This is an example Best Practicable Environmental Option assessment. It is designed to assist in the application for a licence to discharge waste sealice treatment product following treatment of fish in a wellboat at sea cages in Scottish Waters.

MARINE (SCOTLAND) ACT 2010, PART 4: MARINE LICENSING

BEST PRACTICABLE ENVIRONMENTAL OPTION (BPEO) ASSESSMENT: DISCHARGE OF FISH FARM CHEMICAL TREATMENT AGENTS FROM A WELLBOAT

1. Introduction

This section should include the following:

1.1 Background to application

E.g. This Best Practicable Environmental Option (BPEO) assessment supports an application for a sea disposal licence under the Marine (Scotland) Act 2010, Part 4, Marine licensing.

Provide details of all treatment options that have been used and detail the need to adopt an alternative approach. Include evidence/vet’s advice/Suspected Adverse Reaction notifications to the Veterinary Medicines Directorate (VMD) for treatment success/failure as applicable.

Provide the rationale behind your request to treat in a wellboat at the cages rather than a treatment in the cages using tarpaulins, including potential risks to fish welfare of all treatment options.

1.2 Source of materials

List the treatment products you wish to discharge following treatment.

E.g.
Materials –Excis- are supplied by: Materials are manufactured by:

Novartis Animal Health UK Ltd Vericore Ltd
New Cambridge House Kinnoull Road
Litlington Kingsway West
Nr Royston Dundee DD2 3XR
Herts
SG8 0SS

Chemotherapeutants for the control of sea lice are Prescription Only Medicines. This means only a veterinarian can prescribe the treatment for animals under his/her care. Excis is licensed in the UK and has a full marketing authorisation.

1.3 Description (nature and volume) of materials

Refer to Product Data Sheets and Material Safety Data Sheet and provide these in Annexes to the BPEO.
E.g. Excis™ is a clear, yellow tinted, cutaneous solution for water born use, with an alcoholic odour containing 1% w/v Cypermethrin (cis40:trans60). It is to be administered by addition to seawater. Treatment dose: 0.5m/m³ sea water. This is equivalent to 5µg cypermethrin/litre sea water.

1.4 Details of previous operations including current practice

Refer to company Standard Operating Procedure for bath treatment in tarpaulins and a procedure describing wellboat operations and provide theses in annexes. Provide some additional background.

E.g. All company sites hold Controlled Activity Regulations (CAR) (SEPA) discharge licences for these products and they have been used routinely for several years.

Provide a table showing a record of all treatments carried out for the previous five years if possible.

E.g. Site treatment record

<table>
<thead>
<tr>
<th>Date</th>
<th>Treatment Chemical</th>
<th>Supplier</th>
<th>Batch No.</th>
<th>Expiry Date</th>
<th>Cage Treated</th>
<th>Volume Treated</th>
<th>Start time</th>
<th>End time</th>
<th>Amount used</th>
<th>Withdrawal Period</th>
<th>Sea temp</th>
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2. Discussion of Available Disposal Options

Provide an appraisal of the various options available for disposal or alternative approaches to sealice treatment.

E.g. 2.1 Land discharge via an outfall

The volumes of water make land discharge practically and technically unfeasible. Furthermore depths of waters close to the shore don’t allow a large vessel to come inshore.

2.2 Sea disposal

2.2.1 Fish farm cages via CAR consent

CAR consent only allows a limited number of cages to be treated per day for the following reasons:
- It requires full enclosure tarpaulins that are extremely difficult to handle when it comes to this size. Each tarpaulin is 110m circumference and 3 meter deep, a volume close to 1000m³.
- The hydrographic conditions also come into play as the tarpaulin act as a huge sail in
strong tidal currents typical at this place. Although it is possible to treat only at slack water, this does not give enough time to treat the whole site in a short period of time (one week at most) as recommended in the Integrated Pest Management plan.

- Adverse weather conditions affect tarpaulin treatment more than wellboat treatment (waves, wind)
- Furthermore, especially with rising sea temperatures and large fish size, it is very difficult to maintain adequate oxygen levels in the water. The risk of fish mortality is increased significantly when using tarpaulins.

2.2.2 **Fish farm cages via marine licence**

Treating fish with sealice chemical at the fish farm cages in a wellboat gives the farmer access to a controlled environment in which to treat the fish. Seawater temperature control in the wells will allow the farmer to create an environment in which to treat the fish that increases the fish welfare during treatment. The volume of seawater in the well is known to the farmer, who can then administer an exact dose of treatment chemical. Resulting in even bath treatment for the fish and reduces the risk of using too much chemical and going beyond EQS.

2.2.3 **Location other than at fish farm cages**

Not allowable under marine licensing at present.

2.3.4 **Pre-treatment options prior to discharge at sea**

Although there are no known pre-treatment options prior to discharge at sea, the discontinuous discharge may allow working timetables around tides for example. Cypermethrin has low water solubility and degrades rapidly. It binds strongly to organic particles and other solids, and it is rapidly adsorbed by sediments, reducing its biological availability and hence its toxicity to benthic organisms. Cypermethrin released following a bath treatment will be rapidly diluted in the receiving environment and the majority will be adsorbed onto particulate material, which will settle to the seabed.

3. **Aspects to be taken into consideration**

For each option identified, the assessment should include reference to the following:

3.1 **Strategic considerations**

E.g.

3.1.1 **Operational aspects, including handling, transport, etc.**

All treatments are under veterinary supervision and/or instruction. All operations are carried out following written Standard Operating Procedures (please refer to enclosed document).

3.1.2 **Availability of suitable sites/facilities**

This falls under the Farming Production Manager responsibility. It consists in booking a suitable wellboat, for a defined period and a defined task, through an agent.

3.1.3 **Legislative implications, both national and international**

Marine licence sought.
All sites operated by (name Fish Farm Business) have CAR consents for the discharge of chemicals in 1.2.

3.1.4 **Summary of the outcome of discussions with third parties (If possible, copies of consultees replies should be appended to the assessment)**

There have been no formal discussions with third parties. However, (site name) is part of an Area Management Agreement and all stakeholders (including wild fisheries) strive to achieve control over sea lice infestations.

3.2 **Environmental considerations**

E.g.

3.2.1 **Safety implications**

Please refer to the Material Safety Data Sheet.

3.2.2 **Public health implications**

The only Public Health implication identified relates to Food Safety, with consumption of medicated fish. As Excis is a Prescription Only Medicine, all treated fish undergo a withdrawal period (10 degree days as per manufacturer’s instructions) prior to slaughter. Farming traceability system ensures this period is adhered to prior to harvesting. Where shellfish farming interest are located within the vicinity of the fish farm cages they have been consulted.

3.2.3 **Pollution/contamination implications, including discussion on: accumulation, toxicity, hazards, persistence, short and long-term impacts, dilution and dispersion, etc.**

The Scottish Environment Protection Agency (SEPA) has introduced new thresholds for medicines used to treat sea lice infestations in marine fish farms.

It follows the publication in 2005 of a five-year study monitoring and measuring the potential environmental impacts of using sea lice medicines. The independent PAMP* report confirmed there was no evidence of any impact from these substances on the environment which could be separated from the natural variation found in marine ecosystems.

As a result, the modeling approach, which is currently used to determine the license, limits for sea lice bath treatments will be changed, extending the time period over which the dispersal of the medicine is modeled from three to six hours.

The use of the revised modeling approach removes some of the precaution in the way that the sea lice treatment Excis is licensed, allowing fish farmers to more effectively treat sea lice infestations at marine cage fish farms. More effective treatment of such infestations may lead to benefits for wild salmon populations.

Full details of the PAMP report are available at:  
http://www.sams.ac.uk/research/coastal%20imapcts/ecol.htm  
And the revised modeling documentation can be found at:  
Also a copy of the consent for Excis for (name site) is enclosed.

3.2.4 Interference with other legitimate activities, e.g. fishing operations, other aquaculture interests

An Area Management Agreement was signed for Area/date.

The purpose of the Area Management Agreement (AMA) shall be to voluntarily promote and implement measures for the maintenance of healthy stocks of wild and farmed salmonid fish in the geographical area. An Area Management Group (AMG) include representatives of each fish farming company present within the area described, the Fisheries Trust (FT) and the District Salmon Fishery Board (DSFB). Each organisation has nominated one person to act as a point of contact and to represent that organisation at meetings.

The groups involved in the Area Management Group are (name businesses).

Each company strives to achieve a lice burden of zero ovigerous females, particularly between the periods from February to June.

Each company seeks to coordinate lice treatments with all neighbouring farms within the individual management areas with the aims of maximising the benefits of anti-lice treatments and preventing cross-contamination of lice between farm sites.

There will be full recording and documentation of measures taken to control lice on farms. This documentation is available to all members within each management area in conjunction with the TWG liaison officer.

There are no amenity users in this area.

All chemicals are discharged away from mussel farms.

3.2.5 Amenity/aesthetic implications

Provide if applicable

3.2.6 Best practice guidance and mitigation measures

A boat allows precise measurement of volume and administration of chemical, possibly resulting in the use of less product than enclosed cages using tarpaulins. Given the discontinuous nature of the discharge it is possible to discharge at precise times (taking tides into consideration). Fish welfare may also less at risk in a boat (provide reasons).

3.3 Cost considerations

3.3.1 Capital costs, e.g. site costs, transport hire/purchase costs, equipment hire/purchase costs etc.

- Capital cost: None
- Hire cost:
  Hiring a large vessel comes at a cost of £5,000/24 hours.
  Tarpaulins require buying oxygen and renting diffusion systems (approx. £2,000).
- **Purchase:**
  Chemical cost is up to £25,000 for both sites if using a boat
  Chemical cost is up to £50,000 when using tarpaulins.

### 3.3.2 Operating costs, e.g. labour costs, site operation costs, transport costs, equipment costs, environmental monitoring costs etc.

- Operating costs are unchanged
- Labour cost remains unchanged if not lower since less handling is required
- Starvation period must be increased from 1 day when using a tarpaulin to 5 days when using a boat. This means a loss of growth for 4 days (ca. £18,000).
- There are no environmental costs incurred although it is possible some treatments will be monitored with dosage of Cypermethrin in the water.

### 4. Conclusions

#### 4.1 Summary of available options

The only two options to discharge are either under SEPA/CAR licence or under marine licence.

#### 4.2 Summary of pros and cons of each option

The following table summarise aspects of each scenario:

<table>
<thead>
<tr>
<th>Options</th>
<th>Cost</th>
<th>Chemical usage</th>
<th>Technical difficulty</th>
<th>Logistics</th>
<th>Environmental impact</th>
<th>Treatment efficacy</th>
<th>Risk to livestock</th>
<th>Strategic acceptability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tarpaulins – CAR consent</td>
<td>High</td>
<td>High</td>
<td>Very labour intensive.</td>
<td>Weather and tidal restrictions apply</td>
<td>Moderate</td>
<td>Good</td>
<td>Very high</td>
<td>Low</td>
</tr>
<tr>
<td>Wellboat – Marine licence</td>
<td>High</td>
<td>Moderate</td>
<td>Less labour intensive and more efficient</td>
<td>Boat availability and size are the only restrictions</td>
<td>Low</td>
<td>Good</td>
<td>Moderate to High</td>
<td>High</td>
</tr>
</tbody>
</table>
4.3 Identification of BPEO

Present your conclusions and identify the BPEO, referring to environmental impact, chemical usage and fish welfare.

Details of how to submit your application and supporting documentation are found at:

http://www.scotland.gov.uk/Topics/marine/Licensing/marine