



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

Memorandum

REPLY TO THE ATTENTION OF:

DATE: January 28, 2015

SUBJECT: Response to Contaminated Sediments Technical Advisory Group
Recommendations for the Allied Paper, Inc./Portage Creek/Kalamazoo River
Superfund Site, Operable Unit 5, Area 1

TO: Stephen J. Ells, Chair, Contaminated Sediments Technical Advisory Group

FROM: James Saric, Remedial Project Manager, Region 5

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On September 25 and 26, 2014, the U.S. Environmental Protection Agency's (EPA's) Contaminated Sediments Technical Advisory Group (CSTAG) conducted a review of the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund site. Specifically CSTAG toured Operable Unit 5, Area 1 of the Kalamazoo River and participated in a briefing regarding the draft Area 1 Feasibility Study report. In a memorandum dated November 18, 2014, CSTAG provided recommendations for the overall cleanup of the Kalamazoo River as well as for OU 5, Area 1. Each recommendation is provided below, followed by Region 5's response.

The Region greatly appreciates CSTAG's interest in the site and will continue to engage CSTAG as the cleanup continues in the Kalamazoo River. Many of the CSTAG recommendations will be addressed in the Proposed Plan, Record of Decision and remedial design.

Recommendations

Site Characterization Recommendation

1. The CSTAG recommends that the Proposed Plan discuss the background levels of sediment and fish tissue PCB concentrations in context of the risk-based PRGs and in light of what can be achieved realistically.

Region 5 Response

Background concentrations and the potential that they may be limiting factors in achieving PRGs are noted in the final FS (e.g., Sections 2.2, 2.4 and 4.5.2.1), and will also be discussed in the Proposed Plan.

Alternative Analysis Recommendations

2. CSTAG is concerned with the structural integrity and stability of the Otsego Township Dam downstream from Area 1. The Region should consider an early action to remove or contain sediments and PCB mass entrapped behind the dam before a partial breach or failure occurs.

Region 5 Response

Region 5 is working with the Michigan Department of Natural Resources (MDNR) and the Michigan Department of Environmental Quality (MDEQ) to evaluate early options to stabilize the Otsego Township Dam. Region 5 is also evaluating whether to initiate an early action to remove or contain sediments.

3. The contaminant concentrations expected to be achieved by the remedy are unclear. More specifically, the bullets describing RAO 1 (Protect people who consume Area 1 Kalamazoo River fish from exposure to PCBs that exceed protective levels) include two different values for smallmouth bass tissue PCB concentration, 0.11 mg/kg and another concentration relating to the 10^{-5} risk or HI of 1.0. Please clarify what the target number is for 10^{-5} risk and which of these two smallmouth bass targets is expected to be achieved at the end of the 30-year evaluation period. Please also clarify the PCB surface weighted average concentration (SWAC) at the time of construction completion and as expected at the end of the 30-year evaluation period. Please specify the expected PCB SWAC for both the Remediation Reach (section 3 and parts of 2 and 4) and for all of Area 1.

Region 5 Response

Remedial Action Objectives (RAOs) are just that – objectives – and Region 5 believes the values expressed in RAO 1 are achievable targets. The Feasibility Study (and the forthcoming Proposed Plan) will include two fish tissue PRGs for smallmouth bass, one based on a carcinogenic risk level of 1×10^{-5} (0.042 mg/kg PCB) and one based on a non-carcinogenic Hazard Index of 1 (0.072 mg/kg PCB). (Note that the concentration cited in the CSTAG recommendation above is incorrect.) Both PRGs are anticipated to be achieved over time if the SWAC for sediments in each of the eight sections of Area 1 is below 0.33 mg/kg PCB. Long-term monitoring (LTM) will continue until all of the targets for smallmouth bass are achieved. The Proposed Plan will include clear information regarding the anticipated SWAC at the end of construction activities and at the end of the LTM period for the proposed Remediation Reach. At the end of the LTM period it is anticipated all of the river sections will have SWACs below 0.33 mg/kg—this means the SWAC for all of Area 1 will be less than 0.33 mg/kg.

4. CSTAG notes that Alternative 5 was the most aggressive and most expensive remedial alternative evaluated in the Feasibility Study. Remedial alternative 5 (area-wide removal) removes much more sediment than Alternatives 2 and 3 (*i.e.*, more than 300,000 cubic yards versus 19,500 and 63,900 cubic yards, respectively). However, the time to achieve smallmouth bass tissue PRGs was approximately 20 years longer (*i.e.*, 54 vs. 33 or 35) than the other less

extensive remedial alternatives. CSTAG recommends that the Region re-evaluate the assumptions used to calculate the time required for Alternative 5 to meet fish tissue PRGs.

Region 5 Response

The fish projections have been revised since the September 2014 CSTAG review meeting. The updated approach, rationale, and calculations are presented in the final FS, Appendix I. The timeframe for Alternative S-5 has been reduced from 54 to 47 years for smallmouth bass fillet, as compared to 32 and 25 years in Alternatives S-3 and S-4, respectively. The revised projection for Alternative S-5 is longer than the less aggressive alternatives because of the 10-year construction implementation period for S-5 during which no improvement is anticipated due to sediment resuspension, etc., and its relatively slower post-remediation recovery rate that is associated with extensive habitat destruction related to Alternative S-5.

5. The descriptions of remedial alternatives 3 (hot spot removal) and 4 (hot spot and edge removal) include estimates of the reduction in the sediment SWAC in the Remediation Reach resulting from excavation and the estimated time required for PCB levels in smallmouth bass to decrease to the targeted risk level (10^{-5}). The SWAC reductions in the surface sediment (0 - 6") are 1.76 to 1.09 mg/kg for remedial alternative 3, and 1.76 to 0.60 mg/kg for remedial alternative 4. The time estimates are 35 years for remedial alternative 3, and 33 years for remedial alternative 4. Please clarify why the time estimates for Alternatives 3 and 4 are similar despite the much lower post-excavation SWAC for remedial Alternative 4.

Region 5 Response

As noted above in response to recommendation 4, the fish projections have been revised since the CSTAG meeting. The revised fish projections in the final FS present an estimated seven-year difference between alternatives S-3 and S-4 (i.e., 32 and 25 years for smallmouth bass fillet, respectively). The projection for S-4 includes additional construction time during which MNR will not occur. Also, a lower post-remedial SWAC for S-4 does not translate linearly to a lower concentration in fish. As discussed below in response to recommendation 7, the relationship between fish tissue and sediment concentrations is not constant. In addition, a difference of only seven years in the time predicted to reach the fish tissue goals is reasonable given that: 1) the additional mass of PCB removed in S-4 is approximately only 14% more than that removed in S-3 and 2) the geomorphic evaluation indicated that few high concentration areas are located in the added edge removal included in S-4.

6. CSTAG recommends that the Region more clearly explain how the geomorphic PCB analysis presented in Figure 3-6 of the FS is used to identify areas within Area 1 for remediation. Based on Figure 3-6, it appears that the geomorphic analysis can be used to exclude areas from further consideration even when SWACs exceed the sediment PRG (0.33 mg/kg) or a remediation action level (RAL) of 1 mg/kg. If this process does not directly affect whether areas for further evaluation of remedial alternatives are included, the process should be omitted. If

areas are excluded on the basis of the geomorphic analysis, those areas should be identified and the rationale should be described.

Region 5 Response

The cited figure does not indicate that geomorphic analysis was used to eliminate river sections from consideration. Geomorphic analysis was used as a tool to evaluate where higher PCB concentrations are more likely to be present within a river section which has already been selected for remedial alternative development. Text was added in the final FS to clarify how this tool was used (see Section 3.2.1.2 of the final FS).

7. CSTAG recommends that the Region more clearly describe how future fish tissue concentrations were predicted with specific emphasis on the effect of remediation. Please clarify how biota-sediment accumulation factors (BSAFs) were used to predict future fish tissue concentrations. In the current description, BSAFs appear to change over time. For example, from Section 4.3.2.1: "BSAFs were adjusted downward using a percent difference based on the change in SWAC so that negative or unrealistic fish tissue concentration step downs would not be generated." If BSAFs change over time, the scientific basis for this change should be provided.

Region 5 Response

The fish tissue projection equation for the site has been revised in accordance with recommendations from EPA and MDEQ. The updated fish projection approach, scientific rationale, and calculations are presented in Appendix I of the final FS. This revised approach applies a log-linear correlation describing the non-constant relationship between changes in fish tissue and sediment PCB concentrations. This relationship is specific to the Kalamazoo River and was documented in "Temporal Trends and Analysis of Selected Remedial Alternatives for Area 1 of the Kalamazoo River Superfund Site" included as Enclosure 1 to MDEQ's Comments for Draft Area 1 Feasibility Study Report – Morrow Dam to Former Plainwell Dam, Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site (February 15, 2013).

8. The alternatives presented in the FS leave varying amounts of contaminated sediments in place, including some alternatives that may leave sediments with concentrations greater than 50 ppm in the river. In its analysis of the tradeoffs associated with each alternative, CSTAG recommends that the Region clarify the nature and extent of the contaminated sediment that will remain in Area 1 under each alternative. The concentrations of individual samples, SWACs, and areal extent of the contaminated sediment that will remain (*i.e.*, not dredged or capped) should be described.

Region 5 Response

The FS data summary maps depict PCB data throughout Area 1 and the proposed remediation footprints and/or stream tubes pertaining to each alternative. All but one of the samples with

concentrations greater than 50 mg/kg are either associated with areas that underwent a time-critical removal action (TCRA) and represent pre-TCRA values or are within the proposed remedial reach. Sampling in Section 8 will be performed during remedial design to confirm current, post-TCRA conditions. The only other sample with PCB concentrations greater than 50 mg/kg is isolated, with surrounding transect samples less than 2 mg/kg (vertically and horizontally). The PCB concentrations associated with this isolated sample would not result in a population-level effect.

In the Proposed Plan, the preferred alternative will include information on what samples exist that exceed 50 mg/kg that are outside of the final remediation area and will not be addressed, and will also include the rationale for not remediating such sample areas (i.e., do not impact SWACs, small mass, do not contribute to fish concentration).

9. The Region described that their process for identifying areas for potential remedial action relies on using SWACs as a key input parameter. The Region further indicated that they also evaluate and consider discrete data points (i.e., the individual data points used to calculate the SWAC) when making such determinations. The CSTAG recommends that the Region clarify how they use both SWAC and discrete sample location data in making these determinations.

Region 5 Response

The SWACs were used to identify which sections of Area 1 required further investigation for remediation. The SWACs were used as a general screening tool but did not necessarily eliminate a section of Area 1 from potential remediation. Individual data points and analysis of hot spots that exist in river sections with SWACs currently meeting sediment PRGs also were evaluated to expand areas requiring remediation. For example, although the SWAC for section 2 is already below the sediment PRG there are two known hot spots within section 2. A portion of section 2 was therefore included, along with Section 3, in the Remediation Reach.

Monitoring Recommendations

10. CSTAG commends the robust, consistent, and long-term nature of the fish tissue contaminant concentrations that have been collected by the State of Michigan. That data set was essential in monitoring the effectiveness of the Portage Creek removal action and it will also be critical in defining the effect and effectiveness of future actions. In the ROD, describe the elements of the long-term monitoring plan (LTM) (i.e., species, sampling time points, and locations) and explain how remedy effectiveness will be measured.

Region 5 Response

The Proposed Plan and ROD will describe the key elements of the LTM program. During the remedial design a separate LTM plan containing more specific details will be developed and submitted to EPA for approval.

11. The Region should consider, possibly as part of the LTM, a measurement technique to address RAO 4 (reduce transport of PCBs from Area 1 to the downstream Kalamazoo River and Lake Michigan). If a measurement technique cannot be specified, the Region should more clearly explain how progress in addressing this RAO will be evaluated.

Region 5 Response

The RAOs are objectives that EPA is trying to achieve with the remedies. RAO 4 is a more broad objective focusing on the reduction of PCB materials being transported downstream. This objective will be addressed through bank stabilization efforts and floodplain monitoring to ensure that PCB contamination from the floodplains is not a significant source of PCBs to the river. This objective will be achieved by the proposed remedy and confirmed through LTM.

12. The Region should continue the long term monitoring period (*i.e.*, 30 years), until the projected timeframe to achieve acceptable values. Smallmouth bass PRGs were not expected to be reached for at least 33 years, and carp, for 115 years. The LTM should continue past 30 years if RAO 1 PRGs have not been achieved at that time.

Region 5 Response

Region 5 agrees with this comment. The Proposed Plan and ROD will specify that LTM will continue until all PRGs are achieved.

13. The CSTAG commends the Region and MDEQ on working together to develop a comprehensive LTM for the site. Consider adding a stationary biological (*e.g.*, caged or indigenous bivalves) or chemical (*e.g.*, SPMEs) method to evaluate contaminant reductions over time.

Region 5 Response

Region 5 agrees with this comment. LTM is discussed in the FS and the key elements of LTM will be included in the Proposed Plan and ROD, with more details to be provided in the LTM plan to be developed during the remedial design. Also, discussions are ongoing between Georgia Pacific and MDEQ regarding the existing LTM at the site, as well as enhancing the future LTM program using multiple methods to evaluate PCB concentration trends in fish over time.

14. When referring to total PCB in written analysis, tables, and graphs, please clarify whether the data are total PCB by Aroclor or by congener analysis. CSTAG understands that the Region is finalizing a LTM for the site. The Region should consider using total congener analysis for PCB

measurements for the long term monitoring samples, or for a subset of those samples. Total congener analysis can provide greater analytical precision, lower detection limits, and improved laboratory consistency.

Region 5 Response

The only congener data presented in the FS is for smallmouth bass young of year fish tissue, as noted in Section 1.3.1.3 of the FS. The collection of total congener data will be considered during the development of the LTM plan for the site. The advantages noted above, particularly with regard to the lower detection limits and improved laboratory consistency, may not be realized given the high potential for matrix effects in the sample media. The compatibility of future LTM data with historical data (for making comparisons, confirming trends, etc.) must also be considered when considering changes to the analytical methods.

15. The Region should ensure that all laboratories analyzing for lipid content in fish are consistently using the same lipid extraction method.

Region 5 Response

Georgia-Pacific's consultant (Amec Foster Wheeler) and the Kalamazoo River Superfund Site Work Group, which included representatives of EPA and MDEQ, evaluated the historical fish lipid data and laboratory methods and agreed that the historical protocols yielded consistent results, regardless of the extraction method or extraction solvent used. Protocols that continue employing consistent lipid extraction procedures in the future will be included in the LTM plan.