Attachment B – Scope of Work
Sabin Dam Removal and Channel Restoration

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Prepared by AECOM
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Boardman River Ecosystem Restoration Phase II: Sabin Dam Removal and Channel Restoration

Introduction and Summary
This document describes the scope of work (SOW) to develop a dam removal construction project to remove Sabin Dam and restore the Boardman River from approximately 4,000 feet upstream of Sabin Dam to 2,000 feet below Sabin Dam. It includes data collection, engineering and scientific analysis, and engineering design related services to remove the dam and restore the Boardman River in the vicinity of Sabin Dam.

The SOW is organized into nine sections. These are:

1. Project Organization, Management and Reporting
2. Preliminary Engineering Studies
3. Computer Modeling and Assessment
4. Restoration Design
5. Dam Breaching Design
6. NEPA and Permit Application Development
7. Assumptions
8. Fee
9. Schedule

The tasks described in this document are inclusive of all that are needed to complete the engineering analysis and design work for removal of the dam and restoration of the river.

1 Project Organization, Management and Reporting
This section describes the project team, health and safety protocol, project cost controls, quality assurance process and the meeting and communication plan.

Project Team
URS, a wholly owned subsidiary of AECOM, has assembled an outstanding team of highly qualified, locally-based professional planning and engineering companies that have experience working on the Boardman River dams and associated restoration projects. Our Boardman River Restoration Team includes:

- **AECOM**, a full service planning, engineering, design and environmental firm with special expertise in ecosystem restoration, dams disposition (i.e., removal, repair, and modification), road and bridge design, project management, QA/QC and Health and Safety protocols. AECOM will serve as the primary contact with the IT and manage the entire dam removal and river restoration process. AECOM provides a full range of technical support services associated with dam removal/ modification and river restoration in a complex, large-scale setting.
Attachment B – Scope of Work Sabin Dam
Removal and Channel Restoration

- **Inter-Fluve**, an engineering and environmental services firm, with special expertise in geomorphology, stream restoration, fisheries management and dam removal. Inter-Fluve will provide stream restoration design services.
- **Gosling Czubak**, a Traverse City-based engineering firm with geotechnical, survey and recreation planning expertise that has performed extensive survey on the Boardman River and impoundments to support hydraulic and sediment management modeling. Gosling Czubak will provide survey and geotechnical investigation services.

### 1.1 Health and Safety

A Health and Safety Plan (HASP) will be developed to cover activities conducted for this project. All project staff (including subs) will be bound by this document. The HASP requires that all project employees will participate in hazard identification, risk assessments, and determination of controls for their respective work areas and that all employees will be informed of relevant hazards, the related risk assessment, and the respective control measures. In addition, project staff will have access to AECOM safety, health and environmental policies, procedures, and regulatory requirements, and will be informed of relevant changes. It is required that project staff identify and communicate opportunities to remove safety hazards on the project site.

### 1.2 Quality Assurance Process

The AECOM Corporate Quality Management System (QMS) will be used as guidance for overall project quality. Among the most rigorous protocols in the industry, the QMS has been developed over a number of decades and consists of a comprehensive system of project checks and reviews documented in four volumes: 1) Quality Policies; 2) Quality Procedures; 3) Quality Instructions; and 4) Quality Forms.

A Quality Manager is responsible for overseeing the development of the project-specific quality process, working with the Project Team to identify required checks and reviews, assigning qualified independent staff to conduct reviews, and confirming that reviews have been completed and are in full compliance with QMS requirements. The project specific quality control process will be documented in the Engineering and Design Quality Control Plan.

Our QMS is integrated into all aspects of design including dam removal, bridge construction and dam modification. Prior to project start-up, a detailed Project Execution Plan (PXP) is completed, and identifies all project tasks, deliverables and project risks. Qualified team members are assigned to complete timely reviews of every task and deliverable, with identified risks in mind.

As the project progresses, detailed checks are completed by qualified staff not directly associated with project execution. Within this Independent Technical Review (ITR) process, the “detailed checker” works with technical Project Team members to understand each task and review work completed at interim stages of the design. For instance, during the initial stages of bridge design, detailed checkers will review and comment on the geotechnical boring plan and review the geotechnical report including conclusions and recommendations. Questions/ issues identified by the reviewer will be discussed with the appropriate technical lead(s) for resolution. This process continues throughout the project – from conceptual designs and alternatives through 100% complete designs.

At the 100% design stage, a number of additional reviews are conducted by ITR staff, all of whom are senior, independent and highly qualified experts in disciplines applicable to the work being reviewed. The ITR process assesses the overall quality and applicability of the final design and includes a coordination review of the interdependence of technical disciplines, constructability reviews and
bidability reviews. Comments and suggestions are reviewed by the Project Team and incorporated into the final design, as appropriate. Leadership Team members, including the Principal-in-Charge, Project Manager and QA/QC Officer ensure full and rigorous adherence to the QMS process. This provides a level of technical review (and redundancy) critically important to the decision making process for dam removals/ modifications and associated stream restoration efforts.

Compliance with the requirements of the project QMS is documented through a detailed document management system that allows the Team to “look back” at the progress of the design and confirm compliance with the QMS.

1.3 Meetings, Communication and Cost Controls
Management of the Boardman River Restoration project will require attendance at meetings and communication with project partners, stakeholders, and community groups for a variety of reasons. The diverse nature of the project and emphasis on community involvement requires that a clear plan is developed by the project team to ensure that the appropriate information is provided to the community. External communication related to this task will include:

- Attendance and participation in monthly project managers meeting.
- Attendance and participation in monthly Implementation Team meetings.
- Attendance in multiple working group meetings per month. It is expected that participation will be required in several different working groups and that the level of participation will vary depending on the stage of the project.
- As requested, support for/ participation at any public stakeholder meetings/ workshops organized by the IT.
- Content development for project website (www.theboardman.org)

Internal communication and coordination is equally important to the success of the project. To ensure that each task leader is aware of other parts of the project weekly meetings will be held with the PIC, PM, task leaders and key staff. This will be a working meeting to provide project updates, forecast future work, and coordinate ongoing and future tasks.

1.3.1 Project Cost Controls
The AECOM Team will work closely with the IT and CRA to ensure that available grant dollars are expended efficiently, are strategically focused on critical tasks, and are expended within the constraints of grant requirements. To accomplish this, the AECOM Principal-in-Charge and Project Manager will work closely with CRA on task-specific budgeting, regularly tracking and analyzing expenditures, and monitoring/ pursuing grant opportunities, as appropriate, to accomplish project tasks. This will ensure that the IT manages funds consistent with highest priority tasks essential to project goals and objectives. Specifically the following cost control measures will be:

- An established, sophisticated accounting system configured to accommodate individual task orders (all under a single tracking code) that originate from separate entities. This will allow for weekly or monthly updates on project and task expenditures to facilitate project control analysis. To the greatest extent possible, the organization of our internal accounting processes will be configured to mimic CRA processes.
- An “Earned Value” assessment will be developed for the entire project, to present both graphically and tabular, the actual and anticipated expenditures over any defined time period.
This assessment will identify cost performance and schedule performance and indicate deviations from the project plan.

- Proposed changes to tasks prompted by evolving conditions or goals will be promptly brought to the IT and CRA for review, discussion and assessment of impact on project budget.
- Change orders will be documented in writing and include the purpose of the task, expected outcome (e.g., design, data), “not to exceed” fee and schedule.
- A status report on project finances will be a standard feature of regularly scheduled meetings with the IT, CRA and other parties, as appropriate. Background materials will be provided in advance to facilitate and inform key decisions.
- Our Team Leadership will work with the IT and CRA to secure grant funds (from a range of public, private sector and foundation sources) for dam removal and river restoration related work.

1.4 Task 1 Deliverables
Deliverables for the Project Organization, Management, and Reporting will include the following:

- Quality control plan and related documentation
- Health and safety plans
- Monthly progress reports
- Monthly invoicing and project cost tracking
- Meeting minutes / notes for project team meetings

2 Preliminary Engineering Studies
Preliminary engineering studies include data collection and analysis tasks that are completed prior to, or in support of engineering and design. These studies will generate the data needed to design the breaching process at Sabin Dam and design the river restoration approach through Sabin impoundment and the “new” channel between Boardman Dam and Sabin impoundment.

2.1 Sabin Dam Impoundment Investigation
Much of the investigations needed for the development of a river restoration design have been completed under previous scopes. In the fall of 2011, Depth of Refusal (DOR) investigations were completed by Inter-Fluve and documented in the “Sabin Dam Field Reconnaissance Report.” This information was supplemented with addition DOR investigations in 2014 as well as bathymetric surveys, discharge measurements, and historic document review. These investigations were documented in the “Final Concept Design Report: Boardman and Sabin Dam Removals.” However, as the design progresses, it is anticipated that some field data may still need to be collected. Areas of particular interest are immediately upstream and downstream of Sabin Dam.

2.1.1 Depth of Refusal and Channel Survey
DOR data collection was previously completed in 2011 and 2014. Additional DOR investigations may be necessary immediately upstream of Sabin Dam to further clarify the location of the historic channel.

2.1.2 Bathymetric and Topographic Survey
To further define the downstream channel transitional slopes and geometry, additional survey data will be collected between Sabin Dam and a point up to 2,000 feet downstream of Sabin dam. Additional data will also be gathered for tributaries entering the Sabin impoundment. This data will be incorporated
with the survey data collected to date. It is assumed that the Grand Traverse Band (GTB) will support this task through the use of a jon boat, if needed.

2.1.3 Data Synthesis and Mapping
Field data collected will be synthesized into a series of maps using AutoCAD and GIS, as needed. These maps will be sufficient to develop surfaces for volume estimation. Non-map data (e.g., discharge readings, channel observations, synthesis of historic channel conditions) will be detailed in the design report (see below).

2.2 Sabin Dam Embankment Geotechnical Investigation
A geotechnical investigation at the Sabin Dam will be completed to determine concrete thickness and underlying material characteristics at the location of the existing spillway and to determine subsurface material characteristics of the earthen dam embankment located directly east of the spillway. The existing concrete spillway will be removed in order to create a channel for the Boardman River to pass through the dam and flow to the north. Prior to removal of the existing concrete spillway, a combination of coring and auger drilling techniques will be utilized to develop a subsurface profile of the spillway structure and underlying soils. Auger drilling techniques will also be employed at the location of the earthen dam embankment to the east of the spillway and at the earthen embankment immediately behind the spillway’s sidewalls, in order to determine subsurface characteristics for planned removal of the material adjacent to the spillway and to evaluate the earth loads that are currently supported by the sidewalls.

A truck mounted drill rig will access the existing dam area by way of the two track road that enters the site from the east. Rock coring technology will be utilized to drill the upper portion of the borings located in the concrete spillway (B-1 and B-2 on Figure 2). Once the full thickness of concrete in the spillway has been penetrated, hollow stem auger technology will be utilized to advance the borings to a depth of approximately 10 feet below the pre-dam river channel bottom. Concrete cores will also be collected within the sidewalls of the spillway at a minimum of two locations, to establish concrete thickness and strength. This will be performed using a manual concrete coring machine.

Hollow stem auger drilling technology will be utilized to advance two soil borings (B-3 and B-4 on Figure 2) in the earthen dam embankment located east of the spillway. B-3 will be advanced to a depth of approximately 60 feet below existing grade (or at least 25 feet below the dam embankment), while B-4 will be advanced to approximately 40 feet below grade (or at least 10 feet below the spillway base).

Concrete will be cored in general accordance with ASTM D 2113. Soil samples will be collected in all borings at a frequency of four samples in the upper 10 ft of the boring, and at 5 ft vertical intervals thereafter. Disturbed samples will be collected via the Standard Penetration Test (ASTM D 1586). Undisturbed samples in fine-grained materials will be collected with thin-walled (Shelby) tubes, in accordance with ASTM D 1587.

Laboratory testing of select soil samples will include such routine tests as moisture content, Atterberg Limits, and grain-size analysis. Testing on undisturbed samples may include one-dimensional consolidation, direct shear, unconfined and triaxial compression, and permeability, as required. Compressive strength testing of concrete samples obtained from the coring operation will also be performed.
Standard Penetration Test (SPT) values will be recorded in all borings. A field log of all borings and relevant information will be maintained as the soil borings are advanced.

Figure 1: The Sabin Dam geotechnical soil boring locations
Deliverables of this task will include:

1. Geotechnical Engineering Report – A geotechnical engineering report will be created, in accordance with industry standards. The report will provide a summary of the subsurface conditions, typed boring logs, and detailed geotechnical recommendations for the breaching and removal of the earthen embankment, powerhouse and spillway.

2.3 Utility Investigation and Coordination
All utilities in the area near Sabin Dam and Sabin Impoundment will be identified in coordination with utility companies. During the previous project phase, MISS DIG and the utility company’s field marked all of the utility locations and they were added to the topographic survey. AECOM has prepared utility maps and verified locations and impacts with the utility companies. Ongoing coordination will be maintained with the utility companies. Communications with the utility companies will be documented and included in project archives. During the design phase a relocation or protection schedule and cost estimate will be developed with the utility companies to identify any financial or schedule impacts on the project.

2.4 Topographical Survey
With the exception of survey needs for channel restoration activities, as outlined above, topographic survey has been completed for Sabin Dam removal.

2.5 Permitting Support Studies
Preparation of the Boardman River Dams Feasibility Study and Environmental Assessment (EA) for USACE and development of the MDEQ Joint Permit Application for Boardman Dam Removal entailed multiple field studies and sampling efforts conducted by AECOM and its Team. This included:

- Sediment sampling within the Boardman and Sabin Dam impoundments
- Wetland and Stream assessments
- Threatened and Endangered species assessments
- Phase I Cultural Resources Survey
- Phase I Environmental Site Assessment (ESA) for Union Street Dam, Sabin Dam, and Boardman Dam

Information from these studies will be used in permitting. Cultural resource surveys have been conducted for the project and the State Historic Preservation Office (SHPO) concurred with clearance provided by the USACE in June 2013. Additional field resource surveys for cultural resources or sediment sampling are not included in this scope of work, as the previously obtained concurrence and clearance and field data is expected to be sufficient for the permitting process. However, additional wetland delineations are anticipated for downstream of Sabin Dam. These areas have not been previously delineated.

2.6 Task 2 Deliverables
Deliverables associated with the preliminary engineering studies include the following:

- Geotechnical Engineering and Analysis Reports for Sabin Dam (document Task 2.4)
- Utility maps and coordination with utility companies documented, with potential project impacts, in a technical memorandum.
• The results of the survey will be presented in a number of plan sheets for use during the design phase.

3 Hydraulic Modeling
The USACE Feasibility Study process developed a HEC-RAS model that was used by the USACE for hydraulic and sediment transport modeling. This model was further refined during the Boardman Dam Removal phase and will continue to be utilized to support channel design and design of the dewatering process.

3.1 Hydraulic Modeling for Dewatering Support
The HEC-RAS model will be used to assist with drawdown design. The model will be used for design of the channel through the earthen embankment/existing spillway that will be used as part of the dewatering process. Shear stresses will be analyzed within the channel for various stages of construction to verify sufficiency of armor protection measures. Energy dissipation and scour protection measures will need to be analyzed at the toe of the dam. This analysis will accompany the geotechnical analyses of the breaching operation.

3.2 Hydraulic Modeling for Channel Design Support
The refined HEC RAS model will be used for channel design purposes through the Sabin Dam impoundment. The model will utilize hydrologic assessment performed previously and will integrate the discharge and rating curve information developed from this effort to quantify proposed conditions within the model. Modeling will be developed for various iterations of the channel and floodplain dimensions to understand the potential as-built conditions of the project within and upstream of the two impoundments. Results of the modeling will be documented in the Final Design Report.

3.3 Task 3 Deliverables
Deliverables associated with the hydrologic and hydraulic modeling studies include the following:

• Steady state HEC-RAS computer model of proposed conditions to support channel design (Task 3.1). Results of this modeling will be incorporated into the channel design documents.
• Steady state HEC-RAS model used during the dewatering process to support design of the dam dewatering (Task 3.2). Results of this modeling will be incorporated into the dam breaching design.

4 Restoration Design

4.1 Sabin Impoundment Channel
The task descriptions provided below apply to channel restoration for Sabin Dam impoundment.

4.1.1 Concept Design
The concept design for channel restoration through Sabin Impoundment was completed under the Boardman Dam Removal project. This design will be refined and moved into final design
4.1.2 Final Design and Preparation of Construction Documents

4.1.2.1 Final Design
Design and analysis for the ecosystem restoration of the former impoundment will focus on three main components (including tributaries/creek confluences discharging into Boardman River): River Channel; Wetlands/Floodplains; and Uplands.

Each of these components will be addressed in final design from the following perspectives: Engineering; Ecology; and Geomorphology.

Engineering – Hydrology and hydraulics analyses will provide information about channel size and stability appropriate for the Boardman River hydrology. If necessary, habitat elements such as pools and riffles can be modeled to understand hydraulic control in the channel. Cost and constructability will be considered to assure that the project is buildable within the site and budget constraints. Plans to minimize erosion and deal with expected construction dewatering will also be included.

Ecology - Instream elements specific to fish (both game and non-game species), amphibians, mussels (though little is known about design for mussels), and macroinvertebrates will be considered to ensure that all life stages and needs can be met to the extent possible within the restored reach. Wetland and floodplain areas will focus largely on the restoration of hydrologic characteristics that dictate the vegetation community (informing the planting plan) and on the needs of important wildlife (both resident and migrating species). An understanding of inundation frequency as well the community composition of less impacted areas along the Boardman River will provide a template for developing this design. Tribal Traditional Ecological Knowledge (TEK) will be incorporated as well.

Geomorphology – Fluvial geomorphology is a process science. Its basis is in the understanding of the movement of water and sediment through the river corridor and is important in the restoration design because it provides a basis for assessing the fit of the design within the dynamic context of the river. Common issues here are ensuring dynamic stability; not creating banks that are too resistant nor too susceptible to natural erosion, ensuring sediment transport continuity, creating a channel size consistent with the bankfull discharge, etc.

A final design report will be provided that summarizes the basis of the design, methods and data used, and assumptions.

4.1.2.2 Development of Construction Documents
30% Submittal - This task consists of submitting the following: Plan Sheet layouts, initial engineer’s opinion of cost, and specifications package table of contents. This material will confirm with the project team and the stakeholders the direction of final design.

60% Submittal – This progress submittal will include plans, specs, and engineer’s estimate at a 60% complete level. This will include typical details and layouts on the plans, a DRAFT engineer’s estimate based upon quantities derived from the 60% level of design, and an updated outline of Specifications. An outline of a Design report, likely populated with background information will also be delivered for review.
90% Submittal – This submittal includes the near final version of Plans, Specs, Cost Estimate, and Design Report. Upon final review and acceptance of the stakeholders, the documents in this submittal become the Final Stamped set of Construction Documents.

100% Final Construction Documents - Sealed drawings and specifications will be developed suitable for bidding.

4.2 Task 4 Deliverables
Deliverables associated with the Restoration Design Task include the following:

- 30 Percent Design Submittal
- 60 Percent Design Submittal
- 90 Percent Design Submittal
- 100 Percent Design Submittal (including Final Design Report)

5 Dam Breaching Design

5.1 Engineering Design
Engineering tasks will encompass evaluating and incorporating the field data findings into the conceptual design developed in the feasibility study. These efforts will be presented to the IT at incremental stages in the forms of reports, plans and specifications as highlighted in Section 5.2.

During the dam breaching design phase, field collected data and existing drawings and other information will be thoroughly reviewed to establish key parameters that need to be considered in the design of the dam removal. This data will be compiled and documented in reports and plan drawings. From this information, several forms of analysis will be performed to develop a conceptual dam removal design. These analyses include the following:

- Evaluation of Existing Spillway Walls: The envisioned dam removal will occur by successively notching the existing spillway structure. This will alter the stress states within the structure and the spillway walls that bond the structure. Structural capacity and stress analysis of the spillway walls will be performed for various stages of the dam removal. Appropriate sequencing/shoring will be designed based on the analysis.
- Seepage and Slope Stability Analysis: These analyses will be performed to establish a safe drawdown rate for the dam removal process.
- Evaluation of existing energy dissipation measures: By utilizing the existing spillway as the breaching point, cost benefits can be realized by maintaining and/or modifying the existing energy dissipation measures that are in place. However, since there is the potential of full flood flows being directed to these measures, they will need to be evaluated to ensure they are in accordance with accepted hydraulic engineering standards.

The engineering analysis described above will be used in conjunction with other site data (survey, utilities, etc.) to develop design drawings, specifications and sequencing for construction bidding documents. Review of the proposed plans will be available at 30 percent, 60 percent and 90 percent completion.
5.2 Task 5 Deliverables
Deliverables associated with the Restoration Design Task include the following:

- Basis of Design Report
- 30% Submittal - This task consists of submitting outlines of the following: Plan Sheet layouts, initial engineer’s opinion of cost, and specifications. The outlines will confirm with the project team and the stakeholders the direction of final design.
- 60% Submittal – This progress submittal will include plans, specs, and engineer’s estimate at a 60% complete level. This will include typical details and layouts on the plans, a DRAFT engineer’s estimate based upon quantities derived from the 60% level of design, and an updated outline of Specifications. An outline of a Design report, likely populated with background information will also be delivered for review.
- 90% Submittal – This submittal includes the near final version of Plans, Specs, Cost Estimate, and Design Report. Upon final review and acceptance of the stakeholders, the documents in this submittal become the Final Stamped set of Construction Documents.
- 100% Final Construction Documents - Sealed drawings and specifications will be developed suitable for bidding.

6 NEPA / Permit Application Development
The USACE Feasibility Study and Environmental Assessment and related documents will be used to identify permit requirements. Required agency consultations will be completed with local, state, and federal agencies in order to determine permit requirements for the project. A pre-application meeting with MDEQ is not anticipated for this phase of the project as we will be wrapping up the permitting process for Boardman Dam and share a good understanding of the project and permitting needs with the agency.

Clearance with MDNR and US Fish and Wildlife Service has been obtained for threatened and endangered species in 2012. Clearance letters will be updated and sent to these agencies to notify them of project construction. Required permits will pertain to soil erosion and sedimentation control (SESC) and wetland, stream, and floodplain encroachments with the MDEQ/USACE. Consultation letters will be sent to MDNR, USFWS, MDEQ, and SHPO as a courtesy to update project information subsequent to the consultation conducted for the EA.

A Joint Permit Application will be prepared for Sabin Dam removal and river restoration activities. This permit application will include impacts to the Boardman River, associated wetlands, and floodplain. Permitting for this project will be facilitated by the Dam Safety Unit of the MDEQ and USACE. Soil erosion and sedimentation control permitting will be coordinated at the state and local level as well. A Natural Rivers Permit will be prepared and submitted to MDNR. As part of the permitting process AECOM will address review comments from MDEQ and MDNR as well as assist with preparing materials for and attend the public hearing as part of the permit process.

The previously developed USACE EA will be used for this project. Additional field studies will be necessary for updated wetland delineations (Task 2.5).

The table below provides an overview of the permits required for the project.
### Table 1. Summary of environmental permitting requirements

<table>
<thead>
<tr>
<th>Summary of Environmental Permitting Requirements</th>
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<tbody>
<tr>
<td><strong>Federal, State, and Local Permits and Approvals</strong></td>
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<td><strong>Agency</strong></td>
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<td>Michigan Department of State- Bureau of History, State Historic Preservation Office/ Michigan Tribal Council/Michigan Office of State Archaeologist</td>
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<td>Michigan Department of Natural Resources</td>
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<td>MDEQ</td>
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<td><strong>LOCAL</strong></td>
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<td>Grand Traverse County Soil Erosion – Sedimentation Control Department</td>
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6.1 Task 6 Deliverables
Deliverables associated with the NEPA / Permit Application Development Task includes the following:

- Update of wetland delineation maps
- Update of Threatened and Endangered Species Clearance
- Submittal of all permits listed in Table 1

7 Assumptions
During the development of this scope of work and budget the following assumptions were made:

- County permit fees will be covered by the County.
- The County would allow access by geotechnical contractors and support equipment, such as cranes, drill rigs and bulldozers, to the dam embankment and power house.
- The completed USACE cultural resource investigations are sufficient for permitting needs of the project.
- The completed USACE endangered and threatened species investigations are sufficient for permitting needs of the project.
- Does not include design of utility relocation. Does include coordination of utility relocation.
- Our rates are based on performing the design according to the schedule. Should the project extend out more than a year, our hourly rates and overhead rates will need to be updated and the budget adjust accordingly.
- Does not include designing cofferdams or other temporary works that will be the responsibility of the Contractor.
- Does not include review of shop drawings, RFI’s, construction meetings, etc. during construction. These items of work will be performed under a separate budget to be negotiated.
- We assume that we will not encounter any environmentally impacted materials while drilling (no costs have been included for managing or disposing of such materials).
- We assume that minor earthwork (regrading/benching) on the dam embankment in order to position drilling equipment will be allowable, and that no special permitting is necessary to do this work.
- We assume that the gates at Sabin Dam are in working order and will be capable of diverting flow from the Sabin Dam spillway during drilling activities and that drilling activities will be performed on a dry spillway.
- USACE will provide design reviews for 30, 60, and 90 percent submittals. These will be documented with DR Checks process. An Agency Technical Review (ATR) will be completed by the Corps during the 60% design review.
- Plans will be prepared in AutoCAD and plan sheet title blocks will incorporate Corps logo and contract numbers.
8 Estimated Budget for Project
This section includes the expected budget for all tasks (Table 2).

<table>
<thead>
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<th>Task</th>
<th>DESCRIPTION</th>
<th>AECOM</th>
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<th>Total</th>
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<td>$6,649.00</td>
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### Project Management

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<th>Item</th>
<th>Cost</th>
<th>Reimb.</th>
<th>Retain.</th>
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<th>Percent</th>
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**TOTAL EXPENSES**

|               | $277,132| $159,984| $15,500 | $452,616 | 100%    |

*Total fee reflects a reduction in typical labor charges for AECOM in the interest of providing in-kind contribution to the project valued at $19,795.08.
9 Schedule

Note that the schedule will be updated when the contract is signed to reflect the actual start date.

<table>
<thead>
<tr>
<th>Task No.</th>
<th>Task Name</th>
<th>Duration</th>
<th>Start Date</th>
<th>Finish Date</th>
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<tr>
<td>1</td>
<td>Sabin Design</td>
<td>265 days</td>
<td>Nov 4/15</td>
<td>Feb 4/27</td>
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<td>Nov 4/16</td>
<td>Feb 12/31</td>
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<td>Feb 12/31</td>
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<td>Mar 5/18</td>
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<tr>
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<td>Mar 5/18</td>
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<tr>
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<tr>
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<td>Mar 9/18</td>
<td>Mar 9/18</td>
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<tr>
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</tr>
</tbody>
</table>

Note: The schedule will be updated when the contract is signed to reflect the actual start date.