

Fox dredging beats goals

An on-the-water tour reveals progress for the nation's largest PCB river cleanup

Up close by boat on the waters of the Fox, the dredge's four-foot cutter head looks like the angry end of some giant, industrial serpent, ready to chew into the river bottom on its long steel neck. The dredge and its 12-inch-wide hose are removing sediment from the Fox to rid it of polychlorinated biphenyls, or PCBs, discharged into the river during carbonless copy paper production decades ago.

The operation uses three dredges – two smaller ones with eight-inch hoses and the main dredge with its 12-inch system. A flotilla of supporting craft dot miles of the river near the Hwy. 172 bridge in Green Bay, including booster pump platforms that keep the wet “slurry” flowing swiftly into the 248,000-square-foot processing plant on the west bank of the river near the Georgia Pacific plant.

This is the nation's largest river PCB cleanup. What's more, it's beating its goals. In 2009, the first year of dredging on the 13-mile project, 585,000 cubic yards of sediment were removed – 15 percent more than expected, says Jay Grosskopf, vice president of special projects with Boldt Technical Services in Appleton. Boldt is handling project oversight for the Wisconsin Department of Natural Resources. As of late October 2010, with three weeks of dredging until winter shutdown, 631,000 cubic yards had been dredged. That puts the project on track to extract roughly 700,000 cubic yards of sediment for



Top, the dredge operator uses satellite positioning and a digital map of the Fox River bottom to pinpoint where and how deep to dredge. Above, the 4-foot wide cutter head on the main dredge loosens contaminated sediment, while its 12-inch hose system sends the resulting slurry to the processing plant.

PHOTOGRAPHS BY ROBERTO MICHEL

The 248,000-square foot processing plant near Georgia Pacific holds massive tanks, filters and presses for separating sand and water from contaminated sediment, and compacting the remaining material into “filter cake” that is hauled to a landfill near Chilton.

2010, beating the target of equaling last year’s total.

There is plenty of outsized equipment and technology at work. The dredges use global positioning and software with a graphical view of the river bottom. The plant holds massive tanks and other gear to remove sand, dewater sediment, clean the water and press sediment into “filter cake” to haul to a landfill 37 miles away. In the plant’s control room, software gives engineers a real-time view into process status.

But technology doesn’t run the operation, say Grosskopf and others. Instead, its efficiency is attributed to principles like effective collaboration and bottleneck management. [continued] »



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For example, project managers use lean principles. Instead of building huge holding tanks to hold a backlog of slurry, the sediment processing is done in a lean, continuous flow. The bottleneck that paces things is at the end of the process – the 70-foot long filter presses. When the plant runs behind, dredging can be temporarily halted to perform preventive maintenance. Keeping press output consistent keeps the fleet of 20 to 24 trucks rolling on their normal five daily round trips.

Another tactic used to coordinate operations is to adjust where the dredging is done so that material coming off the river holds more solids, which increases plant efficiency. A few times per year when output will be low, daily truck runs are reduced from five to four.

“A fine balancing act is needed to keep everything in synch,” says Grosskopf. “They do it by communicating effectively.”

The key contractors are Tetra-Tech, a California-based company that runs the plant in conjunction with Dutch firm Boskalis Dolman, and J.F. Brennan, which handles dredging. The plant engineers stay in contact with the dredge operators via radio and cellular communications, and both parties use the same GPS-driven display of the river bed to see real-time dredging status.

The project plan was reached collaboratively between regulators and responsible parties. Lower Fox River Remediation LLC, created by Appleton Papers Inc. and NCR Corporation, is funding the cleanup to date.

The project’s methods, however, weren’t dictated by regulators, says Rick Fox, principal scientist with Natural Resources Technology, a Pewaukee-based environmental consulting firm involved with the project. Instead, says Fox, regulators worked with the responsible parties to establish cleanup criteria and efficient methods.

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This is the nation's largest river PCB cleanup. What's more, it's beating its goals. The project is on track to extract roughly 700,000 cubic yards of sediment in 2010, beating the target of equaling last year's total of 585,000 cubic yards – 15 percent above what was expected.

For example, the plan allows for some capping of contaminated sediments in low-risk areas, and was open to the use of hydraulic dredging instead of backhoes.

“Rather than staking out a position through a report, we were able to negotiate the fine points, and hear from each other what our main goals were,” Fox says.

The project still faces some unknowns. On the legal front, the state and U.S. Department of Justice filed a lawsuit in October that seeks funding assurances for the project from nine parties.

There have been few disruptions such as boats damaging hoses, or debris halting the dredges, says Grosskopf, though glitches could arise.

Bruce Baker, DNR water quality administrator, deems the collaborative approach a success. He says dredging could end “significantly earlier” than projected in 2015, though he can't pinpoint a new date. “By working together, we've kept the project moving on an expedited schedule,” he says. “I don't think any project of this size could be going any faster.” ①

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