

The New 49'ers

27 Davis Road, Happy Camp, CA 96039 (530) 493-2012 dcmcra@attglobal.net

State Water Resources Control Board
Division of Water Quality
P.O. Box 100 Sacramento, California 95812-0100
Fax: 916-341-5620; email: commentletters@waterboards.ca.gov

20 June 2007

Dear Sirs:

My name is Dave McCracken. I have been active in suction dredging since 1979 and am generally considered an authority on the subject. I have consulted for companies and governments all over the world concerning suction dredging, including, Borneo, Sumatra, Cambodia, Thailand, Philippines, Papua New Guinea, Madagascar, South Africa, Guinea, Venezuela, Costa Rica and elsewhere. I have published and produced most of the authoritative books and video material on the subject of suction dredging. As I have devoted most of my adult-life to activities related to suction dredging, I am very qualified to speak on the subject. I have been recognized as an expert on the subject in the California State Courts and in Federal Court.

Suction dredging is not the only area that I am an expert. I also have extensive experience in utilizing gravity methods to recover fine gold, mercury and gemstones – especially in recovery systems used by suction dredges.

More background about my experiences concerning suction dredges and recovery systems can be found on my consulting web site at <http://www.promackmining.com/>. I have written extensively on the subject of recovering fine particles of heavy metals and gem stones with the use of suction dredges. One excellent article on the subject can be found at <http://www.promackmining.com/differentsampling.htm>.

Since some of the concerns being expressed at your June 12th workshop had to do with the Water Board's recent report named "Mercury Losses & Recovery," I have taken the time to review that report. Thank you for allowing me this opportunity to comment. Having conducted many similar testing projects myself, I would like to express some of my own concerns about the report:

- 1) Any sampling report should include a section which clearly defines the equipment that was used and how it was used. All suction dredges are not equal in their ability to recover fine particles of heavy metals; especially floured mercury! In addition, there should be some discussion about how the dredge was set up (slope setting of the sluice box, speed of engine operation, etc.), and how fast the raw material was fed into the nozzle (overloading reduces efficiency of recovery).

Without some explanation about how these variables were managed, it is impossible to assess the value of the final outcome.

I can see in Figure 8 that the samplers were using an old-style Keene dredge that employed the use of a header box. Those types of dredges have been out of production for about 15 years. Most modern suction dredges are now being constructed with flare-jets, rather than header boxes. There is a huge difference in the potential affect upon any liquid mercury which would be dredged up. Header boxes subject the full force of dredged material to a dramatic reverse in direction, slamming everything down onto a classification screen and subjecting all dredged material to enormous violence. This could potentially cause liquid mercury to flour. Flare jets gradually diffuse the speed of dredged material as it is washed into the recovery system. This would not be likely to flour mercury.

So while the Water Board's suction dredge testing may have caused some flouring of liquid mercury (it also may not have), a modern flare-jet suction dredge would be far less likely to cause flouring in the very same test scenario.

- 2) In going through the report several times, it still is not clear to me if adequate testing was completed on the raw material (before it was dredged) to see if floured mercury was present there. If that was done, there should be some clear language in the report about it.

The reason is that the report seems to draw a conclusion that the dredge was actually causing the flouring. That is a very important assumption that must be proven by the testing!

It is strongly possible that the suction dredging did not cause any of the flouring; that the floured mercury was present in the raw material in the first place. In fact, the report seems to suggest that it was. Figure 7 shows a pan which includes floured mercury that was panned (not dredged) from creek gravels.

All I can do is suggest that you read my article at <http://www.promackmining.com/differentsampling.htm> on the subject of fine particle recovery. Mercury flouring can reduce particle-size all the way down to a micron. It is unreasonable to assume that a suction dredge, without special modification, will recover 100% of floured mercury that has been disbursed throughout streambed gravels.

The big question is not whether a normal newer-version suction dredge will recover 100% of floured mercury. It is whether or not the dredge itself is the cause of the flouring. I believe, if you do careful testing, using a more modern suction dredge, you will discover that the dredge is not the source of the flouring.

- 3) Your report also suggests that mercury is migrating down California's waterways during flood events. I am certain that Mother Nature's storms (enormous

violence at the bottom of waterways) create more flouring on liquid mercury than anything else in the system.

The reason this is important, is because it suggests that we should remove as much of the liquid mercury from the river systems as possible at every opportunity. Because today's liquid mercury along the bedrock may be tomorrow's floured mercury disbursed all throughout the streambed gravels where it will become much more difficult to extract from the system.

While the Water Board will make its own conclusions in this respect, my own opinion is that is far better to have suction dredgers remove 98% of the mercury from California's river systems, than to leave all the mercury in the system so that it can continue to migrate downstream and further poison our water and food. This is especially true if the 2% loss in your tests turns out to be flouring which is already present in the gravel. Because in that case, suction dredgers are merely moving some floured mercury aside (which is already in the system) while they are in the process of removing 98% of the remaining mercury from the system.

- 4) I know the water board already knows this, but it still needs to be said: In a cooperative arrangement, suction dredgers are the only group in existence that can presently assist the Water Board and other authorities to locate mercury hot spots at the bottom of California's waterways. **Maybe such hot spots, once identified, should receive a special designation because of the dangers.** I would be more than happy to assist you in the development of dredging equipment that will recover 100% of the floured mercury from such locations.

It is important to note that most of the places where dredging takes place are not mercury hot spots. Up here on the Klamath watershed, the only mercury recovery that I am aware of is the occasional bit that we find attached to our gold. I'm sure we recover 100% of that, because the mercury is attached to gold, which is quite heavy.

Since most areas do not contain substantial amounts of mercury, mercury does not pose a water quality issue under the vast majority of circumstances. It would seem that the best solution is to locate the hot spots and use more sophisticated technology to clean those up. I am willing to assist the Water Board in this effort.

Thank you for considering my comments!

Dave McCracken