

CEAA Screening Report

Grieg Seafood BC Ltd. Proposed Finfish Aquaculture Facility at Concepcion Point, Nootka Sound BC

Prepared by:

Department of Fisheries and Oceans
Oceans, Habitat and Enhancement Branch
Aquaculture Division
Vancouver, BC

Transport Canada (NWPA)	8200-03-8463.1
Provincial (LWBC)	1405634
HRTS Reference	03-HPAC-PA6-000-000002
FEAI	41395



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FISHERIES AND OCEANS CANADA
Oceans, Habitat and Enhancement Branch
Aquaculture Division

1.0 PROJECT IDENTIFICATION

1.1 File Numbers:

TC (NWP)	8200-03-8463.1
Provincial (LWBC)	1405634
HRTS Reference	03-HPAC-PA6-000-000002
FEAI	41395

1.2 Proponent:

Grieg Seafood BC Ltd.
Suite 303 – 909 Island Highway
Campbell River BC V9W 2C2

1.3 Contact:

Tim Davies

1.4 CEAA Trigger:

Section 5(1) of the *Navigable Waters Protection Act* (NWP)
Section 35 (2) of the *Fisheries Act*

1.5 Responsible Authority (RA):

Fisheries and Oceans Canada,
Oceans, Habitat and Enhancement
Branch (DFO-OHEB) (Lead)
Transport Canada (TC)

1.6 Referral Received by NWP:

August 8, 2003

1.7 Federal EA Start Date:

September 19, 2003

2.0 PROJECT DESCRIPTION

2.1 Project Name

Grieg Seafood BC Ltd. proposed finfish facility – Concepcion Point, Nootka Sound

2.2 Project Location

Unsurveyed foreshore at the confluence of Hanna Channel and Zuciarte Channel adjacent to Concepcion Point, east side of Bligh Island, Nootka Land District, Nootka Sound on the west coast of Vancouver Island, British Columbia.

Latitude: 49° 39' 45.6" N Longitude: 126° 28' 52" W

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2.3 Project Summary

Grieg Seafood BC Ltd. (hereafter Grieg Seafood) proposes to locate a new finfish aquaculture facility near Concepcion Point at the confluence of Hanna Channel and Zuciarte Channel, Nootka Sound. The project involves, as a maximum, installation of 1 feed barge (30 m X 15 m) and no more than 14 netcages (30 m x 30 m x 15 m) plus associated lines and anchors. The total proposed tenure area is 78 ha and the maximum tenure area to be occupied at full production is 5.7 ha (7.3% of the total tenure area). Grieg Seafood has applied for a license to grow Atlantic salmon. Fish production numbers have been submitted to Fisheries and Oceans Canada (DFO) for this application by the proponent for consideration as part of the *Canadian Environmental Assessment Act* (CEAA) Screening, but are not specifically included in this CEAA screening report as they are protected under section 55(7) of CEAA.¹

3.0 SCOPE OF THE ENVIRONMENTAL ASSESSMENT

The scope of the project and environmental assessment defines the components of a proposed development and the environmental effects that should be included in the environmental assessment (EA).

3.1 Scope of Project

Scoping the project (as per Section 16 of the *Canadian Environmental Assessment Act* - CEAA) involves determining which components of the proposed development should be considered part of the project for the purposes of the EA.

The principle project for which a power, duty or function is being exercised (*Fisheries Act* Section 35(2) Authorization and approval under section 5(1) of the *Navigable Waters Protection Act* - NWPA) is the proposed construction installation, operation, and maintenance phases of the aquaculture application. This includes the following physical works: barges, net pens, walkways, nets, living accommodations and their associated lines and anchors. Physical works or activities accessory to the principle project include transport of stock to and from the site, transport of fish to the harvesting site, net and equipment cleaning, and disposal of all wastes. As per CEAA Section 15(3), the decommissioning and abandonment of the project will also be considered as part of the Environmental Assessment.

¹ Section 55(7) of CEAA states that in order to facilitate public access to records relating to environmental assessments, a public registry shall be established and operated in a manner to ensure convenient public access to the registry. It also states that the public registry shall contain records available to the public, except a record or part, containing third party information. Third party information includes:

- trade secrets of a third party;
- financial, commercial, scientific or technical information that is confidential and supplied to a government institution by a third party and is treated consistently in a confidential manner by the third party;
- Information the disclosure of which could reasonably be expected to result in material financial loss or gain to, or could reasonably be expected to prejudice the competitive position of, a third party; and,
- Information the disclosure of which could reasonably be expected to interfere with contractual or other negotiations of a third party.

3.2 Scope of Environmental Assessment

This is a Screening level EA and hence requires consideration of the factors stated in Section 16(1) of CEAA:

- (a) the environmental effects of the project, including the environmental effects of malfunctions or accidents that may occur in connection with the project and any cumulative environmental effects that are likely to result from the project in combination with other projects or activities that have been or will be carried out;
- (b) the significance of the effects referred to in paragraph (a);
- (c) comments from the public that are received in accordance with this Act and the regulations;
- (d) measures that are technically and economically feasible and that would mitigate any significant adverse environmental effects of the project: and
- (e) any other matter relevant to the screening, such as the need for the project and alternatives to the project, that the responsible authority or, except in the case of a screening, the Minister after consulting with the responsible authority, may require to be considered.

The scope of the environmental effects examined in the EA is included in the following sections titled Environmental Description and Effects and Cumulative Environmental Effects. The potential environmental effects of the proposed project are considered within spatial and temporal boundaries that encompass the periods and areas during and within which the project may potentially interact with, and have an effect on, components of the environment. These boundaries may vary with each environmental component, and reflect factors such as:

- the construction, operation, and maintenance phases of the project;
- the natural cycles of a population or ecological component;
- the timing of sensitive life cycle phases in relation to the scheduling of proposed activities;
- the time required for an effect to become evident;
- the time required for a population or ecological component to recover from an effect and return to a pre-effect condition;
- the area directly affected by the proposed project; and
- the area within which a population or ecological component functions and within which a project effect may be felt.

3.3 Consultation with Relevant Agencies, First Nations, and the Public

3.3.1 Expert Federal Authorities

On July 16, 2003 Land and Water BC (LWBC) indicated that the Project Review Team accepted the application as complete and commenced application review. LWBC referred the project to DFO - Canadian Coast Guard, Navigable Waters Protection Division (now Transport Canada-Navigable Waters Protection Division – TC-NWPD)².

² Responsibility for the *Navigable Waters Protection Act* transferred from Fisheries and Oceans Canada (DFO) to Transport Canada (TC) on March 29, 2004 making TC a Responsible Authority for aquaculture

DFO-NWPD referred details of the project to Indian and Northern Affairs Canada (INAC) and internally referred details of the project to Canadian Coast Guard - Marine Navigation Service (CCG-MNS) on September, 19, 2003. Fisheries and Oceans Canada, Regional Aquaculture Co-ordination Office (DFO-RACO) referred the project to Environment Canada on May 14, 2004, and internally to the DFO South Coast Oceans, Habitat and Enhancement Branch (DFO-OHEB), Fisheries Management Branch (DFO-FMB) and Science Branch (DFO-SB) for their review. The federal departments were requested to provide specialist advice in accordance with Section 12(3) of the *Canadian Environmental Assessment Act*.

3.3.2 Provincial Agencies

All proposed aquaculture facilities (i.e. relocations and new sites) are reviewed by Ministry of Agriculture, Food and Fisheries (MAFF), Water Land and Air Protection (WLAP), and also LWBC, with regard to their agency mandates and legal responsibilities.

3.3.3 Municipal Organisations

The area in which the farm is proposed as located within the Unit 5 Zuciarte Channel area of the Nootka Coastal Land Use Plan – that area has a primary designation as General Management and a secondary designation as Aquaculture. Key values of the planning unit are recreation and tourism. Objectives for the area include consideration of site specific applications for all uses in consideration of existing legal tenures; provision of opportunities for shellfish aquaculture development; and examination of opportunities for fin-fish aquaculture development.

Grieg Seafood gave a presentation to the Regional District of Comox Strathcona (RDCS) West Coast Planning Committee on March 25, 2002. The West Coast Planning Committee includes representatives from the Village of Zeballos, the Village of Tahsis, the Village of Gold River, and the RDCS. Issues discussed during the meeting included fish escapes, waste management, sea lice and fish health. Concerns raised by attendees included human health concerns and the possibility of IHN spreading to Grieg's existing sites in Esperanza Inlet.

Grieg Seafood gave a presentation at the Gold River Council Meeting on April 4, 2002. Comments included queries regarding the use of 5-inch predator nets, potential for culture of other finfish species in future, and queries regarding garbage production expected from the site and frequency of net monitoring.

A document titled "Nootka Sound Development Proposal" dated May 2002 was submitted to the Village of Gold River, the Village of Tahsis, the Village of Zeballos and the Regional District of Comox Strathcona.

The Village of Gold River provided a letter (dated May 7, 2002) in support of Grieg Seafood's aquaculture management plans for Nootka Sound and Gold River.

The Village of Tahsis provided a letter (dated June 12, 2002) in support of Grieg Seafood's plans to develop aquaculture in the Nootka Sound area.

files requiring an approval under the *Navigable Waters Protection Act*. On October 1, 2004, after a transition period, review of project files under the NWPA transferred from DFO to TC.

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The RDCS provided a letter (dated August 8, 2002) in support of Grieg Seafood's aquaculture management plans for the Nootka Sound area subject to the RDCS West Coast Committee's specific review and recommendation for each of the tenure applications.

3.3.4 First Nations

The proposed fishfarm is located within the traditional territories claimed by the Mowachaht/Muchalaht First Nation. The nearest First Nation reserve is the Cheesish reserve (IR 15) located approximately 1km from the north tenure boundary and 1.5 km from the north edge of the net cage system of the proposed fish farm location.

A joint DFO / LWBC letter was sent to the Mowachaht/Muchalaht First Nation and the Nuuchahnulth Tribal Council informing them of the proposed project on July 16, 2003. The Mowachaht/Muchalaht First Nation replied on November 4, 2003 that they that they have concern about the potential for infringement related to their aboriginal rights, including access to fish resources, in their traditional areas.

On September 13, 2002 LWBC met with the Mowachaht/Muchalaht First Nation. During this meeting, the Mowachaht/Muchalaht First Nation stated concerns related to interference from the fish farms proposed for Muchalat Inlet to wild smolt migration and positioning of the netpens. Other issues identified related to steps to be taken in the event of mass mortality events.

The Mowachaht/Muchalaht First Nation outlined their concerns in a letter to the Minister of Fisheries and Oceans dated December 6, 2002 and stated their opposition to net-cage finfish farms in their traditional territory. Concerns outlined included potential for the project to pose risks to the environment and traditional fisheries and potential for the project to impact on control and access to traditional territories and resources.

DFO met with the Mowachaht/Muchalaht First Nation on November 4, 2003 to discuss concerns.

The Mowachaht/Muchalaht First Nation outlined their concerns regarding the proposed Concepcion Point site in a letter to Lands and Water British Columbia dated November 4, 2003; these concerns included fishing station rights, seal hunting, salvage rights, proximity to Cheesish Reserve, historical significance of Concepcion Point, clam beach siting conflict, control and access to traditional territories and resources, previous disallowance of Concepcion Point site in 1988 for fin fish farm, sedimentation impacts to fish habitat, risks to environment and traditional fisheries, and undermining the treaty process.

DFO sent a letter to the Mowachaht / Muchalaht First Nation on October 13, 2004 including a table outlining identified First Nation concerns along with identified mitigation measures addressing those concerns.

A letter was received from the Mowachaht / Muchalaht First Nation dated October 22, 2004 was received at DFO in response to DFO's October 13, 2004 letter.

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3.3.5 Marine Navigation Community

The project description was referred for comment by the Navigable Waters Protection Division on September 19, 2003 to several marine interest groups to evaluate local navigation concerns. These include the Council of BC Yacht Clubs (CBCYC), the Council of Marine Carriers (CMC), the United Fishermen's & Allied Workers Union (UFAWU), and the Pacific Pilotage Authority Canada (PPAC). The CBCYC determined that their interest was unaffected. The CMC determined that the proposal was not considered to present a navigational hazard for the log towing / tug barging operations in that area. The CCG-MNS determined that the installation does not appear to impact the operation or performance of any existing aids to navigation. The PPAC noted that the proposed location could suffer wash damage from deep water traffic if Gold River deep water vessel berths are used again.

3.3.6 General Public

As required under the *Navigable Waters Protection Act (NWPA)*, plans for the project were deposited in the Office of the Commissioner for the Land Recording District at Nootka Land District in the Province of British Columbia and notices requesting comments on the project's impact on navigation, were published in the following publications:

- *Canada Gazette (December 13, 2003)*
- *Gold River Record (December 15, 2003)*
- *Campbell River Courier Islander (December 17, 2003)*

No comments were received from members of the public in response to advertising.

Grieg Seafood also held open house consultations and gave presentations regarding the finfish farm facilities proposed for Nootka Sound. A synopsis of the presentations by Grieg Seafood is presented below:

Date, Location, Attendees	Comments
<p>March 27, 2002 West Coast Vancouver Island Watershed Committee Meeting, Ridgeview Motel Hospitality Room 7:00 to 9:35 pm West Coast Vancouver Island Aquatic Management Board: Paul Smith Village of Gold River: Jim Mitchell Industry: Floyd Cole, Grieg Seafood, Tim Davies, Grieg Seafood, Peter Gibson, Grieg Seafood Four local residents</p>	<ul style="list-style-type: none"> • issues raised related to importation of Atlantic salmon and potential for disease transfer, concerns regarding use of anti-foulant paints, predator control and predator mort disposal, sea lice and effects of SLICE™ on non-target organisms, IHN, ISO certification, use of night lights, employment opportunities

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Date, Location, Attendees	Comments
<p>April 23, 2002 Nootka Sound Residents Association Meeting 7:30 to 9:30 pm. Industry: Peter Gibson, Tim Davies, Floyd Cole of Grieg Seafood Fifteen local residents</p>	<ul style="list-style-type: none"> Issues raised related to tsunamis that have occurred in the past 15 years, fish escapes due to holes in nets, regulation of withdrawal periods for therapeutants, concerns regarding L98, effect of lice treatment on fish, queries regarding processing plant at Gold River in future, concerns related to farming Atlantic salmon, concerns regarding fish transfer methods
<p>May 7, 2002 Gold River Public Information Meeting, Gold River Community Hall, 7 – 9 pm Nootka Resource Board Members: Larry Andrews, Trudy Annand Nuu-chah-nulth Tribal Council Staff: Roger Dunlop, Jack Little Industry: Peter Gibson, Tim Davies, Floyd Cole of Grieg Seafood Forty local residents</p>	<ul style="list-style-type: none"> Issues raised related to siting criteria, NTC opposed to open net cage fish farming, interaction with wild ecology, concern regarding IHN, other fish health issues and migratory routes of wild fish in Muchalat Inlet, employment opportunities, farming of Atlantic salmon, concerns regarding imported eggs carrying disease,

Letters were received from Nootka Sound Service Ltd. (May 14, 2002), Gold River Futures Society (July 15, 2002), Fyfe's Sea and Stream Charters (April 10, 2002), the Outdoor Writers of Canada (April 25, 2002), and a joint letter from various Nootka Sound sport and recreational lodge operators all in support of the proposed project (April 24). A petition was received May 13, 2003 from 24 sport fisherman stating that the main salmon fishing area is from Atrevida Point to Descubierta Point. A letter of concern was received from a member of the public to Land and Water BC dated January 2, 2004 stating concerns with respect to the potential effects of the finfish aquaculture facility on fish health and potential for weather related damage to net pens to lead to escape of cultured fish.

In addition to the consultations outlined above, LWBC and MAFF also conducted their own open house consultations in the communities closest to the proposed project location. The open houses were held in Zeballos (July 3, 2002), Tahsis (July 4, 2002) and Gold River (July 5, 2002). Representatives from Grieg Seafood, BC Fish and LWBC attended the open houses. A total of approximately 20 people attended the three open houses. Comments received during the open house included concerns regarding the size of the tenure and potential to restrict marine traffic.

4.0 ENVIRONMENTAL DESCRIPTION AND EFFECTS

4.1 General Description of the Environment

The proposed finfish farm would be located at Concepcion Point on the east side of Bligh Island. Concepcion Point is at the confluence of Hanna Channel and Zuciarte Channel in Nootka Sound. Nootka Sound consists of intricate channels, which intertwine through the Bligh Island Archipelago. The Sound is relatively shallow with depth to 150 meters (m) compared to the deepwater channels of Muchalat and Tlupana which radiate from it with depths of 310 m and 260 m respectively.

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4.1.1 Shoreline Habitat

An examination of the shoreline for kelp and eelgrass was conducted during a fish stream survey in September/October 2001 by Mainstream Biological Consulting. Neither kelp beds nor eelgrass were identified. International Underwater Surveyors (IUS) conducted an above water video survey of the foreshore parallel to the shoreline at the proposed site in January 2002. The foreshore was characterised by steep creviced bedrock progressing right to the highest high water mark. Scattered intermittently throughout the foreshore are beaches comprised principally of large boulders and small bays with boulder and cobble.

The shoreline was scanned for kelp beds and eelgrass habitat during stream surveys in September /October, 2001. Neither habitat type was found during this survey. Several small beds of eelgrass in isolated pockets of sand along the foreshore of the application area were during underwater habitat surveys conducted in January 2002.

4.1.2 Benthic Habitat

International Underwater Surveyors (IUS) conducted a benthic survey with SCUBA divers and ROV in January 2002. Several small beds of eelgrass were identified in isolated pockets of sand along the foreshore. The SCUBA survey consisted of four quadrat-based transects from the highest high water mark to a maximum corrected water depth of 11.9 m. Transects averaged 39 m in length with an average of 10.5 quadrats per transect. Bedrock was the dominant substrate.

The intertidal zone macroinvertebrate assemblage was dominated by blue mussel, thatched barnacle and acorn barnacle, and the marine plant species were dominated by rockweed, rusty rock algae, sea moss, and black larch. The subtidal zone macroinvertebrate assemblage was dominated by northern compact worms, red turban, orange cup coral, and orange encrusting bryozoan, and the marine plant species were dominated by purple encrusting algae, rusty rock algae, sea moss, and Agarum.

The deeper sub-tidal zone was surveyed by ROV. Four transects were conducted inside the tenure boundary, and three were conducted outside the tenure. The average depth ranged from 59.3 to 63.3 m. Vertebrate species were detected within all seven transects and were principally comprised of rockfish, sculpins, and unidentified species.

Baseline sediment surveys were conducted by International Underwater Surveyors and IEC in March, 2002. Three sampling stations were sampled, with three replicates attempted at each station using a 9-inch Ponar grab. Two sampling stations were located within the proposed tenure boundaries; one reference station was located outside of the proposed tenure boundaries. Two additional locations were attempted but sampling was not possible due to the rocky nature of the bottom.

Physical characteristics of the samples were similar in colour, odour and texture. There were no gas bubbles, bebbiata or terrigenous material noted in any of the samples but all contained worms and shell hash.

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4.1.3 Freshwater Habitat

Mainstream Biological Consulting conducted stream surveys at two survey locations during late September and October, 2001: Hanna Channel near Concepcion Point; and to the south of Concepcion Point, in Zuciarte Channel, near Anderson Point. Fish sampling and habitat assessment methods followed the Reconnaissance (1:20 000) Fish and Fish Habitat Inventory Standards and Procedures.

Eight streams were located in the survey area along Hanna Channel in close proximity to the proposed site: two were mapped on 1:20,000 TRIM maps and six were unmapped. Six of the drainages within the Hanna Channel survey area were determined to be too steep (>32%) to contain potential fish habitat and were not surveyed further. Fish and fish habitat surveys were conducted in two streams on Bligh Island, one within the bay at the southern end of the survey area (ILP14000) and one located just before Concepcion Point at the end of the same bay (ILP14100). Fish access to stream 14100 would be prevented by a 20m cascades at the mouth. Stream 14000 flows over a 2.5m drop of roots, bank and bedrock at the mouth; the gradient was 30% immediately upstream of the mouth, but then lowered to 16% 36m upstream of the mouth. No fish were captured at the sample site, which was located immediately upstream of the mouth. Further sampling was recommended to confirm absence of fish in the lower gradient headwaters of this stream. Stream 14000 was assumed to be fish bearing and was included in stream buffer identification; the stream is 1 km from the proposed netpen location.

The Zuciarte Channel survey area was more distant, located between 1 and 3.5 km from the proposed site, but was included in surveys. Nine streams were located in the Zuciarte Channel survey area. Five streams were too steep for fish use. Two of the remaining four streams were confirmed to have salmonids; those two streams (stream 14800 and stream 930-488100) are located approximately 3 km south of the proposed site.

4.1.4 Fisheries Resources

According to DFO-Stock Assessment, Muchalat Inlet supports all six species of Pacific salmon. The Gold and Burman Rivers support multiple salmon species and in recent years returns averaged approximately 20,000 and 12,000 adults per year, respectively. DFO-FMB state that there are summer and fall run local stocks of coho salmon in several small streams in the inlet. Coho in Muchalat Inlet are not of conservation concern at this time. The Burman River is the major producer of chum salmon along with many small streams in the area. Chinook salmon smolts remain feeding in the inlet for relatively longer than other salmon species, from early spring through late summer, before migrating northward after exiting the Inlet.

The proposed site is located within DFO statistical sub-area 25-4 (Hanna Channel) and 25-15 (Zuciarte Channel).

A recreational hook and line fishery is located to the northwest of the proposed site in Hanna Channel. This fishery is typically open for only salmon sport fishing opportunities once Gold River and other Muchalat Inlet tributary chinook salmon escapement goals have been satisfied. During meetings held by Grieg Seafood (September and October 2001), sport fishery users did not identify the site as a direct conflict to sport fishing opportunities.

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DFO-FMB report that the commercial and recreational salmon fishery is closed in Muchalaht Inlet Sub areas 1, 2 and 3 due to West Coast Vancouver Island chinook stock concerns, in particular to protect the Gold and Burman Rivers at the head of Muchalat Inlet (DFO-FMB, January 20, 2003). Local chum stocks are fished by commercial, recreational and First Nations in Nootka Sound, primarily in Cook Channel on the west side of Bligh Island. Coho and sockeye salmon are identified by DFO-FMB as important as food fish for the local First Nation. DFO-FMB indicates that there may be a low level conflict with the commercial prawn fishery. Sub area 25-2 has a history of several vessels fishing and landings of approximately 4400 lbs. annually. The sub-area was identified by DFO-FMB as the second most important area on the coast for the sardine fishery.

A report titled "Preliminary Review of Pacific Salmon (*Onchorynchus spp.*) Populations at Risk of Extinction with a Single Migration Route in Muchalat Inlet, Nootka Sound" (R. Dunlop, 2003) was provided to DFO-MPRU from the Nuu-chah-nulth Tribal Council Fisheries Program and was considered in this screening report.

No herring spawning areas are historically known to exist within 1 km of the application location.

Harbo, 1997 (Intertidal Clam Resources (Manila, Littleneck and Butter Clams) – Volume 1: The West coast of Vancouver Island) notes that the nearest intertidal clam beach is located at the entrance to Tlupana Inlet approximately 5.7 km from the proposed fish farm site. The Land Use Coordination Office maps note that a shellfish farm is located at the northeast end of Hannah Channel approximately 1.5 km from the proposed fish farm site and in Mooyah Bay, approximately 3 km from the proposed site. Both these distances respect the siting buffers for shellfish.

Consultation by Grieg Seafood with individual prawn fishers (September, 2001) indicated that the site is not located in a prawn fishing "hotspot". Consultation by Grieg Seafood with the Pacific Prawn Fishermen's Association (PPFA) on September 28, 2001 determined that there would not be a direct conflict with the proposed site and a prawn fishery. The PPFA however expressed concerns regarding the use of grow lights at fish farm and how that may affect herring larvae, and effects of sea lice treatments on prawn larvae and other invertebrates.

A commercial crab fishery is located at Mooyah Bay (greater than 2 km to the southeast of the proposed farm site) and at Silverado Creek (2 km to the west-southwest of the proposed farm site). There is no crab fishery at this time due to dioxin contamination.

4.1.5 Wildlife Usage

The nearest eagle nesting sites have been identified just to the north of the proposed site. Bligh Island Marine Park encompasses southern Bligh Island and adjacent islands and includes most of the western side of Zuciarate Channel. The park boundary is south of the site and is approximately 1 km from the proposed site, over land.

No other information regarding potential use of the site by wildlife species has been identified to date.

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4.1.6 Marine Mammals Usage

Harbour seals (*Phoca vitulina*) and California sea lions (*Zalophus californianus*) are the most common pinnipeds found in the study area; the red-listed Stellar sea lion also frequents Muchalaht Inlet. Transient populations of both harbour seal and California sea lions have been observed passing through the study area.

The Mowachaht/Muchalaht FN note the cultural importance of seal hunting and presence of traditional seal hunting in the Concepcion Point area. Seals are identified as using the bay southwest of Concepcion Point on the east side of Bligh Island. (Ricker et al. 1989).

Significant numbers of California sea lions have been observed by DFO staff at the northwest corner of Gore Island approximately 3.5 km from the proposed farm site. It is likely that these animals traveled from the Escalante Point sea lion haul out, at the mouth of Nootka Sound, where a maximum number of 85 individuals have been observed during DFO surveys. The Escalante Point haul out is used seasonally during winter months. During subtidal surveys conducted in December 2001 by IUS/IEC, fifty California sea lions were observed on rocks near the southeast corner of Gore Island for one week before the sea lions moved to the head of Muchalat Inlet near the confluence of the Gold River.

During stream survey and subtidal surveys conducted by the proponent's consultants, seal populations were observed within 5km of the application areas on an infrequent but regular basis.

Rafts of several hundred sea lions (mostly California sea lions) have been reported off the west and east ends of Gore Island and off the old mill site at Gold River. The Mowachaht / Muchalaht state (June 25, 2003) that in the past few years less than 100 sea lions have usually occupied the inlet and then only when pilchards arrived in the winter. DFO-FMB state it is likely that wintering sea lions are attracted to the recent and strong sardine population in this area: a statement confirmed by the Mowachaht / Muchalaht First Nation.

DFO-SB (March, 2003) provided information regarding use of Muchalat Inlet by orcas. Three distinct populations of orcas have the potential to occur in the Muchalat / Nootka area: resident orcas which feed primarily on fish – especially salmon, transient orcas which are marine mammal hunters, and offshore orcas which are very poorly studied. Resident orcas, which number around 300 in coastal waters of BC, have been recorded along the west coast of Vancouver Island on many occasions, but not specifically in Nootka Sound and connecting inlets. This may be due to lack of survey effort in this area. An exception to this is a male "southern" resident known as L98. This whale became separated from his pod and has lived alone in Muchalat Inlet since June 2001. A joint Canada/USA initiative to reunite L98 with its pod in Juan de Fuca Strait has been initiated. Transient orcas are often observed in the Muchalat / Nootka area. The movements of these animals are unpredictable, though they seldom remain in any single location for long. There are approximately 225 transient orcas identified in BC. Offshore orcas are a poorly known ecotype found mostly in waters over the continental shelf. They occasionally come into inshore waters, but have not been recorded in the Nootka Sound area.

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4.1.7 Marine Traffic

TC-NWPD stated that there is use of the site area by deep sea, coastal, commercial fishing, tug and tow, and recreational craft. Anticipated impact upon current and potential waterway use by these marine users is rated by TC-NWPD as 'medium'. Gold River has supported deep-sea vessels in the past, though the waterway is currently not in use for such deep-sea vessels. The PPAC noted that the proposed location "could suffer wash damage from deep water traffic if Gold River deep water vessel berths are used again". It was determined by the NWPD that with the finfish aquaculture facility structures in place a channel of 1.1km width would remain providing a depth of 10m or greater. According to the NWPD, navigation will be possible 40 metres from the netcages. Potential effects to the system due to wave action that could include that from passing vessels is addressed in Table 2.

4.1.8 Weather and Climate

Climatic data (Environment Canada, 2002) were provided in the AMP for Estevan Point located approximately 45km to the southwest of the proposed fish farm site location. These data indicate that temperatures in winter can reach -13.9°C (extreme minimum temperature), with a daily snowfall of 51.8cm (extreme maximum recorded), and maximum wind gust speed of 180km/hr.

The proposed site is located approximately 12 km from the entrance to Nootka Sound. The influence of Pacific swell is noted to stop in Zuciarte Channel almost 2 km to the south of the proposed site. Wind driven waves are not considered to be severe anywhere in the Sound. Wind and waves tend to follow the channels, reaching 120 cm in the vicinity of the proposed site. Muchalat Inlet to the east is known for is known for persistent winds.

Wind moves most frequently from the North between September and April and from the Southwest for May through August. Strongest winds move from the Southeast to the South. Mean monthly wind speed at Nootka range from 12 to 20km/hr. Maximum winds for Nootka Light Station are in the 85 to 100km/hr range.

The Concepcion Point site is partially protected from the extreme wind conditions of the outer coast by the topography of the surrounding area and the direction of major air flows.

Cold temperatures during winter months and outflow periods could generate icing from freezing rain, snow and/or icing from sea spray at this site. The cage system is partially protected from inflows that would create icing conditions. Ice and snow loading will be taken into account in the mooring design. (Ocean Dynamics, 2002).

4.1.9 Archaeological Sites

Bastion Group Heritage Consultants (letter dated January 23, 2002) determined that there are five known archaeological sites in the general area of the proposed site, all located across Hanna Channel from the site. Review of the BC Archaeological Site Inventory System and the Mowachaht/Muchalaht Archaeology Project determined that there are no demonstrated direct conflicts between archaeological sites and the proposed finfish farm at Concepcion Point.

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Information received from the Mowachaht/Muchalat First Nation on December 6, 2002 included a report titled "Muchalat Title and Rights in Muchalat Inlet" outlining archaeological sites identified by the Mowachaht / Muchalaht First Nation near the proposed fish farm site. Registered archaeological site locations were identified in that document. The proposed finfish farm tenure is located a little over 1.0 km across Hanna Channel from the DkSo6 archaeological site on Cheesish I.R. and two cultural sites south of Cheesish I.R.

4.1.10 Physical and Oceanographic Information

The maximum depth at the proposed lease site is approximately 200 m below low tide, with an approximate minimum depth of 50 m of water below the netpens for the primary location. The lease is shallow close to the northern shoreline with the remainder of the lease dropping at 20 to 50 degrees close to the shore (Ocean Dynamics Canada Ltd., June 3, 2002)

Current velocity and tidal water circulation studies for the proposed site were conducted over a period of one month as required by Water Land and Air Protection. Current velocity and direction characteristics taken at two depths (15 m from the surface and 5 m above the bottom at approximately 70 m depth) indicated the following:

- Near-surface currents (15 m) were recorded between 0.5 cm/sec and 22.3 cm/sec and averaged 5.5 cm/sec for the period. Approximately 98% of the current samples were 12.5 cm/sec or lower. General current directions of the upper current were mainly west through south-south-west.
- The near-bottom meter recorded currents from 0.4 cm/sec to 16.7 cm/sec and averaging 6.6 cm/sec for the period. Approximately 98% of the current samples were 12.5 cm/sec or lower. The primary current direction at this depth was west northwest.

4.2 Environmental Effects and Significance

Tables 1 and 2 consist of information summarising the potential adverse effects of the proposed project on key Valued Ecosystem Components (VECs), the effects of project-related changes in the environment on Valued Social Components (VSCs), and the effects of the environment on the project. The tables also contain information on proposed avoidance and mitigation measures, and identify the significance of the residual environmental effects that are likely to exist after mitigation.

A residual effect is any measurable or demonstrable environmental effect remaining after mitigation. Each project activity or component and its associated mitigation is scored based on different attributes of the potential environmental effect (intensity, geographical extent, duration, frequency and reversibility). Residual effects have been assigned a value of negligible, low, intermediate, high, or unknown. A value of negligible is assigned where the environmental effects are not anticipated to be measurable or demonstrable after mitigation. Those VECs/VSCs with a residual effect other than negligible are further assessed to determine whether any cumulative effects might arise through interaction between such project-specific effects and similar effects from other past, present or reasonably foreseeable activities/projects

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(see Section 5.0). Those components that result in no residual effects need not be considered further in the cumulative effects assessment.

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Table 1: Potential direct environmental effects on Valued Ecosystem Components (VECs) and Valued Social Components (VSCs), associated mitigation measures, and significance of residual effects. Significance of effect; negligible, low, intermediate, high, or unknown.

Project component or activity	Potential project-environment interaction	VECs/VSCs	Mitigation measures	Significance of residual effects
Construction and/or decommissioning of facility	Disruption of fish habitat during the construction, installation and/or decommissioning of the facility.	Fish habitat: Benthic habitat	<p>No direct modification of substrate or foreshore is proposed to occur in association with proposed physical works.</p> <p>No construction is proposed to occur on the site or at the upland of the site. All cages and equipment, including support barges will be towed to the site. In addition, there will be no construction on site that would require the pouring of cement or pressure treated lumber.</p> <p>Grieg Seafood will avoid sensitive habitat when placing anchors during facility installation.</p> <p>When planning the decommissioning of this project the proponent will confer with DFO habitat staff regarding intended approaches, and will comply with all conditions identified in any Letter of Advice or Authorisation issued in this regard.</p>	Negligible
Introductions and transfers of fish onto the farm site (disease effects)	Potential introduction and/or transmission of disease and/or parasites from farm fish could impact wild fish populations.	• Fish resources: wild fish populations	<p>Under the Atlantic Salmon Importation Policy, Atlantic salmon smolts cannot be imported from overseas; only fertilised eggs or milt from certified sources are allowed into the province. Imports are limited, held in quarantine, and closely examined before introduction to farms. Species being imported from outside the province for culture must be certified disease free. Fish transferred under Section 56 of the <i>Fishery (General) Regulation</i> must not have any disease or disease agent that may be harmful to the protection and conservation of fish. In addition, the existing <i>Fish Health Protection Regulation</i> requires that any facility serving as a source of salmon must undergo rigorous health testing before fish can be provided to culture operations.</p> <p>The proponent has prepared company procedures, including a Fish Health Management Plan and maintenance of a Fish Health Record, to protect and monitor cultured fish health. A fish Health Management Plan is required to address issues of fish health for farmed fish and takes into account interactions with wild fish. This Fish Health Management Plan also requires a mandatory sea lice monitoring program to further minimize risks to wild fish populations. The Fish Health Management Plan will be reviewed on an annual basis and will be updated as necessary. BCMAFF will conduct audits of sites on a random basis and take compliance actions where</p>	Low

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Project component or activity	Potential project-environment interaction	VECs/VSCs	Mitigation measures	Significance of residual effects
			<p>necessary.</p> <p>In addition, stations have been set up in this general area for sea lice sampling on wild fish. This sampling program has been designed by DFO.</p> <p>Grieg Seafood proposes to hold only single year classes at the farm at one time and proposes to use bay management treatment protocol whereby all sites in an area are treated simultaneously. DFO-SB (February 14, 2003) stated that area management is a successful disease management strategy, including management of sea lice.</p>	
<p>Introductions and transfers of fish onto the farm site (genetic and ecological effects)</p>	<p>Escape of farm fish may have genetic effects from farm salmon inbreeding with wild salmon of the same species, and/or population and ecological effects from farm salmon competing for resources with wild salmon species.</p>	<ul style="list-style-type: none"> Fish resources: wild fish populations 	<p>Grieg Seafood will implement measures as outlined in the company's Escape Prevention and Response Plan that addresses many aspects of the operation including: net inspections and changes; pen system inspections including post storm event inspections, fish sorting and grading; operation of boats in the vicinity of net pens; pen towing protocols, and provide direction on minimising potential for causing escapes. This plan conforms to the requirements of the provincial <i>Aquaculture Regulation</i> (1989) and Amendments (October 31, 2000 and April 12, 2002).</p> <p>The cage system includes a 'double-wide' walkway, which ensures a 2 m gap between predator nets and main stock nets, and provides secondary containment for fish in the event of inner net failure. In addition, the cages will be fitted with top-netting which will prevent fish escape through jumping, and also in the event that the buoyancy of the system is compromised. Initial strength of nets used by Grieg Seafood will exceed the provincial net strength standards by a minimum 35% providing a minimum 300% safety margin in net strength over five years. Cages will not be towed to live haul fish to the upland processing plant.</p> <p>Fish escapes may occur if the system sinks below water level due to ice loading. The proponent's consultant states that the cage system is partially protected from inflows that would create icing conditions. Ice and snow loading will be taken into account in the mooring design (Ocean Dynamics, 2002). If icing does occur at the site then during daily inspections as required by provincial Aquaculture Regulations ice will be removed by mechanical means. Cages will be fitted with top-netting which will prevent fish escape in the event that the buoyancy of the system is compromised.</p> <p>Grieg Seafood has developed an Escape Prevention and Response Plan in accordance with the Provincial Aquaculture Regulation that includes mitigation measures such as net strength standards, containment structure, anchoring equipment and net pen design. These measures will be implemented to reduce</p>	<p>Low</p>

Project component or activity	Potential project-environment interaction	VECs/VSCs	Mitigation measures	Significance of residual effects
Potentially hazardous substance use	Discharges and/or accidental spills of harmful substances (e.g. fuel, lubricants, disinfectants, etc.) could cause toxic or immunological effects on wild organisms, and/or accumulation of substances in organisms that could pose a food safety risk to humans and wildlife.	<ul style="list-style-type: none"> • Water quality • Fish resources: wild fish populations • Fish resources: local shellfish/invertebrate populations • Human health • Marine mammals • Other wildlife 	<p>potential risk of fish escape. Federal siting guidelines locate the facility an adequate distance from salmonid bearing streams.</p> <p>Concerns regarding the establishment of feral Atlantic salmon populations are to some degree addressed by the Atlantic Salmon Watch Program (ASWP), a cooperative research program operated by DFO and BC MAFF. The ASWP monitors the fresh water and ocean catches of Atlantic salmon, operates a public interaction/reward program for information and catches of Atlantic salmon, and conducts active monitoring for, and removal of, Atlantic salmon from streams. Nine rivers and creeks in area 25 (Nootka Sound and Esperanza) are being regularly monitored. Two rivers in Muchalat Inlet are being monitored; the Gold River and the Burman River.</p> <p>Staff will be trained in the appropriate handling and storage of all hazardous materials on site in order to prevent incidental and serious spills. This includes training in the Workplace Hazardous Materials Information System (WHMIS). Areas will be designated for proper containment and storage of all petroleum products, lubricants, cleaning agents and antifoulants. Wood preservatives and ensiling chemicals are not kept on the farm site. Paint kept on the fish farm site will be held in secondary containment units.</p> <p>Injectable therapeutants will be stored in coolers providing secondary containment. Therapeutants to be added to feed will be added at the feed mill only and no powdered therapeutant will be stored on site. Pallets of medicated feed are stored separately at the fish farm facility.</p> <p>Fuels will be sorted in 110% secondary containment units. Fuel lines and valves will be protected and located away from traffic areas. Used oil will be collected and stored appropriately with secondary containment before transport to a recycling facility.</p> <p>Contingency plans have been prepared by Grieg Seafood and will be implemented to avoid potential spills of hazardous or deleterious substances to the environment. A spill kit will be kept at the Concepcion site and staff trained in proper use of the spill kit and provided awareness training of susceptible habitat in the area. Burrard Clean, which maintains a spill response trailer in Campbell River, will be contacted in the event of a large spill event.</p> <p>DFO and the Province will be notified immediately of such a large spill event.</p> <p>Spent disinfectants (from site footbaths) will be added to the mort storage bins, and</p>	Negligible

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Project component or activity	Potential project-environment interaction	VECs/VSCs	Mitigation measures	Significance of residual effects
Fish mortality storage and disposal	Improper storage and/or disposal of fish mortalities may affect marine water quality, cause disease transmission to wild populations, and lead to attraction of predators.	<ul style="list-style-type: none"> • Marine water quality • Fish resources: wild fish populations • Marine mammals • Other wildlife 	<p>are disposed of along with the deceased fish at on-land composting or rendering facilities.</p> <p>Large volumes of disinfectants will be appropriately contained and removed to licensed shore-based facilities for disposal.</p> <p>Moribund fish and fish mortalities on the surface of netpens will be retrieved on a daily basis and disposed of humanely.</p> <p>Divers will retrieve fish mortalities from within the nets on a weekly basis for fish greater than or equal to 1 kg average size and on a twice-weekly basis for fish less than 1 kg average size.</p> <p>Mortalities will be temporarily stored in appropriate closed storage units designed to prevent animal and avian attraction and access. Storage units will be kept on a central containment float located within the tenure and away from the netpens.</p> <p>Every two to three months full storage units will be transported to Tahsis or Gold River by barge, placed onto a truck and transported to a composting facility. Storage units will be emptied, cleaned and disinfected at the composting facility and returned for storage.</p> <p>Grieg Seafood will make every possible effort to remove mass mortalities to licensed land based facilities. In the event of 'moderate' mortality (~150 tonnes), a barge with totes will be towed to the farm and divers will manually or air lift fish into totes. Boats and then trucks will then transport the totes to appropriate compost facilities. In the event of 'heavy' mortality (~150-500 tonnes), two seine vessels will be contracted within 24 hours. Fish will be air lifted and vacuumed into boat holds. Fish will be transported by boat to Gold River, Tahsis or Zeballos and then transferred onto trucks. In the event of an 'extreme' mortality (500+ tonnes), a large vessel or a sealed container barge will be contracted to remove 300+ tonnes within 72 hours. These fish will be offloaded to trucks in Gold River or Tahsis. Additional sealed truck trailers will be contracted from West Coast Rendering and or the vessel/barge would be shipped directly to rendering plant facilities at Duke Point, Nanaimo, BC or Vancouver, BC. For both 'heavy' and 'extreme' mortality events multiple compost facilities could be required. Three composting facilities have confirmed that they can each take approximately 200 tonnes on short notice. Additional capacity exists in Parksville and other farming operations in the Comox Valley. All facilities which receive mortalities will be fully licensed and operate in compliance with the Federal, Provincial, and regional laws and bylaws.</p> <p>Grieg Seafood will not use lethal means of predator control eliminating the need for</p>	Negligible

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Project component or activity	Potential project-environment interaction	VECs/IVSCs	Mitigation measures	Significance of residual effects
Domestic waste storage and disposal	Improper storage and/or disposal of domestic waste may affect marine water quality, and lead to attraction of predators.	<ul style="list-style-type: none"> • Marine water quality • Human health 	<p>disposal of predator mortalities.</p> <p>Domestic wastes will be stored in a metal dumpster or large nylon feed bags inside the feed barge to preclude access to the waste by birds and other animals. The waste dumpster will be removed regularly during feed deliveries and transported to an appropriate landfill facility in Campbell River, and all sewage and garbage will be disposed of at appropriate locations in accordance with all applicable legislation, guidelines, and best management practices.</p> <p>Sewage and domestic wastewater will be collected in a sewage tank with a 48-hour retention time. Excess brown water will be released at a minimum depth of 15 m below chart datum, in accordance with the <i>Provincial Waste Management Regulations</i>. Sewage outfall will be located under the accommodation / feed barge.</p> <p>Solid wastes will be removed by a pump boat on an as-needed basis, to be disposed of at licensed sewage treatment plants at Gold River, Tahsis, or Campbell River.</p> <p>Grieg Seafood will develop and implement a safety manual for the site as company policy; a safety committee will be formed for the site to promote safety, review incidents or concerns, and recommend changes to workplace practices.</p>	Negligible
Blood water and fish offal discharge	Discharge of blood water and other fish remains and/or offal to the environment in association with harvesting of product may cause water quality change, disease transmission to wild populations, and/or predator attraction.	<ul style="list-style-type: none"> • Marine water quality • Fish resources: wild fish populations • Marine mammals • Other wildlife 	<p>Grieg Seafood confirms they will comply with all appropriate legislation and bylaws of the region including the federal <i>Fisheries Act</i> and the provincial <i>Waste Management Act</i>.</p> <p>Fish are slaughtered on a contracted harvest vessel at the site. All blood water is collected onboard the harvest vessel. Dead harvest fish are off loaded in Gold River. A dewatering table and closed recirculation system ensure blood water is contained. Blood water is treated with chlorine at a rate prescribed by a fish health specialist and then neutralized using the appropriate amount of sodium thiosulfate before release into Muchalat Inlet near the outfall of the former pulp mill. This temporary practice of treated water release is after examination of BOD and consultation with the Ministry of Water, Land and Air Protection and Environment Canada. Longer term plans are to transfer all blood water to a land based facility for treatment. Harvest activities and off loading activities are inspected by the company Lease and Environmental Manager on a regular random basis to ensure protection of the environment.</p> <p>Fish are trucked to a fish processing facility on Quadra Island. Totes are lined with bags that are sealed before transport. Trucks are equipped with spill tanks that are emptied and disposed of at the processing facility. Blood water from the totes will be disposed of at the processing facility in accordance with the operational parameters</p>	Negligible

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Project component or activity	Potential project-environment interaction	VECs/IVSCs	Mitigation measures	Significance of residual effects
Net cleaning and use of anti-foulants	Release of toxic and biological waste into the environment resulting from use of antifoulants and net cleaning could impact fish and fish habitat through water quality change, waste deposition and toxic substance release.	<ul style="list-style-type: none"> • Marine water quality • Fish habitat: benthic habitat • Fish resources: wild fish populations 	<p>and HACCP (Hazard Analysis Critical Control Point) of the facility, and will not be released untreated into the environment.</p> <p>Nets will be transported by truck via Gold River or Tahsis to a land based net cleaning facility near Campbell River. End disposal of all refuse generated from net cleaning will occur at licensed on-land facilities. Nets will be fully contained during transport to the net washing facilities.</p> <p>Grieg Seafood will not conduct any other equipment cleaning processes that may introduce harmful materials into the surrounding environment.</p> <p>Cage nets and predator nets will be treated with Flexgard that chemically and physically deters growth of fouling organisms. Flexgard is applied at Cards Aqua in Campbell River. The solution will be disposed of in a method approved under the BC Waste Management Act or Environmental Management Act.</p> <p>Untreated nets may be cleaned in-situ at the site. Provincial monitoring requirements will be used to detect any impacts of this activity.</p> <p>Development of a compensation plan to address habitat disruption in bottom areas under the netpens is included as part of a Section 35(2) <i>Fisheries Act</i> authorisation to ensure no net loss of habitat productivity.</p>	
Feeding and rearing of farmed fish	Excess fish food and fish faecal materials may accumulate on benthic substrates in the vicinity of the facility, altering the ecosystem and productive capacity of the area.	<ul style="list-style-type: none"> • Fish habitat: benthic habitat • Fish resources: wild fish populations • Fish resources: local shellfish/invertebrate populations 	<p>Grieg Seafood B.C. Ltd. will require a Section 35(2) Authorization (see Section 8.2) under the Federal <i>Fisheries Act</i> for the harmful alteration, disruption, or destruction of fish habitat. Compensation habitat must be created as mitigation to ensure there is no net loss of productive fish habitat. Monitoring will be required at the site to ensure the footprint of impact is no larger than that authorized under Section 35(2) of the <i>Fisheries Act</i>. Monitoring of the compensation site will be required to ensure that the replacement habitat is functioning as fish habitat in order to achieve no net loss of productive fish habitat. Grieg will implement all mitigation measures as outlined in Section 8.2 of the CEAA screening.</p> <p>Grieg Seafood will monitor waste dispersal and benthic habitat at the site DFO may require further action from Grieg Seafood if issues of concern arise as a result of this monitoring. Feed usage will be monitored to reduce wastage through the use of cameras and automatic feeders.</p> <p>Fallow periods will be used for the purpose of site remediation in order to minimise any accumulation of fish farm wastes in the tenure and/or in nearby depositional areas. Netpens will be shifted to a fallow location within the tenure boundary after the end of a production cycle or when benthic monitoring indicates potential for</p>	Low

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			<p>adverse effects on the benthos.</p> <p>FOR SHELLFISH & INVERTEBRATES: NEGLIGIBLE (same mitigations as above), and: Muchalaht First Nation has noted presence of an intertidal clam beach at the head of the small bay within the proposed tenure that they fish both commercially and for sustenance purposes. The proposed net cage location is located at least 300 m from the intertidal area at the head of the small bay. Benthic monitoring will be conducted by the proponent. Impacts to the benthos will be addressed through habitat compensation in accordance with a Section 35 (2) <i>Fisheries Act</i> authorization.</p> <p>Benthic survey information provided by the proponent does not identify abalone at the site.</p> <p>FOR HERRING SPAWNING & REARING: NEGLIGIBLE. no vital, major, or high importance spawn sites within 1 km.</p>	
Contaminants in fish feed	Impact to the health of wild organisms, water quality, and human health could result with release into the environment of contaminants in waste feed or through resultant contaminants in fish feces.	<ul style="list-style-type: none"> Fish habitat: benthic habitat Fish Resources: wild fish populations Fish resources: local shellfish/invertebrate populations Human health 	<p>In accordance with the national standards under the Canadian Shellfish Sanitation Program, the proposed fish farm is located at least 125 m from shellfish beds that are harvested for commercial, recreational, or subsistence use.</p> <p>Measures (such as use of underwater cameras to monitor stop-feeding signals) will be implemented to minimise losses of medications and medicated feed to the environment.</p> <p>Grieg Seafood will monitor levels of copper and zinc in sediment as part of Provincial monitoring requirements and results of this monitoring will be requested. DFO may require further mitigation measures should issues of concern arise.</p>	Low
Location and structure of the net pen facility	Decreased primary production in immediate vicinity of net pens due to shading of water column by net pens, and impairment of water circulation.	<ul style="list-style-type: none"> Fish habitat: algae/primary production, marine water quality 	<p>The water column directly beneath the net pen structures will be shaded. Although this is a substantial amount of cover, effects on primary production will be minimal owing to the localised area of shading and to natural low light levels at typical depths. The water depth under the proposed netpen location is greater than 50 m.</p>	Negligible
Therapeutant and antibiotic use	Use of therapeutants (e.g. sea lice treatments) and antibiotics may have direct toxic or immunological impacts on non-target organisms (e.g.	<ul style="list-style-type: none"> Marine water quality Fish resources: wild fish populations Fish resources: local 	<p>As above, Grieg Seafood has a Fish Health Management Plan to address issues of fish health for farmed fish and takes into account interactions with wild fish resources.</p> <p>Therapeutants that Grieg Seafood may use at the fish farm site are administered by a veterinarian and under the release control of Health Canada. Emamectin benzoate is available only through an Emergency Drug Release from a Veterinarian</p>	Low

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Project component or activity	Potential project-environment interaction	VECs/IVSCs	Mitigation measures	Significance of residual effects
	crustaceans), affect the surrounding environment, and/or potentially result in a human food safety risk.	shellfish/invertebrate populations • Human health	to Health Canada. The Bureau of Veterinary Drugs. Health Canada is responsible for setting maximum residue limits, administrative maximum residue limits or tolerances for these drugs. When an antiparasitic (such as emamectin benzoate) is orally administered to fish (via feed or another mechanism) it is deemed to be a drug and is regulated under the <i>Food and Drugs Act and Regulations</i> . Health Canada places use restrictions on the number of times per production cycle emamectin benzoate may be used at a farm site (no more than five treatments in any two year growth cycle). These use restrictions are meant to ensure that emamectin benzoate is found in only negligible amounts in the water column and poses little risk to sediment dwelling organisms. Also, cultured salmon must undergo a required withdrawal period after treatment with therapeutants before they may be harvested. Measures (such as use of underwater cameras to monitor stop-feeding signals) will be implemented to minimise losses of medications and medicated feed to the environment. With use restrictions in place (no more than three treatments in any 12 calendar months and no more than five treatments in any two year growth cycle) emamectin benzoate is found only in negligible amounts in the water column and poses negligible risk to sediment-dwelling organisms. Grieg Seafood will restrict therapeutant use to only when needed to minimise risk of loss of therapeutants to the environment. Staff are trained in the appropriate storage and handling procedures for hazardous materials such as fish medications, etc. in Workplace Hazardous Materials Information System (WHMIS).	
Night lighting	Use of night lighting to enhance fish growth can reportedly attract wild fish to the net pens, increasing the chance for disease transfer and causing small wild fish to be consumed. Night lighting may also attract predators.	<ul style="list-style-type: none"> • Fisheries resources: wild fish populations • Marine mammals 	The proponent will be using night-lighting to reduce the incidence of grilse development. The proposed finfish farm at Conception Point is located a minimum of approximately 190 m from the shoreline to minimize effects of out-migrating smolts which tend to follow the shoreline. Night lighting will not be used during timing of expected herring spawn times, egg hatching and juvenile herring presence in Muchalat Inlet or from Feb 22 nd to Oct 31 st of any year to avoid the times for salmonid migration.	Negligible
Predator control measures	Mortality of animals that are attracted to the fish farm and become nuisance	<ul style="list-style-type: none"> • Marine mammals • Wildlife resources: shark species, 	Grieg Seafood will use only non lethal control methods and will avoid the use of lethal methods of predator control at Conception Point. No predator removal permit (Nuisance Seal Licence) will be sought from DFO.	Negligible

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Project component or activity	Potential project-environment interaction	VECs/VSCs	Mitigation measures	Significance of residual effects
	predators of farm fish.	birds, and terrestrial wildlife	Grieg Seafood will implement a company Predator Avoidance Plan that includes the use of predator netting which will be deployed when grow-out nets replace smolt nets. The cage system has a 'double-wide' walkway, which ensures a 2 m gap between the predator nets and main stock nets. Down-haul weights will be hung from the walkway to maintain taut netting of both the production and predator nets. Most nets will be treated with antifoulants that stiffen nets. Top nets will be fastened on the tops of individual pens to deter pinnipeds should they board the cage system. Approved bird netting will be used to cover the net pens to minimise conflict with wildlife in the vicinity of the site. Grieg Seafood will implement good husbandry practices, such as proper storage of domestic waste, frequent removal of floating dead fish and storage in an access-proof bin, to minimise attraction of predators. Fish feed will be stored in 1 tonne recyclable nylon bags held in a secure location to avoid attraction of predators. Mortalities will be regularly removed from the site.	
Interactions with marine mammals and use of marine mammal deterrents.	Displacement of marine mammals from traditional feeding areas, alteration of habitat and food, contamination of food resources.	<ul style="list-style-type: none"> Marine mammals 	Acoustic deterrents will not be used at this site, so the disruption of larger scale migratory routes associated with these devices is not a concern. Grieg Seafood will use predator nets and will ensure its nets are maintained in a taut fashion to reduce the risk of marine mammal entanglement. Smolt net mesh is of sufficiently small size to eliminate the potential for entanglement. Predator net mesh size is derived after consultation with DFO. Grieg Seafood will ensure that staff are appropriately trained not to approach, or interact with, L98 or any other whales in the area. A Joint Canada/USA initiative to reunite L98 with its pod in Juan de Fuca Strait has been initiated.	Negligible
Physical existence and operation of the aquaculture facility	Interference or damage to structure, site or thing of historical, archaeological, paleontological, or architectural significance.	<ul style="list-style-type: none"> Structure, site, or thing of historical, archaeological, paleontological, or architectural significance 	The Muchalat/Mowachahat First Nation has provided specific information related to potential effects to historical sites in proximity to this proposed site. Conception Point was first sighted by Europeans by Muchalat people, and location of historical and culturally important seal hunting, including the related (Honi) salvage rights legend that involved seal and sea lion hunting in the area. The farm cages will be situated at least 190 m from shore. Potential effects on seal hunting and other traditional resource use in the area are discussed below. Bastion Group Heritage Consultants conducted a review of the BC Archaeological Site Inventory System and a review of reports resulting from archaeological field investigations in the vicinity of Tlupana Inlet / Gore Island. Based on the review, there are no direct conflicts between known archaeological sites and the proposed	Low

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Project component or activity	Potential project-environment interaction	VECs/VSCs	Mitigation measures	Significance of residual effects
Physical existence and operation of the aquaculture facility	Exclusion from, or damage to, current use of lands and resources for traditional purposes by First Nations.	<ul style="list-style-type: none"> First Nation current use of lands and resources 	<p>fish farm site at Concepcion Point. The closest archaeological site that they identify is located on the opposite side of Hannah Channel, approximately 1 km (Cheesh-ish IR #15) from the proposed tenure boundary of the site.</p> <p>Cultural heritage site locations have been outlined in the document titled "Muchalaht Title and Rights in Muchalaht Inlet". The two sites nearest to the proposed finfish farm site are sites 35 and site 26. The proposed finfish farm is located approximately 0.6-0.7 km from those two sites.</p> <p>There is low potential for the project to impact on archaeological resources given that project is located entirely in relatively deep water.</p> <p>The Heritage Conservation Act applies and protects all cultural and heritage sites from damage. Grieg Seafood will train their staff with regards to the BC Heritage Conservation Act (1996) in order to encourage and facilitate the protection and conservation of heritage property in British Columbia.</p>	Low
			<p>1. According to the Muchalaht/Mowachaht First Nation, the site is a place where seals come up to gather, where Muchalat people have historically hunted seal – Concepcion Bay is considered to be last primary seal hunting area.</p> <p>Grieg Seafood confirms that they commit to non-lethal methods for predator control for the proposed Nootka Sound sites (letter dated October 11, 2002). This commitment will ensure that there is no reduction in the numbers of seals for subsistence harvest.</p> <p>Upon receiving twenty-four hour notice from the Mowachaht/Muchalaht First Nation, Grieg Seafood will take all reasonable and necessary steps to ensure the safety of its employees and property in order to allow the First Nation to access this area for traditional harvesting activities for seals and sea lions.</p> <p>2. Mowachaht/Muchalaht have identified the traditional use of fish species near Concepcion Point.</p> <ul style="list-style-type: none"> Red snapper (Mituk) hereditary fishing station used in winter. Southern point of Concepcion Bay is important red snapper fishing station. Used traditionally as part of winter inshore halibut fishery that supported the adjacent village of Cheesish. <p>A separation of the net cages from shore will ensure opportunity for First Nations to access fishing opportunities: the net cages will be approximately 150-300 m from shore. In addition, wild fish will not be obstructed by the site and can be captured outside the physical barrier of the structures such that any potential</p>	

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Project component or activity	Potential project-environment interaction	VECs/VSCs	Mitigation measures	Significance of residual effects
			<p>impacts to access are minimized. The location of the netcages is sufficiently deep (deeper than 55 m) to provide access to whatever rockfish stocks inhabit the rock subtidal habitat near the cages.</p> <p>3. The Mowachah/Muchalaht First Nation identified a small intertidal clam beach at the head of the small bay on the proposed site, where clams are harvested commercially and for sustenance purposes.</p> <p>The farm cages will be sited over 125 m away from any shellfish beds that are harvested by First Nations as per the national standards under the Canadian Shellfish Sanitation Program. This siting criterion mitigates against any possible risks to human health, and should not affect on the Mowachah/Muchalaht First Nation ability to harvest clams. Apart from the small bay noted along the shore of the tenure boundary, the nearest known shellfish beach site is located on the opposite side of Hannah Channel approximately 1.5 km from the proposed farm cages.</p> <p>The license of occupation offered to Grieg Seafood by LWBC is for non-exclusive use of the tenure and restricts Grieg Seafood from impeding access to upland areas adjacent to the fish farm.</p> <p>Other issues raised by MMFN related to access, fish health, therapeutants, navigation, fish habitat impacts have been addressed in the relevant sections within these VECs.</p>	
Physical existence and operation of the aquaculture facility	Damage to or loss of cultural or heritage attribute resulting from changes in the environment caused by the project.	<ul style="list-style-type: none"> • Physical or cultural heritage 	Project induced changes in the environment will not effect cultural or heritage attributes. Potential environmental changes are discussed above.	Negligible
Physical existence and operation of the aquaculture facility	Impairment of current use of lands and resources by recreational fisheries, commercial fisheries, and/or tourism resulting from changes in the environment caused by the project.	<ul style="list-style-type: none"> • Recreational and/or Commercial fishery • Tourism 	<p>A recreational hook and line fishery is located along Hannah Channel to the northwest of the proposed site and is not expected to be affected by the proposed site.</p> <p>No conflicts existing commercial fishing locations or activities were identified.</p> <p>Potential effects and risks to existing wild salmon stocks from escapes, sea lice, effects of drug treatments on other fish resource and the environment are discussed in sections above.</p> <p>Bligh Island Marine Park encompasses southern Bligh Island and adjacent islands</p>	Negligible

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Project component or activity	Potential project-environment interaction	VECs/VSCs	Mitigation measures	Significance of residual effects
Physical existence and operation of the aquaculture facility	Risk to marine navigational safety from the existence of the facility in marine waters.	<ul style="list-style-type: none"> Marine navigational safety 	<p>and includes most of the western side of Zuciarie Channel. The park boundary is south of the site and is approximately 1 km distant from the site at its closest point, which is over land. The aquaculture facilities will likely be visible to some recreational boaters traveling to Bligh Island Marine Park. The distance between the fish farm tenure boundary and park boundary conforms to the siting criterion of 1 km.</p> <p>Potential effects of the project on the environment that may affect tourism are addressed in sections above.</p> <p>TC - Navigable Waters Protection Division requires that NWPA conditions specified in Section 8.1, including placement of yellow cautionary buoys and lighting, be implemented to reduce the potential risks to marine navigational safety that could result from the project. NWPD will monitor the site for compliance with marking requirements post approval.</p> <p>Grieg Seafood will ensure unimpeded access within the tenure for First Nations for the purpose of navigation. Navigation is possible within 40 m off works both on the outside and the inside. Chain is used from shore pins so vessels will be able to manoeuvre between the cage system and the shore.</p>	Negligible

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Table 2: Potential direct effects of the environment on the project and associated mitigation measures. Note that residual effects are not considered here, as these are effects on the project and not on Valued Ecosystem Components, and therefore do not contribute to the Cumulative Environmental Effects.

Project Component	Potential Adverse Effects to the Project Caused by the Environment	Mitigation Measures
<p>Physical structure of facility</p>	<p>Weather and wave action, as well as ice accumulation, may result in loss/damage of equipment, and consequently loss of product.</p>	<p>The proponent's consultant states that the proposed cage system is protected by Bligh Island and Gore Island providing protection to the cage system from high wind and waves generated by outflows, westerlies and southerlies. As well the cage system is partially protected from inflows that would create icing conditions. Ice and snow loading will be taken into account in the mooring design.</p> <p>Grieg Seafood has maintenance and inspection protocols in place that should help prevent system malfunction and minimise the risks associated with any physical damage to the infrastructure.</p> <p>A doublewide (2 m wide) walkway system will be used on the site. The proponent states that the doublewide system is engineered to withstand a significant wave height of 2.5 m for up to 12 to 15 hours and a maximum wave height of 5m for 1 to 2 hours. Deep water significant wave heights for a 1 in 30 year condition have been calculated for the Conception Point site 1.91 m for a wind speed of 26 m/s from the east.</p> <p>The MAFF licence requires that a recognised professional must inspect the facility once installed to ensure design parameters have been met, that anchors are secure, and that the system can accommodate anticipated ice and snow loading.</p> <p>Grieg Seafood confirms that snow loading and potential icing are factored into cage system suitability analysis (Grieg Seafood letter dated October 11, 2002). If icing does occur, then during daily inspections required by the provincial <i>Aquaculture Regulation</i>, any ice will be removed by mechanical means only.</p>
<p>Product</p>	<p>Algal blooms resulting from environmental conditions (e.g. warm water, etc.) may result in mass mortality of farm fish.</p>	<p>In late spring to early fall, there is a greater risk of fish health concerns related to algae blooms. Equipment, such as tarps and/or upwelling pumps, will be utilised during this period of higher risk. Grieg Seafood participates in DFO's Harmful Algae Monitoring Program.</p>
<p>Product</p>	<p>Transfer of disease from wild fish to farm fish.</p>	<p>Mandatory Fish Health Management Plans are required as a condition of the provincial Aquaculture Licence. These plans are comprehensive and designed to protect the health of farmed fish as well as consider potential impacts to wild fish health. Health of farm fish will be routinely monitored in accordance with the proponent's fish health management practices, and therapeutants will be administered as necessary according to the advice of a licensed veterinarian. Mandatory sea lice sampling on both farmed and wild fish in this area will take place.</p>
<p>Product</p>	<p>Loss of stock due to predation</p>	<p>Only non lethal measures will be employed to discourage predators, including birds, sharks, and marine mammals, in accordance with the proponent's Predator Avoidance Plan.</p>

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4.3 Accidents and Malfunctions

Grieg Seafood has developed operations and procedure protocols for staff prescribing practices for handling, including:

- fish to avoid fish escapes/mortalities;
- deleterious substances (such as fuel and anti-fouling agents) to avoid spillage;
- netpen installations/inspections routinely scheduled to detect and avoid torn mesh and subsequent escapes;
- equipment maintenance;
- transport of live fish to minimise escapes;
- boats and other special equipment; and
- other activities associated with the netpen operation.

Navigational aids used to mark the site as required under the *Navigable Waters Protection Act* permit will operate to minimise the risk of accidents due to hazards to navigation created by the finfish aquaculture facility.

Given the precautions that the proponent will implement at the farm site, it is unlikely that significant effects on the environment would result from accidents or malfunctions. Risks to the environment associated with accidents or malfunctions do not exceed those associated with many other operations along the coast and do not constitute a reason for rejecting the project.

5.0 CUMULATIVE ENVIRONMENTAL EFFECTS

Under CEAA, all environmental assessments are to include a consideration of “any cumulative environmental effects that are likely to result from the project in combination with other projects or activities that have been or will be carried out” (Section 16(1)a of CEAA). The primary objective of a cumulative effects assessment (CEA) is to determine the potential contribution of the proposed project to existing and reasonably foreseeable cumulative effects.

The potential residual effects that may result from the proposed installation, construction, operation, maintenance and decommissioning of the aquaculture project include:

- effects on benthic habitat (from fish feed, faecal material, and therapeutants);
- effects on wild fish populations (from disease/parasites, including sea lice, and escaped farm salmon);
- effects resultant from the uptake of therapeutants by non-target organisms such as crabs or shrimp, which may be harvested and consumed by humans without adequate clearance time;
- effects on site of historical and cultural significance; and
- effects on interruption of the current use of lands and resources for traditional purposes by First Nations.

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5.1 Past, Present and Reasonably Foreseeable Projects and Activities

In order to assess the potential contribution of the residual effects of the scoped project to a cumulative effect in association with effects from any past, existing, or reasonably foreseeable projects and activities, DFO examined other projects/activities in the general area. In this case, existing projects and activities in the immediate vicinity are outlined as follows:

Several log booming grounds and log dumps have been identified within Muchalaht Inlet, Hanna Channel and Zuciarte Channel and were considered in the cumulative effects assessment as they may result in impacts on environment components. A number of forestry activities (logging etc.) take place in upland areas around Muchalat Inlet. There is an active log-dump in Mooyah Bay (approximately 4 km southeast of the site).

Proposed projects and activities in the vicinity of the fish farm site include one shellfish aquaculture site proposed for the west side of Bligh Island. LWBC has established conditional withdrawal sites under Section 17.1 of the *Land Act* with the Mowachah/Muchalaht First Nation for application by the First Nation as shellfish culture sites. The nearest sites are Kleeptee, approximately 3 km from the proposed finfish farm site, and Cheesish, approximately 1 km from the proposed finfish farm site.

Other approved salmon farm projects in the area include other finfish farm tenures located at:

- Atrevida Point (the cage location in that tenure is approximately 2.0 km from the Concepcion Point proposed cage location); and
- Williamson Point (the cage location in that tenure is approximately 3.5 km from the Concepcion Point proposed cage location); and
- Muchalat Inlet South (the cage location in that tenure is approximately 8 km from the Concepcion Point proposed cage location)

At the time of the Concepcion Point CEA, Grieg had submitted two additional applications, one for the west end of Gore Island and one in Muchalat Inlet (Muchalat North) on the north side of the inlet across from the existing Muchalat south site. These proposed tenure locations were included in the assessment of Concepcion Point.

A seventh site application, Zuciarte Channel approximately 3 km south of Concepcion Point, was not approved because of multiple conflicts with siting criteria and presence of a species at risk (Northern abalone) at that location.

Grieg Seafood, in a letter to DFO-MPRU dated October 9, 2002 confirmed that they are committed to actively operating a maximum of four of the seven salmon farming tenure site locations should all seven sites receive all approvals and permits. The additional locations are proposed to be used alternatively for waste management and fish health purposes.

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5.2 Spatial and Temporal Boundaries

The spatial boundaries for the CEA will vary between different VEC/VSCs but in general include the area between and surrounding Anger Anchorage and Petrel Point. In determining the study area or spatial boundaries for this CEA, DFO considered the spatial distribution and movement of the finfish project's residual environmental effects (effects may be either stationary such as impacts on the benthic environment, or dynamic such as disease transfer). In addition, the spatial distribution and behaviour of VEC/VSCs is taken into account since the movements of a VEC/VSC can result in a residual effect accumulating with others. For example, migratory fish may be exposed to effects in several areas, resulting in a cumulative effect on the population.

For the purposes of this CEA effects from any past or currently existing projects along with any likely future projects that may be constructed during the operational life of this project will be considered with the assumption that residual effects end when the subject project ends. In this case, however, the operational life of the project may be extended as the proponent can, pending all approvals, renew their NWPA five-year permit. For this reason, DFO has assumed the operational life of the project and its potential residual effects to be approximately 20 years. This decision was made as looking beyond 20 years would not make a substantial difference for CEA purposes, and would add substantial uncertainty to the review. Any substantial changes to the project may require another NWPA assessment and another Section 35(2) *Fisheries Act* assessment and may re-trigger CEAA.

5.3 Analysis, Mitigation and Significance of Effects

The purpose of this section is to analyse whether the residual effects resulting from the aquaculture project under review can become significant when they cumulate or interact with the effects of other projects or activities. Table 3 below provides information on the residual effects (including their significance), activities whose effects might combine with the residual effects, mitigation and monitoring measures, and the significance of any combined or cumulative effects.

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Table 3: Cumulative effects analysis of the significance of residual effects on Valued Ecosystem Components and Valued Social Components. Significance of cumulative effects; negligible, low, intermediate, high, or unknown.

Valued Ecosystem or Social Component	Residual Effects (After Mitigation) & Significance of these Effects	Other Activities/Projects Contributing to Cumulative Effects	Comments	Significance of Cumulative Effects
Fish habitat <i>Benthic habitat</i>	Excess fish food and faecal materials may accumulate on benthic substrates in the vicinity of the fish farm altering the ecosystem and productive capacity of the area.	Similar potential effects may occur within 3.5 km of Concepcion Point site, at the Atrevida Point and Williamson Passage sites and proposed Gore Island site. At a greater distance, 10km, similar effects would occur at the Muchalat South site and proposed Muchalat North site. Log handling facilities in the vicinity may impact on benthic habitat. Log handling facilities (booming grounds and log dump sites) could also affect benthic fish habitat by the addition of highly refractory carbon.	Grieg Seafood will monitor benthic substrates. Mitigation measures to reduce the risk of impact on benthic habitat from the fish farm will be implemented by Grieg Seafood Log handling facilities in the vicinity are reviewed under the <i>Fisheries Act</i> such that any impact on benthic habitat is avoided or is accounted for through compensation habitat (required as part of a Section 35(2) Fisheries Act Authorization). Impacts will be compensated for under terms and conditions described in a section 35(2) Authorization (Section 8.2). Also, <i>Grieg Seafood has indicated their intent to fallow sites in order for benthic areas to recuperate between production cycles.</i>	Low
Fish habitat <i>Benthic habitat</i>	Compounds such as metals, therapeutants and antibiotics could accumulate in sediment beneath the net pens potentially reaching concentrations that affect the surrounding environment, including non-target organisms (e.g. crustaceans).	Similar potential effects may occur within 3.5 km of Concepcion Point sites, at the Atrevida Point and Williamson Passage sites and proposed Gore Island site. At a greater distance, 10km, similar effects would occur at the Muchalat South site and proposed Muchalat North site	Grieg Seafood applies therapeutants only when necessary and under the direction of a veterinarian. Measures will be implemented to minimize loss of medicated feed to the environment. Levels of contaminants such as copper and zinc will be monitored as part of provincial monitoring requirements. Studies on crabs and prawns indicate aversion to SLICE. If SLICE (emamecin benzoate) is administered, it is controlled through Health Canada's Emergency Drug Release program. Its use in terms of frequency and application is limited such that it is not expected to bioaccumulate in sediments. <i>Grieg Seafood has indicated their intent to fallow sites in order for benthic areas to recuperate between production cycles.</i>	Low

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Valued Ecosystem or Social Component	Residual Effects (After Mitigation) & Significance of these Effects	Other Activities/Projects Contributing to Cumulative Effects	Comments	Significance of Cumulative Effects
<p>Fisheries Resources: <i>Wild fish populations</i></p>	<p>The potential introduction and/or transmission of diseases and/or parasites could impact wild fish populations.</p>	<p>Similar sources of potential effects may occur within 3.5 km of Concepcion Point sites, at the Atrevida Point and Williamson Passage sites and proposed Gore Island site.</p> <p>At a greater distance, 10 km, similar sources of potential effects would occur at the Muchalat South site and proposed Muchalat North site</p>	<p>Transmission between farmed fish and wild stocks remains a possibility and chances of transmission may increase with higher densities of fish farms within a given area. The Fish Health Management Plan and other mitigation measures (e.g. Escape Prevention and Response Plan) outlined in Table 1 reduce this potential. The Fish Health Management Plans are subject to annual review in order to make any necessary adjustments in conjunction with an adaptive management approach. In addition, stations have been set up in this general area for sea lice sampling on wild fish. This sampling program has been designed by DFO.</p> <p><i>Greg Seafood has indicated their intent to operate a proportion of the total final number of successful applications at any one time (in initial submissions they indicated a maximum of four sites out of seven, if all applications were successful). Greg Seafood proposes to hold only single year classes at each farm at one time and proposes to use bay management treatment protocol whereby all sites in an area are treated simultaneously. DFO-SB (February 14, 2003) stated that area management is a successful disease management strategy, including management of sea lice.</i></p> <p><i>Analysis of cumulative effects indicated uncertainty if both the Concepcion Point site and Gore Island site entered production, together with the existing Atrevida and Williamson Passage sites, given close proximity of all four sites. Accordingly, this yielded a significance rating of high. This was not based on a prediction that significant adverse effects would inevitably occur; it was a precautionary rating based on uncertainty of cumulative effects of four farms potentially operating simultaneously in the Zuciarie-Hannah Channel area.</i></p> <p><i>If Concepcion Point enters production but the Gore Island site does not, confidence increases that a significant adverse effect will not occur. The assessment rating is based on the assumption that production occurs at a maximum of only three of the four sites, Gore Island, Concepcion Point, Atrevida Point, and Williamson Passage simultaneously, and production does not take place simultaneously at Gore Island and Williamson Passage sites.</i></p>	<p>Intermediate</p>

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Valued Ecosystem or Social Component	Residual Effects (After Mitigation) & Significance of these Effects	Other Activities/Projects Contributing to Cumulative Effects	Comments	Significance of Cumulative Effects
Fisheries Resources: <i>Wild fish populations</i>	Escaped farm fish could result in feral Atlantic salmon populations becoming established in nearby streams, where they could compete with wild populations.	Similar sources of potential effects may occur within 3.5 km of Concepcion Point sites, at the Atrevida Point and Williamson Passage sites and proposed Gore Island site. At a greater distance, 10 km, similar sources of potential effects would occur at the Muchalat South site and proposed Muchalat North site	Any escaped fish from the proposed Concepcion Point facility could be cumulative to any fish escaping from the Atrevida, Williamson or proposed Gore Island facility, and, towards the head of Muchalat, Inlet, with fish from the Muchalat South site and proposed Muchalat North site. The proponents Escape Prevention and Response Plan and associated mitigations are expected to reduce the potential significance of this cumulative effect. Several of the streams in the area are also monitored regularly by the Atlantic Salmon Watch Program. <i>Grieg Seafood has indicated their intent to operate a proportion of the total final number of successful applications at any one time (in initial submissions they indicated a maximum of four sites out of seven, if all applications were successful).</i>	Low
Structure, site or thing of historical, cultural, archaeological, paleontological or architectural significance	Interference or damage to that structure, site, or thing.	Similar potential effects may occur within 3.5 km of Concepcion Point sites, at the Atrevida Point and Williamson Passage sites and proposed Gore Island site. At a greater distance, 10 km, similar potential effects would occur at the Muchalat South site and proposed Muchalat North site	<i>The Concepcion Point site is an area of traditional fishing and seal hunting and is an area of historical/cultural importance to the local FN. Potential adverse effects at the site can be mitigated, though small effects at this location will combine with similar small effects at other locations.</i>	Low

Valued Ecosystem or Social Component	Residual Effects (After Mitigation) & Significance of these Effects	Other Activities/Projects Contributing to Cumulative Effects	Comments	Significance of Cumulative Effects
Current use of lands and resources for traditional purposes by First Nations	Potential loss of access to traditional hunting and fishing areas	<p>Similar potential effects may occur within 3.5 km of Concepcion Point sites, at the Atrevida Point and Williamson Passage sites and proposed Gore Island site.</p> <p>At a greater distance, 10 km, similar potential effects would occur at the Muchalat South site and proposed Muchalat North site</p>	<p><i>The Concepcion Point site is an area of traditional fishing and seal hunting. Several other sites have the potential to affect the area for harvesting; however, to minimize potential effects, sites are located to ensure shoreline access for both fishing and hunting opportunities. Wild fish passage is not obstructed and harvest opportunities can occur outside the netcages which will minimize loss of access to fishing opportunities.</i></p> <p><i>Potential adverse effects at the site can be mitigated, though small effects at this location will combine with similar small effects at other locations.</i></p>	Low

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5.4 Cumulative Effects Summary

At present fish farms are located at Atrevida Point, Williamson Passage, and South Muchalat Inlet. Past projects include the Bowater pulp mill at Gold River. Other past, present and reasonably foreseeable projects in the vicinity of the proposed fish farm site at Concepcion Point site are discussed in Section 5.1.

Grieg Seafood will be required to monitor benthic habitat at the proposed fish farm site. In order to produce fish at the Concepcion Point site at the same time that fish are being produced nearby at two existing fish farms (Atrevida Point, Williamson Passage) and one proposed site (west end of Gore Island), Grieg must undertake studies to demonstrate that simultaneous fish production at multiple salmon farms sites in the Zuciarte-Hannah Channel will not cause significant adverse cumulative effects.

Grieg Seafood must operate the Concepcion Point site (as well as other proposed sites) in accordance with the Federal *Fisheries Act*, *Navigable Waters Protection Act*, Provincial Performance-Based Standards developed under the *Waste Management Act*, the Fish Health Management Plan, and joint agency monitoring protocols. With production-timing and multiple-site assumptions outlined in this section (only three of the four sites, Gore Island, Concepcion Point, Atrevida Point, and Williamson Passage may operate simultaneously, and production must not take place simultaneously at Gore Island and Williamson Passage sites), direct effects of the Concepcion Point project on valued ecosystem components and valued social components are not likely to lead to significant adverse cumulative effects.

6.0 SUMMARY

Grieg Seafood has provided an Aquaculture Management Plan and additional details of the proposed finfish aquaculture facility at Concepcion Point for review, which allows DFO-OHEB and Transport Canada to make a determination under Section 20(1) of CEEA. Details of the project, potential effects of the project on VECs/VSCs, and proposed mitigation measures have been outlined in the preceding sections of this report.

Grieg Seafood will be required to operate in compliance with the Federal *Fisheries Act* and *Navigable Waters Protection Act*. Grieg Seafood will also be required to provide compensation habitat for impacted habitat at the site, and monitor specified environmental and operational parameters to enable implementation of adaptive management approaches as necessary so that developing environmental impacts can be prevented in accordance with a Section 35(2) *Fisheries Act* Authorization (Section 8.2). The proponent will also be required to adhere to the specific mitigation measures provided by TC-NWPD, DFO-OHEB and EC (Section 8). The screening decision is outlined in Section 9.

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8.0 MITIGATION MEASURES

8.1 Transport Canada – Navigable Waters Protection Division

1. Any materials or equipment used in construction or other operations should be marked in accordance with the Collision Regulations of the *Canada Shipping Act* if located in or on the waterway.
2. Ensure that equipment used in construction or in other operations does not interfere with navigation and that all materials, equipment, temporary structures and debris are removed from the waterway upon completion of the work.
3. Construction material, netting, and similar debris are not allowed to become waterborne. Should debris become waterborne, the proponent will effect recovery without delay.
4. In the event that use of the facility is no longer required, it will be the proponent's responsibility to maintain or remove the works and associated equipment in its entirety.
5. Yellow cautionary buoys are to be placed and maintained along the outside perimeter of the works. These buoys are to be no more than 60 meters apart, no less than 0.6 meters in diameter. Horizontal bands of yellow reflective tape no less than 10cm in width and 15cm in length shall be placed at intervals around the circumference of the buoys so as to show in all directions seaward of the works.
6. A yellow flashing light shall be placed on the outside corners of the facility and on either side at the midpoint of the long axes. The light will display a 0.5 second flash every four seconds, visible on a clear dark night for not less than one nautical mile.
7. Mort floats and/or other ancillary equipment shall show a similar light and shall display reflective material so as to be visible from all directions.
8. All mooring lines are to be of fabricated non-buoyant material and/or counterweighted to prevent them from floating at low water. Rock pins/shore anchors if used are to be placed at or below the Low Water mark.
9. The Navigable Waters Works Regulations apply.
10. The proponent shall provide unimpeded access to the Minister or his/her representatives for inspection.
11. The site/work shall be adequately marked/lit during all phases of construction/operation to safeguard marine navigation.

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12. Notice to Shipping action shall be taken by contacting the agency below at least two (2) days in advance of your intended date of commencement.

Canadian Coast Guard
Vessel Traffic Services
Room 2308
555 West Hastings Street
Vancouver, B.C. V6B 5G3

Tel (604) 666-6011
Fax (604) 666-8453

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8.2 Fisheries and Oceans Canada – Oceans, Habitat and Enhancement Branch

1. The proponent, Grieg Seafood BC Ltd., shall ensure that all work associated with the subject project complies with the requirements of the *Federal Fisheries Act*, and all other applicable legislation, guidelines, and best management practices.
2. Only those structures applied for in the Commercial Aquaculture Management Plan have been approved. Any additional residences, net washing facilities, etc. that are required to service this site must be reviewed for effects to fish habitat under separate application.
3. All debris and deleterious materials generated by the proponent shall be collected and disposed of at appropriate upland locations in accordance with all applicable legislation, guidelines, and best management practices.
4. It is understood that by proceeding with the subject works, the proponent and their agent(s) and/or contractor(s) shall have indicated that they understand, accept and have agreed to all conditions. In this regard, a copy of the Navigable Waters Protection Approval and all Oceans, Habitat and Enhancement Branch mitigation measures are to be provided to any contractors prior to work commencing and are to be retained on site at all times when the subject works are underway.
5. Grieg Seafood BC Ltd. must implement and comply with the mitigation, monitoring, compensation and financial security requirements outlined in a Section 35(2) *Fisheries Act* Authorization issued for the project by Fisheries and Oceans Canada.
6. Given the production level planned at this site, production should be carefully monitored and not exceed the licensed production amount.
7. Only three of the four sites, Gore Island, Concepcion Point, Atrevida Point, and Williamson Passage may operate simultaneously, and production must not take place simultaneously at Gore Island and Williamson Passage sites.
8. All necessary measures must be adopted to prevent the release of Atlantic salmon to the wild.
9. All necessary measures to prevent effects to marine mammals and their habitat must be implemented including minimizing predator attraction and no lethal control.
10. All other mitigations outlined in Table 1, 2, and 3 of this screening document must be implemented.
11. All floats must be located in at least 10 m of water or greater at low tide (i.e. at 0 chart datum).
12. Water depth must be at least 10 m from the bottom of all net pens at low tide (i.e. at 0 chart datum).

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8.3 Environment Canada

1. The Canadian Wildlife Service advises that the operation may attract birds, which prey on small fish or shellfish. If a predation problem develops, the crop should be protected by methods other than destruction of the birds (e.g., no shooting and the mesh of any predator nets should be of such a size and type that predatory birds will not become entangled and drown).
2. Care should be taken to ensure that sewage disposal is adequate to prevent contamination of the marine environment, especially during high rainfall periods which can have an adverse effect on the performance of land based sewage disposal systems. However, Environment Canada strongly advocates Land disposal of sewage as the preferred option. Land disposal methods include chemical/incinerator toilets, pit privies and septic tank and tile field, well removed from the foreshore.
3. Please be advised that under the *Fisheries Act, Management of Contaminated Fisheries Regulations*, the harvesting of bivalve molluscs, (oysters, clams, mussels) is prohibited within 125 m of any wharf, dock, platform or other structure, including float homes, barges, platforms and vessels.
4. Any fuel stored or used on the site is to be contained and transferred as required in a manner that minimizes the risk of accidental spillage of fuel into the aquatic environment and appropriate clean-up materials are to be kept on hand to allow clean-up of any spillage which may occur.
5. Any timber preservatives are to be applied in a manner consistent with current Best Management Practices (BMP). Documentation regarding BMP is available directly from several member agencies, including Environment Canada.
6. The use of organotin (or tributyltin) anti-foulant paints on salmon farm nets poses a considerable threat to marine life, particularly oysters, due to the occurrence of toxic effects at extremely low concentrations. Present federal legislation prohibits the use of tributyltin based anti-foulants for use in aquaculture operations. Should you have any questions regarding the use of anti-foulant paints please contact Stan Liu at 666-2104 or Doug Wilson at 666-3197 of Environmental Protection, 201 – 401 Burrard Street, Vancouver, BC V6C 3S5.
7. If steel piles are to be used, they must be capped to prevent the entry of wildlife.
8. All of Fisheries and Oceans Canada concerns are to be fully addressed.

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9.0 SCREENING DECISION

The Department of Fisheries and Oceans Canada – Oceans, Habitat and Enhancement Branch (DFO-OHEB) conducted an environmental assessment for the proposed Concepcion Point Finfish Aquaculture Facility. The screening level environmental assessment was based on all information provided during the project review. All relevant factors required by Section 16 of CEAA were considered including the environmental effects of the project and their significance. Based on the assessment, Fisheries and Oceans Canada and Transport Canada conclude that the project is not likely to cause significant adverse environmental effects. In accordance with Section 20(1)(a) of CEAA, such a determination allows the Department of Fisheries and Oceans Canada to proceed with issuance of an Section 35(2) Authorization under the *Fisheries Act* and the Navigable Waters Protection Division of Transport Canada to proceed, if appropriate from a navigation perspective, with the issuance of an Approval under Section 5(1) of the *Navigable Waters Protection Act*.

Confirmation by Proponent

I, _____, having the authority to commit funds and activities on behalf of Grieg Seafood BC Ltd., have read and understood the above material outlining conditions for the above project. I confirm that Grieg Seafood BC Ltd. will undertake all of the mitigation conditions outlined in this environmental screening report and any additional measures necessary to ensure protection of the environment and compliance with environmental regulations during the planning, construction, operation, maintenance and decommissioning of this project.

Signed by: _____ Date: _____

Title: _____

Environmental Screening Report

Approved by: _____ Date: _____

Name: Robert Sisler

Title: Regional Manager, Environmental Services
Transport Canada, Pacific Region

Conclusions of the CEAA Screening Report are based on advice from expert Federal Departments, other Federal Authorities, internal Branches of TC, and other interested parties as defined under CEAA.

Environmental Screening Report

Approved by: _____ Date: _____

Name: Susan Farlinger

Title: Regional Director
Fisheries and Oceans Canada – Oceans, Habitat and Enhancement Branch, Pacific Region

Conclusions of the CEAA Screening Report are based on advice from expert Federal Departments, other Federal Authorities, internal Branches of DFO, and other interested parties as defined under CEAA.

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