5. Estimated Costs

Estimated initial capital costs were developed for each of the alternative screening approaches developed and presented in Section 3 as well as the alternative supply development approach presented in Section 4. In addition to these initial capital costs, annual operations and maintenance costs and 40-year life-cycle costs were developed for continued use of the Screen House facility in combination with a 30-inch diameter pipeline bypass (developed and presented in the July 22, 2014 DRAFT Screen House condition assessment technical memorandum). These estimated costs were developed to the "concept level" or "Class 5" level of accuracy as defined by the Association for the Advancement of Cost Engineering International (AACEI). This level of cost estimating is considered accurate to +30 to -20 percent.

These estimated costs were prepared for guidance in evaluating the recommended improvement approach for the Screen House facility based on information available at the time of the estimate. The final cost of the project will depend upon the actual labor and material costs, competitive market conditions, implementation schedule, and other variable factors. As a result, the final project costs will vary from the estimates presented herein. Because of this variation, project feasibility and funding needs must be carefully reviewed prior to making specific financial decisions.

A summary of these estimated capital, operations and maintenance, and life-cycle costs for all five alternatives are presented in Table 5-1. Estimated capital, annual O&M, and life-cycle costs for each of the five alternative screening approaches are presented in Tables 5-2 through 5-6. The following markups are incorporated into the construction costs listed in the tables below:

- Contractor overhead: 10%
- Contractor profit: 6%
- Mobilization/bond/insurance: 10%
- Contingency: 30%

TABLE 5-1
Summary of Estimated Costs for Screening Alternatives

Cost Element	Alternative 1, Screen House Rehabilitation Plus Bypass	Alternative 2, Screen House Rehabilitation Plus Alternative Supply	Alternative 3, In-Lake Cylindrical Screens	Alternative 4, In-Lake Velocity Caps	Alternative 5, Gate House Site Screening
Initial Capital Cost	$3,948,000	$2,913,000	$6,958,000	$6,352,000	$14,932,000
Annualized O&M	$81,000	$81,000	$42,000	$33,000	$106,000
Life Cycle Cost	$5,333,000	$4,298,000	$7,675,000	$6,913,000	$16,750,000

TABLE 5-2

Summary of Estimated Costs – Alternative 1, Screen House Rehabilitation Plus Bypass

Item		Cost
Construction Costs:		
Screen House Improvements		
Slide gates		$551,000
12-inch mud valve		$66,000
Grout repair/concrete patching		$26,000
48-inch pipe repair		$559,000
Screen House bypass		$1,456,000
	CONSTRUCTION SUBTOTAL	**$2,658,000**
Construction w/ Escalation to February 2016 (6.5%)		$2,831,000
Construction w/ Sales Tax (8.7%)		$3,078,000
Non-Construction Costs:		
Permitting Allowance		$100,000
Engineering and Construction Management [1]		$770,000
	CONSTRUCTION TOTAL	**$3,948,000**
Annual O&M		
Annualized Cost of Inspection (every 5 years)		$10,000
Annualized Cost of Major Repair (every 5 years)		$6,000
Annualized Cost of Minor Screen Repair (every 10 years)		$26,000
Annualized Cost of Replacement (after 30 years)		$39,000
	O&M TOTAL	**$81,000**
Life Cycle		**$5,333,000**

Notes:

[1] Engineering and Construction Management costs estimated as 25 percent of construction subtotal with sales tax.

TABLE 5-3

Summary of Estimated Initial Costs – Alternative 2, Screen House Improvements Plus Alternative Supply

Item		Cost
Construction Costs:		
Screen House Improvements		$1,202,000
Alternative Supply		
Upstream connection		$136,000
30-inch pipe		$276,000
Downstream connection		$260,000
	CONSTRUCTION SUBTOTAL	**$1,874,000**
Construction w/ Escalation to February 2016 (6.5%)		$1,996,000
Construction w/ Sales Tax (8.7%)		$2,170,000
Non-Construction Costs:		
Alternative Supply - Additional Study/Evaluation Allowance		$100,000
Permitting Allowance		$100,000
Engineering and Construction Management [1]		$543,000
	CONSTRUCTION TOTAL	**$2,913,000**
Annual O&M		
Annualized Cost of Inspection (every 5 years)		$10,000
Annualized Cost of Major Repair (every 5 years)		$6,000
Annualized Cost of Minor Screen Repair (every 10 years)		$26,000
Annualized Cost of Replacement (after 30 years)		$39,000
	O&M TOTAL	**$81,000**
Life Cycle		**$4,298,000**

Notes:

[1] Engineering and Construction Management costs estimated as 25 percent of construction subtotal with sales tax.

TABLE 5-4
Summary of Estimated Costs – Alternative 3, In-Lake Cylindrical Screens

Item		Cost
Construction Costs:		
Screen House Improvements Plus Bypass		$2,658,000
In-Lake Cylindrical Screens		
Cylindrical screens		$834,000
Screen manifold		$467,000
Pile-supported structure		$84,000
Electrical/I&C/Site civil		$626,000
	CONSTRUCTION SUBTOTAL	**$4,669,000**
Construction w/ Escalation to February 2016 (6.5%)		$4,973,000
Construction w/ Sales Tax (8.7%)		$5,406,000
Non-Construction Costs:		
Permitting Allowance		$200,000
Engineering and Construction Management [1]		$1,352,000
	CONSTRUCTION TOTAL	**$6,958,000**
Annual O&M		
Drive Energy		$3,000
Annualized Cost of Inspection		$10,000
Annualized Cost of Major Repair (every 5 years)		$7,000
Annualized Cost of Replacement (after 20 years)		$22,000
	O&M TOTAL	**$42,000**
Life Cycle		**$7,675,000**

Notes:

[1] Engineering and Construction Management costs estimated as 25 percent of construction subtotal with sales tax.

TABLE 5-5

Summary of Estimated Costs – Alternative 4, In-Lake Velocity Caps

Item		Cost
Construction Costs:		
Screen House Improvements Plus Bypass		$2,658,000
Velocity Caps		
Velocity caps		$1,001,000
Manifold		$424,000
Pile-supported structure		$167,000
	CONSTRUCTION SUBTOTAL	**$4,250,000**
Construction w/ Escalation to February 2016 (6.5%)		$4,527,000
Construction w/ Sales Tax (8.7%)		$4,921,000
Non-Construction Costs:		
Permitting Allowance		$200,000
Engineering and Construction Management [1]		$1,231,000
	CONSTRUCTION TOTAL	**$6,352,000**
Annual O&M		
Annualized Cost of Inspection (every 5 years)		$3,000
Annualized Cost of Replacement (after 40 years)		$30,000
	O&M TOTAL	**$33,000**
Life Cycle		**$6,913,000**

Notes:

[1] Engineering and Construction Management costs estimated as 25 percent of construction subtotal with sales tax.

TABLE 5-6
Summary of Estimated Costs – Alternative 5, Gate House Site Screening

Item		Cost
Construction Costs:		
Screen House Improvements Plus Bypass		$2,658,000
Gate House Screening		
Bypass caisson		$586,000
Temporary (short-term) lake intake		
Intake w/ cylindrical screen		$251,000
200 feet of 30-inch HDPE pipe		$101,000
On-shore pumping plant and submersible pump		$501,000
Temporary pump discharge piping to Gate House		$76,000
Gate House structure		$4,052,000
Vertical traveling fish screens		$1,701,000
Fish bypass return		$184,000
	CONSTRUCTION SUBTOTAL	**$10,110,000**
Construction w/ Escalation to February 2016 (6.5%)		$10,768,000
Construction w/ Sales Tax (8.7%)		$11,705,000
Non-Construction Costs:		
Permitting Allowance		$300,000
Engineering and Construction Management [1]		$2,927,000
	CONSTRUCTION TOTAL	**$14,932,000**
Annual O&M		
Drive Energy		$20,000
Annualized Cost of Inspection (weekly)		$3,000
Annualized Cost of Major Repair (every 10 years)		$33,000
Annualized Cost of Replacement (after 30 years)		$50,000
	O&M TOTAL	**$106,000**
Life Cycle		**$16,750,000**

Notes:

[1] Engineering and Construction Management costs estimated as 25 percent of construction subtotal with sales tax.