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Remedial Design, Bidding Strategy and Smart Risk Sharing

By Tim Olean, GEI Consultants

Management of MGP sites is shifting away from investigation and study phases toward design and remediation. The potential value of the MGP remediation market is very enticing for new or growth-oriented remedial contractors. As such, more contractors with more varied experience levels are pursuing and bidding on MGP work.

Typical remediation costs can be 75–90 percent of the overall project lifecycle costs, and with common MGP lifecycle costs between $5 and 15 million, it's easy to understand why site owners and their consultants have developed smart risk-sharing strategies for cost predictability and control on MGP projects of all sizes. The strategies range from minimal design and project definition (with substantial risk placed on the remedial contractor) to well developed, tightly scoped designs (with limited risk placed on the contractor), and a range of risk sharing strategies in between.

Persuasive arguments can be made in favor of each strategy, depending on the objectives, and there are dramatic success and failure stories for each strategy. The highest probability of success is attained when the site owner and design consultant:

- Clearly understand the risks of the selected strategy;
- Make informed decisions, early in the planning process, on risk sharing in remediation; and,
- Implement the plan with discipline.

The further a project moves along a typical time-line, the more difficult (and expensive) it is to change course. The ability to impact final project costs decreases steadily the as remediation construction draws near.

Two primary approaches for implementing remediation are discussed herein.

Minimal Design – Shift Risk to Contractor

Under this strategy, similar to design-build contracting, an owner may have the consultant prepare a preliminary design or use a regulatory

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What's News

Newsbriefs

Dredging, Steel wall and Patience

Central Hudson began the first phase of its Newburgh, New York cleanup in 2007, when it removed portions of old storage tanks and excavated the former manufactured gas plant. Dozens of test wells showed that coal tar settled around Newburgh's sewage treatment plant and in the riverbed, as far as 150 feet past the Hudson's shoreline. The second phase of the cleanup began in early 2010 when Central Hudson started installation of a gigantic, underground steel wall along Newburgh's shoreline. The wall, which stretches 450 feet along the shore and 50-60 feet deep, will be buried permanently there to block the remaining coal tar from reaching the river. Spot dredging is also being used to remove coal tar that settled in the Hudson River. A barge will carry a GPS-guided claw that will precisely scoop out toxic sediment located anywhere from 2 to 20 feet below the riverbed. The dredging area will be closed off by temporary walls, silt curtains and absorbent booms built into the river to prevent the coal tar non aqueous phase liquid (NAPL) from floating away. All told, 26,000 cubic yards of sediment will be removed. A majority of the cleanup is expected to be completed in 2010, with the final restoration completed in early 2011. *By Adam Bosch, 2/7/10, recordonline.com; updated by Central Hudson 5/21/10*

Poughkeepsie to Benefit from National Study

Nine power companies from across the country are participating in a study supported by the Electric Power Research Institute (EPRI) in California that could help clean up coal-tar pollution in the Hudson River at Poughkeepsie. Dredging at the Poughkeepsie site could be challenging because the river is deep, the current is strong and electric and gas lines are buried below the riverbed. As a potential alternative to dredging at this site, scientists designed absorbent panels of organoclay. The panels sit inside a 1-foot thick mattress that's loaded with stone so that it remains in contact with the riverbed. Several panels were joined together to form a 10,000 square foot cap on the Hudson River sediment. The panels absorb non aqueous phase liquid (NAPL) as it bubbles out of the riverbed. Installation was completed in May 2009. The panels will be removed in late 2010 and will be studied to see how they performed. If the panels successfully absorbed NAPL, they could be installed permanently on the bed of the Hudson River. *By Adam Bosch, 2/7/10, recordonline.com; updated by Central Hudson 5/21/10*

Sites and Smells of Dig

In Columbia, South Carolina, SCE&G has implemented an odor control system to minimize fugitive odors in downtown Columbia from a $7 million SCE&G remediation project. SCE&G Project Manager Bob Apple says they are removing 100-year-old waste left by a manufactured gas plant. "At that time there were no environmental rules that addressed how to properly remediate a manufactured gas plant," said Apple. "So the plant was bulldozed and covered up along with tons of coal tar." Years later, the site would become the home of SCE&G's bus maintenance facility.

The soil removal project will require approximately 16,000 dump truck movements in downtown Columbia to transport (for disposal) the affected soils left behind from the century-old gas plant operations.

The odor control system was installed to manage the smell of the old coal tar. SCE&G is using odorant control agents on the working face of the excavation and a perimeter misting system to minimize off-site fugitive odors. The dirt that they take out of the ground will either go to a landfill in the area or to an incinerator in Virginia. Once the work's done, SCE&G will implement a groundwater monitoring program at the site to ensure groundwater restoration takes place. *3/1/10, wistv.com, updated by South Carolina Electric & Gas Company on 5/21/10*

A floating coal-tar containment barrier off the Hudson shoreline near the Newburgh water treatment plant will be replaced by a permanent containment wall. Times Herald-Record/JEFF GOULDING

Welder Steve "Shorty" Haviland of Cambridge works on a barge in late January as part of the Hudson River coal-tar cleanup. Times Herald-Record/JEFF GOULDING

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required work plan to define the intended scope. Requests for Proposals (RFPs) are sent to qualified bidders who then provide a technical and cost proposal (the bid).

The RFP bid documents should clearly state how changes in scope (waste volume increases, regulatory changes, stakeholder requirements, and unforeseen conditions) will be managed and who assumes the risk for each. By definition, this type of procurement has more uncertainty and thus more risk. If the risk for the uncertainties is shifted to the contractor, the bid prices will rise to offset the risk. If that risk is not realized, the contractor may experience a windfall. Conversely, if risk is underestimated and does materialize, the contractor may bear a loss so great that it could impact the ability to successfully complete the project, regardless of the contractual responsibility. As stated above, more and more contractors are anxious to enter the MGP market. A contractor, inexperienced in MGP remediation, may feel pressure to take unwise risks as a justification to enter a promising market.

Thorough contractor qualification, due diligence, a careful review of the risks, and a thoughtful strategy on where that risk is best placed are critical. Site owners may be tempted to place all the risk on the contractor; however that may result in unnecessarily high bids, conflicts down the road, or – in the worst case – an unfinished project that makes life extremely difficult and expensive for the site owner.

If a site owner chooses this approach, then the roles and responsibilities of the contractor and the consultant should be clearly defined. In many cases the consultant may only act as the owner's representative for design review and quality assurance. In other cases the consultant may be actively engaged in permitting and regulatory negotiation. The expectation for regulatory negotiation, regulatory imposed deadlines and management of regulatory submittals must be discussed and responsibilities assigned and documented prior to the selection of the contractor. Lack of clarity in these matters can result in substantial finger-pointing and little acknowledgement of responsibility if something goes wrong. We've seen this recently in the Gulf of Mexico, where British Petroleum (BP), Transocean Limited and Halliburton are jostling on an international stage to manage a disasterous oil spill.

One of the primary advantages of a contactor-led design is expediency; it may reduce time to get to the field, and thus may make sense for smaller projects with predictable scopes and minimal regulatory interface or long lead time approvals. This approach may also reduce design costs as detailed bid packages are not required. Another advantage of contractor-led remediation is the ability to take advantage of the contractor's constructability experience or a special technical ability or proprietary technology possessed by the contractor.

One potential serious disadvantage of this strategy is cost uncertainty. As the contractor is being selected prior to the final design, the risks (waste volume increases, regulatory changes, stakeholder requirements, and unforeseen conditions) can have major impacts on the final project cost. Avoiding a comprehensive scope definition in the preliminary phases will likely lead to claims and disputes no matter how the risk is defined in the contract. The plans and specifications provided with a comprehensive design provide detailed direction to the contractor on all manner of items from documentation, scheduling and meeting requirements and clear guidelines on how to manage changes in scope. Without this framework, misunderstandings and disagreements may develop on the part of both the owner and the contractor.

Contractors may have less project history and regulatory experience or may lack relationships with regulators and stakeholders. These issues may impact the ability to get the proper approvals to implement a remedy.

Comprehensive Design – Minimize Risk to Contractor

This approach, often called design-bid, is based on having a design engineer produce a comprehensive design and bid package with a prescribed scope, clear pay items, and a clear delineation of risk. Often the pay items on these projects include a mix of fixed cost items for tasks of known quantity or duration and unit price items for tasks that are related to quantities or volumes that cannot be fixed during the design phase. Costs for pre-design investigations are expected to be higher than for the Minimal Design approach, but the clear scope and competitive bidding should provide closer more competitive bids, and result in minimal construction costs and fewer change orders. Completing a comprehensive design is also likely to provide more cost predictability earlier in the process.

For design-bid projects it is critical that constructability input is incorporated to ensure the final scope can be implemented both safely and efficiently. Site owners who take this approach should select consul-

The ability to impact final project costs decreases steadily the as remediation construction draws near.

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GEI Consultants

Editorial

Tar Trek – The Next Generation

By Roger Hathaway, GEI Consultants, Inc.

For the last few decades, electric utilities have primarily observed as other industries navigate impacted waterways, assign responsibility for impacts, and negotiate clean-ups between multiple parties and agencies. For the most part, the utilities have avoided these tricky currents, performing occasional clean up of rivers, streams, and creeks where the liability and clean-up criteria have been clear.

But more and more of the nation's waterways are being targeted by regulatory agencies and PRP groups, and utilities are inevitably being drawn in. This is no surprise for MGP aficionados, because most major waterways had at least one MGP on a nearby bank. And since "poke and sniff" sediment reconnaissance frequently generates immediate and distinctive evidence of coal tar (regardless of significant co-mingled metals and PAHs from other sources) it's easy to see why other stakeholders immediately attribute the entire problem to utilities – the current responsible parties for former gas plant operations.

As a result, I've been spending more and more time at conference room tables, elbow to elbow with oil companies, chemical manufacturers, and anyone who ever bought, sold, manufactured or otherwise used PCBs. These meetings remind me of the early, anxious days of CERCLA, when no one really understood the regulations, whether there was a sensible process for making decisions, or how the regulators would interpret a risk assessment.

Sediments still pose vexing questions about receptors and re-suspension, combined sewers and capping effectiveness, upland sources, and future uses. There is little apparent agreement on which agencies are addressing which parts of the issues, and a lot of reasonable and appropriate consternation about spending large sums of money for little long term gain. My advice for utility managers stepping deeper into the muck is to bone up on the mummichog, or your local anadromous fish. You will be getting to know them a lot better over the next few years.

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tants and engineers who can demonstrate similar successful projects and have capable constructability reviewers in-house with real world implementation experience. For specialty technologies such as in-situ solidification or sediment dredging, constructability review and real world implementation experience is a must.

Design-bid strategies work best for complex projects that require substantial stakeholder or regulatory involvement and buy-in. The consultant/designer and the owner can review conceptual and preliminary designs with critical stakeholders throughout the process. Adjustments and design revisions can be made prior to contractor bidding avoiding re-pricing or change orders. Major changes in direction, technology or methodology can also be evaluated prior to locking in with any vendor. Cost impacts based on market conditions can be evaluated without being locked into the cost structure and capabilities of any single contractor.

As an example, a design-build project may be bid prior to having a full understanding of requirements for excavation support. With this scenario, the successful design-builder may initially propose a common technology with which they have in-house experience, such as driven sheet pile, when an alternate technology (with which the bidder is not familiar) could be more cost effective. Owners will also get more cost certainty earlier in the process to support decisions on direction of the project based on these cost projections.

The design-bid process should provide closer, more competitive bids, as the bidders are less likely to load their costs with contingencies. As a way to capture some of the benefits of design-build, many owners request and encourage alternate bids and value engineering proposals. Competing firms are required to bid on the base bid as designed but may provide an alternate bid based on their special capabilities or proprietary technologies. Owners can then compare theses proposals against the base bid design concept and evaluate if the alternates meet their requirements and the obligations negotiated with regulators and other stakeholders.

The design and review process may extend the time to get to the field versus the minimal design approach. Hybrid concepts, such as bidding at the 50% to 65% design stage, can realize some of the benefits of a comprehensive design while also benefitting from bringing a contractor on board early to provide input into the design to expedite remediation.

Owners who have completed large remediation projects have many success and horror stories to tell using all forms of contracting and risk sharing approaches. There is no one perfect option. Each owner should assess their organization's tolerance for risk, need for cost certainty, stakeholder commitments and past experience when planning for future remediation projects. Change orders are inevitable in remediation given the inability to characterize any site with 100% certainty. However, smart strategies minimize the number and value of change orders and allow for smart decision making when assessing, mitigating and sharing risks between the owner, consultant and contractor. In the end, the actual strategy selected may not be as important as making the decision early and following through with discipline and planning.

If you have comments or questions, please contact Tim Olean at tolean@geiconsultants.com

Coal Tar History

Gig Harbor icon remembers early days of fishing with nets dipped in hot coal tar

Nick Markovich is one of the elder statesmen of Gig Harbor's fishing fleet. Markovich, who was born and raised in Gig Harbor, Wash., comes from a long line of fishermen. Markovich began purse-seining for salmon with his dad at the tender age of 14, back in 1942. When they weren't out fishing, the fishermen hung their nets and did repairs in net sheds all along the shore of the harbor.

In those days the nets were made of cotton, which rotted after three or four years of use. To preserve them and slow the deterioration, the nets were dipped in hot coal tar, then rung out and hung or spread to dry. Then they had to be cleaned every couple of weeks. "That was the worst part of fishing – tarring the nets," Markovich said. Once the nets were in the water, the saltwater helped to loosen up the tar, so the nets got softer and easier to use as the season wore on. "But they had to be re-tarred every year before we left to fish."

Read more at: http://www.kitsapsun.com/news/2010/apr/10/gig-harbor-icon-remembers-early-days-fishing/#ixzz0lYut7AtH

Nick Markovich is one of many local fishermen that were the pioneers of the Gig Harbor fishing fleet.

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