



International Molybdenum Association
Summary of Comments on Proposed Pennsylvania Water
Quality Standards – August 21, 2012

IMO is a non-profit trade association representing 85% of western world molybdenum production facilities and all western world conversion facilities. IMO's major activities include intensive efforts to develop scientific data concerning the impact of molybdenum ("Mo") on human health and the environment. IMO is dedicated to assuring that regulatory standards be based on sound science, and it is in that spirit that IMO's comments are offered. Those comments are summarized below.

The rationale for moving forward at this time to establish water quality criteria for Mo is, at best, questionable. The database released by PaDEP of alleged "hits" of Mo in Pennsylvania waters in fact contains a mix of instream samples (almost all non-detect) with samples from a few industrial effluent streams – 60% of which were from one facility that has since ceased the chemical process that produced wastewaters bearing molybdenum. In the absence of any national standard for Mo, Pennsylvania is not justified in moving to establish Mo water quality criteria at this time, given that (1) the limited studies upon which PaDEP has attempted to justify its proposal are dated, with more recent studies indicating that a number of the "effects" observations cited could not be replicated by other researchers; and (2) the values proposed by PaDEP are substantially at variance with the most recent scientific data, where recent peer-reviewed and additional ongoing studies suggest that the numbers derived by PaDEP from the early studies cited are not well justified.

The proposed aquatic life water quality criteria do not reflect current best scientific knowledge. PaDEP based its proposal for acute and chronic Mo criteria on selected information for four organisms contained in a database compiled for Nevada, with results that are largely driven by data from one organism (the burrowing worm *T. tubifex*) which was tested under laboratory conditions that imposed unusual stresses – where the organism was placed in beaker water, deprived of its normal substrate and subjected to 96-hours without food. The data relied on by PaDEP would suggest that *T. tubifex* is the most sensitive aquatic species, when in fact this worm is an organism characteristic of strongly-polluted waters. If the questionable *T. tubifex* data are not used, the resulting calculations would be quite different. Indeed, the most recent studies of Mo chronic (non-lethal) effects (*De Schamphelaere 2010* and *Heijerick 2012a*) indicate that all freshwater species **chronic** EC₁₀ values exceed PaDEP's proposed **acute** value of 6 mg/L – a result that makes PaDEP's calculated acute value illogical. Further, PaDEP's derivation of a proposed chronic standard based solely on the proposed acute value and application of an acute-to-chronic ratio, ignores the substantial body of chronic effects data now available in the peer-reviewed literature.

The proposed human health criterion is substantially based upon a single study (*Fungwe 1990*) of female rats, whose data is now subject to serious question as a result of subsequent studies. The *Fungwe* study did not conform to good laboratory practices or modern toxicity study guidelines. As detailed in IMO's full comments and attachments, more recent studies performed in the United States in accordance with strict OECD toxicity study guidelines, were unable to replicate the *Fungwe* findings even at doses that were much higher than those at which *Fungwe* reported alleged observations of effects. Data from the most recent studies constitute significant weight of evidence leading to the conclusion that the early *Fungwe* study should be disregarded due to its insufficient reliability for regulatory purposes.

In conclusion, in the absence of any pressing problem or need, the prudent course would be to step back for a reexamination of the evolving scientific literature, and then (if necessary) set values that are based on the most recent data.

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