Narrative of Cost and Schedule Assumptions
Ecosystem-Based Rehabilitation Plan for the Lower Fox River

Introduction

The cost estimate is based on the draft "Ecosystem-Based Rehabilitation Plan – An Integrated Plan for Habitat Enhancement and Expedited Exposure Reduction in the Lower Fox River and Green Bay" (compiled by The Johnson Company, Inc., December 20, 2001). The Ecosystem-Based Rehabilitation Plan (Rehabilitation Plan) was written by a panel of scientific, engineering and environmental experts and incorporates the following remedy for the Lower Fox River:

- Subaqueous capping contaminated sediment in Reaches 1, 3, and the upper portion of Reach 4 (Reach 4A);
- Creation and enhancement of fishery and water-dependent wildlife habitat in Reaches 1, 3, and 4A, and, in cooperation with other groups, 5;
- Ongoing removal of contaminated sediment from Reaches 4B and 5 via periodic navigational dredging; and
- Long-term monitoring and maintenance of habitat, physical cap integrity and chemical cap integrity.

The schedule is based on the maximum durations for placing the subaqueous caps in Reaches 1, 3 and 4A that are cited in the Rehabilitation Plan:

- Reach 1 – 4 years
- Reach 3 – 2 years
- Reach 4A – 10 years.

The proposed remedy begins with simultaneous construction at Reaches 1 and 4A. Once Reach 1 is completed, capping will begin in Reach 3. The schedule assumes that each of these three reaches will require approximately four years for a pre-design investigation, draft and final design (including agency review and revision) and permitting, and staging area preparation prior to any construction. For Reach 3, these tasks are scheduled in parallel with latter construction stages of Reach 1, so that construction will not be interrupted.

The costs assume a five-day workweek with a construction season of approximately six months per year (mid-April through mid-October). In general, all cost estimates were generated from a collection of direct vendor quotes (including internet sites), RS Means®, and records of local real estate transactions.

The general cost categories are as follows:

- Property Acquisition / Preparation / Restoration for Staging Areas
- Navigational Dredging / Tipping Fees
- Subaqueous Capping
- Emergent Wetlands Construction
- Staging Area Materials Management
- Prime Contractor
- Baseline Sampling and Long-Term Monitoring
- WDNR and EPA Oversight
- Professional / Technical Services (Level of Effort)

Property Acquisition/Preparation/Restoration for Staging Areas

As mentioned above, the Rehabilitation Plan scenario includes subaqueous capping for Reaches 1, 3, and 4A. Remedial construction in these reaches will require shoreline property during the capping (construction) seasons for the purpose of moving aggregates for cap construction from offsite resources to the river. These staging areas will require the construction of a paved access road, areas for storing and handling the aggregates used to build the caps and a shorefront barge-loading area. Due to the length of each reach and the locks currently separating them, acquisition and improvement of shoreline property to provide access and area for materials handling is assumed for each reach. For the purpose of estimating and staging of variety of aggregates, it is assumed that ten acres of property will be purchased for each of the three reaches (lease or rental may be alternatives). It is assumed that an existing vacant structure will be removed and that half of the property is undeveloped and will, therefore, require clearing. Site preparation assumptions include: grading, fencing, stormwater runoff and erosion control measures, installing a hydrant, an access road (asphalt) and a docking facility.

Once the capping construction is completed, the property will be restored. Restoration assumptions include: removal of the road and chain-link fence, final grading with topsoil, hydroseeding, and landscaping.

The estimated costs include those for purchase of the property and payment of applicable property taxes. It has been assumed that the property would be owned for period extending from one year prior to construction in the reach, to accommodate preparation of the staging area, to one year after the completion of construction in the reach to accommodate restoration. Estimated taxes for this period have been included. After the property has been restored, we have assumed that it would be donated to municipal, county or state ownership. In addition, there would be recorded an easement providing for access to the river and reconstruction of staging facilities should these properties be needed for maintenance of the caps.

Navigational Dredging/Tipping Fees

Reach 4B

According to the Great Lakes Commission, approximately 130,000 cubic yards (cy) of sediment is dredged annually from Green Bay Harbor (including Reach 4B) to maintain the navigational channel. This dredge spoil is reportedly disposed of into the Bayport Confined Disposal Facility (CDF) in Green Bay. The cost model assumes payment of tipping fees (at $10/cy) from this annual event until two years after completion of Reach 4A capping. The cost model also assumes that dredge spoils will be analyzed (at a frequency of 1 sample per 500 cy) prior to disposal. Sampling and analysis for this effort is approximately $2/cy. The cost model assumes that tipping fees include the additional $2/cy analytical cost for a total of $12/cy.

Navigational Dredging for Recreational Boats

Many of the Lower Fox River (LFR) locks may soon be reopened for recreational boat traffic. According to an Environmental Impact Statement entitled "Disposition of Fox River Project, Wisconsin Navigation Portion, (U.S. Army Corps of Engineers, 1997)", approximately 74,000 cy of sediment will have to be removed from navigation channels along the LFR to maintain federally required depths. This assumes a depth of 6-feet, however a 4-feet deep channel may be sufficient to accommodate recreational navigation needs.

The cost model assumes payment of tipping fees for this proposed dredging. Because of the uncertainty of the depth requirement and the age of the data, the cost model assumes that 74,000 cy of sediment will be dredged. The schedule assumes that this lock rehabilitation dredging will occur in year 2003.

The WDNR compiled a document in 1999 titled, "Quantification of Lower Fox River Sediment Bed Elevation Dynamics through Direct Observations, Model Evaluation Workgroup Technical Memorandum 2g". This document includes a table (see Table 1 of supporting documentation) that indicates during the period 1957 to 1998 the Menasha Channel was dredged once in 1965, which produced approximately 11,000 cubic yards of dredge spoil. This implies a very low depositional rate in Reach 1. The cost and schedule model assumes paying for a second dredging event within Reach 1 in 2019 (during the long-term monitoring period) to maintain navigational depths. Tipping fees for the navigational dredging are assumed to be $12/cy based on 2001 dollars inflated to 2019.

Subaqueous Capping

Capping locations, volumes, and materials were provided by the Johnson Company, Inc. memoranda to PCC of November 8, 2001. All capping will require silt curtains to mitigate the effects of turbidity from potential sediment agitation. The silt curtains require anchors and will encompass the submerged working construction (or placement) areas.

Equipment

The capping process will occur in Reaches 1, 3, and 4A, and will place the following three types of material: quartz based screened sand (fine, medium, and coarse), and limestone based crushed aggregate (medium and coarse sand and fine and coarse gravel). The cost estimate assumes the aggregate placement or "capping" procedures will require the following equipment and labor: four barges (with a labor foreman on two), two tow boats (with one captain and two deckhands on each), one conveyor Telebelt® truck (operated by one heavy equipment operator and one medium equipment operator), one excavator (operator included), one front end loader (operator included), and one shoreline crane (operator and oiler included).

Setup

One of the barges will hold the excavator, front-end loader, and conveyor belt truck. The heavy and medium equipment operator will be responsible for the conveyor Telebelt® truck operation. The barge that carries the Telebelt® and places the capping aggregate in the designated locations is referred to as the "conveyor barge" in this document. The conveyor barge will have moveable "posts" (commonly referred to as "spuds") for anchoring during material placement.

One labor foreman and two deckhands will staff two of the barges. These barges will be used to receive material from the stockpile area located onshore (described below) and transport the aggregate to the conveyor barge, which will be positioned at the designated placement area. The third barge will be used to carry additional aggregate and will be attached to one of the other barges. In this description of the operation, the three barges will be referred to as “material barges.”

The two towboats will each have a captain and will be used to position the four barges. Once the conveyor barge is positioned by a towboat, the same towboat will then be attached to one of the material barges.

The crane will be located onshore and will be operated and maintained by a crane operator and oiler. The crane will be used to load the aggregate from the onshore stockpile onto the material barges.

Procedure

The daily barge placement begins with the towboat moving the conveyor barge to the designated placement location. The deckhands will be responsible for tying the towboat to the conveyor barge and positioning the silt curtain around the proposed placement location. Once the conveyor barge has been anchored in the appropriate location, the deckhands will tie off the towboat and travel back and attach it to the available material barge. At the end of the day, this process will be reversed to bring all barges back to a shoreline docking facility.

After the conveyor barge has been placed, the deckhands will tie the material barges to the loading dock. The crane will move the aggregate from the stockpile and place it on the barges. The labor foreman will supervise the operation. Once a material barge is loaded, the deckhands will tie off the barge and travel to the conveyor barge. In the case of the third barge, the loading procedure will continue until both material barges are completely loaded. After the material barge reaches the conveyor barge, the deckhands will tie the barges together, and the excavator will begin unloading the material barge and stockpile the material on the conveyor barge. In addition to stockpiling, the excavator will also load the material into the hopper on the conveyor Telebelt® truck. The front-end loader will work with the excavator by organizing each of the different materials into separate piles. In addition, the front-end loader will continue to maintain the piles to provide for better accessibility for the excavator. The conveyor Telebelt® truck will be used for the actual placement of the material. After the excavator unloads the material barge, the deckhands will tie off the material barge, and travel back to the loading dock to repeat the process. In the case of the third barge, the deckhands will tie off the empty material barge from the conveyor barge, and the towboat will turn the attached material barges around so the filled material barge is closest to the conveyor barge. Then, the deckhand will tie on the material barge, and the unloading procedure will continue. Each of the material barges will follow in a routine order of loading and unloading material. This procedure will operate eight hours a day.

Subaqueous Capping QA/Bathymetry Survey

The estimates include costs to monitor the placement of cap aggregates (via frequent bathymetric surveys), the composition of the cap (via sieve analysis and specific gravity testing), and the turbidity of the surface water during cap installation.

Subaqueous Capping Rates

The capping program assumes that the conveyor will deliver approximately 1.7 cy/minute for 8-hours/day (this assumes a 12-hour working day at 2/3 production time) for a total of 820 cy/day. At 1.4 tons/cy, delivery is 1,150 tons/day. The Putzmeister Telebelts® (TB105 and TB130) are rated for an average maximum output of 360cy/hour and can deliver up to 4-inch stone. The estimates assume that the conveyor system and an excavator (and/or front loader) will be sitting on a shallow-draft spud barge. The three other shallow-draft barges (at 200+ cy capacity) will deliver aggregate to the conveyor barge.

Emergent Wetlands Construction

Equipment

Emergent wetlands will be constructed in Reaches 1 and 4A. This construction will include placement of two different types of material in certain wetland areas located near the shoreline. The materials are the following: quartz-based screened sand (medium) and topsoil. The cost estimate assumes that aggregate placement or "capping" procedures will require the use of the same equipment as the subaqueous capping minus one material barge. In addition, one Heavy Duty Amphibious Swamp Excavator "Marsh Buggy®" (operated by one heavy equipment operator) will be used.

Setup

The setup for emergent wetlands construction will be the same as subaqueous capping. In addition, the marsh buggy will be located near the wetland area and will be operated by a heavy equipment operator. It will be used for grading the aggregate and topsoil over the wetland area that is deposited by the conveyor Telebelt® truck.

Procedure

During the subaqueous capping process, materials will be moved to the proposed wetlands area in the same manner as described in the subaqueous capping section.

The conveyor Telebelt® truck will be used for the actual placement of the aggregate and topsoil. The marsh buggy will grade these deposited materials and distribute them evenly over the constructed wetland area. After the excavator unloads the material barge, the deckhands will tie off the material barge and travel back to the loading dock to repeat the process. Each of the material barges will follow in a routine order of loading and unloading material. This procedure will operate eight hours a day. Once topsoil has been placed in the constructed wetland area, this entire area will be hydroseeded and landscaped with appropriate hydrophilic vegetation. In addition, crushed limestone may be spread for proper pH adjustment. The entire area will be watered at least one time.

Emergent Wetland Construction QA/Survey

The estimates include costs to monitor surface-water turbidity during the wetland construction and costs for land surveying and global positioning system (GPS) mapping of the completed wetland.

Emergent Wetland Construction Rates

The emergent wetland construction will be completed at a slower rate than that of the subaqueous cap because the surface of the constructed wetland will be finely graded. The cost model and schedule assumes that the wetland in Reach 1 will require a full season to complete and the conveyor will deliver approximately 1.1 cy/minute for 8-hours/day (this assumes a 12-hour working day at 2/3 production time). The calculated daily placement rate for constructing the emergent wetlands is 530cy. At 1.4 tons/cy, delivery is 740 tons/day. The estimates assume that the conveyor system and an excavator (and/or front loader) will be used on a shallow-draft spud barge to deliver the aggregate to the Telebelt®. The two other shallow-draft barges (at 200+ cy capacity) will deliver material to the conveyor barge.

Emergent Wetlands Repair

The following year after the emergent wetlands are created, these wetlands will be inspected and repaired from damage that might have occurred during the previous winter.

Equipment

The wetland repair process is modeled to occur in Reaches 1 and 4A during the time the subaqueous capping process is occurring. As for the original construction, the assumed repair of the constructed wetlands will include placement of quartz-based screened sand (medium) and topsoil. The cost estimate assumes that repair procedures will use the same type of equipment as the emergent wetland construction: two barges, one tow boat (including its crew), and the hydraulic excavator. In addition, a second front-end loader with an operator will be added to the operation to manage aggregate loaded onto the barges.

Setup

Both barges will hold a front-end loader. These barges will act as “material barges”. The “material barges” will have moveable “posts” for anchoring during material placement. Since there is only one labor foreman for the operation of two “material barges”, the labor foreman will only be present on the barge that is in transport. The barges will be used to receive material from the stockpile area located onshore (as described below) and transport it to the Heavy Duty Amphibious Swamp Excavator “Marsh Buggy®”. The “Marsh Buggy®” will be located near the wetland area and will be operated by a heavy equipment operator. It will be used for placement and grading of the aggregate and topsoil over the wetland area to be repaired.

A captain will drive the towboat. The towboat will be used for the movement of both barges. The two deckhands will be responsible for attaching and detaching the towboat from the barges and setting up the silt curtain.

The crane will be located onshore and will be operated and maintained by a crane operator and oiler. The crane will be used to load the aggregate and topsoil from the onshore stockpile onto the material barges.

Procedure

The marsh buggy will place the aggregate and topsoil in the area, grade the placed material, and distribute it evenly over the wetland area to be repaired. The front-end loader will organize each of the different materials into separate piles. In addition, the front-end loader will continue to maintain the piles to provide for better accessibility for the marsh buggy. After the marsh buggy unloads the material barge, the deckhands will tie off the material barge and travel back to the loading dock to repeat the process. Each of the material barges will follow in a routine order of loading and unloading material. This procedure will operate approximately eight hours a day. Once topsoil has been placed in the wetland area to be repaired, this area will be hydroseeded and landscaped with appropriate vegetation. In addition, crushed limestone will be spread for proper pH adjustment. The repaired area will be watered at least one time.

Staging Area Materials Management

As mentioned above, a materials delivery road (asphalt) and staging areas will be constructed on the shorelines of Reaches 1, 3, and 4A. It is assumed that two full-time workers will operate loaders within the staging areas. It is assumed that up to 60 trucks (each carrying approximately 22 ton loads) will deliver the material to the staging areas each day. Because there will be up to eight gradations of aggregate and topsoil delivered (different sizes of quartz and limestone sand, topsoil, and different sizes of gravel), one loader will move these materials from the asphalt delivery area to their respective stockpiles. The second loader will move these materials from each stockpile to a loading barge area adjacent to a crane.

The cost estimate also includes dust control (watering truck every 2 weeks) and the following full-time workers: a safety engineer/foreman, a site superintendent, two semi-skilled laborers, a crane operator, and an oiler.

Prime Contractor

The cost estimate incorporates overhead and profit for all of the construction contractors. In addition, the estimate assumes that a prime contractor will conduct and supervise all field operations and subcontractors. The prime contractor will include (at a minimum) the site foreman and superintendent (as described above) and will incur overhead costs and be paid a set profit margin (as described below.)

The following information was taken from “A Guide to Developing and Documenting Cost Estimates During the Feasibility Study (USEPA, July 2000)”.

Prime Contractor Overhead

Prime contractor overhead is a fee paid to the prime contractor to cover costs incurred for field office overhead (general conditions) and home office overhead (general and administrative). Field office overhead will include items such as field supervision and office personnel, temporary facilities and utilities, telephone and communication, permits and licenses, travel per diem, personal protective equipment, quality control, insurance, bond, and taxes. Home office overhead is the contractor’s overall cost of doing business, as shared by the project. The prime contractor’s overhead fee is assumed to be 8% of the overall construction cost (less tipping fees). This is higher than the suggested range of 5% because it includes the cost to manage and oversee all off-season activities such as mob/demob of barge equipment, any winter site maintenance activities, spring start-up, any other on-site labor beyond the site superintendent and foreman (mentioned in the Materials Management Section).

Prime Contractor Profit

Prime Contractor Profit is the prime contractor’s return on investment in the project.
For this project, the prime contractor’s profit margin is calculated to be 8% of the overall construction costs (including contractor overhead but not including tipping fees). This is the low range of the EPA suggested 8-10% percent because of the magnitude of the project.

Baseline Sampling and Long-Term Monitoring

Screening Level Risk Assessment

The following chemicals of potential concern (COPCs) were identified by the WDNR following completion of the Screening Level Risk Assessment (SLRA) (ThermoRetec, 1998):

- Polychlorinated biphenyls (PCBs; total and/or Aroclor 1242)
- Dioxins (2,3,7,8-TCDD) and Furans (2,3,7,8-TCDF)
- DDT, DDE, DDD and Dieldrin
- Arsenic, Lead and Mercury

Baseline Risk Assessment

A draft baseline human health and ecological risk assessment (HHRA and ERA) was recently prepared for the Lower Fox River (ThermoRetec, 2001). The HHRA and ERA determined that bioaccumulation of PCBs from sediment represent the greatest threat to human health and the environment. Other COPCs carried forward for remedial evaluation and long-term monitoring were mercury and DDE.

The HHRA calculated the highest cancer risks and non-cancer hazard indices for recreation anglers and high-intake fish consumers on consumption of fish containing PCBs. The only other receptors with cancer risks exceeding acceptable EPA thresholds were hunters, drinking water users, and local residents. The risk to the hunter was attributed to ingestion of PCBs in waterfowl. The risk to drinking water users was attributed to arsenic in surface water, only in Reach 4. However, the elevated arsenic was from a single detected value and the water in this reach is not currently used as a source of drinking water.

The ERA focused principally on reproductive risks and determined that sediment concentrations of PCBs, TCDD, DDE, DDT, lead, and mercury were at levels sufficient to pose risk to ecological receptors.

Because of the various concerns for the chemicals mentioned above, it is assumed that all of the COPCs will be evaluated as part of the long-term monitoring along the LFR.

Sampling Program

We have modeled the sampling and analysis programs in four parts. These parts are the following: 1) Design investigation; 2) Pre-Construction monitoring sampling and analysis; 3) Construction sampling and analysis; and 4) Long Term Monitoring (LTM) at completion of construction. The LTM estimates conservatively assume that WDNR will require monitoring every Reach for all COPCs identified in the SLRA. For reaches 1 and 4, the schedule for the Design Investigation includes over two years for developing the work plan for and implementing the baseline sampling (over two work seasons) of sediment, fish, and surface water as well as bathymetric surveying. This investigation will be initiated four years prior to the construction start date and includes extensive sampling in order to characterize each Reach. The Design Investigation sampling and analysis for Reach 3 has been scheduled to accommodate starting construction in Reach 3 after completion of construction in Reach 1. Following the Design Investigation, annual Pre-Construction Baseline Sampling will be implemented to record changes in sampled media since the Design Investigation. The Pre-Construction Baseline Sampling will be two years long for Reaches 1, 2, 4A, and 5 while Reach 3 will be 6 years long (4 years prior to the Design Investigation and 2 years after the Design Investigation). Annual Baseline sampling during construction will be implemented to record any changes in sampled media since the Design Investigation. This sampling is not associated with the water quality and cap placement monitoring, which will occur on a daily basis during construction. A 40-year post-construction monitoring duration per Reach was chosen based on the Draft Feasibility Study (ThermoRetec, 2001). The 40-year post-construction duration for LTM will begin once the capping and wetlands restoration program (by reach) is complete, and will include 5-year remedy review reports. Post-construction LTM for Reaches 2 and 5 will begin once the capping program for Reaches 1 and 4A (respectively) are complete. The cost and schedule models assume that LTM will be performed annually until 5-years post-construction of the respective reach. The five year post-construction (annual) LTM for Reach 2 will coincide with Reach 1 and Reach 5 will coincide with Reach 4A. After the five annual LTM events are completed (respectively for each reach), then LTM will be performed every other year for a total of six years. Once this 6-year period is up, LTM will be conducted on simultaneous 5-year cycles (to coincide with the 5-year reporting) until the 40-year post-construction LTM cycle is complete.

The LTM sampling program includes laboratory analysis of surface water, sediment (from both capped and non-capped areas), and fish as follows:

- Surface water samples will be collected (bi-annually) at each reach inlet and outlet for the COPC suite and total suspended solids.
- Sediment samples will be collected (annually) from capped and non-capped locations within each reach for the COPC suite, grain-size distribution, and macroinvertabrates.
- Fish will be collected every year within each reach and analyzed for PCBs, mercury, DDE, and biomarkers.

In addition to the above sampling program, it is assumed that composites of the dredge spoil and leachate from the navigational dredging task will be analyzed for the COPC suite.

<u>Institutional Controls (deed restrictions)/Community Relations/Long-Term Monitoring Plans (One-time event)</u>

Institutional controls, community relations, and long-term monitoring plans are essential ingredients for the LTM program. The cost and schedule assumptions include one-time events (for each reach) for the development of institutional controls (or deed restrictions) to maintain the cap and to regulate post-construction activities to minimize the potential for damage to the caps, for a community relations program (CRP), and for a long-term monitoring plan (detailing items including data quality objectives, sampling, reporting, QA/QC and scheduling).

For Reaches 2 and 5, the costs for institutional controls and monitoring plans along with $200,000 from the cost of design investigation baseline monitoring were allocated evenly across four tasks: design investigation work plan with approval, procurement of investigation contractors, institutional controls and monitoring plans, and 30%/100% design of MNR program with approval.

Annual QC, Data Management, and Audit/Reporting

The monitoring estimates include annual costs for the following: QC, data management, and reporting. Quality control includes an evaluation of monitoring progress, satisfaction of data quality objectives and modification of the monitoring plan, if necessary. Data management includes long-term data storage and packaging for evaluations and reports. Audit/reporting includes responding to any audit compliance and annual reporting to the agencies. It is also assumed that there will be 5-year trend evaluations and a final report during the LTM (one-time demonstration of compliance). Reporting will also support the CRP and information repositories.

WDNR and EPA Oversight Costs

Costs for WDNR and EPA Oversight of the remediation, from pre-construction activities through long term monitoring for each reach, have been included in the estimate. These cost estimates were built by reviewing the project schedule, the EPA Remedial Design/Remedial Action Handbook (EPA 540/4-95/059, June 1995), and the Guidance on EPA Oversight of Remedial Designs and Remedial Actions Performed by Potentially Responsible Parties (EPA/540/G-90/001, April 1990) to model the agencies personnel likely to be involved in the oversight, their responsibilities, and their level of effort.

The key personnel modeled in the estimate are the Remedial Project Manager, the Remedial Project Manager Assistant, and the Oversight Official. As defined in EPA documents the Remedial Project Manager (RPM) is "the Federal official designated by EPA to coordinate, monitor, or direct remedial activities." The RPM is responsible for overall approval of Remedial Design documents, the Remedial Action Work Plan, and Construction Quality Assurance Plans. Due to the size and complexity of this project a Remedial Project Manager Assistant was included. The Oversight Official reports directly to the RPM and provides technical support and monitors project compliance. The Oversight Official's responsibilities may include review of design and work plans and review of the Remedial Action for compliance with the Construction Quality Assurance Plan.

The RPM will form Technical Review Teams, as required, to assist in review of the Design Investigation, Design and Permitting, and Construction Quality Assurance and Construction Quality Control Plans. The following teams in are included in the estimate: a Legal team, a Schedule and Budget team, an Investigation team, a Permitting team, a Capping team, and a Quality Assurance team. The assumed structure and members of the review teams are based on Figure 3-2 from the Remedial Design/Remedial Action Handbook.

Once the tasks and personnel were identified, the level of effort required for the tasks was estimated. The estimates are based on the assumption that the project will experience a moderate number of issues that will not, however, cause the rates to invoke formal dispute process or engage in protracted negotiations. That is, if the design and or remedial activities are consistently not meeting the standards set in the Record of Decision or the approved design, the WDNR and EPA oversight costs could increase significantly. Direct expenses such as document preparation cost and travel expenses have also been included for each task.

The salary rates for personnel are from the Federal Government General Schedule Pay, 2001 Locality Pay Chart for Milwaukee-Racine, WI. Grade levels based on the assumed education and experience required for each position were used. Step 6 salaries were assumed for consistency. Open positions advertised by the EPA on the EPA website and salary vs. grade information from the US government were reviewed to compare grade levels with the assumed position responsibilities.

Once the total direct costs of the project were estimated, the indirect overhead cost was added according to the EPA Guidance on exercising CERCLA Enforcement Discretion in Anticipation of Full Cost Accounting Consistent With the "Statement of Federal Financial Accounting Standards No.4". According to this guidance, for Region 5 a 41.6% mark-up is applied to the total cost of the project to distribute indirect costs.

Professional/Technical Services (Level of Effort)

The following information was taken from "A Guide to Developing and Documenting Cost Estimates During the Feasibility Study (USEPA, July 2000)".

Professional and technical services were separated into the following elements and were calculated as a percentage of the total construction:

- Remedial Design
- Permitting
- Construction (Oversight) Management
- Project Management
- Technical Support

Remedial Design

Remedial design is estimated to be 6% of the total construction cost (less tipping fees). This element includes analysis of pre-characterization data and reports, and the development of all plans and specifications (draft and final) for each reach. The EPA guidance suggests 6%. The monies for remedial design in Reaches 1, 3, and 4A were allocated as follows: 40% for the design investigation work plan with approval, 10% for the procurement of investigation contractors, and the remainder for the 30% and 100% design and permitting with approval.

Permitting

Permitting is estimated to be 3% of the total construction cost (less tipping fees) because of the number and complexity of permits likely required to perform the construction. This will likely include such items as: 1) obtaining an Order of Conditions from local conservation commissions for the staging areas and work within buffer zones; 2) Army Corps of Engineers permits for the capping program; and 3) any permits required from the WDNR or other local agencies. The EPA guidance suggests putting the permitting category within project management. The nature and magnitude of this project, however, indicates that the permitting process would be executed as an integral part of the design process.

Construction Oversight

Construction oversight is estimated to be 5% of the overall construction cost (less tipping fees) and includes at least one full-time resident engineer/inspector and design engineering technical support/oversight. Activities will include review of submittals and design modifications, and documentation of quality control/quality assurance, and record drawings. The EPA guidance recommends 6% for this category.

Project Management

Project Management costs are estimated to be 7% of the overall project cost (including tipping fees) and include planning, scheduling, reporting, regulatory compliance, community relations support during the design and construction, and bid and contract administration. The EPA guidance suggests 5% for the project management category. We have increased the percentage to 7 to accommodate the political sensitivity and the complexity of the project and costs for cost estimating.

Technical Support

Technical support includes activities that pertain to the baseline sampling and LTM and includes oversight of monitoring activities, updating the monitoring plans, QC, audit compliance, community relations' support, and progress reporting. The technical support activities are estimated to be 13% of the annual baseline sampling and LTM costs and 15% for every 5 year LTM reporting cycle. These percentages fall within the EPA recommended range of 10-20% for O&M. The low end of the range was chosen because there will be no long-term treatment system (e.g., water treatment plant) in place once the construction ceases.