## FORM 1 – REQUEST FOR INTERPRETATION OR VARIANCE

Control Union Peru Request

<table>
<thead>
<tr>
<th>1.1 NAME OF CAB</th>
<th>1.2 DATE OF SUBMISSION</th>
<th>1.3 CAB CONTACT PERSON</th>
<th>1.4 EMAIL ADDRESS OF CAB CONTACT PERSON</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONTROL UNION PERU SAC</td>
<td>27-08-19</td>
<td>Midori Kawazo</td>
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</tr>
</tbody>
</table>

1.5 SOURCE OF THE REQUIREMENT FOR WHICH THE VARIATION OR INTERPRETATION IS REQUESTED

- Type 1 – Requirement found in the CAR
- Type 2 – Requirement found in an ASC Standard

1.6 LIST OF SITES FOR WHICH THE VARIATION IS REQUESTED

- Caleta Velero

### 1.7 ASC DOCUMENT REFERENCE

ASC Salmon Standard v 1.2

Criterion 5.2 Therapeutic treatments

Indicators 5.2.5

### 1.8 BACKGROUND (PROVIDE FULL EXPLANATION OF THE ISSUE)
1. ASC Parasite Treatment Index background

Sea lice have become one of the main problems for salmon farming worldwide, threatening the productivity of both salmon and trout farming. This ectoparasitic copepod attaches to the skin of its host to feed on its mucus, generating wounds and therefore exposing fish to secondary infections, even leading to death at high infestation levels.

In Chile, the main parasite species is Caligus rogercresseyi. Sea lice infections in Chile have mainly been controlled by the application of chemical treatments. Organophosphates applied by bath treatments (1981–2001); and avermectins (late 1980s), or emamectin benzoate administered in the feed (late 1990s). Later, pyrethroids such as deltamethrin (2007) and cypermethrin (2009) were introduced; and in 2010 the chitin synthesis inhibitor diflubenzuron appeared on the market and the organophosphate azamethiphos obtained authorization in 2013.

The use of parasiticides to control sea lice infestations is exhaustively regulated and controlled by the governing authority in Chile, National Fishery and Aquaculture Service (SERNAPESCA), through Res. 013/2015. In order to perform the baths, coordinated treatment windows are established which are differentiated by site locations.

The current ASC Salmon Standard incorporate a Parasite Treatment Index (PTI) to measure the use of medicinal products employed to control sea lice infection levels over the production cycle, to serve as mechanism for reducing sea lice numbers on farms and minimising potential environmental impacts.

The operational review of the Salmon Standard that began in 2015 finalised its first updates — which were agreed by the ASC Technical advisory group (TAG) — including feedback from two rounds of public consultation. Following a review of the Salmon Standard’s operational impact and effectiveness since its initial publication in 2012 — and revision in 2017 — a technical working group (members include ASC, academia, industry and NGO) was setup to discuss any shortcomings of the current PTI approach and given the task to formulate an alternative approach [the Weighted Number of Medicinal Treatments (WNMT)].

In July 2019, the version 1.3 of the ASC Salmon Standard was released. The measure of the Parasite Treatment Index (PTI) was replaced by the Weighted Number of Medicinal Treatments (WNMT) which seeks a continuous reduction of applying medicinal parasite treatments.

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1 https://www.leychile.cl/Navegar?idNorma=1074098
It is required for farms to reduce from Entry Level to Global Level by means of a fixed rate of reduction. This rate is determined at 25% WNMT per 2-year.

It is important to mention, that since the beginning of August 2019 ASC authorised that audits could be performed using the version 1.3 of the Standard. Currently, part of the farms under assessment were audited with this Standard.

2. Variance Request (VR) background

Farm **Caleta Velero** of Mowi Chile is located in ACS 17A. Its geographical coordinates are:

- Vertex A Latitude S 42°11´45.0900 Longitude W 72°34´21.6100
- Vertex B Latitude S 42°11´50.6500 Longitude W 72°34´10.8800
- Vertex C Latitude S 42°11´53.3100 Longitude W 72°34´13.3700
- Vertex D Latitude S 42°11´47.7500 Longitude W 72°34´24.1000

The farm is asking for a VR related to Indicator 5.2.5 (Parasite Treatment Index) of the ASC Salmon Standard, considering the following arguments to sustain its request:

- The version 1.3 of the ASC Salmon Standard was released in July 2019, which replace the metric to estimate the parasite treatments from PTI to WNMT. (the new version will apply from December 2019 onwards).
- Deficit of precipitations during the current productive cycle and its effect in the increasing of sea lice infestations.
- Regulatory requirements by the Chilean fishery Authority, which forces the site to treat against sea lice to avoid the "High Dissemination Site" category. (Resolution Nro 13 of National Fishery and puede serAquaculture Service - Specific Sanitary Program for monitoring and control of Caligidosis (PSEVC-Caligidosis)
- The Variance Request Nro 181 and 182 granted to Los Fiordos Company in 2016 which were approved with the following arguments:
  - Rainfall decrease due to “El Niño” stream, which cause the salinity increase, subsequently a higher sea lice presence.

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- Regulatory requirement by the Chilean Fishery Authority. It forces the site to treat the fish in the water to avoid the “High Dissemination Site” Category.
- According to ASC revisions, was known that the WNMT methodology is in development, so, a chance to modify the PTI calculation is in advance.

Effects of deficit of precipitations in the increasing of sea lice infestations.

According to the Annual Report on the evolution of the climate in Chile, prepared by the Climate Change Office from the Meteorological Direction of Chile, 2018 was a year with deficit of precipitation with a national average reduction of 23% compared with 2017. Los Lagos Region presented a 12% of reduction in rainfall.

As a complementary information, the rainfall data from 2016 up to date for two stations: Hornopiren (Nearest station from the farm) and Quemchi (Almost the same latitude as Hornopiren), source: http://explorador.cr2.cl/

Figure 4: Halahue and Quemchi Rainfall monitoring station.
Results:

Standardized Precipitation Index

It quantifies the precipitation deficit for several time scales, that is, for 1, 3, 6, 9, 12, 24 and 48 months, which affect the impact of the drought on the availability of different water resources. The World Meteorological Organization recommend the use of this indicator to the monitoring during dry periods.

Figure 5: Standardized Precipitation Index Map for Chile. Loss data from 57 weather stations (DMC, DGA, SERVIMET, FDF, CODELCO) are used. (Red Line shows the farm location)

3 Monitoreo de la sequía meteorológica en Chile, Dirección Meteorológica de Chile, Boletín Junio 2019.
The farm is located in an area with big influence of fresh water from rivers and mountains near the site. As a result of less rainfall during the current cycle, the salinity of the water body where the farm is located has increased as can be observed in the figure below:

![Figure 4: Historical salinity data (Information supplied by the AquaFarmer Software)](image)

There are scientific literature about the relation of salinity and temperature and how these environmental variables could affect the caligus during its early developmental stages. According with a investigation development by chilean scientists called “Early development of the ectoparasite Caligus rogercresseyi under salinity and temperature gradients”\(^4\) temperature and salinity are two environmental factors which may have a profound effect on the survival, hatching, rate of development of larvae and the distribution of marine invertebrates.

![Figure 5: Combined effect of salinity (14, 20, 26 and 32 PSU) and temperature (6, 9, 12, 15 and 18 ºC) on survival of nauplius I and nauplius II (%)](image)

In this research, elevated mortalities (100%) were observed when nauplius I stage were exposed to salinities of 14 PSU and > 50% mortality of nauplius II were also observed at salinities ≤20 PSU. In some areas where salmon farms are located in Chile (Seno Reloncavi) environmental salinity can fluctuate.

\(^4\) https://doi.org/10.1016/j.aquaculture.2017.12.017 - Early development of the ectoparasite Caligus rogercresseyi under combined salinity and temperature gradients.
between 22 and 32 PSU (Barria et al., 2012), and it has been observed that salinities < 25 PSU reduce the parasite load of C. rogercresseyi per fish by 71% (Bravo et al., 2014)  

Current Parasite Treatment Index status for Caleta Velero farm

Caleta Velero was ASC certified in 2015. In that production cycle, the PTI for this farm was lower than 13. To achieve this, hydrogen peroxide was used, because the therapeutic factor is 0 (Appendix VII of ASC Salmon Standard v 1.2).

In 2015, hydrogen peroxide was not considered a medicinal treatment against parasites, therefore, it was not part of the rotation of the treatments defined in the regulations. In July 2018, an update of the regulation took place and hydrogen peroxide was considered a medicinal treatment and currently it use must to follow the regulations about medicinal treatment rotations.

Integrated Pest Management implementation on site

Mowi Chile and its site Caleta Velero is compromised with the principles of Integrated Pest Management (IPM) and in particular rotation of medicinal treatments is a requirement within a production cycle.

Integrated Pest Management (IPM) has long been recognized as being critical to effective and robust sea lice management. IPM is based upon the implementation of a number of proven techniques and approaches developed for pest management in terrestrial agriculture systems, often with the central aim of slowing the development of drug resistance in pest species.

According to this, each site can fulfill requirements of the IPM as a way to deliver improvements in sea lice management, reduce the need for medicinal treatments and reduce the risk of resistance development.

<table>
<thead>
<tr>
<th>IPM Measures</th>
<th>ASC reference</th>
<th>Site Implementation</th>
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</thead>
<tbody>
<tr>
<td>Adherence to relevant thresholds/limits on sea lice levels and required action</td>
<td>3.14</td>
<td>The Sanitary authority sets the maximum load of female sea lice and the farm site is governed according to current regulations.</td>
</tr>
<tr>
<td>Regular counting and reported of sea lice levels</td>
<td>3.17</td>
<td>Weekly samplings are reported to the Sanitary authority and published on the Company webpage.</td>
</tr>
<tr>
<td>Maintenance of treatment records</td>
<td>Appendix VI</td>
<td>All treatment records are kept in the farm site and are informed to the Sanitary authority through the SIFA platform.</td>
</tr>
<tr>
<td>Single year-class stocking</td>
<td>5.4.1</td>
<td>The farm site accomplishes the fallow periods established by the authority and maintains the entry guidelines for all the fish stocked.</td>
</tr>
<tr>
<td>Fallowing between cycles</td>
<td>3.1.1</td>
<td>The farm site accomplishes the fallow period established by the authority.</td>
</tr>
<tr>
<td>Health management / veterinary health plan</td>
<td>5.1.1</td>
<td>The farm site has a veterinary health plan according to the monitoring for present and not present diseases in Chile.</td>
</tr>
<tr>
<td>Cleaning of nets to increase water flow</td>
<td>5.1.1</td>
<td>Non-impregnated fishnets are cleaning according to the Chilean regulation.</td>
</tr>
<tr>
<td>Routine removal of moribund fish</td>
<td>5.1.3</td>
<td>Daily extraction of mortality and classification.</td>
</tr>
<tr>
<td>Monitoring of fish state</td>
<td></td>
<td>Official sampling, routine internal sampling.</td>
</tr>
<tr>
<td>Monitoring and control of other fish diseases</td>
<td>5.1.1</td>
<td>Official PVA sampling, for monitoring diseases not present in Chile.</td>
</tr>
</tbody>
</table>

5 Factors affecting the abundance of Caligus rogercresseyi (Boxshall and Bravo) on farmed salmonids in Chile in the period 2006–2007
3. Recommended actions

Base on point out in the previous table, the following recommendations are part of our strategy to implement the IPM

- Monitor sea lice on farmed fish, additionally the farm has defined to monitoring all the cages weekly, to detect increase in the sea lice abundance in order to apply the single cage approach, which is part of sea lice strategy to reduce the successful reproduction of gravid female (Stormoen et al., 2013)
- Grow only 1-year class of fish at a time at any given site: These is measures is part of the Chilean regulatory.
- Fallow between production cycles: The fallow period is mandatory; we have to apply a minimal of 3 months between cycles.
- Keep nets clean to increase water flow and minimize retention of lice larvae: The sites have a clean and change nets program.
- Remove moribund fish, slow swimmers and runts on a frequent basis: These measures are part of the sanitary plan defined by the Fish Health area, the Veterinarians and Site Managers give fulfillment and follow up these best practices.
- Use chemotherapeutants at appropriate times and in accordance with the label: All the treatments are done according to technical sheet and recommendations defined by the supplier.
- Avoid unnecessary use of anti-sea lice agents: Before to apply treatments in these sites, bioassays to determine the sea lice sensitivity are done.
- Monitor the efficacy of treatments to achieve early indications of resistance: According to the sea lice regulation all the sites have to inform the treatments efficacy to the authorities. If occur a treatment failure, the Vet responsible must report the probable causes (operatives or reduced sensitivity)
- Synchronize control strategies through use of area-wide management plans: The treatments are coordinated in a window period, that is defined by the national authority. The Salmon Neighborhood Area (SNA) 17A has regular technical meeting with all the companies to discuss and define the best practices to improve the sea lice control.
- Rotate the use of chemotherapeutants having different modes of action: The rotation of different medicines is defined in the Chilean regulation.
According to the revision of the background, Control Union recommends to ASC approve this Variance Request presented for Caleta Velero considering:

- Previously VR 181-182 approved under the same conditions in 2016.

In this case, are present the same conditions shown under the approval of these VRs (181-182) in 2016, these were: Rainfall decrease due to “El Niño” stream and the Regulatory requirement of mandatory treatment.

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1.9 RECOMMENDED ACTION/DECISION

According to the revision of the background, Control Union recommends to ASC approve this Variance Request presented for Caleta Velero considering:

- Previously VR 181-182 approved under the same conditions in 2016.

In this case, are present the same conditions shown under the approval of these VRs (181-182) in 2016, these were: Rainfall decrease due to “El Niño” stream and the Regulatory requirement of mandatory treatment.