessment.

⁸² Scottish Government Scotland Environment Map. Available at: <https://map.environment.gov.scot/sewebmap/> (Accessed 21/01/2019)

10.4.3.2 Bedrock and Superficial Geology

The groundwater unit underlying the majority of the Terrestrial Area is classified by the BGS 1:625,000 hydrogeological map as part of the Cuil Bay Slate Formation - Graphitic Pelite And Semipelite⁸³. These are both identified as “low productivity aquifers” with limited groundwater in the near surface weathered zone and secondary fractures. Available BGS mapping information on superficial deposits indicates the majority of the site to be underlain by till.

Due to the limited potential effects on superficial and bedrock deposits which are not likely to be significant, impacts to bedrock and superficial geology are scoped out from further assessment.

10.4.4 Statutory Designated Sites

The statutory designated sites relating to the water environment were identified within 10 km of the Site boundary through the use of NatureScot⁸⁴ and SEPA⁸⁵ GIS datasets. There are no statutory designated sites within the Site.

The following statutory designated sites are located within 10 km of the Site Boundary.

- Eileanan agus Sgeiran Lios mor Special Area of Conservation (SAC) (3.86 km south west);
- Glen Etive/Glen Fyne SPA (4.40 km north east and east);
- Moidart and Ardgour SPA (4.78 km north);
- Loch Creran SAC (7.57 km south);
- Glen Creran Woods SAC (9.26 km south east); and
- Inner Hebrides and Minches SAC (9.67 km south west).

A number of Statutory Designated Sites are present within 10km, however, they are considered hydrologically disconnected from the Site based upon the surrounding topography and their distance from the Development, and therefore have been scoped out of further assessment.

At distances greater than 10 km within upland catchments, it is considered the Project is unlikely to contribute to a hydrological effect, in terms of chemical or sedimentation effects, due to dilution and attenuation of potentially polluting chemicals.

10.4.5 Groundwater Dependent Terrestrial Ecosystems

Groundwater Dependent Terrestrial Ecosystems (GWDTes) are wetlands such as springs, flushes and fens which are fed by groundwater rather than rainfall or surface run-off. GWDTes are specifically protected under the Water Framework Directive, and are sensitive receptors to the pressures that are potentially caused by the Development.

Due to the loch-side location of the Site, GWDTes are considered to be fed by surface water and therefore have been scoped out of further assessment.

10.4.6 Private and Public Water Supplies

There is one property located to the east of the Site’s Terrestrial Area and west of the A828 which may be served by a private water supply (PWS), due to its remote location. It is unlikely that this will be affected due to its location upslope of the development. On this basis, PWS have been scoped out further assessment.

⁸³ British Geological Survey (BGS) Geoindex Onshore [online]. Available at: <http://mapapps2.bgs.ac.uk/geoindex/home.html> (Accessed on 21/01/2021)

⁸⁴ SNH (2019) Natural Spaces [Online] Available at: <http://gateway.snh.gov.uk/natural-spaces/index.jsp> (Accessed 21/01/2021)

⁸⁵ SEPA (2019) Datasets [Online] Available at: <https://www.sepa.org.uk/data-visualisation/water-classification-hub/> (Accessed 21/01/2021)

10.4.7 Flood Risk

The Indicative River and Coastal Flood Map (Scotland) produced by SEPA shows the areas of Scotland with a 0.5 % (1:200) or greater chance of flooding⁸⁶. These areas are known as medium to high risk areas for flooding.

The SEPA Flood Map shows that minor areas of surface water either side of the A828 and adjacent to the unnamed modified drain in the southern section of the Terrestrial Area, are classed as having a 1 in 200 (0.5%) annual probability of river flooding in any year.

The SEPA Flood Map also shows the Terrestrial Area and Marine Area lie within an area of High probability of coastal flooding.

Impacts relating to coastal flooding will utilise coastal flood boundary extreme sea levels and assessed in accordance with SEPA flood guidance.

10.5 Key Sensitivities

At this stage, the key sensitive receptors are considered to be:

- the unnamed watercourses within the site area;
- Loch Linnhe; and
- underlying groundwater body.

10.6 Potential Effects Assessment

10.6.1 Scoped In Effects

The onshore Development works include construction of areas of hardstanding, excavation works and restoration works, all activities which have the potential to result in the following effects:

- Chemical pollution and sedimentation of watercourses and the wider hydrological environment as a result of construction;
- Impediments to watercourse and near-surface water flow from shallow excavation works and culverting, including changes to soils as a result of soil compaction; and
- Increased run-off and flood risk due to increased impermeable hardstanding as part of this Development.

Long term effects arising from the operational phase include:

- Increased run-off and flood-risk within the Terrestrial Area including areas of hardstanding;
- Risk of pollution event from run-off from any organic (salmon) waste; and
- Risk of a pollution event from minor spills from maintenance vehicles.

10.6.2 Scoped Out Receptors

As detailed in Section 10.4, certain receptors are unlikely to be affected by the potential effects identified in Section 10.6.1. Therefore, the following receptors are scoped out of further assessment:

- Soil and geological receptors – as the sensitivity of these receptors is considered to be low, with the impacts relating to earthworks for the site likely to be minimal;
- Designated receptors – as these are not hydrologically connected to the Development;
- Public and Private Water Supplies – as these receptors are not present within the defined study area;

⁸⁶ Scottish Environment Protection Agency (2021) Flood Map [Online] Available at: <https://map.sepa.org.uk/floodmap/map.htm> [Accessed 21/01/21].

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- GWDTes - Due to the loch-side location of the Site, GWDTes are considered to be fed by surface water and therefore have been scoped out of further assessment.

10.7 Key Questions for the Council / Consultees

The following questions have been designed to ensure that the proposed methodologies and assessment are carried out in a robust manner and to the satisfaction of the determining authority:

- Do Consultees agree with the proposed methodology and scope of the geology, hydrology and hydrogeology assessment?
- Do you agree with the aspects to be scoped in, and out, of the assessment?
- Do you agree with the proposed study area?
- Do the Council, NatureScot, SEPA or other consultees have any other datasets or other sources of information that you consider should be taken into account in undertaking the hydrology and hydrogeology assessment?

11 MARINE WATER QUALITY

11.1 Introduction

This Section describes marine water quality, including status and any classifications within and in the vicinity of the Development area. A high-level description of potential impacts on the water column that may be affected by the Proposed Development is provided determine the requirements for the assessment that will be included within the EIA Report.

11.2 Relevant Guidance and Legislation

The following guidance, legislation and information sources have been considered in carrying out this assessment:

- the EIA Regulations;
- The Water Environment (Controlled Activities) (Scotland) Regulations 2011⁸⁷; and
- Scottish Government Marine Scotland Science Locational Guidelines for the Authorisation of Marine Fish Farms in Scottish Waters⁸⁸.

11.3 Assessment Methodology

In the first instance, the extent of the proposed Study Area (detailed in Section 11.3.1 below) will be assessed by carrying out a hydrographic survey. This survey will allow observations to be made on the current profile at the surface, mid-column and seabed, as well as also giving the maximum depth within the Site.

To assess nutrient enhancement associated with discharge of fish waste, in line with SEPA issued and published key industry guidance⁸⁹, a high resolution three-dimensional marine model will be developed, which will then be validated and calibrated against measured data, to support the assessment of the potential impacts the Development would have in terms of both dissolved and particulate bound nutrients released from the Development. Data extracted directly from this model, and from pertinent particle tracking simulations, will be employed to:

- Validate the output of the loch nutrient model used previously to assess nutrient enhancement within the receiving water body via the application of verified input data to the model; and
- To provide additional lines of evidence regarding the dispersion potential of particulate bound nutrients (i.e. waste) from the Development and the existing fish farm site.

A desk-based assessment of the potential effects on marine water quality will be undertaken to assess the impact on Marine Water Quality from sediment disturbance and chemical pollution from groundworks and construction of the Terrestrial Equipment.

11.3.1 Study Area

The Study Area for the Marine Water Quality assessment is defined as the southern portion of Loch Linnhe and the northern portion of the Firth of Lorn. As the water flows down from the upper reaches of Loch Linnhe and out to sea via the Firth of Lorn, the Study Area is considered to cover the reaches of potential impacts on marine water quality. Loch Linnhe and the Firth of Lorn are uncategorised within the Marine Scotland Science Fish Farm

⁸⁷ Scottish Government (2011) Controlled Activities Regulations [Online] Available at: <https://www.legislation.gov.uk/ssi/2011/209/contents/made> (Accessed: 28/01/2022)

⁸⁸ Scottish Government (2020) Authorisation of marine fish farms in Scottish waters: locational guidelines [Online] Available at: <https://www.gov.scot/publications/authorisation-of-marine-fish-farms-in-scottish-waters-locational-guidelines/> (Accessed: 28/01/2022)

⁸⁹ SEPA (2019). Aquaculture Modelling. Regulatory Modelling Guidance for the Aquaculture Sector

Location Guidelines and as such are unrestricted and considered low risk in terms of sensitivity to anthropogenic activities.

11.4 Baseline Conditions

The Development is situated within the Loch Linnhe (South) coastal water body (ID: 200081). The Water Framework Directive (WFD) classification scheme in 2020 identified surface waters of the Loch Linnhe (South) water body as having "Good" overall status and "Good" overall ecological status. Furthermore in 2020, the Dissolved Inorganic Nitrogen (DIN) status of the Loch Linnhe (South) water body was classified as "High", indicating the presence of conditions associated with no, or very low, human pressure⁹⁰.

Locational Guidelines published by Marine Scotland Science designate WFD water bodies on the basis of calculated indices to estimate nutrient enhancement and benthic impacts (Gillibrand et al., 2002). Under the Locational Guidelines the Loch Linnhe water body is categorised as Class 3 (combined nutrient enhancement and benthic impact indices of 0 – 4) (Gillibrand et al., 2002), which indicates an area of low sensitivity to further fish farming development and where the potential level of nutrient enhancement and benthic impacts are likely to be acceptable.

There are a number of operational finfish farms within Loch Linnhe, with the nearest being Shuna Island Fish Farm located approximately 2 km south west of the Site from Site centre to site centre, and which is situated to the north of Shuna Island.

11.5 Key Sensitivities

At this stage, the key sensitive receptor is considered to be:

- The Marine Water Quality within the defined Study Area.

11.6 Potential Effects Assessment

11.6.1 Scoped In Effects

The following could potentially result in significant effects and are therefore scoped in:

- Reduction in marine water quality due to sediment disturbance and chemical pollution from groundworks and construction of the Slipway; and
- Nutrient enhancement associated with the discharge of fish waste from the Marine Farming Enclosures and point-source discharges from the Terrestrial Equipment Wastewater Treatment Plant.

11.6.2 Scoped Out Effects

As standard surface drainage systems/ Sustainable Drainage System (SuDs) will be installed as part of Terrestrial Equipment design, and due to the design of the semi-closed containment technology prohibiting sea lice entering the Marine Farming Enclosures, the following effects have been scoped out of further assessment:

- Reduction in marine water quality due to surface and foul water discharges associated with operation of the Terrestrial Equipment; and
- Sea lice bath medicine discharges to the water column.

⁹⁰ SEPA (2020) Water Classification Hub: Loch Linnhe (South) [Online] Available at: <https://www.sepa.org.uk/data-visualisation/water-classification-hub/> (Accessed: 28/01/2022)

11.7 Key Questions for the Council / Consultees

The following questions have been designed to ensure that the proposed methodologies and assessment are carried out in a robust manner and to the satisfaction of the determining authority:

- Do you agree with the proposed scope and method of assessment for impacts on Marine Water Quality?
- Do you consider that there are any relevant policies or guidance documents that ought to be taken into account as part of the assessment of effects of the Development on Marine Water Quality?
- Do you agree with the aspects to be scoped in, and out, of the assessment?
- Do you agree with the proposed study area?

12 CULTURAL HERITAGE AND ARCHAEOLOGY

12.1 Introduction

This Section of the Scoping Request establishes a high level archaeological and historical baseline for the area surrounding the Development and assesses the potential impacts of the Development on the cultural heritage and archaeology resource to determine the requirements for inclusion / exclusion of cultural heritage and archaeology within the EIA.

12.2 Relevant Heritage Legislation and Guidance

Heritage legislation of relevance includes:

- The Historic Environment Scotland Act 2014⁹¹;
- The Ancient Monuments and Archaeological Areas Act 1979⁹²; and
- The Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997⁹³.

In addition to the aforementioned legislation, the following is a summary of the key heritage policy and guidance:

- Scottish Planning Policy (Revised 2020): Valuing the Historic Environment, Paragraphs 135-151⁹⁴;
- Scottish Natural Heritage (now known as NatureScot) and Historic Environment Scotland (HES) EIA Handbook⁹⁵;
- Historic Environment Policy for Scotland (HEPS)⁹⁶;
- Our Place in Time: The Historic Environment Strategy for Scotland⁹⁷;
- Argyle and Bute Local Development Plan (SG LDP ENV 15-21)⁹⁸;
- Argyle and Bute Historic Environment Strategy (Section 7)⁹⁹;
- Planning Advice Note (PAN) PAN 2/2011: Planning and Archaeology¹⁰⁰;
- CIfA Standards and Guidance for Desk-Based Assessments¹⁰¹; and
- HES (2016) Managing Change in the Historic Environment Series, specifically 'Managing Change in the Historic Environment: Setting'¹⁰².

⁹¹ Scottish Government (2014) The Historic Environment Scotland Act [Online] Available at http://www.legislation.gov.uk/asp/2014/19/pdfs/asp_20140019_en.pdf (Accessed 01/02/2022)

⁹² UK Government (1979) The Ancient Monuments and Archaeological Areas Act [Online] Available at: <https://www.legislation.gov.uk/ukpga/1979/46> (Accessed 01/02/2021)

⁹³ Scottish Government (1997) The Planning (Listed Buildings and Conservation Areas) (Scotland) Act [Online] Available at: <https://www.legislation.gov.uk/ukpga/1997/9/contents> (Accessed 01/02/2022)

⁹⁴ Scottish Government (2020) Scottish Planning Policy [Online] Available at <https://www.gov.scot/publications/scottish-planning-policy/pages/5/> (Accessed 01/02/2022)

⁹⁵ SNH and HES (May 2018). EIA Handbook. Available at <https://www.historicenvironment.scot/archives-and-research/publications/publication/?publicationId=6ed33b65-9df1-4a2f-acbb-a8e800a592c0> (Accessed 01/02/2022)

⁹⁶ HES (2019) Scottish Environment Policy for Scotland [Online] Available at: <https://www.historicenvironment.scot/archives-and-research/publications/publication/?publicationId=1bcfa7b1-28fb-4d4b-b1e6-aa2500f942e7> (Accessed 06/09/2021)

⁹⁷ Scottish Government (2014) Our Place in Time: The Historic Environment Strategy for Scotland [Online] Available at: <https://www.gov.scot/publications/place-time-historic-environment-strategy-scotland/> (Accessed 01/02/2022)

⁹⁸ Argyle and Bute Local Development Plan Available at: https://www.argyll-bute.gov.uk/sites/default/files/Unknown/supplementary_guidance_adopated_march_2016_env_9_added_june_2016.pdf (Accessed 01/02/2022)

⁹⁹ Argyle and Bute Historic Environment Strategy <https://www.argyll-bute.gov.uk/our-historic-environment> (Accessed on 01/02/2022)

¹⁰⁰ The Scottish Government (2011) Planning Advice Note 2/2011 [Online] Available at <https://www.gov.scot/publications/pan-2-2011-planning-archaeology/> (Accessed 01/02/2022)

¹⁰¹ Chartered Institute for Archaeologists (2017) Standard and Guidance for Historic Environment Desk-Based Assessment, Published December 2014, Updated October 2020 [Online] Available at: https://www.archaeologists.net/sites/default/files/CIfAS%26GDBA_4.pdf (Accessed 01/02/2022)

¹⁰² HES (2016, updated February 2020) Managing Change in the Historic Environment: Setting [Online] Available at: <https://www.historicenvironment.scot/archives-and-research/publications/publication/?publicationId=80b7c0a0-584b-4625-b1fd-a60b009c2549> (Accessed 01/02/2022)

12.3 Assessment Methodology

In order to establish the historic environment baseline and aid in the assessment of the physical and ground-based archaeological potential of the Core Study Area (CSA) a high level desk-based review of data from the following sources was undertaken:

- Historic Environment Scotland (HES) Datasets including:
 - Canmore Archaeological Records;
 - Database of World Heritage Sites;
 - Database of Scheduled Monuments;
 - Database of Listed Buildings;
 - Database of Inventoried Garden and Designed Landscapes; and
 - Database of Inventoried Battlefields;
- Marine Scotland Historic Marine Protected Areas¹⁰³;
- Cartographic evidence from the Ordnance Survey and historic maps; and
- The Statistical Accounts for Scotland.

The findings of this high level review are presented below in Section 12.4. This assessment is a desk-based exercise, and as such, no on-site survey has been undertaken.

12.3.1 Study Area

To assess the potential for on-site archaeology, three study areas were defined based upon the likelihood of potential significant effects upon archaeology and cultural heritage:

- Core Study Area (CSA);
- 5 km Study Area for designated assets; and
- 3km Study Area for non-designated assets

The Core Study Area (CSA) comprises the Site Boundary for the Development, which is made up of both the Marine area and the Terrestrial Area, housing the fish farm support systems (Figure 12.1).

Both the 3km and 5 km Study Areas, which includes the CSA and land within a 5 km radius (Figure 12.1), were used to identify known heritage assets and to aid in the assessment of the potential for any unknown heritage assets. The 3 km Study Area is considered appropriate due to the absence of development within the immediate landscape. An area of 3km was utilised to allow a satisfactory baseline to be produced, which could be used to inform the archaeological potential of the area. Furthermore, the 5 km Study area accounts for the visual envelope of the Development. Both onshore and offshore heritage assets were assessed within the Study Area.

12.3.2 Previous Consultation

Historic Environment Scotland (HES) were previously consulted in regard to the Development and have raised no objections in relation to the assets for which they are responsible.

The following pre-application response was issued by HES on 15/12/2021:

'We can confirm that there are no heritage assets within our remit, as listed above, within the proposed development area or its vicinity. We are therefore content for impacts on cultural heritage assets within our remit to be scoped out of the assessment.'

¹⁰³ <https://marinescotland.atkinsgeospatial.com/nmpi/default.aspx?layers=1469>
(Accessed 01/02/2022)

West of Scotland Archaeology Service (WoSAS), who advise the local planning authority on all matters pertaining to heritage and archaeology, have yet to be consulted in relation to the Development.

12.4 Baseline Conditions

12.4.1 Designated Assets

No designated assets are recorded within the CSA. Within the 5 km Study Area, the following designated assets are recorded:

- 16 Listed Buildings (HBNUM 12364, 12336, 12341, 12342, 12343, 12348, 6877, 12367, 12342, 12366, 12337, 12341, 12340, 12345, 12365, and 6890); and
- 4 Scheduled Monuments (SM6279, 5680, 3919, and 167).

No World Heritage Sites, Battlefield Sites, Conservation Areas or Inventoried Garden/Designed Landscapes are recorded within the 5 km Study Area. No protected wrecks have been identified. Full details of the designated assets within the 5 km Study Area are provided in Tables 12.1 and 12.2.

Table 12.1 Table of Listed Buildings within the 5 km Study Area¹⁰⁴.

Designation	Designation Number	Name	Description	Distance and Direction from CSA (to closest point)
Category C	12364	Gate Lodge, Aird's Estate	18th C. Trad. 1 storey. Polygonal end. Rubble, lime-washed. Piended slated roof.	4.9 km S
Category B	12336	Bank House (Post Office) Tynribbie	18th C. Trad. 2 storeys. Rubble, lime-washed. Piended slated roof. An early house (oblong with wing) altered and extended in 18th and 19th C.	4 km S
Category B	12341	Portnacraish Cottages Portnacraish	18th C. S Traditional Cottages. 1 storey. Harled. Gabled. Slated roof. 4 cottages line the road. 1 lies to rear of E. one.	3.2 km SW
Category B	12342	Portnacraish Inn Portnacraish	18th Cent. Trad. 2 storeys. Harled. Gabled. Slated roof. 2 ground-floor windows and 1 door are later insertions. 1-storey gabled barn at W. end.	3.2 km SW
Category B	12343	Shuna Farmhouse	18th cent. Trad. 2 storeys and garret. 3 bays. Harled. Gabled. slated roof. Gabled porch. 1 1/2 storey outlying wing.	2.9 km SW
Category C	12348	Stalcaire Memorial, St Cross Churchyard, Portnacraish	Circa 1910. Roughly hewn granite obelisk with inscribed plinth and stepped base. Inscribed, 'A. D. 1468. Above this spot was fought the bloody battle of Stalc, in which	3.2 km SW

¹⁰⁴ Measurements are taken from closest point of Site boundary – closest point of designation boundary.

Designation	Designation Number	Name	Description	Distance and Direction from CSA (to closest point)
			many hundreds fell, when the Stewarts and the Maclarens, their allies, in defence of Dugald, chief of Appin, son of Sir John Stewart, Lord of Lorn and Innermeath, defeated the combined forces of the Macdougalls and the Macfarlanes'.	
Category B	6877	Keil Chapel And Burial Ground	Chapel: probably late medieval, simple rectangular roofless rubble church orientated east/west. Burial Ground: roughly coped walled burial ground surrounds chapel filled with tombstones, of which the late 18 th and 19 th C slate head stones are of exceptional quality.	3.34 km NE
Category B	12367	Kinlochlaich House	C.1830. Gothic. 2 storeys. Harled. Slated roofs, Central portion gabled to front (pinnacled buttresses; pointed window and doorway): garret with piended dormers at sides. Piended wings with crenellated turrets. Wing on E. side is earlier, probably 18 th C.	4 km S
Category B	12342	Portnacraoish Inn Portnacraoish	18th Cent. Trad. 2 storeys. Harled. Gabled. Slated roof. 2 ground-floor windows and 1 door are later insertions. 1-storey gabled barn at W. end.	3.2 km SW
Category C	12366	Old Appin Kirk Tynribbie	Dated 1749. Georgian. Rubble, somewhat dilapidated. Roofless. Overgrown. Segmental-headed windows and door (key-stone incised with date.) Round arch at W. end with old headstone commemorating Stewarts of Appin killed and wounded at Culloden. Interior: Grass grown floor. Head stones.	4 km S
Category B	12337	Achnacone House	1 1/2 storeys. Harled. Gabled. Slated. Gablets to front. Additions at rear.	4 km S
Category B	12341	Portnacraoish Cottages Portnacraoish	18th century. S Traditional Cottages. 1 storey. Harled. Gabled. Slated roof. 4 cottages line the road. 1 lies to rear of E. one.	3.2 km SW
Category B	12340	Holy Cross Episcopal	1809. Gothic Revival. Oblong. Rubble. Gabled. Slated roof.	3.2 km SW

Designation	Designation Number	Name	Description	Distance and Direction from CSA (to closest point)
		Church, Portnacroish	Lancets, Porch.	
Category A	12345	Castle Stalker	16th cent. Oblong. 3 storeys and cap-house. Random rubble. Corbie-steps. Allure Flush parapet. Loop-holes. Modern fore-stair to entrance (armorial panel over) at 2nd storey. INTERIOR: Barrel-vaulted 1st storey. Corbel course to support floors (now gone) of 3rd storey and cap house. Half of 2 nd storey has remains of ornamental fireplace. Turnpike stair in N.W. corner.	3.47 km SW
Category C	12365	Appin Parish Manse (Old F.C. Manse.) Ardtur	Later 19th cent. Victorian. 2 storeys; 3 bays. Rubble; (Snowcemed) harled ends and rear. Gabled. Slated roof. Dressed stone chimneys. Cornice. Band-courses. 1 storey bay window added.	4.42 km S
Category B	6880	Achara House (By Duror)	Circa 1900, incorporating 19th C baronial dwelling. Tall 3-storey, NW facing 4-bay house. All harled with extensive tooled ashlar dressings and margins. Main entrance in single storey, projecting bowed porch in return SW elevation, with bowed piended slate roof and entrance door approached by shallow flight of steps. 3 renewed crests and insignia frame doorway. NW garden front with shallow, wide mullioned and transomed bay window; paired mullioned and transomed bipartites. Regular 1st floor fenestration; 4 dormers break 2nd floor wallhead into shaped or triangular polished ashlar pediments each with carved insignia. Mid-later 19th C angle bartizans frame front elevation, corbelled out at 2nd storey angles with conical bellcast slated roofs and leaded finials. Multi-pane glazing; crowsteps; coped end and ridge stacks; slate roofs.	5 km NE

It should be noted that the majority of the Listed Buildings are located over 3 km south of the Development around the settlement of Appin/Port of Appin and Portnacroish. The listed buildings are largely characterised as C18th and C19th century dwellings and places of business. The notable exceptions being Castle Stalker (12345), a C16th fortification and the Kiel Chapel and burial ground (6877), a church with probable late medieval origins.

Table 12.2: Table of Scheduled Monuments within the 5 km Study Area

Designation	Designation Number	Name	Description	Distance and Direction from CSA
Scheduled Monument	SM6279	Castle Shuna	The monument consists of the ruins of a castle, probably dating from the late 16th century, and an area to its SE, where foundations of buildings appear to represent a barmkin, or outer enclosure. The castle initially comprised a rectangular block measuring 11.6m NE-SW by 7.4m NW-SE over walls 1.1m in thickness. To the SE side a circular stair tower projecting approximately 2.5m was added during the 17th century. The NE half of this stair tower is now missing.	3 km SW
Scheduled Monument	SM5680	Keil, church, Duror of Appin	The monument consists of the remains of a late medieval church and its burial ground situated immediately to the SW of Keil House. The earliest reference to this church occurs in 1354 when the lands of the churches of Durobwar (Duror) and Glencown (Glencoe) were quit-claimed by John of Lorn to John of Islay. The church, dedicated to St Columba, appears to have fallen out of use at some time after 1630 when a topographical account suggests that the church was still in use.	3.3 km NE
Scheduled Monument	SM3919	Appin, old parish church	Built in 1749, superseding a previous structure dating to 1641. Continuity at the site is evidenced by a tombstone of 16 th or early 17 th century origin. Now lies as a roofless, ivy-covered ruin.	4 km S
Scheduled Monument	SM167	Achara, standing stone 190m NW of	Located in a field 180 m NW of Achara. Measures 3.7 m in height and 1.1 by 0.6 m at the base. It tapers to a pointed top, approximately 0.4 m in thickness. The long axis of the stone is NE-SW oriented.	4.8 km NE

It should be noted that all of the recorded Scheduled Monuments sit at a distance of 3 km or greater from the CSA. The most notable of these monuments is Shuna Castle, dated to the late C16th. The castle is now ruinous and sits on the south side of Shuna Island which blocks visibility to the CSA. The remaining monuments comprise of two churches and an undated standing stone with no views of the CSA.

12.4.2 Non-designated Assets

A review of Canmore data indicates that there are no recorded non-designated assets within the CSA. Canmore Records have identified 14 Areas of Historic Environment Interest within the 3 km Study Area: Canmore ID 145227, 145226, 145225, 295453, 23292, 312022, 152098, 79658, 312002, 352614, 149231, 152096, 152097, 23299.

Table 12.3: Table of Areas of Historic Interest within a 3km Study Area

Designation	Designation Number	Name	Description	Distance and Direction from CSA
Unassigned, Monument (By Form)	145227	Lurignich	One Small Unroofed Building Is Depicted On The 1st Edition Of The Os 6-Inch Map (Argyllshire 1875, Sheet Lvii), But It Is Not Shown On The Current Edition Of The Os 1:10000 Map (1973).	0.3 km SE
Agriculture And Subsistence, Domestic	145226	Beinn Sgulich	What May Be One Unroofed Shieling-Hut Is Depicted On The 1st Edition Of The Os 6-Inch Map (Argyllshire 1875, Sheet Lvii), But It Is Not Shown On The Current Edition Of The Os 1:10000 Map (1975).	0.6 km SE
Farmstead (Period Unassigned)	145225	Gleanamuckrach	A farmstead comprising four unroofed buildings, one of which is a long building of two compartments, and one enclosure is depicted on the 1st edition of the OS 6-inch map (Argyllshire 1875, sheet lvii) and on the current edition of the OS 1:10000 map (1975).	2.75 km E

Kiln (Period Unassigned)	295453	Appin House Draw Kiln	<p>NM 9349 4940 Modest but well preserved rubble draw kiln within improved estate landscape above Appin House. Kiln facing SW, 3.6m high, lower part 5.4m square x 2.1m high capped by paving slabs, upper part 3.8m diameter x 1.5m high.</p> <p>Brick-lined pot 1.5m diameter, tapering at base. Single draw arch to front, 1.6m wide x 1.6m high tapering inwards for 1.8m to draw hole.</p> <p>Rear loading ramp 15m long retained by rubble walls. Track then continues uphill retained on W side by rubble retaining wall or 'ha-ha'.</p> <p>Rectangular rubble walled enclosure 0.8m thick extends forwards from kiln frontage for 4.3m, 5.6m wide, ending with 2.7m wide opening. Wallheads slope outwards, indicating former pitched roof, and side walls partly retain adjacent ground. Possible lime quarry, now a reservoir, 100m uphill to E.</p>	1 km S
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Building (17th Century) A structure with a roof to provide shelter from the weather for occupants or contents. Use specific type where known. , Country House (18th Century), Stable(S) (Period Unassigned)	23292	Appin House And Stables	N of Appin House, and on the E side of a small court is a building, 17th c in design but altered later. It is T-shaped, with a round staircase tower, W of the main block, with re-entrant doorway in its S. The stair has now gone, and the building seems to have been two stories and attics high. H B Millar and S Kirkhope 1966. Before a major scheme of reconstruction was begun about 1965, Appin House incorporated work of two main periods. The earlier part comprised a small classical mansion of the first half of the 18thc extended about 1831, when the original house was remodelled externally. RCAHMS 1975; Visited 1970. Appin House is still being renovated. The 17th c building referred to by Millar and Kirkhope was completely demolished in 1970. Mr Davidson, the owner has a set of photographs of the original buildings. Visited by OS 15 November 1971.	1 km S
Jetty (C20th)	312022	North Dallens	No entry	2.1 km SW
Head Dyke (Post Medieval), Township (Period Unassigned)(Possible)	152098	North Dallens	What may be a township, comprising three unroofed buildings and two short lengths of head-dyke, is depicted on the 1st edition of the OS 6-inch map (Argyllshire 1875, sheet lvii). One unroofed building is shown on the current edition of the OS 1:10000 map (1974).	2.46 km SW
Stone (Period Unassigned)	79658	Portnacraoish	In a mature forestry plantation to the N of Strathappin House there is a 'ringing stone' of indeterminate form which bears many 'cup marks'. It resembles the RCAHMS description of that at Balephetrish, Tiree (NM04NW 6).	2.85 km S
Nursery Garden (20th Century)	312002	The Knap	No entry	2.88 km SW

Observation Post (Second World War)	352614	The Knap, Roc Post	An ROC aircraft observation post is situated on top of a hill above the Sound of Shuna. It comprises a two compartment brick walled building on a concrete foundation measuring about 2.9m N-S by about 2m transversely. The smaller compartment still has part of its roof in place.	2.88 km SW
Farmhouse (Period Unassigned)	149231	Shuna Island, Shuna Farm House	No entry	2.91 km SW
Building(S) (Period Unassigned)	152096	Shuna Island	One unroofed building is depicted on the 1st edition of the OS 6-inch map (Argyllshire 1875, sheet lvii). Four unroofed buildings are shown on the current edition of the OS 1:10000 map (1974).	2.08 km SW
Building(S) (Period Unassigned)	152097	Shuna Island	One unroofed building is depicted on the 1st edition of the OS 6-inch map (Argyllshire 1875, sheet lvii), but it is not shown on the current edition of the OS 1:10000 map (1974).	2.19 km SW
Rock Shelter(S) (Period Unassigned)	23299	Shuna Island, Caves	Coles suggests that, if examined, several of the rock-shelters along the W beach of Shuna island might reveal evidence of mesolithic habitation, this area being central to the distribution of the Obanian culture. In 1958, the main shelter, at NM 915 497, was excavated by him, revealing, below levels of clay and roof fall, a 3' deep layer of habitation debris comprised mainly of limpet shells with charcoal and carbonised wood. Several limpet-hammers made from beach pebbles and some unifacially and bifacially trimmed scrapers were found near the top of the shell-bed. J M Coles 1958. NM 9147 4968 & NM 9152 4970. Two possible rock shelters were located along the base of a high precipitous cliff at the NW end of Shuna, but no evidence of occupation was observed in either.	2.4 km SW

The two non-designated assets situated within 0.6 km of the CSA can both be characterised as relating to the post-medieval farming economy. The majority of the remaining assets are related to post-medieval settlement and land use of the area and all lie at a distance greater than 1 km from the CSA. The notable exceptions to this are Shuna Island Caves

(23299), Portnacraish stone (79658), which are both likely related to prehistoric occupation and land use. Both of these assets are located at a distance of 2.4 km or greater from the CSA.

12.4.3 Map Regression Exercise

A review of available on-line historic mapping including Ponts Maps of Scotland (1583-1614AD), Blaue Atlas of Scotland (1654AD) and OS mapping up to and inclusive of the 2nd Edition OS within the National Library of Scotland¹⁰⁵.

Ponts Map of Scotland fails to show the CSA in any clear detail.

Blaue's Atlas of Scotland does not show the CSA in any great detail. The settlements of Apping and Ardeurich are denoted on the mainland, some distance to the south and southeast of the CSA.

OS mapping throughout the nineteenth and twentieth century refer to the hamlet of Lurignish as 'Lurignich'. The historic spelling of this place name will be used in relation to discussions of historic mapping.

The 1st edition OS map of the site (1875 AD) marks the position of the small hamlet of Lurignich 0.4 km East of the CSA (shown as a cluster of 3-4 buildings with a well) with the hamlet of Polonach (shown as 2 buildings) located 0.5 km SE of the CSA. No archaeological features of particular interest are marked. The area can be characterised as being made up of rough pasture and copse woodland. The occasional sheep fold is marked on this edition. The onshore elements of the CSA are shown to be rough coastal pasture and shoreline with no features of interest within the footprint of the CSA.



Plate 14.1: CSA on 1st edition OS.

The 2nd edition OS map of 1900AD shows no significant changes to the above.

¹⁰⁵ <https://maps.nls.uk/series/> (Accessed 01/02/2022)

OS mapping from 1940 AD shows no significant changes to the above with the exception of a NE-SW aligned railway line running between Lurignich and Polonach and continuing further to the north and south.

In the second half of the twentieth century the railway line was replaced between Polonach and Lurignich, by a new stretch of road running west of Polonach and Lurignich between these hamlets and the shore. This replaced the old road which was located east of these hamlets. The old road subsequently forming access to the current buildings at Lurignish.

A review of OS mapping has shown that the onshore section of the CSA and its immediate environs have been undeveloped and unsettled since the C19th with the only occupation located at the hamlets of Lurignich and Polonach. The onshore section of the CSA has been used for pasture throughout this period with the only construction related to new transport infrastructure.

12.4.4 The Statistical Accounts for Scotland

The 1791-1845 accounts mention the Sound of Shuna, located 1.5 km of the CSA as being a frequently used anchorage for ships travelling the coast. The accounts also make note of the numbers of herring in the waters and the benefits of this to the local economy.

In relation to the agricultural economy, the accounts note that pasture accounts for the bulk of farmland with very little land suitable for agriculture. Further discussions on the economy of the area are primarily focused on Appin and Lismore. The small hamlet of Lurignich (marked down on the 1st edition OS) is not mentioned.

The accounts make note of several prehistoric finds within the parish, with 'Druidical' cairns recorded outside of the Study Area.

The Statistical Accounts for Scotland paint a picture of a rural pastoral economy for the area of the CSA and its immediate environs, with small populations living in hamlets grazing livestock and fishing in the Sound of Shuna, with produce likely being sold at the larger settlements of Appin and Lismore. The small-scale rural economy described corresponds with the available OS mapping from the late C19th and C20th.

12.5 Key Sensitivities

Development within the CSA is considered to have very low potential to impact directly on any previously unidentified heritage assets. A review of the available historic mapping and the Statistical Accounts for Scotland are suggestive of a small population employed in a pastoral economy and living in small hamlets. The picture does not change from the late C18th onwards. No designated assets are recorded within 2.9 km of the CSA. The only non-designated assets within 1 km of the CSA relate to the post-medieval pastoral use of the area. As such, the likelihood of encountering unrecorded assets of significance is low.

In regard to changes in setting that may affect cultural significance, the CSA could potentially be within the line of sight SM6279: Castle Shuna, with full details provided in Table 12.4.

Table 12.4: Table showing assets that may be subject to a change in setting

Designation	Designation Number	Name	Description	Distance and Direction from CSA
Scheduled Monument	SM6279	Castle Shuna	The monument consists of the ruins of a castle, probably dating from the late 16th century, and an area to its SE, where foundations of buildings appear to represent a barmkin, or outer enclosure. The castle initially	3 km SW

			<p>comprised a rectangular block measuring 11.6m NE-SW by 7.4m NW-SE over walls 1.1m in thickness. To the SE side a circular stair tower projecting approximately 2.5m was added during the 17th century. The NE half of this stair tower is now missing.</p>	
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However, the CSA is at some significant distance from this asset (3km SW of the CSA on the south side of Shuna Island). The distance to the CSA combined with the low lying visible infrastructure of the Development would not alter key aspects of setting and the cultural significance would remain unaffected. It should also be noted that consultation with Historic Environment Scotland (HES), who manage the Scheduled Monument of Shuna Castle has resulted in HES raising no objections to the Development.

A review of the available Marine Scotland mapping has shown that no known wrecks lay within the 5km Study Area. There are no historic jetty's immediately adjacent to the CSA on the reviewed historic mapping and the Statistical Accounts for Scotland suggest that the waters immediately around the CSA were not fished in any significant way, with the only mention of fishing relating to the Sound of Shuna, located 2 km to the south. Whilst the waterways immediately around the development would undoubtedly have been sailed and used to transport people and goods it is considered unlikely that the CSA contains any, previously unidentified heritage assets.

12.6 Potential Effects Assessment

12.6.1 Scoped In Effects

The following effects have been scoped in for possible further assessment:

- None

12.6.2 Scoped Out Effects

The following effects have been scoped out for further assessment:

- All direct and indirect impacts to any marine heritage assets; and
- All direct and indirect impacts to any onshore heritage assets.

12.7 Key Questions for the Council / Consultees

The following questions have been designed to ensure that the recommended descoping of Cultural Heritage and Archaeology satisfies HES and WOSAS.

- Are WoSAS aware of any undesignated heritage assets in proximity to the CSA that may inform the need for further work in relation to the Development?; and
- Are HES/WOSAS content that the Development would not alter the setting of any recorded heritage assets?
- Do you agree that all direct and indirect effects on marine heritage assets and onshore heritage assets can be scoped out of the EIA?

13 TRAFFIC AND TRANSPORT

13.1 Introduction

This Section of the Scoping Request defines the proposed methodology and approach to undertaken for the traffic and transport assessment that will be included within the EIA Report.

The Traffic and Transportation chapter of the EIA Report will consider the effects of vehicle movements to and from the Site associated with construction, operation and decommissioning phases of the Development. Vehicle movements to the Site will likely consist of heavy goods vehicles (HGVs), light goods vehicles (LGVs) and cars. The significance of these effects will be assessed against recognised guidelines. Where required, appropriate mitigation measures will be proposed to reduce these effects.

13.2 Study Area

The Development is located approximately 0.5 km north of Lurignich Farm from Site centre, or 58 m from closest point of Site boundary, adjacent to the eastern bank of the upper reaches of Loch Linnhe in the Firth of Lorn. The Site is adjacent to the A828 Trunk Road which runs from Ballachulish in the north, terminating at its junction with the A85 at Connel. Transport Scotland manages the A828 and the road is operated by Bear Scotland (as maintenance contractor for Scotland North West Area).

The Study Area has been defined by the public road network in the vicinity of the Development and potential delivery corridors to be used during construction. These take into account the local and strategic road network, sources of labour and the potential sources of construction materials, specifically stone and concrete from local quarries. The A828, A82 and the A85 are anticipated to be included in the study area.

Vehicular access to the Site will be taken from the A828 and would require either the upgrade of the existing access, which appears to be currently used by large agricultural vehicles, or for a new access junction to be constructed to the south of the existing access junction.

13.3 Assessment Methodology

13.3.1 Legislation, Policy and Guidance

The assessment will follow guidance contained in the following planning policy documents:

- 'Guidelines for the Environmental Impact of Road Traffic'¹⁰⁶ ("The IEMA Guidelines", 1993);
- Scottish Planning Policy (2020)¹⁰⁷;
- National Transport Strategy¹⁰⁸ (The Scottish Government);
- Planning Advice Note 75 (PAN 75) – Planning for Transport¹⁰⁹ (The Scottish Government);
- SCOTS' National Roads Development Guide (Transport Scotland, 2015)¹¹⁰; and

¹⁰⁶ Institute of Environmental Assessment (1993) *Guidelines for the Environmental Assessment of Road Traffic*. Available at: <https://www.thenbs.com/PublicationIndex/documents/details?Pub=IEA&DocID=257892> (Accessed 18/01/2022).

¹⁰⁷ The Scottish Government (2020) Scottish Planning Policy [Online] Available at: <https://www.gov.scot/publications/scottish-planning-policy/pages/2/> (Accessed 18/01/2022)

¹⁰⁸ The Scottish Government (2020) – Scottish National Transport Strategy 2 [Online] Available at: <https://www.transport.gov.scot/publication/national-transport-strategy-2/> (Accessed 18/01/2022)

¹⁰⁹ The Scottish Executive (2005). Planning Advice Note, PAN 75, Planning for Transport. Available at: <https://www.gov.scot/binaries/content/documents/govscot/publications/publication/2005/08/planning-advice-note-pan-75-planning-transport/documents/0016795-pdf/0016795-pdf/govscot%3Adocument>. (Accessed on 18/01/2022)

¹¹⁰ Chief Officers of Transport in Scotland. (2015). SCOTS' National Road Development Guide. Available at: <http://scotsnet.org.uk/documents/NRDG/national-roads-development-guide.pdf> Accessed (18/01/2022)

- Guidance on Transport Assessment (Transport Scotland, 2012).¹¹¹

13.3.2 Methodology for Assessing Traffic and Transport

The assessment methodology will be based on 'the IEMA Guidelines'. A screening process, using two broad rules from these guidelines, will be employed to identify roads on which potential significant effects may occur. These are:

- Roads where traffic is predicted to increase by more than 30% a result of the Development, or where the number of HGVs is predicted to increase by more than 30% must be assessed; and
- Roads in specifically sensitive areas where overall traffic flow or HGVs are predicted to increase by more than 10% must be assessed.

Where the predicted increase is lower than threshold, the guidelines suggest the significance of effects can be stated to be low or not significant and further detailed assessment is not warranted.

It is worth noting that on roads where existing traffic levels are generally low (e.g., rural roads and some unclassified roads), any increase in traffic flow may result in a predicted increase that would be higher than the guideline thresholds. In these situations, it is important to consider any increase in terms of overall traffic flow in relation to the capacity of the road before making a conclusion in EIA terms.

Any change in traffic flow which is greater than the thresholds set out in the guidelines would be subject to further analysis to establish if the increased traffic flow is within the capacity of the road. In instances where traffic flow is higher than the IEMA (1993) guideline thresholds but within the capacity limits of the road and the potential magnitude on receptors is minor or negligible, this increase would generally be considered to be not significant. It is acknowledged that capacities can be reduced by local conditions that cannot be accounted for within the relevant guidance such as temporary road works or road failure.

It is not proposed to submit a formal Transport Assessment (TA) to accompany the planning application for the Development, as TAs principally relate to developments that generate a significant permanent increase in traffic as a direct consequence of function (e.g., retail parks). Traffic associated with the Development is below the required threshold for a formal TA. Nevertheless, a capacity assessment will be undertaken for the access junction to demonstrate that it will operate well within capacity and accommodate the development proposals.

A new access junction will be formed onto the A828. This will be designed in accordance with the Design Manual for Roads and Bridges (DMRB) in consultation with Transport Scotland and Argyll & Bute Council Roads Department. A visibility splay assessment will be undertaken for the for the proposed access.

13.3.2.1 Sensitivity of Receptor

The sensitivity of receptors will be determined based on the value of the affected resource and the extent of the area that might be affected by the Development. The receptor sensitivity is summarised as follows:

- High sensitivity refers to receptors of greatest sensitivity to traffic flow: schools, colleges, playgrounds, retirement homes, residential roads without pedestrian or cyclist facilities, and accident black spots;

¹¹¹ Transport Scotland. (2012). *Transport Assessment Guidance*. Available at: https://www.transport.gov.scot/media/4589/planning_reform_-_dpmtag_-_development_management_dpmtag_ref_17_-_transport_assessment_guidance_final_-_june_2012.pdf Accessed (18/01/2022)

- Medium sensitivity refers to traffic flow sensitive receptors: congested junctions, community centres, parks, businesses with roadside frontage, recreation facilities;
- Low sensitivity refers to receptors with some sensitivity to traffic flows: public open spaces, nature conservation areas, listed buildings, tourist attractions, and residential roads with adequate footway provision, places of worship; and
- Negligible sensitivity refers to receptors with very low sensitivity to traffic flows; receptors that are sufficiently distant from the affected roads and junctions.

13.3.2.2 Magnitude of Change

The magnitude of change related to the increase in traffic is a function of the existing traffic volumes on the surrounding highway network, the percentage increase associated with the Development and the changes in the type of traffic.

This approach is intended for the assessment of environmental effects of road traffic associated with major new developments giving rise to traffic generation, as opposed to short-term construction. In the absence of alternative guidance and, as the traffic generation during the operational phase is very low, these guidelines will be applied to assess the short-term construction phase of the Development.

Table 13.1 shows the criteria to be employed to determine the magnitude of change related to the increase in traffic. The absolute increase refers to the change in number of vehicles per hour while the percentage increase refers to the change in number of vehicles per hour expressed as a percentage of the base traffic flows.

Table 13.1: Magnitude of the Change Thresholds

Percentage increase (%) (Vehicles per hour of base traffic flows)	Absolute increase (Vehicles per hour)			
	< 30	30 - 60	60 - 90	> 90
< 5	Negligible	Negligible	Negligible	Negligible
5 – 10	Negligible	Low	Low	Low
10 – 20	Low	Low	Medium	Medium
20 – 30	Medium	Medium	High	High
> 30	High	High	High	High

13.3.2.3 Significance of Effect

The significance of effect will be determined by considering both the sensitivity of the receptors and magnitude of change as shown in Table 3.2. The receptors will be identified as the physical resource or user group that would potentially be affected by the Development, e.g., human being(s) and the transport network.

Table 3.2: Framework for Assessment of the Significance of Effects

Magnitude of Change	Sensitivity of Receptor				
	Very High	High	Medium	Low	Negligible
High	Major	Major	Moderate	Moderate	Minor
Medium	Major	Moderate	Moderate	Minor	Negligible
Low	Moderate	Moderate	Minor	Negligible	Negligible

Magnitude of Change	Sensitivity of Receptor				
	Negligible	Minor	Minor	Negligible	Negligible

Where the predicted increase in traffic flows is lower than the thresholds, the guidelines suggest the significance of effects can be stated to be low or not significant and further detailed assessments are not warranted. Peak traffic flows will be identified to assess a worst-case scenario.

On routes where traffic is predicted to increase above the thresholds identified in the screening process further assessment may be warranted. This further assessment will consider the potential for receptors to receive impacts relating to the effects.

13.3.3 Cumulative Effects

In accordance with guidance, the assessment will consider the potential for any significant cumulative effects that may occur in combination with other consented, and/or in planning, traffic-generating developments that exist within the study area. Consultation will be undertaken with relevant authorities to establish where significant cumulative effects may occur, and with which developments.

13.4 Baseline Conditions

Baseline traffic flow conditions on routes within the Study Area will be established and detailed in the EIA Report. This geographic scope of the baseline assessment will be confirmed in consultation with the relevant local authorities as appropriate. As construction vehicles may approach the Development from a distributed set of origins then all routes within the Study Area will be assessed.

Where publicly available traffic flow information is available, for example from the Department for Transport (DfT), then this will be used as a basis for baseline assessment. The baseline traffic flows would inform the analysis to determine the impact of the development proposals on the road network. Baseline traffic data will be factored to take into account traffic growth between the date of recording and the anticipated date of construction.

The latest available DfT data is for the year 2020, however due to significant uncertainty of travel patterns as a result of the Coronavirus Pandemic, we proposed to use 2019 traffic flows and apply a suitable adjustment factor.

13.5 Potential Effects Assessment

The following potential effects, which are taken from the IEMA Guidelines, will be assessed when considering the effects of construction of the Development on traffic and transportation:

- Traffic generation;
- Hazardous Loads;
- Accidents and Safety;
- Driver Delay;
- Pedestrian Amenity;
- Road Safety at the proposed new access junction onto the A828;
- Severance; and
- Air Quality.

13.5.1 Scoped Out Effects

13.5.1.1 Operational Traffic

Vehicle movements to the site during the operation of the Development will comprise activities associated with inspection, removal of waste, delivery of feed and oxygen and general site up-keep. There may be additional HGVs or works vehicles for delivery of replacement equipment, maintenance, etc. Approximately 16 staff in as many cars are anticipated to arrive and depart in any 24-hour period and, at the peak delivery period for operation, it is anticipated that 9 HGVs per day will access the Site, with likely at least 5 arriving between 8am-10am.

Under IEMA (1993) guidelines, operational traffic is expected to be minimal and negligible in terms of existing traffic flow levels on routes within the vicinity of the Development. Assessment of operational traffic has therefore been scoped out of the EIA assessment.

13.5.1.2 Decommissioning Traffic

Traffic associated with decommissioning of the Development will be the same or less than that experienced during construction. Further work would be undertaken at the time of decommissioning to determine if significant transport effects might be experienced. Decommissioning effects are therefore Scoped Out of further assessment.

13.5.1.3 Visual Effects

The movements of HGVs are not considered visually intrusive as it is an everyday occurrence. The assessment of visual effects of both operational and construction traffic has therefore been scoped out of this assessment.

13.5.1.4 Noise and Vibration

Environmental impacts arising from HGV movements will include vibration, noise and highway safety risks, but these will be temporary during the construction phase and would have a negligible highway impact. With regards to operational noise, this route is an established transport corridor, and there should be an expectation that it is used by HGV traffic and the predicted increase in HGV traffic is not of a magnitude to cause a disruption to the status quo. Therefore, the assessment of the impact of operation and construction traffic noise has been scoped out of this assessment.

13.6 Key Questions for Council / Consultees

The following questions have been designed to ensure that the proposed methodologies and assessment are carried out in a robust manner and to the satisfaction of the determining authority:

- Do you agree with the proposed methodology and scope of the traffic and transport assessment?
Do you agree with the aspects to be scoped in, and out, of the assessment?
- Do consultees agree with initial proposals to create a new access junction for the proposed development off the A828?
- Do you consider that there are any relevant policies or guidance documents not that ought to be taken into account as part of the assessment of effects of traffic and transport?

14 NOISE

14.1 Introduction

This Section of the Scoping Report defines the proposed methodology and approach to be undertaken for the noise assessment that will be included within the EIA Report.

The effects of noise from the Development will be assessed in consultation with the Council Environmental Health Officer and will consider the impacts on nearby noise sensitive receptors during construction and operation of the Development.

14.2 Relevant Guidance and Legislation

The following legislation, policy and guidance is relevant to the assessment of noise during construction and operation of fish farms:

- Planning Circular 1/2007: Planning Controls for Marine Fish Farming¹¹²;
- Scottish Planning Policy, 2014¹¹³;
- Planning Advice Note: PAN 1/2011 Planning and Noise¹¹⁴;
- The Control of Pollution Act 1974 (CoPA 1974)¹¹⁵;
- The Environmental Protection Act 1990;¹¹⁶
- BS 5228:2009+A1:2014 *Code of Practice for noise and vibration control on construction and open sites*¹¹⁷; and
- BS 4142:2014+A1:2019 *Methods for rating and assessing industrial and commercial sound*¹¹⁸.

14.3 Baseline Conditions

Figure 14.1 shows the location of potential Noise Sensitive Receptors (NSRs) in the vicinity of the Development. The identified nearest NSRs are Lurignish House, Lurignish Cottage, and Polanach, which operates as a holiday home. These properties are located approximately 145 m, 150 m and 520 m respectively from the nearest point of the Terrestrial Area.

A survey will be carried out in line with BS 4142:2014 to establish the baseline noise level at locations representative of these receptors. The exact number and location of monitoring locations will be discussed and agreed with the Council Environmental Health Officer.

14.4 Assessment Methodology

14.4.1 Study Area

The assessment of noise associated with the construction and operation of the Development will be carried out at the nearest identified NSRs, as described in Section 14.3, on the basis that should noise effects be acceptable at these locations, they will also be acceptable at locations further from the Development.

¹¹² <https://www.gov.scot/publications/scottish-planning-series-planning-circular-1-2007-planning-controls-marine/pages/0/>, [Online] (Accessed on 17/08/21)

¹¹³ Scottish Planning Policy [Online] Available at: <https://www.gov.scot/Resource/0045/00453827.pdf> (Accessed 17/08/2021)

¹¹⁴ Planning Advice Note: PAN 1/2011 Planning and Noise, The Scottish Government, 2011

¹¹⁵ Control of Pollution Act 1974 c. 40, Available at: <https://www.legislation.gov.uk/ukpga/1974/40/contents> (Accessed 24/09/21)

¹¹⁶ Environmental Protection Act 1990 c. 43, Available at: <https://www.legislation.gov.uk/ukpga/1990/43/contents> (Accessed 24/09/21)

¹¹⁷ BS 5228:2009+A1:2014 Code of Practice for noise and vibration control on construction and open sites – Part 1: Noise and Part 2: Vibration

¹¹⁸ BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound

14.4.2 Consultation

Consultation will be undertaken with the Council Environmental Health Officer to agree baseline survey locations, assessment methodology, and assessment criteria for the construction and operation of the Development.

14.4.3 Construction Noise

It is proposed that a qualitative construction noise assessment be undertaken following guidance contained in British Standard 5228:2009+A1:2014 *Code of Practice for Noise and Vibration Control on Construction and Open Sites (BS 5228)*. BS 5228 contains detailed information on noise reduction measures and promotes the 'Best Practicable Means' (BPM) approach to minimise noise and vibration impacts on local residents.

The assessment will predict noise from construction activities based on likely number of plant items, noise emission data, on-times and construction traffic. The predicted noise levels will be assessed against the Example Method 2 – the '5 dB(A) change' outlined in BS 5228. Based on this method, noise levels generated by site activities are deemed to be potentially significant if the total noise (pre-construction ambient plus site noise) exceeds the pre-construction ambient by 5 dB or more, subject to lower cut off values of 65 dB, 55 dB and 45 dB from site noise alone, for daytime, evening and night-time respectively. BS 5228 states that noise levels are potentially significant if activities have a duration of one month or more. Based on the above, the following thresholds have been identified:

- 65 dB(A) during daytime (0700 – 1900, includes 0700 to 1300 Saturday);
- 55 dB(A) during evenings and weekends (1900 – 2300 weekdays, 1300 – 2300 Saturdays and 0700 – 2300 Sundays); and
- 45 dB(A) at night (2300 – 0700).

The above thresholds apply in the amenity spaces of the nearest NSRs. The proposed construction noise magnitude criteria have been derived from the thresholds above. Please note these magnitudes are subject to the total noise being 5 dB above the pre-construction ambient levels at assessment locations, and construction activities having a duration of one month or more. Table 14.1 below presents the subsequent magnitude of effects:

Table 14.1: Criteria for Construction Noise Assessment

Period	Magnitude of Effect			
	Negligible	Small	Medium	Large
Daytime	<55	55 – 65	65 – 75	> 75
Evening and Weekend	<45	45 – 55	55 - 65	> 65
Night-time	<35	35 – 45	45 - 55	> 55

Where appropriate, the assessment of construction noise will also consider off-site activities such as construction traffic and deliveries, where the necessary information is available, following guidance contained within CRTN¹¹⁹ and DMRB¹²⁰.

14.4.4 Operational Noise

The potential effect of operational noise levels will be determined by assessing predictions of noise at the nearest NSRs in accordance with British Standard BS 4142:2014+A1:2019 *Methods for rating and assessing industrial and commercial sound (BS 4142)*. The assessment shall be based on the prediction of noise due to the operation of the proposed Development (including any embedded mitigation) and that 'additional mitigation' would be considered for any potential residual significant adverse effects.

¹¹⁹ Calculation of Road Traffic Noise, 1988

¹²⁰ The Design Manual for Roads and Bridges (DMRB) HD213/11, Volume 11, 2011.

Noise levels due to operation of the Development will be calculated using the environmental noise propagation model ISO 9613-2:1996. Where required, corrections will be applied to the specific noise level in order to account for acoustic features (tonality, intermittency and impulsivity) which have the potential to increase the level of perception of the noise at nearby dwellings. Any required character corrections will be added to the Specific sound level in order to determine the Rating level.

Predicted rating noise levels from the proposed Development will be assessed using the methods set out in BS 4142. An initial assessment will be undertaken as required by BS 4142 in which the amount by which the predicted Rating level exceeds the baseline noise level is calculated. The results of the initial assessment are then subject to contextual factors, which will be taken into account in determining overall significance.

It is proposed that the criteria set out in Table 14.2 are used for the initial assessment of impact magnitude, in line with the recommendations of BS 4142.

Table 14.2: Proposed Impact Magnitude Criteria for Operational Noise

Impact Magnitude	Description
Large	A rating level greater than 10 dB above background, subject to context
Medium	A rating level greater than 5 dB above background, subject to context
Small	A rating level between 0 and 5 dB above background, subject to context
Negligible	A rating level equal to or lower than background, subject to context

Following initial assessment, contextual factors inherent in determining the overall level of noise impact will be considered, as follows:

- The absolute level of sound;
- The character of the background noise environment compared to the character of the specific sound (i.e., the noise due to the Development);
- The sensitivity of the receptors under consideration; and
- Factors relating to individual properties, such as existing screening, or local noise sources specific to that location.

14.5 Potential Effects Assessment

14.5.1 Scoped In Effects

The following could potentially result in significant effects and are therefore scoped in:

- Construction noise (including construction traffic where necessary); and
- Operational noise from both Marine and Terrestrial Equipment, including harvesting and grading of fish stocks via well boat.

14.5.2 Scoped Out Effects

Due to the large separating distances between the Site and the nearest NSRs (i.e. > 100 m), no effects from vibration associated with construction or operation of the terrestrial equipment is anticipated at the surrounding receptors. As such, it is proposed that the assessment of vibration relating to the Development is scoped out.

Typically, well boat visits to maintain offshore equipment and treat livestock will occur on an "as required" basis, and last a short duration (up to a week), with the boats following a designated route to minimise disturbance. As such, noise from treatment and maintenance well boat visits and operations has been scoped out.

It is anticipated that traffic movements during the operational phase of the Development will be negligible, and as such operational traffic has been scoped out.

14.6 Key Questions for the Council / Consultees

The following questions have been designed to ensure that the proposed methodologies and assessment are carried out in a robust manner and to the satisfaction of the determining authority:

- Do you agree with the proposed methodology and scope of assessment?;
- Do you agree with the aspects to be scoped in, and out, of the assessment?

15 LAND USE AND MARITIME ACTIVITIES

15.1 Introduction

This section describes the land uses and maritime activities within and in the vicinity of the Proposed Development. A high-level description of potential impacts on land use and maritime activity resources arising from the construction, operational and decommissioning phases of the Proposed Development is provided to determine the requirements for the assessment that will be included within the EIA Report. Likely receptors to be assessed include commercial aquaculture, and commercial maritime activities and navigation.

15.2 Relevant Guidance and Legislation

The following guidance, legislation and information sources will be considered in carrying out the assessment:

- Argyll and Bute Supplementary Guidance: Aquaculture Development (2016)¹²¹;
- the EIA Regulations;
- Guidelines for Environmental Impact Assessments¹²² and a Handbook for Environmental Impact Assessment;
- NatureScot (2018) Environmental Impact Assessment Handbook;
- Scottish Planning Policy (SPP)¹²³; and
- Argyll and Bute Local Development Plan¹²⁴.

15.3 Assessment Methodology

The proposed methodology is based on established best practice, including that used in the UK Government and industry reports on the sector. Effects will be considered based on the wider environmental impact guidance from Guidelines for Environmental Impact Assessments¹²⁵ and a Handbook for Environmental Impact Assessment¹²⁶.

Effects on the land use and maritime activity resources can be described as direct, indirect or cumulative. The methodology for assessment of effects takes account of the NatureScot (2018) Environmental Impact Assessment Handbook.

The assessment aims to predict the likely effects (positive, negative or neutral) arising from the Development; these effects are divided into:

- Direct effects: those arising from an immediate effect of the Development such as physical disturbance to land use resource such as the footprint of the Development and/or construction/decommissioning activities;
- Indirect effects: for example, disruption to operations or activities ongoing around the Site; and
- Cumulative Effects: where the combined effect of two or more developments are of greater significance than those of the Development itself.

The significance of the potential effects of the Development will be classified by professional consideration of the sensitivity of the receptor and the magnitude of change.

¹²¹ Argyll and Bute Council (2016) Supplementary Guidance 2: Aquaculture Development [Online] Available at: https://www.argyll-bute.gov.uk/sites/default/files/sq_ldp_aqua_1_dec_2016.pdf (Accessed: 26/01/2022)

¹²² Institute of Environmental Management and Assessment. (2004). *Guidelines for Environmental Impact Assessment*.

¹²³ Scottish Government (2014) Scottish Planning Policy [Online] Available at: <https://www.gov.scot/publications/scottish-planning-policy/pages/2/> (Accessed: 26/01/2022)

¹²⁴ Argyll and Bute Council (2015) Local Development Plan [Online] Available at: <https://www.argyll-bute.gov.uk/ldp> (Accessed: 26/01/2022)

¹²⁵ Institute of Environmental Management and Assessment. (2004). *Guidelines for Environmental Impact Assessment*.

¹²⁶ Scottish Natural Heritage. (2003). *A Handbook for Environmental Impact Assessment, Appendix 5: Guide to Outdoor Access Assessment*.

A desk based assessment will be carried out to determine potential effects on land use and maritime activities. Consultation will be undertaken with relevant consultees to inform and identify potential obstructions or hazards to land use and maritime activities users and to allow for appropriate mitigation measures to be identified.

15.3.1 Study Area

The study areas in this assessment are as follows:

- For direct effects, the 'Study Area' comprises the land and marine waters within the red line boundary, either temporarily during construction and decommissioning or permanently after operation and decommissioning. This will be referred to as 'The Core Study Area' (CSA);
- For indirect effects, the 'Study Area' comprises the extent of land and marine waters which the Development could potentially adversely effect. It is considered that this area is within 5 km of the site boundary. This will be referred to as the 'Wider Study Area' (WSA). The WSA is considered appropriate based on the SLVIA, and professional judgement regarding the reaches of potential significant effects; and
- For cumulative effects, the 'Study Area' again comprises of the entire area within 5 km of the site boundary. This will be referred to as the 'Cumulative Study Area'

15.4 Baseline Conditions

15.4.1 Land Use

The land within the Site is not used for any commercial use based on the findings of a preliminary walkover and communications with the landowner. The terrestrial component of the Site contains some native tree species, while rhododendron covers the majority. Invasive species will be considered during the EIA and addressed in an Outline Biosecurity Action Plan as necessary. . The land to the southwest of this is unused land which is flat, clear of trees and currently unused for grazing.

There are no utility assets within the vicinity of the Terrestrial Area. There is one property located to the east of the Site's Terrestrial Area and west of the A828 which may be served by a private water supply (PWS), due to its remote location. It is unlikely that this will be affected due to its location upslope of the development. On this basis, disruption to utility assets and PWS have been scoped out further assessment.

15.4.2 Maritime Activities

15.4.2.1 Core Study Area

The Site is not within the limits of any statutory ports or harbours with the closest being Glensanda, approximately 11.7 km to the southwest of the Site¹²⁷. This area is owned by Aggregate Industries with the port here being used to serve the loading and exporting of granite aggregate from the Yeoman Glensanda Quarry and is regularly used by ships of between 100 and 110,000 m/t deadweight¹²⁸.

A site visit on the 17th March 2021 also identified fishing buoys as being located in the Marine Area of the Site which may be evidence of recreational or small scale commercial fishing currently taking place within the Site. The existence of jetties and anchorages nearby is further evidence that Loch Linnhe is used for recreational purposes that is likely

¹²⁷ Marine Scotland (2014) Maps NMPI [Online] Available at:

<https://marinescotland.atkinsgeospatial.com/nmpi/default.aspx?layers=841> (Accessed: 01/02/2022)

¹²⁸ Aggregate Industries (2019) Glensanda Port & Terminal Information Booklet [Online] Available at:

https://www.aggregate.com/sites/aiuk/files/atoms/files/the_mariners_guide_to_glensanda_v15.pdf (Accessed: 01/02/2022)

used for recreation purposes rather than commercial activities (i.e. fishing, fish farming, yachting, canoeing or sailing etc.)

15.4.2.2 Wider Study Area

Loch Linnhe is classed as unregulated waters in that marine traffic is able to navigate the waters of the Loch without being subject to the jurisdiction of a Harbour Authority. The types of vessels typically using the loch are cruise liners, coastal cargo vessel, leisure crafts, ferries, fishing boats, aquaculture and other various miscellaneous vessels. Leisure and recreational use of the Loch is considered in Section 16 Socio Economics, Tourism and Recreation.

Due to the large number of islands and peninsulas in the WSA, ferry travel is an important part of the local transport network, and although this is true for Loch Linnhe, there are no regular ferries which travel the length of the loch, passing the Development.

The Appin House Jetty is located approximately 1.3 km to the southwest which is likely used for recreation purposes rather than commercial activities. This may also be used when travelling back and forth to Shuna Island, approximately 0.6 km from the jetty. As mentioned in Section 15.4.2.1, the Glensanda Harbour limit is located approximately 11.7 km southwest of the Site. Although this is outwith the 5 km WSA, and commercial vessels arriving or leaving the harbour are most likely to come and go from the southwest therefore avoiding the WSA, there is the possibility that commercial vessels may enter the WSA dependent on their destination if travelling north up the loch. The Scottish Association for Marine Science also used this harbour area to drop 6,230 tonnes of concrete blocks from the quarry into Loch Linnhe to create five groups of six artificial reefs around the loch¹²⁹. Although this project was completed in 2006, it illustrates the possibility that vessels leaving the Glensanda Harbour may sail in the vicinity of the Site.

The MOD also uses Loch Linnhe as a military practice area (X5624: Linnhe) where submarine practice exercises may be carried out. Two historic munitions disposal sites area also located approximately 18 km to the southwest of the Development although these are now disused¹³⁰. In regards to commercial fisheries, historical data received from Marine Traffic did not identify any large fishing vessels from 2016-2021; however, there are smaller fishing vessels that are not recorded by Marine Traffic who are known to utilise Loch Linnhe.

15.4.2.3 Cumulative Study Area

It is known that there are a number of operational fish farms on Loch Linnhe and in the vicinity of the Site, with the closest being Shuna Island Fish Farm located approximately 2 km south west of the Site from centre to site centre, or 900 m from closest point of Site boundary.

The extent of any cumulative assessment relative to each technical assessment will be agreed during the consultation process and can include both existing and proposed fish farm developments as well as other forms of development.

15.5 Key Sensitivities

At this stage, the key sensitive receptors are considered to be:

- Commercial fishing and aquaculture activities within 5km of the Site;
- Other commercial users of Loch Linnhe, who may have to divert or avoid the Site;
- Recreational users of Loch Linnhe who may have to divert or avoid the Site;

¹²⁹ SAMS (2022) The Loch Linnhe Artificial Reef [Online] Available at: <https://www.sams.ac.uk/facilities/artificial-reef/> (Accessed: 27/01/2022)

¹³⁰ Marine Scotland (2014) Maps NMPI [Online] Available at: <https://marinescotland.atkinsgeospatial.com/nmpi/default.aspx?layers=1006> (Accessed: 27/01/2022)

- Anchorage areas within the WSA (Appin House Jetty) whereby users of the anchorages having to divert or avoid the site whilst travelling to and from the anchorages;
- Commercial vessels leaving / travelling to the Glensanda Harbour; and
- MOD use of Loch Linnhe for military submarine practice exercises.

Indirect effects such as visual effects and impacts on the amenity of the users of the loch will be considered within the chapter 4 Seascape Landscape Visual Impact Assessment and chapter 16 Socio Economics, Tourism and Recreation

15.6 Potential Effects Assessment

15.6.1 Scoped In Effects

The following could potentially result in both beneficial and adverse significant effects and are therefore scoped in:

- Disruption to existing activities and operations currently active within and surrounding the Site, both the Marine Area and Terrestrial Area (such as commercial maritime activities, MOD activities, navigation routes, commercial fisheries); and
- Cumulative impacts on other Fish Farms in the vicinity such as the CAR Licenced Shuna Fish Farm.

15.6.2 Scoped Out Effects

The following effects have been scoped out of further assessment:

- Disruption to utility infrastructure and services during construction and installation works associated with the Development;
- Due to the relatively small area which will be accommodated by the Development when compared to Loch Linnhe as a whole, disruption to other sea users is scoped out as the Development is unlikely to restrict maritime movements on the Loch allowing impacts on recreational users and navigation routes to and from nearby anchorages and harbours to be Scoped out; and
- Impacts on land use and maritime activities during decommissioning are expected to be similar or less than those during construction and installation. Use of the loch and the surrounding area also can not be predicted at the current time, any impacts on land use and maritime activities would be assessed at the time of decommissioning thus these effects have been scoped out of further assessment at this stage.

15.7 Key Questions for the Council / Consultees

The following questions have been designed to ensure that the proposed methodologies and assessment are carried out in a robust manner and to the satisfaction of the determining authority:

- Do you agree with the proposed method of assessment for impacts on Land Use and Maritime Activities?
- Do you consider that there are any additional sensitive land use or maritime activities in the area that should be considered in the EIA?
- Do you agree with the aspects to be scoped in, and out, of the assessment?
- Do you agree with the proposed study area?

16 SOCIO-ECONOMICS, TOURISM AND RECREATION

16.1 Introduction

This Section describes socio-economic receptors of relevance within and in the vicinity of the Development. The local economy, employment and contributions from economic activities, including tourism and fish farming will be detailed and a high-level description of potential impacts on these interests that may be affected by the Development in the construction and operation phases is provided to determine the requirements for the assessment that will be included within the EIA Report.

16.2 Relevant Guidance and Legislation

The following guidance, legislation and information sources will be considered in carrying out this assessment:

- Argyll and Bute Supplementary Guidance: Aquaculture Development (2016)¹³¹;
- the EIA Regulations;
- Economic Action Plan 2019 – 2020¹³²;
- Scotland's Economic Strategy¹³³;
- Protecting Scotland, Renewing Scotland: Scotland's Programme for Government 2020 – 2021¹³⁴;
- National Performance Framework¹³⁵;
- Scottish Planning Policy¹³⁶;
- National Planning Framework 3¹³⁷;
- Towards a Robust, Resilient Wellbeing Economy for Scotland: Report of the Advisory Group on Economic Recovery¹³⁸;
- Institute of Environmental Management and Assessment (IEMA) (2011) The State of Environmental Impact Assessment in the UK¹³⁹;
- NatureScot (2018) Environmental Impact Assessment Handbook¹⁴⁰;
- Guidelines for Environmental Impact Assessments¹⁴¹ and a Handbook for Environmental Impact Assessment; and
- Scottish Government (2015) Scotland's national Marine Plan¹⁴².

¹³¹ Argyll and Bute Council (2016) Supplementary Guidance 2: Aquaculture Development [Online] Available at: https://www.argyll-bute.gov.uk/sites/default/files/sg_ldp_aqua_1_dec_2016.pdf (Accessed: 26/01/2022)

¹³² Scottish Government (2018) Economic Action Plan 2019 – 2020 [Online] Available at: <https://economicactionplan.mygov.scot/> (Accessed 09/07/2021)

¹³³ Scottish Government (2015) Scotland's Economic Strategy [Online] Available at: <https://www.gov.scot/publications/scotlands-economic-strategy/pages/0/> (Accessed 09/07/2021)

¹³⁴ Scottish Government (2020) Protecting Scotland, Renewing Scotland: Scotland's Programme for Government 2020 – 2021 [Online] Available at: <https://www.gov.scot/programme-for-government/> (Accessed 09/07/2021)

¹³⁵ Scottish Government (2019) National Performance Framework [Online] Available at: <https://nationalperformance.gov.scot/national-outcomes> (Accessed 09/07/2021)

¹³⁶ Scottish Government (2014) Scottish Planning Policy [Online] Available at: <https://www.gov.scot/publications/scottish-planning-policy/pages/2/> (Accessed 09/07/2021)

¹³⁷ Scottish Government (2014) National Planning Framework 3 [Online] Available at: <https://www.gov.scot/publications/national-planning-framework-3/> (Accessed 09/07/2021)

¹³⁸ Scottish Government (2020) Towards a Robust, Resilient Wellbeing Economy for Scotland: Report of the Advisory Group on Economic Recovery [Online] Available at: <https://www.gov.scot/publications/towards-robust-resilient-wellbeing-economy-scotland-report-advisory-group-economic-recovery/> (Accessed 09/07/2021)

¹³⁹ IEMA (2011) The State of Environmental Impact Assessment Practice in the UK [Online] Available at: <https://transform.iema.net/article/state-eia-practice-uk> (Accessed 11/02/2021)

¹⁴⁰ SNH (2018) Environmental Impact Assessment Handbook [Online] Available at: <https://www.nature.scot/handbook-environmental-impact-assessment-guidance-competent-authorities-consultees-and-others> (Accessed 09/07/2021)

¹⁴¹ Institute of Environmental Management and Assessment. (2004). *Guidelines for Environmental Impact Assessment*.

¹⁴² Scottish Government (2015) Scotland's National Marine Plan [Online] Available at: <https://www.gov.scot/publications/scotlands-national-marine-plan/> (Accessed 09/07/2021)

16.3 Assessment Methodology

The proposed methodology is based on established best practice, including that used in the UK Government and industry reports on the sector. Effects will be considered based on the wider environmental impact guidance from Guidelines for Environmental Impact Assessments¹⁴³ and a Handbook for Environmental Impact Assessment¹⁴⁴.

16.3.1 Socio-economics

The Development will result in opportunities for local and regional contractors both for construction and maintenance activities themselves and throughout the supply chain. The investment in the Development has the potential to generate a range of economic and social effects and opportunities for local businesses, most notably employment opportunities and local spending.

Potential economic effects can be divided into:

- Direct effects: for example, employment opportunities in the construction, operation and maintenance and decommissioning of the Development. The nature and scale of the economic effects would depend on the total cost and the sources of the materials and labour. Other direct effects could include a community benefit fund and the payment of business rates payable to the local authority throughout the operational phase of the Development; and
- Indirect effects: such as employment opportunities created down the supply chain by those companies providing services to the Development during construction, operation and decommissioning;

The economic impact of the Development upon surrounding settlements will be assessed in terms of the level of employment and contract opportunities the Development could bring. These effects will be assessed for each phase of the Development: construction, operation and decommissioning.

An assessment of the potential economic benefits to the wider area of Argyll and Bute, in terms of capital and operational expenditure, will be undertaken and presented in the EIA Report with reference to up-to-date figures on the economic impact of fin fish aquaculture.

16.3.2 Recreation and Tourism

This assessment will consider the potential effect that the Development could have on tourism attractions and the associated local tourism industry, the experience of cultural heritage assets, routes, trails and local accommodation providers. Effects on any on-site or nearby recreation and tourism receptors will be considered in detail where direct effects are predicted. Direct effects would be those that are an immediate effect of the Development such as physical disturbance to the tourism and recreation resource, such as the footprint of the Development and/or installation activities. Indirect effects on any tourism or recreation receptors that may derive from visual effects will be considered as part of the LVIA, and the findings of the LVIA will inform an assessment of the effect on the wider experience of the receptors under this topic heading within the EIA Report.

Effects to recreational users of the Loch could be varied as both direct and indirect effects could occur. As discussed in Section 15.4.2 of Section 15: Land Use and Maritime Activities, there are a range of recreational users of the loch ranging from fishing, yachting, canoeing and sailing etc., and with fishing buoys having been identified within the Site, direct effects are likely on those who use the Site for fishing or other recreational purposes. Indirect

¹⁴³ Institute of Environmental Management and Assessment. (2004). *Guidelines for Environmental Impact Assessment*.

¹⁴⁴ Scottish Natural Heritage. (2003). *A Handbook for Environmental Impact Assessment, Appendix 5: Guide to Outdoor Access Assessment*.

effects could include visual effects on users partaking in yachting, canoeing and sailing etc. influencing the pattern of behaviour and the perception of the amenity of the area.

16.3.3 Study Area

The study areas in this assessment are receptor specific and are detailed in the following sections.

16.3.3.1 Socio-Economics

The 'Study Areas' for socio-economics are defined as at local, regional, and national scale as follows:

- 'Local' is defined as comprising the electoral ward 'Oban North and Lorn'
- 'Regional' is defined as Argyll and Bute. The geographical size of Argyll and Bute means that the Development will not affect the entire area. As national statistics apply to Argyll and Bute as a single area, it will be referred to as a whole for a number of assessments. Additionally, due to the close proximity of the Site to the Highland Council Planning Authority boundary, the regional assessment will also consider the Highlands; and
- 'National' is defined as Scotland.

16.3.3.2 Recreation and Tourism

Table 16.1 details the Study Area's used for tourism and recreation when considering direct and indirect effects (as defined in Section 16.3.5).

Table 16.1: Study Areas

Effect	Name	Range
Direct	Direct Study Area (DSA)	The Site Boundary
Indirect	5 km Core Study Area (CSA)	5 km from the Marine Area and Terrestrial Area

Where there are particularly sensitive recreation and tourism assets/receptors outwith the Study Area but fall within the Zone of Theoretical Visibility (ZTV), these will be included on the basis of professional judgement.

16.4 Baseline Conditions

16.4.1 Socio-Economics

16.4.1.1 Argyll and Bute

The Development is located within the Oban North and Lorn electoral ward. The population is largely dispersed with many small villages, townships and settlements. This ward comprises of an estimated population of 9,595 residents, whereas Argyll and Bute as a whole has an estimated population of 85,430¹⁴⁵. The Development is located approximately 21.0 km north of Oban, the third largest settlement in Argyll and Bute¹⁴⁶ as well as the closest recognised settlement based on the definition of a settlement used by the Council:

"a contiguous group of high density postcodes with a population of 500 or more".

Although there are no recognised settlements nearby, there are many rural properties situated along the A828, with the closest residential receptor being Lurignish Cottage

¹⁴⁵ Scottish Government (2020) Statistics: Electoral Ward Oban North and Lorn [Online] Available at: <https://statistics.gov.scot/atlas/resource?uri=http%3A%2F%2Fstatistics.gov.scot%2Fid%2Fstatistical-geography%2FS13002520> (Accessed: 26/01/2022)

¹⁴⁶ Argyll and Bute Council (2020) Population: Where we live. [Online] Available at: <https://www.argyll-bute.gov.uk/info/population-where-we-live> (Accessed: 26/01/2022)

located directly adjacent to the Development. Appin Home Farm is also located 1 km to the south of the Development. As the Development will be using the A828 for site access, if any roadworks are required which leads to road closure or increased traffic build up, impacts on the local populace who use this road will need to be investigated.

In terms of potential supply chain benefits, the Development provides opportunities for the involvement of local, regional and Scottish suppliers in a range of activities, including research and development, design, project management, civil engineering, component fabrication / manufacture, installation and maintenance. There are also a number of other fish farm developments within Loch Linnhe and therefore there is the potential for cumulative benefits as the local area would see an increase in jobs that the Development would bring directly, with the potential for further job opportunities in the area specifically to service a number of fish farms on Loch Linnhe.

Tourism and Recreation is a key element in the socio-economic, environmental, and cultural welfare of Scotland. In 2019, around 17.5 million overnight trips were taken in Scotland (UK and international visitors) for which visitor expenditure totalled around £5.9 billion¹⁴⁷. These figures represent substantial increases on 2018 figures; in 2018, around 15.5 million overnight trips were taken in Scotland, for which visitor expenditure totalled around £5.1 billion¹⁴⁸.

Between 2017 and 2019 Argyll and the Isles saw on average 993,000 overnight visitors, 147,000 of which were international visitors, and 846,000 were domestic visitors¹⁴⁹. An average tourism spend of £433 million was spent in Argyll and the Isles during this time¹⁴⁹.

The Site is located within a relatively remote setting with recreation opportunity based around the natural environment such as hills, wildlife, lochs and rivers, with limited formally recognised tourist attractions within the CSA.

Given that the area is host to many natural landforms etc. that lend themselves to recreational activity, the Site itself – as part of a natural sea loch – can be used for informal recreation such as water activities like swimming etc.

There are a number of informal recreational / tourist receptors which may be impacted by visual effects as a result of the Development, as discussed in Section 17.4.2 of Section 4.4.4 of Section 5: Seascape, Landscape and Visual. The Lynn of Lorn National Scenic Area is located only 1.2 km to the southwest of the Site and the North Argyll Area of Panoramic Quality is directly adjacent to the south of the Site. The C152(a) - Oban to Appin (National Cycle Network) Core Path is also located only 20 m south of the Site. There may also be recreational users of Loch Linnhe itself which may be impacted by visual effects.

16.4.1.2 Highland

The Highland Council Area has a population of 235,430, a decrease of 0.2% since 2019¹⁵⁰. As with Argyll and Bute, tourism and recreation are 'central' to the socio-economic, environmental, and cultural welfare of the region¹⁵¹. In 2019, the region saw 2.9 million overnight visitors, a 30% increase from 2018. The growth in overnight tourism was much

¹⁴⁷ VisitScotland (2020) Key Facts on Tourism in Scotland 2019 [Online] Available at: <https://www.visitscotland.org/binaries/content/assets/dot-org/pdf/research-papers-2/key-facts-on-tourism-in-scotland-2019.pdf> (Accessed 12/07/2021)

¹⁴⁸ VisitScotland (2019) Key Facts on Tourism in Scotland 2018 [Online] Available at: <https://www.visitscotland.org/binaries/content/assets/dot-org/pdf/research-papers-2/key-facts-on-tourism-in-scotland-2018-v2.pdf> (Accessed 12/07/2021)

¹⁴⁹ Visit Scotland (2019) Insight Department: Argyll and the Isles Factsheet [Online] Available at: <https://www.visitscotland.org/binaries/content/assets/dot-org/pdf/research-papers-2/regional-factsheets/argyll-and-the-isles-factsheet-2019.pdf> (Accessed 12/07/2021)

¹⁵⁰ National Records of Scotland (2021). Highland Council Area Profile [Online]. Available from: <https://www.nrscotland.gov.uk/files//statistics/council-area-data-sheets/highland-council-profile.html> (Accessed: 16/09/2022).

¹⁵¹ Highlands and Islands Enterprise (2022). Tourism [Online]. Available from: <https://www.hie.co.uk/our-region/our-growth-sectors/tourism/> (Accessed: 16/09/2022).

more significant compared to the national average, which saw an 11 – 12% increase. Visitors to the region in 2019 spent £202 million, a sizeable percentage of the £2,538 million spent in Scotland as a whole¹⁵². The Site is located within a relatively remote setting with recreation opportunity based around the natural environment such as hills, wildlife, lochs and rivers, with limited formally recognised tourist attractions within the CSA.

16.5 Key Sensitivities

At this stage, the key sensitive receptors are considered to be:

- Nearby recreation and tourism receptors;
- Recreational users of the Loch; and
- Potential impacts on A828 road users (if roadworks are required);

16.6 Potential Effects Assessment

16.6.1 Scoped In Effects

The following could potentially result in both beneficial and adverse significant effects and are therefore scoped in:

- Economic benefits associated with capital expenditure (CAPEX).
- Economic benefits associated with operational expenditure (OPEX);
- Increased employment opportunities in a rural setting and associated income; and
- Exclusion of recreation sea users from the Site during the operational period.

The direct effects of commercial and recreational user exclusion from the Site are considered in Section 15: Land Use and Maritime Activities. Indirect effects are considered in Section 4: Seascape, Landscape and Visual Assessment.

Impacts during decommissioning are expected to be similar or less than those during construction and installation.

16.6.2 Scoped Out Effects

The following effects have been scoped out for further assessment:

- Disruption to recreational sea users due to the construction phase of the Development. This has been scoped out as effects are temporary and access to navigate north and south of the loch will be maintained at all times and the effects are considered unlikely to be significant.

16.7 Key Questions for the Council / Consultees

The following questions have been designed to ensure that the proposed methodologies and assessment are carried out in a robust manner and to the satisfaction of the determining authority:

- Do you agree with the proposed method of assessment for impacts on socio-economics, land use, recreation and tourism?
- Do you consider there are any additional economic activities in the area that should be considered as part of the assessment?
- Do you agree with the aspects to be scoped in, and out, of the assessment?
- Do you agree with the proposed study area(s)?

¹⁵² Visit Scotland (2020). Insight Department: Highland Factsheet 2019 [Online]. Available from: <https://www.visitscotland.org/binaries/content/assets/dot-org/pdf/research-papers-2/regional-factsheets/highland-factsheet-2019.pdf> (Accessed: 16/09/2022)

17 MISCELLANEOUS ISSUES (CLIMATE CHANGE AND ODOUR)

17.1 Introduction

A Miscellaneous Issues chapter in the EIA Report will assess the likely impact of the Development upon receptors surrounding the Site which are not covered in other technical disciplines.

This section of the Report sets out the proposed approach in respect to additional assessments that are required in order to provide a comprehensive assessment of the likely environmental impacts of the Development, together with a summary of the baseline based on information that is currently available.

17.2 Climate Change

This section of the Report describes the potential effects of the Development on climate change, and the potential effects of climate change on the Development. A high-level description of potential impacts on the climate change resource that may be affected by the Development or the Development may be affected by during the construction and operation phases is provided to determine the requirements for the assessment that will be included within the EIA Report.

17.2.1 Relevant Guidance and Legislation

The following legislation, policy and guidance have been considered in carrying out this assessment:

- Institute of Environmental Management and Assessment (IEMA) Environmental Impact Assessment Guide to Climate Change Resilience and Adaption 2020¹⁵³;
- The Scottish Climate Change Plan (2018)¹⁵⁴; and
- The Scottish Government's Declaration of a Climate Emergency (April 2019)¹⁵⁵

Notable information sources containing baseline and projected climate data include:

- Digest of United Kingdom Energy Statistics (DUKES) 2020¹⁵⁶;
- The State of the UK Climate 2019¹⁵⁷;
- Met Office UK Climate Projections 2018 (updated September 2019)¹⁵⁸; and
- The Met Office UKCP18 Science Overview Report¹⁵⁹.

17.2.2 Assessment Methodology

IEMA published 'Environmental Impact Assessment Guide to: Climate Change Resilience & Adaption'¹⁶⁰ in June 2020 as a revision to the 2015 guidance. At the time of writing, no

¹⁵³ IEMA (2020) Environmental Impact Assessment Guide to Climate Change Resilience and Adaption 2020 [Online]. Available at: <https://www.iema.net/resources/reading-room/2020/06/26/iema-eia-guide-to-climate-change-resilience-and-adaptation-2020> (Accessed: 28/01/2022)

¹⁵⁴ Scottish Government (2018) Climate Change Plan: Third Report on Proposals and Policies 2018 – 2031 (RPP3) [Online] Available at: <https://www.gov.scot/publications/scottish-governments-climate-change-plan-third-report-proposals-policies-2018-9781788516488/> (Accessed: 28/01/2022)

¹⁵⁵ Scottish Government (2019) Action to Address Climate Emergency [Online] Available at: <https://www.gov.scot/news/action-to-address-climate-emergency/> (Accessed: 28/01/2022)

¹⁵⁶ UK Government (2020) Digest of United Kingdom Energy Statistics 2020 [Online] Available at: <https://www.gov.uk/government/statistics/digest-of-uk-energy-statistics-dukes-2020> (Accessed: 28/01/2022)

¹⁵⁷ International Journal of Climatology, volume 39, Issue S1 (July 2020) ed. Radan Huth. Wiley

¹⁵⁸ Met Office (2019) UK Climate Projections – Updated September 2019 [Online] Available at: <https://www.metoffice.gov.uk/research/collaboration/ukcp> (Accessed: 28/01/2022)

¹⁵⁹ Lowe, J.A. *et al.* (2018) UKCP18 Science Overview Report. The Met Office. Available at: <https://www.metoffice.gov.uk/pub/data/weather/uk/ukcp18/science-reports/UKCP18-Overview-report.pdf> (Accessed: 28/01/2022)

¹⁶⁰ IEMA. (2020). *Environmental Impact Assessment Guide to: Climate Change Resilience & Adaption*. Available at: <https://www.iema.net/assets/newbuild/Policy%202020/IEMA%20EIA%20Climate%20Change%20Resilience%20June%202020.pdf> (Accessed: 28/01/2022)

update of to these guidelines has been published. The proposed methodology focusses on the following elements:

- Assessment of the Development's vulnerabilities and resilience in the context of climate change by identifying appropriate climate change projections and climate change effects; and
- Assessment of the Development's effects upon identified environmental receptors in the context of the emerging baseline.

The most recent climate change projection iteration, UKCP18, has identified the following climatic trends as a result of climate change:

- Increased temperature;
- Changes in the frequency, intensity and distribution of rainfall events (e.g. an increase in the contribution to winter rainfall from heavy precipitation events and decreases in summer rainfall);
- Increased windstorms; and
- Sea level rise.

17.2.2.1 Study Area

The Study Area for the assessment of climate change effects on the Development considers potential adverse weather and climate impacts on the Site, that being the area within the red line boundary, only, however considers the climate changes at the national level.

17.2.3 Baseline Conditions

The State of the UK Climate 2019¹⁶¹ provides the latest report on observed climate data for UK. Key findings are as follows:

- The decade 2010-2019 was on average 0.3°C warmer than the 1981-2010 average and 0.9°C warmer than 1961-1990. The ten warmest years on record have occurred since 2002;
- The decade 2010–2019 has been on average 1% wetter than 1981–2010 and 5% wetter than 1961–1990 for the UK overall. Six of the ten wettest years for the UK in a series from 1862 have occurred since 1998;
- In the context of seasonal changes, for the most recent decade (2010-2019):
 - UK summers have been on average 11% wetter than 1981–2010 and 13% wetter than 1961–1990;
 - UK winters have been on average 4% wetter than 1981–2010 and 12% wetter than 1961–1990; and
- In the UK, there is no strong evidence for trends in storminess as determined by maximum gust speeds over the last five decades.

Climate Projections show that the trends over the 21st Century in the UK are towards warmer and wetter winters and hotter, drier summers, with an increase in frequency and intensity of extremes.

The Fifth Assessment Report from the Intergovernmental Panel on Climate Change (IPPC)¹⁶² provides evidence of global warming and its effects on oceans, coastal areas and inland waterbodies. Climate change is affecting the abundance and distribution of fisheries resources and the suitability of some geographical locations for aquaculture systems due to an increase in carbon emissions. These carbon emissions are causing physical and chemical changes to aquaculture as oceans and waterbodies are absorbing these emissions

¹⁶¹ International Journal of Climatology, volume 39, Issue S1 (July 2020) ed. Radan Huth. Wiley

¹⁶² IPCC, (2014), The Fifth Assessment Report, [Online] Available at: <https://www.ipcc.ch/assessment-report/ar5/> (Accessed: 28/01/2022)

which is causing substantial changes in aquatic ecosystems which in turn is affecting food security and livelihoods¹⁶³.

Climate-related changes that affect ecological functions include changes in salinity and freshwater content; oxygen concentration; carbon uptake and acidification; temperature and thermal stratification; sea levels; ocean circulation; surface wind, storm systems and waves. Additionally, sea lice exhibit temperature-dependent development rates and increased water temperatures can induce increased production of sea lice larvae. These changes can be expected to have a range of impacts, both direct and indirect, on fisheries and aquaculture¹⁶⁴.

17.2.3.1 Precipitation

Rainfall patterns over the UK are not uniform and vary on regional and seasonal scales, which will continue in the future. Future changes are uncertain but point to wetter winters and drier summers in general. Northern Scotland is associated with greatest increased precipitation in winters¹⁶⁵.

Over the UK, the changes to precipitation projected for 2041-2060 (compared to 1981-2000) for RCP8.5 (unmitigated scenario) are:

- Winter precipitation – increase of 7%. Results for the 10th to 90th percentile range are between -5% and +21%;
- Summer precipitation – decrease of 15%. Results for the 10th to 90th percentile range are between -31% and +0%.

17.2.3.2 Wind Speed

The global projections over the UK show an increase in near surface (10 m height) wind speeds over the UK in the second half of the 21st Century, in the winter season when higher wind speeds are generally experienced. The increase is modest when compared to inter-annual variability. This would be accompanied by an increase in frequency of winter storms over the UK¹⁶⁶. There are no significant changes forecast in the wind speeds over the first half of the century.

These projections are in line with earlier findings by Pryor and Barthelmie (2010)¹⁶⁷ who concluded that in the near-term (i.e., until the 2050s) there will be no detectable significant change in the wind resource of northern Europe.

The North-East Atlantic is predicted to experience increased storm activity and as climate change increases the frequency and intensity of storms and adverse weather events as projected, farm cages will be more likely to get damaged, leading to increased numbers of fish farm escapes and greater economic losses¹⁶⁸.

¹⁶³ Food and Agriculture Organisation of the United Nations, (2017), Climate-Smart Fisheries and Aquaculture, [Online] Available at: <http://www.fao.org/climate-smart-agriculture-sourcebook/production-resources/module-b4-fisheries/chapter-b4-3/en/> (Accessed: 28/01/2022)

¹⁶⁴ Food and Agriculture Organisation of the United Nations, (2017), Climate-Smart Fisheries and Aquaculture, [Online] Available at: <http://www.fao.org/climate-smart-agriculture-sourcebook/production-resources/module-b4-fisheries/chapter-b4-3/en/> (Accessed: 28/01/2022)

¹⁶⁶ UKCP18 (2018) Factsheet: Wind.

¹⁶⁶ UKCP18 (2018) Factsheet: Wind.

¹⁶⁸ Climate X Change, (nd), Frequency of Escapes from Fish Farms due to Weather [Online] Available at: <https://www.climatechange.org.uk/research/indicators-and-trends/indicators/nm9b-frequency-of-escapes-from-fish-farms-due-to-weather/> (Accessed: 28/01/2022)

¹⁶⁸ Climate X Change, (nd), Frequency of Escapes from Fish Farms due to Weather [Online] Available at: <https://www.climatechange.org.uk/research/indicators-and-trends/indicators/nm9b-frequency-of-escapes-from-fish-farms-due-to-weather/> (Accessed: 28/01/2022)

17.2.3.3 Adverse Weather Events

Adverse weather events due to climate change range from extreme cold weather to heatwaves, to heavy rainfall and flooding and can have a major impact on fish farming.

The latest State of the UK Climate report shows that in the most recent decade (2008–2017) there have been 5% fewer days of air frost (when daily minimum temperature falls below 0°C) and 9% fewer days of ground frost compared to the 1981–2010 average, and 15%/14% fewer respectively compared to 1961–1990¹⁶⁹.

On the opposite side of the spectrum, we have heatwaves which are proving to increase with the impacts of climate change in the UK. The latest UK State of the Climate report shows we are experiencing higher maximum temperatures and longer warm spells¹⁷⁰. The hottest day of the year for the most recent decade (2008–2017) has increased by 0.8°C above the 1961–1990 average. Warm spells have also more than doubled in length – increasing from 5.3 days in 1961–90 to over 13 days in the most recent decade (2008–2017). South East England has seen some of the most significant changes, with warm spells increasing from around 6 days in length (during 1961–1990) to over 18 days per year on average during the most recent decade¹⁷¹.

Several indicators in the latest UK State of the Climate report show that the UK's climate is becoming wetter¹⁷². The highest rainfall totals over a five-day period are 4% higher during the most recent decade (2008–2017) compared to 1961–1990. Furthermore, the amount of rain from extremely wet days has increased by 17% when comparing the same time periods. In addition, there is a slight increase in the longest sequence of consecutive wet days for the UK; the change in rainfall depends on the location and Scotland is set to see the largest changes with a higher increase in rainfall and flooding¹⁷³.

UKCP18 showed that the UK will experience warmer, wetter winters and hotter drier summers on average. Colder than average winters and summers will still occur but will become less likely the further we go into the 21st century.

17.2.3.4 Increase in Water Temperature

Data from the US National Oceanic and Atmospheric Administration (NOAA) shows that the average global sea surface temperature – the temperature of the upper few metres of the ocean – has increased by approximately 0.13°C per decade over the past 100 years. The report predicted that there is likely to be an increase in mean global ocean temperature of 1–4°C by the year 2100¹⁷⁴.

The Fifth Assessment Report published by the Intergovernmental Panel on Climate Change (IPCC) in 2013 revealed that the ocean had absorbed more than 93% of the excess heat from greenhouse gas emissions since the 1970s¹⁷⁵.

¹⁷⁴ International Union for Conservation of Nature, (2017), Ocean Warming, [Online] Available at: https://www.iucn.org/sites/dev/files/ocean_warming_issues_brief_final.pdf (Accessed: 28/01/2022)

¹⁷⁴ International Union for Conservation of Nature, (2017), Ocean Warming, [Online] Available at: https://www.iucn.org/sites/dev/files/ocean_warming_issues_brief_final.pdf (Accessed: 28/01/2022)

¹⁷⁴ International Union for Conservation of Nature, (2017), Ocean Warming, [Online] Available at: https://www.iucn.org/sites/dev/files/ocean_warming_issues_brief_final.pdf (Accessed: 28/01/2022)

¹⁷⁴ International Union for Conservation of Nature, (2017), Ocean Warming, [Online] Available at: https://www.iucn.org/sites/dev/files/ocean_warming_issues_brief_final.pdf (Accessed: 28/01/2022)

¹⁷⁴ International Union for Conservation of Nature, (2017), Ocean Warming, [Online] Available at: https://www.iucn.org/sites/dev/files/ocean_warming_issues_brief_final.pdf (Accessed: 28/01/2022)

¹⁷⁴ International Union for Conservation of Nature, (2017), Ocean Warming, [Online] Available at: https://www.iucn.org/sites/dev/files/ocean_warming_issues_brief_final.pdf (Accessed: 28/01/2022)

¹⁷⁷ Scottish Government (2011) Scotland's Marine Atlas: Information for the National Marine Plan [Online] Available at: <https://www.gov.scot/publications/scotlands-marine-atlas-information-national-marine-plan/pages/9/> (Accessed: 28/01/2022)

The ocean absorbs higher levels of CO² which in turn increases the temperature of the water; the warming is more prominent in the Northern Hemisphere. The trend in sea surface temperature already exceeds the range in natural seasonal variability. For freshwater systems, an increase of water temperature is expected to occur in most areas, as a result of an increase of air temperature¹⁷⁶.

Sea temperatures around Scotland are affected by local climatic conditions and the heat transferred to the shores of Scotland by ocean currents. Around the coast of Scotland, the sea surface temperature is increasing. The rate of increase between 1985 and 2009 has generally been >0.2°C per decade¹⁷⁷, and in the southeast of Scotland this rate increases to 0.5°C per decade over 1985-2009.

As noted above, an increase in water temperature can affect ecological functions including changes in salinity and freshwater content; oxygen concentration; carbon uptake and acidification; temperature and thermal stratification; and sea lice reproduction rates. These changes can be expected to have a range of impacts, both direct and indirect, on fisheries and aquaculture¹⁷⁸.

17.2.4 Potential Effects Assessment

It is proposed that the Development's vulnerabilities and resilience to climate change can be scoped out of the EIA. None of the identified climate change trends listed above could affect the Development as fish farms are designed to withstand extreme conditions (wind speeds, precipitation and adverse weather events) associated with exposed marine locations. Although trends predict an increase in overall water temperature, it is not considered that the water temperatures in Loch Long will increase at a rate which would adversely affect the operation of the Development over its lifetime. Additionally, the design of the Development and operation have and will consider variations in water temperature. The semi-closed system is designed to draw in deeper water, which is cooler, in the summer, to ensure stable water temperatures for the salmon.

17.2.4.1 Scoped Out Effects

It not considered necessary for climate change to be assessed further in the EIA and is scoped out of further assessment due to the following:

- The Development itself will have a limited impact on climate change itself due to the nature of the Development, and therefore any effects on climate change are considered to relate to waste;
- The influence of climate change on the Development and the vulnerability of the project to climate change, including adverse and extreme weather events.

17.3 The Development's vulnerabilities and resilience to climate change. Odour

This Section of the Report describes the effects of the odour as a result of the Development. A high-level description of potential impacts on the potential odour emissions associated with the Development during the construction and operation phases is provided to determine the requirements for the assessment that will be included within the EIA Report.

¹⁷⁷ Scottish Government (2011) Scotland's Marine Atlas: Information for the National Marine Plan [online] Available at: <https://www.gov.scot/publications/scotlands-marine-atlas-information-national-marine-plan/pages/9/> (Accessed: 28/01/2022)

¹⁷⁷ Scottish Government (2011) Scotland's Marine Atlas: Information for the National Marine Plan [online] Available at: <https://www.gov.scot/publications/scotlands-marine-atlas-information-national-marine-plan/pages/9/> (Accessed: 28/01/2022)

¹⁷⁸ Food and Agriculture Organisation of the United Nations, (2017), Climate-Smart Fisheries and Aquaculture, [Online] Available at: <http://www.fao.org/climate-smart-agriculture-sourcebook/production-resources/module-b4-fisheries/chapter-b4-3/en/> (Accessed: 28/01/2022)

17.3.1 Relevant Guidance and Legislation

The following guidance, legislation and information sources have been considered in carrying out this assessment:

- Institute of Air Quality Management (IAQM) Guidance on the assessment of odour for planning (2018);
- Scottish Environment Protection Agency (SEPA) Odour Guidance (2010);
- Scottish Planning Policy (SPP);

17.3.2 Assessment Methodology

Emissions associated with the Development have the potential to cause adverse odour effects at sensitive locations. These were therefore assessed using the IAQM 'Guidance on the Assessment of Odour for Planning v1.1'¹⁷⁹ document, as summarised in the following Section.

The first step in the assessment will be to estimate the odour generating potential of activities associated with the operational phase of the Development. This is termed the Source Odour Potential, which takes into account three factors:

- The scale (magnitude) of the release from the odour source, taking into account the effectiveness of any proposed odour control or mitigation measures. This involves judging the relative size of the release rate after mitigation and taking account of any pattern of release (*e.g.* intermittency);
- How inherently odorous the emission is. In some cases it may be known whether the release has a low, medium or high Odour Detection Threshold (ODT). This is the concentration at which an odour becomes detectable to the human nose. In most instances the odours released by a source will be a complex mixture of compounds and the detectability will not be known. However, for some industrial processes the odour will be due to one or a small number of known compounds and the detection thresholds will be a good indication of whether the release is highly odorous or mildly odorous; and
- The relative pleasantness/unpleasantness of the odour.

The next step will be to estimate the effectiveness of the pollutant pathway as the transport mechanism for odour through the air to the receptor, versus the dilution/dispersion in the atmosphere. Any factor that increases dilution and dispersion of the plume as it travels from source to receptor will reduce the concentration at the end point, and hence reduce exposure. Important factors for consideration are:

- The distance between sensitive receptors and the odour source;
- Whether receptors are downwind with respect to the prevailing wind direction. Odour episodes often tend to occur during stable atmospheric conditions with low wind speed, which gives poor dispersion and dilution. Receptors close to the source in all directions can be affected under these conditions. When circumstances are not calm, it will be the downwind receptors that are affected. As such, receptors that are downwind with respect to the prevailing wind direction tend to be at higher risk of odour effect;
- The effectiveness of the point of release in promoting good dispersion *e.g.* releasing emissions from a high stack will increase the pathway, dilution and dispersion; and
- The topography and terrain between the source and receptor. The presence of topographical features such as hills and valleys, or urban terrain features such as buildings, can affect air flow and therefore increase, or inhibit, dispersion and dilution.

¹⁷⁹ IAQM. (2018). Guidance on the Assessment of Odour for Planning v1.1. IAQM, London.

Table 17.1 details the framework for determining the sensitivity of the receiving receptor.

Table 17.1: Odour Receptor Sensitivity

Sensitivity	Description
High	<p>Surrounding land where:</p> <ul style="list-style-type: none"> • Users can reasonably expect enjoyment of a high level of amenity; and • People would reasonably be expected to be present here continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land. <p>Examples may include residential dwellings, hospitals, schools/education and tourist/cultural.</p>
Medium	<p>Surrounding land where:</p> <ul style="list-style-type: none"> • Users would expect to enjoy a reasonable level of amenity, but would not reasonably expect to enjoy the same level of amenity as in their home; or • People would not reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land. <p>Examples may include places of work, commercial/retail premises and playing/recreation fields.</p>
Low	<p>Surrounding land where:</p> <ul style="list-style-type: none"> • The enjoyment of amenity would not reasonably be expected; or • There is transient exposure, where the people would reasonably be expected to present only for limited periods of time as part of the normal pattern of use of the land. <p>Examples may include industrial use, farms, footpaths and roads.</p>

The interaction between Source Odour Potential and Pathway Effectiveness is used to predict the risk of odour exposure (effect) at the receptor location, as shown by the matrix in Table 17.2.

Table 17.2 Risk of Odour Effect

Pathway Effectiveness	Source Odour Potential		
	Small	Medium	Large
Highly effective	Low	Medium	High
Moderately effective	Negligible	Low	Medium
Ineffective	Negligible	Negligible	Low

The final step is to determine the significance of odour effect at the specified receptor location through the interaction between sensitivity and risk, as outlined in Table 17.3.

Table 17.3 Significance of Odour Effect

Risk of Odour Exposure	Receptor Sensitivity		
	Low	Medium	High
High	Slight	Moderate	Substantial
Medium	Negligible	Slight	Moderate
Low	Negligible	Negligible	Slight
Negligible	Negligible	Negligible	Negligible

The IAQM guidance¹⁸⁰ states that an assessment must reach a conclusion on the likely significance of the predicted effect. Where the overall effect is **moderate** or **substantial**, the effect is likely to be considered **significant**, whilst if the effect is **slight** or **negligible**, the effect is likely to be considered **not significant**.

17.3.2.1 Study Area

As per the IAQM guidance, residential and tourist/cultural receptors can be considered as high sensitivity receptors. With the nearest residential receptor being directly adjacent to the Development, the second nearest being just over 1 km to the south and 15 residential receptors being within 2 km of the Development, these will be investigated for impacts from Odour. There are also a number of recreational assets adjacent to the Development in the form of Core Paths as well as Loch Linnhe itself as this may be used for recreational fishing and boating. The IAQM guidance describes recreational assets as being potentially medium sensitivity receptors.

17.3.3 Baseline Conditions

The Site is located in a rural setting on the eastern shore of Loch Linnhe. The A828 road lies adjacent to the south of the Site with a small area of native woodland in the east of the Site. There is also small area of farmland to the south of the Site at Lurignish farm.

There are no other significant odour sources within the vicinity of the Site.

The closest residential receptor being Lurignish Cottage located directly adjacent to the Development. Appin Home Farm is also located 1 km to the south of the Development.

17.3.4 Key Sensitivities

At this stage, the key sensitive receptors are considered to be:

- Residential Receptors within the vicinity;
- Recreational routes / core paths directly adjacent to the Development; and
- Recreational users of Loch Linnhe in the vicinity of the Development

17.3.5 Potential Effects Assessment

17.3.5.1 Scoped In Effects

The following effects have been scoped in for further assessment:

- Odour impacts on residential receptors during operation from fish waste and waste management processes;
- Odour impacts on tourist receptors during from fish waste and waste management processes; and
- Odour impacts on recreation receptors during from fish waste and waste management processes

17.3.5.2 Scoped Out Effects

The following effects have been scoped out for further assessment:

- Receptors beyond 2 km from the Site.

¹⁸⁰ IAQM. (2018). Guidance on the Assessment of Odour for Planning v1.1. IAQM, London.

17.4 Key Questions for the Council / Consultees

The following questions have been designed to ensure that the proposed methodologies and assessment for climate change and odour are carried out in a robust manner and to the satisfaction of the determining authority:

- Do you agree the effect of the Development on climate change can be scoped out of the assessment?
- Do you agree that the resilience of the Development to climate change can be scoped out of the assessment?
- Do you agree with the proposed method of assessment for impacts on receptors from the odour resource?
- Do you consider that there are any other sensitive receptors that should be considered as part of the assessment?
- Do you agree with the aspects to be scoped in, and out, of the assessment?
- Do you agree with the proposed study area(s)?

APPENDIX A: SCOPING FIGURE LIST AND FIGURES

This Scoping Report contains the following figures:

- Figure 1.1: Site Location;
- Figure 1.2: Site Boundary Plan;
- Figure 1.3: Indicative Site Layout;
- Figure 4.1: Landscape Designations;
- Figure 4.2: Seascape and Landscape Character Areas;
- Figure 4.3: Recreational and Transport Routes;
- Figure 4.4: ZTV;
- Figure 6.1: Location of Salmonid Rivers in relation to the Development;
- Figure 7.1: Location of SACs and SHOs in Relation to the Development;
- Figure 8.1: Natural Heritage Designations with Ecological Interests within 10 km of the Development;
- Figure 9.1: Natural Heritage Designations with Ornithological Interests within 20 km of the Development;
- Figure 12.1: Designated Cultural Heritage Assets within 5 km of CSA
- Figure 14.1: Location of Potential Residential NSRs.

APPENDIX B: LIST OF SUGGESTED CONSULTEES AND CONSULTATION ADDRESS

The organisations shown below will be consulted with the relevant information as part of the Scoping process, although not all consultees will receive a copy of the Scoping Report.

Consultees to receive a copy of the Scoping Report:

Statutory Consultees

- Argyll and Bute Council
- Highland Council
- Historic Environment Scotland
- Marine Scotland
- Maritime and Coastguard Agency
- NatureScot
- Northern Lighthouse Board
- Scottish Environmental Protection Agency (SEPA)
- Scottish Water

Non-Statutory Consultees

- Appin Community Council
- Argyll District Salmon Fisheries Board
- Crown Estate Scotland
- Defence Infrastructure Organisation, including Ministry of Defence
- Duror and Kentallen Community Council
- Fisheries Management Scotland
- Forestry and Land Scotland (FLS)
- RSPB Scotland
- Scottish Wildlife Trust
- Transport Scotland
- Visit Scotland

Responses

All responses should be addressed to:

Argyll and Bute
1A Manse Brae
Lochgilphead
PA31 8RD
Email: centralvalidation@argyll-bute.gov.uk

Responses should also be directed to the agent, on behalf of the Applicant, at:

Arcus Consultancy Services Ltd
7th Floor
144 West George Street
Glasgow
G2 2HG

Email: info@arcusconsulting.co.uk

Telephone: 0141 221 9997

If you would like any more information prior to responding to the Scoping Report, please contact Arcus at the address above.