

Scope of Work - Preliminary Engineering Study for Whitewater Park  
At The Granite Falls Dam

June 2017

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# 1.0 Background and Assignment

The City of Granite Falls has formed a committee to evaluate the potential for the development of a whitewater park at the current site of their dam and hydroelectric facility. Based on conversations with the City and preliminary site evaluations by others, the current understanding is that the river flow volume and head (drop) conditions at the site are in line with those of Olympic caliber parks. Developing a safe attraction that maintains the renewable hydroelectric generation, improves the ecological health of the river by adding fish passage, adds a recreational facility, and contributes to economic development of the community are the primary goals of the project.

## 1.1 Background

Two studies have already been completed for this project. One entitled “The potential Beneficial Values of Waters Diverted in the Minnesota River for the Granite Falls Whitewater Park” was prepared by the Minnesota State University Mankato developed an economic case for the project. The other study prepared by John Anderson and the Shimoda Group provided several high-level concepts, ideas, several considerations, and a range of potential costs.

## 1.2 Assignment Summary

In order to move forward, the committee needs to identify or rule out potential fatal flaws to the project, or selected project options. Maintaining the existing exempt status that the hydroelectric facility has with the Federal Energy Regulatory Commission (FERC) and maintaining acceptable (to the City) hydropower production have been identified as critical to the success of the project. Although there are several other necessary elements to a successful project, these should be addressed first. This portion of the assignment will precede the 10% feasibility study.

After regulatory and power production impacts are clarified, the design team will work with the committee to identify up to three options to be reviewed during the 10% design phase. This phase will develop the concepts adequately to highlight project impacts and provide concept-level cost estimates.

Upon completion of the 10% design phase, a single option would be moved forward to the 30% design phase. Engineering for this phase would include preliminary drawings and a refined (but still preliminary) cost estimate for use in community input gathering, obtaining feedback from regulators and soliciting grant funding.

## 1.3 Assignment Scope

### 1.3.1 Phase 1 – Review Terms of FERC Exemption and Evaluation of Flow and Lost Power Generation

#### 1.3.1.1 Scope

##### *Task 1 – Exemption Review*

- Obtain and review the terms of the City’s FERC exemption.

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- Contact appropriate personnel within the FERC to request an informal conference call to discuss the potential regulatory impacts of proceeding with the project, and the impacts of modifying and possibly moving the dam versus leaving the dam in-place.
  - Prepare a one-page high-level description of the facility and proposed whitewater project options to share with the FERC staff in advance of the call.
  - Facilitate a conference call discussion with the FERC and City officials. Conference call should include contributions from a FERC approved independent consultant.
  - Prepare an agenda in advance of the meeting and minutes to document the discussion and conclusions. The meeting should either determine if the project options would eliminate/maintain the exemption or identify next-steps to reach a determination.

### **Task 2 – Flow & Lost Power Generation Evaluation**

- Obtain historic USGS flow records for the river.
- Consult with MDNR on a bypass flow regime for the two options. Seasonal flow levels should be considered.
- Determine reduced power generation (if any) that would result from construction of a whitewater park. Determination would include flow requirements for the hydroelectric facility with all three units, flow required for fish passage, and flow required for the whitewater park.
- Determine lost generation cost associated with the project. This cost would later be added to the capital cost of the project if/when developed. Lost generation would utilize power costs and interest rates provided by the City for use in economics evaluation.
- Cursory analysis of inlet hydraulics. Determine 1) how much higher the new dam will have to be in order to deliver the same flow through penstocks or an open flume, and 2) how much lower the flow will be with no increase in dam height. (No analysis of flood hydraulics or impact to the impoundment will be done).

#### **1.3.1.2 Deliverable(s)**

- Minutes documenting facilitated discussion with appropriate FERC personnel. The meeting should be held and the minutes delivered to the City within one month of the notice to proceed from the City.
- Report explaining the anticipated cost of lost generation associated with the addition of a whitewater park. The report should be delivered to the City within 3 months from the notice to proceed from the City.

### **1.3.2 Phase 2 – 10% Preliminary Engineering Study**

Pending the outcome of Phase 1, the City will decide whether to proceed with evaluation of options for the proposed whitewater park to the 10% design level. Scope

The 10% design will include the following tasks:

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- Obtain and review existing data, including available bathymetric and topographic data. Collected data may be supplemented with publicly available LiDAR data of surrounding features.
  - Perform a bathymetric survey of the Minnesota River primarily upstream but potentially also downstream of the dam (this could be postponed to the 30% design phase if necessary).
  - Layout up to three concepts to a 10% design level in AutoCAD Civil3D. The alternatives will be finalized with the City. Alternatives shall include
    - Provisions for whitewater recreation with integral fish passage. Emphasis on accommodation of a full range of skill levels.
    - Modification / replacement of the Granite Falls dam and related appurtenances to the Granite Falls hydroelectric project
    - Landscape architecture and planning
      - High level planning effort to identify existing land use and parking. Recommend changes under the proposed project.
      - Delineate improvements for parking, access, viewing areas, and plantings.
  - Perform preliminary hydraulic modeling of the alternatives using HEC-RAS software.
  - Perform a constructability review of the alternatives.
  - Develop 10% figures for the alternatives. The figures will show a plan view and profile view of each of the alternatives.
  - Develop 10% construction cost estimates for the alternatives. The construction cost estimates will be presented as a range in conformance with ASTM E2516.11 (approximately +70% to -35%).
  - Develop a 10% design memorandum summarizing the work completed and summarizing the evaluation of alternatives.
  - Present the findings of the 10% design memorandum at an in-person meeting with the City and discuss the path forward.
  - Detailed structural or geotechnical assessment of the dam are not included in this phase.
  - Meetings/Presentations
    - Initial kick-off meeting with City. Conduct public information meeting.
    - Presentation to City of study results. Conduct a public presentation of the schematic design.

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### 1.3.2.1 Deliverable(s)

10% design memorandum, including summary of analyses, 10% figures and construction cost estimates for up to three alternatives

## 1.3.3 Phase 3 – 30% Preliminary Engineering Study

### 1.3.3.1 Scope

Following the presentation of the 10% design memorandum, it is assumed the City (in consultation with other stakeholders and design team) will select a single alternative. The selected alternative will then be developed to a 30% design level. The 30% design will include the following tasks:

- Refine hydraulic modeling of the selected option.
- Perform preliminary sediment analysis for release of accumulated sediment downstream. No sediment field-investigations or laboratory testing are assumed.
- Design development of the selected option, including refinement of the whitewater concept and surrounding park features, including parking.
- Develop 30% drawings (more detailed than the 10% figures, but not construction drawings).
- Prepare artist rendering of preferred option.
- Develop 30% construction cost estimate. The construction cost estimate will be presented as a range in conformance with ASTM E2516.11 (approximately +40% to -20%).
- Develop a 30% design memorandum summarizing the design work that was completed, further describing the selected option and list potential funding partners for final design and construction.
- Permitting feasibility. Provide an overview of required environmental permits. Conduct a pre-permitting review of the project with stakeholders, tribes, and resource agencies.
- Participate in three conference calls with the City.
- Present the findings of the 30% design memorandum at an in-person meeting in the City and discuss the path forward.
- Special Services: The scope of special services is dependent upon the selected alternative.

### 1.3.3.2 Deliverable(s)

30% design memorandum, including 30% drawings and construction cost estimate for the selected alternative