ASHTABULA RIVER (ASHTABULA, OH)
(MCSS DATABASE PROJECT 05-29)

General Project Overview

The Ashtabula River is located in northern Ohio and flows northward into Lake Erie. The Ashtabula River is a Great Lakes Area of Concern and the current dredging project involves two distinct phases of work -- a first phase that is primarily environmental dredging and a second phase that is primarily navigational dredging. Project design for both phases of work was coordinated through the USACE–Buffalo District.

The environmental dredging phase of the project was the first phase to be implemented and involved the removal of approximately 545,000 cy of sediment reportedly containing approximately 25,000 pounds of PCBs. The PCBs originated from the Fields Brook Superfund site (MCSS Database Project 05-04; remediation completed in February 2003), which flows into the Ashtabula River. The target area for this phase of dredging extends from the mouth of Fields Brook downstream to the 5th Street Bridge, approximately 30 acres total. Approximately 150,000 cy of this sediment is considered TSCA based on TSCA sediment containing 40 ppm PCBs or greater and removal cut lines (only 29,000 cy of sediment was estimated to contain 50 ppm PCBs or greater) that were established during project design. Other constituents of concern (COCs) have been found at the site including hexachlorobenzene, hexachlorobutadiene, and radionuclides (e.g., uranium, radium, and thorium).

Dredge area and cut lines established for this phase of dredging using modeling in an effort to maximize PCB mass removal while minimizing the surface-weighted area concentration (SWAC) of PCBs at the final excavated sediment surface. Additionally, a value engineering study performed in April 2006 in an effort to increase the likelihood of achieving the SWAC recommended the placement of six inches of clean cover material (sand) over the entire dredged area following dredging. This option was included in the final design for this phase of dredging. Funding for the first phase of dredging, $50 million, was partially from the Great Lakes Legacy Act ($25 million) and the Ashtabula City Port Authority ($18 million from PRPs; $7 million from the State of Ohio).

The second phase of dredging is considered navigational dredging, involves the removal of approximately 155,000 cy of moderately PAH-contaminated sediment from the 5th Street Bridge to the mouth of the river within primarily the navigational channel, and will be funded entirely by the USACE.

Sediment removal for the first phase of dredging began in September 2006 and was completed on October 14, 2007. J.F. Brennan was the dredging contractor, CH2M Hill was the prime contractor for dredging and the dredging oversight contractor, de maximis, inc. was the oversight contractor for the land-based operations (e.g., pipeline, dewatering, landfill, water treatment) and EPA and Ohio EPA provided joint regulatory oversight.

Cleanup Objectives

The stated project goals as summarized from the Basis of Design Report are:

- Leave residual surface sediment contaminant concentrations no worse than existing surficial sediment concentrations prior to the start of dredging;
- Remove TSCA and scour-risk mass;
- Remove 82 percent of the PCB mass;
- Immediately following dredging activities, achieve an estimated post-dredge SWAC of 7.5 ppm PCBs or less;
- Achieve a long-term SWAC for PCBs of 0.25 ppm, for radionuclides of 2 pCi/g or average background; and
- Reestablish in-water littoral shoreline habitat from the railroad bridge to 5 ½ slip.

First Phase Dredging In-Water Operations

The original design for this phase of dredging specified mechanical removal of the sediment with offloading at a nearby land-based facility for processing and then trucking of the processed sediment to the disposal location at the former RMI Sodium Plant site (State Road site). A suitable location for the land-based processing facility could not be established and the project design was subsequently changed to hydraulic dredging with the removed sediment being transported via dredge slurry pipeline directly to the disposal location.

Dredging began in 2006 with sediment removal being accomplished using a 12" hydraulic cutterhead dredge that discharged to a land-based transfer location that then pumped the sediment slurry to the disposal site through a 2.5-mile-long, double-line pipe (12" dia. inside pipe; 18" dia. outside pipe; both 1" thick walls). Two additional sets of booster pumps were used along the pipeline to maintain slurry flow. EPA estimates that during 2006 an average of 700 to 800 cy of sediment per day was removed.

For 2007, two hydraulic cutterhead dredges were used to remove sediment, the 12" dredge used in 2006 was used for production dredging and a second 8" dredge was used for performing cleanup passes at the bedrock interface. Both dredges operated simultaneously and discharged to the land-based transfer system where the slurries were combined for transport through the slurry pipeline to the disposal site. In late June, a Vic Vac dredgehead was also being used to further reduce the thickness of residual sediment remaining following removal by the other two dredges. EPA estimates that the 12" cutterhead dredge leaves ~2 feet of residual sediment behind, the 8" cutterhead dredge leaves ~1 foot of residual sediment behind, and Vic Vac leaves ~0.5 to 1 foot of residual sediment behind. A dredge tolerance of +1"/-6" was established for all "easily accessible sediments;" this language allowed for the use of increased dredge tolerances for less accessible areas such as in and around docks or other man-made structures. The production rate for 2007 is estimated to be 2700 to 2800 cy of sediment per day (113 to 117 cy per hour; two dredges).

Dredging was performed 24/7 and EPA reported that dredge uptime is averaging ~75%. Debris (e.g., animal hides, other debris of varying size including one car) was encountered and contributed to the dredge downtime, but not to the extent predicted during design. Larger debris items were initially causing the booster pumps to clog and shutdown. In-line cutters were installed at the dredgehead and upstream of the booster pumps to reduce the size of debris; EPA reports that the addition of the in-line cutters has greatly reduced the clogging and subsequent

unplanned shutdown of the booster pumps due to debris.

TSS is being used to monitor for resupension; the TSS limits are 25 mg/L (warning level) and 50 mg/L (shutdown level), both 4-hour rolling averages, and are based on the difference between upstream and downstream levels. Instead of depending on TSS analytical results to monitor for resuspension during dredging, EPA used the results of a correlation study performed in 2006 to develop a site-specific NTU to TSS correlation function (TSS=0.7396*NTU+3.6446) to allow the use of turbidity as a surrogate measurement for resuspension. As a result, turbidity monitoring was performed upstream of dredging and at 700 feet downstream of dredging. Water column samples were also collected once per week and analyzed for TSS, PCBs, and radionuclides. EPA reported that the warning level of 25 mg/L was exceeded a few times in 2007. EPA also reported that the turbidity monitors experienced considerable operations problems due to low water depth (impacted by boat traffic) and relatively high background turbidity, and that the monitors required considerable maintenance to function as intended. No in-water resuspension controls (e.g., silt curtains) are being used at the site. Confirmation surface sediment samples are being collected using a Ponar sampler on a 150-foot grid; redredging was to be performed in areas where surface sediments were found to contain >40 ppm PCBs.

First Phase Dredging Land-based Operations

Dewatering of the sediment is accomplished primarily using Geotubes that have been placed in the landfill area located at the former RMI Sodium Plant site. In 2006, the filtrate being discharged from the Geotubes was treated using sand and GAC filters and released back to the river. Significant problems occurred due to the filters becoming blinded as a result of the addition of polymer used to assist in the dewatering of the sediment. During 2006, problems with the water treatment system were the primary impediment to increased dredge production. Following shutdown of dredging for the winter in November 2006, the contractor added primary water treatment units (e.g., lamella separators, a polishing Geotube field) between the Geotubes and the water treatment plant to increase the efficiency of the water treatment system. All other processing systems remain the same as for the 2006 dredging.

The former RMI Sodium Plant site, owned by one of the PRPs, is a 12.5-acre area designed as a permanent single-cell landfill for the long-term storage of the removed sediment. Following dewatering, the sediment will be covered with a soil cap, and the landfill monitored for 50 years.

Project Schedule and Current Status

The first phase of dredging began on September 7, 2006 and continued until November 27, 2006 when activities were suspended for the winter; an estimated 65,000 cy of sediment was removed in 2006. In 2006, dredging was performed 6.5 days per week, with scheduled maintenance on Sundays. Dredging recommenced on or about April 1, 2007 and ended on October 14, 2007 following the removal of the remaining 490,000 cy of sediment. Following the completion of dredging, a sand cover is to be placed near bulkhead areas where >3 ppm PCBs remain in surface sediment and in open dredge areas where >40 ppm PCBs remain in surface sediment; sand placement is targeted to begin on November 5, 2007 with approximately 25% of the dredged area to receive the sand cap.

Area residents and sports fishermen were advised not to eat fish caught in the lower two miles of the waterway during dredging due to elevated levels of suspended solids that are anticipated as part of the dredging.

The second phase of dredging, the navigational dredging in the lower portions of the river, will be performed by the USACE and is currently targeted for 2008, as well as completing habitat restoration activities in the previously dredged areas.

References

Basis of Design Report, Ashtabula River Area of Concern, Ashtabula, Ohio, Final Design, prepared by CH2M Hill, Ecology and Environment, Inc., TN & Associates, Inc., Tucker, Young, Jackson, Tull, Inc., June 2006

Personal communications w/ S. Cieniawski, Remedial Project Manager, EPA.
[None that I depended on for this write-up – they are typically much too general and non-technical]