

**Saginaw Tittabawassee Rivers Contamination CAG
DRAFT Summary of Full CAG Meeting
Saginaw Valley State University – Curtiss Hall
Monday, October 17, 2011**

CAG Members Present

Drummond Black
Charles Curtiss
Leonard Heinzman
Deborah Huntley
Ryan Jankoska
Wendy Kanar
Judith Lincoln
Annette Rummel
Joel Tanner
Paul Vasold
Bob Weise
William Webber

CAG Members Absent

Jeffrey Bulls
Matthew de Huis
Michael Espinoza
Michael Kelly
Rachel Larimore
Janet McGuire
David Meyer
Laura Ogar

Ex-Officio Members Present

Joe Haas, US FWS
Mary Logan, US EPA
Al Taylor, Michigan MDEQ

Ex-Officio Members Absent

Todd Konechne, Dow Chemical

Support and Agency Staff Present

Don DeBlasio, US EPA
Cheryl Howe, MDEQ
Diane Russell, US EPA
Doug Sarno, Facilitator

Doug Sarno called the meeting to order at 6:15 PM. Agenda items Included:

- Leadership Team Update
- Update on Cleanup Activities
- University of Michigan Dioxin Exposure Study

1. Leadership Team Update

- The CAG has established a bank account and paid the lawyers for the cost of incorporation, leaving just a few dollars in the account at this point. We will work with Dow to access additional funding in the grant as we identify needed costs.
- Potential additional speakers have been recommended by EAG members. Two people work for state agencies--one with expertise on the Fish advisory, and the other on dioxin toxicity. A third speaker identified is the past director of EPA's National Center for Environmental Assessment who would be asked to discuss the EPA dioxin study.
- The EAG discussed these topics and decided that they would like to hear about the fish advisory, and also about dioxin toxicity from both the EPA and the state as appropriate. The leadership team will work with the state to identify appropriate speakers for the two topics, and also contact EPA's National Center for Environmental Assessment to identify an appropriate speaker.

2. Cleanup Activities Update

- The Segment 1 decision process is underway and EPA is currently evaluating public comments it received on its proposed approach. EPA will provide a more detailed update at the next CAG meeting.
- With regard to interim controls at high use properties, EPA reported that 24 properties have had exposure controls implemented to date, with a non-participation rate of about 30%.
- At the June CAG meeting, the EPA Region 5 Administrator promised that EPA would produce a site newsletter for the public, and the first issue of this newsletter will soon be distributed. The newsletter will primarily be distributed through the web site, and the plan is to have it updated semi-annually, most likely before and after construction season.
- The work on Island MM is complete. Work began in mid August. Crane mats were used to limit disruption of sediments, and a temporary bridge was used to get equipment into the river without creating a great deal of disruption in the sediments and on shore. Buoys, signs, and lights at night were used to direct traffic underneath the bridge (which had about 5 feet of clearance). There was also 24-hour security. A silt curtain helped to contain any silty water from moving downstream. All removal at the island was above the water line, and resulted in very little turbidity. Contaminated materials were taken away by truck to the Bercheron landfill. 2" diameter stone was used to create a 6 to 12" thick cap on the island, with about 8" average. The rock cap was then covered by soil fill and

an 8" thick geoweb to hold material in place. Larger river rock, 4-12" in diameter, was used around the edges to stabilize the island and hold all of the material in place. The island was then vegetated with native species of sedges and grasses and an organic spray was used to bind sediment in place until grasses took hold in order to minimize erosion. The river will also wash seeds onto the island each year that will take hold. The bridge was removed and bank area restored. All work was completed by August 31.

- A CAG member asked to know the final cost and how this compared with the original estimate and budget. EPA noted that this information was not available at the meeting as Dow was not present, but EPA would seek to provide if at the next CAG meeting.
- Was it necessary to place the planting on top of armor cap or was that just for aesthetics? It was primarily for aesthetics. A CAG member remarked that this might have been a waste of money on top of the armor cap. EPA noted that this was not an issue that came up during public comment. Fish and Wildlife noted that from a Natural Resource Trustee perspective, they are seeking to restore as much habitat as possible and there are few islands in the river.
- It was asked why not plant trees? Deep-rooted plants are not appropriate over the top of a cap as the roots could disrupt the performance of the cap. One of the important aspects of these early actions is that everything provides opportunities to learn lessons for future actions.
- A question was asked regarding budgets, and who is responsible for budget control. EPA makes the final decision and cost is a factor in the decision-making. Under the agreement, Dow implements the action and manages costs as part of that process.
- Is there a maximum dollar value for the cleanup under the agreement? No.

Public Comment

A member of the public noted that for Island MM, it was understood that the final option would be contingent on levels of contamination found at the site once construction started as there was limited knowledge of subsurface contamination. However, there was no reference to the level of contamination found at the island and how this impacted what was done? EPA answered that they did an extensive pre-design sampling all around and through the island. As a result, EPA found that the water line was the appropriate place to stop excavation. At the far downstream tip of the island there were some higher levels of dioxin found, but other than that, the cut line was pretty clean. Modelling also looked at what impact this action would have on the hydrodynamics of the river and found that it would have none.

3. University of Michigan Dioxin Exposure Study

Dr. Garabant of the University of Michigan provided an overview of the study. The study was conducted under an unrestricted Dow grant based on a proposal by the University. UM did not report to Dow directly, instead all work was reported to an independent

Scientific Advisory Board. The project also developed a detailed web site which provides access to all data and findings.

The primary purpose of the study was to evaluate the degree to which exposure to soil and house dust increased body burden (blood levels) of dioxins, furans, and PCBs. The study sought to determine if increased exposure to these soils and dust resulted in higher blood levels, determine the pathways for these exposure, and communicate the results.

The study looked at households in five areas where contamination was present and one control area:

- Floodplain of the Tittabawassee River,
- Areas near the floodplain,
- The Midland Plume, downwind of the Dow plant
- Other Midland/Saginaw areas, and
- Jackson/Calhoun Counties (used for comparison, about 100 miles away).

Project staff conducted in-person interviews, collected blood samples, vacuumed homes to collect dust, and collected soil samples on properties on each side of houses and gardens and as close to the Tittabawassee River as possible at the downstream end. Soils samples looked at top 1" and 1-6" of soil. In total, the project included over 1300 interviews, 946 blood samples, 764 dust samples, and 766 soil samples. 731 persons include all four of these activities.

The project also saw significantly higher contamination of soils in the project area than in Jackson/Calhoun. Household dust was slightly higher in the other four regions but not appreciably higher than at Jackson/Calhoun.

The project did see higher levels of dioxin in blood serum at contaminated areas. However, blood dioxin levels varied widely due to a variety of factors. Mostly due to age (higher in older people), sex (higher in females), body mass index (higher in people with higher BMI), breast feeding (lower), and smoking (lower).

Overall, results showed that contamination in soil and house dust was not a significant pathway to blood levels. For 2,3,7,8-TCDD, living in the area prior to 1980 was the most significant predictor of higher blood levels. People who only lived in Saginaw/Midland after 1980 are virtually identical to those in Jackson/Calhoun. Residents who lived in the area prior to 1980 show significantly higher blood levels.

The full Results are available at the university of Michigan web site.

Though only 23 houses had TEQ above the EPA hazard level of 1000 ppt, many more had levels of specific congeners of dioxin above that level. OCDD, PCB 105, and PCB118 showed the highest concentrations in soil, dust and blood.

There was no significant relationship between levels in soil and dust and the major congeners, but there was a relationship with household dust and PCB 105 and 118,

such that for PCB 105 blood levels increased 0.2% when dust increases by 1000 ppt. For PCB 118 blood levels increased 0.1% when dust increases by 1000 ppt.

Data produced by UM study does not support EPA's theoretical models.

Dr. Garabrant offered the following concluding remarks:

- Indirect pathways of exposure through the food chain can be important (participant who raised and ate cattle showed highest level of blood contamination),
- Household dust showed little impact on blood levels,
- The project did not study children under 18 because of the volume of blood needed to achieve the limits of detection necessary,
- The project did look at young adults who had lived in the project area as children, showed no relationship between soil contamination and blood levels,
- Over 20 peer reviewed papers have been published, and many are available on the web, though some are copyrighted so cannot be placed on the web site,
- Over 126 presentations have been given by the project team at meetings throughout the world, including at the Annual Dioxin conference each year.

EPA offered the following remarks about the study: The study did not include children, and this is a focus of EPA. It also may not have included a large number of properties with high levels of dioxin contamination. It is also uncertain how well this represents other human activities such as consumption of local fish and game.

MDEQ also looked at the study, and agrees it has lots of important information, however it presents only part of the overall picture and they are concerned that the communication of these results can have an impact on the overall public health messages that the state is trying to communicate.

CAG Comments and Questions

- Don't current adults represent former children at the site? Yes, however dioxins have a half-life in the body of 7-8 years (half of the amount will leave the body every 7-8 years assuming that there is no further intake). As a result, a middle-aged person would no longer have any effect from childhood exposures (7 half lives results in 49 years which will result in 1% of the original concentrations). The project did look at young adults who were children within 1-3 half-lives and saw no difference compared to people of the same age who lived elsewhere. It is reasonable to believe that if they had had very high levels that would have been seen, but smaller amounts would not have been seen. More recent Japanese studies of children have shown no effects from soils.
- People who lived here prior to 1980s must have had very high levels of dioxin for it to still be noticeable? Yes.
- What were the exposure pathways that led to this? The project did not focus on this because specific data on sources of food at that time would not have been available.

- Would this approach be generalizable to all the higher level contaminated properties? Most of the data lies within 3.7 to 100 ppt (the current range of action levels under consideration by EPA). The argument of not enough properties above 1000 ppt is also not true, we had a lot of properties at that level for several congeners. What is true for TCDD is also true for OCDD, they all perform in very similar ways. What we see for OCDD, PCB 105, and PCB 118 is what you would expect for all the other congeners.
- But doesn't the elimination rate vary dramatically so some congeners stay in the body longer, so at the end of the day we care about total TEQ remaining in the blood? The three compounds modeled are all long half-life compounds. The shorter half life compounds would not be appropriate to study. There is a review on all the half-lives of all the 29 compounds in the studies.
- Since we don't know the toxicity of any of these compounds, how is TEF relevant? They are relative binding affinities to AH receptors, so they would show the potential for affects on DNA, but would not be a direct predictor.
- MDEQ identified some people who seem to be highly affected individuals above the best fit line. Yes, this is true, but all these individuals lived here prior to 1980, so once you account for that the soil did not seem to have any affect. So speculation is that prior to 1980 there must have been some other pathway (probably air emissions, but there is no data for this), and it was not for every congener, mainly TCDD, and not for PCBs.
- Is the study ongoing? Finished collecting data in 2006, project is still analyzing and writing papers. A few more papers wrapping up in the next few months then it would be done.
- What did it mean to have an unrestricted grant? Dow gave a grant of \$17 million based on the original scope of work presented by UM and did not have a role after that.
- What direction did Dow give? Dow had no oversight or influence or participation in any way in the study. Dow got the results in the same way everyone else got them.
- Why none of the studies in Bay City? Because there are a lot of other sources contributing to that flood plain, upstream
- After you received the peer review results, did you see anything you missed or would like to study further? The process of science includes having all of your colleagues try to falsify your results, this forces you to show that you got it right. There has been a lot of criticism and we have taken all of it seriously. To date we don't believe that we have made any mistakes or that there is an alternative interpretation of the science. We have produced many peer reviewed papers and presentations which have all opened us up to a lot of additional critical input.
- Can people reduce their risk by reducing their BMI? Dioxins are stored in fat, so lots of body fat would result in more dioxin uptake and storage. If you lose weight after having the dioxin in your body, your concentration of dioxins actually go up. Breast milk is also rich in fat, dioxins excrete in milk. So losing weight would not be a good public health message for dioxin. Staying away from fish and meat consumption are important however.

- The only weapon we seem to have is removing soil, if this is not really helping, should we be spending more money on education rather than dredging, why not just give money to communities to better educate people.

4. Public Comment

- Question was asked how volunteers were chosen, was there any extra effort to get to farmers, hunters or others not on the flood plain that might have had high exposures? Grabrant responded that in the floodplan, there is a population of people, if you want to know the pattern in that population you would want to ask everyone, but that is too many people and too expensive so we took a completely random sample of the population in order to characterize the habits of the total population. If the sample is big enough, you get close to representing the full populations. We understood how many people we would need in each of the five populations we studied to understand those populations. We used census data and knowledge of where soil concentrations were likely to be high to pick census tracts at random. Then we identified all the residences in those tracts and picked homes at random, and contacted those individuals directly.
- One commenter noted concern with the tone. Most of us are aware of how science works, its tentative, always ready to change when the data changes. I would suggest that the UM study is advocacy.
- One commenter noted the desire to see another university study without Dow funding to duplicate the results. There is no recognition in the study that there is any possibility of risk. The implications at face value are that there are no problems and should be no cleanup. Dr. Garabrant notes they have spent five years looking at all these criticisms, agreed that in science nothing is set in stone, and everything advances. As more data is collected and analyzed this should be considered and used in decision-making. The latest manuscript is a review of every soil study done around the world, about 7-8 of them, and they all show the same results that there is no direct pathway on blood levels from soil.

The Meeting was adjourned at 9:00 PM.