MINERS ASSEMBLED
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The Honorable Marc Levine, Chair
Assembly Water, Parks & Wildlife Committee

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Mr. Chair, Committee Members, Staff,

I am writing you as the liaison for Miners Assembled, a Constitutional assembly of individuals, associations, businesses, and organizations with interest in mineral resources and mining from throughout this great state and beyond; each of us is acting independently for our common cause. I hereby oppose SB-637 of 2015 as written and amended on the behalf of the aforementioned assembly, and wish for this letter, all documents associated with it, and all letters written to & documents presented before the Senate committees to be distributed to all members and staff of the committee, and for all positions and arguments presented therein be accurately represented in the legislative analysis prepared for the upcoming hearing on Tuesday, July 14th.

The proposed permitting scheme contemplated by SB-637 both contradicts federal law (see page 3), and will act as a significant disincentive to small-scale miners carrying out the only practical means to bring about the long-term positive environmental and water-quality outcomes the bill aspires to bring about. Small-scale miners represent the most effective, most environmentally friendly, and least costly means of remediating lead, mercury, other heavy metals, and general trash from our polluted waterways. In the past several months alone, I am personally aware of several individuals who collectively recovered in excess of a pound of mercury, and that's only hand-fed operations! In addition to source reduction of elemental mercury (98% according to Humphreys Study), suction dredging also reduces or eliminates the environment suitable for methylmercury formation in rivers by reducing compaction of sediments and exposing them to oxygenated water. Furthermore, existing methylmercury is exposed to sunlight in shallow water, where it is destroyed, and the mercury converted to relatively non-bioavailable forms (see page 4).

When operated responsibly, suction dredge mining can actually improve habitat by decompacting gravel beds downstream of dams that no longer receive natural scouring floods, and by creating depressions in the river bed that hold cold water and act as refugia for fish. In fact, judicious dredging regimes may even be able to improve survival rates for young salmon on the Klamath River by breaking the lifecycle of the worm that carries the Ceratomyxa shasta parasite —

> From May 20, 2015 Redding Record Searchlight Article:
>
> 'Randy Turner, the Klamath Basin Monitoring Program coordinator, said with low flows and warm water, worms that carry the disease have flourished on the streambed.
>
> "The problem isn't as bad in years when the river is cooler and runs higher and faster in the winter and spring because the current kicks up the gravel and cobble on the streambed, disrupting the worms' life cycle", he said.'

Fostering cooperation between miners, tribal members, agencies, and scientists could potentially lead to requiring less stored water be released down river during drought conditions to maintain healthy and productive fisheries in the future.

After several conversations with Senator Allen, I believe that we, the miners, and he agree on many key issues surrounding water, mercury, and environmental stewardship. I would invite this committee to set aside this well-meaning, but ill conceived bill and instead encourage its author, miners, and other interested parties to engage in cooperative efforts to identify opportunities to improve water and environmental quality through mining and related activities while simultaneously providing educational and economic development possibilities in largely financially disadvantaged communities.

Thank you,

Chris A. Giorgi
Miners Assembled Liaison

Dredging & The Federal Clean Water Act

The Federal Clean Water Act requires National Pollution Discharge Elimination System or NPDES permit under Section 402 be obtained and its terms complied with by anyone discharging or proposing to discharge any pollutants into navigable waters of the United States.

Under Section 502 General Definitions of the CWA, it defines:

> "(12) The term "discharge of a pollutant" and the term "discharge of pollutants" each means (A) any addition of any pollutant to navigable waters from any point source, (B) any addition of any pollutant to the waters of the contiguous zone or the ocean from any point source other than a vessel or other floating craft."

By the clear language of the law the "discharge of a pollutant" requires four clauses to be satisfied to meet the definition under (A) — To qualify as a "discharge of a pollutant":

(1) there must be an **addition** from an external source;
(2) it must be of a **pollutant**;
(3) it must impact **navigable waters**; and,
(4) it must originate from a **point source**.

In the case of suction dredge mining, material is excavated from the bottom of a waterway, passed over a density-based recovery system, and allowed to fall directly back into substantially the same location it was removed from — no addition is taking place at any point in time, only a selective net-removal of high density materials — and thus can not be defined as discharge of a pollutant under the Clean Water Act. (See: National Mining Association v. U.S. Army Corps of Engineers, 145 F.3d 1399, 1404 (D.C.Cir.1998))

While rocks, sand, and gravel may be deemed a pollutant when their deposition at a distance from their sources causes obstruction to navigation, such as material dredged to channelize a river being dumped in a bay as fill, the indigenous sediments of a river from within the high water line clearly do not themselves constitute a pollutant. Excavated material allowed to fall back in substantially the same location as it was removed within a short period of time is properly defined as "incidental fallback", and explicitly exempted from section 404 classification as "dredge and fill". (See: *Revisions to the Clean Water Act Regulatory Definition of "Discharge of Dredged Material" Final conforming rule Questions and Answers*.)

The legislation which most directly addresses the excavation, movement, and deposit of sand, gravel, and rock in navigable waters is not the CWA, but the "Rivers and Harbors Appropriation Act of 1899" (as amended), codified under 33 U.S.C. Chapter 9 Subchapter I. Therein it states:

> "**§ 419. Regulation by Secretary governing transportation and dumping of dredgings, refuse, etc., into navigable waters; oyster lands; appropriations**
>
> The Secretary of the Army is authorized and empowered to prescribe regulations to govern the ***transportation and dumping into any navigable water, or waters adjacent thereto, of dredgings***, earth, garbage, and other refuse materials of every kind or description, whenever in his judgment ***such regulations are required in the interest of navigation***." *[Emphasis Added]*

Section 502 General Definitions of the Clean Water Act further defines:

> "(14) The term "point source" means any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged. This term does not include agricultural stormwater discharges and return flows from irrigated agriculture."

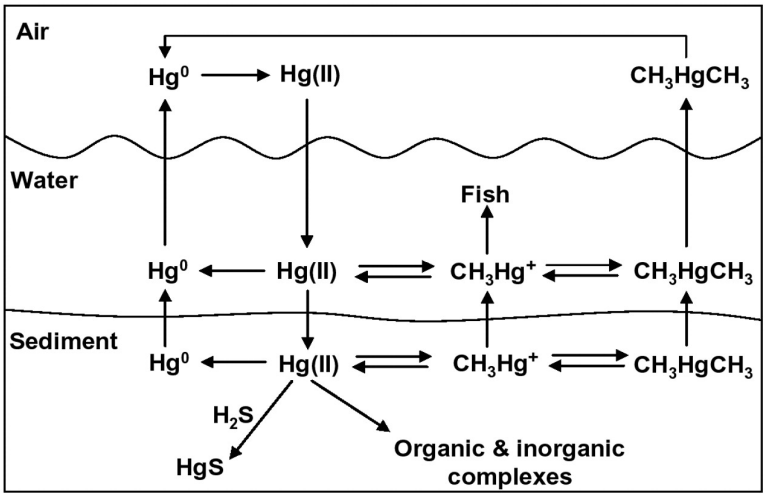
After brief consideration of the actual method by which a suction dredge operates — taking material in at one end and letting it fall back at the other while motivated only by water pumped from the same waterbody — it is clear that if there is any pollutant involved, its source must not be at the end of the sluice box on the dredge where it falls back, but must rather be the bottom of the river itself, from whence it originally entered the nozzle.

Since the pumping or conveyance of polluted water from one location in a water body to another location in that same body of water does not constitute an "addition" in the view of the US Supreme Court (See: *South Florida Water Management District v. Miccosukee Tribe of Indians*, 541 U.S. 95, 124 S. Ct. 1537, 158 L. Ed. 2d 758 (2004) and *Los Angeles County Flood Control District v. Natural Resources Defense Council, Inc.*,133 S. Ct. 710, 184 L. Ed. 2d 547 (2013)), there can (absent any actual addition of any other sort), as a matter of law, be no regulable point source where any addition of any pollutant takes place; the only foreseeable concern would be an operation which causes an obstruction to navigation or shipping through their negligence.

Mercury

Species

From Mercury Methylation Versus Demethylation: Main Processes Involved:
"It is well known that mercury presents high toxicity, causing a great damage to the environment and living organisms; however, its properties depend on the mercury species present. Organomercury compounds, where methylmercury is included, cause more concern." (Pg. 1)



Elemental Mercury — Hg^0

From CDC ATSDR ToxFAQs™ for Metallic Mercury:

"**What is metallic mercury?**
Mercury is a naturally occurring metal. It is the only metal on earth which is liquid at room temperatures. Metallic mercury is the pure form of mercury. It is a shiny, silver-white, odorless liquid, much heavier than water."

"**How can mercury enter my body?**
Metallic mercury is absorbed into the body primarily by breathing the airborne vapors. *Metallic mercury cannot go through intact skin very well*, so touching the beads is less of a problem than breathing the vapors. **If you swallow the metal mercury (which is certainly not recommended), it passes through your body almost completely without being absorbed.** Therefore, *in almost all circumstances, breathing the mercury vapors in the air is the only real source of entry of metallic mercury into the human body*." *[Emphasis added]*

So, unless elemental mercury is in vapour form (such as may found in fluorescent and HID light bulbs or from coal combustion), it is essentially harmless in the short term, even if directly ingested!

Inorganic Mercury — $Hg(II)^{2+}$ -mercuric ions and complexes

Free mercuric ions are formed predominantly in the atmosphere through interaction with free-radicals or in acidic aquatic environments. Upon contact, mercuric ions are readily reduced to elemental mercury by (and often plated onto) many metals such as copper, lead, tin, nickel, iron, chromium, zinc, aluminum, or magnesium. Most inorganic mercury salts (other than chlorides, nitrates, or cyanides) are largely to completely insoluble in water — for instance mercuric oxide (HgO) saturates at 53ppm, while cinnabar (HgS) is nearly completely insoluble.

Organic Mercury — Methylmercury (MeHg) CH^3Hg^+, its complexes, and Dimethylmercury (DMeHg) $(CH^3)_2Hg$

From Mercury Methylation Versus Demethylation: Main Processes Involved:
"Organomercury compounds are the most toxic mercury species, not belonging to this group of compounds the mercury complexes formed with organic matter originally present in Mercury Methylation Versus Demethylation: Main Processes Involved 3 the aquatic systems.
…
Methylmercury is the most common organomercury compound found in aquatic environments. It is also one of the most hazardous mercury species, due to its high stability in combination with its lipid solubility, leading to a high ability to penetrate membranes in living organisms (Beijer and Jernelöv, 1979)." (Pg. 3)

“The knowledge of the efficiency of the different pathways of mercury methylation and demethylation is one of the key steps to predict methylmercury concentrations in the different environmental compartments and to estimate the mercury bioaccessibility to the organisms.
…
In this sense, it is important to consider that the net amount of biologically available methylmercury is a function of the processes that regulate its formation, degradation and exchanges between compartments. So, methylation and demethylation are two important processes regulating the mercury cycle in natural environments (Rodríguez MartínDoimeadios et al., 2004; Monperrus et al., 2007a)
…
If demethylation of methylmercury is occurring in a significant extent, this is advantageous;” (Pg. 4)

From Planning for Statewide Mercury Program for Reservoirs meeting January 14, 2015:
“Methyl-mercury (MeHg) [is] [p]roduced by bacteria, usually in sediments or close by & under ANOXIC (no oxygen) conditions”; the introduction of even a small amount of dissolved oxygen nearly totally inhibits its formation. (Pg. 4)

Further from Mercury Methylation Versus Demethylation: Main Processes Involved:
“The photolytic decomposition of methylmercury remains the only abiotic demethylation mechanism that is significant in surface waters exposed to sunlight (Sellers et al., 1996; Gårdfeldt et al., 2001; Chen et al., 2003; Hammerschmidt and Fitzgerald, 2006; Monperrus et al., 2007a). … Hammerschmidt and Fitzgerald (2006) demonstrate that the methylmercury decomposition in surface waters is an exclusively abiotic and sunlight-induced process. Monperrus et al. (2007b) estimate demethylation rates of methylmercury in coastal and marine waters (6.4– 24.5 % day− 1) and suggest that an important part of the demethylation is mostly driven by sunlight because those rates decrease severely under dark conditions.
...
Hammerschmidt and Fitzgerald (2006) demonstrated that the rate of the methylmercury degradation is positively correlated with the intensity of photosynthetically active radiation (PAR) at a 0.75-6 m depth in the water column. Nevertheless, methylmercury can be degraded more rapidly at lower depths due to the additional influence of the ultraviolet (UV) light. In this sense, other authors suggested that the methylmercury photodecomposition is largely limited to the upper 0.5-1 m layer of surface waters, which is consistent with the penetration of the UV light in the water column (Krabbenhoft et al., 2002). Moreover, Lehnherr and Vincent (2009) attribute the most important driver of the methylmercury photodecomposition to the UV radiation in freshwaters because wavelengths in the visible spectrum degrade methylmercury at a much slower rate than the former” (Pg. 11)

In short, the formation of methylmercury is inhibited by the presence of dissolved oxygen even at very low concentrations (~1PPM DO), and exposure to sunlight quickly and effectively destroys the toxic compound.

PREVIOUS CORRESPONDENCE FOLLOWS

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Dear Committee Members and Staff,

As a liaison working in coordination with numerous interested non-profit organizations, businesses, politicians, members of the scientific community, and individuals, I hereby oppose SB-637 of 2015 as written and amended. Please include this letter, my comments, and provided documentation for consideration when preparing the legislative analysis and in hearing this bill.

Previously, I submitted my written and verbal statements of opposition, comments, and supporting documentation to the Natural Resources a Water Committee, which shall be forwarded to this committee.

Furthermore, I wish to lodge my objection in the strongest manner regarding the amendments to the bill introduced in the analysis for NR&W, which would drastically increase the scope of the originally proposed bill:

- Amendment 1 significantly alters the criteria from that which is “deleterious to fish” — the causing of harm to fish, to “does not cause any significant effects to fish and wildlife”, a much less clear and more broad definition which could be construed to disallow activities which may have significant positive impacts.

- Redefining a suction dredge per Amendment 2 is absurd on its face — it would cause sluices, rocker boxes, water pumps, and culvert maintenance equipment to be defined as “suction dredges”, which they clearly are not.

- Amendment 3 proposes to give DFG “explicit authority to set suction dredge mining fees by regulation to fully cover all program costs”, despite their clear statement that they do not

in fact have the appropriate regulatory and permitting authority or premacy to administer such a program.

National Pollution Discharge Elimination System — 40 CFR §122.2 Definitions.

...

Discharge when used without qualification means the "discharge of a pollutant."

Discharge of a pollutant means:

(a) Any addition of any "pollutant" or combination of pollutants to "waters of the United States" from any "point source," or

(b) Any addition of any pollutant or combination of pollutants to the waters of the "contiguous zone" or the ocean from any point source other than a vessel or other floating craft which is being used as a means of transportation.

Porter-Cologne Water Quality Control Act § 13263.3. Legislative findings; definitions

...

(b)(1) For the purposes of this section, "pollution prevention" means any action that causes a net reduction in the use or generation of a hazardous substance or other pollutant that is discharged into water and includes any of the following:

...

(c) For the purposes of this section, "discharger" means any entity required to obtain a national pollutant discharge elimination system (NPDES) permit pursuant to the Clean Water Act (33 U.S.C. Sec. 1251 et seq.), or any entity subject to the pretreatment program as defined in Part 403 (commencing with Section 403.1) of Subchapter N of Chapter 1 of Part 403 of Title 40 of the Code of Federal Regulations.

This bill misconstrues the "incidental fallback" of "indigenous sediments" in substantially the same location as they are removed for processing by a suction dredge as a "waste discharge", despite there being no "addition" under the Clean Water Act, and in fact generally resulting in a "net reduction [...] of a hazardous substance...", as explicitly encouraged by the Porter-Cologne Water Quality Control Act. It is thus counterproductive to the purpose of achieving long-term water quality improvements through the reduction of mercury, lead, and other heavy metals — not to mention removal of other anthropogenic waste and trash — with little or no additional costs to taxpayers, individuals, or businesses, and minimal impact to fish, wildlife, and the ecosystem.

Sincerely,

Chris A. Giorgi

Comments on Text of SB637:
(Note: I am not a lawyer.)

The first sentence of (a) conflicts with the concept of equal application of the law by singling out mining activities, while ignoring other uses of the same techniques which have equal or greater impact.

The second sentence of (a) states that “The regulations shall be consistent with the requirements of this division…”, however no actual requirements are articulated anywhere within the text. The list of impacts to address states no goals or criteria of any sort.

Impact (1) fails to identify what is meant by loading, nor why it is a concern — a dredge removes mercury and thus reduces total loading. Seasonal high-water events frequently transport the entire sediment bed (including the mercury and gold) a long distance downstream, while sediment processed through a suction dredge has the vast majority of the heavy materials selectively removed, and the remaining material is re-deposited in the same area from which it was extracted, minus most of the mercury.

Impact (2) is a naturally occurring process which takes place faster in warm, stagnant, and anoxic conditions, commonly found in reservoirs and the delta where non-mining dredging activities are common, but occur rarely in most areas where suction dredge mining is prevalent.

Impact (3) is a much greater concern in areas where mercury enters the food-chain in vapor form than liquid. Consider that nearly 30% of air pollution impacting the San Francisco Bay Area originates from coal-powered (mercury, lead, and radioisotope laden) industries in China and travels here on the winds in less than a week. In aquatic environments, if elements such as selenium are present in sufficient quantities, they can chemically bind with mercury to reduce its bioavailability and apparent toxicity to organisms.

The undefined statutory fine under (b) fails to consider the nature, severity, or impact of a purported violation of yet undefined regulations.

The classification of fallback of dredged material under (c) as waste discharge has already been litigated and found invalid. Prohibition is against federal law, which contradicts the clause internally. Many criteria given are unrelated to the activity of dredging itself, and are already covered under existing law. Clause allows specifically for unlimited construction regarding criteria which may be used as a basis for prohibition, regardless of relevance or impact.

Clause (d) provides additional evidence of failure of the equal application of the law.

Further Comments Regarding the Transport, Methylation, and Bioaccumulation of Mercury:

- A properly operating dredge is usually more than 90% efficient at removing elemental mercury (in fact, state and federal studies show actual efficiency near 98%) , and will generally recover at least 99% after 2 passes; furthermore, given even huge quantities:

  Removing 90% of the original quantity leaves 10%
  Removing 90% of the remaining 10% leaves 1%
  Removing 90% of the remaining 1% leaves 0.1%
  Removing 90% of the remaining 0.1% leaves 0.01%
  Removing 90% of the remaining 0.01% leaves 0.001%
  Removing 90% of the remaining 0.001% leaves 0.0001%

  Thus, after 6 passes through a dredge between a concentrated point source in a stream or river and a downstream reservoir, up to 99.9999% of original mercury is reclaimed, leaving only one ounce for every 1,000,000 ounces of elemental mercury contained in sediments processed, and recovering 999,999 ounces. Consider that each seasonal high water event move significantly more material than all the dredgers on a river could move in an entire season; the entire quantity of mercury thus mobilized moves downstream unimpeded, unlike when material is processed through a dredge and the mercury captured.
- Methylmercury is rapidly broken down by exposure to UV light, which can only penetrate to shallow depths in water; a sluice box and the area of dispersion in the water a short distance beyond its end provide just such an environment; methylmercury formation preferentially takes place in deep, compacted, anoxic sediments, which dredging breaks up and oxygenates.
- Since dredging necessarily results in a reduction of total elemental mercury through direct removal, and reduction of methylmercury through photochemical degradation and inhibiting formation, the net effect of consistent dredging on the bioaccumulation of mercury is a potentially significant overall reduction, especially where such operations are undertaken upstream of lakes, reservoirs, deltas, floodplains, or coastal shallows.

See US Supreme Court case: LOS ANGELES COUNTY FLOOD CONTROL DISTRICT v NATURAL RESOURCES DEFENSE COUNCIL, INC. — “Pot of Soup” analogy by Justice Ruth Bader Ginsburg.