

## Section 9

### Costs

#### 9.1 Purpose and Scope

This section presents an opinion of probable project cost for the Poor Farm Pond Dam removal alternatives as described in Section 7. The opinion of probable project cost presented in this section includes construction, contingencies, escalation to mid-point of construction, and anticipated implementation costs for each alternative.

In the following section (Section 10), the preferred alternative is chosen based on consideration of both project costs and non-cost factors.

#### 9.2 Dam Removal Alternatives

The two dam removal alternatives are described in Section 7 and include:

- Partial dam removal
- Full dam removal

#### 9.3 Opinion of Probable Project Costs

This section presents opinions of probable project costs for each alternative. The project costs include the following components:

- Construction
- Escalation to mid-point of construction
- Project contingency, engineering and implementation

##### 9.3.1 Construction

The construction cost is the sum of direct construction costs, such as labor and materials, and indirect construction costs, such as permits and insurance. The unit costs that comprise the direct construction cost are estimated based on the Engineering News Record (ENR) 20-city average Construction Cost Index (CCI).

The indirect construction costs include building permits, sales tax, builders risk insurance, general liability insurance, general contractor bonds, general contractor field conditions, and contractor overhead and profit. Industry and experience averages on bid data was used to develop average percentage “mark-ups” of the direct construction costs to calculate the indirect construction costs.

The opinions of probable project costs presented include a 25 percent construction contingency based on the current level of design development, which is only conceptual.

### 9.3.2 Escalation to Mid-Point of Construction

The opinions of probable project costs were estimated in June 2013 dollars based on an ENR CCI of 9542. To account for the continued increase in construction materials, an escalation to mid-point of construction has been estimated. An annual escalation factor of 3 percent per year has been added to the opinions of probable project costs presented in this report. The escalation factor is linearly applied to the number of months until the mid-point of construction, which is estimated to be March 2015.

### 9.3.3 Project Contingency, Engineering and Implementation

Several factors can impact the overall bidding environment of a project, including contractor competition and project funding. Contractor competition may be limited based on the difficulty of a project or number of other projects being constructed simultaneously. A 10 percent project contingency was applied to the sum of the costs above (construction, and escalation to mid-point of construction).

Engineering and implementation costs can range from 15 to 40 percent of the escalated construction costs and are developed on a project-specific basis. Engineering and implementation costs can include permitting, finance bonding costs, engineering design, legal, construction oversight, administrative, geotechnical program (including borings), survey, and public participation. Twenty percent of the above costs (sum of construction, and escalation to mid-point of construction) was included for engineering and implementation costs.

### 9.3.4 Present Worth Analysis

A present worth analysis is prepared for alternatives that may have different capital and operating costs so they can be compared on an equivalent basis. All costs occurring in the future are brought back to present worth using a discount rate. For this analysis the discount rate has been assumed at 4 percent and the construction inflation cost at 3 percent per year.

Under the Partial Removal alternative, the capital cost of \$880,000 projected in March 2015 is brought back to the present date. In addition, it was estimated that major maintenance/renovations would be required on the training walls and structure in 20 years after the partial removal construction and repair work. This future cost is estimated to be \$150,000. Annual costs were also included in the present worth calculation. It was assumed that routine ongoing maintenance would average \$4,000 per year for clearing vegetation and minor maintenance and that periodically an inspection would be required to evaluate any specific maintenance needs and the annual equivalent cost of inspection would be \$1,000 per year.

Under the Full Removal alternative, the capital cost of \$980,000 projected in March 2015 is brought back to the present date. With no hard structures contemplated under this alternative no future renovation was included. Annual costs were also included in the present worth calculation. It was assumed that routine ongoing maintenance would average \$2,000 per year principally for vegetation control and that periodic inspection would not be required with no hard structures in place.

Salvage values were not considered for this analysis. The present worth costs are included in Table 9-1 below.

### 9.3.5 Opinion of Probable Project Cost

Table 9-1 summarizes the opinions of probable project cost and the present worth costs for the two alternatives evaluated in this feasibility study.

**Table 9-1**  
**Opinion of Probable Project Cost Summary**

<i>Cost Item</i>	<i>Probable Cost Partial Dam Removal</i>	<i>Probable Cost Full Dam Removal</i>
Construction <sup>1</sup>	\$630,000	\$700,000
Escalation to Mid-Point of Construction <sup>2</sup>	\$30,000	\$40,000
Project Contingency, Engineering and Implementation <sup>3</sup>	\$220,000	\$240,000
<b>Total</b>	<b>\$880,000</b>	<b>\$980,000</b>
<b>Present Worth of Alternative</b>	<b>\$1,084,000</b>	<b>\$1,005,000</b>

**Notes:**

<sup>1</sup>Construction include construction contingency of 25%.

<sup>2</sup>Escalation to mid-point of construction assumes mid-point of construction occurs in March 2015. Escalation assumed to be 3% per year of the sum of the construction and construction contingency.

<sup>3</sup>Project contingency is 10% of the sum of the construction, and escalation to mid-point of construction. Engineering and Implementation is 20% of the sum of construction, and escalation to mid-point of construction.