

## **M. Berry: Notes on Visit to Aquaseed/Sweet Spring Coho/Steelhead Facility in Rochester, Washington – October 4, 2011.**

### **Purpose of Visit:**

M. Berry (ALBY Systems Ltd.) was asked by TIDES Canada (Catherine Emrick), the Pacific Salmon Foundation (Terry Tebb), and the 'Namgis RAS (K'udas Project) Planning Team (Garry Ullstrom), to visit the Sweet Spring Salmon production facility in Rochester. The purpose of the trip was to see first hand what the facility looked like and, more specifically, to look at the effluent treatment and disposal systems in use there.

### **Host(s):**

The visit was arranged through Per Heggelund, Principle of AquaSeed; Greg Hudson, Vice President of Production, joined for part of the on-site tour and discussion. Catherine Emrick (TIDES) facilitated the introductions via email. M. Berry visited the facility on October 4, 2011.

### **General Overview of SweetSpring Facility:**

: The SweetSpring land-based salmon and steelhead production facility is located on the outskirts of Rochester, Thurston County, Washington.

: The facility produces about 130 MT of Coho and Steelhead annually for the fresh market (mainly Overwaitea). Plans to expand to 250 Tt with RAS.

: Much of their production is eyed eggs and smolts for other farms, including international. Per notes that exporting to Canada is the hardest market because of the stringent and ever-changing rules.

: SweetSpring/Aquaseed has a full genetics and broodstock program; the eggs, smolts & fish they sell are all products from the original DomSea stock that they purchased some 20+ years ago.

: The Rochester facility uses only groundwater from 3 main wells; water flow is 3,500 usgpm from 30 HP pumps. They have large auto-start generators on stand-by.

:The SweetSpring facility uses a combination of straight flow-through, re-use and, re-circulating (RAS) systems. At this point only about 15% of the total water used is fully re-circulated, the rest is either partial re-use or flow through. In any case, the total discharge of effluent is still the 3,500 usgpm and that goes into Black River after primary treatment.

: SweetSpring is switching to more RAS. They have a new, large, metal building and are waiting for some 50' round tanks, more bio-filters, rotary screens, CO2 stripper etc.

### **Effluent treatment:**

: Effluent is run through solids separators and then revolving drum screen filters before leaving the 'upper site' via open ditches. Effluent from RAS can be chlorinated/de-chlorinated as needed.

: The total effluent stream (3,500 usgpm) and all surface run-offs are discharged into a lined settling basin (approx. 20m x 30m x 2-3m deep). There is no aeration or mechanical mixing in the settling basin.

: The settling basin has developed healthy colonies of duckweed and various other freshwater plants and algae.

- : The settling basin requires very little maintenance; solids have only been pumped out once or twice in 20 years.
- : Water entering the settling basin appears clear, perhaps because it is conducted there via open ditches with prolific plant life present in them?
- : There is no odor coming from the settling basin or from the nearby composting pit that is layered with wood waste.
- : Water from the settling pond flows into a parallel series of 6 earthen ponds. Some of these ponds are plastic lined as they used to be used for fish rearing. These 'secondary' ponds have well-established, healthy plant and algae populations.
- : Effluent is discharged to natural wetlands and then to Black River.
- : Monthly sampling and reporting at final discharge. Grab samples analyzed for: Flow, TSS, Hardness, Residual Chlorine, pH, Wet biodegradable solids, BOD5, Ammonia, Total P.
- : Sample results expressed in mg/L and Mass (lbs/day).
- : Morts, culls, blood water pit-composted on site; compost later spread on fields on property.

#### **Disease control:**

- : Aquaseed/SweetSpring has had no outbreaks of major disease in the 20+ years of operation at this site.
- : Fungus on Coho fins and caudal peduncles an ongoing but non lethal issue.
- : Some fin erosion noted in Coho broodstock esp. but not in Steelhead.
- : Fungus on fish and incubating eggs controlled with salt treatments.
- : BKD at low levels is an ongoing issue but not causing excessive mortalities – no therapeutants administered.
- : Disease screening continually on fish as they will show presence far more readily than testing effluent.
- : Mortalities at SweetSpring 1-1.5% per month

#### **The US Regulatory System:**

- : The US Regulatory System is very complex in that many agencies and acts are involved. These include: EPA; Clean Water Act; National Pollution Elimination System (NPDES); various Tribal standards that may over-ride other statutes; the Wildlife Act (1905 Lacey Act) that still governs Aquaculture; local zoning and other by-laws etc.
- : Presently a two-tiered permit system – General Permits that are less stringent and Independent (Individual) Permits that are watershed based. E.g. a given permit may have discharge restrictions that limit copper if the receiving waters have reached or nearing max. allowable levels.
- : The US is in the process of consolidating the various statutes to provide more consistent permit guidelines – work in progress.

#### **Synopsis of discussions with Per Heggelund:**

- : Discussion about Hazard Analysis Critical Control Points (HACCP) used by US Space Agency. Important to minimize CCP's and use applicable points to develop mitigation strategies.
- : Fish health issues are not directly parallel to livestock or human health; some human waste pathogens not present from fish and vice-versa.

- : “Be careful not to over-prescribe testing and monitoring without good reason or it could become regulation for its own sake.” (Per H.)
- : “Avoid ‘nice to do’ testing at the outset because it bears high costs that might not be affordable after grants and at ‘scale up’ of operations – could lead to failure.” (Per H.)
- : The ideal model for establishing criteria would be: Establish Terms of Reference>Agreement in Principle>Contractual Agreement
- : Must build in “sunset” clauses if no need to monitor further is established.

Submitted by: Michael Berry (R.P.Bio.)  
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*\*\*PHOTOS IN SEPARATE FILE*