Sediment Management Work Group
Comments on the Proposed Modifications to the Fox River ROD

U.S. EPA Region V
January 11, 2007

I. Introduction

The Sediment Management Work Group (SMWG)[1] is pleased to provide comments to the United States Environmental Protection Agency (EPA) on the proposed amendment to the Fox River ROD for OUs 2-5.

II. Executive Summary

In the June 16, 2006 Fox River Basis of Design Report (Basis of Design Report), U.S. EPA proposed an Optimized Remedy for OUs 2-5 as an alternative to the remedy set forth in the Fox River Records of Decision (December 2002 for OUs 1-2, June 2003 for OUs 3-5) (collectively "ROD" or "ROD Remedy"). Using adaptive management principles, the Optimized Remedy incorporates the results of considerable additional data collected in 2004 and 2005 (more than 1,400 sediment cores and 10,000 sediment samples). The Optimized Remedy was described in detail in the Basis of Design Report, and was summarized in the Lower Fox River/Green Bay Site Technical Memorandum: Current and Proposed Plan (Technical Memorandum).

The Optimized Remedy embodies EPA's national policy on contaminated sediment, as reflected in the *Contaminated Sediment Remediation Guidance for Hazardous Waste Sites, December 2005* (Guidance). In particular, the Optimized Remedy focuses on overall risk reduction, as well as the specific net risk reduction that realistically can be achieved by the

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[1] The Sediment Management Work Group is an ad hoc group of industry and government parties actively involved in the evaluation and management of contaminated sediments. (See Exhibit "A" for a list of its Members.) The Group is dedicated to the use of sound science and risk-based evaluation of contaminated sediment management options. The SMWG recognizes that the management of sites involving contaminated sediments frequently involves unique and complex scientific and technical issues, including assessment methodologies and evaluation of risk and risk reduction options. As an active participant in the national discussions on sediment management issues, the SMWG welcomes the opportunity to offer observations and comments on the Proposed Modifications to the Fox River ROD for OUs 2-5.

available remedial alternatives. The Optimized Remedy appropriately took into consideration the limitations of dredging when developing an alternative to the ROD Remedy.

Consistent with the Guidance's emphasis on risk reduction, the Optimized Remedy will achieve lower surface weighted average concentrations (SWAC) of PCBs in both OU 3 and OU 4 (OU 3: 0.28-0.49 ppm (Optimized Remedy) v. 0.31-0.57 ppm (ROD); OU 4: 0.25-2.9 ppm (Optimized Remedy) v. 0.32-3.7 ppm (ROD)) in a shorter time frame than the ROD Remedy, is more protective of human health and the environment, and is more cost effective ($390 million (Optimized Remedy) v. more than $580 million (ROD)). The Guidance supports implementation of remedies that are more effective in the short-term, more implementable, more cost-effective, and that can be completed earlier. Thus, the Optimized Remedy, which is more consistent with the Guidance than the ROD Remedy (which was issued prior to the Guidance), should be approved. In addition, the Guidance's adaptive management concepts and risk management framework should continue to be applied at the Fox River, permitting the Optimized Remedy to be further refined and improved as new information is obtained and more refined engineering analyses are conducted during the remedial design phase.

III. EPA's National Contaminated Sediment Policy

In December 2005, EPA issued the *Contaminated Sediment Remediation Guidance for Hazardous Waste Sites*. This Guidance embodies national policy on contaminated sediment and should be followed at all contaminated sediment sites. The Guidance provides a risk management decision-making framework to assist with selecting appropriate remedies. There are six key principles in the Guidance. First, the focus of remediation should be on risk reduction, not simply on contaminant removal or on the number of cubic yards of dredged sediment (*Guidance,* p. 7-1, 7-16). The Guidance reinforces the focus on risk reduction by stating that contaminated sediment that is not bioavailable or bioaccessible and that is reasonably stable, meaning that the contaminants are unlikely to be released from the sediment in concentrations which will pose an unacceptable risk to human health and the environment, does not necessarily contribute to site risks (*Guidance*, p. 7-3).

Second, a realistic, site-specific evaluation of the potential effectiveness of each sediment management option, including dredging, capping, and monitored natural recovery, should be incorporated into the selection of remedies at a site (*Guidance,* p. 7-3).

Third, as part of the remedy selection process, an appropriate evaluation of the comparative net risk reduction potential of the various sediment management options, including a realistic evaluation of their respective advantages and site-specific limitations should be conducted (*Guidance*, p. 7-13, 7-14). This evaluation includes the risks introduced by implementing the remedial alternatives (*Guidance*, p. 7-14). For example, the risks associated with implementing a dredging remedy include contaminant resuspension and releases during sediment removal, transport, and disposal, continued exposure to contaminants during the construction and implementation phases, residual contamination, disruption of the benthic community, destruction of habitat, worker risk during sediment removal and handling, and community impacts including accidents, truck traffic volume, noise, lights, residential and/or commercial disruption (*Guidance*, p. 7-14).

Fourth, at large and/or complex sites, consideration of the use of combinations of remedies may be appropriate (*Guidance*, p. 7-3).

Fifth, adaptive management concepts, which recognize the need for reconsideration of the original remedy chosen where new data and/or results of pilots suggest the appropriateness of revising the original approach, should be applied (*Guidance*, p. 2-22, 3-1, 7-16).

Sixth, comparing and contrasting the costs and benefits of the various remedies is part of the risk management decision-making framework (*Guidance*, p. 7-1). These six principles, if applied appropriately, will lead to protective remedies that are also cost effective as required by CERCLA.

IV. Issues with the ROD Remedy

After the Fox River RODs were finalized, more than 1,400 sediment cores and 10,000 sediment samples were collected as part of the remedial design (*Basis of Design Report*, p. 14-17). The data derived from these samples identified site characteristics "that are substantively different than those contemplated at the time of the ROD" (*Basis of Design Report*, p. 142-43).

These differences include the following site characteristics, which are important to the remedial design and indicate that the ROD should be amended:

- Deeply buried, stable contaminated sediments below the authorized federal navigation channel are covered by cleaner sediments at a depth below the bottom of the navigation channel. Removal of these deeply buried contaminated sediments "would require dredging of considerable additional volumes (greater than 1.0 million cy) of less contaminated non-neatline sediments" (*Basis of Design Report*, p. 143).

- Several areas are covered by a thin layer (up to 6 inches thick) of sediments with PCB concentrations between 1 and 2 ppm. "While such low-risk areas collectively represent only about 0.5% of the total PCB mass in OUs 2 to 5, such areas represent nearly 18 percent of the remedial action area and about 5% of the volume of sediments that would be dredged under the ROD" (*Basis of Design Report*, p. 143). Dredging of these areas "would remove substantial volumes of sediment at or below the 1 ppm remedial action level and would provide little or no net environmental benefit" (*Technical Memorandum*, p. 7) (emphasis added).

- Due to an undulating neatline surface and the necessary overdredge allowance, achieving the 1 ppm remedial action level would require dredging 2.0 – 2.6 million cy of sediments with PCB concentrations at or below the remedial action level. This approach "may result in unnecessary remediation of uncontaminated sediment, straining the available disposal site capacity, prolonging the cleanup process, and potentially resulting in relatively ineffective use of cleanup resources with little or no risk reduction" (*Basis of Design Report*, p. 143) (emphasis added).

- Substantial thicknesses (more than 13 feet in some locations) of contaminated sediments were discovered along several areas of developed shoreline. Dredging all the contaminated sediments is not practicable because of the predicted adverse impacts on the stability of the shoreline and shoreline infrastructure (*Basis of Design Report*, p. 79, 144; *Technical Memorandum*, p. 6).

- Limited landfill disposal capacity may be insufficient to handle the large sediment volumes that would be generated under the ROD (*Basis of Design Report*, p. 144).

In addition to the site characteristics identified above, several other issues with the ROD Remedy were identified in the Basis of Design Report and Technical Memorandum. First, the limitations of dredging, even with modern equipment, have become apparent (*Basis of Design Report*, p. 144). Residuals are "commonly spread both within the dredged areas and off site" and can "potentially result in post remediation surface concentrations that are similar to pre-remediation levels" (*Basis of Design Report*, p. 94-95). In fact, the post-dredge SWAC for OU 4 is predicted to be 3.7 ppm without implementation of a residuals management plan (post-dredging sand cover), which is higher than the existing SWAC – 3.2 ppm (*Basis of Design Report*, p. 95). The post-dredge SWAC for both OU 3 (0.57 ppm before implementation of the residuals management plan and 0.31 ppm after) and OU 4 (3.7 ppm before implementation of the residuals management plan and 0.32 ppm after) is predicted to be higher than the remedial goal of 0.25 ppm (*Basis of Design Report,* p. 95; *Technical Memorandum*, p. 2, 4, 11). Thus, dredging as contemplated in the ROD Remedy is unlikely to achieve the target SWAC.

Second, there are serious issues associated with dredging around utilities and infrastructure located in the River (*Technical Memorandum*, p. 7). Utilities and infrastructure include road and railway bridges, submerged pipelines, submerged cables, overhead cables, outfalls, and other submerged structures (*Basis of Design Report*, p. 22). Dredging would require relocation of the utilities, which is neither practicable nor feasible (*Basis of Design Report*, Appendix D, p. 4).

Landfill capacity is also a serious issue. There is limited landfill disposal capacity in the region, and very few regional landfills have the capacity or the willingness to accept large volumes of sediment (*Basis of Design Report*, p. 144). Moreover, the duration of the required easements for pipelines to carry sediments from the staging areas to the regional landfills may not cover the entire cleanup period, which leads to uncertainty on the feasibility of the ROD's transportation and disposal plan. (*Basis of Design Report*, p. 144). Thus, the "judicious use of regional landfill capacity" needs to be considered (*Basis of Design Report*, p. 144).

V. The Optimized Remedy Utilizes the Principles of EPA's December 2005 Contaminated Sediment Remediation Guidance for Hazardous Waste Sites.

The Guidance encourages the use of adaptive management concepts in managing contaminated sediment sites (*Guidance*, p. 7-16). At the Fox River, a more comprehensive sampling and analysis program implemented during remedial design, along with a more detailed review of recently completed environmental dredging projects, led to important, new information on site characteristics and clarified the limitations of dredging. Using adaptive management concepts, this new information was incorporated into a modified remedy, the Optimized Remedy, that follows the risk management framework of the Guidance (*Basis of Design Report*, p. 147, *Technical Memorandum*, p. 9).

In proposing the Optimized Remedy, both the Basis of Design Report and the Technical Memorandum appropriately focus on risk reduction and the comparative net risk potential of each alternative. Four examples of this focus on risk reduction and comparative net risk follow.

- **Sand Cover v. Dredging:** The Optimized Remedy recognizes that due to the limitations of dredging, removal of areas with a thin "veneer" of PCBs (1 – 2 ppm in a thin layer (six inches or less) overlying cleaner sediments) will not provide a net environmental benefit (*Technical Memorandum*, p. 7). Rather, placing a 6 inch sand cover will more effectively reduce risk than attempting to dredge these areas, as originally proposed in the ROD.

- **Engineered Capping v. Dredging**: The Optimized Remedy recognizes that, due to the limitations of dredging (e.g., resuspension, residuals, submerged utilities, and shoreline stability), and the lower risk posed by deeply buried stable contaminants, engineered capping will be more effective and feasible (i.e., implementable) in certain areas than the originally proposed dredging (*Technical Memorandum*, p. 6).

- **Use of Dredging/Capping Combinations:** The Optimized Remedy provides for the use of combinations of dredging and engineered capping in certain areas, as determined to be appropriate during the remedial design, to make use of the demonstrated strengths of both dredging and engineered capping (*Technical Memorandum*, p. 5). The Optimized Remedy provides for more targeted dredging by focusing on the sediments posing the most risk and supplements dredging with a combination of engineered capping and

placement of sand covers. The result is more protective of human health and the environment compared to the ROD Remedy, with an expected lower SWAC of PCBs (OU 3: 0.28 – 0.49 (Optimized Remedy) v. 0.31 – 0.57 ppm (ROD); OU 4: 0.25 – 2.9 ppm (Optimized Remedy) v. 0.32 – 3.7 ppm (ROD)), due to having fewer areas with post-dredging residuals, and, as noted below, resulting in earlier lifting of the fish consumption advisories. (*Technical Memorandum*, p. 11). In fact, under the ROD Remedy for OU 4, dredging would increase the SWAC if no residual management (i.e., sand cover) is implemented (*Technical Memorandum*, p. 11). The Optimized Remedy "would achieve a lower SWAC than the [ROD] after construction due to having fewer areas with dredging residuals" (*Technical Memorandum*, p. 11) (emphasis added). Thus, the Optimized Remedy provides better risk reduction and is more protective of human health and the environment than the ROD Remedy.

- **Reduced Implementation Time:** Implementation is expected to be completed between 6 and 15 years earlier under the Optimized Remedy (9 years (Optimized Remedy) v. 15 – 24 years (ROD Remedy)). In fact, the ROD Remedy's estimate is likely overly optimistic considering the relatively large number of substantive implementability issues listed in the Basis of Design Report. The Optimized Remedy's earlier completion, in turn, is expected to reduce water and fish tissue concentrations faster than the plan under the ROD, resulting in earlier lifting of the fish consumption advisories (*Technical Memorandum*, p. 12).

By applying the Guidance's principles and risk management framework to the substantial additional technical information developed since the ROD was issued, the Optimized Remedy more realistically addresses the limitations of dredging and the benefits of alternative remedial methods. The resulting Optimized Remedy is superior to the ROD Remedy for a number of reasons. It utilizes targeted dredging and incorporates engineered capping and the use of sand covers in order to maximize overall risk reduction. In addition, with the Optimized Remedy post-dredging residuals will be reduced, the SWACs will be improved, implementation time will be decreased, less landfill space will be required, and areas where dredging is infeasible, such as those areas with shoreline stability concerns or utility issues, will be effectively remediated.

Thus, the Optimized Remedy is more protective of human health and the environment than the ROD Remedy.

VI. SMWG Support for the Optimized Remedy.

The Optimized Remedy embodies EPA's national policy on contaminated sediment, as reflected in the Guidance, by focusing on risk reduction and appropriately evaluating the comparative net risk reduction of remedial options by realistically considering the limitations of dredging in designing an appropriate and effective remedial plan. The Optimized Remedy's expected achievement of lower SWACs in two operable units in a shorter time frame than the ROD Remedy is more protective of human health and the environment. The Optimized Remedy is also more cost effective than the ROD Remedy ($390 million (Optimized Remedy) v. more than $580 million (ROD)) (*Technical Memorandum*, p. 13). The Guidance supports implementation of remedies that are more effective in the short-term, more implementable, more cost-effective, and that can be completed earlier. Thus, the Optimized Remedy, which is more consistent with the Guidance than the ROD Remedy, should be approved. The Guidance's adaptive management concepts and risk management framework should continue to be applied at the Fox River such that the Optimized Remedy can be further improved as new information is obtained and more refined engineering analyses are conducted during the final stages of remedial design.

The SMWG would be pleased to answer any questions about its comments on the Fox River Optimized Remedy. For further information, please feel free to contact the SMWG's Coordinating Director, Steven C. Nadeau, c/o Honigman Miller Schwartz and Cohn LLP, 2290 First National Building, 660 Woodward Avenue, Detroit, MI 48226, (313) 465-7492, snadeau@honigman.com.

Respectfully submitted,

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EXHIBIT A
MEMBERSHIP IN THE SEDIMENT MANAGEMENT WORK GROUP

ALCOA, Inc.
Atlantic Richfield (a BP company)
BASF Corporation
Beazer East, Inc.
Boeing Company, The
CBS Corporation
Chevron Energy Technology Company
Consumers Energy
Dow Chemical Company
DTE Energy
E.I. duPont de Nemours and Company
El Paso Corporation
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