SAGINAW-TITTABAWASSEE RIVERS CONTAMINATION COMMUNITY ADVISORY GROUP (CAG) COMMENTS ON SEGMENT 6 AND 7 RESPONSE PROPOSAL

FINAL, 11/20/18

I. Subject:

CAG Comments and Recommendations on the *Preferred Cleanup Method or Methods for Segments 6 and 7 of the Tittabawassee River.*

II. Background and Information Considered:

The Environmental Protection Agency represented by Mary Logan presented the Agency's proposal at the September 18, 2018, meeting of the Community Advisory Group (CAG). The CAG also asked discussed a number of issues with Joe Victory of Michigan DEQ at the November 19 CAG meeting. The CAG subcommittee also requested and received comments made by the Natural Resource Trustees.

III. Agency Proposal:

There are distinct areas in Segments 6 & 7 that require cleanup called Sediment Management Areas, or SMAs, and Bank Management Areas, or BMAs. Here is what EPA proposes for the different areas:

- SMA 6-1 – A combination of technologies will be used, including safely covering some areas and monitoring other areas where contamination is already buried.
- SMAs 7-1 through 7-3 -- Contaminated sediment will be covered to keep it safely in place.
- BMAs 6-1 through 6-4 and 7-1 through 7-3 Technologies that stabilize the bank and stop erosion of contaminated riverbank soil will be applied.

IV. Summary of CAG Discussions and Concerns

Sediment Management Area 6-1

The EPA is proposing Alternative 4 of the several alternatives considered. This is a combination of capping and monitored natural recovery (MNR).

The CAG agrees that MNR is appropriate at the downstream and in-channel portion of the SMA because the elevated TEQ levels are buried beneath approximately 6 to 7 feet of cleaner sediment. The sediment bed has been proven to be stable in the MNR area based on differential bathymetry data. However, the CAG expressed concerns about leaving contaminants at shallower depths in place both because of the CAG's preference for permanent remedies and additional concerns about the potential for burrowing animals.

In considering the response to SMA 6-1 the committee looked at the *Natural Resources Trustees'* comments of May 30, 2014, particularly the concerns around containment of contaminants in shallow water.

As the *Natural Resource Trustees'* Comments of May 30, 2014, point out …"soil cover does not permanently isolate contaminants in the soil. Organisms including earthworms, burrowing crayfish, small mammals, and woodchucks mix soil layers over time as do freeze-thaw and drought-flood cycles …In addition to our comment letter of February 7, 2014, we sent an e-mail specifically on the potential for burrowing crayfish to move soil and accumulate PCOIs on February 11, 2014, which included additional information beyond the following summary:

> Burrowing crayfish in Michigan include *Cambarus Diogenes* and *Fallicambarus (Creaserinus*) *fodiens C. Diogenes* is the more common of the two and is found in floodplains, wet meadows, other wetlands, rivers, streams, springs, lake and pond edges, and ditches, where groundwater is found near the ground surface. *C. Diogenes* has been found associated with 48 different soil types in Indiana in burrows that averaged up to 121 cm deep with an average depth to water of 75.5 cm (Thoma and Armitage, 2008).

Sediment Management Areas 7-1, 7-2, AND 7-3.

EPA Proposal: *The EPA is proposing Alternative 2, capping, for SMAs 7-1, 7-2, and 7-3, because these areas are remote and access will be extremely challenging. Access for heavy construction equipment in the Shiawassee National Wildlife Refuge could have a significant impact on the upland habitat. The adjacent areas are thickly wooded. While temporary roads and staging areas would be replanted, forests may require decades to return to their pre-construction condition. These SMAs seem well suited for cellular containment systems or combination caps, which would enhance sediment stability and in-channel habitat, while short-term effects are minimized.*

Based on the documents reviewed, the CAG found the analysis biased toward capping, and would have liked to have seen a more thorough analysis of the long-term damage to forests vs. long-term protection from contaminants in the river. The document should have noted that that the ecosystem is not original growth, and may include many non-native species. A more

aggressive approach might address the contamination permanently, avoid contamination of flora and fauna, and replace invasive plants with native. Upon discussion with Michigan DEQ, the CAG developed a more thorough understanding of the conditions present in this location, and does not have a specific recommendation for an alternative remedy. However, the CAG would have liked to see an alternative that explored the opportunity for an in-river hydraulic removal of relatively shallow areas of contamination by way of barge, and replacing with clean sediment, while capping the deeper contaminants.

Bank Management Areas

EPA Proposal: *The EPA proposes Bank Management Areas Alternative I, stabilization, for all Segment 6 & 7 BMAs because these bank stretches have characteristics that indicated that stabilization will be effective and disturb the existing natural habitat much less than removal. There are several technologies included in the stabilization alternative. The design process would examine key characteristics on a bank-by-bank basis, and would allow EPA to select the best suited technologies at each BMA.*

The CAG concurs with EPA in its reflexive response to bank configurations and contaminant depths and concentrations. This report's discussion of the difficulties with bank stability made more sense after our visual of a high-east-side bank compared to the west side-bank with its gentle slope. It's understandable that stabilizing tall, tree lined and root infested banks will take considerable study.

However, the CAG would like to see a more detailed discussion of Bank Management Areas in the decision documents in keeping with the more detailed analysis and comparisons created for the sediment management areas. Contaminated banks appeared to have lower priority in the Response Proposal and specifically in the Executive Summary. There does not appear to be the same rigor as applied to SMAs; that is, explanatory detail and alternatives.

EPA and Dow have a great deal of experience in bank management at this point, but did not provide much in the way of explaining this experience and best practices in relation to the banks currently under consideration. Also, would like to see a more thorough discussion of specific long-term operation and maintenance for BMAs.

In the discussion of Remedial Action Objectives (RAOs), it was not clear what weight was given for each. The CAG suggests that table could be made for relative costs of each of the RAOs mentioned similar to tables used for SMAs.

Additional Concern: MNR

As in previous recommendations, that CAG is concerned about the use of MNR for any contamination that is close to the surface which could result in leaching, dilution, and ultimately transport. The hydrological stresses on the river and even the natural biota of a recovered ecosystem present a challenge to "doing nothing." Confidence in MNR, we believe, is dependent on robust monitoring, another frequent topic in the CAG's oversight. This concern is supported by comments on MNR by the *National Research Council, 2000:*

> *A major drawback for MNR is that contaminated sediment is left in place and could be reintroduced into the environment. This shortcoming must be considered in light of potential degradation rates. Leaving the contaminated sediment in place also results in a public perception that MNR is a "do-nothing" approach. At sites where this misconception exists, public education is critical.*
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> *Another limitation of MNR, which affects all remedial alternatives to some degree, is the uncertainty associated with the data, the site Conceptual Site Model (CSM), and model predictions. Uncertainty can result from unexpected disturbance to the sediment, changes in sedimentation and resuspension rates, bioavailability, and abiotic or biotic transformation rates.*

Additional Concern: Long-Term Monitoring

The discussion on cost estimates in the EPA's *Tittabawassee River Response Proposal* (page 93) refers to a 30 year period of monitoring, but many primary constituent(s) of concern (PCOI) are stable and toxic far longer.

The CAG recognizes that EPA has yet to fully design a comprehensive long-term monitoring and reporting process, but has concerns about the information that is currently available and the overall understanding of monitoring in the community.

The proposed response activities require long term operation and maintenance, particularly considering the frequent use of the Monitored Natural Recovery alternative. We concur with the *Natural Resource Trustees' Comments* that this Proposal should discuss how Dow proposes to address its long-term obligations and how this will be incorporated into the process.

The CAG would like to have additional discussions of monitoring to look at how monitoring results will ultimately be tied to the need for additional response, and to understand questions such as:

- What is the response criteria for determining a failed MNR?
- What is a measure of success?
- What criteria triggers a response?
- What is the basis for choosing a thirty-year period?

Again, the *National Research Council* points out the importance of confidence through monitoring: "Confidence in MNR as a remedial solution is gained by developing multiple lines

of evidence to minimize uncertainty by defining declining trends in contaminant concentrations in fish tissue and sediment through consistent monitoring of the site over time. Providing routine updates to the stakeholders on the outcome of the remedy also builds confidence in this remedial approach."

A brief literature search suggests that MNR can be an effective remediation tool, but, again, not without a monitoring plan in place.

> *Specific monitoring components should be determined by the RAOs and natural processes that contribute to site recovery. Each monitoring component should have a specific, defined purpose. Monitoring for cleanup levels and remedial goals may focus on source control and contaminant concentrations in sediment and fish tissue; pore water or surface water may be included to further monitor bioavailable concentrations. Ecological recovery monitoring may include such measures as sediment toxicity, benthic community status, or population status of key fish or wildlife species. Sediment bed stability monitoring should evaluate conditions that demonstrate the integrity of the remedy under normal and high-energy events through time. Stability can be monitored using such methods as bathymetry, coring and contaminant profiling, sediment profile imagery, and visual assessment following storm events; at issue is whether and to what extent sediment deposition or erosion change contaminant exposure and risk on and off site.*
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> From: *Technical Guide, Monitored Natural Recovery at Contaminated Sediment Sites, ESTCP Project ER-O622, May 2009*

V. CAG Recommendations

1. The CAG would like to emphasize how important it is to create models capable of providing support for identifying targets for modelling to help understand the success (or failures) of the various approaches to containing both contaminated sediment and banks.

2. The CAG would like to reiterate its strong preference for permanent remedies wherever possible to remove contamination from the river environment. Whenever removal of contaminants of concern can be achieved without significant disruption or long-term damage the ecosystem, that should be the preferred permanent solution.

3. For SMA 6-1, the CAG recommends removal be used for the upstream contaminants which are located at shallower depths.

4. The CAG would like to see the development of simple annual reports to help the community understand the effectiveness of remediation that has already taken place.

These reports could identify the remediation completed, the monitoring being conducted and, as results become available, sampling measures indicating successful remediation.

5. Future Response Documents should include a section on anticipated future conditions. As noted by the Trustees: "Over time, land uses may change and improved agricultural practices may reduce the input of relatively clean sediment into the system. Changes in dam operation and water withdrawals may affect hydrology and erosion. Climate-related changes are also expected to affect hydrology, erosion, and ice scour, especially as extreme weather events become more frequent.

6. The response proposal should include a bibliography of all other documents referenced in the report.

7. Document IDs or other relevant information should be provided for all other documents referenced in the report, such that online retrieval is possible.

In addition to the above recommendations, the CAG would like to reiterate a few of the recommendations provided in response to Segments 4 and 5.

1. The CAG requests EPA provide further information to better understand how MNR relates to previous decisions for all segments with information about size, location, extent of soil removal, capping, and MNR, and the contamination levels and depths in each and the particular issues related to accessibility, etc. that were used to decide what method was selected for the remediation.
2. The CAG requests EPA develop a Fact Sheet explaining the variety of long-term obligations expected to be identified during course of this cleanup project, such as monitoring, maintenance, corrective action, etc., what financial assurance methods will be used and how they are to be maintained in order to meet these obligations in perpetuity.