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SUPERIOR COURT OF THE STATE OF CALIFORNIA

FOR THE COUNTY OF SAN BERNARDINO

Coordination Proceeding Special Title (Rule 1550(b) **SUCTION DREDGE MINING CASES**	Judicial Council Proceeding No. JCPDS 4720 **DECLARATION OF CLAUDIA J. WISE IN SUPPORT OF MINERS' JOINT MOTION FOR INJUNCTION AGAINST DEFENDANTS** Judge: Hon. Gilbert G. Ochoa Dept.: S36 Date: June 23, 2015 Time: 8:30 a.m.
Related Actions: *Karuk Tribe of California, et al. v. California Department of Fish and Game* *Hillman, et al. v. California Department of Fish and Game*	 RG 05211597 – Alameda County RG 09434444 – Alameda County

Karuk Tribe of California, et al. v. California Department of Fish and Game	RG 1263796 – Alameda County
Kimble, et al. v. Kamala Harris, Attorney General of California, et al.	CIVDS 1012922 – San Bernardino County
Public Lands for the People, et al. v. California Department of Fish & Game, et al.	CIVDS 1203849 – San Bernardino County
The New 49er's, et al. v. State of California; California Department of Fish and Game, et al.	SCCVCV 120048 – Siskiyou County
Foley, et al. v. State of California; California Department of Fish and Wildlife, et al.	SCSCCV 13-00804 – Siskiyou County
Walker v. Harris, et al.	34-2013-80001439 – Sacramento County

Claudia J. Wise declares:

1. I retired after 32 years of civil service with the United States Environmental Protection Agency as a Physical Scientist/Chemist. I have been a member of many scientific projects over the years starting my federal career in the Fish Toxicology arena and ending it with the Salmon Restoration division. I have worked on projects ranging from urban fish populations and fish avoidance testing to eelgrass habitat and global climate change. I have been and remain a strong proponent of protecting the environment. My Curriculum Vitae is attached to this Declaration as Exhibit 1.

2. I have been involved in temperature surveys on the Klamath River in California in regards to suction dredge activity and existing conditions of refugia. We have found specified natural refugia to be no better in many cases to that of dredge made refugia.

3. I have studied a plethora of peer reviewed papers too numerous to list here regarding effects of suction dredging on the environment. Most have come to the same conclusion of insignificant or *de minimis* environmental impact that is local and temporary in its effect on the streams inhabitants.

4. It appears that although there are many peer reviewed journal articles written that support this conclusion giving the proof already at hand that the dredging community is not significantly harming the environment or the fish this issue is re-surfacing in this Court. My experience regarding suction dredge mining is that the fish are very happy to feed from the dredged spoils presented to them and rest in the dredge holes left much like in natural refugia. I have never seen or heard of any harm that has come to any fish present during suction dredging activities. California Fish and Wildlife currently have rules and regulations that do regulate dredging out of situations that would be harmful to fish, such as, spawning seasons.

Mercury Toxicity Allegedly Associated with Suction Dredge Mining Poses No Real Threat to the Health of Californians.

5. For nearly 50 years there has been a large body of (peer reviewed) evidence published that demonstrates that dietary selenium moderates or counteracts mercury toxicity. Mercury exposures that might otherwise produce toxic effects are counteracted by selenium,

particularly when the Se:Hg molar ratios approach or exceed one to one. This is because selenium has a high affinity to bind with mercury thereby blocking it from binding to other substances, such as brain tissue. This has practical significance because even if fish ingest mercury which then becomes available for human consumption, such mercury may be effectively inert because selenium concentrations in the fish may protect humans who eat them.

6. A group of scientists from USEPA published research in 2009 that included data from fish samples collected in California which, in all cases, contained proportions of mercury to selenium that were adequate to protect fish, wildlife and human health. Results showed that 100% of the freshwater fish surveyed in California had sufficient selenium to protect them and their consumers against mercury toxicity (Peterson et al, 2009). This may be why no one has ever become sick from eating sport fish in California, even though mercury warnings have been issued.

7. A 2011 report by the California Water Board, Contaminants in Fish from California Rivers and Streams[1] showed no significant mercury contamination in areas where suction dredge mining continued for years. Concentrations in the Klamath River, a favored area for suction dredging, were very low. Indeed, in general river and stream locations outside the Delta region all had low or moderate methyl mercury contaminations. And in its SEIR, the Department concluded that mercury mitigation actions were not "believed to be necessary to avoid deleterious effects to fish" (DSEIR at 5-29).

8. In 2010 as a member of the CDFG Suction Dredge Public Advisory Committee, I gave a presentation to the group sharing these and other facts, a true copy of which is attached hereto as Exhibit 2. The California Department of Fish and Game (now CDFW) never offered any response to this information.

9. Since that time research points even more strongly to a beneficial health value obtained from selenium in living organisms being the most crucial factor. Adverse health effects caused from exposure to mercury may not be due to mercury in itself but rather the fact that

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[1] This report is available online at http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/rivers_study/rs_rptonly.pdf.

mercury irreversibly binds with selenium, producing a deficiency of this essential micronutrient all living organism require for critical functions (Sørmo et al., 2011), especially in the brain and nervous system. All living organisms require selenium to be healthy however there is no known requirement by the body for mercury. (Ralston, 2014)

10. In personal communications, Dr. Ralston, a well-known ecotoxicologist, recently told me that only 2 percent of waters of the United States have any real need for mercury remediation and nearly all waters of California are not in this category.

11. Aside from grossly polluted environments, mercury is normally a problem only where the rate of natural formation of methyl mercury from inorganic mercury is greater than the reverse reaction. Methyl mercury is the only form of mercury that accumulates appreciably in macroinvertebrates and fish. Environments that are known to favor the production of methyl mercury include certain types of wetlands, dilute low-pH lakes in the Northeast and North central United States, parts of the Florida Everglades, newly flooded reservoirs, and coastal wetlands, particularly along the Gulf of Mexico, Atlantic Ocean, and the Sacramento-San Joaquin Delta and San Francisco Bay (USGS 2000). Mercury does not form the potentially toxic compound methylmercury in areas of high dissolved oxygen such as gold-bearing rivers and streams where suction dredge mining occurs, but more in low-dissolved oxygen areas such as swamps and deltas.

12. Since the cessation of hydraulic mining, accumulated sediment from hydraulic placer mining has been transported to the Delta and Bay by sustained remobilization (James, 1991). The mercury used by early hydraulic miners move downstream with this sediment. If not collected and removed from the environment, mercury in California rivers and streams is guaranteed to end up farther downstream, and eventually in the Delta or the Bay, where methylation is a real environmental problem. In particular, mercury left in place is vulnerable to the next storm event moving it downstream closer to, and eventually into, the Bay and Delta.

Suction Dredges Benefit the Environment by Removing Mercury.

13. I have spent much time over the last decade studying mercury effects on the environment in relation to suction dredging activity. A paper published by the California Water

Board's Water Quality Division (Humphreys, 2005) ("Board") discussed mercury losses and recovery during small-scale suction dredging. He demonstrated that a suction dredge in the American River was able to collect 98 percent of the measured mercury processed through the dredge. The results may have been higher if the investigators had been using a dredge with the modern jet flare design.

14. Removing 98 percent of mercury before it reaches the Delta and Bay is a very significant positive environmental impact and it would be irresponsible to not allow mercury to be removed from the rivers and streams whenever it is found in this fashion.

15. In Humphreys report (2005), the author expressed concern for the loss of a small portion (2%) of the mercury from the back end of the sluice box. In the conclusions it was than ten times higher than that needed to classify it as hazardous waste. Yet 98 percent of the mercury was now secured and the process did not add any mercury to the system that was not already present. The small fraction lost, because of its density, would relocate back onto the river floor buried in the sediment close to where it was removed while dredging.

16. In my opinion it would be a highly irresponsible management practice to leave a large portion of mercury in the rivers and streams because of unrealistic concerns for the lesser amount moving only a short distance away from an operating dredge. Most likely, the movement of fine mercury would extend no farther than 50-feet off the end of the sluice box. The distance transported would relate to the distance a turbidity plume might extend downstream from a small-scale suction dredge.

17. In fact, according to Humphrey's study in 2005 mercury was seen moving downstream and re-deposited on bedrock already dredged clean. The important fact here is mercury was flowing down stream in a suction-dredge-free zone during lower river flows than take place under high winter river conditions. Whatever incremental contribution suction dredging might make to this process is obviously insignificant compared to the benefit of removing 98% of the mercury.

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The Flouring Issue.

18. Mercury can become floured, i.e., put into small particles like specks of flour. One charge against suction dredges is that they may flour mercury they encounter in larger units. In general, flouring is aggravated by agitation, exposure of mercury to air, and other chemical reactions.

19. In the test described by Humphreys (2005), a small portion of floured mercury was collected in the sediments as they escaped the sluice box. It is unclear from reading the Humphrey's report whether or not the floured mercury was already present in the river sediments. If one were to study the picture in the report that showed the results of panning materials from a nearby creek it does appear that the mercury in the materials was already floured. In any event, because the study was conducted in a seriously contaminated area it is impossible to determine what portion of flouring of mercury was caused by the crash box design of the suction dredge in use. Moreover, because the crash box may also have caused flouring, the results do not demonstrate adverse impacts from using a more modern jet-flare-type suction dredge, which would also probably improve mercury recovery.

20. More study is required to see if reducing the amount of floured mercury would be enhanced by utilizing the modern jet flare style suction dredge. The jet flare which is widely in use today, in the suction dredge mining community, is the best equipment available for collecting fine gold and because of this design and the density of mercury 13.53 grams per cubic centimeter (g/cm3) it would be more effective in collecting mercury particles with little disturbance that would result in further breaking the mercury particles down.

21. In either event, floured mercury is still in elemental form, not methylated. Regardless of surface area it would be no more or no less toxic then the 98 percent collected by the dredge.

Suction Dredges Make No Appreciable Contribution to Ambient Mercury Concentrations.

22. The remarkable position of the Department and Water Board is that even though suction dredges may remove over 98% of the mercury they encounter, dredging should be restricted because the process of suction dredging may result in increased mercury

concentrations into the environment. In the SEIR, the Department characterized this as a "significant and unavoidable" impact of permitting dredging, while acknowledging that few studies are available on the issue.

23. However, there was a cumulative impact study using an 8 and 10-inch dredge (actually operating in a flowing river) commissioned by the USEPA (Royer et al., 1999), which demonstrated values of dissolved mercury that were actually greater *upstream* of the dredge, suggesting that any effect of the dredge was likely within the range of natural variation. The operator reported observing deposits of liquid mercury within the sediments he was working. This is the most relevant piece of published scientific evidence, addressing dredging at intensity beyond that typically experienced in California, with real world interceptions of occasional mercury deposits. Neither the Department nor the Water Board has ever offered information to undermine the conclusions of this study.

24. Instead, they have pointed to a report by Fleck et al. (2011). But this report attempted to infer conclusions about the effect of suction dredges with an entirely different mechanism, involving re-circulating water through a hand-dug hole in the most highly mercury contaminated area known to the State of California. To utilize this setup to infer effects for suction dredging is, to put it bluntly, the poorest excuse for science that Mr. Greene and I ~~we~~ have observed in our combined 60+ years of scientific research.

25. A further defect of the Fleck et al. report analysis was to predict the impact of suction dredges by using mining industry data to compare output between differing dredge sizes using 100 percent sand for the dredged material. This type of material is not represented in real world riverbed materials processed by gold suction dredge miners. Materials found in all mining areas are composed of boulders, cobbles, gravel, sand etc. Using only sand, although perfect for comparing dredge size output in a factory, is a misrepresentation of real world conditions.

Suction Dredges Can Also Aid in Targeted Mercury Remediation.

26. Providing a program to collect mercury from miners would aid the Water Board's mission of reducing mercury contamination in the deltas and bays where mercury methylation is a large concern. It is most important to reduce the total amount of mercury in the streams and

rivers and its transport downstream into the bays and deltas. This is defined as a part of water pollution control regulations goal to reduce the Total Maximum Daily Load ("TMDL") of contaminants such as mercury.

27. Suction dredges are being used by government agencies to remediate stream conditions in some cases. According to the National Oceanic and Atmospheric Administration (2006) ("NOAA"), Duck Creek, a surface water body in Alaska, is impaired by urban runoff from non-point source pollutants including, heavy metals, hydrocarbons, iron flocs and excess nutrients. This small coastal stream orlginates from a spring that drains runoff from Mendanhall Valley, a relatively high density residential and business area. Historically there were runs of nearly 10,000 chum salmon and Coho runs of about 500 fish in Duck Creek. Currently the chum run is extinct and the Coho run consists of only 20 fish. Restoration at Duck Creek involves the development and implementation of bioremediation methods to restore water quality and anadromous fish habitat in impaired streams. NOAA scientists attempted to correct the degraded conditions by using high-pressure jet pumps and suction dredges to remove fine sediment from the streambed.

28. The suction dredge community could provide the state with a source of help that is willing to do what they do best, prospecting for gold. In the event that suction dredge miners run across a hot spot of mercury, the miners would be willing to hand it over to a collection facility if such a facility existed. The Board's Water Quality Division report (Humphreys, 2005) idea of paying the miners for their efforts would help facilitate this plan. The cost would be much less than what is presently being spent on remediation activity that is less effective.

29. The Water Board has spent a lot of time and money on mercury remediation projects with limited success though in 2001 EPA, Region 9 located in San Francisco, California did collect mercury from miners very effectively. Collections of mercury are currently happening in Oregon and Washington through the states respective Division's of Ecology and with even greater success at miner's rallies.

30. During the first EPA, Region 9 mercury "milk run" in 2000 agency personnel were able to collect 230 pounds of mercury from miners. The total amount of mercury collected

was equivalent to the mercury load in 47 years' worth of wastewater discharge from the city of Sacramento's sewage treatment plant or the mercury in a million mercury thermometers. (US EPA, 2001.)

31. Over the past four years, the Resources Coalition and other small-scale miners associations in Washington have turned in 127 pounds of mercury and eight pounds of lead for safe disposal with the help from the Washington Department of Ecology. Ecology staff attended miners' rallies in Oroville and Monroe, explaining the state's program for proper disposal of lead and mercury. (ENS) 2007

32. The mining community of today is, in my opinion, the only group that is in a position with the technology to help out at a very economical price to the public. Any residual mercury remaining after dredging a location is that much less to worry about in our Nation's waterways.

33. In my opinion, suction dredge mining is beneficial to the rivers and streams in California.

I certify under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Executed on May 18, 2015.

Claudia J. Wise

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PROOF OF SERVICE

I, Carole Caldwell, hereby declare under penalty of perjury under the laws of the State of California that the following facts are true and correct:

I am a citizen of the United States, over the age of 18 years, and not a party to or interested in the within entitled cause. I am an employee of Murphy & Buchal, LLP and my business address is 3425 SE Yamhill Street, Suite 100, Portland, Oregon 97214.

On May 18, 2015, I caused the following document to be served:

DECLARATION OF CLAUDIA J. WISE IN SUPPORT OF MINERS' JOINT MOTION FOR INJUNCTION AGAINST DEFENDANTS

by transmitting a true copy in the following manner on the parties listed below:

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