

MTCA Science Advisory Board Meeting Summary

December 16, 2004

9:00 AM – 3:30 PM

EPA Region 10
1200 6th Avenue
Multnomah Room
Seattle, WA

Agenda:

Agenda Review, Review of 11/09/04 meeting summary
Defining Moderate Levels – Arsenic
Public Comment
Fish Consumption Rate – Adjustments for Asian Pacific Islanders
Natural Attenuation Guidance
Public Comment

Attendees:

SAB Members: Dr. Hank Landau; Dr. Marjorie Norman; Dr. Elaine Faustman.
Dr. Duncan was unable to attend due to illness; Dr. Peterson was unable to attend due to service commitment in Iraq.

Agency Staff: Dave Bradley; Michael Feldcamp; Dawn Hooper; Pete Kmet; Hun Seak Park; Lon Kissinger (EPA)

Public: Greg Glass; Paul Agid; Karen Pickett; Jim. W. White; Scott Hooten;

Agenda Review; Review of 11/9/04 Meeting Summary (Dawn Hooper)

At the request of Ecology, the Board agreed to add a presentation related to MTCA fish consumption rate.

The Board then engaged in a detailed review of the 11/9/04 meeting summary. Several changes were requested both to the summary and the report on the Board's review of Ecology's tiered approach for addressing lead contaminated soils. Ecology agreed to incorporate these into the summary.

Defining Moderate Levels – Arsenic (Dave Bradley)

Cancer Slope Factor: The Board re-affirmed its conclusion that Ecology's proposal to use a cancer slope factor different than that used in IRIS is appropriate. The Board requested Ecology further research the basis for the

value selected in California to determine whether this is the appropriate value to use in Washington State.

Chronic Reference Dose: Dave reviewed his summary of the various studies evaluating the non cancer effects of arsenic. He queried the Board if, based on this information, Ecology should continue to use the RfD currently in IRIS.

Dr. Faustman indicated based on this information, use of the RfD in IRIS would be inappropriate. There are now several additional studies available indicating other endpoints need to be considered when developing an RfD and that this will result in a more stringent value. As for what should be used instead, she requested additional time to review the information, but it would appear the CAL EPA value would be an appropriate value.

Dr. Norman concurred, noting that all of the available studies reached a similar conclusion. Dr. Faustman stated that her opinion was based on the assumption that all of the studies are based on different data sets, and not just different interpretations of the same data set. Dave confirmed these different studies are based on several different study populations and different data sets.

Dr. Landau asked if the arsenic species would make a difference in its toxicity. Dr. Faustman responded that it would. Jim White (DOH) noted that the various forms of arsenic, while different in toxicity, behave similarly once ingested, which is why speciation has not been considered to be an important distinction in the various studies.

Dr. Landau and Dr. Norman asked, given that Ecology now defaults to background for arsenic cleanup levels, what would be the practical difference of changing the chronic reference dose? Dave responded that while it is unlikely the arsenic cleanup level would change, this change could significantly influence interim action levels. Greg Glass reinforced this also noting that this proposed change reinforces concerns that arsenic is a very toxic substance that should continue to have a low cleanup level and that cancer risk is not the only concern.

Dr. Landau asked what value Ecology is currently using for natural background for arsenic. Dave responded that we have been using 7 mg/kg based on data compiled from several USGS studies.

Dr. Landau noted that the latest arsenic and lead area wide sampling data from Thurston County along the Nisqually River bluff showed a lot of variability, with one location much higher than soil concentrations much closer to the Ruston smelter and he ask why this is so.

Greg Glass responded that the reasons for the variability are not known but many factors could influence the soil concentration including: another unknown source, whether the sample was under a tree canopy or not, how much

bioperturbation occurred at the location, the slope and orientation of the ground and the type of vegetative cover.

Dave summarized the Board's comments as follows:

- There is enough scientific information to consider other endpoints than the chronic RfD currently in IRIS.
- The CAL-EPA RfD appears to be reasonable but the basis for this value need to be looked at for appropriateness for use in WA State.

Dr. Landau then invited comments from the audience.

Karen Pickett said that ASARCO is interested in the discussion and the practical implications of these recommendations but has no specific comment at this time.

Paul Agid (Port of Seattle) noted that given that soil USGS background level for arsenic is 7 mg/kg and this new toxicity information, it could result in changing the Method A table value of 20 mg/kg. He asked how the cleanup values might be impacted if Ecology uses a more stringent value.

Dave responded that since the Method B Arsenic soil cleanup approach incorporates the more recent value for natural background Ecology does anticipate it changing as a result of this work. However, it is possible the Method A value could change.

Dr. Faustman stated that since we now have identified areas with elevated soil arsenic concentrations, it would be useful to look at human biomonitoring (e.g. urinary arsenic levels) data for additional insight into arsenic bioavailability and appropriate action levels.

Karen Pickett noted their company has been doing health screening for 60 to 100 people over the last 2 years and, if useful, would be willing to share the raw data.

Greg Glass noted that the arsenic toxicity factors have changed a lot over the last 15 years and this is confusing to the public. When we publish new values, we need to explain that they are different and to emphasize that a lot of progress has been made in understanding arsenic over the years and these new values are based on much more information.

Acute/Subchronic RfD for Arsenic

Dave noted that Ecology is currently using a subchronic RfD developed by Jim White at the Department of Health. He reviewed the handout summarizing the values various branches of the federal government have been using. He noted that the NOAEL is very similar in all these studies and that the major difference is in the safety factor applied to the NOAELs to derive the RfDs.

Using this information, Dave asked the Board if there is sufficient information available to warrant using a subchronic RfD that is different than the chronic RfD?

Dr. Faustman noted that there was an additional study available (“Waalkes study”) on the subchronic dose effects (such as cancer after birth) of *in utero* exposures that should be considered in looking at this question. She commented that this is a major point to consider. This study is more recent than the studies on which the various federal values were based. She noted several factors to consider such as whether there are exposure periods of vulnerability, whether the values are adequately protective, and whether the values would change if it were considered. She also asked whether any of these studies had looked at skin keratosis in children. She would like to see the Office of Pesticides Program rational for the use of a higher safety factor than the other studies. The Board requested that Ecology review this additional study before making a decision.

Dave responded that he plans to look further at the Waalkes study. He also noted that the less-than-lifetime RfD value developed by EPA Region VIII for the Vasquez Boulevard/I-70 Site outside of Denver CO is based on increased incidence of skin keratosis in children. However, he also noted that EPA’s Office of Pesticides Programs concluded that the children in the study population were probably exposed to arsenic for periods longer than 6-12 months. He will provide her with the Office of Pesticides Program rational for the uncertainty factors.

Dr. Faustman also inquired if CAL EPA had looked at subchronic RfDs? Dave responded that their focus appeared to be on chronic RfDs but he would look again to see if there was any information in their report on subchronic RfDs.

Fish Consumption Rate – Adjustments for Asian Pacific Islanders

Pete introduced this topic by saying Ecology staff have been looking at the issue of whether the current MTCA fish consumption rate is protective of Asian Pacific Islanders that frequently fish and gather seafood in the lower Duwamish River-Elliott Bay area of Seattle. Ecology has been working on this issue with EPA Region 10 staff and would like to bring this topic up for discussion at a future SAB meeting. He noted that this does not address tribal fish consumption rates, which is a separate issue that EPA is currently working on with tribes. An adjusted fish consumption rate could affect many cleanup sites in the vicinity of the lower Duwamish River-Elliott Bay.

Lon Kissinger (EPA) then reviewed a brief handout on this issue (see attached). He asked if the Board would support his plan to consult with Dr. Faustman’s staff on the approach he is developing.

Dr. Faustman indicated she was very supportive of this issue being looked at, and that this has been an issue of concern for some time since fish consumption varies widely across different populations.

Dr. Landau asked if Lon's work takes into account the fish diet fraction. Lon responded that he considered individual fraction consumption and that the other studies looked at fish caught within Puget Sound, outside of Puget Sound and restaurant and store-bought fish.

Dr. Landau noted he was working on a site in the lower Duwamish River area that could be affected by a revised fish consumption rate but that he felt he could provide unbiased advice on the topic. The Board responded that they support Lon's plan to consult with Dr. Faustman's staff to help identify or address any areas that need more consideration prior to presentation to the full Board.

Natural Attenuation Guidance (Hun Seak Park)

At Dr. Landau's request, Pete explained the difference between guidance and rule, emphasizing that Ecology can use guidance to recommend a certain approach but cannot require something through guidance. Requirements can only be done through rule-making. Pete noted that a legal review of the guidance for the appropriate use of "should" (denoting a recommended approach) and "must" (denoting a requirement) still needs to be completed.

The Board commended Ecology's effort and praised the quality of the draft document noting that while they have suggested many changes that Hun Seak Park has done excellent work.

Hun Seak Park then reviewed the changes he had made to the guidance since the November 9, 2004 SAB meeting. He noted he had consulted with Dr. Peterson before he left for Iraq and that his comments have been incorporated into the changes. (See 12/16/04 notes highlighting changes.)

1. Purpose and applicability of guidance.

Dr. Faustman expressed concern that the guidance needs to explicitly state that it does not apply to radionuclides. Dr. Landau said he was not comfortable with the statement that the guidance doesn't apply to chlorinated solvents, since parts of the document could apply, especially if there is a solvent and TPH mixture. He also noted that the guidance does apply to soils below the water table. He noted his concern that this guidance not preclude use of natural attenuation at other sites for other contaminants. Dr. Faustman expressed concern about expanding the applicability of the guidance to chlorinated solvents because of concerns about how to address the combined health risk of such solvents and TPH mixtures and regarding demonstration of attenuation time. She would not support expanding the applicability of the guidance without first completing a thorough

review. Dr. Norman noted that many other factors would need consideration in order to use the guidance for other contaminants.

A lengthy discussion ensued on these issues.

Ecology staff agreed that the guidance doesn't apply to radionuclides. Ecology noted that this guidance is intended for addressing natural attenuation for petroleum contaminated sites and that it was developed in consideration of the large number of petroleum contaminated sites in the state. The MTCA regulation reference to natural attenuation can be used for other types of sites. For chlorinated solvent/TPH mixtures, parts of the guidance may be applicable but other types of information would be needed to properly evaluate natural attenuation at these types of sites. Staff agreed to draft alternative language to address the Board's concerns.

2. Source mass calculations

The board concurred with the proposed changes.

3. Tiers

The board concurred with the proposed changes.

4. Flowchart

Dr. Faustman noted some additional changes to the flow chart on page 4 may be needed to reflect changes to the guidance narrative, to note the point where the guidance begins and also suggested that it be moved to the front of the document. Dr. Norman suggested that portions of the flow chart be reproduced in strategic locations in later chapters to help the reader understand where they are in the process. It was mentioned that the flowchart can be used to show the process, distinguishing between the typical cleanup process and the unique or different steps used for natural attenuation.

5. Oxidation-Reduction Potential

Dr. Landau suggested a rewording of the statement on page 54 to read: "Oxidation-reduction potential (E_H) and pH have a significant influence on iron and manganese solubility."

6. Plume definition

The board concurred with the proposed changes.

7. Puncture of aquitards

Dr. Landau suggested the statement on page 143 be reworded as follows: “It is important to note that a high degree of care must be taken when drilling a ground water monitoring well where confining layers are present to minimize the potential for creating a pathway for cross-contamination between different aquifers.”

8. Editorial changes

Dr. Faustman requested jargon like “polishing step” be explained or not used. On page 74, Dr. Landau suggested that “subtracted” be used rather than “added”.

Considerable discussion ensued on the Chapter 3 discussion (specifically Sections 3.1, 3.2, 3.3 and 3.4). The Board questioned if there was value added to the document by some of the discussion in these Sections, since it is a summary of rule requirements. It was suggested Ecology focus this guidance on the additional or unique requirements that use of natural attenuation brings on as was done in 3.4.2, rather than repeating requirements or processes not related to natural attenuation.

9. Toxicity of biodegradation by-products

Dr. Faustman requested that three peer reviewed references from original literature be added backing up the statements regarding the toxicity of petroleum hydrocarbons degradation by-products.

Ecology agreed to add additional references.

10. Mann-Whitney tests

The board concurred with the proposed changes.

11. Biodegradation capacity

On page 17, Dr. Landau suggested the definition of assimilative capacity is really a definition of “potential” assimilative capacity.

12. Feasibility Study

The focus of the Board discussion for this was on the plume stability test and whether this could be applied to situations where there is more than one plume or background is already degraded. It was suggested a statement be added that these types of situations are beyond the scope of this guidance.

13. Quantitative vs. qualitative assessment

The board concurred with the proposed changes.

14. Role of biodegradation

Dr. Faustman suggested the quotes from the NRC and EPA SAB in the notes be added to the guidance.

Dr. Landau questioned whether a demonstration that biodegradation is occurring is needed at all sites or just at selected sites where there is a question whether biodegradation is occurring. Ecology staff responded that we believe this demonstration is necessary to comply with the rule.

15. Use of natural attenuation as a sole cleanup action

See earlier discussion under purpose and scope of guidance. Board members noted that natural attenuation was not intended as the sole cleanup action at sites where contaminant levels are high enough that natural attenuation processes would take too long or there is a higher likelihood of contact with receptors.

16. Engineer or geologist license

The Board is okay with Ecology checking with licensing boards.

17. Public notice

The Board is okay with Ecology's explanation.

18. Restoration time frame

Dr. Faustman suggested the potency/toxicity of contaminants be added to the list of factors on page 61. The board discussed whether Ecology was asking for more from natural attenuation cleanups than at other types of remedies. Dr. Faustman suggested that the longer time frame warranted extra care. Dr. Landau discussed whether dilution may be preferable in situations where biodegradation may yield a more toxic by-product. The board discussed the importance of monitoring degradation of constituents from the soil and other mixtures of contaminants to demonstrate that natural attenuation is actively occurring.

19. Protectiveness of remedy

Dr. Landau expressed a concern that the ecological risk discussion on page 68 may not be consistent with the rule approach. He recommended Ecology check in with Dr. Duncan on this revision.

20. Case Study

The board concurred with the proposed changes.

21. Figure D.1 page 106.

Add a footnote to explain that it won't always intersect at a common point

Pete Kmet then asked the Board, if Ecology makes adjustments to the document to address the Board's comments, does the Board concur this document is ready for wider public review and comment?

All Board members indicated they believed the document was ready for public review. They requested Ecology consult with Dr. Duncan before releasing the document. They also all noted that they thought this was a very good guidance document and appreciated the work Hun Seak Park has done to date.

Dr. Landau adjourned the meeting at 4 PM and wished everyone a happy holiday season.

Meeting summary was corrected and approved by the Board on 3/28/05