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October 19, 2008

Mr. Tom Miller
Designated Federal Officer
Science Advisory Board
US Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Washington, DC 20460

Re: SAB white paper on aquatic life criteria for emerging contaminants

Dear Mr. Miller,

Thank you for the opportunity to comment on the EPA Science Advisory Board white paper on aquatic life criteria for contaminants of emerging concern (CEC). I am well aware of the issues of endocrine disrupting contaminants and literature on the topic, as I recently fished my PhD studying endocrine description in fish. I currently work on a project at UC Davis deriving pesticide water quality criteria and am also familiar with the EPA's 1985 Guidelines for setting water quality criteria.

Overall I find the approach to criteria for CECs to be technically sound and a timely response to Dr. Kidd's 2007 study about the collapse of a minnow population in the whole lake study. I agree that alternatives are needed for contaminants that do not display typical acute toxicity and to allow for the calculation of chronic criteria. Additionally I agree with the methods used to derive such criteria including: the call for full life cycle testing, the move to a "guilty until proven innocent" approach, that taxa shown to not be affected should not be required to set criteria, the use of data from compounds with similar MOA (mechanism of action) to show that certain taxa are insensitive, and use of biomarker data (such as vitellogenin) to demonstrate insensitive taxa.

My first comment relates to the main concerns over estrogenic compounds, which is occurrence of intersex and reproduced abnormalities in larger, longer lived fish species, such as carp, flatfish, bass, and sturgeon. Almost none of the data presented in the example reflect these species. The one data point used that does reflect these type of fish was for rainbow trout and was inconclusive (<16 ug/L). With no NEOC reported, the proper data for the EPA requirement for species in the family salmonidae is lacking. This is discussed in section 3.3 (in Part 2) of the report, in rearguards to rainbow trout "Actual criteria development will require a decision whether to (a) require more information for this species, (b) use other information to help estimate rainbow trout sensitivity or (c) justify setting the MDR aside." While I agreed with the methodology, I did not agree with this statement. According to the methodology outlined in part one, knowing that trout are sensitive and a species of concern would seem to make options "c" certainly unacceptable. It would be better to have this section more clearly in agreement with part one, which

appeared straight forward in that setting the MDR aside should only be an option for insensitive species. The white paper also discusses the preference for full life cycle tests, especially it seems, for known sensitive species. Considering that 1) rainbow trout is a species that best represents those for which there is concern, 2) the data obtained so far show that it is sensitive, and 3) that the partial life cycle test is not unreasonable to perform for this species, I feel that it should clearly be required, if not a full life cycle test.

Though minnows are fairly closely related to carp and fulfill the warm water fish requirement, we do not know that fish with short reproductive cycles are good surrogates for longer lived species (as is discussed in section 3.4). With hormone mimics (and likely other contaminants with chronic effects) differences in life history may well make a difference in the chronic toxic effects. For instance a fish species with a longer time of sexual development could be more susceptible to endocrine disruption, because it will be open to influence of contaminants for a much longer time. Although studies with larger, longer lived fish are more difficult, this data is key for endocrine disruptors as these are the animals in which effects are observed in the wild.

My second comment is related to the first. EE2 (ethynylestradiol) represents and ideal case in the large amount of data that has been generated, but still it is lacking important information, as discussed above. If there is insufficient data for the case of EE2 how are these methods to be implemented for other CECs? Some of this was touched on in the methodology, using data from compound with a similar MOA, but this is unlikely to provide adequate data for the variety of CEC with different mechanisms noted in the white paper. Realistically, how will there be enough data to set limits for more than a few compounds? It is worth considering where this data will come from, as well as the responsibility of industry in providing adequate data. Without the data, the methods in white paper with have limited practical use.

Overall, the approach seems well thought out, however in the EE2 example it became apparent that situations that warrant use of substitute data should be more clearly defined, including situations when MDR should certainly be met, ie: when the required species is thought to be one of the sensitive species and standard tests would adequately address toxicological concerns. It seems very dangerous to suggest in the EE2 example that the most desirable data may not be required. Such data should be obtained so that a criterion for EE2 may be derived soon. Flowing that I urge EPA to consider where the burden of generating such data should lie, as limited data is likely to be a common problem in setting effective criteria for CECs.

Sincerely,

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