

MEMORANDUM

May 10, 2011

TO: SCIENCE PANEL MEMBERS

Bruce Duncan, Ph.D., Chair, Science Panel, U.S. EPA Region -10
Elaine Faustman, Ph.D., University of Washington
Teri Floyd, Ph.D., Floyd/Snider
Michael Riley, Ph.D., Anchor QEA, LLC
Rosalind Schoof, Ph.D., Environ Corporation

FROM: MARTHA HANKINS, DEPARTMENT OF ECOLOGY, TOXICS CLEANUP PROGRAM
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CC: Chance Asher, Dave Bradley, Pete Kmet, Craig McCormack, Russ McMillan,
Laura Inouye

SUBJECT: UPCOMING SCIENCE PANEL MEETING

DETAILS:

Meeting Date: Friday, May 20, 2011
Location: UW Botanic Gardens, Isaacson Classroom
3501 NE 41st Street, Seattle, Washington

Enclosed are the agenda and meeting materials. *Please bring these with you.*

MEETING MATERIALS AND TOPICS

The primary focus of this meeting will be continuing discussion of freshwater sediment standards. You will recall that we began this topic at the last meeting by presenting a number of questions. Science Panel members in turn left Ecology with several questions and areas for further clarification and research. We are returning with proposed responses to your questions and to continue discussion.

The second topic we would like to discuss is the toxicity information hierarchy. The CLARC web application has been recently updated to reflect current toxicity information. In doing this, Ecology has been grappling with how to provide toxicity data for cleanup decisions when the MTCA hierarchy does not lead to a value and evaluating risk or setting cleanup levels requires using toxicity information.

Freshwater Sediment Standards – continued

Ecology continues work on updates to the Sediment Management Standards, including developing chemical and biological freshwater sediment standards. At our last meeting we discussed biological criteria for developing freshwater sediment standards protective of benthic species, and started discussion on chemical criteria and the floating percentile method (FPM), which is the model used to develop the criteria.

Enclosed in this mailing is an updated *Development of Benthic SQVs for Freshwater Sediment in Oregon, Washington, and Idaho (draft)*.¹ Please recall that this work was initiated by the multi-agency Regional Sediment Evaluation Team (RSET).² RSET developed a framework for assessing and characterizing sediments in Idaho, Oregon, and Washington for both sediment cleanup and dredge management. Ecology is proposing that freshwater sediment standards consistent with the existing Sediment Management Standards framework for marine standards be developed using the FPM as described in the report.

After the discussions with the Science Panel at the last meeting (August 25, 2010) Ecology continued with stakeholder input and review. In particular, Ecology staff:

- Evaluated and incorporated input from the Sediment Workgroup review. (this group of sediment experts met eight times between November 2009 and December 2010; freshwater sediment standards were discussed at four of the meetings).³
- Completed a scientific peer review. National experts were asked to review and comment on the approach being proposed by Ecology. Ecology has received review comments from four nationally recognized sediment scientists. (See enclosed materials.)
- Updated the draft *Development of Benthic SQVs for Freshwater Sediment in Oregon, Washington, and Idaho* report to address questions and issues identified during the Sediment Workgroup's review. The document is in draft form and will be updated with all peer review and Science Panel comments at a later date. (Attached.)

Goals for this meeting

As part of the scientific review process, Ecology is asking the Science Panel to review and consider the scientific defensibility of the method used to develop freshwater chemical sediment standards.

At the August 25, 2010, meeting Ecology posed the following questions:

¹ SQVs are sediment quality values, sometimes called sediment quality guidelines (SQGs). The terms SQV and SQG are used interchangeably.

² The RSET participants are Idaho Department of Environmental Quality, National Oceanic and Atmospheric Administration, Oregon Department of Environmental Quality, Washington State Department of Ecology, Washington State Department of Natural Resources, US Environmental Protection Agency, US Fish and Wildlife Service, and the US Army Corps of Engineers.

³ Sediment Workgroup meeting materials are posted at:

<http://www.ecy.wa.gov/programs/tcp/regs/2009MTCA/SedMtgGroupInfo/SGMtgInfo/SediWGMeetingInfo.html>

1. Do you agree that the approach for developing freshwater chemical sediment standards described in the draft report *Development of Benthic SQVs for Freshwater Sediment in Oregon, Washington, and Idaho* is within the range of scientific defensibility?
2. Do you agree with Ecology's conclusion that multivariate statistical analysis provides a credible basis for characterizing the relationships between chemical concentrations and biological test results?
3. Do you agree with Ecology's conclusion that the data set used to develop freshwater sediment standards is sufficient to support the development of statewide chemical criteria?
4. Do you believe that the approach used to evaluate the reliability of the criteria is within the range of scientific defensibility?

At that meeting, we asked Science Panel members a number of questions about bioassays and about the FPM. Ecology ran out of time before completely describing the floating percentile method.

Ecology would like to respond to your questions. In addition, inherent in the FPM approach, and a point we would like to more clearly identify, are the policy choices facing Ecology. That is, as a matter of policy, Ecology intends to determine an acceptable number of false positive and false negatives to reach an appropriate level of protection. We will be asking you to focus on the scientific defensibility of the data set and methodology used, and whether, given policy choices Ecology makes, the results are sufficiently protective relative to other methods of establishing standards.

At the upcoming meeting we would like to finish describing the FPM, address questions raised by Science Panel members at the last meeting, and go over technical issues and peer review comments. In particular, we will spend time on:

- Questions around the number of endpoints needed to establish a reliable dataset.
- Balancing acceptable false positives and false negatives.
- How covariance is addressed as a measure of the effects of multiple contaminants.

Based on the discussion in August 2010, it seems appropriate also to spend some time on the reasoning behind the empirical approach being used to develop the freshwater chemical standards. The discussion at the last meeting raised questions about the degree that mechanistic links between chemical concentrations and biological effects were explained or accounted for when using the FPM to establish standards. Ecology acknowledges considerable uncertainty regarding the specific mechanisms for benthic toxicity. We have employed a rigorous empirical approach to develop what we believe are scientifically defensible and appropriately protective biological and chemical standards.

Use of Toxicological Parameters

At the March 25, 2010 Science Panel meeting Ecology presented information about updates to the MTCA rule for the hierarchy of toxicological information used in establishing cleanup requirements.

- The Science Panel said that the EPA Regional Screening Tables (RSTs) may be reasonable sources of toxicity values but noted that they include several sources with varying degrees of peer review. The panel was not familiar enough with the various sources to provide a generic answer to Ecology.
- The Panel appeared to be supportive of using the RST values as a starting point for updating the MTCA cleanup levels. However the rationale for updates needs to reflect more than that the value appears in the RST.
- Internal peer review within EPA is not equivalent to the external peer review used for IRIS updates; the Panel was unclear on the RST review process.
- The Panel appeared to support some type of external review process around the use of some or all RST values prior to use under MTCA. The Panel thought that once-a-year updates were sufficient. In terms of mid-year updates, the panel thought that changes less than an order of magnitude could wait for annual updates.
- The Panel agreed that HEAST values should not be used as a general reference. However, some HEAST values may still reflect current science on particular chemicals.

Since the March 2010 meeting, Ecology has put on hold efforts to update the hierarchy of toxicity values in the MTCA rule per direction of the Governor.⁴ We have, however, reviewed and are updating the information in the CLARC web application. CLARC is a tool used by Ecology site managers, and periodic updates are intended to ensure that the information provided in the tool is useful and current.

As part of updating the information in CLARC, many toxicity values were removed from the database because these toxicity values did not correspond to the MTCA toxicity information hierarchy. The regulatory dilemma is how to establish cleanup levels and proceed with cleanups under MTCA using toxicity information from sources other than IRIS, NCEA, and HEAST. In general Ecology believes that CalEPA values are appropriate for use under MTCA; however prior to using values outside the MTCA hierarchy may require additional review.

Our approach, that we would like to discuss with you, relates to screening the CalEPA values into categories based on priority for review. That is, Ecology considers high priority those chemicals for which no IRIS review process has been initiated, the chemical is frequently identified as a contaminant of concern at MTCA sites, it is included in the EPA regional Screening Tables, a CalEPA value was developed in 2005 or later, and the CalEPA value is similar to values from other agencies. Conversely, those chemicals considered low priority for review would be those for which an IRIS review is scheduled to be complete in the next year, there is low frequency of detection at MTCA sites, there are significant policy and science questions beyond Ecology resources to resolve, and the CalEPA values were developed before

⁴ Executive Order 10-06, November 2010, directed agencies to suspend for one year non-essential rulemaking.

2000. In addition, some chemicals may fall somewhere between these high and low priority categories.

Ecology is proposing to look at the CalEPA toxicity values using the MTCA rule quality of information criteria (153-340-702(16) WAC), which evaluates:

1. Whether the information is based on a theory or technique that has widespread acceptance with the relevant scientific community.
2. Whether the information was derived using standard testing methods or other widely accepted scientific methods.
3. Whether a review of relevant scientific information, both in support of and not in support of the proposed modification, has been provided along with the rationale explaining the reasons for the proposed modification.
4. Whether the assumptions used in applying the information to the facility are valid and would ensure the proposed modification would err on behalf of protection of human health and the environment.
5. Whether the information adequately addresses populations that are more highly exposed than the population as a whole and are reasonably likely to be present at the site.
6. Whether adequate quality assurances and quality control procedures have been used, any significant anomalies are adequately explained, the limitations of the information are identified and the known or potential rate of error is acceptable.

Questions for the Science Panel

Ecology is faced with making decisions in a number of areas that require toxicity information. We are considering using CalEPA toxicity values to set cleanup levels and make site specific cleanup decisions; we are updating the CLARC web application; and we want to look at the toxicity data used in the WARM ranking. (That is, the site assessment database has not been updated in some time and we believe it should be consistent.)

Consequently Ecology has the following questions for your consideration:

1. Do you continue to believe that the EPA toxicity hierarchy provides a reliable and defensible approach for selecting toxicity values that are used to establish MTCA cleanup levels and remediation levels?
2. Should Ecology consider other factors when screening California EPA toxicity values for further review?
3. Do you agree that the MTCA quality of information criteria provides a reliable and defensible approach for evaluating the use of California EPA toxicity values to support MTCA cleanup decisions?
4. Are there other issues that Ecology should consider when implementing the toxicity hierarchy specified in the current MTCA rule?

Ecology recognizes the dilemma presented in how to stay current on toxicity information. Plans to update the MTCA rule are on hold and we are grappling with how to best proceed as we are faced with needing to make decisions based on current science. Ecology recognizes that the values in the PRG tables are mixed and have variable levels of scientific review. We believe that generally the CalEPA numbers are scientifically valid and would like to use these values, on a chemical-by-chemical basis, after applying the MTCA quality of information criteria.

Enclosures

Draft Agenda

August 25, 2010, Meeting Summary (draft)

Materials related to Freshwater Sediment Standards

List of acronyms

Ecology Responses to Science Panel Questions

Peer Review Responses to Bioassay Issues

Development of Benthic SQVs for Freshwater Sediment in Oregon, Washington, and Idaho Draft Report

Technical Discussion – Reliability Statistics

Materials related to Toxicity Information

Hierarchy of Toxicological Information (discussion paper)