United States Department of the Interior
Fish and Wildlife Service
Entiat National Fish Hatchery
Leavenworth Fisheries Complex
12790 Fish Hatchery Road
Leavenworth, WA 98826

April 17, 2012

Rob Jones
U.S. Department of Commerce
NOAA Fisheries NW Regional Office
Salmon Recovery Division
1201 NE Lloyd Blvd., Suite 1100
Portland, Oregon 97232

RE: Hatchery and Genetic Management Plan (HGMP) for the Entiat National Fish Hatchery (ENFH)

Mr. Jones,

Enclosed is a new, updated SECTION 4. WATER SOURCE to replace the SECTION 4 (page 19) currently in the July 31, 2009 HGMP for ENFH. This SECTION 4 includes the updated information provided on February 15, 2012 and also incorporates the following additional conservation measure as part of ENFH's operations.

> USFWS personnel will monitor Entiat River stream flows at the USGS gage site Entiat River near Entiat #12452990. ENFH's diversion of surface water: (a) will not exceed 10 % of mean daily flow whenever the combination of flow minus the amount of hatchery surface diversion is less than 100 cfs, from November 1st through April 30th, and (b) will not exceed 5% of mean daily flow whenever the combination of flow minus the amount of hatchery surface diversion is less than 200 cfs from May 1st through October 31st.

This additional conservation measure will further ensure that ENFH operations will not likely jeopardize the continued existence of ESA listed species nor adversely modify critical habitat in the Entiat River.

Use of surface water withdrawal operations are not expected to affect the straying rate of Entiat NFH origin summer Chinook salmon adults. A mix of surface water and ground water will be used during overwinter acclimation of juveniles and as attraction flow during ladder operations for adult collection. The use of surface water for overwinter acclimation of juveniles has been identified by local fishery co-managers as a contributing factor towards the success of summer Chinook salmon programs in the Okanogan River basin, whereas out of basin hatchery rearing and spring acclimation on surface water are thought to be a cause of the lower SARs seen for the Methow basin summer Chinook programs. However, the USFWS will continue its active monitoring program of evaluating the impacts of hatchery origin Chinook salmon on natural spawning grounds in the Entiat River.

If you have any questions or concerns, please contact Malenna M.J. Cappellini, Leavenworth Fisheries Complex's Environmental Compliance Biologist at (509) 548-2928 or Craig Chisam, ENFH's Manager at (509) 784-1131.

Sincerely,

David B. Irving
Leavenworth Fisheries Complex Manager

SECTION 4. WATER SOURCE

4.1) Provide a quantitative and narrative description of the water source (spring, well, surface), water quality profile, and natural limitations to production attributable to the water source.

In 1943, the USFWS ENFH was granted a surface water use Certificate for 22.5 cubic feet per second (cfs) (Surface Water Certificate No. 3058) and a spring Certificate (No. 3059) for 7.0 cfs. The river water intake is located at river mile 7.2 (rkm 11.6), approximately 0.5 miles (0.8 km) upstream of the hatchery's effluent discharge. Water is conveyed to the hatchery through a buried 36 inch pipe system to inclined 3/32 inch fish screens. After passing through the screens the water passes through a settling basin before distribution to the fish rearing units. Screened debris and downstream migrants are diverted through an 18 inch line back to the Entiat River. The water intake structure consists of a diversion structure, intake sump, and bar trash racks (3 inch spacing). Non-hatchery fish and other aquatic organisms that enter the system can return to the river via the 18 inch water line that diverts screened debris and water from the stations surface water screen chamber building. The screen chamber meets the standards for screening criteria described in the *1994 Policies and Procedures for Columbia Basin Anadromous Salmonid Hatcheries* developed by NOAA Fisheries (NMFS 1994).

Years after production started, it was determined that Entiat River water contained high organic loads and a detrimental parasite (*Myxobolus sp.*) which had a negative impact on hatchery spring Chinook salmon production. Groundwater wells were drilled as an alternative to try to resolve the parasite problem and in 1994 the service requested to change the point of diversion authorization under Certificate No. 3058, to include the six wells on the existing certificate and the request change was granted in 1996 (Table 4). ENFH now has the ability to withdraw from either ground water wells, the surface diversion, or a combination of both not to exceed 22.5 cfs (10,098 gpm).

Table 4: The following table represents current water use rights for the Entiat National Fish Hatchery.

Certificate Number	Source	Priority Date	Amount
Surface & Ground Water 3058	Entiat River and/or Wells 1- 6	June 4, 1943 Amended Feb.21, 1996	22.5 CFS (10,098 GPM)
3059	Limekiln (Packwood Spring)	June 4, 1943	7.0 CFS 3,142 GPM

Hatchery production has relied primarily on ground and spring water for fish production. The availability of ground water determines fish production at ENFH. An average of 2,000 gpm is available at an average temperature of 50° F (10^0 C) year round. In the recent past, surface water was used on a limited basis to supply adequate amounts of water to operate the station's fish ladder during adult returns. Currently, the hatchery is using groundwater from May 1st through October 31st and using a combination of groundwater and surface water from November 1st through April 30th. The amount of surface water withdrawn is dependent on groundwater availability and is expected to average 18 cfs. In the near future, ENFH intends on gradually increasing its surface water withdrawal to year-round (January 1st through December 31st). Surface water is also used in case of long-term loss of ground water supplies (emergency).

ENFH requests that this ESA consultation cover surface water withdrawal of its full water right of 22.5 cfs year-round.

All of the river water and groundwater used at the hatchery, minus any leakage and evaporation, is returned to the Entiat River (non-consumptive use). The majority of surface and ground water used for ENFH operations returns to the Entiat River near the base of the adult return ladder (rm 6.7, rkm 10.8), except during pond cleaning and maintenance activities when all water is routed through the pollution abatement pond.

4.2) Indicate risk aversion measures that will be applied to minimize the likelihood for the take of listed natural fish as a result of hatchery water withdrawal, screening, or effluent discharge.

If surface water withdrawal is maximized, approximately 4 to 16% of the mean monthly stream flow in the stream reach between rm 7.2 (point of water withdrawal) and rm 6.7 (point of discharge) could be removed, with lower mean monthly flows occurring December through February, September, and October. Year-round surface water withdrawal of 22.5 cfs may affect, but is unlikely to adversely affect, endangered UCR spring Chinook salmon and threatened UCR steelhead migration through and critical habitat in the stream reach between rm 7.2 and 6.7. It is unlikely that surface water withdrawal by ENFH will affect UCR spring Chinook salmon and steelhead migration past the hatchery as upstream migration and emigration for both species are typically associated with higher stream flow. However, USFWS personnel will visually assess the stream reach between rm 7.2 and 6.7 for fish passage barriers created from low stream flow and reduce or stop surface water withdrawals as necessary. ENFH water withdrawal activities may affect juvenile salmonid rearing habitat between rm 7.2 and 6.7. To reduce or eliminate these potential impacts, USFWS personnel will monitor Entiat River stream flows at the USGS gage site Entiat River near Entiat #12452990. ENFH's diversion of surface water: (a) will not exceed 10 % of mean daily flow whenever the combination of flow minus the amount of hatchery surface diversion is less than 100 cfs, from November 1st through April 30th, and (b) will not exceed 5% of mean daily flow whenever the combination of flow minus the amount of hatchery surface diversion is less than 200 cfs from May 1st through October 31st.

Entiat River water temperatures above rm 7.2 can exceed 59^{0}F (15^{0}C) in late July and August which may negatively affect UCR spring Chinook salmon and steelhead critical habitat. ENFH's water withdrawal operations may increase this potential negative environmental effect. To reduce or eliminate this potential cumulative effect, USFWS personnel will monitor stream temperatures (7DADMax – seven day average daily maximums) at the point of surface water withdrawal (rm 7.2) and between the point of withdrawal and discharge (~ rm 6.7). Surface water withdrawal operations will stop if: (1) water temperatures at the point of withdrawal are greater than 59^{0}F (15^{0}C) and water withdrawal activities increase temperatures between rm 7.2 and 6.7, and (2) water temperatures are less than 59^{0}F (15^{0}C) at the point of withdrawal and greater than 59^{0}F (15^{0}C) between rm 7.2 and 6.7.

ENFH intake screens conform to NOAA Fisheries screening guidelines described in the *1994 Policies and Procedures for Columbia Basin Anadromous Salmonid Hatcheries* developed by NOAA Fisheries (NMFS 1994) to minimize the risk of entrainment of juvenile fish. Screens are

cleaned at least twice per day. Deflectors were installed in the screen chamber to divert sufficient amounts of water through and over 3/32 inch holed screens when water demand from the river is low. These deflectors simply shunt water over the screens so that downstream migrants and debris washes off the screens. Additionally, spray nozzles were installed to prevent algae from plugging holes on the screens. The nozzles were mounted on the underside of the screens spraying a jet of water up through the screen holes allowing the algae to continue flowing out of the screen chamber into the discharge pipe.

ENFH consults with the Washington Department of Ecology (WDOE) and the EPA to make sure appropriate regulations are followed when the pollution abatement ponds are cleaned and the sediment is disposed of. ENFH operates under its National Pollutant Discharge Elimination System (NPDES) permit number WAG-13-0000, August 1, 2009 through July 31, 2014 (US EPA 2009).