

EPA's proposed 304(a) criterion for selenium

- EPA has noticed draft 304(a) criteria for selenium based on whole-body fish tissue, egg-ovary tissue, and by regressing the data retains a chronic water column criterion, as well as proposing an "intermittent exposure" criterion
- Cabinet agrees that fish tissue is the preferred medium to test for potential selenium toxicity in the aquatic habitat, while maintaining careful adherence to consistent protocols that incorporate the complexities of the chemical pathway of the toxicant.
 - Particularly one that has such a great number of oxidative states with inherent changes to both bioavailability and strength of toxicity.
- Cabinet supports lentic vs. lotic considerations, and endpoint and criterion calculations.



EPA's proposed 304(a) criterion for selenium

- Cabinet has concerns that the FCV of the draft criterion is driven in-part by inclusion of study results that appear flawed, and at best does not adhere to strict levels of laboratory control performance or the established pathway of exposure of fish to toxic forms of selenium and metabolic processes that result in transport to, and bioaccumulation in, tissue or organ systems.



EPA's proposed 304(a) criterion for selenium

- Inappropriate inclusion of study (Linville, 2006)
 - Inappropriate methodology: injection of larval yolk sacs with seleno-L-methionine is unorthodox bioassay procedure
 - In the past EPA (2004 draft selenium criterion) had rejected studies (e.g. Doroshov, 1992) where test animals were exposed through injection (i.e. there were likely different processes occurring in studies of direct injection).
 - Inadequate sample sizes
 - High mortality rates (45-70%) does not demonstrate rigor and test acceptability per EPA Guidance
 - Truncated some bioassays short relative to lab problems



EPA's proposed 304(a) criterion for selenium

- Intermittent Exposure criterion:
 - Intended to mitigate for spikes or pulses of selenium pollution over a 30-day period (directed at intermittent discharges; read: bench ponds at coal mining)
 - Unnecessarily complicates implementation of a national criterion; “the intermittent approach proposed is unnecessarily complicated if the simpler approach achieves the same objective.”



EPA's proposed 304(a) criterion for selenium

- Water Column Criterion:
 - not adequately explained how water column values were derived
- Implementation: using water column number for new/expanded discharges until water body comes into equilibrium
 - EPA does not define, by aquatic conditions or by duration, the term "equilibrium"
 - Attempting to define and defend when a waterbody is in "equilibrium" or steady state in order to determine what criterion should apply creates a legally and technically unworkable (and unnecessary) requirement for states

