

## **Comments on Chemicals regularly used by Loch Duart in Scotland and registered with the Scottish Environmental Protection Agency (SEPA)**

**Phosphorus** and **total organic carbon** refer to the amount of nutrients and organic matter released in fish feces and uneaten food. They are not “hazardous chemicals.”

**Copper** on the other hand is highly toxic to aquatic organisms and it is associated with fish feed and the antifoulants used to treat nets and other equipment.

**Zinc** is also added to fish feed. It accumulates in the sediments under fish pens and has been found to have sub-lethal effects on some species of worms. Concentrations of zinc and copper in sediments under fish pens often exceed Canadian sediment quality guidelines.

The other chemicals are pesticides. All of these agents have been at one time or another used in New Brunswick--some under emergency registration, some apparently illegally (cypermethrin has not to date been registered for use in Canada).

**Emamectin benzoate** (the active ingredient in SLICE) is a member of the avermectin family and is a relative of ivermectin. It works as a neurotoxin, which affects brain development and function.

**Teflubenzuron** (the active ingredient in CALICIDE) is an in-feed sea lice treatment. It can persist in sediment for several months and is known to inhibit the formation of chitin, the primary component of the hard shell of crustaceans such as lobster, crab and shrimp. Juvenile lobsters held near fish cages during treatment were killed by the exposure.

**Azamethiphos** (the active ingredient in SALMOSAN) is an organophosphates compound and these compounds are neurotoxic and inhibit acetylcholinesterase activity (nerve transmission)

**Deltamethrin** (the active ingredient in AlphaMax, Pharmaq) is a synthetic pyrethroid and it works by interfering with nerve membrane function.

**Cypermethrin**, the active ingredient in EXCIS, is chemically related to pyrethrin. It is illegal for use in aquaculture in Canada. It is very toxic to fish, aquatic insects and crustaceans. It has the potential to bioaccumulate in the environment. Cypermethrin is the illegal pesticide Cooke Aquaculture is accused of using in New Brunswick.