US Army Corps of Engineers®
St. Paul District

Appendix I: Costs

UPPER ST. ANTHONY FALLS LOCK AND DAM

SECTION 216 DISPOSITION STUDY

DRAFT INTEGRATED DISPOSITION STUDY AND ENVIRONMENTAL ASSESSMENT

June 2025

TABLE OF CONTENTS

1 Introduction 1
2 Cost Assumptions and Constraints 1
2.1 Funding Authority 1
2.2 Acquisition Strategy 1
2.3 Inspection Schedule 2
2.4 Real Estate 2
2.5 Material Sources and Disposal Sites 2
2.6 Soil Factor Development 2
2.7 Dewatering and Temporary Bypasses 2
2.8 Interest 2
2.9 Design Life 3
2.10 Quantities and Frequencies 3
2.11 Pricing Level 3
2.12 Project Escalation and Inflation 3
2.13 Project Contingency 3
2.14 Project Direct Markups 3
2.15 Labor Rates 3
2.16 Unit Costs 3
3 Average Annual Costs 5
4 Alternatives 6
4.1 No Action Alternative 6
4.2 Full Disposal 7
4.3 Partial Disposal 7

Figures

Figure 4-1: USAF Feature Locations 5

List of Tables

Table 4-1. All Cost Items…… 8

1 Introduction

This appendix presents the detailed cost estimate prepared for the Draft Integrated Disposition Report and Environmental Assessment. The study investigated alternative measures to address problems and opportunities associated with the disposition of the Upper St. Anthony Falls (USAF) Lock and Dam. A complete description of existing site and features, plan formulation measures and alternatives can be found in of the disposition report.

This project is unique in that it has reached the end of its useful life in terms of carrying out its authorized mission (navigation) and no longer produces the economic benefits as intended. However, while the project no longer produces benefits, it still incurs costs to the federal government in the form of minimal operation and maintenance costs to carry out its other secondary purposes: water supply, hydropower, recreation and flood control.

The estimate was conducted at a rough order-of-magnitude level for design details, and all costs were based on quantities developed from the Disposition Report and Environmental Assessment as reviewed.

This estimate includes all operation, maintenance, repair, replacement & rehabilitation (OMRR&R) cost items for each alternative for parametric comparison.

Guidance for the preparation of this estimate was obtained from Engineer Regulation (ER) 1110-2-1150, Engineering and Design for Civil Work Projects; ER 1110-1-1300, Cost Engineering Policy and General Requirements; ER 1110-2-1302, Civil Works Cost Engineering; and ER 1105-2-100, Planning Guidance Notebook - Appendix E. Guidance was also obtained from Engineer Technical Letter (ETL) 1110-2-573, Construction Cost Estimating Guide for Civil Works; Engineering Manual (EM) 1110-2-1304, Civil Works Construction Cost Index System (CWCCIS); Engineering Circular (EC) 1105-2-410, Review of Decision Documents; and the Cost DX website at http://www.nww.usace.army.mil/html/OFFICES/Ed/C/default.asp.

2 Cost Assumptions and Constraints

2.1 Funding Authority

The USAF Disposition and Environmental Assessment was funded under Section 216 of the Flood Control Act of 1970 (Public Law 91–611) authority.

2.2 Acquisition Strategy

Preparation of contracts for transfer requires input from Real Estate (RE), Office of Counsel (OC), Engineering (EC), Operations (OP), Contracting (CT), and Environmental (EV) groups to address State Historic Preservation Office (SHPO) issues.

2.2.1 Decommissioning

Decommissioning and removal of non-fixed federal property would be performed by the USACE St. Paul District's operation division (MVP-OP).

2.3 Inspection Schedule

MVP-OP has programmed Dam Safety Periodic Inspections for USAF to occur every 5 years, with the next periodic inspection scheduled to occur in 2026.

2.4 Real Estate

It was assumed that all work necessary to complete the recommended plan would be done within the existing USAF site and right of way conditions as described in Appendix D - Real Estate.

2.4.1 Staging Areas and Site Access

General access to the project for delivery of equipment, materials and personnel would be on public primary and secondary roads. The roads along the project area are gravel-, asphalt- and concrete-surfaced and will require vehicle tracking control, maintenance and restoration. Traffic control signage along the roadway would be needed to caution the public during construction activities. Detours and road closures would be necessary to accomplish some OMRR&R work efforts. Small staging areas were assumed to be made available and adjacent to project features to allow equipment and material storage throughout the project site.

2.5 Material Sources and Disposal Sites

Material sources to be used would be based on the lowest price for materials of acceptable salient quality. It is assumed that the disposal of all construction debris would be removed from the project site and disposed of at a local landfill or recycling facility within a 10-mile round trip from the project site.

2.6 Soil Factor Development

Shrinkage at the disposal site was not factored into the cost estimate due to materials being spread at the local landfill or recycling facility. Excavation for utility removals and relocations were considered in-place cubic yards, with no shrink or swell soil factors applied; conservative excavation volumes were assumed to capture the variance in the soils and debris materials. Quantities were based on current and historic work orders, pending further design efforts.

2.7 Dewatering and Temporary Bypasses

Cofferdams and localized pumping would be necessary to perform some in-water OMRR&R features of the project and were included in individual unit cost items.

2.8 Interest

The interest rate, as described in Appendix A Economics, is 3 percent.

2.9 Design Life

Remaining hydraulic structure design life of 50 years was assumed.

2.10 Quantities and Frequencies

Individual cost item quantities and event frequencies were provided by MVP-OP. Figure 4-1 provides the locations of the USAF features.

2.11 Pricing Level

Unit costs were escalated to fiscal year 2025 pricing level, using the appropriate September 2024 CWCCIS factors. Estimated costs were considered fair and reasonable for a prudent and capable contractor and include overhead, subcontractor profit and bond.

2.12 Project Escalation and Inflation

Annualized costs were used in place of project escalation and inflation percentages and applied to individual cost items.

2.13 Project Contingency

Contingency was applied to individual unit cost items and is not globally applied.

2.14 Project Direct Markups

2.14.1 Overtime

Overtime was not considered, and standard work hours were assumed to be 5 days per week and 8 hours per day, with no multipliers applied Monday through Friday.

2.14.2 Material Tax

Tax on materials were included in unit costs and applied for Minneapolis, Hennepin County, Minnesota, at a rate of 9.03 percent.

2.15 Labor Rates

Labor rates were set to reflect current MVP-OP union negotiated rates and meet the minimum Davis Bacon rates for Hennepin County, Minnesota, for building and heavy construction as required.

2.16 Unit Costs

If the government takes no action toward disposition, the USAF project will continue to incur costs. Cost avoidance forms the foundation for the economic benefits of a project's disposal. These avoided costs take a variety of forms, which include costs related to 1) routine operation and maintenance; 2) utilities; 3) flood operations; 4) major maintenance and 5) inspections. The estimate included costs for routine OMRR&R, inspections, property disposal, site security, decommissioning, utilities, flood operations and major maintenance. OMRR&R unit costs were developed to cover the avoided costs for each alternative.

2.16.1 Unit Cost Contingency

Contingency was applied to individual unit cost items at a rate of 25 percent to capture the unknowns of design features and to capture the following indirect markups for all work items to be subcontracted to others.

2.16.1.1 Mobilization

Mobilization was applied at a rate of 3 percent.

2.16.1.2 Bonds

Performance and payment bonds were applied at a rate of 1 percent.

2.16.1.3 JOOH and HOOH

Where appropriate, job office overhead and home office overhead were applied at rates of 6 and 7 percent, respectively.

2.16.1.6 Profit

Profit was applied at a rate of 8 percent.

2.16.2 Pre-Construction, Engineering and Design (PED)

PED was assumed to be included in MVP-OP labor rates included within the work effort.

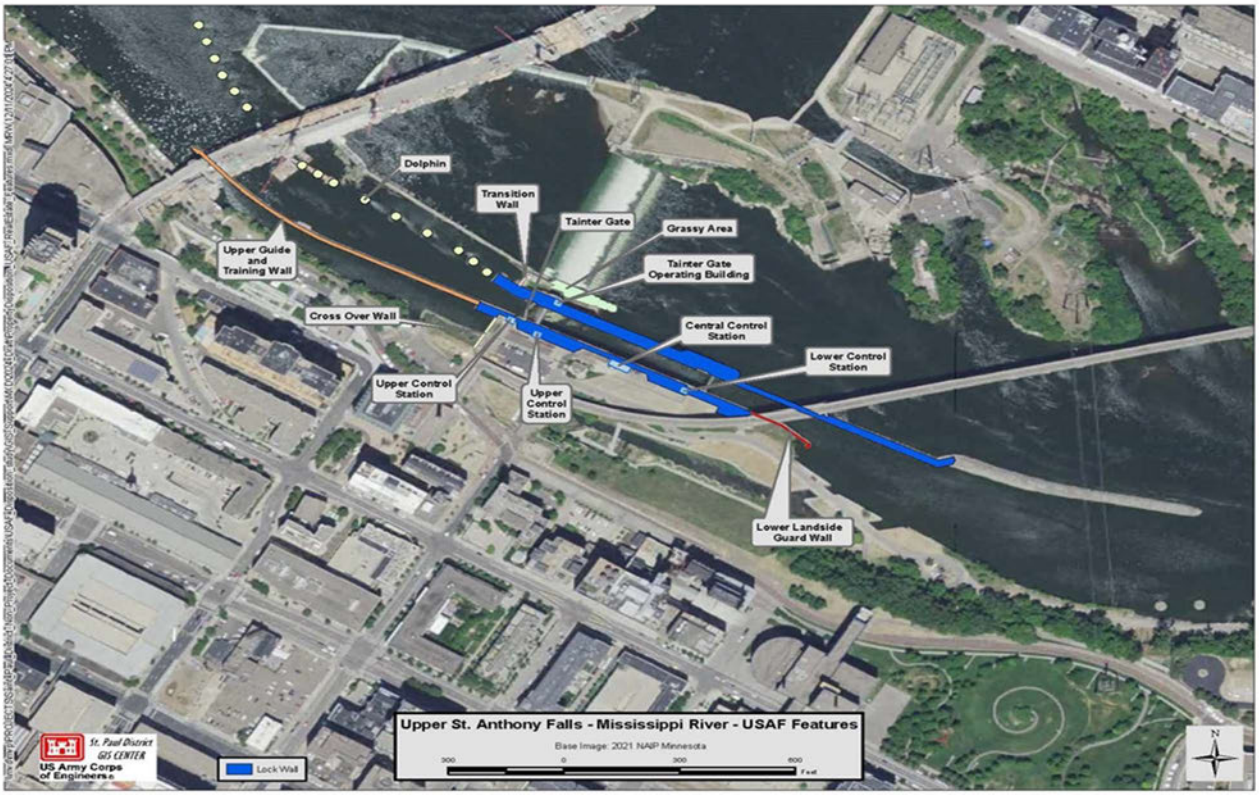
2.16.3 Construction Management (CM)

CM was assumed to be included in MVP-OP labor rates reflecting the work effort.

3 Average Annual Costs

Costs were developed to express the average annual terms and parametrically compare the alternatives: for analysis results and further discussion, see Appendix A - Economics.

Figure 3-1: USAF Feature Locations



4 Alternatives

4.1 No Action Alternative

The No Action Alternative serves as the basis from which the impacts of other alternatives can be assessed and is the condition or scenario expected to prevail if none of the action's alternatives are found worthy of implementation; see Table 4-1.

4.1.1 No Action Alternative Assumptions

a. The study period is the next 50 years.
b. The facility receives electrical power free from Excel Energy.
c. USACE will retain ownership and maintenance responsibility for the facility.
d. The costs contained in this estimate are required to operate and maintain the facility in its current condition.
e. The facility is not permanently staffed.
f. The facility will be maintained and operated to fulfill the flood damage reduction mission as required.
g. All current routine maintenance will continue.
h. The public restroom will be maintained and operated during the summer months.
i. USACE St. Paul District will continue to comply with ER 1110-2-8157, "Responsibility for Hydraulic Steel Structures".
j. All hydraulic steel structures will be dewatered for inspection at 20-year intervals.
k. The upper miter and Tainter gates will be painted and have their seals replaced twice during the study period.
l. Periodic inspections, bridge inspections, instrumentation inspections, and diving and sounding inspections will continue the five-year intervals.

4.2 Full Disposal

For this analysis, the Full Disposal Alternative calls for the complete deauthorization and disposal of the project on; see Table 4-1.

4.2.1 Full Disposal – Assumptions

a. All features would be sold or bequeathed to a separate individual or entity, absolving the government from any future operation or maintenance activities.
b. Property would be sold in an as-is condition.
c. A survey for hazardous materials would be conducted prior to property sale or transfer.

4.3 Partial Disposal

For this analysis, the Partial Disposal Alternative calls for Congressional action to modify the project authorization and partial disposal of only project improvements necessary only for passing navigation traffic.

4.3.1 Partial Disposal – Assumptions

a. Some features would be sold or bequeathed to a separate individual or entity, absolving the Government from any future operation or maintenance activities.
b. Assume property would be sold in an as-is condition.
c. A survey for hazardous materials would be conducted prior to property sale or transfer.

Table 4-1: All Cost Items

ITEM DESCRIPTION	FULL DISPOSAL	NO ACTION	PARTIAL DISPOSAL	WORK EFFORT: (Includes 25% Contingency)	OMRR&R FREQUENCY
Repair, reactivate and recalibrate sensor perimeter fence	NO	Yes	Yes	[redacted]	Starting at YR 10; 20; 30; 40; 50
Repair Decorative perimeter fence adjacent to main external parking lot (vehicle damage)	NO	Yes	Yes	[redacted]	Replace @ Year 1; then maint. Starting at YR 25; 50
Fencing with gate access to emergency generator area	NO	Yes	Yes	[redacted]	Starting at YR 25; 50
Install concertina wire on top of perimeter fence	NO	Yes	Yes	[redacted]	Starting at YR 25; 50
Install balanced magnetic switches and glass breakage sensors on all windows	NO	Yes	Yes	[redacted]	Starting at YR 25; 50
Emplace Bars, metal mesh, or fence fabric on all windows at ground level, and second level if access	NO	Yes	Yes	[redacted]	Replace @ Year 1
Emplace Bars, metal mesh, or fence fabric on all windows at ground level, and second level if access	NO	Yes	Yes	[redacted]	Starting at YR 25; 50
Contract Security force or coordinate contract security with local law enforcement	NO	No	No	[redacted]	Annually; Starting YR 1
Replace & Upgrade perimeter fence and gates to current standards (min-8' Recommended 9')	NO	Yes	Yes	[redacted]	Replace @ Year 1
Replace & Upgrade perimeter fence and gates to current standards (min-8' Recommended 9')	NO	Yes	Yes	[redacted]	@ Year 25
Add flood lights to North side fence and gate	NO	No	No	[redacted]	Starting at YR 5; 10; 15; 20; 25; 30; 35; 40; 45; 50
PI-2020-USAF-002- Disposition Impacts on Dam Safety	NO	Yes	Yes	[redacted]	Annually; Starting YR 1
PERIODIC ROUTINE OPERATION & MAINTENANCE: PI-2020-USAF-001- New Tainter Gate Exercising	NO	Yes	Yes	[redacted]	Annually; Starting YR 1
PI-2015-USAF-011- Bulkhead Stencil Hydraulic Capacity	NO	No	No	[redacted]	Annually; Starting YR 1
PI-2020-USAF-004- INSPECTIONS: Item R: Soundings/ Diving Inspection During Low-Flows	NO	Yes	Yes	[redacted]	Starting at YR 5; 10; 15; 20; 25; 30; 35; 40; 45; 50
CCS gallery door exit sign burned out and damaged.	NO	No	No	[redacted]	Replace @ Year 1
PI-2020-USAF-003- Xcel Inspections	NO	Yes	Yes	[redacted]	Starting at YR 5; 10; 15; 20; 25; 30; 35; 40; 45; 50
PI-2015-USAF-003- Update HEC-RAS Modeling	NO	Yes	Yes	[redacted]	Completed @ Year 1
PERIODIC ROUTINE OPERATION & MAINTENANCE: Miter Gate Anchorages - Paint	NO	Yes	No	[redacted]	@ Year 25
PERIODIC ROUTINE OPERATION & MAINTENANCE: Miter Gate Anchorages - Paint	NO	No	Yes	[redacted]	@ Year 25
USAF Disposition Study Tour	NO	No	No	[redacted]	@ Year 1
Barr Contracting Tour USAF Disposition Study	NO	No	No	[redacted]	@ Year 1
USAF Disposition Study Tour Shakoppe Tribe	NO	No	No	[redacted]	@ Year 1
USAF Disposition Study Tour Bauer Tribal Leaders Media Friends of Falls	NO	No	No	[redacted]	@ Year 1
USAF Disposition Study Tour Clayton Tribal Leaders Media Friends of Falls	NO	No	No	[redacted]	@ Year 1
Visitor Center Camera missing needs Replacement	NO	Yes	Yes	[redacted]	Starting at YR 25; 50
Lower Land I-Star panel Communication Failure	NO	Yes	Yes	[redacted]	Starting at YR 10; 20; 30; 40; 50

Table 4-1: All Cost Items

ITEM DESCRIPTION	FULL DISPOSAL	NO ACTION	PARTIAL DISPOSAL	WORK EFFORT: (Includes 25% Contingency)	OMRR&R FREQUENCY
PI-2020-USAF-006- EAP Update	YES	Yes	Yes	[redacted]	Completed @ Year 1
Video Camera 5 & 8 has broken RG-6 that needs to be pulled and connected.	NO	Yes	Yes	[redacted]	Starting at YR 25; 50
PI-2020-USAF-005- INSPECTIONS: Item P: Bridge Inspection	NO	Yes	Yes	[redacted]	Starting at YR 5; 10; 15; 20; 25; 30; 35; 40; 45; 50
PI-2020-USAF-007b- Roofing Repair	NO	Yes	Yes	[redacted]	@ Year 25
PERIODIC ROUTINE OPERATION & MAINTENANCE: Item B: Supplies related to lighting maintenance	NO	Yes	Yes	[redacted]	Annually; Starting YR 1
PI-2020-USAF-009b- Riprap Overlay	NO	Yes	Yes	[redacted]	@ Year 25
PI-2020-USAF-008- Stairway Painting	NO	Yes	Yes	[redacted]	@ Year 25
PI-2020-USAF-009a- Piezometers	NO	Yes	Yes	[redacted]	Starting at YR 5; 10; 15; 20; 25; 30; 35; 40; 45; 50
PI-2020-USAF-011- Training Dike Erosion	NO	Yes	Yes	[redacted]	Starting at YR 10; 20; 30; 40; 50
PI-2020-USAF-012- Culvert Valve Bulkheads	NO	Yes	Yes	[redacted]	@ Year 25
PI-2020-USAF-010- Mooring Cell Inspections	NO	Yes	No	[redacted]	Starting at YR 5; 10; 15; 20; 25; 30; 35; 40; 45; 50
PI-2020-USAF-013- PMF Update	YES	Yes	Yes	[redacted]	Completed @ Year 1
Painting Safety Yellow in Landside Gallery Steps and Trip Hazards	NO	No	No	[redacted]	Starting at YR 2; 4; 6; 8; 10; 12; 14; 16; 18; 20; 22; 24; 26; 28; 30; 32; 34; 36; 38; 40; 42; 44; 46; 48; 50
Painting Safety Yellow in Riverside Gallery Steps and Trip Hazards	NO	No	No	[redacted]	Starting at YR 2; 4; 6; 8; 10; 12; 14; 16; 18; 20; 22; 24; 26; 28; 30; 32; 34; 36; 38; 40; 42; 44; 46; 48; 50
Painting Safety Yellow in Riverside Gallery Stairs to Crossover Tunnel	NO	No	No	[redacted]	Starting at YR 2; 4; 6; 8; 10; 12; 14; 16; 18; 20; 22; 24; 26; 28; 30; 32; 34; 36; 38; 40; 42; 44; 46; 48; 50
Painting Safety Yellow in CCS Stairway	NO	No	No	[redacted]	Starting at YR 2; 4; 6; 8; 10; 12; 14; 16; 18; 20; 22; 24; 26; 28; 30; 32; 34; 36; 38; 40; 42; 44; 46; 48; 50
Painting Safety Yellow in Landside Gallery Stairs to Crossover Tunnel	NO	No	No	[redacted]	Starting at YR 2; 4; 6; 8; 10; 12; 14; 16; 18; 20; 22; 24; 26; 28; 30; 32; 34; 36; 38; 40; 42; 44; 46; 48; 50
Asphalt crack filling in parking lot	NO	No	No	[redacted]	Starting at YR 5; 10; 15; 20; 25; 30; 35; 40; 45; 50
Paint Floating Mooring Bits/Ballard's	NO	Yes	No	[redacted]	Starting at YR 2; 4; 6; 8; 10; 12; 14; 16; 18; 20; 22; 24; 26; 28; 30; 32; 34; 36; 38; 40; 42; 44; 46; 48; 50
CCS Stairs-Yellow Safety Paint	NO	No	No	[redacted]	Starting at YR 2; 4; 6; 8; 10; 12; 14; 16; 18; 20; 22; 24; 26; 28; 30; 32; 34; 36; 38; 40; 42; 44; 46; 48; 50
Diesel Fuel Tank-Paint	NO	Yes	Yes	[redacted]	Starting at YR 2; 4; 6; 8; 10; 12; 14; 16; 18; 20; 22; 24; 26; 28; 30; 32; 34; 36; 38; 40; 42; 44; 46; 48; 50
Caulk Doors and Windows-Public Restrooms	NO	No	No	[redacted]	
Caulk Doors and Windows-Central Control Stand	NO	Yes	Yes	[redacted]	Starting at YR 5; 10; 15; 20; 25; 30; 35; 40; 45; 50
Caulk Doors and Windows-Lower Control Stand	NO	Yes	Yes	[redacted]	Starting at YR 5; 10; 15; 20; 25; 30; 35; 40; 45; 50
Window Glazing-Central Control Stand	NO	Yes	Yes	[redacted]	@ Year 25
Caulk Doors and Windows-Upper Control Stand	NO	Yes	Yes	[redacted]	Starting at YR 5; 10; 15; 20; 25; 30; 35; 40; 45; 50
Window Glazing-Lower Control Stand	NO	Yes	Yes	[redacted]	@ Year 25

Table 4-1: All Cost Items

ITEM DESCRIPTION	FULL DISPOSAL	NO ACTION	PARTIAL DISPOSAL	WORK EFFORT: (Includes 25% Contingency)	OMRR&R FREQUENCY
Window Glazing-Upper Control Stand	NO	Yes	Yes	[redacted]	@ Year 25
Replace Broken Glass CCS Lock Door	NO	Yes	Yes	[redacted]	Replace @ Year 1; then @ Year 25
Xcel Hydropower Plant Operation and Maintenance Coordination	NO	Yes	Yes	[redacted]	Annually; Starting YR 1
Dewatering Event	NO	Yes	Yes	[redacted]	Starting at YR 20; 40
PERIODIC ROUTINE OPERATION & MAINTENANCE: Item A: Building and Grounds weekly site checks (4 hours per week)	NO	Yes	Yes	[redacted]	Annually; Starting YR 1
PERIODIC ROUTINE OPERATION & MAINTENANCE: Item D: Grease/ Hydraulic fluid/ Misc. wear items (Land Wall and River Wall)	NO	Yes	Yes	[redacted]	Annually; Starting YR 1
PERIODIC ROUTINE OPERATION & MAINTENANCE: Item E: Winterization & Spring Start Up	NO	Yes	Yes	[redacted]	Annually; Starting YR 1
PERIODIC ROUTINE OPERATION & MAINTENANCE: Item F: Tainter Gate Operation for Horseshoe Dam Maintenance	NO	Yes	Yes	[redacted]	Annually; Starting YR 1
PERIODIC ROUTINE OPERATION & MAINTENANCE: Item G: Elevator Maintenance	NO	Yes	Yes	[redacted]	Annually; Starting YR 1
UTILITIES: Item H: City Water & Storm Water Sewer Tax	NO	Yes	Yes	[redacted]	Annually; Starting YR 1
UTILITIES: Item I: Phone & Internet	NO	Yes	Yes	[redacted]	Annually; Starting YR 1
UTILITIES: Item J: Trash Pickup	NO	Yes	Yes	[redacted]	Annually; Starting YR 1
UTILITIES: Item K: Electrical Services (Free, without cost by Excel Energy)	NO	Yes	Yes	[redacted]	(Excel Energy bill is $0)
MAJOR MAINTENANCE (OCCUR ON 25-Year INTERVAL): Item L: Blast & Paint Bulkheads	NO	Yes	Yes	[redacted]	@ Year 25
MAJOR MAINTENANCE (OCCUR ON 25-Year INTERVAL): Item M: Blast & Paint Tainter Gates	NO	Yes	Yes	[redacted]	@ Year 25
INSPECTIONS: Item O: Periodic Inspection Safety	NO	Yes	Yes	[redacted]	Starting at YR 5; 10; 15; 20; 25; 30; 35; 40; 45; 50
INSPECTIONS: Item Q: Instrumentation	NO	Yes	Yes	[redacted]	Starting at YR 5; 10; 15; 20; 25; 30; 35; 40; 45; 50
FLOODING OPERATIONS: Item S: Tainter Gate Operations & Sandbagging Labor	NO	Yes	Yes	[redacted]	Starting at YR 10; 20; 30; 40; 50
FLOODING OPERATIONS: Item T: Sandbags/ misc. flood related supplies	NO	Yes	Yes	[redacted]	Starting at YR 10; 20; 30; 40; 50
LOWER GUIDE WALL RESURFACING	NO	Yes	No	[redacted]	@ Year 25
RIVER WALL RESURFACING	NO	Yes	No	[redacted]	@ Year 25
CONCRETE MUD JACKING (for uneven walkways; option for grouting underneath)	NO	Yes	Yes	[redacted]	@ Year 25
HIGH MAST POLE REMOVAL	NO	No	Yes	[redacted]	@ Year 25
HIGH MAST POLE REPLACEMENT	NO	Yes	No	[redacted]	@ Year 25
SPILLWAY STRUCTURE CONCRETE REHABILITATION	NO	Yes	Yes	[redacted]	@ Year 25
VERTICAL CONCRETE REHABILITATION (vertical surfaces for Upper Guide & Lower Guide Walls, and any vertical surface outside of lock chamber used for navigation)	NO	Yes	No	[redacted]	@ Year 25
CONCRETE PAVEMENT REHABILITATION TO RESURFACE	NO	Yes	Yes	[redacted]	@ Year 25

Table 5-1: All Cost Items

ITEM DESCRIPTION	FULL DISPOSAL	NO ACTION	PARTIAL DISPOSAL	WORK EFFORT: (Includes 25% Contingency)	OMRR&R FREQUENCY
ELECTRICAL CABINET REHABILITATION	NO	Yes	No	[redacted]	@ Year 25
MACHINERY REPLACEMENT	NO	Yes	No	[redacted]	@ Year 25
DOLPHIN REPLACEMENT	NO	Yes	No	[redacted]	@ Year 25
DOLPHIN MAINTENANCE	NO	Yes	No	[redacted]	Starting at YR 15; 30; 45
COMPLETE DEAUTHORIZATION AND DISPOSAL	YES	No	No	[redacted]	Completed @ Year 1