6/12/07 Workshop
Suction Dredge Mining
Deadline: 6/22/07 Noon

June 13, 2007

State Water Resources Control Board
Division of Water Quality
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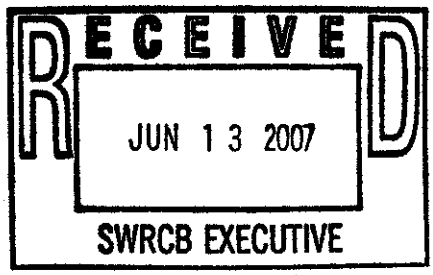

Subject: **SUCTION DREDGE MINING**

Dear Board Members,

As Siskiyou County Supervisor for District 5, I represent the mid-Klamath River, Scott River and Salmon River areas. I have served on the Klamath Basin Fisheries Task Force, the Klamath Province Advisory Council, Five County Salmonid Conservation Committee and the Seven County North Coast Integrated Regional Water Management Planning Council. I have been involved in salmon and related water quality issues since 1990.

My district has a history of more than 150 years of mining activities. Suction dredge mining makes a major contribution to the economy of the Klamath River corridor in my district. Visitor and resident miners support local community grocery and other enterprises in an otherwise severely economically depressed area. Continuation of the mining tradition enriches the fabric of living history for tourism and is important to our local culture. Local miners have successfully defended two lawsuits attempting to eliminate their opportunity to dredge mine in the Klamath River system. (KARUK TRIBE OF CALIFORNIA v. US FOREST SERVICE and KARUK TRIBE OF CALIFORNIA v. CALIFORNIA DEPARTMENT OF FISH AND GAME.)

I have reviewed some of the literature on the water quality impacts of small-scale suction dredge mining on the environment. The overwhelming preponderance of scientific study appears to conclude that there is a de minimus impact of suction dredging on water quality. Impacts to turbidity, water temperature and suspension of heavy metals have been found to be less than significant, highly localized and temporary.

According to the Army Corps of Engineers, turbidity produced from $\leq$ 6-inch suction dredges is *de minimus.* Scientific studies establish the localized, short-lived and insignificant nature of impacts of suction dredge mining, such as the California Department of Fish and Game – 1997 and Oregon Siskiyou National Forest Dredge Study -2001.) One study concluded that "*Water quality was typically temporally and spatially restricted to the time and immediate vicinity of the dredge*" (North, P.A. - 1993).

SEDIMENT

The 1997 California study established that suction dredge mining may re-suspended streambed sediment and that there is a possibility of spilling of gas and oil used to operate suction dredges. The study found that effects on turbidity varied considerably depending upon the amount and type of fine sediment in the substrate, the size and number of suction dredges relative to stream flow and reach of stream, and background turbidities. However, the study concluded that "Effects from elevated levels of turbidity and suspended sediment normally associated with suction dredging as regulated in the past in California appear to be less than significant with regard to impacts to fish and other river resources because of the level of turbidity created and the short distance downstream of a suction dredge where turbidity levels return to normal" (CDFG, 1997).

Another study specifically established the minimal impact of operations on sediment and turbidity (Cooley -1995.) Others measured special impact in the limited plumes produced from suction dredging activity (Harvey -1986; Somer and Hassler - 1992; Thomas - 1985; Lewis - 1962; Griffith and Andrews – 1981; Wanty, R.B., B. Wang, and J. Vohden. 1997).

USGS study in Alaska's Fortymile River). Several studies also determined that the operation of multiple dredges in a watershed fails to have a cumulative impact on turbidity (Harvey, B.C., K. McCleneghan, J.D. Linn, and C.L. Langley - 1982; Harvey, B.C. - 1986; Huber and Blanchet – 1992.)

Several studies have been done on the temporal impacts to sediment. Harvey (1982) established the "...generally rapid recovery to control levels in both turbidity and settable solids occurred below dredging activity." Hassler (1986) noted "...water quality was impacted only during the actual operation of the dredge...since a full day of mining by most Canyon Creek operators included only 2 to 4 hours of dredge running time, water quality was impacted for a short time."

TEMPERATURE

Shade and channel width to depth ration are contributing factors to stream temperature. According to the study done by the Siskiyou National Forest in 2001, suction dredge operations are confined to the existing stream channel and do not affect riparian vegetation/ stream shade or stream width. Operations may alter pool dimensions by excavation and deposition of tailings, however, this may actually benefit fish by providing additional coldwater habitat for salmonids living in streams with elevated temperatures. The study concluded that suction dredging resulted in no measurable increase in stream temperature.

In additional studies, Hassler found that dredge mining had little, if any, impact on water temperature (Hassler, T.J., W.L. Somer and G.R. Stern, 1986). The California Department of Fish and Game concluded in their 1997 study that "current regulations restrict the maximum nozzle size to 6 inches on most rivers and streams which, in

conjunction with riparian habitat protective measures, results in a less than significant impact to channel morphology."

WATER CHEMISTRY

In 1997, USGS and the State of Alaska studied the impacts of suction dredge mining on the Fortymile River and found no measurable effect in pH, turbidity, electrical conductivity and trace metals in comparison with natural stream chemistry (Wanty, R.B., B. Wang, and J. Vohden. 1997).

A final report from an EPA contract for analysis of the effects on mining in the Fortymile River, Alaska stated, "At Site 1, dredge operation had no discernable effect on alkalinity, hardness, or specific conductance of water in the Fortymile. Of the factors we measured, the primary effects of suction dredging on water chemistry of the Fortymile River were increased turbidity, total filterable solids, and copper and zinc concentrations downstream of the dredge. These variables returned to upstream levels within 80-160 m downstream of the dredge. The results from this sampling revealed a relatively intense, but localized, decline in water clarity during the time the dredge was operating" (Prussian, A.M., T.V. Royer and G.W. Minshall, 1999). ..."The data collected for this study help establish regional background geochemical values for the waters in the Fortymile River system. As seen in the chemical and turbidity data any variations in water quality due to the suction dredging activity fall within the natural variations in water quality" (Prussian, A.M., T.V. Royer and G.W. Minshall, 1999).

Early historic mining used mercury to recover gold. Legacy deposits exist in many areas that were historically mined. Modern day small-scale gold suction dredgers do not use mercury to recover gold during the operation of the dredge, although they may actually remove mercury from the stream as a beneficial by-product of their extraction activities.

According to Joseph C. Greene, Research Biologist, U.S. EPA – Retired: "Mercury occurs in several different geochemical forms, including elemental mercury, ionic (or oxidized) mercury, and a suite of organic forms, the most important of which is methylmercury. Methylmercury is the form most readily incorporated into biological tissues and is most toxic to humans. The process of mercury removal by suction dredging does not contaminate the environment because small-scale suction dredging removes elemental mercury. Removal of elemental mercury before it can be converted, by bacteria, to methylmercury is a very important component of environmental and human health protection provided as a secondary benefit of suction dredging."

It is my opinion that the scientific literature clearly indicates that the impact of small scale suction dredge mining is less than significant, highly localized and temporary. There is even evidence to show that these mining activities have beneficial effects on cold water habitat creation and mercury removal.

Thank you for this opportunity to comment.

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