PROJECT SUMMARY
WOOD RIVER LEVEE SYSTEM, MADISON COUNTY, ILLINOIS

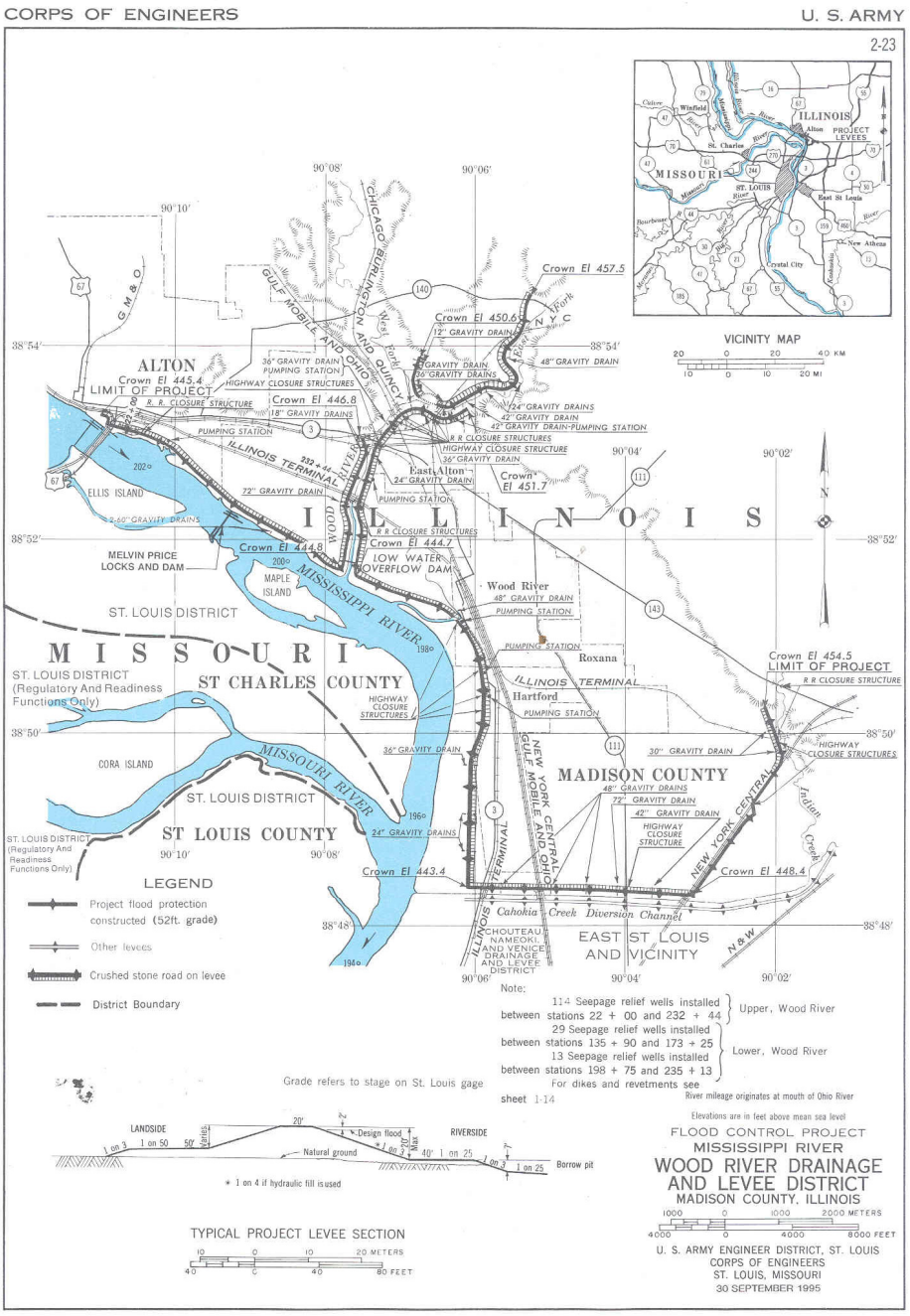
STUDY INFORMATION

Study Authority. This study is authorized by the Resolution of the Committee on Transportation and Infrastructure, U.S. House of Representatives, dated May 7, 1997, which reads:

> *"Resolved by the Committee on Transportation and Infrastructure of the United States House of Representatives, That the Secretary of the Army is requested to review the report of the Chief of Engineers on the Mississippi River between Coon Rapids Dam, Minnesota, and the mouth of the Ohio River, published as House Document 669, 76th Congress, 3rd Session, and other pertinent reports, to determine whether modifications of the recommendations contained therein are advisable at this time, for the purpose of reconstructing the facilities of the Wood River Drainage and Levee District along the Mississippi River in Madison County, Illinois to return the levee and pump stations and other appurtenant features to their original degree of protection."*

Study Purpose and Scope. The purpose of this draft Limited Re-evaluation Report is to investigate the existing condition of the Wood River Levee system in order to determine what if any actions are required to return the levee, pump stations and other appurtenant features to a condition that ensures they continue to provide their intended original degree of protection into the future. The report is a final response to the study authority.

Project Location. Wood River Drainage and Levee District (Levee District) lies in southwestern Illinois, on the left bank of the Mississippi River flood plain, within Madison County, Illinois, between river miles 195 and 203 above the Ohio River. The levee district is protected by an urban design levee, across the Mississippi River from St. Louis and St. Charles counties in Missouri. This system includes approximately 21 miles of main line levee, 160 relief wells, 26 closure structures, 41 gravity drains and 7 pump stations. The study area lies in the Mississippi River flood plain of Madison County, Illinois, just upstream of the city of East St. Louis. There are approximately 13,700 acres of bottomland within the District and 4,700 acres of hill land tributary to the levee units.



Prior Reports and Existing Water Projects.

Original Project Authority**.** The Wood River Levee project originally was authorized by the Flood Control Act of 28 June 1938, Flood Control Committee Document No. 1, 75th Congress, and First Session to provide flood protection to urban, agricultural and industrial areas.

Grassy Lake Pump Station Authority**.** The Flood Control Act, approved 27 October 1965 by Public Law 89-298, House Document No. 150, 88th Congress, First Session, modified

the project to provide for construction of a pumping station with collector ditches and necessary appurtenant facilities for removal of interior water impounded by the existing levee. This project was never constructed and a Reconnaissance study for the Wood River Drainage & Levee District, Illinois - Pump Station, dated January 1998, was approved for Pre-Engineering Design. The purpose of this project is to solve interior flooding near the southern end of District through the addition of a 45-cfs pump station as a new feature to the original system. This station has not yet been constructed.

Mel Price Lock and Dam Authority. The Internal Revenue Code of 1954 - Bingo - Tax - Exempt Organizations, Public Law 95-502 (H.R. 85331), October 21, 1978. Title I - Replacement of Locks and Dam 26; Upper Mississippi River System Comprehensive Master Management Plan. This project resulted in pool modifications that authorized the addition of a pump station for the Wood River Levee System.

"Sec. 102. (a) The Secretary of the Army, acting through the Chief of Engineers, is authorized to replace locks and dam 26, Mississippi River, Alton, Illinois, and Missouri, by constructing a new dam and a single, one-hundred-and-ten-foot by one-thousand-two-hundred-foot lock at a location approximately two miles downstream from the existing dam, substantially in accordance with the recommendations of the Chief of Engineers in his report on such project dated July 31, 1976, at an estimated cost of $421,000,000."

Design Memorandum No. 16 Wood River Drainage and Levee District Alteration, March 1985. DM documents changes required to the Upper Wood River Levee System resulting from the Lock and Dam No. 26 (Replacement), Mississippi River.

1993 P.L. 84-99 Memorandum. Memorandum, CELMV-CO-E, dated 9 March 1994, Subject: Project Approval/Funding Request, Final Repairs, Wood River Drainage and Levee District, Madison County, Illinois, provided assessment of system performance failures recommended for emergency repairs, under authority of PL84-99/PL99-662, resulting from the flood of 1993.

Periodic Inspection No. 7. Periodic Inspection No. 7, Levee and Closure Structures, Wood River Flood Protection Project, dated March 1997, which documents system performance deficiencies identified as a result of problems experienced during the 1993 flood.

Reconnaissance 905(b) Report**.** Wood River Levee, Illinois, Flood Damage Reduction 905b Report dated April 1999. This report was prepared in response to study authorization 4.1 above, and details problems identified during and after the flood of 1993 and recommends project reconstruction be further investigated.

STUDY OBJECTIVES

Federal Interest. At current estimates, levee failure could cost some $1.5 billion dollars in economic damages, and potentially another $2 billion dollars in environmental damages.

Problems and Opportunities. The potential for levee failure is a major problem. As time continues to pass without a comprehensive reconstruction being undertaken for the Wood River Drainage and Levee System the probability that the project will fail continues to increase. The Wood River Drainage and Levee District has remained a good steward of this Federal infrastructure. They continue to provide routine operation and maintenance of the system and take action to repair as circumstances require IAW the agreements under which they assumed Sponsorship responsibility. However, as all parts of this integral system continue to degrade with time the chances of multiple failures occurring simultaneously continue to increase. This serious situation truly creates a "pay me now" or "pay me later" scenario. The opportunity exists to proactively take action to reconstruct the system now in order to prevent a future catastrophe caused by system deterioration.

Planning Objectives and Constraints. The objective of this study is to reduce flood damages and flood related costs by restoring operational functionality of the levee system and appurtenances to ensure the system continues to provide its intended level of protection. Based on the Planning Guidance Memorandum (PGM) dated 4 August 1999, received following submission of the Section 905b Analyses, a Limited Reevaluation Report is being produced only to document reconstruction requirements and to fix proximate responsibility for corrective actions while ensuring the scope, function and purpose of the authorized Federal project is maintained. The PGM restricted the focus of this investigation to the reconstruction project by stating "There is no authority to add ecosystem restoration…..we are not seeking new authorization." Therefore, for the purpose of this investigation the primary problem facing the Wood River Drainage and Levee District is the deterioration of the existing levee system and its appurtenances due to design deficiency on the levee underseepage control measures, advanced age and the system exceeding its performance life.

Systems / Watershed Context. The loss of the Wood River Levee system would not only have devastating economic impacts in the traditional measurement of losses but would have the added implication of creating an environmental contamination scenario not experienced on any inland waterway system to date. Not only would the land-side of the levee experience significant contamination from oil, oil byproducts and chemicals used in the refining process, but the Mississippi River system itself would be impacted. At a conservative estimate of $125,000 per acre of clean up costs a loss of this levee would result in environmental damages exceeding $2,000,000,000 (two billion dollars) not including the relocation costs of residents and future loss of agriculturally productive land.

Measures of Success. The recommended project is expected to provide the original level of urban design protection of the area. The proposed plan provides and accounts for all necessary investments or other actions to ensure the realization of the objectives (completeness), achieves and planning objectives (effectiveness), is the most cost effective plan (efficiency), and is acceptable to the local sponsor (Wood River Drainage and Levee District).

ALTERNATIVES

Plan Formulation Rationale. Three basic alternative plans were used to guide the alternative development process for this study. The No Action alternative assumed no action would be taken. Under this scenario the Levee District would continue to perform its operation and maintenance responsibilities and maintain their standing in the P.L. 84-99 program, but no Federal action outside of the P.L. 84-99 program would be taken. The reconstruction alternative sought to identify actions that could be taken to correct system deficiencies through a variety of specific approaches that would be equal in performance to replacement. The replacement alternative sought to identify actions that could be taken to correct system deficiencies through replacement of system components.

Management Measures and Alternative Plans / Final Array of Alternatives.

CMP Gravity Drains

No Action: CMP gravity drains have exceeded their expected performance life and failure to address this situation could lead to catastrophic failure of the levee system.

Reconstruction: Insituform lining and High Density Polyethylene (HDPE) lining was considered. High Density Polyethylene (HDPE) lining was determined viable and was carried forward for cost estimating.

Replacement: Since Corps design criteria requires RCP for this type urban levee system this was utilized for replacement evaluation costing.

Sluice Gates and Flap Gates

No Action: Flap gates and sluice gates are nearing 50 years of age and will continue to deteriorate until their condition results in failure. Failure of a flap gate or sluice gate could cause isolated flooding in the drainage area leading to the gravity drain.

Reconstruction: Sluice gates would be removed and refurbished and gate hoist, stem gate slide and frames completely refurbished with new anchors, fasteners, hinge bushings and bearings installed. Flap gates would be removed and refurbished with new hinge bushings, anchors and fasteners installed.

Replacement: Sluice Gates would be replaced to include new hoists, stems, slides and frames. Two types of Flap Gate replacements were investigated, cast iron similar to those currently in service and a rubber "duckbill" check valve.

Gatewell Structures

No Action: Gatewell structures will continue to deteriorate over time at varying rates based on the problems they currently manifest until their condition results in failure of the structure. Failure during a high water event could result in significant interior flooding and possible loss of the levee.

Reconstruction: The steel handrails and existing steel bridge joists would be sand blasted and recoated. Reconstruction of the steel grating was investigated and determined to be cost prohibitive. Reconstruction of GW-9 is not an option based on its existing condition and no further reconstruction is required for the remaining concrete gatewell structures.

Replacement: Replacement of the steel grating and steel handrails with fiberglass and complete removal and replacement of the concrete structure of GW-9.

Closure Structures

Concrete Structures

No Action: Closure structures will continue to deteriorate over time until their condition eventually results in failure of the structure. Failure during a high water event could result in significant interior flooding and possible failure of the levee.

Reconstruction: Removal and replacement of joint sealant material patch, chemical injection grouting, epoxy grouting or concrete encapsulation of the damaged concrete at gate sills, monoliths, aprons and monolith floodwalls.

Replacement: Removal and replacement of gate monoliths, monolith floodwalls, gate sill concrete, corner protections and gate seals.

Gates/Stoplogs

No Action: Steel gates will continue to deteriorate over time until their condition results in failure of the structure. Failure during a high water event could result in significant interior flooding and possible loss of the levee. Stoplogs were determined to be acceptable in their present condition.

Reconstruction: Steel gates would be sand blasted and recoated with a multi-coat paint with rubber-J-seals and steel clamping bars replaced and a steel skinplate added on the backside of the gates to act as weather shields

Replacement: Fabricate and install new steel gates with appurtenances including steel skinplate weather shields.

Pump Stations

*Gravity Drains**

No Action: The two pump stations (Wood River and Hawthorne) with concrete drain structures that are in good condition with a slight chance of problems at joints, which could lead to loss of levee embankment material and subsequent levee instability. After 50 years it is anticipated that the two cast iron drains at the Rand Pump Station may have corrosion problems that could contribute to failure of these pipes. Failure of these cast iron pipes would prevent this station from being able to remove interior water causing localized flooding.

Reconstruction: Concrete pipes at Wood River can be lined with HDPE or Insituform as they are structurally sound and this would prevent future joint problems. At Rand the two cast iron pipes could be lined with HDPE to indefinitely extend their life or if found to still be structurally sound they could also be lined with insituform. At Hawthorne the joints of the concrete box culvert gravity drain would be repaired.

Replacement: It was determined that replacement of Wood River, Rand and Hawthorne drain structures was infeasible as they cross under Illinois Route 3 and the mainline levee and would be cost prohibitive. Replacement was eliminated prior to cost estimating.

*Two pump stations (Homegarden and Lakeside) with CMP drains are covered under Gravity Drains

Pump Station Structures

No Action: In general deterioration at all pump stations will continue eventually reaching a point where the degree of deterioration will become significant and require repair in order for the station to properly function. At the Wood River Station the emergency stoplog slots have corroded to the point that the inability to place stoplogs in the event a flap gate failure during a high water event would result in increased pumping demand and should more than one flap gate fail result in interior flooding.

Reconstruction: In general replacement of trashracks, grating, roofing, ladders, chain link fencing, and tuckpointing as applicable should return the structures to an acceptable standard.

Replacement: It was determined that replacement of pump station structures was not warranted as the conditions do not warrant such drastic action and cost would be prohibitive when compared to reconstruction.

Pumps and Motors

No Action: As this equipment reaches 50 years of age there will be an increased probability of failure. Failure during a high water event would result in the localized flooding in the drainage area served and depending on the station effected, the backup of sanitary sewer lines in several cities and the cessation of refinery process at Conoco-Phillips.

Reconstruction: In general the removal, disassembly, and replacement or refurbishment of all pump and motor components as detailed in the Engineering Appendix would be accomplished.

Replacement: Existing pumps at various locations could be replaced with vertical line-shaft pumps or submersible pumps as detailed in the Engineering Appendix.

Sluice Gates and Flap Gates

No Action: If no action is taken on flap gates and sluice gates and appurtenances as this equipment reaches 50 years of age there will be increased probability of failure. Failure of these components has varying consequences based on their location and function in the pump station. These consequences range from interior flooding to the inability to perform maintenance and repairs on other items such as pumps and sewer lines. These consequences are detailed for each station in the Engineering Appendix.

Reconstruction: In general the removal, disassembly, and replacement or refurbishment of all gate and gate hoist assemblies and components as detailed in the Engineering Appendix would be accomplished.

Replacement: Sluice gates would be replaced with similar type cast iron sluice gates with stainless steel stems. Gate hoists would be replaced by similar manually operated geared hoists or with electric motor actuated gate hoists with limit switches. Flap gates would be replaced either with similarly designed cast iron flap gates or rubber Tideflex duckbill type check valves.

Electrical Equipment

No Action: Reliability of the electrical switchgear will decrease rapidly in the near future and with no spare parts being available equipment failures will cause extended downtime as components will have to be completely replaced. Failure of a motor starter or main circuit breaker would render stormwater pumps useless until replacement could be located and installed. These systems are likely to fail during high water events when they are critical to system operation.

Reconstruction: As repair parts are no longer available for the installed equipment this option was not pursued.

Replacement: Existing switchgear would be replaced with a motor control center. The float control device would be replaced with a radar or sonar level measurement and a lightning transformer fed from the MCC would be installed to eliminate the 120/208 volt service from the utility. The lighting panelboard and other wiring devices would also be replaced.

Underseepage

Existing Relief Wells

No Action: Existing relief well performance will continue to degrade over time making them ineffective in performing their required functions resulting in certain reaches of the levee system becoming unstable during high water events. Failure of any reach of the levee will result in widespread and catastrophic flooding of the protected area.

Reconstruction: Based on the Districts experience with the rehabilitation of the East St. Louis Levee System all wells need to be pump tested and those showing performance below 80% of original capacity need to be re-developed in order to restore efficiency.

Replacement: Replacement of all wells is not a viable option based on cost and land area available, however, those wells not achieving 80% efficiency after reconstruction will be replaced and 10 wells identified as damaged/abandoned will be replaced.

Underseepage control

No Action: Seepage during high water events will continue to create stability problems for certain reaches of the levee. Failure of any reach of the levee will result in widespread and catastrophic flooding of the protected area.

Reconstruction: The addition of relief wells, seepage berms and slurry walls were evaluated for their ability address underseepage concerns for the system.

Replacement: It was determined that replacement was not feasible either for function or cost.

Comparison of Alternatives. For each of these three basic alternative plans, costs were calculated so that they could be evaluated against one another. In each instance the final recommended action was determined to be necessary in order to provide the original level of protection. In this manner each of the system features were analyzed and evaluated.

Primary Assumptions.

Development is expected to continue on the interior, as a major Interstate Highway has recently opened in the Levee District. The connection that this new highway makes to the regional interstate system increases the likelihood of future development in the project area. The surrounding region has become a distribution center and this new interstate spur, which will soon be further expanded, makes the project area attractive for development. New investments by Conoco-Philips and the issuance of another permit for refinery operations during the spring of 2004 by the State would indicate that this base will continue to expand also. This increases the importance of the flood protection system to perform as intended in the future. However, as the levee systems' features continue to degrade as a result of flood events and to exceed their performance life, the systems' ability to operate, as originally intended under future flood events becomes an even greater concern. If no action is taken underseepage problems and degradation of gravity drain structures pose a threat to the integrity of the levee while further degradation to pumping stations and appurtenant works could cause interior flooding that can impact industries, infrastructure and interrupt the transportation system. Future odds increase that a significant failure could occur under the no action alternative.

Recommended Plan.

Design Deficiency

According to Engineer Regulation ER 1165-2-119, a design or construction deficiency is a flaw in the Federal design or construction of a project that significantly interferes with the project's authorized purposes or full usefulness as intended by Congress at the time of original project development. Corrective action, therefore, falls within the purview of the original project authorization. Work to correct a design or construction deficiency may be recommended for accomplishment under existing project authority without further Congressional authorization if the proposed corrective action meets all the following conditions:

- It is required to make the project function as initially intended by the designer in a safe, viable and reliable manner; e.g., pass the original design flow without failure. This does not mean the project must meet present-day design standards. However, if current engineering analysis or actual physical distress indicates the project will fail, corrections may be considered a design or construction deficiency if the other criteria are met.

- It is not required because of changed conditions.

- It is generally limited to the existing project features. Remedial measures that require land acquisitions or new project features must not change the scope or function of the authorized project.

- It is justified by safety or economic considerations.

- It is not required because of inadequate local maintenance.

Additional Relief Wells. The analysis of underseepage requirements for the Wood River flood projection system indicates that a total of 68 new wells are required to meet original design intent at an estimated cost of $2,394,800.

Existing Relief Wells. Relief well re-development requirements were not provided to the local sponsor, therefore, current performance problems should be addressed as a project deficiency. The relief wells will be pump tested and re-developed as required to achieve 80% performance efficiency or replaced at an estimated cost of $2,081,700. Under modifications to existing projects, this work would be cost shared with the non-Federal sponsor on a 65% Federal and 35% non-Federal basis and could be undertaken within existing project authority.

Reconstruction

The following items fall into the category of reconstruction. These items would be cost shared with the non-Federal sponsor on a 65%Federal and 35% non-Federal basis but could be undertaken only with additional authority being received to undertake this work.

Gravity Drainage Structures. Of the thirty-eight corrugated metal pipe gravity drains twenty-five will be lined with HDPE and thirteen will be replaced with RCP at a cost of $4,800,900.

Closure Structures. Removal and replacement is recommended for four sills and one approach apron. Three closure structures are recommended to be permanently closed. Eleven gates will be reconstructed, five gates will be replaced, three gates will be removed as the closure will be permanently closed and tow gates will require no action. No action is required at the five stoplog closures. Investigation of three closure structure monoliths, three closure structure monoliths and floodwalls and one gatewell structure indicates that while they have been in place for many years, in comparison to other like structures in the system, they are deficient. In each situation deterioration is directly attributable to the poor quality of the concrete aggregate with the possibility of low or no entrained air. The aggregate used in the concrete is soft and appears to be highly absorptive. Since there is no legal recourse against any contractors for any alleged construction deficiencies so it is recommended that these items be addressed by the reconstruction project. The cost for reconstruction/replacement of these items is $3,150,700.

Pump Stations. East Alton No. 2, Wood River, Rand Avenue and Hawthorne Street Pump Station structures will be reconstructed to include trashracks, grating, roofing, ladders, discharge chamber embedded metals, chain link fences and tuckpointing. Lakeside and Homegarden Pump Station structures will have grating and sheet metal roofs replaced. At East Alton No. 2 both stormwater pumps and their associated electric motors will be completely reconstructed and each of the three sluice gates gate slides and frames reconstructed with gate stem and stem guides replaced. At Wood River Pump

Station the vertical stormwater pumps and their associated electric motors will be reconstructed, the baseflow pump replaced with a submersible centrifugal pump, and of the eleven sluice gates, seven gate slides and frames are to be reconstructed with gate stem and stem guides replaced with four of these gates having manual operated gate hoists replaced with electric and three being reconstructed but remaining manually operated. At Rand Avenue Pump Station the one remaining original electric motor will be completely reconstructed and each of the six sluice gates gate slides and frames will be reconstructed with gate stem and stem guides replaced with two gates having manually operated gate hoists replaced with electric and four being reconstructed but remaining manually operated. At Hawthorne Street Pump Station both stormwater pumps and their associated electric motors will be completely reconstructed and the two sluice gates gate slides and frames will be reconstructed with gate stem and stem guides replaced with one of these gates having a manual operated gate hoist replaced with electric and one being reconstructed but remaining manually operated. At Lakeside Pump Station the existing vertical pump will be replaced with a pump of similar design and the vertical electric motor completely reconstructed. At Homegarden Pump Station the existing vertical pump will be replaced with a pump of similar design and the vertical electric motor completely reconstructed. At the East Alton No.1 Pump Station the trash rack will be replaced. The cost for reconstruction/replacement of these items is $4,565,000.

EXPECTED PROJECT PERFORMANCE

Project Costs.

Summary of Cost by Accounts

Summary of Cost by Accounts

Feature Accounts	Costs	Contingency	Total Costs
01 Lands and Damages	100,000	25,000	125,000
11 Levees and Floodwalls	10,521,000	1,907,000	12,428,000
13 Pumping Plant	3,840,100	725,000	4,565,100
30 Planning, Engineering & Design	2,441,000	732,300	3,173,300
31 Construction Management	1,436,000	430,800	1,866,800
Total*	**18,338,100**	**3,820,100**	**22,158,200**

**Total does not include PED costs of $1,600,000*

Cost Share Table

	Federal	Non-Federal	Total
PED LRR/Deficiency	$1,200	$ 400	**$ 1,600**
PED Reconstruction	$ 337	$ 181	**$ 518**
Construction			
5% Cash		$1,188	**$ 1,188**
LERRD		$ 125	**$ 125**
Additional Cash	$13,906	$6,421	**$20,845**
Total	**$15,443**	**$8,315**	**$23,758**

Cost-Sharing is 75% Federal/25% Non-Federal during PED LRR/Deficiency
Total Project Cost Sharing is 65% Federal/35% Non-Federal

Equivalent Annual Costs and Benefits.

Recommended Plan – Expected Annual Costs and Net Benefits (NED)

ESTIMATE OF EXPECTED ANNUAL NET BENEFITS

ITEM	5-3/8%, SEPT 2004 PRICE LEVEL
Expected Annual Benefits	**$ 5,780,750**
First Costs	**22,158,200**
Interest During Construction	**1,908,840**
Average Annual Construction Costs	**1,588,710**
OMRR&R	**331,600***
Total Average Annual Costs	**1,920,310**
B/C Ratio	**3.01**
Expected Annual Net Benefits	**$ 3,860,440**

**Reflects increased costs to cover OMRR&R*

Operation, Maintenance, Repair, Rehabilitation, and Replacement (OMRR&R).

The Wood River Drainage and Levee District has received PL 84-99 assistance as follows:

1943	$8,000	1944	$13,000	1951	$133,500
1952	$20,200	1967	$350,000	1973	$1,606,000
1974	$1,640,400	1975	$196,800	1976	$400
1980	$34,100	1981	$11,400	1993	$620,000 est

Over the past ten years, the Wood River Drainage and Levee District has averaged approximately $451,000 annually on the operation and maintenance of the system. Now that required OMRR&R costs have been fully disclosed, the Sponsor has the ability to raise the necessary financial resources to fully accomplish future OMRR&R requirements currently estimated to add an additional $331,600 annually to the Sponsor's current O&M budget.

Cost Sharing / Project Implementation.

The Wood River Drainage and Levee District is expected to serve as the Sponsor for both the deficiency and reconstruction projects.

The Sponsors' share of the Project cost is estimated to be $8,315,000 of which $400,000 will have already been contributed during PED. Additionally, now that required OMRR&R costs have been fully disclosed the Sponsor now has the ability to raise the necessary financial resources to fully accomplish future OMRR&R requirements currently estimated to add an additional $331,600 a year to the Sponsor's current O&M budget. The Wood River Levee and Drainage District is authorized by the Illinois Drainage Act of 29 June 1955 to assess taxes in support of the levee system and its requirements. The Sponsors has the capability to finance this Project.

The estimated total project cost, based on October 2004 price levels is $22,158,200, with actions required to address design and construction deficiencies being $ 5,608,500 and the reconstruction plan being $16,549,700. This recommendation is made with the provision that prior to implementation, non-federal interests will agree to comply with the following requirements:

a. Provide 35 percent of the separable project costs allocated to flood damage reduction, as further specified below:

(1) Enter into an agreement to provide, prior to execution of the project cooperation agreement, 25 percent of design costs;

(2) Provide during construction, any additional funds needed to cover the non-Federal share of design costs;

(3) Provide all lands, easements, and rights-of-way, including suitable borrow and dredged or excavated material disposal areas, and perform or ensure the performance of all relocations determined by the Government to be necessary for the construction, operation, and maintenance of the project;

(4) Provide or pay to the Government the cost of providing all retaining dikes, waste weirs, bulkheads, and embankments, including all monitoring features and stilling basins, that may be required at any dredged or excavated material disposal areas required for construction, operation, and maintenance of the Project;

(5) Provide during construction, any additional costs as necessary to make the total non-Federal contributions equal to 35 percent of total project costs allocated to flood damage reduction.

b. Provide the non-Federal share of that portion of the costs of mitigation and data recovery activities associated with historic preservation that are in excess of one percent of the total amount authorized to be appropriated for the project, in accordance with the cost-sharing provisions of the agreement;

c. For so long as the project remains authorized, operate, maintain, repair, replace, and rehabilitate the completed project, or functional portion of the project, at no cost to the Government, in accordance with applicable Federal and State laws and any specific directions prescribed by the Government;

d. Give the Government a right to enter, at reasonable times and in a reasonable manner, upon land which the non-Federal sponsor owns or controls for access to the project for the purpose of inspection, and, if necessary, for the purpose of completing, operating, maintaining, repairing, replacing, or rehabilitating the project;

e. Comply with Section 221 of Public Law 91-661, Flood Control Act of 1970, as amended, and Section 103 of the Water Resources Development Act of 1986, Public Law 99-662, as amended, which provides that the Secretary of the Army shall not commence the construction of any water resources project or separable element thereof until the non-federal sponsor has entered into a written agreement to furnish its required cooperation for the project or separable element;

f. Hold and save the Government free from all damages arising from the construction, operation, maintenance repair, replacement, and rehabilitation of the project and any project-related betterments, except for damages due to the fault or negligence of the Government or the Government's contractors;

g. Keep and maintain books, records, documents, and other evidence pertaining to costs and expenses incurred pursuant to the project to the extend and in such detail as will properly reflect total project costs for a minimum of three years after completion of the accounting for which such books, records, documents and other evidence are required;

h. Perform, or cause to be performed, any investigations for hazardous substances that are determined necessary to identify the existence and extent of any

hazardous substances regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 USC 9601-9675, that may exist in, on, or under lands, easements of rights-of-way necessary for the construction, operation, and maintenance of the project; except that the non-Federal sponsor shall not perform such investigations on lands, easements, or rights-of-way that the Government determines to be subject to the navigation servitude without prior specific written direction by the Government;

i. Assume complete financial responsibility for all necessary cleanup and response costs of any CERCLA- regulated materials located in, on, or under lands, easements, or rights-of-way that the Government determines necessary for the construction, operation, or maintenance of the project;

j. To the maximum extent practicable, operate, maintain, repair, replace, and rehabilitate the project in a manner that will not cause liability to arise under CERLA;

k. Prevent obstructions of, or encroachments on, the project (including prescribing and enforcing regulations to prevent such obstructions or encroachments) that might reduce the ecosystem restoration, hinder its operation and maintenance, or interfere with its proper function, such as any new development on project lands or addition of facilities that would degrade the benefits of the project;

l. Comply with the applicable provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Public law 91-646, as amended by title IV of the Surface Transportation and Uniform Relocation Assistance Act of 1987 (Public Law 100-17), and the Uniform Regulations contained in 49 CFR part 24, in acquiring lands, easements, and rights-of-way, and performing relocations for construction, operation, and maintenance of the project, and inform all affected persons of applicable benefits, policies, and procedures in connection with said act;

m. Do not use Federal funds to meet the non-Federal sponsor’s share of total project costs unless the Federal granting agency verifies in writing that the expenditure of such funds is authorized.

n. Comply with all applicable Federal and State laws and regulations, including, but not limited to: Section 601 of the Civil Rights Act of 1964, Public Law 88-352 (42 U.S.C. 2000d) and Department of Defense Directive 5500.11 issued pursuant thereto; Army Regulation 600-7, entitled "Nondiscrimination on the Basis of Handicap in Programs and Activities Assisted or Conducted by the Department of the Army"; and all applicable federal labor standards requirements including, but not limited to, 40 U.S.C. 3141-3148 and 40 U.S.C. 3701-3708 (revising, codifying and enacting without substantive change the provisions of the Davis-Bacon Act (formerly 40 U.S.C. 276a et seq.), the Contract Work Hours and

Safety Standards Act (formerly 40 U.S.C. 327 et seq.) and the Copeland Anti-Kickback Act (formerly 40 U.S.C. 276c)).

o. Provide and maintain necessary access roads, parking areas, and other public use facilities, open and available to all on equal terms.

Key social and environmental issues. An environmental assessment was completed and based on the analysis of the impacts that would result from both the design deficiency and reconstruction project, a finding of no significant impact is recommended. Archeological surveys are scheduled to be completed during the PED phase. Based on the location of new relief wells at the existing levee toe and the ability to move these laterally with no impact to the project it is anticipated that issues will be resolved without further action.

Hydrology and Hydraulic Conditions. The project is intended to provide protection against a 52 foot Mississippi River stage on the St. Louis Gage, which has a current expected frequency of greater than 500 years. For the design flow of 1,300,000 cfs, the height of protection is based upon confinement by industrial and urban area projects. The flood of record occurred during the summer of 1993 when the St. Louis gage recorded 49.58 ft. The frequency of that event was 175 years.

Environmental Contamination. As a result of the nature of the industries who have dominated the riverfront area, a number of sites are in the State Site Remediation Program. In addition, there are several Resource Conservation and Recovery Act (RCRA) sites and Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (commonly known as Superfund sites) in the area. These combined sites occupy thousands of acres of the floodplain with Shell Oil being the largest with 2220 acres. The loss of the Wood River Levee system would not only have devastating economic impacts in the traditional measurement of losses but would have the added implication of creating an environmental contamination scenario not experienced on any inland waterway system to date. Not only would the land-side of the levee experience significant contamination from oil, oil byproducts and chemicals used in the refining process, but the Mississippi River system itself would be impacted. At a conservative estimate of $125,000 per acre of clean up costs a loss of this levee would result in environmental damages exceeding $2,000,000,000 (two billion dollars) not including the relocation costs of residents and future loss of agriculturally productive land.

National Security Considerations. A two-mile portion of the Levee provides containment for the navigation pool at the Mel Price Lock and Dam. Loss of this pool would stop the movement of goods on the upper Mississippi River system between St. Louis and St. Paul and Chicago. The Conoco-Phillips facility produces defense grade fuels including some 1,500,000 gallons a day of jet fuel. The Winchester Division of the Olin Corporation supports munitions production for the Defense Department and law enforcement agencies across the nation, while the Brass Division provides copper and copper alloy strip used to support a variety of industrial purposes as well as the U.S. Mint. Interruption to these fuel and munitions production activities would not only adversely impact the area in

traditional economic terms but also have implications to defense and national security needs. Additionally, any loss of refinery capability would impact gasoline availability and prices throughout the mid-west and western states.

Economic Analysis**.** A risk based economic analysis was completed for the study area in accordance with Engineering Regulation (ER) 1105-2-100, Planning Guidance, using the National Economic Development Procedures Manual for Urban Flood Damage, prepared by the Water Resources Support Center, Institute for Water Resources, as a reference. Results indicated a total structural value of residential, commercial and industrial buildings inventoried in the study area as being slightly over $1.5 billion. Discussions held in June 2004 with Factory Mutual Global (an insurance underwriter for this area) would indicate that these values, while the best available, are understated. While their information is proprietary, they have a client base protected by this levee system (not including any refineries) that they have insured for over $1 billion.

Stakeholder perspectives and differences. During the draft report comment period a public meeting will be conducted to provide information and clarification of questions related to the project. To date public involvement has been limited to the Levee and Drainage District, local units of government, the State of Illinois and major industrial customers of the area. Additionally, the study has been discussed monthly at the Metro East Regional Stormwater Committee Meetings, which are a public/private coalition of interested parties or the metropolitan area that meet monthly to address local issues and concerns regarding flooding and stormwater management.

CEMVS-PM-F 27 September 2004

Compliance Memorandum
Wood River Levee, Illinois Limited Reevaluation Report
Alternative Formulation Briefing Report
Project Guidance Memorandum

1. Background. Headquarters appreciates that the district has raised the issue of whether existing project authority is sufficient to undertake reconstruction of the levee. The district noted a discrepancy between guidance contained in EC 11-2-183 dated 31 March 2002 and the PGM guidance with email traffic between HQUSACE and CEMVD. Although the budget guidance since 1994, the Wood River PGM, and the guidance contained in draft PGL 50 all indicated that new authority was not needed for project reconstruction, the policy guidance for project reconstruction has never been finalized due to legal concerns that there is no authority for reconstruction of projects that have been turned over for maintenance by local sponsors, absent specific Congressional authorization. It should be noted that this lack of authority does not apply to measures addressing design and construction deficiencies, but rather relates to the reconstruction of older projects that are no longer performing as intended due to long term degradation of features which have exceeded their expected service life. Given the Congressional authority for studies of reconstruction of the Wood River project, the district should proceed with the technical and analytical study efforts to move the project forward and resolve other policy concerns. It is envisioned that the final policy with respect to analytical requirements for justification of reconstruction at projects where OMRR&R is a local responsibility will involve similar requirements to those for major rehabilitation at projects, which are Federally maintained. Except for those specific features on which it is determined that a design or construction deficiency is involved or the action is a local OMRR&R responsibility, additional Congressional authorization will be required to undertake the reconstruction.

2. Comments. The items below discuss the concerns, which were raised during the policy review of the material.

Comment 2.a. Project Construction History. The text discussions on the existing project do not clearly identify when the various project features were constructed and what entities have undertaken repair and rehabilitation actions in the past. The project authority dates from 1938 according to paragraph 4.1, however it is not clear when the construction was actually started. Table 1 of Appendix A indicates that the ages of the CMP gravity drains vary, reflecting construction between 1948 and 1961. Paragraph 5.1.3.5 indicates that the relief wells were installed in the 1950's and 1960's. Were all the relief wells installed by the Government during construction or were some installed subsequently as problems were identified? A table should be provided as a clear and concise reference to show the age of the various features and their likely need for reconstruction due to age.

District Response: *In 1938 a local levee system was already in place. Action taken by the Federal government in the 1950's and early 1960's, as a result of the 1938 act, raised and reinforced portions of this existing levee, added relief wells, added or modified gravity drains,*

added or modified closure structures and added pump stations. The government installed all relief wells during construction of the project. These actions were taken under various construction contracts over several years. Information contained in General Design Memorandum No. 4 was utilized to create the following table.

Item	QTY	Completed	Age in Years	Reconstruction Required
Gravity Drains				
Upper Wood River	4	1952	51	Yes
East & West Fork	8	1950	53	Yes
Lower Wood River	24	1948- 1961	42+	Yes
Closure Structures				
Upper Wood River	9	3 -1961 5-1982 1-1992	42 21 11	Yes No No
East & West Fork	2	1964	39	Yes
Lower Wood River	17	6-1959 6-1960 2-1961 3-1964	44 43 42 39	Yes Yes Yes Yes
Pump Stations with Gravity Drains				
East Alton No.2		1950	53	Yes
Homegarden		1953	50	Yes
Lakeside		1953	50	Yes
Wood River		1953	50	Yes
Hawthorne		1955	48	Yes
Rand		1957	46	Yes
East Alton No.1		1988	15	No
Relief Wells				
Upper Wood River	103	1954	49	Yes
	12	1964	39	Yes
East & West Fork	0			
Lower Wood River	45	1964	39	Yes

HQ Analysis: The table provided in response to the comment is helpful and demonstrates the correlation between the age of features and the need for reconstruction. Some further clarification would be helpful to resolve discrepancies between the text on page 5 of the AFB and the table on the number of features included in the project. The table provides age data for 36 gravity drains, 28 closure structures and 160 relief wells. The text on page 5 indicates there

are 41 gravity drains, 26 closure structures, and 164 relief wells. The values should be reconciled and the completion dates and age provided for the final list of features, which is included in the report. The discrepancies may be partly attributable to features that have already been rehabilitated or replaced.

Discussion: Concur.

Required Action: The district will include information from the response in the draft report. In addition, the district will review this information to ensure consistency with other information presented in the report and explain any noted differences.

Compliance Action: Construction history table has been included in paragraph 5.1.3 of the draft report and numbers have been reconciled throughout the document.

Comment 2.b. Maintenance History. The ITR comments (on page 3) note that there is need for clarification of past O&M activities to explain whether they have been sufficient and whether there was a timely response to requirements of periodic inspection reports. The report does not appear to provide much clarification beyond the language cited in the comment. The text in paragraph 5.1.2.2 notes that there were four years out of eighteen in which the inspection reports were not satisfactory for the levee and it would be helpful to know what issues were raised and how they were addressed. Although cost information is provided on the most recent 10 years and inspections were evaluated back to 1985, there is a lack of information on the long-term maintenance history and expenditures except for P.L. 84-99 assistance. Further information should be provided to describe the extent and cost of past maintenance efforts in order to demonstrate a long-term history of adequate maintenance.

District Response: *Data past 15 years is not readily available. However, if 15 years ago the levee system was satisfactory and the pumping plants were outstanding then is prior information really pertinent? The system was in compliance then and is in compliance today. The Wood River Drainage and Levee District have continued to uphold their agreement with the Federal government under the terms of Title 33 and have funded these requirements on an annual basis as required since the system was turned over for operation.*

The following table provides the 15-year maintenance history and noted deficiencies.

Year	Levee Condition Rating	Issue	Maintenance Effort	Extent of Maintenance Effort	Pump Station Rating
2002	Minimum Acceptable	Deterioration of closure structures. Deterioration and siltation of gravity drains and drain aprons.	Work in progress	Low level effort	Satisfactory
2001	Acceptable				
2000	Acceptable				Satisfactory
1999	Acceptable				Satisfactory
1998	Acceptable				Satisfactory
1997	Acceptable				Acceptable
1996	Acceptable				Acceptable
1995	Acceptable				Acceptable
1994	Acceptable				Acceptable
1993	Acceptable				Acceptable
1992	Acceptable				Acceptable
1991	Acceptable				Acceptable
1990	Minimum Acceptable	Vegetation needs to be removed. Siltation in outlet channels. Debris in inlet drain.	Issues addressed	Low level effort	Acceptable
1989	Acceptable				Acceptable
1988	Minimum Acceptable	Two slides in levee section. Vegetation in floodways. Siltation in outlet channels. Flap gate silted shut.	Issues addressed	Medium level effort	Acceptable
1987	Minimum Acceptable	Vegetation in riprap around drainage structures and in floodways.	Issues not addressed		Acceptable
1986	Satisfactory				Outstanding
1985	Satisfactory				Outstanding

In addition to the deficiencies noted during the annual inspection in the 15-year maintenance history table above, the problem of concrete deterioration has been noted during the annual inspections. The levee district has performed maintenance on these concrete structures to stop the deterioration. These maintenance attempts consisted of surface overlays to repair the deteriorated concrete. Since the concrete was defective to begin with, the surface overlays could not stop the deterioration of the concrete and the concrete continued to deteriorate into its present condition of needing to be replaced. This deterioration occurred through no fault of the levee district as they did perform the necessary maintenance on the concrete structures. The problem is that no amount of maintenance could stop the deterioration of concrete that was defective to begin with.

HQ Analysis: The information provided should be included in the report since it is helpful in understanding the past maintenance activities and whether there was any correlation between past maintenance efforts and the deficiencies currently experienced. In addition, it is not clear what has been done under PL 84-99 assistance and how those actions may have contributed to the current project conditions or may have changed/clarified the sponsor requirements relative to

OMRR&R. Section 5.1.2.1 indicates that after the flood event in 1973, about $3.5M of assistance was provided under PL 84-99 between 1973 and 1975. This is substantially higher than the $620,000 estimated following the 1993 flood of record and based on the dates for replacement of gravity drains in Table 1 of the Engineering Appendix, the PL 84-99 efforts likely included replacement of two gravity drains in 1973 and one in 1993 that are now recommended for rehabilitation as design deficiencies. It is not clear what further agreements /explanations of responsibilities were associated with the PL84-99 work efforts. This should be clarified to assure that work proposed for reconstruction/replacement is consistent with any requirements and conditions associated with the previous PL 84-99 activities.

Discussion: Concur. The district will attempt to explain PL84-99 work accomplished but is limited by the available historical documentation. In order to save time, the district would find it useful to understand which features are worthy of this investigation (e.g., are roofs included or not?). HQ acknowledged that they now have a better understanding of the work involved and how it relates to the work proposed.

Required Action: The district will include information from the response in the draft report. In addition, the district will include information to clarify responsibilities required by any PL84-99 work completed to date and any associated inconsistencies.

Additional HQ Analysis: Subsequent to the AFB, HQ further discussed the issues presented by this project related to concrete described above. These discussions concluded that the concrete has largely performed its function, but should be considered as part of the reconstruction effort proposed in the draft report and not as a design deficiency.

Compliance Action: A maintenance history table has been included in paragraph 5.1.2.2 of the draft report. Drains repaired under PL84-99 are not recommended for action and this has been clarified in paragraph 2.02 of the Engineering Appendix. Concrete problems identified in the report have been recommended for action under the reconstruction alternative as indicated in paragraph 6.2.2.

Comment 2.c. Maintenance versus Reconstruction Measures. The text does not provide adequate rationale to support characterizing some of the recommended features as reconstruction. The Title 33 maintenance requirements are fairly detailed and absent further rationale it appears that several measures, such as sand blasting and painting metal closure gates, replacement of seals, corroded metal parts and fences, and pump replacements should be accomplished by the local sponsor as maintenance activities under Title 33. Further detail is needed to clarify the sponsor's understanding of maintenance requirements under Title 33, to describe the actions accomplished throughout the project life as maintenance versus P.L. 84-99 repairs, and to document the response to the recommended actions in inspection reports. Information should also be provided regarding past rehabilitation and replacement activities. This information is needed to support the conclusion that the recommended measures are all reconstruction rather than maintenance activities and have not resulted from a lack of past maintenance. Specific concerns are as follows:

District Response: *Information in the report is complete with respect to the sponsor's understanding and execution of their responsibilities under Title 33. They have operated and maintained the system and when something has failed or broken then it has been repaired or replaced. The sponsor has not undertaken an advanced repair or replacement program (rehabilitation/reconstruction) in anticipation of failure. Rehabilitation is major project feature restoration consisting of structural work intended to improve reliability of an existing structure, the result of which will be a deferral of capital expenditures to replace the structure. Such actions have not been undertaken by the Levee District and are not required or implied in Title 33 requirements. N or was any schedule provided to the Levee District that would have provided information for such a plan as none existed and none was provided at project turnover. The case at hand is that now with the age of the system it would be prudent to complete a major rehabilitation/reconstruction (i.e. take planned action in advance of a failure) of the system to ensure it continues to operate and provide the benefits intended by congress into the future. Under the current scenario without action being taken all pieces and parts continue to age and failure becomes a more common occurrence under the laws of probability. With the potential loss off life, loss of economic base and catastrophic environmental contamination a future failure could pose it appears prudent to undertake a major rehabilitation (reconstruction) project for this levee system now. The sponsor does not have the technical or financial wherewithal to accomplish such an undertaking independently. They do however have the capability to participate as cost share partners in such a project.*

HQ Analysis: The current requirements for OMRR&R are not new, but a clarification of what had been intended as local sponsor's O&M. Once a project has been turned over to the local sponsor for maintenance, there has been no mechanism or authority for the Corps to go back into the construction phase except to remedy design and construction deficiencies. Therefore, reconstruction requires Congressional authorization. Specific comments regarding the district's responses on the various features are noted in the paragraphs below.

(1) <u>Closure Structures</u>. For closure structures, the Title 33 O&M responsibilities included inspection to assure proper closure could be made and that metal parts were adequately covered with paint. Damaged or missing parts were to have been repaired or replaced immediately. It is not clear how the recommended closure gate rehabilitation, which includes painting and seal repair of closures as well as other measures, differs from required maintenance under Title 33. Section 3.01.b.(6) in Appendix A notes that two gates have been rehabilitated by sand blasting and painting, although it does not indicate the date or entity that performed the work. Previous rehabilitation of these gates by the sponsor would indicate an understanding that this was a local O&M responsibility and would support treating the remainder of the gates similarly.

District Response: *Paint coat maintenance has been carried out for some 40 years by Wood River personnel obviously with some success as these structures are still operable. Paint coat failures at the project are attributable to the very aggressive environment caused by road spray containing de-icing agents (salt) and debris projectiles. The Original title 33 requires that metal parts remain adequately covered with paint. In the conditions that existed during design of the project, providing adequate paint coverage was a reasonable and acceptable responsibility for the DLD. However, since the environmental condition has worsened, with the increase of traffic and use of chemical snow removal methods this provision is no longer such a simple matter on*

structures that are now 40+ years old. Normal painting would do little at this point to provide for continued long-term structural integrity and sand blasting, a precursor to more serious major rehabilitation, now requires permitting and expensive environmental controls because original coatings were lead based. None of these situations was anticipated by the requirements detailed in the original Title 33. Modern paint materials and proper application methods (recoating vs painting) could be used to resist the degradation associated with the increased environmental exposure, but the cost and expertise required for these methods removes them from the definition of "maintenance". It is the difference between for example performing touch up painting on your car as a part of your normal maintenance and taking your car to say MAACO for a complete repainting. In summary, after 40 years maintenance of the existing paint coatings, the current condition requires in today's changed environment a fix that is not reasonably defined as maintenance under the terms of original agreements

As indicated throughout the report the Wood River Drainage and Levee District has maintained and operated the system in compliance with requirements given them and as items have failed the Wood River Drainage and Levee District has taken actions required by Title 33 to "repair" the system. As the system now after 45+ years continues to age, failures are likely to occur with greater regularity and even simultaneously during future flood events. However, the fact that the DLD repairs or replaces items as they break or fail does not lead one to the conclusion that they therefore have an understanding or knowledge of, or responsibility for, major rehabilitation/ reconstruction under Title 33. It is not reasonable to assume that the DLD has the technical or financial resources to rehabilitate/reconstruct this system now all at one time. Had DLD been given the type of information provided under today's OMRR&R requirements they would have had an organized method to plan for, budget for, and take action across the system over the past 45 years so that today they would not be in this situation. However, this is not the case, as they were never given such information upon which to plan and take action. The current situation significantly increases the possible failure of the system during a future flood event.

The justification of a major rehabilitation/reconstruction project should be predicated on the fact that future failure will occur at an increased rate and economic and environmental consequences of failure are great enough to warrant advanced action. It is clear that neither Title 33 nor the O&M agreements at the time of levee turn over placed this level of sophisticated action on the DLD.

HQ Analysis: It is understandable that rehabilitation/reconstruction of the system may be beyond the financial capabilities of the sponsor to perform all at one time. However, the Title 33 requirements (inspection and replacement of damaged or missing parts needed to assure proper closure could be made) would seem to include seal replacement as a maintenance item. The response indicates that changed conditions are responsible for accelerated corrosion and the current need for rehabilitation or replacement of the steel closure structures. Such changed conditions were beyond the capability of the government to foresee or advise the sponsor. The comparison of alternatives should include seal replacement as part of the No Action/Continued Maintenance scenario, which is considered relative to the Rehabilitation and Replacement/Reconstruction scenarios.

Discussion: Some items related to closure structures are unclear to the review team (e.g. are there some areas where we are only replacing seals and not gates?) and need further discussion in the Limited Reevaluation Report. For example, the district explained seal replacement work would only be undertaken if rehabilitating or replacing a closure structure – this kind of information needs to be clarified in the Limited Reevaluation Report.

Required Action: The district will explain that the proposed work relates to the rehabilitation/reconstruction of closure structures in the draft report.

Compliance Action: Two tables have been included in paragraph 3.03 of the Engineering Appendix to assist in clarifying actions recommended for the closure structures. Text has been modified to reflect the fact that seals etc. will be replaced as a part of replacing a gate or reconstructing a gate.

(2) Pumping Stations. For pumping plants, measures to be undertaken under Title 33 included cleaning plant, buildings and equipment; repainting as necessary; and lubricating all machinery, in addition to testing of electrical and communication systems and making a record of the results. Have the corrugated metal roofs, fences, and embedded metal been routinely painted? Some pumps (Rand Avenue) have been replaced or repaired through the years and it is not clear whether that was done under O&M or as a previous Federal rehabilitation. If pump repair and replacement was accomplished previously under O&M it would support treating further actions of that nature similarly.

District Response: *A review of inspection reports indicates the Levee District has maintained all pumping plants in an acceptable manner.*

As indicated throughout the report as items fail the Wood River Drainage and Levee District takes actions required by Title 33 to "repair" the system. As the system continues to age these failures are likely to occur with greater regularity and even simultaneously. This significantly increases the possible failure of the overall system. However, the fact that the DLD repairs items as they fail does not lead one to the conclusion that they are therefore responsible under their Title 33 terms for major rehabilitation/reconstruction. Major rehabilitation/reconstruction would be the repair and replacement in advance of failure on some predetermined schedule based on use or age. The justification of a major rehabilitation/reconstruction project should be predicated on the fact that future failure will occur at an increased rate and economic and environmental consequences of failure are great enough to warrant advanced action. . It is not reasonable to assume that the DLD has the technical nor financial resources to rehabilitate/ reconstruct this system now all at one time. Had they been given the type of information provided under today's OMRR&R requirements they would have had an organized method to plan for, budget for, and take action across the system over the past 45 years so that today they would not be in this situation. However, this is not the case, as they were never given such information upon which to plan and take action. It is clear that neither Title 33 or the O&M agreements at the time of levee turn over placed this level of sophisticated action on the DLD.

HQ Analysis: HQ understands and accepts the response. There is a concern though as to the degree to which future OMRR&R costs and responsibilities are defined for the sponsor as part of

this report analysis. In particular, for those project features, which are not proposed for rehabilitation because they are currently in good condition or have been previously rehabilitated (some components of pumping plants, stop log closures, previously rehabilitated closures), does the OMRR&R estimate represent the total project requirement versus just those features recommended for rehabilitation/reconstruction?

Discussion: Concur.

Required Action: The district will review information currently included in the Limited Reevaluation Report related to Title 33 requirements, the sponsor's maintenance activities and determine whether any additional clarifying information should be included in the draft report.

Additional HQ Analysis: Subsequent to the AFB, HQ further discussed the issues presented by this project related to pump stations. These discussions concluded that pump station improvements should be treated as a reconstruction activity and analyzed for justification in accordance with general Corps' Major Rehabilitation methodologies.

Compliance Action: A schedule for all required replacements, repairs and rehabilitations has been made that addresses all project components that will require future action. This schedule, which has been included in the Cost Engineering Appendix covers a 50-year period and provides a repeating sequence of actions necessary to keep the system fully operational. The annualized costs associated with these required activities are reflected in the economic analysis. These costs are over and above the annual operation and maintenance costs currently being borne by the Wood River Levee District. The current annual operation and maintenance funding identified paragraph in the draft report in paragraph 5.1.2.2 that is being currently spent by the Sponsor is considered adequate to address ongoing O&M needs.

A reliability analysis was performed in order to determine a probability of failure for each pump station. This information is contained in paragraph 4.04 of the Engineering Appendix. An incremental analysis is provided in the Economic Appendix. This analysis demonstrates that recommended actions are incrementally justified.

(3) <u>Relief Wells and Drains</u>. Title 33 indicates that relief wells and toe drain systems were to have been inspected to assure that they were in good working condition and had not become clogged. The drains and gates were to be maintained in good working condition. Although the underseepage design may have been inadequate, it isn't clear what the sponsor has done to satisfy the Title 33 maintenance requirement for the maintenance of relief wells, since efficiency is severely reduced and they are not functioning as needed (how does the existing condition differ from being clogged?).

District Response: *'Clogged' infers the prevention of flow from the well due to outside considerations – damaged outlet works, debris due to inundation from flood events. The existing conditions being discussed in this document, which recommends the major rehabilitation of the relief wells, is due to chemical/biological incrustation of the well screen and gravel pack.*

Maintenance has traditionally included maintaining the outside (outlet) portion of the relief wells works, including clearing debris or replacement, when necessary. Maintenance has not included rehabilitation of the relief wells, either by mechanical or chemical methods, to be the responsibility of the sponsor. This requirement was not clearly understood by the government until the Wood River wells were well past an age for action that today would be recommended practice.

HQ Analysis: HQ understands and accepts the response. There is a question with regard to those gravity drains that were already replaced in 1973 and 1993. The report indicates those drains are to be lined with concrete as well as the older drains that have not been replaced as part of the recommended plan. It is assumed that replacement of those drains was accomplished under PL84-99 and there may be local cooperation requirements that are different for such features with regard to OMRR&R.

Required Action: The district will include explanatory information provided in the response in the draft report. In addition, the district will include information in the draft report that describes the sponsor's OMRR&R requirements for the whole project in order to ensure OMRR&R responsibilities are clearly defined in one document to protect the interests of the sponsor and the Federal government.

Compliance Action: The Engineering Appendix, paragraph 2.02, clarifies that drains replaced or lined as a result of PL 84-99 response are not recommended for action. These features are not included in the 50 year RR&R schedule described above as they are considered to be a final solution with a life expectancy of greater than 50 years. As discussed in paragraph 5.6.3 of the draft report, all levee features would be covered for future OMRR&R by the reconstruction project.

Additional HQ Analysis: Subsequent to the AFB, HQ further discussed the issues presented by this project related to relief wells. These discussions concluded that an insufficient number of relief wells appears to be a design deficiency and should be treated as such in this report. With regards to clean out of existing relief wells the district needs to present historical information that has been gained about relief wells to better support an understanding of the need for rehabilitation of existing wells. The district will explain, in the draft report, why it makes sense for the Corps to repair the existing wells while undertaking the construction of needed new relief wells, regardless of whether the repairs are considered a design deficiency, since the cost-share relatively low and would assure the reliability of the underseepage control system. The draft report will further explain that the sponsor would be responsible for O&MRRR for both existing and newly placed relief wells based on the execution of a new PCA. Proposed work related to gravity drains should be treated as reconstruction and analyzed in accordance with Corps Major Rehabilitation methodologies.

Compliance Action: The draft report paragraphs 5.3.2.3 and 5.6.3 describe the lack of knowledge by the Corps and absence of direction to the Sponsor for the adequate maintenance of existing relief wells. The current degradation is directly attributable to this. The 50 year RR&R schedule developed for future relief well maintenance, contained in the Cost Engineering Appendix, makes it clear that there was never an understanding by either party of the extent to

which this maintenance was required nor was there a disclosure previously of costs associated with this maintenance. The one time rehabilitation of these well should be considered as a part of the authorized project with future OMRR&R costs to be borne by the sponsor.

An incremental analysis is provided in the Economic Appendix for the gravity drains. This analysis demonstrates that recommended actions are incrementally justified.

Comment 2.d. Economic Analysis.

(1) Future Rehabilitation Costs. Discussion should be provided to clarify the Operation and Maintenance Costs used in the BCR computation. The annual value of $650,000 is higher than what has historically been documented over the last 10 years ($451,000 on page 11), but there is no mention of future rehabilitation by the sponsor- only O&M. The discussions in the Engineering Appendix on the condition of project features infer that future rehabilitation will be required beyond the actions proposed as part of this reconstruction project. Paragraph E-5.d. on page E-17 of ER 1105-2-100 requires that the life cycle costs including OMRR&R be accounted for in the development of project cost estimates. Rehabilitation was to be included as a local responsibility in a revised PCA, according to the 4 August 1999 CECW-PC guidance memorandum contained as Item 12 of the submission. Additional information is needed to assure that the future rehabilitation requirements have been adequately accounted for in the economic analysis.

District Response: *The questions raised here will be more completely addressed in the draft report. A review of the projected OMRR&R costs for the project annualized at $650,000 will be re-verified. However, the project B/C is sufficient to justify the project under almost any scenario.*

HQ Analysis: The response appears acceptable to address the concern. The future rehabilitation costs are important from the standpoint of economic justification and as a basis for financial planning by the levee district to accomplish future OMRR&R.

Discussion: Noted. A discussion of how to handle OMRR&R costs was undertaken. HQ acknowledged that a simple approach is acceptable; the bottom line is that the OMRR&R costs need to be clearly outlined and accurately accounted for in the Limited Reevaluation Report.

Required Action: The district will ensure the Limited Reevaluation Report includes sufficient information to assure that the future rehabilitation requirements have been adequately accounted for in the economic analysis and in the computation of the OMRR&R requirements of the sponsor. This will provide a sound basis for the sponsor to do financial planning for the total project.

Compliance Action: A schedule for all required replacements, repairs and rehabilitations has been made that addresses all project components that will require future action. This schedule contained in the Cost Engineering Appendix covers a 50-year period and provides a repeating sequence of actions necessary to keep the system fully operational. The annualized costs associated with these required activities are reflected in the economic analysis. These costs are

over and above the annual operation and maintenance costs currently being borne by the Wood River Levee District discussed in paragraph 5.1.2.2 of the draft report. The current annual operation and maintenance funding identified in the draft report that is being currently spent by the Sponsor is considered adequate to address ongoing O&M needs. As discussed in paragraph 5.6.3 of the draft report, all levee features would be covered for future OMRR&R by the reconstruction project PCA.

(2) MCACES Project Costs. The project costs included in the MCACES estimate include features that do not directly correlate with the project description for the recommended plan on page 33 of the text. This leads to confusion as to whether the MCACES estimate used in the economic analysis is appropriate for the recommended plan. For instance, the selected plan section makes no mention of work at the East Alton No. 1 Pumping Station although costs of $682,000 are included in the MCACES estimate. The MCACES estimate notes that there are 25 closure structures requiring rehabilitation work. It is not evident from the description in paragraph 6.4.2 how many closure structures are being rehabilitated. Also, paragraph 6.4.1 indicates that there are 38 gravity drains being either replaced or lined, however the MCACES estimate shows work on 37. The district should review the MCACES estimate in relation to the selected plan description and revise the text or estimates as needed to assure that there is agreement between the two sections and the appropriate project costs are used for the economic analysis.

District Response: *The questions raised here will be clarified and/or corrected in the draft report.*

HQ Analysis: The response appears adequate to address the concern. Discrepancies should be resolved in the draft report.

Required Action: The district will review the MCACES estimate to ensure it is accurate as part of the development of the Limited Reevaluation Report.

Compliance Action: Discrepancies have been corrected and the MCACES components match those described in the draft report.

(3) OMRR&R Costs. No MCACES cost estimates or descriptive backup is provided relative to the estimate of O&M costs. Similar cost information to that provided for the reconstruction costs should be provided to support the estimate for the O&M costs used in the analysis to assure that it is complete in accordance with paragraph D-3.e.(9) of ER 1105-2-100.

District Response: *The questions raised here will be more completely addressed in the draft report.*

HQ Analysis: The response appears adequate to address the concern. The draft report will include further MCACES and descriptive information with regard to OMRR&R costs.

Required Action: The district will develop MCACES estimates to support the OMRR&R costs included in the Limited Reevaluation Report.

Compliance Action: See Compliance Action paragraph 2.d(1)

(4) <u>Interest During Construction</u>. The text does not discuss the analysis of interest during construction, although Table 6 of the Economic Appendix appears to include a compound value for construction expenditures that may reflect the calculation of IDC as part of the benefit to cost evaluation. The text should explicitly address the calculation of interest during construction to assure that it is clear that this has been included in the economic analysis in accordance with the guidance in paragraph D-3.e.(10) of ER 1105-2-100.

District Response: *Table 6 has been revised to clarify this confusion by specifically breaking out interest during construction, which is $2,734,370. This does not change the Total Average Annual Costs, which remain $2,117,000. These revised tables will be included in the draft report.*

HQ Analysis: The response resolves the concern. Interest during construction was included in the analysis and Table 6 was revised to display IDC as a separate line item.

Required Action: The district will include the revised Table in the draft report and make any associated changes to the report text.

Compliance Action: Revised tables reflecting interest during construction are included in the Economic Appendix of the draft report

(5) <u>Benefit Analysis</u>. An estimate of benefits for the overall rehabilitation project was developed based on a comparison of the damages that would be experienced with failure of the project due to exterior flood stages under the without and with rehabilitation conditions. That methodology seems appropriate for measures like underseepage control/relief wells, which protect the structural integrity of the levee and for which failure is related to exterior flooding levels. However, a different methodology and damage stream would seem appropriate for the other components proposed for rehabilitation, such as closure structures, pump station structures, or pumps and motors, where the damage mechanism may be very different and less related to the exterior flood stages. The damages, which would be experienced without rehabilitation of those features, may involve increased ponding and interior flooding or closure leakage/failure, requiring increased flood fighting costs at very infrequent events. Incremental analyses of the individual features should be undertaken to evaluate the benefits for rehabilitation using methodology appropriate for the features, based on reducing the damages, which would occur in the absence of rehabilitation for those measures, similar to the requirements for major rehabilitation at projects operated by the Federal government (reference Appendix E, Section X of ER 1105-2-100 and EP 1130-2-500).

District Response: *Disagree with the conclusion that each part of this system must be incrementally justified. This may be appropriate for a new system to be recommended for construction but not an existing system requiring major rehabilitation/reconstruction. The levee in place is an operational system that works as a unit to provide the overall level of protection as*

intended by congress. The original authorization for the Wood River D & LD as well as all the other urban design levee projects built by the St. Louis District, except Prairie Du Pont, did not include incremental justification for any of the pumping stations or closure structures.. For urban projects, storm water is primarily fed to the line of protection by sewers rather than open channels, there is little detention storage available, and temporary ponding of water on streets is unacceptable. The need for pumping stations was considered just as necessary as the requirement for gravity drainage. Likewise closure structures are necessary for the functioning of the system in the urban environment and their reliability is integral to the performance of the overall system.

Since the original authorization for Wood River did not require incremental justification for the pumping stations, no data is available as a basis for hydrologic-hydraulic analysis of interior flooding related to each individual pumping station drainage area. A detailed analysis for each of these drainage areas would be very costly, especially in light of the fact that most of these areas are primarily sewered. That same money would be better spent actually repairing the existing pumping equipment. There has been no significant decrease in population or housing stock in the protected area that would eliminate the need for any of the existing stations.

Records from the Wood River D & LD show that all the pumping stations have logged a significant number of hours of pumping since they were originally built. If little pumping time was recorded on these stations the last 40 years, then maybe a logical conclusion would be that major rehabilitation may not be justified.

The project was originally justified and remains so today. To continue to expend the financial resources of both the Federal government and of this already cash strapped sponsor to prove by further study what is already intuitively obvious does not appear to meet the test of being good stewards of the tax payers money. During the development of this report the St. Louis District took its lead from comments received during the preparation for the rehabilitation justification of Lock 27 Major Rehabilitation, March 2002, where St. Louis District was specifically told in review comments that the "system" should be justified for rehabilitation not the individual pieces and parts.

HQ Analysis: It is understood this is rehabilitation/reconstruction of an existing project, not new construction, and that the levee district has limited funds. However, sufficient analysis is needed to assure a prudent investment. The Federal government should not undertake less stringent investigations to support its decision making on a cost-shared rehabilitation than it would undertake for a Federally funded rehabilitation. Major rehabilitation projects for Federally maintained projects are required to evaluate individual features to establish the justification for rehabilitation/reconstruction, based on a comparison between with and without rehabilitation conditions that may involve failure. This does not require evaluating justification for individual parts and pieces that form a system as noted in the Lock 27 guidance. For the Wood River project, the features evaluated should include closure structures, pumping stations, and relief wells/gravity drains (ie. no analysis is needed of individual pumps, valves etc. versus a pumping station).

Guidance in ER1165-2-119 entitled Modifications to Completed Projects indicates in Paragraph 7.c. that proposed corrective work should be justified incrementally by current economic considerations (future project costs and benefits; the sunk costs for the original project excluded) unless it is otherwise shown that the work is necessary for safety reasons. Although the various component features of the Wood River project act together to provide protection, the implications of failure for the component features may be significantly different and require separate evaluation. For instance, the underseepage problems related to relief wells and failure of large CMP gravity drains could result in structural failure of the overall project at levels below the design level of protection, resulting in significant safety and environmental concerns.. The closure structures would seem to have very different failure mechanisms if not reconstructed. They would cause lesser impact that might involve significant increases in maintenance costs, leaking seals, and increased emergency response requirements.

The failure of pumping stations might create increased interior flooding and emergency response costs if they are not reconstructed. Current economic considerations for interior drainage analyses involve the evaluation of coincidence between storm events, which affect the tributaries/interior areas and the river for which the main line protection is provided. If the two are essentially independent, the damage/benefit stream for interior flooding is additive to that from the main line protection and the benefit analysis for the overall levee would have no bearing on the justification of interior flood control features beyond minimum facilities. Given that the text states that there has been and will continue to be development in the protected area, the incremental justification of interior flood control facilities should be evaluated to assure that replacement/reconstruction of pumping stations is recommended in the most efficient manner considering the existing and future development conditions. For instance, replacement of the existing pumping station facilities with similar capacity pumps may result in damages that could be avoided if slightly larger pumps were recommended. It would be prudent to conduct sufficient studies to make the best investment in the pumping stations for the current conditions, since new authority will be necessary to undertake reconstruction.

Discussion: It was acknowledged that formulation of projects was different in prior times. However, the need to meet contemporary analytical and cost-sharing standards was discussed. HQ needs to understand whether it is “worth it” to invest in pump stations, for example. It was explained that the system was built to match the flows delivered via the sewer system. It is unclear to the district how to demonstrate how the pump stations are justified given the lack of data availability (flat area, little accurate information on the existing sewer system, etc.). The district inquired as to whether there was a different way to approach this contemporary need given the data constraints (and limited funds). HQ explained that a new start investment would be impossible to justify without such information. The district thought maybe the pump stations could be looked at as meeting a minimum health and safety requirement, etc. A crude analysis based on reasonable assumptions perhaps could be undertaken to support the analysis needs although it could not be used for optimization purposes. The district does have first floor elevations based on random samples available in the GIS. In addition, it was acknowledged that this type of analysis may need to be undertaken for each pump station, as they all differ character.

Required Action: The district will include an incremental benefit analysis for pump stations as discussed in the draft report to extent practicable given the data limitations using appropriate assumptions. The district will explain changes in the area since the original construction and whether this poses any implication for the sizing of pump station in the draft report. In addition, incremental analyses will be shown for the underseepage, gravity drains, and gate closure components.

Compliance Action: An incremental benefit analysis for pump stations has been included in the Economic Appendix based on available data and standard failure analysis.

Comment 2.e. Plan Formulation.

(1) Life Cycle Costs. The analysis of alternatives discusses the consideration of various options for rehabilitation and replacement. However, there is no presentation on the life cycle costs (para.E-5.d. of ER 1105-2-100) to support plan formulation and selection. Further information should be provided in support of the findings and conclusions in section 5.6 to demonstrate that the plan formulation has resulted in the selection of the most economical alternatives.

District Response: *This comment is confusing. Preliminary information contained in the Engineering Appendix should indicate to the reader that Life cycle costs were considered during plan analysis and selection of alternatives. This was the rationale used to determine what items would be refurbished, replaced or left alone. For example lining vs. replacement of gravity drains of a size that would allow adequate flow is based on cost and the predicted performance period of the rehabilitation, refurbishing pump motors rather than replacement is based on cost and their predicted performance period. Throughout the report if the least cost alternative was not chosen it was so stated and justified. During finalization of the draft report this concern will be addressed and the report modified as required so that this information is clearly understood by the reader.*

HQ Analysis: The provision of additional cost information in the report for alternatives will help to clarify the concern. It is understood that the analysis considered options for rehabilitation and replacement versus no action/continued O&M and recommended a course of action based on these considerations. However, it would be helpful to decision makers to understand how competitive the alternatives are and the significance of any tradeoffs between initial investment that is cost shared and OMRR&R which is not. In addition, it will more clearly depict the OMRR&R requirements for the sponsor as a basis for financial planning.

Required Action: The district will include additional cost information (planning level estimates) in the draft report.

Compliance Action: Planning level estimates developed during alternative development and comparison have been included in the Cost Engineering Appendix.

(2) Incremental Analysis. The various features recommended for reconstruction should be evaluated as to their incremental justification in a manner similar to that used for major

rehabilitation at projects, which are maintained Federally, in accordance with Chapter 3 of EP 1130-2-500. The analysis would need to address the probability of a component/element not performing properly (e.g. failing basically), consequences of that failure (physical and fiscal), and consideration of what actions would be taken after the failure occurred and how that affects the likelihood of failure again in the future.

District Response: *Refer to comment (5) above.*

HQ Analysis: See the response for comment 2.d.(5).

Discussion: See the discussion for comment 2.d.(5).

Required Action: See the required action for comment 2.d.(5).

Compliance Action: Features recommended for reconstruction have been incrementally justified. The Engineering Appendix paragraphs 2.04, 3.04, 4.04 and 5.04 provide analysis of the probability of failure and the Economic Appendix provides an economic analysis that documents the incremental justification of each system component recommended for action.

Comment 2.f. Cost Sharing. Paragraphs 6.2 and 6.3 of the text indicate that those aspects of the tentatively recommended plan which are considered related to design and construction deficiencies or non-disclosed maintenance requirements should be cost-shared 75% Federal/ 25% non-Federal in accordance with ER 1165-2-119. Although the regulation is out of date, it does not appear to provide a basis for the proposed 75%/25% cost sharing, but notes that deficiencies would be considered part of the original project and should be cost shared accordingly. The cost sharing for the original project is not discussed in the report, but presumably would have involved provision of LERRD. DAEN-CWR-R memorandum dated 13 February 1987, subject: Cost Sharing for Design or Construction Deficiencies provides substitute guidance for paragraph 7.c of ER 1165-2-119. It states that projects for correction of design and construction deficiencies should be cost shared as specified in PL 99-662 (WRDA 86, as amended) for the project purposes. Therefore, it is appropriate to apply 65%/35% cost sharing for the deficiency correction measures as a basis for determining the overall project cost sharing. Following response to the previous comment on reconstruction versus maintenance costs, the report should apply the appropriate cost sharing to the various features as appropriate for the classification of measures as deficiency, maintenance, and reconstruction in order to determine the overall project cost sharing requirements.

District Response: *Disagree, PGL No. 51 provides the policy for applying the 65/35% cost sharing required by WRDA 96. It indicates that the 65/35% cost sharing only applies to projects authorized after 12 October 1996. Since Wood River was authorized prior to WRDA 86 our policy is to cost share the design or construction deficiency work at 75/25%. However, since the major rehabilitation/reconstruction work is anticipated to require additional Congressional authority, this work would be considered a project modification that would require that portion of the project to be cost shared at the new rate of 65/35% per WRDA 96.*

HQ Analysis: The project cost sharing is 65% Federal /35%non-Federal whether the features are recommended for reconstruction requiring new authority, or are design deficiency corrections that may be addressed under the existing project authority. The budget EC provides clearer direction in this regard and cites the cost sharing for reconstruction as in accordance with WRDA 86, as amended.

Required Action: The district will use the referenced cost-sharing in the draft report to be in accord with law and policy.

Compliance Action: Referenced cost-sharing has been corrected in Section 10 and paragraph 8.5 to be compliant with HQ policy.

Comment 2.g. Completeness. It is not clear what provisions are being made to assure that the project will function as intended in the event that a large flood occurs during the recommended rehabilitation efforts (i.e., what will be done if a flood occurs during gate rehab). The report should provide information to show that the project is complete and will achieve the planned effects in accordance with the paragraph E-3.a.(4)(a)(2) on page E-4 of ER 1105-2-100.

District Response: *This is an alternative formulation briefing package not a draft or final report or a design package. The questions raised here are valid and can be further addressed in very broad terms in the draft report however, this level of detail is not known in its specifics until actual design and construction packages are prepared and sequenced for execution. This is not an uncommon situation faced during levee modifications and repairs all of the time. Contingency plans are always considered prior to work being undertaken to ensure protection of the area under construction.*

HQ Analysis: Refinement of the details for contingency plans during further studies is acceptable, however sufficient costs should be included in the MCACES estimate to assure the project is complete and addresses these considerations The text should note whether they are included as either line item or as contingency values.

Required Action: The district will include requested explanatory information in the draft report.

Compliance Action: The MCACES estimate includes costs with specific line items for coffer dams etc. that may be required during construction.

Comment 2.h. Environmental. The environmental and real estate appendices are still under development. It is recommended that these appendices be submitted to HQ for review prior to release of the LRR.

District Response: *These items will be incorporated into the draft report.*

HQ Analysis: It is acceptable to incorporate the real estate and environmental appendices into the draft LRR and provide the document for review prior to release for public coordination.

Required Action: The district will provide both the environmental and real estate appendices of the draft report to HQ for review prior to release for public coordination.

Compliance Action: An Environmental Appendix and Real Estate Appendix are included in the draft report. These appendices have been provided to HQ for review simultaneously with the draft report ITR period and prior to submission of the draft report to HQ and release to the public.

Comment 2.i. Local Cooperation. The report should include a listing of the local cooperation requirements for a new project agreement in accordance with the guidance in the PGM. This should include future rehabilitation efforts as well as current standard language for floodplain regulation and other applicable items.

District Response: *These items will be incorporated into the draft report.*

HQ Analysis: The response appears adequate to address the concern.

Required Action: The district will include referenced information in the draft report.

Compliance Action: Requirements for local cooperation are identified in Section 10, Recommendations, of the draft report

Comment 2.j. Editorial Comments.

(1) Table of Contents. Paragraph 4.6 should be corrected to show 905(b) report.

District Response: *Noted, correction will be made in the draft report.*

(2) Paragraph 5.1.2, page 10. The referenced ER in the first sentence should be ER 1105-2-100.

District Response: *Noted, correction will be made in the draft report*

(3) Paragraph 5.6.3. The last sentence on page 30 needs clarification- was it intended to read as "failed during known flood event…?"

District Response: *Sentence should read during non-flood events. This will be corrected in the draft report.*

HQ Analysis: The proposed editorial changes address the comments.

Required Action: The district will include the suggested editorial information in the draft report.

Compliance Action: Corrections to the draft report have been made.

3. Conclusions. The review of this AFB package facilitated the identification of a number of policy issues that required resolution. Many of these policy concerns required a number of discussions outside the AFB to resolve. To ensure the record is clear with regards to the key policy decisions made as they relate to this project, a summary is provided below.

a**. New relief wells**. Work related to new relief wells can be classified as a design deficiency and, as such, can be undertaken under existing project authority.

b. E**xisting relief well clean-out**. It appears that proposed work to clean-out existing relief wells can be pursued as a design deficiency, however the district needs to provide additional information to support this tentative decision.

c. **Existing concrete and closure seals.** Replacement of deteriorated concrete should not be treated as a design deficiency. The district will need to pursue this work as a reconstruction item. Replacement of closure seals may be considered integral to the concrete reconstruction work.

d. **Gravity Drains**. The proposed gravity drain work should be treated as a reconstruction activity and not a design deficiency.

e. **Pump plants.** Work related to pump plants should be treated as a reconstruction activity.

f. **Incremental justification.** All work needs to be shown to be incrementally justified and based on the primary causative factors of unsatisfactory performance.

Compliance Action:

a. The need for new relief wells has been classified in the draft report as a design deficiency.

b. The need to provide a one time well reconstitution program is documented in the draft report and the costs associated with future operation and maintenance for the well system clearly identifies the fact that neither the Federal government nor the local sponsor understood or anticipated this level of effort and financial investment and as such should be considered a design deficiency.

c. All concrete work has been classified as reconstruction.

d. All gravity drain work has been classified as reconstruction.

e. All work related to pump plants has been classified as reconstruction.

f. An incremental justification has been included in the draft report.

LIMITED RE-EVALUATION DRAFT REPORT
WOOD RIVER LEVEE SYSTEM
RECONSTRUCTIONPROJECT

WOOD RIVER LEVEE SYSTEM
MADISON COUNTY, ILLINOIS

DECEMBER 2004

US Army Corps of Engineers
St. Louis District®

1222 SPRUCE STREET
ST. LOUIS, MISSOURI 63103-2833

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APPENDIX E - COST ENGINEERING APPENDIX

APPENDIX F - INDEPENDENT TECHNICAL REVIEW

1. STUDY AUTHORITY

This study is authorized by the Resolution of the Committee on Transportation and Infrastructure, U.S. House of Representatives, dated May 7, 1997, which reads:

> *"Resolved by the Committee on Transportation and Infrastructure of the United States House of Representatives, That the Secretary of the Army is requested to review the report of the Chief of Engineers on the Mississippi River between Coon Rapids Dam, Minnesota, and the mouth of the Ohio River, published as House Document 669, 76th Congress, 3rd Session, and other pertinent reports, to determine whether modifications of the recommendations contained therein are advisable at this time, for the purpose of reconstructing the facilities of the Wood River Drainage and Levee District along the Mississippi River in Madison County, Illinois to return the levee and pump stations and other appurtenant features to their original degree of protection."*

2. STUDY PURPOSE

The purpose of this draft Limited Re-evaluation Report is to investigate the existing condition of the Wood River Levee system in order to determine what if any actions are required to return the levee, pump stations and other appurtenant features to a condition that ensures they continue to provide their intended original degree of protection into the future. EC 11-2-183 dated 31 March 2002 provides that:

> "Older projects that are properly operated and maintained by non-Federal sponsors but are no longer performing satisfactorily primarily due to their advanced age may be considered for reconstruction. The proposed work will insure that the project continues to deliver the full benefits intended by Congress at the time of authorization; will not expand or change the authorized scope, function, or purpose of the project, and is not operation and maintenance typically associated with project or corrective work required due to improper maintenance on the part of the non-Federal sponsor."

As a function of this investigation current engineering standards were utilized, original design intent was compared to existing conditions, and problems identified were categorized as design deficiency, construction deficiency, maintenance deficiency and/or advanced age. An investigation of project operation and maintenance requirements has been made to assign responsibilities in order to recommend cost sharing requirements. The goal of the study is to evaluate levee conditions and determine the federal interest in addressing problems in the Wood River Levee system identified during and subsequent to the flood of 1993.

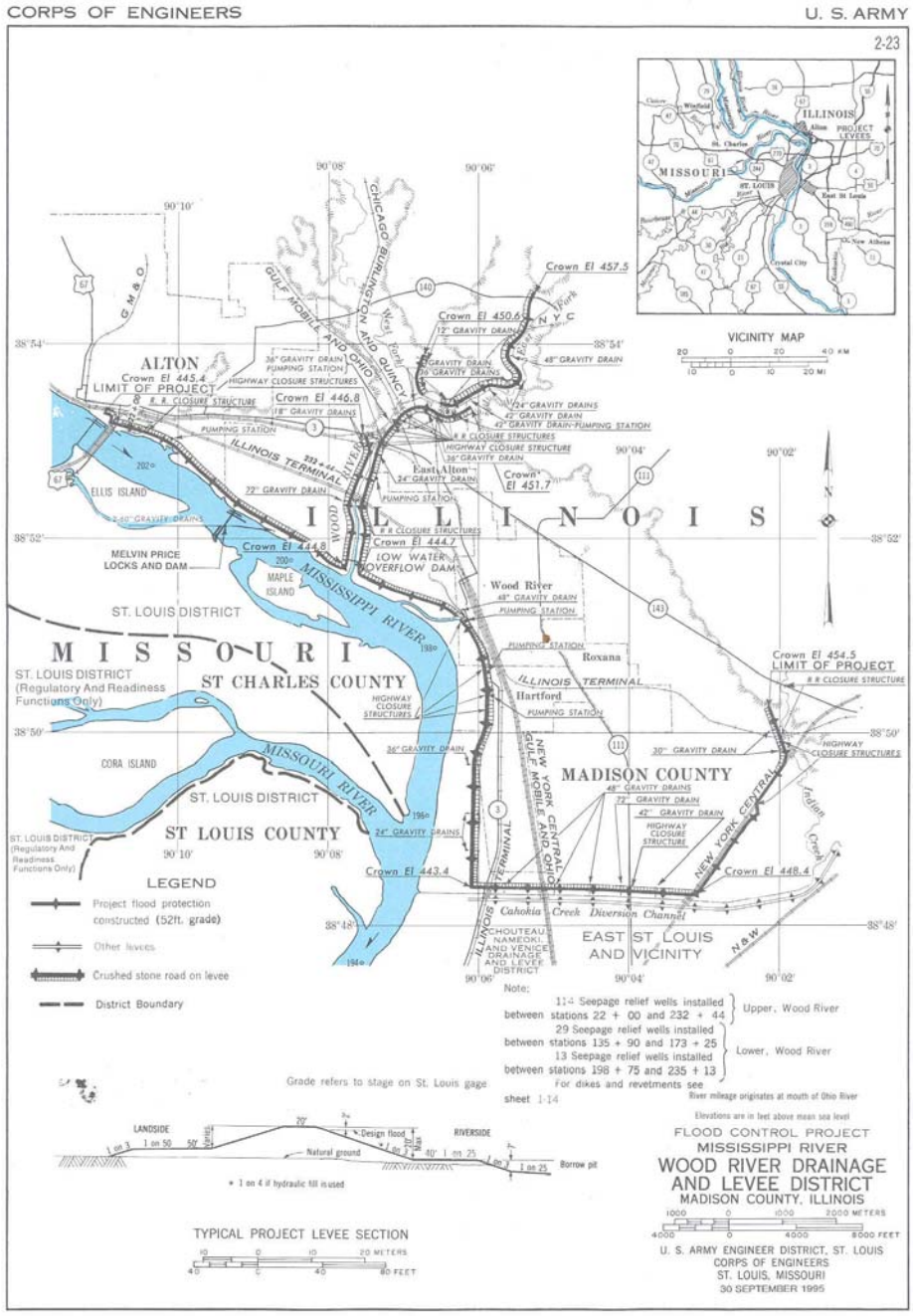
3. LOCATION OF PROJECT/ CONGRESSIONAL DISTRICT

Wood River Drainage and Levee District (Levee District) lies in southwestern Illinois, on the left bank of the Mississippi River flood plain, within Madison County, Illinois, between river miles 195 and 203 above the Ohio River. The levee district is protected by an urban design levee, across the Mississippi River from St. Louis and St. Charles counties in Missouri. This system includes approximately 21 miles of main line levee, 160 relief wells, 26 closure structures, 41 gravity drains and 7 pump stations. The study area lies in the Mississippi River flood plain of Madison County,

Illinois, just upstream of the city of East St. Louis. There are approximately 13,700 acres of bottomland within the District and 4,700 acres of hill land tributary to the levee units.

The study area is located in both the Illinois 12th and 19th Congressional Districts, which are currently held by Congressman Jerry Costello and John Shimkus respectively.

Figure 1 Project Map



4. DISCUSSION OF PRIOR STUDIES, REPORTS AND RELATED WATER PROJECTS

4.1. Original Project Authority. The Wood River Levee project originally was authorized by the Flood Control Act of 28 June 1938, Flood Control Committee Document No. 1, 75th Congress, and First Session to provide flood protection to urban, agricultural and industrial areas.

UPPER MISSISSIPPI RIVER BASIN

The general comprehensive plan for flood control and other purposes in the Upper Mississippi River Basin, described in Flood Control Committee Document Numbered 1, Seventy-fifth Congress, first session, with such modifications thereof as in the discretion of the Secretary of War and the Chief of Engineers may be advisable, is approved and there is hereby authorized $6,600,000 for reservoirs and $2,700,000 for local flood-protection works on the Upper Mississippi and Illinois Rivers; the reservoirs and local protection projects to be selected and approved by the Chief of Engineers: *Provided*, That this authorization shall include the enlargement and extension of a system of levees located on the south side of the Sangamon River east of the town of Chandlerville, Illinois, as set forth in House Document Numbered 604, Seventy-fifth Congress, third session.

4.2. Grassy Lake Pump Station Authority. The Flood Control Act, approved 27 October 1965 by Public Law 89-298, House Document No. 150, 88th Congress, First Session, modified the project to provide for construction of a pumping station with collector ditches and necessary appurtenant facilities for removal of interior water impounded by the existing levee. This project was never constructed and a Reconnaissance study for the Wood River Drainage & Levee District, Illinois - Pump Station, dated January 1998, was approved for Pre-Engineering Design. The purpose of this project is to solve interior flooding near the southern end of District through the addition of a 45-cfs pump station as a new feature to the original system. This station has not yet been constructed.

4.3. Mel Price Lock and Dam Authority. The Internal Revenue Code of 1954 - Bingo - Tax - Exempt Organizations, Public Law 95-502 (H.R. 85331), October 21, 1978. Title I - Replacement of Locks and Dam 26; Upper Mississippi River System Comprehensive Master Management Plan. This project resulted in pool modifications that authorized the addition of a pump station for the Wood River Levee System.

"Sec. 102. (a) The Secretary of the Army, acting through the Chief of Engineers, is authorized to replace locks and dam 26, Mississippi River, Alton, Illinois, and Missouri, by constructing a new dam and a single, one-hundred-and-ten-foot by one-thousand-two-hundred-foot lock at a location approximately two miles downstream from the existing dam, substantially in accordance with the recommendations of the Chief of Engineers in his report on such project dated July 31, 1976, at an estimated cost of $421,000,000."

4.4 Design Memorandum No. 16 Wood River Drainage and Levee District Alteration, March 1985. DM documents changes required to the Upper Wood River Levee System resulting from the Lock and Dam No. 26 (Replacement), Mississippi River.

4.5. 1993 P.L. 84-99 Memorandum. Memorandum, CELMV-CO-E, dated 9 March 1994, Subject: Project Approval/Funding Request, Final Repairs, Wood River Drainage and Levee District,

Madison County, Illinois, provided assessment of system performance failures recommended for emergency repairs, under authority of PL84-99/PL99-662, resulting from the flood of 1993.

4.6. Periodic Inspection No. 7. Periodic Inspection No. 7, Levee and Closure Structures, Wood River Flood Protection Project, dated March 1997, which documents system performance deficiencies identified as a result of problems experienced during the 1993 flood.

4.7. Reconnaissance 905(b) Report. Wood River Levee, Illinois, Flood Damage Reduction 905b Report dated April 1999. This report was prepared in response to study authorization 4.1 above, and details problems identified during and after the flood of 1993 and recommends project reconstruction be further investigated.

5. PLAN FORMULATION

5.1 Existing Conditions

5.1.1 Background

5.1.1.1 Project Description. The Wood River Flood Protection Project provided for raising and enlarging 20.8 miles of existing levee, construction of gravity drainage structures, closure structures at railroad and highway crossings, alterations to existing or construction of new pump stations, surfacing of service road on levee crown, seepage control measures, and construction of a low-water dam at the mouth of Wood River. The project as intended provides protection against a 52 foot Mississippi River stage on the St. Louis Gage, which has a current expected frequency of greater than 500 years. The area protected extends from the city of Alton, Illinois at the northwest end to the Cahokia Creek Diversion Channel at the southeast, protecting the industrial and urban areas of East Alton, Hartford, Roxana and Wood River. In addition to providing protection to the land side area, the levee structure is a part of the containment features for the Melvin Price Locks and Dam Project. Modifications made to Lock and Dam 26 that resulted in construction of the Mel Price Lock and Dam raised the height of the navigation pool on an approximate 2 mile stretch of the existing levee increasing seepage in this levee stretch and necessitating the construction of a new Pump Station at East Alton. Additionally, The Wood River System provides upstream protection to the adjoining East St. Louis Levee System that extends from the Cahokia Diversion Canal to Dupo.

5.1.1.2 Assurances by Local Interests. Applicable portions of the Flood Control Act approved 28 June 1938 provides in part as follows: "Local interests have given assurances satisfactory to the Secretary of War that they will: a. Provide without cost to the United States all lands, easements and rights of way necessary for the construction of the project. b. Hold and save the United States free from damages due to the construction works. c. Maintain and operate all the works after completion in accordance with regulations to be prescribed by the Secretary of War. " These assurances were provided by the officials of the Wood River Drainage and Levee District that is located in the County of Madison and State of Illinois in accordance with Section 2 of the Flood Control Act approved June 28, 1938.

5.1.1.3 Flood Control Regulations for Maintenance and Operation of Flood Control Works. Title 33 Navigation and Navigable Waters, Chapter II - Corps of Engineers, War Department, Part 208 - Flood Control Regulations, Maintenance and Operation of Flood Control Works is the governing regulation covering maintenance and operation of all flood control works. A copy of this

document from 1954, which was provided to the local sponsor at time of turn over and acceptance of completed works is contained below.

5.1.1.3.1 Title 33 Information contained in 1954 Sponsor Assurance Documents

TITLE 33—NAVIGATION AND NAVIGABLE WATERS

Chapter II—Corps of Engineers, War Department

PART 208—FLOOD CONTROL REGULATIONS

MAINTENANCE AND OPERATION OF FLOOD CONTROL WORKS

Pursuant to the provisions of section 3 of the Act of Congress approved June 22, 1936, as amended and supplemented (49 Stat. 1571; 50 Stat. 877; and 55 Stat. 638; 33 U. S. C. 701c; 701c–1), the following regulations are hereby prescribed to govern the maintenance and operation of flood control works:

§ 208.10 *Local flood protection works; maintenance and operation of structures and facilities*—(a) *General.* (1) The structures and facilities constructed by the United States for local flood protection shall be continuously maintained in such a manner and operated at such times and for such periods as may be necessary to obtain the maximum benefits.

(2) The State, political subdivision thereof, or other responsible local agency, which furnished assurance that it will maintain and operate flood control works in accordance with regulations prescribed by the Secretary of War, as required by law, shall appoint a permanent committee consisting of or headed by an official hereinafter called the "Superintendent," who shall be responsible for the development and maintenance of, and directly in charge of, an organization responsible for the efficient operation and maintenance of all of the structures and facilities during flood periods and for continuous inspection and maintenance of the project works during periods of low water, all without cost to the United States.

(3) A reserve supply of materials needed during a flood emergency shall be kept on hand at all times.

(4) No encroachment or trespass which will adversely affect the efficient operation or maintenance of the project works shall be permitted upon the rights-of-way for the protective facilities.

(5) No improvement shall be passed over, under, or through the walls, levees, improved channels or floodways, nor shall any excavation or construction be permitted within the limits of the project right-of-way, nor shall any change be made in any feature of the works without prior determination by the District Engineer of the War Department or his authorized representative that such improvement, excavation, construction, or alteration will not adversely affect the functioning of the protective facilities. Such improvements or alterations as may be found to be desirable and permissible under the above determination shall be constructed in accordance with standard engineering practice. Advice regarding the effect of proposed improvements or alterations on the functioning of the project and information concerning methods of construction acceptable under standard engineering practice shall be obtained from the District Engineer or, if otherwise obtained, shall be submitted for his approval. Drawings or prints showing such improvements or alterations as finally constructed shall be furnished the District Engineer after completion of the work.

(6) It shall be the duty of the superintendent to submit a semiannual report to the District Engineer covering inspection, maintenance, and operation of the protective works.

(7) The District Engineer or his authorized representatives shall have access at all times to all portions of the protective works.

(8) Maintenance measures or repairs which the District Engineer deems necessary shall be promptly taken or made.

(9) Appropriate measures shall be taken by local authorities to insure that the activities of all local organizations operating public or private facilities connected with the protective works are coordinated with those of the Superintendent's organization during flood periods.

(10) The War Department will furnish local interests with an Operation and Maintenance Manual for each completed project, or separate useful part thereof, to assist them in carrying out their obligations under these regulations.

(b) *Levees*—(1) *Maintenance.* The Superintendent shall provide at all times such maintenance as may be required to insure serviceability of the structures in time of flood. Measures shall be taken to promote the growth of sod, exterminate burrowing animals, and to provide for routine mowing of the grass and weeds, removal of wild growth and drift deposits, and repair of damage caused by erosion or other forces. Where practicable, measures shall be taken to retard bank erosion by planting of willows or other suitable growth on areas riverward of the levees. Periodic inspections shall be made by the Superintendent to insure that the above maintenance measures are being effectively carried out and, further, to be certain that:

(i) No unusual settlement, sloughing, or material loss of grade or levee cross section has taken place;

(ii) No caving has occurred on either the land side or the river side of the levee which might affect the stability of the levee section;

(iii) No seepage, saturated areas, or sand boils are occurring;

(iv) Toe drainage systems and pressure relief wells are in good working condition, and that such facilities are not becoming clogged;

(v) Drains through the levees and gates on said drains are in good working condition;

(vi) No revetment work or riprap has been displaced, washed out, or removed;

(vii) No action is being taken, such as burning grass and weeds during inappropriate seasons, which will retard or destroy the growth of sod;

(viii) Access roads to and on the levee are being properly maintained;

(ix) Cattle guards and gates are in good condition;

(x) Crown of levee is shaped so as to drain readily, and roadway thereon, if any, is well shaped and maintained;

(xi) There is no unauthorized grazing or vehicular traffic on the levees;

(xii) Encroachments are not being made on the levee right-of-way which might endanger the structure or hinder its proper and efficient functioning during times of emergency.

Such inspections shall be made immediately prior to the beginning of the flood season; immediately following each major high water period, and otherwise at intervals not exceeding 90 days; and such intermediate times as may be necessary to insure the best possible care of the levee. Immediate steps will be taken to correct dangerous conditions disclosed by such inspections. Regular maintenance repair measures shall be accomplished during the appropriate season as scheduled by the Superintendent.

(2) *Operation.* During flood periods the levee shall be patrolled continuously to locate possible sand boils or unusual wetness of the landward slope and to be certain that:

(i) There are no indications of slides or sloughs developing;

(ii) Wave wash or scouring action is not occurring;

(iii) No low reaches of levee exist which may be overtopped;

(iv) No other conditions exist which might endanger the structure.

Appropriate advance measures will be taken to insure the availability of adequate labor and materials to meet all contingencies. Immediate steps will be taken to control any condition which endangers the levee and to repair the damaged section.

(c) *Flood walls.*—(1) *Maintenance.* Periodic inspections shall be made by the Superintendent to be certain that:

(i) No seepage, saturated areas, or sand boils are occurring;

(ii) No undue settlement has occurred which affects the stability of the wall or its water tightness;

(iii) No trees exist, the roots of which might extend under the wall and offer accelerated seepage paths;

(iv) The concrete has not undergone cracking, chipping, or breaking to an extent which might affect the stability of the wall or its water tightness;

(v) There are no encroachments upon the right-of-way which might endanger the structure or hinder its functioning in time of flood;

(vi) Care is being exercised to prevent accumulation of trash and debris adjacent to walls, and to insure that no fires are being built near them;

(vii) No bank caving conditions exist riverward of the wall which might endanger its stability;

(viii) Toe drainage systems and pressure relief wells are in good working condition, and that such facilities are not becoming clogged.

Such inspections shall be made immediately prior to the beginning of the flood season, immediately following each major high water period, and otherwise at intervals not exceeding 90 days. Measures to eliminate encroachments and effect repairs found necessary by such inspections shall be undertaken immediately. All repairs shall be accomplished by methods acceptable in standard engineering practice.

(2) *Operation.* Continuous patrol of the wall shall be maintained during flood periods to locate possible leakage at monolith joints or seepage underneath the wall. Floating plant or boats will not be allowed to lie against or tie up to the wall. Should it become necessary during a flood emergency to pass anchor cables over the wall, adequate measures shall be taken to protect the concrete and construction joints. Immediate steps shall be taken to correct any condition which endangers the stability of the wall.

(d) *Drainage structures*—(1) *Maintenance.* Adequate measures shall be taken to insure that inlet and outlet channels are kept open and that trash, drift, or debris is not allowed to accumulate near drainage structures. Flap gates and manually operated gates and valves on

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drainage structures shall be examined, oiled, and trial operated at least once every 90 days. Where drainage structures are provided with stop log or other emergency closures, the condition of the equipment and its housing shall be inspected regularly and a trial installation of the emergency closure shall be made at least once each year. Periodic inspections shall be made by the Superintendent to be certain that:

(i) Pipes, gates, operating mechanism, riprap, and headwalls are in good condition;

(ii) Inlet and outlet channels are open;

(iii) Care is being exercised to prevent the accumulation of trash and debris near the structures and that no fires are being built near bituminous coated pipes;

(iv) Erosion is not occurring adjacent to the structure which might endanger its water tightness or stability.

Immediate steps will be taken to repair damage, replace missing or broken parts, or remedy adverse conditions disclosed by such inspections.

(2) *Operation.* Whenever high water conditions impend, all gates will be inspected a short time before water reaches the invert of the pipe and any object which might prevent closure of the gate shall be removed. Automatic gates shall be closely observed until it has been ascertained that they are securely closed. Manually operated gates and valves shall be closed as necessary to prevent inflow of flood water. All drainage structures in levees shall be inspected frequently during floods to ascertain whether seepage is taking place along the lines of their contact with the embankment. Immediate steps shall be taken to correct any adverse condition.

(e) *Closure structures*—(1) *Maintenance.* Closure structures for traffic openings shall be inspected by the superintendent every 90 days to be certain that:

(i) No parts are missing;

(ii) Metal parts are adequately covered with paint;

(iii) All movable parts are in satisfactory working order,

(iv) Proper closure can be made promptly when necessary;

(v) Sufficient materials are on hand for the erection of sand bag closures and that the location of such materials will be readily accessible in times of emergency.

Tools and parts shall not be removed for other use. Trial erections of one or more closure structures shall be made once each year, alternating the structures chosen so that each gate will be erected at least once in each 3-year period. Trial erection of all closure structures shall be made whenever a change is made in key operating personnel. Where railroad operation makes trial erection of a closure structure infeasible, rigorous inspection and drill of operating personnel may be substituted therefor. Trial erection of sand bag closures is not required. Closure materials will be carefully checked prior to and following flood periods, and damaged or missing parts shall be repaired or replaced immediately.

(2) *Operation.* Erection of each movable closure shall be started in sufficient time to permit completion before flood waters reach the top of the structure sill. Information regarding the proper method of erecting each individual closure structure, together with an estimate of the time required by an experienced crew to complete its erection will be given in the Operation and Maintenance Manual which will be furnished local interests upon completion of the project. Closure structures will be inspected frequently during flood periods to ascertain that no undue leakage is occurring and that drains provided to care for ordinary leakage are functioning properly. Boats or floating plant shall not be allowed to tie up to closure structures or to discharge passengers or cargo over them.

(f) *Pumping plants*—(1) *Maintenance.* Pumping plants shall be inspected by the Superintendent at intervals not to exceed 30 days during flood seasons and 90 days during off-flood seasons to insure that all equipment is in order for instant use. At regular intervals, proper measures shall be taken to provide for cleaning plant, buildings, and equipment, repainting as necessary, and lubricating all machinery Adequate supplies of lubricants for all types of machines, fuel for gasoline or diesel powered equipment, and flash lights or lanterns for emergency lighting shall be kept on hand at all times. Telephone service shall be maintained at pumping plants. All equipment, including switch gear, transformers, motors, pumps, valves, and gates shall be trial operated and checked at least once every 90 days. Megger tests of all insulation shall be made whenever wiring has been subjected to undue dampness and otherwise at intervals not to exceed one year. A record shall be kept showing the results of such tests. Wiring disclosed to be in an unsatisfactory condition by such tests shall be brought to a satisfactory condition or shall be promptly replaced Diesel and gasoline engines shall be started at such intervals and allowed to run for such length of time as may be necessary to insure their serviceability in times of emergency. Only skilled electricians and mechanics shall be employed on tests and repairs. Operating personnel for the plant shall be present during tests. Any equipment removed from the station for repair or replacement shall be returned or replaced as soon as practicable and shall be trial operated after reinstallation. Repairs requiring removal of equipment from the plant shall be made during off-flood seasons insofar as practicable.

(2) *Operation.* Competent operators shall be on duty at pumping plants whenever it appears that necessity for pump operation is imminent. The operator shall thoroughly inspect, trial operate, and place in readiness all plant equipment. The operator shall be familiar with the equipment manufacturers' instructions and drawings and with the "Operating Instructions" for each station. The equipment shall be operated in accordance with the above-mentioned "Operating Instructions" and care shall be exercised that proper lubrication is being supplied all equipment, and that no overheating, undue vibration or noise is occurring. Immediately upon final recession of flood waters, the pumping station shall be thoroughly cleaned, pump house sumps flushed, and equipment thoroughly inspected, oiled and greased. A record or log of pumping plant operation shall be kept for each station, a copy of which shall be furnished the District Engineer following each flood.

(g) *Channels and floodways* — (1) *Maintenance.* Periodic inspections of improved channels and floodways shall be made by the Superintendent to be certain that:

(i) The channel or floodway is clear of debris, weeds, and wild growth;

(ii) The channel or floodway is not being restricted by the depositing of waste materials, building of unauthorized structures or other encroachments;

(iii) The capacity of the channel or floodway is not being reduced by the formation of shoals;

(iv) Banks are not being damaged by rain or wave wash, and that no sloughing of banks has occurred;

(v) Riprap sections and deflection dikes and walls are in good condition;

(vi) Approach and egress channels adjacent to the improved channel or floodway are sufficiently clear of obstructions and debris to permit proper functioning of the project works.

Such inspections shall be made prior to the beginning of the flood season and otherwise at intervals not to exceed 90 days. Immediate steps will be taken to remedy any adverse conditions disclosed by such inspections. Measures will be taken by the Superintendent to promote the growth of grass on bank slopes and earth deflection dikes. The Superintendent shall provide for periodic repair and cleaning of debris basins, check dams, and related structures as may be necessary.

(2) *Operation.* Both banks of the channel shall be patrolled during periods of high water, and measures shall be taken to protect those reaches being attacked by the current or by wave wash. Appropriate measures shall be taken to prevent the formation of jams of ice or debris. Large objects which become lodged against the bank shall be removed. The improved channel or floodway shall be thoroughly inspected immediately following each major high water period. As soon as practicable thereafter, all snags and other debris shall be removed and all damage to banks, riprap, deflection dikes and walls, drainage outlets, or other flood control structures repaired.

(h) *Miscellaneous facilities* — (1) *Maintenance.* Miscellaneous structures and facilities constructed as a part of the protective works and other structures and facilities which function as a part of, or affect the efficient functioning of the protective works, shall be periodically inspected by the Superintendent and appropriate maintenance measures taken. Damaged or unserviceable parts shall be repaired or replaced without delay. Areas used for ponding in connection with pumping plants or for temporary storage of interior run-off during flood periods shall not be allowed to become filled with silt, debris, or dumped material. The Superintendent shall take proper steps to prevent restriction of bridge openings and, where practicable, shall provide for temporary raising during floods of bridges which restrict channel capacities during high flows.

(2) *Operation.* Miscellaneous facilities shall be operated to prevent or reduce flooding during periods of high water. Those facilities constructed as a part of the protective works shall not be used for purposes other than flood protection without approval of the District Engineer unless designed therefor. (49 Stat. 1571, 50 Stat. 877; and 55 Stat. 638; 33 U.S.C. 701c; 701c-1) (Regs. 9 August 1944, CE SPEWF)

[SEAL] J. A. ULIO,
Major General,
The Adjutant General.

[F. R. Doc. 44-12285; Filed, August 16, 1944; 9:44 a. m.]

5.1.1.3.2 Subsequent Clarification of Sponsor Assurances Not Provided for in the Wood River Drainage and Levee District Assurances. The following additions to local sponsor assurances made following the initiation of cost sharing by the non-federal sponsor are not a part of the Wood River Drainage and Levee District Sponsor Assurances. Additionally, no cost estimates or financing plan were prepared related to the operation, maintenance, repair, replacement or reconstruction of this flood protection system during the course of execution and turn over of this project.

5.1.1.3.2.1 Article VIII of the Current Model Project Cooperation Agreement

"[ARTICLE VIII - OPERATION, MAINTENANCE, REPAIR, REPLACEMENT, AND REHABILITATION]

a. After the Government has turned the completed Project, or functional portion of the Project, over to the Local Sponsor, the Local Sponsor shall operate, maintain, repair, replace, and rehabilitate the completed Project, or functional portion of the Project, in accordance with regulations or directions prescribed by the Government.

b. The Local Sponsor hereby gives the Government a right to enter, at reasonable times and in a reasonable manner, upon land which it owns or controls for access to the Project for the purpose of inspection, and, if necessary, for the purpose of completing, operating, maintaining, repairing, replacing, or rehabilitating the Project. If an inspection shows that the Local Sponsor for any reason is failing to fulfill its obligations under this Agreement without receiving prior written approval from the Government, the Government will send a written notice to the Local Sponsor. If the Local Sponsor persists in such failure for 30 calendar days after receipt of the notice, then the Government shall have a right to enter, at reasonable times and in a reasonable manner, upon lands the Local Sponsor owns or controls for access to the Project for the purpose of completing, operating, maintaining, repairing, replacing, or rehabilitating the Project. No completion, operation, maintenance, repair, replacement, or rehabilitation by the Government shall operate to relieve the Local Sponsor of responsibility to meet its obligations as set forth in this Agreement, or to preclude the Government from pursuing any other remedy at law or equity to assure faithful performance pursuant to this Agreement.

5.1.1.3.2.2 7 February 1991 Project Management Guidance Letter No. 9 - Cost Estimates and Financing Plans For Operation, Maintenance, Repair, Replacement and Rehabilitation (O,M,R,R,&R) of New Start Construction Projects. This Guidance Letter clarifies requirements for the improvement of Corps estimates associated with O,M,R,R&R of projects in order to assure sponsor capability to perform.

5.1.2 Operation and Maintenance of the Wood River Drainage and Levee System. The Drainage and Levee District has provided for the operation and maintenance of the system remaining in compliance with ER 110-2-100 inspections and ER1105-2-100 requirements. Operation and maintenance guidance provided by Title 33, Part 208 - Flood Control Regulations, Maintenance and Operation of Flood Control Works has been complied with and the system has remained eligible for PL84-99 assistance as circumstances dictated.

5.1.2.1 P.L. 84-99 Assistance. The Wood River Drainage and Levee District has received PL 84-99 assistance as follows:

1943	$8,000	1944	$13,000	1951	$133,500
1952	$20,200	1967	$350,000	1973	$1,606,000
1974	$1,640,400	1975	$196,800	1976	$400
1980	$34,100	1981	$11,400	1993	$620,000 est

5.1.2.2 Annual Operation and Maintenance. The Wood River Drainage and Levee District over the past 10 years has averaged approximately $451,000 annually on the operation and maintenance of the system. Annual Inspection records dating back to 1985, as kept by the St. Louis District, indicate that Wood River has always received an Acceptable or higher rating for their pump stations and with the exception of four years out of eighteen has achieved an acceptable or higher rating for the levee. A minimum acceptable rating was received four times but corrective measures were taken to fix identified deficiencies. Table 5-1 provides information regarding these inspections and their results. As these inspections show as items have required repair these actions have been taken and the system remains fully operational. However, the age of the system continues to increase the probability that multiple failures will occur on currently operational equipment or appurtenances during periods of high water. As this trend continues the future of the systems reliability comes more into question.

TABLE 5-1 Annual Inspection Results

Year	Levee Condition Rating	Issue	Maintenance Effort	Extent of Maintenance Effort	Pump Station Rating
2003	Minimum Acceptable	Siltation around several flap gates and a drainage ditch and rust on 4 gates	Work in progress	Low level effort	Satisfactory
2002	Minimum Acceptable	Deterioration of closure structures. Deterioration and siltation of gravity drains and drain aprons.	Work in progress	Low level effort	Satisfactory
2001	Acceptable				
2000	Acceptable				Satisfactory
1999	Acceptable				Satisfactory
1998	Acceptable				Satisfactory
1997	Acceptable				Acceptable
1996	Acceptable				Acceptable
1995	Acceptable				Acceptable
1994	Acceptable				Acceptable
1993	Acceptable				Acceptable
1992	Acceptable				Acceptable
1991	Acceptable				Acceptable
1990	Minimum Acceptable	Vegetation needs to be removed. Siltation in outlet channels. Debris in inlet drain.	Issues addressed	Low level effort	Acceptable
1989	Acceptable				Acceptable
1988	Minimum Acceptable	Two slides in levee section. Vegetation in floodways. Siltation in outlet channels. Flap gate silted shut.	Issues addressed	Medium level effort	Acceptable
1987	Minimum Acceptable	Vegetation in riprap around drainage structures and in floodways.	Issues not addressed		Acceptable
1986	Satisfactory				Outstanding
1985	Satisfactory				Outstanding

5.1.3 General System Conditions. Many project features have reached or are nearing the end of their performance life. Table 5-2 provides an overview of the system construction history that indicates the age of different system components. During the flood of 1993, as detailed in Emergency Repair Reports of 1994, and again in the periodic inspection of 1997 there were documented problems concerning the integrity of the flood protection system which raise questions regarding the systems ability to provide its originally intended level of protection. The Drainage and Levee District has consistently performed its normal operation and maintenance responsibilities in accordance with applicable regulations of the Secretary of War and their assurances provided at assumption of responsibility for levee system features. In order to determine specific feature conditions, an assessment plan was determined for each of the major project features. The goal of this plan was to allow features to be inspected in a manner that would permit their condition to be characterized. This was the baseline used for developing problems and opportunities and determining measures that could be used to address them. Details of this assessment process and

results are contained in the Engineering Appendix. The following is a general description of findings.

TABLE 5-2 Project Construction History

Item	QTY	Completed	Age in Years
Gravity Drains			
Upper Wood River	6	1952	51
East & West Fork	8	1950	53
Lower Wood River	27	1948- 1961	42+
Closure Structures			
Upper Wood River	9	2 -1959 1-1960 1- 1964 4-1982 1-1992	44 43 39 21 11
East & West Fork	1	1-1953	50
Lower Wood River	16	2-1953 6-1959 7-1960 1-1964	50 44 43 39
Pump Stations with Gravity Drains			
East Alton No.2		1950	53
Homegarden		1953	50
Lakeside		1953	50
Wood River		1953	50
Hawthorne		1955	48
Rand		1957	46
East Alton No.1		1988	15
Relief Wells			
Upper Wood River	103	1954	49
	12	1964	39
East & West Fork	0		
Lower Wood River	45	1964	39

5.1.3.1 Gravity Drains. Of the originally constructed 41 corrugated metal pipe (CMP) gravity drains, 38 CMP are currently in operation throughout the system. Two pump station's (Lakeside and Homegarden) gravity drains are included in this total. The consequences of the failure of any gravity drain is considered serious. Inspection of a representative sample of these drains finds what would be expected of these structures that are well past their performance life. They exhibit signs of corrosion and some joint separation. However, at this time all are considered operational.

5.1.3.2 Gatewells. The overall condition of the concrete gatewell structures is good with light to moderate corrosion taking place on secondary items, such as grates and ladders, that are primarily comprised of galvanized steel. Only one (GW-9) is structurally degraded and requires action.

5.1.3.3 Closure Structures.. All of the closure structures in the Wood River Drainage and Levee District are operational. Of the 26 closure structures 6 are severely degraded, 16 are showing deterioration that requires attention, 3 are no longer required for railroad operations and should be abandoned and 1 rebuilt in 2000 is in good condition. Of the 26 closure gates 5 are severely degraded, 11 are showing signs of deterioration but are generally in satisfactory condition, 3 should be abandoned, 2 are in good condition and the 5 that use stoplogs are in good condition.

5.1.3.4 Pump Stations. Each of the seven pump stations within the Wood River Levee and Drainage District was inspected. The U.S. Army Corps of Engineers built six of these in the 1950's and the seventh in the late 1980's as a part of the Mel Price Project described in paragraph 4.3 above. Overall pump station primary structures (beams, columns, concrete foundations, etc) are generally in good condition. However secondary structural items, such as brick walls (mortar), roofs and galvanized steel grates, ladders, trash racks and fencing are showing signs of moderate corrosion and wear as would be expected based on their age. At the Wood River Station the emergency stoplog slots for the pump discharge flap gates is a significant problem with originally installed angles having been corroded with time to the point that stoplogs can not be placed into these slots. With the few exceptions noted in the Engineering Appendix, pumps and motors were installed in the 1950's and are currently operating satisfactorily. However, pumps of this type installed and operational for this period of time have been shown to require re-construction. Work done as a part of the Rehabilitation of the East St. Louis Flood Protection Project demonstrated that unseen problems such as bearing wear, shaft damage, misalignment, wear of impeller tips and bowls, and deterioration of the winding insulation are typical system degradations that occur over time. Sluice gates and flap gates at each station were inspected as detailed in the Engineering Appendix. In general the gates installed in the 1950's have and are currently operating properly. However, inspection shows that gates, flaps, hinge arms and pins, wedges, seals, gate stems and other operating components are showing evidence of moderate to severe corrosion and wear as would be expected by their age and operating conditions. Electrical equipment is original to the project constructed in the 1950's. Replacement and spare parts are unavailable. While some of the motor starters have been replaced, parts for the main circuit breaker and other systems remain a problem. Auxiliary equipment such as roof ventilators, sump ventilators, overhead cranes and sump pumps are operable, however, due to the age of this equipment future reliability is questionable.

5.1.3.5 Relief Wells. There are approximately 160 relief wells that were originally installed in the 1950's and 1960's. In order to determine the existing condition of these wells and their current performance 50 were pump tested as a representative sample. This pump testing showed that 80% of the wells were performing below the recommended 80% efficiency established as a minimum acceptable performance level. The deficient well efficiency ranged between 14% and 79% with the majority falling between the 40-70% range.

5.1.3.6 Underseepage. During the flood of 1993, the Wood River system's current flood of record, portions of the levee experienced unexpected seepage problems that had to be handled on an emergency basis. The flood of 1993 showed that the Wood River project has a design deficiency related to underseepage, and will not function as intended because of inadequate underseepage features. During the 1993 flood, as the Mississippi River approached the 170-year flood level

(below the design flood), sandboils appeared at many locations along the interior of the levee. Problems with the overall Alton to Gale system were first identified in the Chain of Rocks Design Deficiency Report dated July 1997 which detailed discrepancies in original design analysis assumptions and actual performance of a segment of the Alton to Gale system as manifest during the flood of 1993. A similar investigation conducted for the Wood River reach of the Alton to Gale system also identified underseepage design deficiencies. This analysis is documented in the Engineering Appendix.

5.1.4 General Conditions of the Protected Area

5.1.4.1 Geotechnical Setting. The geotechnical setting of the Wood River Drainage and Levee District can be conveniently treated by separate consideration of the bluff area bordering the east side of the Mississippi Valley and the valley flood plain. The bluffs are as high as 650 feet above sea level. The floodplain is characterized by ridge and swale topography, with a maximum natural relief of approximately 30 feet (elevations ranging from 435 to 405).

The line of bluffs that more or less define the eastern boundary of the levee district consist of relatively soft shales and sandstones. However, bedrock is not exposed as the bluffs are mantled with deposits of glacial drift overlain with loess. The drift is commonly an unsorted deposit of pebbly clay, very plastic clay, sandy clay, and occasional lenses of sand or gravelly sand. The loess that blankets the summit and faces of the bluffs consists of windblown silts and lean clays locally 50 feet or more thick. Adjacent to the bluffs a series of sand and gravel deposits form terraces which stand an average of 30 feet above the level of the surrounding plain. These terraces are remnants of an aggraded fill resulting from glacial meltwater deposits.

Wood River, a tributary of the Mississippi River, divides just west of East Alton and the valleys of the two forks are coincident with the Mississippi flood plain for several miles upstream. The deepest part of the bedrock surface ranges in depth from 160 to 170 feet beneath the valley fill with an average thickness of 130 feet of overlying alluvial deposits. Immediately above the bedrock surface is a stratum consisting of coarse gravels and sands with occasional boulders. Overlying this stratum is a thick section of medium to fine sands. The surface deposits are complex and varied as they result from filled lakes and swamps, abandoned meander loops, and flood water deposition. The materials range from heavy plastic clays to fine sands. In addition, industrial waste and artificial deposits are also found as part of the surface deposits.

5.1.4.2 Climate and Weather. The Project area is directly across the Mississippi River and approximately 20 miles upstream from the city of St. Louis. It sits across from the confluence of the Missouri and Mississippi Rivers and is also near the geographical center of the United States. Because of its central U.S. location, St. Louis feels the effects of warm moist air moving north from the Gulf of Mexico and the cold air masses moving south from Canada. The conflict along the frontal zones of these invading air masses provides a variety of weather conditions.

Winters are brisk with temperatures dropping to zero or below generally only two or three days per year. The record low temperature at the current weather station site is -18 degrees F, occurring in January 1985, although temperatures as low as -22 degrees F have been measured at other area sites. Snowfall averages about 20 inches per season. Daily temperatures of 32 degrees or less occur less than 25 days per year, while temperatures of 90 degrees F or higher occur about 35-40 days a

year. The record high temperature for the area is 115 degrees F, occurring in July 1954. Temperatures exceeding 100 degrees F occur every other year generally, although some years may see 15 or more days with temperatures exceeding 100 degrees F. The prevailing wind direction is from the south for May through November and from the northwest for December through April.

Precipitation averages about 36 inches per year. The winter months are the driest while the months of May through July are the wettest. Rainfall can be severe at times with as much as eight inches of rain recorded in a 24-hour period in 1957. Thunderstorms occur between 40 and 50 days per year, with a few being severe, causing hail and damaging winds. Tornadoes have produced damage and loss of life in the St. Louis area. Climatological data for the area are summarized in Table 5-3. Data were collected at the National Weather Service meteorological station at Lambert-St. Louis International Airport.

An important condition affecting precipitation in the Project area is the St. Louis urban effect. Studies by the Illinois State Water Survey have shown substantial increases in rainfall downwind of the City of St. Louis. The increases tend to be the largest in relatively heavy rainstorms and most pronounced in spring and summer when most of the large rainstorms occur.

Table 5-3 Climatological Data for St. Louis, Missouri.

Month	Temperature (^{0}F)			Precipitation Average (IN)	Wind Velocity (MPH)	Wind Direction
	Average Daily		Average Monthly			
	Min	Max	Mean			
January	19.9	37.6	28.8	1.90	10.6	NW
February	24.5	43.1	33.8	2.14	10.8	NW
March	33.0	53.4	43.2	3.36	11.8	WNW
April	45.1	67.1	56.1	3.63	11.4	WNW
May	54.7	76.4	65.6	3.93	9.5	S
June	64.3	85.2	74.8	3.78	8.8	S
July	68.8	89.0	78.9	3.99	8.0	S
August	66.6	87.4	77.0	2.78	7.6	S
September	58.6	80.7	69.7	2.85	8.1	S
October	46.7	69.1	57.9	2.77	8.9	S
November	35.1	54.0	44.6	3.13	10.1	S
December	25.7	42.6	34.2	2.54	10.4	WNW
Annual	45.3	65.5	55.4	36.66	9.7	S

Source: NOAA 1992, Local Climatological Data of St. Louis, Missouri and NWS 1995, St. Louis WSCMO AP, St. Louis County, Missouri.

5.1.4.3 Socio-Economics. The project area has long supported the oil refinery industry with all of the major companies having had a presence in the area. Currently Conoco-Phillips, American Refining, Clark-Hartford, Piasa Motors Fuels and Shell have facilities in the area. On a daily basis Conoco-Philips alone produces about 6.3 million gallons of gasoline; 1.3 million gallons of diesel fuel, 1.6 million gallons of defense grade jet fuel and about 1.4 million gallons of asphalt. They

have recently invested some $160,000,000 to expand this capability. BOC Gases has a state of the art air separation plant in Hartford and their liquid and gaseous products are used by a wide variety of industries including oil refining, chemicals, fabrication, welding, food, electronics, glass, iron and steel. As with many other communities in the nation this region is undergoing economic shifts from such industries as steel manufacturing, Laclede Steel closed in 2000 to service related industries such as Schiber Truck Company that transports waste in 38 states and National Maintenance and Repair that repairs barges and marine and other motors. Olin Corporation has both their Brass and Winchester Ammunition Divisions located in the project area. The area has a population of approximately 23,106, of which some 9,930 are employed. The following three tables (5-4, 5-5 and 5-6) taken from the 2000 U.S. Bureau of Census provide an overview of the area's economic character.

Table 5-4 Occupations

Occupation	**Number**	**Percentage**
Management, professional	2,140	22
Service occupation	1,953	20
Sales and office occupation	2,731	28
Farming, fishing and forestry	11	---
Construction, extraction, and maintenance	1,054	10
Production, transportation and material moving	2,041	20
Total	**9,930**	**100**

The project area average median household income (Table 5-4) is below that of both Madison County and the State by 20% and 28% respectively.

Table 5-5 Median Household Income

Community	**Median Household Income**
Wood River	$33,875
Hartford	$33,828
Roxana	$38,800
South Roxana	$33,295
East Alton	$28,404
Madison County	$41,541
State of Illinois	$46,590

Approximately 16% of the project area's population is over 65 years of age compared to the State average of 12% and Madison County average of 14%. The following (Table 5-6) are retirement mean incomes as reported by the U.S. Bureau of Census. The average for the project area of $15,126 is 7% and 10% below the mean for Madison County and the State respectively.

Table 5-6 Retirement Mean Incomes

Community	Mean Retirement Income
Wood River	$17,051
Hartford	$10,532
Roxana	$14,916
South Roxana	$21,574
East Alton	$11,560
Madison County	$16,117
State of Illinois	$16,770

5.1.4.4 Hydrology and Hydraulic Conditions. The project is intended to provide protection against a 52 foot Mississippi River stage on the St. Louis Gage, which has a current expected frequency of greater than 500 years. For the design flow of 1,300,000 cfs, the height of protection is based upon confinement by industrial and urban area projects with a design flood profile having a flow-line elevation of 443.4 feet, NGVD at the upper end (opposite river-mile 202.7); elevation 442.7 feet, NGVD at the mouth of Wood River; and elevation 441.4 feet, NGVD at the lower end (Cahokia Creek Diversion Channel) of the District. Levee grade freeboard is 2 feet above water surface profile by design. The flood of record occurred during the summer of 1993 when the St. Louis gage recorded 49.58 ft. River elevations were above flood stage from 3 April to 7 October. Peak flow was estimated at 1,080,000 cfs. The frequency of that event was 175 years. The project endured two other significant flood events; 43.3 feet on the St. Louis gage in 1973, and 41.9 feet on the St. Louis gage in 1995. For the flank levees, a net grade equal to the main stem design flood elevation plus 2-foot freeboard was projected back along the tributaries. The interior drainage system relies on two methods of conveyance, open drainage ditches and combined sewers. Only two of the seven pump stations are fed by open drainage ditches these are Lakeside and Homegarden. Sewer fed pump stations must pump effluent irrespective of interior rainfall events whenever gravity flow is impeded by high river stages.

5.1.4.5 Environmental Contamination. As a result of the nature of the industries who have dominated the riverfront area, a number of sites are in the State Site Remediation Program including, Explorer Pipeline Company, Koch Pipeline Company, The Premcor Refining Group, Inc., and Clark Oil Refinery, Shell Oil Company. Resource Conservation and Recovery Act (RCRA) sites include BP, Conoc-Phillips, and Olin Corporation. Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), commonly known as Superfund sites in the area include Laclede Steel Company, Clark Oil Refinery, Owens Illinois Inc, and Chemetco. These combined sites occupy thousands of acres of the floodplain with Shell Oil being the largest with 2220 acres. The loss of the Wood River Levee system would not only have devastating economic impacts in the traditional measurement of losses but would have the added implication of creating an environmental contamination scenario not experienced on any inland waterway system to date. When U.S. EPA was contacted for information on potential effects they likened such an occurrence to that experienced as a result of the EXON Valdez. Not only would the land-side of the levee experience significant contamination from oil, oil byproducts and chemicals used in the refining process, but the Mississippi River system itself would be impacted. At a conservative estimate of $125,000 per acre of clean up costs a loss of this levee would result in environmental damages

exceeding $2,000,000,000 (two billion dollars) not including the relocation costs of residents and future loss of agriculturally productive land.

5.1.4.6 National Security Considerations. As previously mentioned a two-mile portion of the Levee provides containment for the navigation pool at the Mel Price Lock and Dam. Loss of this pool would stop the movement of goods on the upper Mississippi River system between St. Louis and St. Paul and Chicago. The Conoco-Phillips facility produces defense grade fuels including some 1,500,000 gallons a day of jet fuel. The Winchester Division of the Olin Corporation supports munitions production for the Defense Department and law enforcement agencies across the nation, while the Brass Division provides copper and copper alloy strip used to support a variety of industrial purposes as well as the U.S. Mint. Interruption to these fuel and munitions production activities would not only adversely impact the area in traditional economic terms but also have implications to defense and national security needs. Additionally, any loss of refinery capability would impact gasoline availability and prices throughout the mid-west and western states.

5.1.5 Economic Analysis. A risk based economic analysis was completed for the study area in accordance with Engineering Regulation (ER) 1105-2-100, Planning Guidance, using the National Economic Development Procedures Manual for Urban Flood Damage, prepared by the Water Resources Support Center, Institute for Water Resources, as a reference. A copy of this analysis is contained in the Economic Appendix. Table 5-7 provides a graphic representation of inventory results showing a total structural value of residential, commercial and industrial buildings inventoried in the study area as being slightly over $1.5 billion. Discussions held in June 2004 with Factory Mutual Global an insurance underwriter for this area would indicate that these values while the best available are understated. While their information is proprietary they have a client base protected by this levee system that does not include any refineries that they have insured for over $1 billion.

Table 5-7 Structure Inventory

Structure Inventory by Study Area Reach			
Reach	**Building Category**	**Number of Buildings**	**Average Value of Buildings ($)**
Lower Wood River (mile 197)	Residential	8,640	66,728
	Commercial	960	212,011
	Industrial	50	3,561,800
	Total	**9,650**	**na**
East - West Fork (mile 199.4)	Residential	-	-
	Commercial	1	68,320
	Industrial	463	539,957
	Total	**464**	**na**
Upper Wood River (mile 201)	Residential	-	-
	Commercial	59	1,638,739
	Industrial	29	7,462,300
	Total	**88**	**na**
TOTAL	Residential	8,640	66,728
	Commercial	1,020	294,396
	Industrial	542	1,189,108
	Total	**10,202**	**na**

5.2 Future Without Project Conditions (no action alternative). Development is expected to continue on the interior, as a major Interstate Highway has recently opened in the Levee District. The connection that this new highway makes to the regional interstate system increases the likelihood of future development in the project area. The surrounding region has become a distribution center and this new interstate spur, which will soon be further expanded, makes the project area attractive for development. New investments by Conoco-Philips and the issuance of another permit for refinery operations during the spring of 2004 by the State would indicate that this base will continue to expand also. This increases the importance of the flood protection system to perform as intended in the future. However, as the levee systems' features continue to degrade as a result of flood events and to exceed their performance life, the systems' ability to operate, as originally intended under future flood events becomes an even greater concern. If no action is taken underseepage problems and degradation of gravity drain structures pose a threat to the integrity of the levee while further degradation to pumping stations and appurtenant works could cause interior flooding that can impact industries, infrastructure and interrupt the transportation system. Future odds increase that a significant failure could occur under the no action alternative.

5.3 Problems and Opportunities. The potential for levee failure is a major problem. As time continues to pass without a comprehensive reconstruction being undertaken for the Wood River Drainage and Levee System the probability that the project will fail continues to increase. The Wood River Drainage and Levee District has remained a good steward of this Federal

infrastructure. They continue to provide routine operation and maintenance of the system and take action to repair as circumstances require IAW the agreements under which they assumed Sponsorship responsibility. However, as all parts of this integral system continue to degrade with time the chances of multiple failures occurring simultaneously continue to increase. This serious situation truly creates a "pay me now" or "pay me later" scenario. The opportunity exists to proactively take action to reconstruct the system now in order to prevent a future catastrophe caused by system deterioration. Levee failure could cost at current estimates some $1.5 billion dollars in economic damages, and potentially another $2 billion dollars in environmental damages.

5.3.1 Main Line Levee. During the 1993 flood there were areas that exhibited amounts of through seepage and underseepage deemed serious enough to warrant immediate and significant remedial measures such as the placement of rock dikes and berms. These temporary features remained after the 1993 flood fighting efforts as a precaution. In general, the magnitude of seepage problems requiring extensive efforts was greater than anticipated. The project did not perform as expected in this regard. Subsequently underseepage problems have been experienced at lower river stages since the flood of 1993.

5.3.2 Relief Wells. Three separate but interrelated issues regarding relief wells as control measures have raised questions about the ability of the Wood River system design to perform as intended. A better knowledge of conditions has changed design criteria, observation of actual performance and greater than anticipated loss of efficiency with time have combined to raise questions regarding the current systems ability to perform satisfactorily at or near its current design flood level. The following describe these three areas of concern.

5.3.2.1 Design Criteria. When the Wood River Levee seepage control system was designed and installed as a part of the Alton to Gale levee system. When completed it represented the best engineering design thinking of the time. This is especially true with respect to the use of wells under conditions of infrequent use (flow) and a requirement to be functional over a long period of operation – 50 years or more. However, at the time, design criteria, especially the levels at which seepage measures should be installed, and design curves used to develop the size and spacing of these measures were being revised as a result of extensive laboratory and field work by the Waterways Experiment Station. Additional work conducted from the 1960's until early 1990's resulted in additional revisions to the design criteria. While the original work was known to impact design of seepage berms, it was found to also impact the determination of where wells should be used. The studies on seepage berms and relief wells have caused investigators to reevaluate existing criteria on when and where seepage control measures should be installed. Studies by the St. Louis District have shown that the original Alton to Gale design of underseepage measures does not provide an adequate level of safety. It is our belief that, should the existing system experience floods at or near the current design/authorized project levels, a failure has a high probability of occurrence. Further studies are needed to quantify the existing risk (i.e., probability of failure) and determine if measures are necessary to insure a safe system. Studies already completed for the Chain of Rocks and Wood River levee systems identified deficiencies in design of underseepage control measures for those portions of the Alton to Gale system.

The Corps of Engineers designed the Wood River Levee relief well system in 1952 and documented these results in TM-3-430, *Investigation of Underseepage Mississippi River Levees, Alton to Gale, Illinois*, dated April 1956. At that time, the system represented the best engineering design of partially penetrating relief wells in aquifers confined by leaky blankets that would be required to be

functional for a long period of time but would flow infrequently. Two critical factors of this original design are found in paragraphs #61 and #108 on pages 36 and 63 of TM 3-430 which state.

> "61. The need for seepage control measures was based on a study of the thickness and characteristics of the top stratum landward of the levee, the thickness and permeability of the pervious substratum, the maximum possible net head on the levee, and the source of seepage. If the hydrostatic head at the landside toe of the levee computed from these factors and the following formulas was greater than 0.85 (0.67 in the East St. Louis levee district), some seepage control measures were considered warranted; if between 0.67 and 0.85 (0.50 and 0.67 in the East St. Louis levee district), check piezometers were installed, and if less than 0.67 (0.50 in East St. Louis levee district), no piezometers or seepage control measures were considered warranted.'
>
> '108. The spacing of relief wells where a landside top stratum is present was set so that the head above tailwater or ground surface midway between wells at the design flood stage would not exceed 0.67 z in agricultural areas or 0.50 z in the East St. Louis levee district."

The selection of 0.85 as the critical vertical seepage gradient resulted in only 3-miles of the levee being protected by relief wells. At the same time that TM 3-430 was being published, design criteria, especially the levels at which seepage control measures should be installed and the design curves used to develop the magnitude of these measures were being revised by the Corps. Based on extensive laboratory and fieldwork completed by the Waterways Experiments Station and during the same time frame that TM 3-430 was published, the Corps was considering using a lower, more critical vertical seepage gradient. The Waterways Experiments Station published TM-3-424, *Investigation of Underseepage and Its Control, Lower Mississippi River*; October 1956 for the President, Mississippi River Commission, just 6-months after TM 3-430. Paragraph #675 on page 276 of this TM is reproduced below;

> "675. Seepage control measures are considered necessary where observed or estimate values of h_o may be expected to equal or exceed h_c (approximately 0.75 z_t) at design flood stages."

This requirement that seepage control measures be installed when the calculated vertical seepage gradients reached 0.75io, substantially more conservative than the 0.85 value used in the Wood River design.

As indicated earlier, TM 3-430 set the design spacing of the Wood River relief wells so that the maximum gradient between the wells was no more than 0.67z. In TM 3-424, the Corps considered a more conservative well spacing criterion. Paragraph number 675.a.(2) from that document is reproduced below;

> "Where no control measures are present, relief wells should be designed so that i_{max} midway between wells or landward from the well line does not exceed 0.5 to 0.6. Where landside berms wider than 100 ft are present, but additional control measures are considered necessary, relief wells should be designed so that i_{max} = 0.6 to 0.7."

The requirement of spacing the relief wells so that the maximum gradient midway between the wells does not exceed 0.50 to 0.60 is substantially more conservative than the 0.67 value used in the Wood River design.

5.3.2.2 Observations of Actual Performance. The original designers of the Alton to Gale system, which includes Wood River Levee, were well aware of the fact that while they were using leading edge thinking with respect to control measures, further research work in this area was being done by the Waterways Experiment Station. Additionally, they knew that future flood events would provide new and useful information that would confirm but more likely show a need to modify the original work of the Alton to Gale system. In the conclusions/recommendations presented in the original Alton to Gale Underseepage Design Report the team stated "As the levees in the St. Louis District generally have not been subjected to very high river stages and relatively few sand boils have occurred to date, the critical gradient was assumed…." It was also recommended "The design assumptions used should be reviewed and revised as necessary to comply with actual observations and performance data obtained during future flood events." It was not until the system was some 40 years old that it was tested against an event, the flood of 1993, which was even close to the system's design flood event.

Observations made by the St. Louis District during the flood events of 1973, 1986, 1993, and 1995 and subsequent evaluations have shown that certain areas have not performed up to levels, which would have been predicted by the original design. In some reaches along the current Alton to Gale project if this data were extrapolated to design level floods the corresponding level of performances of this system would be well below acceptable limits. Observations have shown development of high uplift gradients, sand boils and heavy seepage along reaches of the system with no current seepage control measures as well as in some reaches that have operational systems currently in place. These conditions have also been observed in the areas where relief wells have been installed to help alleviate these problems. It has been concluded that these actual conditions occurred as a result of the design analysis discussed above and the very limited subsurface data used by the original designers.

5.3.2.3 Gradual Loss of Underseepage Control Efficiency Over Time. For the most part the underseepage control measures currently in place within the various flood control systems along the Mississippi River that are within the St. Louis District area are approaching the age of fifty years or more. Relief wells constitute over 95% of the seepage control measures currently in use. Relief wells may malfunction for a variety of reasons including vandalism, breakage or excessive deformation of well screen due to ground movements; corrosion or erosion of well screens that result in a gradual but steady loss of efficiency with time. It is this latter reason, the gradual but steady loss of efficiency, that has been the focus of concern within the St. Louis District as well as other Corps Districts in recent years. Studies have shown that this reduction is far greater and not self-correcting as assumed by earlier designers. The reduction of specific capacity with time can result from mechanical, chemical or biological processes. The introduction of fines into the well by back flooding of muddy surface waters is the major mechanical agent. While the major forms of chemical incrustation are caused by the precipitation of carbonates, sulfates, as well as iron and manganese compounds. Bio-fouling, or clogging of screens, filter packs and even the natural aquifer adjacent to the well is caused by the activity of microscopic bacteria, molds and algae.

This activity manifest itself as slimes, incrustations, precipitation of metals and accumulation of inorganic fines. While designers have long recognized these processes, the extent and damage

caused was greatly underestimated. In addition it had been originally assumed that natural flow during flood events and/or simple pumping of the well at select intervals (10-20 years) would correct the problem and bring the well back to /or very close to original installed efficiency. Studies in the early 1960's confirmed that relief well efficiency did reduce with time and that in some cases more than pumping was required to bring a relief wells efficiency back up to an acceptable level. Studies in 1976 following the 1973 flood indicated that the problem might be far greater than assumed in the 1960's, and that extensive mechanical or chemical means might be required even with relief wells that flowed naturally as a result of a flood event. Studies conducted by the St. Louis District in the early 1990's, rehabilitation of relief wells in flooded districts following the 1993 flood, and extensive redevelopment of relief wells within the East St. Louis/Chain of Rocks Levee System has confirmed, that to maintain an acceptable level of relief well efficiency an active program of relief well rehabilitation must be undertaken at regular intervals (8-10 years). This relief well rehabilitation must consist of a carefully controlled combination of chemical and mechanical redevelopment methods carried on inside the relief well. This level of relief well redevelopment or maintenance is well beyond any requirement originally anticipated as being necessary and well beyond the guidance originally provided to the local levee and drainage districts. This is especially critical in light of the fact that many of the relief wells have gone some 40 years plus and have yet to receive this critical level of maintenance in order to maintain them at an acceptable level of efficiency (80% of design/installed specific capacity.)

5.3.3 Gravity Drains. The majority of gravity drains in this levee system today 38 are corrugated metal pipe (CMP). CMP drains already experienced failures in 1973 (2) and 1993 (1). Design criteria for the use of CMP in levee systems has changed since the Alton to Gale system was designed. EM 1110-2-2902 address the use of corrugated metal pipes for Agricultural levees where the size of pipe is less than 36 inches and levee height is less than 12 feet, not the situation with the Wood River Levee. EM1110-2-3104 specifies "Reinforced concrete pipe should be used as conduit through urban levees and any other levee where loss of life of substantial property damage could result from an embankment failure." The useful performance life of the CMP drains of between 40-50 years is being exceeded. During the 1993 flood the failure of the 60" CMP gravity drain at East Alton Pump Station No. 2, Sta. 69+35 placed the levee in eminent danger of failure and required the emergency placement of 300 tons of rock. Only as the result of quick action and innovation was the Levee District able to maintain the levee at this location.

5.3.4 Closure Structures. Of the 26 closure structures in the levee system the condition of the concrete structures varies greatly with 3 having concrete monoliths that are severely degraded, 4 with deteriorated gate sills and 1 with a deteriorated approach slab. Three of the structures including monoliths have severe concrete damage and 3 should be abandoned as they are no longer required. Of these 26 closures there are 5 closures whose steel gates are in extremely poor condition, 11 requiring some action, 3 to be abandoned and 7 with no problems.

5.3.5 Pump Stations. Switchgear and other electrical equipment, which is integral to the pump system operation, are obsolete. Repair parts for these systems are not available. Wholesale replacement is required. Likewise, all rotating elements of the operating pumps are exceeding their life expectancy and are in need of being re-built or re-habilitated. It is not economically feasible to repair these large and expensive items on a piecemeal basis. The pump stations are integral to the intended operation of the flood control system and to its ability to provide the authorized level of protection. They operate routinely, as they must be used to evacuate interior waters when the river stage reaches or exceeds 418. While each of the stations serves an independent function they must

all work collectively for the levee system to maintain function as designed. In both 1994 and 1995 storm water pumps at the Rand Avenue Station and East Alton Pump Station No. 1 failed.

5.4 Planning Objectives and Constraints. Based on the Planning Guidance Memorandum (PGM) dated 4 August 1999, received following submission of the Section 905b Analyses, a Limited Reevaluation Report is being produced only to document reconstruction requirements and to fix proximate responsibility for corrective actions while ensuring the scope, function and purpose of the authorized Federal project is maintained. The PGM restricted the focus of this investigation to the reconstruction project by stating "There is no authority to add ecosystem restoration…..we are not seeking new authorization." Therefore, for the purpose of this investigation the primary problem facing the Wood River Drainage and Levee District is the deterioration of the existing levee system and its appurtenances due to design deficiency on the levee underseepage control measures, advanced age and the system exceeding its performance life. The objective of this study is to reduce flood damages and flood related costs by restoring operational functionality of the levee system and appurtenances to ensure the system continues to provide its intended level of protection.

5.4.1 Consequences of Failure. A failure of this system would affect thousands of residents in the immediate vicinity and result in billions of dollars worth of damage. Depending on the level and type of failure experienced there is a potential for the loss of pool at Melvin Price Lock and Dam resulting in a stoppage of river navigation. As is the case with any such system, loss of life is always a potential consequence, especially considering the urban nature of this system.

A catastrophic failure on the Upper Wood River Levee could impact the Lower Wood River Levee, while the Lower Wood River Levee could impact the downstream levee (East St. Louis), potentially affecting an additional 200,000 residents and potentially producing an additional billion plus dollars in damage. As previously mentioned failure of the levee at the oil refineries or the other heavy industrial areas adjacent to the system could create an environmental disaster whose recovery cost are projected to be a minimum of $125,000 an acre not accounting for relocation costs, loss of agricultural lands and damage to the river and surrounding ecosystems. The following provides an overview of system specific problems.

5.5 Alternative Development. Three basic alternative plans were used to guide the alternative development process for this study. The No Action alternative assumed no action would be taken. Under this scenario the Levee District would continue to perform its operation and maintenance responsibilities and maintain their standing in the P.L. 84-99 program, but no Federal action outside of the P.L. 84-99 program would be taken. The reconstruction alternative sought to identify actions that could be taken to correct system deficiencies through a variety of specific approaches that would be equal in performance to replacement. The replacement alternative sought to identify actions that could be taken to correct system deficiencies through replacement of system components. For example in the case of gravity drains no action, lining (reconstruction) or replacement of the drain was considered. For each of these three basic alternative plans costs were calculated for them so that they could be evaluated against one another. In each instance the final recommended action was determined to be necessary in order to provide the original level of protection. In this manner each of the system features were analyzed and evaluated. The following is a summary of alternative plans evaluated for each pertinent levee system feature each is described in detail in the Engineering Appendix.

5.5.1 CMP Gravity Drains:

No Action: CMP gravity drains have exceeded their expected performance life and failure to address this situation could lead to catastrophic failure of the levee system.

Reconstruction: Insituform lining and High Density Polyethylene (HDPE) lining was considered. High Density Polyethylene (HDPE) lining was determined viable and was carried forward for cost estimating.

Replacement: Since Corps design criteria requires RCP for this type urban levee system this was utilized for replacement evaluation costing.

5.5.2 Sluice Gates and Flap Gates:

No Action: Flap gates and sluice gates are nearing 50 years of age and will continue to deteriorate until their condition results in failure. Failure of a flap gate or sluice gate could cause isolated flooding in the drainage area leading to the gravity drain.

Reconstruction: Sluice gates would be removed and refurbished and gate hoist, stem gate slide and frames completely refurbished with new anchors, fasteners, hinge bushings and bearings installed. Flap gates would be removed and refurbished with new hinge bushings, anchors and fasteners installed.

Replacement: Sluice Gates would be replaced to include new hoists, stems, slides and frames. Two types of Flap Gate replacements were investigated, cast iron similar to those currently in service and a rubber "duckbill" check valve.

5.5.3 Gatewell Structures:

No Action: Gatewell structures will continue to deteriorate over time at varying rates based on the problems they currently manifest until their condition results in failure of the structure. Failure during a high water event could result in significant interior flooding and possible loss of the levee.

Reconstruction: The steel handrails and existing steel bridge joists would be sand blasted and recoated. Reconstruction of the steel grating was investigated and determined to be cost prohibitive. Reconstruction of GW-9 is not an option based on its existing condition and no further reconstruction is required for the remaining concrete gatewell structures.

Replacement: Replacement of the steel grating and steel handrails with fiberglass and complete removal and replacement of the concrete structure of GW-9.

5.5.4 Closure Structures

5.5.4.1 Concrete Structures:

No Action: Closure structures will continue to deteriorate over time until their condition eventually results in failure of the structure. Failure during a high water event could result in significant interior flooding and possible failure of the levee.

Reconstruction: Removal and replacement of joint sealant material patch, chemical injection grouting, epoxy grouting or concrete encapsulation of the damaged concrete at gate sills, monoliths, aprons and monolith floodwalls.

Replacement: Removal and replacement of gate monoliths, monolith floodwalls, gate sill concrete, corner protections and gate seals.

5.5.4.2 Gates/Stoplogs:

No Action: Steel gates will continue to deteriorate over time until their condition results in failure of the structure. Failure during a high water event could result in significant interior flooding and possible loss of the levee. Stoplogs were determined to be acceptable in their present condition.

Reconstruction: Steel gates would be sand blasted and recoated with a multi-coat paint with rubber-J-seals and steel clamping bars replaced and a steel skinplate added on the backside of the gates to act as weather shields

Replacement: Fabricate and install new steel gates with appurtenances including steel skinplate weather shields.

5.5.5 Pump Stations

5.5.5.1 Gravity Drains:*

No Action: The two pump stations (Wood River and Hawthorne) with concrete drain structures that are in good condition with a slight chance of problems at joints, which could lead to loss of levee embankment material and subsequent levee instability. After 50 years it is anticipated that the two cast iron drains at the Rand Pump Station may have corrosion problems that could contribute to failure of these pipes. Failure of these cast iron pipes would prevent this station from being able to remove interior water causing localized flooding.

Reconstruction: Concrete pipes at Wood River can be lined with HDPE or Insituform as they are structurally sound and this would prevent future joint problems. At Rand the two cast iron pipes could be lined with HDPE to indefinitely extend their life or if found to still be structurally sound they could also be lined with insituform. At Hawthorne the joints of the concrete box culvert gravity drain would be repaired.

Replacement: It was determined that replacement of Wood River, Rand and Hawthorne drain structures was infeasible as they cross under Illinois Route 3 and the mainline levee and would be cost prohibitive. Replacement was eliminated prior to cost estimating.

*Two pump stations (Homegarden and Lakeside) with CMP drains are covered under Gravity Drains

5.5.5.2 Pump Station Structures:

No Action: In general deterioration at all pump stations will continue eventually reaching a point where the degree of deterioration will become significant and require repair in order for the station to properly function. At the Wood River Station the emergency stoplog slots have corroded to the point that the inability to place stoplogs in the event a flap gate failure during a high water event would result in increased pumping demand and should more than one flap gate fail result in interior flooding.

Reconstruction: In general replacement of trashracks, grating, roofing, ladders, chain link fencing, and tuckpointing as applicable should return the structures to an acceptable standard.

Replacement: It was determined that replacement of pump station structures was not warranted as the conditions do not warrant such drastic action and cost would be prohibitive when compared to reconstruction.

5.5.5.3 Pumps and Motors:

No Action: As this equipment reaches 50 years of age there will be an increased probability of failure. Failure during a high water event would result in the localized flooding in the drainage area served and depending on the station effected, the backup of sanitary sewer lines in several cities and the cessation of refinery process at Conoco-Phillips.

Reconstruction: In general the removal, disassembly, and replacement or refurbishment of all pump and motor components as detailed in the Engineering Appendix would be accomplished.

Replacement: Existing pumps at various locations could be replaced with vertical line-shaft pumps or submersible pumps as detailed in the Engineering Appendix.

5.5.5.4 Sluice Gates and Flap Gates:

No Action: If no action is taken on flap gates and sluice gates and appurtenances as this equipment reaches 50 years of age there will be increased probability of failure. Failure of these components has varying consequences based on their location and function in the pump station. These consequences range from interior flooding to the inability to perform maintenance and repairs on other items such as pumps and sewer lines. These consequences are detailed for each station in the Engineering Appendix.

Reconstruction: In general the removal, disassembly, and replacement or refurbishment of all gate and gate hoist assemblies and components as detailed in the Engineering Appendix would be accomplished.

Replacement: Sluice gates would be replaced with similar type cast iron sluice gates with stainless steel stems. Gate hoists would be replaced by similar manually operated geared hoists or with electric motor actuated gate hoists with limit switches. Flap gates would be replaced either with similarly designed cast iron flap gates or rubber Tideflex duckbill type check valves.

5.5.5.5 Electrical Equipment:

No Action: Reliability of the electrical switchgear will decrease rapidly in the near future and with no spare parts being available equipment failures will cause extended downtime as components will have to be completely replaced. Failure of a motor starter or main circuit breaker would render stormwater pumps useless until replacement could be located and installed. These systems are likely to fail during high water events when they are critical to system operation.

Reconstruction: As repair parts are no longer available for the installed equipment this option was not pursued.

Replacement: Existing switchgear would be replaced with a motor control center. The float control device would be replaced with a radar or sonar level measurement and a lightning transformer fed from the MCC would be installed to eliminate the 120/208 volt service from the utility. The lighting panelboard and other wiring devices would also be replaced.

5.5.6 Underseepage

5.5.6.1 Existing Relief Wells:

No Action: Existing relief well performance will continue to degrade over time making them ineffective in performing their required functions resulting in certain reaches of the levee system becoming unstable during high water events. Failure of any reach of the levee will result in widespread and catastrophic flooding of the protected area.

Reconstruction: Based on the Districts experience with the rehabilitation of the East St. Louis Levee System all wells need to be pump tested and those showing performance below 80% of original capacity need to be re-developed in order to restore efficiency.

Replacement: Replacement of all wells is not a viable option based on cost and land area available, however, those wells not achieving 80% efficiency after reconstruction will be replaced and 10 wells identified as damaged/abandoned will be replaced.

5.5.6.2 Underseepage control:

No Action: Seepage during high water events will continue to create stability problems for certain reaches of the levee. Failure of any reach of the levee will result in widespread and catastrophic flooding of the protected area.

Reconstruction: The addition of relief wells, seepage berms and slurry walls were evaluated for their ability address underseepage concerns for the system.

Replacement: It was determined that replacement was not feasible either for function or cost.

5.6 Findings and Conclusions. Based on the analysis of the problems facing the flood protection system a series of alternatives designed to address identified problems were developed. Costs were associated with these various plans, which were compared for reasonableness, efficiency and effectiveness. An analysis of problems was also made in an attempt to characterize their origin for classification of potential responsibility. Following are the overall conclusions drawn from this analysis process.

5.6.1 Findings

5.6.1.1 Alternative Analysis. Based on engineering experience, cost effectiveness and efficiency the following alternatives were identified as being those providing the best solution to identified system problems.

5.6.1.2 Gravity Drainage Structures

5.6.1.2.1 CMP Gravity Drains. As previously discussed drains were evaluated for reconstruction by lining or replacement. It was determined based on hydraulic conveyance requirements that drains 24 inches or smaller would have to be replaced with RCP and drains 30 inches or larger could be lined with HDPE pipe. This action was determined to be required for all 38 CMP drains based on the probability of future failure of these structures and the fact that the Corps has learned since the 1950's that CMP drains for an urban system such as Wood River are not viable.

5.6.1.2.2 Sluice Gates and Flap Gates. As previously discussed reconstruction or replacement were evaluated. Based on the St. Louis Districts previous experience the replacement of gate stems, stem guides and gate hoists and the reconstruction by refurbishment of sluice gate slides and frames and flap gates will effectively address the identified problems.

5.6.1.2.3 Gatewell Structures. The replacement of steel handrails, ladders and grates with fiberglass was determined to be the most effective solution to problems identified with reconstruction by refurbishment to bridge beams where applicable on all gatewell structures except GW-9. While the cost of replacement with fiberglass components was slightly higher it was justified by the long-term effectiveness and life expectancy of the final product. Replacement of GW-9 was determined to be the necessary solution for this structure.

5.6.1.3 Closure Structures

5.6.1.3.1 Concrete Structure. After extensive investigation removal and replacement of of 3 closure structure monoliths and 3 closure structure monoliths and floodwalls with major deterioration was determined to provide the most reliable solution to the identified problems. For the 4 closure structures with deteriorated gate sills, it was determined that the entire gate sill concrete and corner protections and gate seal should be removed and replaced. Approach apron removal and replacement provides the best solution for the problem identified at 1 structure.

5.6.1.3.2 Gates and Stoplogs. Two of the gates are in good condition and require no action. The 8 large and 3 small gates that are currently in satisfactory condition should be reconstructed by sand blasting and recoating with the inclusion of a weather shield to extend their performance life. The 5 gates that are currently in poor condition should be replaced in order to provide the degree of confidence that they will perform satisfactorily into the future and a weather shield should be installed on each to extend their performance life. The 5 stoplog closures are considered to require no action. Removing the gates and backfilling the opening in the concrete structure with compacted earthen material should permanently close the 3 closure structures that are no longer required.

5.6.1.4 Pump Stations

5.6.1.4.1 Gravity Drains. No action is deemed necessary on the concrete gravity drains at Wood River Pump Station and further investigation at Rand and Hawthorne will be required to determine if action is necessary. If problems are found then repair of the concrete box culvert at Hawthorne and lining of the drains at Rand should be undertaken.

5.6.1.4.2 Pump Station Structures. At East Alton No. 2, Wood River, Rand Avenue and Hawthorne Pump Stations reconstruction of existing trashracks, grating, roofing, ladders discharge chamber embedded metals, chain link fences and tuckpointing the mortar joints is deemed necessary. At the Lakeside and Homegarden Pump Stations grating and sheet metal roofs need to be replaced.

5.6.1.4.3 Pumps and Motors. At East Alton No. 1 reconstruction of the two stormwater pumps is required while at East Alton No. 2, Hawthorne and Wood River stormwater pumps and their associated electric motors should be reconstructed. Additionally, replacement of the baseflow pump at Wood River with a submersible centrifugal pump was found to provide the best solution to the problem. At Lakeside and Homegarden Pump Stations the exiting vertical pumps need to be replaced with pumps of a similar design and vertical electric motors reconstructed.

5.6.1.4.4 Sluice Gates and Flap Gates. At East Alton No. 1 reconstruction is recommended for the emergency closure sluice gate, while a combination reconstruction of gate slides and frames and replacement of gate stem, stem guides, and manual operated gate hoists with electric motor actuated gate hoists be undertaken for 3 sluice gates at East Alton No. 2, 4 sluice gates at Wood River and 1 sluice gate at Rand. Additionally a combination reconstruction of gate slides and frames and replacement of gate stem, stem guides, and manual operated gate hoists should be under taken for 3 sluice gates at Wood River and 5 sluice gates at Rand. No action is recommended for the remaining 4 sluice gates at Wood River based on their function in the station. The pump discharge flap gates at Wood River should be replaced with the "TideFlex" duckbill type rubber check valves, while the pump discharge flap gates at Rand should be reconstructed.

5.6.1.4.5 Electrical Equipment. With the exception of East Alton No. 1,which already contains modern electrical equipment, existing switchgear in each of the pump stations will be replaced with Motor Control Centers (MCC). Additionally, float controls should be replaced with radar or sonar level measurements and lighting transformers fed from the MCC will be installed to eliminate the 120/208 volt service from the utility. Lighting panel boards and other wiring devices will also be completely replaced.

5.6.1.5 Underseepage

5.6.1.5.1 Relief Wells. All existing relief wells will be pump tested and those showing performance below 80% of original capacity will be re-developed. Those not achieving 80% efficiency following reconstruction procedures will be replaced. The 10 abandoned or damaged wells will be replaced.

5.6.1.5.2 Underseepage Control. 43 new relief wells will be installed on the Lower Wood River Levee and 25 new relief wells will be installed on the Upper Wood River.

5.6.2 Classification of Problems. Table 5-8 has been created to classify the nature of the problem identified and describe the cause as can best be determined. Explanations are provided to illuminate conclusions.

Table 5-8 Classification of Problems

Feature	Problem	Cause	Responsibility	Discussion
Gravity Drainage Structures CMP Gravity Drains	Deteriorating structurally	Age	Sponsor assurances and Title 33 place responsibility with the sponsor to operate, maintain and repair. This has and is being accomplished.	Corps experience since the 1950's has changed the minimum standard to concrete pipe for this type of drain based on reliability issues. Number of drains (38) that are now almost 50 years old increase the probability of multiple simultaneous failures of drains which are now operational. Failure during a high water event could be catastrophic and would be addressed by PL84-99 and other federal disaster relief funds following the event. There is no maintenance procedure for these items since they deteriorate from the outside (side against earth) in.
Sluice Gates and Flap Gates	Deteriorating Structurally	Age		Wholesale rehabilitation is not a part of this sponsors assurances. However, as these items continue to age the probability of failure during a high water event increases. Failure during such an event would be addressed by PL84-99 and other federal disaster relief funds following the event.
Gatewell Structures	GW-9 has deteriorated structurally	Deficient Structure	Corps of Engineers is responsible for adequacy of construction quality control	The structural problems noted with GW-9 appear to be related to improper construction methods. The quality of the concrete aggregate appears to be the cause of the concrete deterioration along with

				the possibility of low or no entrained air. While this structure has performed adequately for many years, compared to the other gatewell structures in the system this one is deficient. Improper construction methods is the responsibility of the Corps.
	Remainder have shown signs of initial deterioration but are acceptable at this time	Age		Components will continue to slowly deteriorate over time eventually resulting in lower reliability.
Closure Structures				
Structure	Structural 6 closure structures	Deficient structures	Corps of Engineers is responsible for adequacy of construction quality control	The quality of the concrete aggregate appears to be the cause of the concrete deteriorations along with the possibility of low or no entrained air. The aggregate used in the concrete is soft and appears to be highly absorptive. Improper construction methods is the responsibility of the Corps
	Structural 16 closure structures	Age	Sponsor assurances and Title 33 place responsibility with the sponsor to operate, maintain and repair. This has and is being accomplished.	Wholesale rehabilitation is not apart of this sponsors assurances. However, as these items continue to age even though being maintained, the probability of multiple simultaneous failures during a high water event increases. Failure during such an event would be addressed by PL84-99 and other federal disaster relief funds following the event.
	Need for 3 closure structures	Change in area use	Sponsor assurances and Title 33 place responsibility with the sponsor to operate, maintain and repair. This has and is being accomplished.	
Gates	Structural 16 Gates	Age		
	Need for 3 Gates	Change in area use		Three closures could be permanently closed based on changes in area use.
Stoplogs	None			

Pump Stations Structures Pumps and motors	 Structural Operational integrity	 Age Age	Sponsor assurances and Title 33 place responsibility with the sponsor to operate, maintain and repair. This has and is being accomplished.	Wholesale rehabilitation is not apart of this sponsors assurances. However, as these items continue to age even though being maintained, the probability of multiple simultaneous problems during a high water event increases.
Pump Stations – Cont. Sluice and Flap Gates Electrical Equipment **Levee** Relief Wells	 Structural Obsolescence Out put efficiency	 Age Age Age	Sponsor assurances and Title 33 place responsibility with the sponsor to operate, maintain and repair. This has and is being accomplished. Sponsor assurances and Title 33 place responsibility with the sponsor to operate, maintain and repair. This has and is being accomplished. Sponsor assurances and Title 33 place responsibility with the sponsor to operate, maintain and repair. This has and is being accomplished.	Wholesale rehabilitation is not apart of this sponsors assurances. However, as these items continue to age even though being maintained, the probability of multiple simultaneous problems during a high water event increases. Failure during such an event would be addressed by PL84-99 and other federal disaster relief funds following the event. In the 1950' and 60's no "down hole" maintenance information was provided to the sponsor. Long after the fact through experience the Corps determined certain degradation of well function would happen over time. However, this degradation had already occurred. Wholesale rehabilitation is not apart of this sponsors assurances. However, as these items continue to age even though being maintained, the probability of multiple problems leading to levee failure during a high water event increases. Failure during such an event would be addressed by PL84-99 and other federal disaster relief funds following the event
Levee	underseepage	Design	Corps of Engineers is responsible for adequacy of design	Lack of adequate underseepage measures is a function of design and a responsibility of the Corps.

5.6.3 Conclusions. Underseepage problems associated with the levee system are clearly a Federal responsibility for design deficiency reasons and should be addressed immediately as such. These underseepage problems are related to a lack of sufficient relief wells and wells with insufficient output. As described in this report, the extent to which relief wells needed to be maintained because of bio-fouling was not understood by the designers. As a result the Levee District was never provided adequate information regarding necessary maintenance and rehabilitation actions required to maintain adequate performance. Estimates for relief well OMRR&R contained in the Economic Appendix reflect the extent of effort that is required to maintain this well system. Once these wells are reconstituted under this project the Sponsor will for the first time have the information necessary to perform future maintenance, repair and replacement required for the well system. The remaining work recommended by this report falls into the reconstruction category based on the age of the flood protection system and the maintenance history of the system. The Wood River Levee and Drainage District has continued to operate and maintain their levee system in accordance with the assurances provided at the time of levee turn over. This maintenance has included repair of items that have failed during none flood event periods in accordance with Title 33 requirements and repair under P.L.84-99 guidelines for failures occurring during flood events. The Wood River Drainage and Levee District continues to be a good steward for this essential infrastructure system.

As noted earlier the Corps of Engineers has since the 1990's modified the terms and agreements of sponsorship for federally cost shared projects. Information is provided to the sponsor today that addresses all facets of operation, maintenance, repair, replacement, and reconstruction. There is full disclosure of the future financial responsibilities associated with sponsorship. Costs of these activities are provided to sponsors in a linear schedule allowing for future planning of required activities.

As our flood protection systems on the Mississippi River have now been in operation since the 1940's the Corps has learned about the necessity for replacement and reconstruction that was not understood during the construction of these early projects. A significant portion of the flood protection systems on the Mississippi River are actually repaired, replaced and rehabilitated by the Corps of Engineers at full federal cost while operated and maintained by non-Federal Sponsors. The special legislation covering these flood protection projects, which were also constructed in the 1940's and 1950's, prevents these levee and drainage districts from facing the difficult choices being made by their upper river counterparts on how to stretch scarce operation and maintenance dollars to cover unanticipated costs of system reconstruction.

EC 11-2-183 dated March 2002 provides the much needed assistance and relief opportunity for drainage and levee districts like Wood River who have continued to meet their original project assurances but who are now faced with bearing the total cost and meeting the technical requirements associated with a comprehensive reconstruction of a complex flood protection system. Such an undertaking is not within their capability to accomplish.

As long as Wood River is able to remain approved in the P.L. 84-99 program future failures during flood event periods will be subject to full federal funding for repairs, while disaster relief and other federal resources will be expended to provide compensation for economic and property loss as well as any required environmental clean-up. However, experience tells us that deferral of needed major rehabilitation will increase the flood protection system's chances of ultimately failing during a future high water event. Our experience has further taught us that preventative costs to fix a problem are significantly less than repair costs following a failure. This cost savings does not even

take into consideration the other associated compensations that are provided when a failure occurs for economic and property losses by other Federal and State agencies. Based on criteria contained in EC 11-2-183 dated March 2002 and the findings of this investigation the Wood River Drainage and Levee District meets the eligibility criteria for a cost shared reconstruction project.

Undertaking a major reconstruction project with the Wood River Drainage and Levee District under the Corps' existing cost share requirements would permit the entire system to be determined to be whole again and entail a full disclosure of future operation, maintenance, repair, replacement and reconstruction requirements for all components of the levee system and its appurtenances. This comprehensive action would allow the entire system to become the responsibility under today's standards of the non-Federal sponsor following completion and turn over of the reconstructed system. This situation would allow receipt from the non-Federal sponsor of the assurances required to qualify under today's criteria as a non-Federal sponsor, eliminating any future confusion regarding requirements for operation, maintenance, repair, rehabilitation and reconstruction.

6. DESCRIPTION OF RECOMMENDED PLAN

6.1 Design Deficiency. According to Engineer Regulation ER 1165-2-119, a design or construction deficiency is a flaw in the Federal design or construction of a project that significantly interferes with the project's authorized purposes or full usefulness as intended by Congress at the time of original project development. Corrective action, therefore, falls within the purview of the original project authorization. Work to correct a design or construction deficiency may be recommended for accomplishment under existing project authority without further Congressional authorization if the proposed corrective action meets all the following conditions:

- It is required to make the project function as initially intended by the designer in a safe, viable and reliable manner; e.g., pass the original design flow without failure. This does not mean the project must meet present-day design standards. However, if current engineering analysis or actual physical distress indicates the project will fail, corrections may be considered a design or construction deficiency if the other criteria are met.

- It is not required because of changed conditions.

- It is generally limited to the existing project features. Remedial measures that require land acquisitions or new project features must not change the scope or function of the authorized project.

- It is justified by safety or economic considerations.

- It is not required because of inadequate local maintenance.

6.1.1 Additional Relief Wells. The analysis of underseepage requirements for the Wood River flood projection system indicates that a total of 68 new wells are required to meet original design intent at an estimated cost of $2,394,800.

6.1.2 Existing Relief Wells. Relief well re-development requirements were not provided to the local sponsor, therefore, current performance problems should be addressed as a project deficiency. The relief wells will be pump tested and re-developed as required to achieve 80% performance efficiency or replaced at an estimated cost of $2,081,700. Under modifications to existing projects, this work would be cost shared with the non-Federal sponsor on a 65% Federal and 35% non-Federal basis and could be undertaken within existing project authority.

6.2. Reconstruction. The following items fall into the category of reconstruction. These items would be cost shared with the non-Federal sponsor on a 65%Federal and 35% non-Federal basis but could be undertaken only with additional authority being received to undertake this work.

6.2.1. Gravity Drainage Structures. Of the thirty-eight corrugated metal pipe gravity drains 25 will be lined with HDPE and 13 will be replaced with RCP at a cost of $4,800,900.

6.2.2. Closure Structures. Removal and replacement is recommended for 4 sills and one approach apron. 3 closure structures are recommended to be permanently closed. 11 gates will be reconstructed, 5 gates will be replaced, 3 gates will be removed as the closure will be permanently closed and 2 gates will require no action. No action is required at the 5 stoplog closures. Investigation of three closure structure monoliths, three closure structure monoliths and floodwalls and one gatewell structure indicates that while they have been in place for many years, in comparison to other like structures in the system, they are deficient. In each situation deterioration is directly attributable to the poor quality of the concrete aggregate with the possibility of low or no entrained air. The aggregate used in the concrete is soft and appears to be highly absorptive. Since there is no legal recourse against any contractors for any alleged construction deficiencies so it is recommended that these items be addressed by the reconstruction project. The cost for reconstruction/replacement of these items is $3,150,700

6.2.3. Pump Stations. East Alton No. 2, Wood River, Rand Avenue and Hawthorne Street Pump Station structures will be reconstructed to include trashracks, grating, roofing, ladders, discharge chamber embedded metals, chain link fences and tuckpionting. Lakeside and Homegarden Pump Station structures will have grating and sheet metal roofs replaced. At East Alton No. 2 both stormwater pumps and their associated electric motors will be completely reconstructed and each of the three sluice gates gate slides and frames reconstructed with gate stem and stem guides replaced. At Wood River Pump Station the vertical stormwater pumps and their associated electric motors will be reconstructed, the baseflow pump replaced with a submersible centrifugal pump, and of the eleven sluice gates, seven gate slides and frames are to be reconstructed with gate stem and stem guides replaced with four of these gates having manual operated gate hoists replaced with electric and three being reconstructed but remaining manually operated. At Rand Avenue Pump Station the one remaining original electric motor will be completely reconstructed and each of the six sluice gates gate slides and frames will be reconstructed with gate stem and stem guides replaced with two gates having manually operated gate hoists replaced with electric and four being reconstructed but remaining manually operated. At Hawthorne Street Pump Station both stormwater pumps and their associated electric motors will be completely reconstructed and the two sluice gates gate slides and frames will be reconstructed with gate stem and stem guides replaced with one of these gates having a manual operated gate hoist replaced with electric and one being reconstructed but remaining manually operated. At Lakeside Pump Station the existing vertical pump will be replaced with a pump of similar design and the vertical electric motor completely reconstructed. At Homegarden Pump Station the existing vertical pump will be replaced with a pump of similar design and the

vertical electric motor completely reconstructed. At the East Alton No.1 Pump Station the trash rack will be replaced. The cost for reconstruction/replacement of these items is $4,565,000.

6.3 Economic Benefits of the Recommended Plan (the With Project Condition)

A comparison of with project to without project (no action alternative) benefits indicates that there is a positive benefit to cost ratio of 3.01 to 1. Table 6-1 taken from the Economic Appendix displays this information, which indicates the recommended design deficiency and reconstruction project is economically justified. It should be reiterated that these damages represent those identified traditionally in a risk based structure inventory analysis and do not include the environmental damages and associated clean up costs that would occur with a failure of this levee system.

Table 6-1 Recommended Plan - Expected Annual Net Benefits

ESTIMATE OF EXPECTED ANNUAL NET BENEFITS

ITEM	5-3/8%, SEPT. 2004 PRICE LEVEL
Expected Annual Benefits	**$ 5,780,750**
First Costs	**22,158,200**
Interest During Construction	**1,908,840**
Average Annual Construction Costs	**1,588,710**
OMRR&R	**331,600***
Total Average Annual Costs	**1,920,310**
B/C Ratio	**3.01**
Expected Annual Net Benefits	**$ 3,860,440**

**Reflects increased costs to cover OMRR&R*

7. ENVIRONMENTAL CONSEQUENCES. An environmental assessment was completed and documented in Appendix C. Based on the analysis of the impacts that would result from both the design deficiency and reconstruction project, a finding of no significant impact is recommended. Archeological surveys are scheduled to be completed during the PED phase. Based on the location of new relief wells at the existing levee toe and the ability to move these laterally with no impact to the project it is anticipated that issues will be resolved without further action.

8. PROJECT IMPLEMENTATION.

8.1 Project Implementation Process. A set of plans and specifications will be undertaken as a part of the scope of the existing PED agreement to address the system design deficiencies. Construction on these items requires no additional project authorization. Prior to the acquisition of Project lands and the subsequent initiation of the first item of construction, a Project Cooperation Agreement (PCA) will be executed for the deficiency portion of the already authorized Project. Work under this PCA can begin in levee reaches requiring no additional lands. The Sponsor will acquire easements, rights-of-way and necessary disposal areas in advance of the advertisement and award of the first construction contract for relief well work. During this period the Sponsor will acquire lands necessary to complete relief well reconstruction in levee reaches requiring additional land. A new Design Agreement will be executed to cover preparation of the first set of plans and specifications for the reconstruction project. Prior to the initiation of the first item of construction for the reconstruction project, an amendment to the existing Project Cooperation Agreement (PCA) will be executed to cover the reconstruction project.

8.2 Project Management. The Project will be managed in accordance with all applicable laws, regulations, and policies. Information that outlines the philosophy of project management within the Corps of Engineers is contained in Engineering Regulation 5-1-11. There will be a lead Corps of Engineers person designated to manage the Project during its life cycle. This person will be responsible for managing the programmatic and the technical aspects of the Project as well as coordinating all issues related to the Project between the Sponsors, the stakeholders, and the public.

8.3 Schedule Development. A Project schedule has been developed based upon the assumption that a positive Chief of Engineers' report will be forwarded to the Assistant Secretary of the Army for Civil Works during fiscal year 2005. The Project schedule sequences design, and construction activities to allow immediate execution of the deficiency work construction beginning in FY2006 and for the reconstruction project to be programmed to begin construction in FY2007. Work is sequenced to allow contracts for different features to be undertaken simultaneously in order to ensure efficiency. The development of this schedule assumes funding is available in the years required and that the real estate actions are completed on schedule.

8.4 Implementation Schedule. The recommended schedule reflects the information currently available and the current departmental policies governing execution of projects. It does not reflect program and budgeting priorities inherent in either the formulation of a national civil works construction program or the perspective of higher review levels within the Executive Branch. Consequently, the schedule recommended may be modified before it is transmitted to higher authority for authorization and/or implementation funding. Under current plans, this schedule begins with PED activities completing for deficiency work in FY 2005 and PED for reconstruction work being completed in FY2006. Advertisement and award of the first item of construction for deficiency work is scheduled in FY2006. Reconstruction will be programmed to begin in FY2007.

8.5 Funding Stream. In order to support the planning and budget development process for the Project, a table depicting the necessary funding stream required to support the Project schedule is presented below. This table identifies the resource requirements by year and details non-Federal requirements for Project implementation. Table 8-1 and 8-2 identify both cash requirements and the requirements estimated for LERRD's for both the deficiency and reconstruction project Project. PED activities were cost shared at 75% Federal and 25% Non-federal. During the construction

period the Sponsor will make contributions equaling 35% of the total project cost including PED activities.

Table 8-1 Funding Stream

1	2	3	4	5	6	7	8	9
FY	Total Project Implementation Cost	LERRDs	Construction	%	Non-Fed 5% Minimum Cash	Additional Non-Fed Cash	Non-Fed Cash Schedule	Federal Cash Schedule
Prior FY's	$1,200	$0	$1,200			$300	$300	$900
FY05(PED)	$400	$0	$400			$100	$100	$300
FY06(PED/CON)	$3,910	$125	$3,785	0.23	$271	$1,196	$1,466	$2,319
FY07(CON)	$8,340	$0	$8,340	0.35	$419	$2,471	$2,890	$5,450
FY08(CON)	$9,908	$0	$9,908	0.42	$498	$2,936	$3,434	$6,474
Total	$23,758	$125	$23,633	1.00	$1,188	$7,002	$8,190	$15,443

Table 8-2 Cost Share Table

		Federal	Non-Federal	Total
PED LRR/Deficiency		$1,200	$ 400	**$ 1,600**
PED Reconstruction		$ 337	$ 181	**$ 518**
Construction				
	5% Cash		$1,188	**$ 1,188**
	LERRD		$ 125	**$ 125**
	Additional Cash	$13,906	$6,421	**$20,845**
	Total	**$15,443**	**$8,315**	**$23,758**

Cost-Sharing is 75% Federal/25% Non-Federal during PED LRR/Deficiency

Total Project Cost Sharing is 65% Federal/35% Non-Federal

8.6 Recommended Features. The Project construction items have been categorized based on their contribution to project objectives. Additionally, the standard features of Lands and Damages, Relocations, Planning, Engineering and Design, and Construction Management are applicable to this Project. All estimated costs have been allocated among these feature accounts and will be managed in this manner. The Project Cost Estimate contained in Appendix reflects the feature account breakout. Table 8-3 is a summary of costs by account.

Table 8-3 Summary of Cost by Accounts

Feature Accounts	Costs	Contingency	Total Costs
01 Lands and Damages	100,000	25,000	125,000
11 Levees and Floodwalls	10,521,000	1,907,000	12,428,000
13 Pumping Plant	3,840,100	725,000	4,565,100
30 Planning, Engineering & Design	2,441,000	732,300	3,173,300
31 Construction Management	1,436,000	430,800	1,866,800
Total*	**18,338,100**	**3,820,100**	**22,158,200**

**Total does not include PED costs of $1,600,000*

8.7 Financial Analysis. The schedule of Federal and non-Federal expenditures by year is shown in paragraph 8.5. The Wood River Levee and Drainage District is expected to serve as the Sponsor for both the deficiency and reconstruction projects.

The Sponsors' share of the Project cost is estimated to be $8,315,000 of which $400,000 will have already been contributed during PED. Additionally, now that required OMRR&R costs have been fully disclosed the Sponsor now has the ability to raise the necessary financial resources to fully accomplish future OMRR&R requirements currently estimated to add an additional $331,600 a year to the Sponsor's current O&M budget. The Wood River Levee and Drainage District is authorized by the Illinois Drainage Act of 29 June 1955 to assess taxes in support of the levee system and its requirements. The Sponsors has the capability to finance this Project

9. PUBLIC INVOLVMENT. During the draft report comment period a public meeting will be conducted to provide information and clarification of questions related to the project. To date public involvement has been limited to the Levee and Drainage District, local units of government, the State of Illinois and major industrial customers of the area. Additionally, the study has been discussed monthly at the Metro East Regional Stormwater Committee Meetings, which are a public/private coalition of interested parties or the metropolitan area that meet monthly to address local issues and concerns regarding flooding and stormwater management.

10. RECOMMENDATIONS. I recommend that the plan to address design deficiencies be implemented immediately under existing project authority and the plan to reconstruct the Wood River Levee System be authorized for implementation in order to address improvements necessary to continue providing the flood control benefits as intended by Congress. This is contingent upon such discretionary modifications as deemed necessary by the Chief of Engineers, and funding requirements satisfactory to the Administration and Congress. The estimated total project cost,

based on October 2004 price levels is $22,158,200, with actions required to address design and construction deficiencies being $ 5,608,500 and the reconstruction plan being $16,549,700. This recommendation is made with the provision that prior to implementation, non-federal interests will agree to comply with the following requirements:

a. Provide 35 percent of the separable project costs allocated to flood damage reduction, as further specified below:

(1) Enter into an agreement to provide, prior to execution of the project cooperation agreement, 25 percent of design costs;

(2) Provide during construction, any additional funds needed to cover the non-Federal share of design costs;

(3) Provide all lands, easements, and rights-of-way, including suitable borrow and dredged or excavated material disposal areas, and perform or ensure the performance of all relocations determined by the Government to be necessary for the construction, operation, and maintenance of the project;

(4) Provide or pay to the Government the cost of providing all retaining dikes, waste weirs, bulkheads, and embankments, including all monitoring features and stilling basins, that may be required at any dredged or excavated material disposal areas required for construction, operation, and maintenance of the Project;

(5) Provide during construction, any additional costs as necessary to make the total non-Federal contributions equal to 35 percent of total project costs allocated to flood damage reduction.

b. Provide the non-Federal share of that portion of the costs of mitigation and data recovery activities associated with historic preservation that are in excess of one percent of the total amount authorized to be appropriated for the project, in accordance with the cost-sharing provisions of the agreement;

c. For so long as the project remains authorized, operate, maintain, repair, replace, and rehabilitate the completed project, or functional portion of the project, at no cost to the Government, in accordance with applicable Federal and State laws and any specific directions prescribed by the Government;

d. Give the Government a right to enter, at reasonable times and in a reasonable manner, upon land which the non-Federal sponsor owns or controls for access to the project for the purpose of inspection, and, if necessary, for the purpose of completing, operating, maintaining, repairing, replacing, or rehabilitating the project;

e. Comply with Section 221 of Public Law 91-661, Flood Control Act of 1970, as amended, and Section 103 of the Water Resources Development Act of 1986, Public Law 99-662, as amended, which provides that the Secretary of the Army shall not commence the construction of any water resources project or separable element thereof until the non-

federal sponsor has entered into a written agreement to furnish its required cooperation for the project or separable element;

f. Hold and save the Government free from all damages arising from the construction, operation, maintenance repair, replacement, and rehabilitation of the project and any project-related betterments, except for damages due to the fault or negligence of the Government or the Government's contractors;

g. Keep and maintain books, records, documents, and other evidence pertaining to costs and expenses incurred pursuant to the project to the extend and in such detail as will properly reflect total project costs for a minimum of three years after completion of the accounting for which such books, records, documents and other evidence are required;

h. Perform, or cause to be performed, any investigations for hazardous substances that are determined necessary to identify the existence and extent of any hazardous substances regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 USC 9601-9675, that may exist in, on, or under lands, easements of rights-of-way necessary for the construction, operation, and maintenance of the project; except that the non-Federal sponsor shall not perform such investigations on lands, easements, or rights-of-way that the Government determines to be subject to the navigation servitude without prior specific written direction by the Government;

i. Assume complete financial responsibility for all necessary cleanup and response costs of any CERCLA- regulated materials located in, on, or under lands, easements, or rights-of-way that the Government determines necessary for the construction, operation, or maintenance of the project;

j. To the maximum extent practicable, operate, maintain, repair, replace, and rehabilitate the project in a manner that will not cause liability to arise under CERLA;

k. Prevent obstructions of, or encroachments on, the project (including prescribing and enforcing regulations to prevent such obstructions or encroachments) that might reduce the ecosystem restoration, hinder its operation and maintenance, or interfere with its proper function, such as any new development on project lands or addition of facilities that would degrade the benefits of the project;

l. Comply with the applicable provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Public law 91-646, as amended by title IV of the Surface Transportation and Uniform Relocation Assistance Act of 1987 (Public Law 100-17), and the Uniform Regulations contained in 49 CFR part 24, in acquiring lands, easements, and rights-of-way, and performing relocations for construction, operation, and maintenance of the project, and inform all affected persons of applicable benefits, policies, and procedures in connection with said act;

m. Do not use Federal funds to meet the non-Federal sponsor’s share of total project costs unless the Federal granting agency verifies in writing that the expenditure of such funds is authorized.

n. Comply with all applicable Federal and State laws and regulations, including, but not limited to: Section 601 of the Civil Rights Act of 1964, Public Law 88-352 (42 U.S.C. 2000d) and Department of Defense Directive 5500.11 issued pursuant thereto; Army Regulation 600-7, entitled "Nondiscrimination on the Basis of Handicap in Programs and Activities Assisted or Conducted by the Department of the Army"; and all applicable federal labor standards requirements including, but not limited to, 40 U.S.C. 3141-3148 and 40 U.S.C. 3701-3708 (revising, codifying and enacting without substantive change the provisions of the Davis-Bacon Act (formerly 40 U.S.C. 276a et seq.), the Contract Work Hours and Safety Standards Act (formerly 40 U.S.C. 327 et seq.) and the Copeland Anti-Kickback Act (formerly 40 U.S.C. 276c)).

o. Provide and maintain necessary access roads, parking areas, and other public use facilities, open and available to all on equal terms.

APPENDIX A - Engineering Appendix

APPENDIX B - Economic Appendix

APPENDIX C - Environmental Appendix

APPENDIX D - Real Estate Appendix

APPENDIX E - MCACES Cost Estimate

APPENDIX F - Hydrologic and Hydraulic Appendix

APPENDIX G - Independent Technical Review

APPENDIX - A

WOOD RIVER DRAINAGE & LEVEE DISTRICT
RE-EVALUATION REPORT
ENGINEERING APPENDIX

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WOOD RIVER DRAINAGE & LEVEE DISTRICT
RE-EVALUATION REPORT
ENGINEERING APPENDIX

1. INTRODUCTION. The Wood River Flood Protection Project was authorized by the Flood Control Act of 1938. In the late 1940's and throughout the 1950's the Federal Government raised and improved the existing levees and constructed a series of drainage structures and pump stations. These improvements provided flood protection to the towns of Alton, East Alton, Hartford, Roxana, Wood River and surrounding areas of Madison County, IL from the 500 Year Mississippi River Flood. There is a total of 21 miles of levee divided into three separate systems (Upper Wood River – 5.2 miles; Lower Wood River – 13.3 miles; East and West Forks – 2.5 miles). In addition to the levees there are 41 gravity drainage structures, 7 pump stations, 26 closure structures, 160 relief wells and a low water dam that are a part of the Wood River project. The flood protection system protects a total of 13,700 acres (Upper Wood River – 2,410 acres; Lower Wood River – 10,770 acres; East and West Forks – 520 acres).

2. GRAVITY DRAINS AND GATEWELLS

2.01 Existing Conditions.

a. Inspections. Ten CMP gravity drains were inspected using a mobile, remote controlled video camera. Following is summary of what was observed during these inspections.

Location	Pipe Size	Comment
88+88.55	30"	Debris consisting of large gravel was observed within the pipe. Evidence of encrustation at the joint and light corrosion was noted at 21.20 and 130 feet.
506+02.09	72"	2 holes in the pipe at 5 and 155.35 feet. No running leaks observed.
490+39.91	48"	Medium corrosion was noted at 43.95 feet.
399+07.13	24"	Medium corrosion at 120.55 feet. Scale/mineral deposits and light corrosion were noted at the joint at 103.75 and 134.05 feet.
343+45.17	36"	Medium joint encrustation at 132.10 feet and holes in the pipe at 73.90 and 149.70 feet. Light encrustation was noted at the joints at 44.20, 67.75, and 88.30 feet, in addition to the light corrosion at 73.90 feet.
260+31.15	18"	3 joints contained medium scale/mineral deposits at 42.80, 62.80 and 103.30 ft. Light corrosion observed at 32.25 feet and dip or sag between 77.30 and 106 feet.
463+66.01	48"	Medium corrosion observed at 179.85 feet. Four joints within the pipe were found to contain light scale/mineral deposits at 23.60, 63.20, 83.45 and 103.10. Light corrosion observed at 118.70 feet. Evidence of a slightly separated joint was noted at 208.55 feet.
530+39.06	42"	A section of the pipe was observed to have a dip or sag starting at approximately 96 feet. The pipe observed to be deformed at 132 feet.
Lakeside PS	48"	Light corrosion at 182 feet.
Homegarden PS	36"	Slightly offset joint at 150 feet.

b. Water Quality. Water quality sampling and testing was conducted at various gravity drains throughout the levee district. Sediments collected within the gravity drains during this investigation do not pose a major threat to the environment and therefore, require no special precautionary measures for handling during any planned or future reconstruction of the gravity drains.

c. Gatewell Structures. There are four types of gatewell structures present in the Wood River Flood Protection Project. There are 18 single box units, 6 double box units, 15 stem units and 2 bridge units. The overall structural condition of these concrete gatewell structures is good. The concrete for these units is in very good condition except at one location (GW-9). There is no appreciable concrete defect or damage on any other unit. Some secondary items are showing somewhat more wear. Overall the steel handrails appear to be in good condition. There are a few rails that are showing some sign of localized moderate corrosion that needs attention. With minor exceptions a sufficient coating of paint has been maintained on these handrails. The galvanized steel grating is showing a light to moderate amount of corrosion on most grating panels. The overall condition of the galvanized steel ladders is very similar to the grating again showing light to moderate amounts of corrosion. Additionally, some localized light damage has taken place on an occasional ladder on these units. On the two bridge units (GW-2 and GW-22) the structural steel bridge joists are showing signs of moderate corrosion and will need to be refurbished. Overall, with the exception of GW-9 the condition of major structural components is very good with only light to moderate corrosion taking place on secondary items.

Typical Single Box Unit

Typical Stem Unit

Typical Stem Unit

Typical Bridge Unit

GW-9

d. Corrugated Metal Pipe Drains. The Wood River Levee System was constructed with 41 corrugated metal pipes through the levee that are part of the gravity drain system. These pipes range in age from 41 years to 54 years, the average age being 49 years. Two of these corrugated metal pipes failed during the 1973 flood and one failed during the 1993 flood. These were replaced under the PL 84-99 program. There are thirty-eight remaining CMP drains in the Wood River System that have not been replaced. Corrugated metal pipes deteriorate due to chemical and galvanic corrosion caused by their contact with the surrounding soil. Therefore, the corrosion occurs from the outside of the pipe to the inside. Failure usually occurs under flood conditions due to additional water load on the outside of the pipe. Typically, there is little or no warning of an impending failure, and there are no maintenance procedures available for these structures to prevent their deterioration. EM 1110-2-2902 published in March 1998 states that corrugated metal pipes may only be used in rural levee systems where the risk of substantial property damage and loss of life is low. This certainly is not the case with the urban Wood River Levee System, which protects over 1.5 billion dollars of property and many lives. EM 1110-2-2902 projects the expected life of corrugate metal pipes to be 50 years which is about the average age of the 38 corrugated metal pipes in the Wood River Levee System. Therefore these pipe are due for rehabilitation.

e. Sluice Gates and Flap Gates. The existing sluice gates and flap gates are of cast iron construction and have been in service 50+ years. The sluice gates are either square or rectangular and are of the typical design used in the late 1940's and early 1950's. The flap gates are circular, square and rectangular depending on their location on each gravity drain. These also are of the typical design used in the late 1940's and early 1950's. The sluice gates are equipped with manually operated geared gate hoists, which use handwheels or hand cranks, to operate the gates. The sluice gates and flap gates show signs of corrosion typical of that which you would find with equipment of this age. Paints and coatings that were applied when the gates were originally installed have worn off at most locations. The geared lifts have become increasingly difficult to operate due to worn bearings and wear on the lift nut and stems. The Wood River Drainage and Levee District maintenance program has done a good job insuring that the gate hoists have been lubricated. Flap gate hinges are in fairly good condition and there have not been any reports of flap gates binding up during operation. Following are pictures of the typical sluice gates and flap gates found at the gravity drains along this levee system.

2.02 Alternatives.

a. No Action.

(1) CMP Drains. Failure to address the condition of the existing thirty-eight CMP gravity drains could lead to a catastrophic failure of the levee system. Collapse of a section of an existing gravity drain will allow erosion of levee material and lead to a decreased levee section being present. This will be similar to a landside levee slide. During high river levels this could result in a levee breach at the site, which would cause widespread flooding of the protected area. The three drains previously repaired as the result of failures in 1973 and 1993 require no further action.

(2) Sluice Gates and Flap Gates. Failure of a flap gate or sluice gate could cause flooding in the drainage area leading to that gravity drain.

(3) Gatewell Structures. If no action is taken these structures will continue to operate satisfactorily for an extended period of time but will begin to deteriorate. Initially that deterioration will progress at a slow rate but as the structures continue to age it will increase to a more moderate rate eventually reaching a point where the degree of deterioration will become appreciable and require reconstruction. The exception to this is the GW-9 gatewell structure, which is in such bad condition that if no action is taken it could result in a complete failure of the structure during the next flood event.

b. Reconstruction. Various alternatives were considered for the reconstruction of the CMP drains, sluice gates and flap gates and the gatewell structures.

(1) CMP Drains. Two alternatives were initially considered for the CMP drains. Those were using Insituform or High Density Polyethylene (HDPE) pipe to line the existing pipes. After investigating the option of using Insituform it was determined that this option was not viable since to use an Insituform lining the original pipe had to be structurally sound which was not the case with the existing CMP drains. Lining of existing CMP drains with HDPE pipe has been done successfully in the past by the St. Louis District at various locations including one within the Wood River Drainage and Levee District. The 60-inch CMP drain at the East Alton No. 2 Pump Station was lined with 54-inch HDPE pipe in 1994 to repair a partial collapse of this CMP drain, which occurred during the Great Midwest Flood of 1993. It was determined that the size of the existing CMP drain would be a limiting factor as to which drains could be lined. For purposes of this study it was decided that the twenty-five drains 30-inch diameter and greater could be lined and the thirteen drains 24-inch diameter and less would need to be replaced.. When an existing CMP drain is lined the next size smaller pipe diameter would be used with the resulting void between the new HDPE pipe and the existing CMP filled with grout.

(2) Sluice Gates and Flap Gates. Reconstruction of the sluice gates would consist of removal of the gate hoist, stem and gate slide and frame. The gate slide and frame would be sand blasted, inspected for cracks or other significant damage and then recoated. The bronze seals along the gate slide and frame would be inspected and cleaned. The fasteners on the adjustable wedges would be replaced. The frame and gate slide would be reinstalled with new anchors and fasteners. The gate hoist would be completely disassembled, cleaned, inspected for damage and reassembled with new bearings. The gate stem would be cleaned and then inspected for damage or severe wear. Reconstruction of the flap gates would consist of removal of the flap gate and frame. The flap and frame would be sand blasted, inspected for cracks or other significant damage and then recoated. New hinge bushings would be installed and the flap gates reinstalled with new anchors and fasteners.

(3) Gatewell Structures. This would consist of two major items; reconstruction of the steel handrails and replacement of the steel grating. Reconstruction of the steel handrails would consist of cleaning and painting the existing steel handrail. Since the cost to refurbish the existing steel grating versus replacement of this item is prohibitive all of the existing steel grating would be removed and replaced with new fiberglass grating. On the two bridge units the steel bridge joists would be cleaned and recoated with the existing steel grating removed and replaced with new fiberglass grating. These changes

would bring these units to an acceptable standard. Due to the extremely deteriorated condition of the GW-9 gatewell there is no reconstruction technique which could be used to bring this gatewell back to an acceptable standard..

c. Replacement. Various alternatives were considered for the replacement of the CMP drains, sluice gates and flap gates and the gatewell structures.

(1) CMP Drains. Three alternatives were initially considered for replacement of the CMP drains. Those were using new CMP pipe , new HDPE pipe and new Reinforced Concrete Pipe (RCP). Current Corps of Engineers design criteria requires the use of RCP for all new gravity drains. Therefore, the other alternatives were eliminated from further consideration. Current inspections show the existing gate wells and headwalls to be in good shape so the new pipe would be attached to them. Other considerations for replacement are cofferdaming, excavation procedures and construction procedures to minimize the amount of time the levee is in a degraded state.

(a) Current practice is to provide for a 10-year protection level plus 1 foot during construction. Material must be readily available to make an immediate raise of the protection level to the design if a significant flood event is forecast. Some of the material from the existing levee will be used as a cofferdam (approximately 30% of the excavated material will be used as a cofferdam) and the remainder will be stockpiled on the landside of the levee so it will be readily available in case of a cofferdam over topping. Emergency levee raise in event of a major flood event will be to replace the levee without regard of the completeness of the gravity drain replacement. Additional material to raise the levee to full height is available within 2 miles of the work site.

(b) Earthwork. The excavation for the drain replacement will be done in two stages. The first will be to excavate a notch in the levee with a minimum bottom width and 1V on 2H side slopes to a point 2 to 3 feet above the top of the pipe. A second test for minimum bottom width will be for the 1V on 2H slope projection to pass to the outside of the maximum excavation. The second part of the excavation will be a trench excavated from the bottom of the notch to the maximum depth needed to remove the old pipe and install the new pipe with the proper bedding material. This will allow a backhoe to work over the old and new pipes and use normal trench laying methods. In the event of multiple pipes, an evaluation will be done to assure the backhoe track or wheel will not be over the adjacent pipe and damaging that pipe. Backfill will be the same as in the adjacent levee with any additional material required to be obtained from to be determined borrow sources. 15 – 20 percent additional material will be required at each site due to recovery losses in the cofferdam and shrinkage due to reworking the originally excavated material.

(c) Design Considerations. The details for attachment of the concrete pipe will be worked out during detail design preparation. In general, it is anticipated that collars will be cast adjacent to the structures and doweled into the existing structure. The existing opening will be modified as required to give smooth flow characteristics. The first section of pipe adjacent to gate wells and/or outlet structures will be supported by a concrete cradle.

(1) Sluice Gates and Flap Gates. Replacement of a sluice gate would consist of complete removal of the existing gate hoist, stem and gate slide and frame. A new cast iron sluice gate consisting of a cast iron frame and cast iron slide along with a new stainless steel stem with stem guides and a new manually operated gate hoist would be installed. New anchors would be installed for the gate frame and stem guides. Replacement of a flap gate would consist of complete removal of the existing flap gate including the frame. Two types of replacement flap gates were considered. The first type would be a cast iron flap gate similar to the existing flap gate. The second type would be a rubber “duckbill” check valve of the type manufactured by the Red Valve Company. Due to the higher costs for the rubber “duckbill” check valves (2-3 times the cost for the cast iron flap gate) it was determined that the replacement flap gates should be the standard cast iron flap gates similar to the existing ones. The new flap gates would be installed using new anchors and fasteners.

(2) Gatewell Structures. Remove the existing steel handrail and replace with a new fiberglass handrail. Remove the existing steel grating and replace with a new fiberglass grating. Remove the existing steel ladders and replace with new fiberglass ladders. On the two bridge units the steel bridge beams would be replaced with new steel bridge beams. These changes would bring these units to a more acceptable standard. For the GW-9 gatewell complete replacement of the structure is the only viable alternative to bring this structure up to any reasonable standard. Complete replacement would include removing the existing concrete to it's foundation, replace with new cast-in-place concrete, new steel reinforcement, new fiberglass handrail, fiberglass grating, steel sheetpiling, a new 36-inch sluice gate, flap gate and a manual gate hoist.

2.03 Recommended Plan. The recommended plan for the gravity drains and gatewells was selected based on the alternative that best met the needs of the system and were cost effective. The following alternatives are recommended for action.

a. CMP Drains. The thirteen CMP drains that are 24-inch diameter or smaller will be replaced with RCP drains of the same size. The twenty-five CMP drains that are 30-inch diameter and larger will be lined with HDPE pipe.

b. Sluice Gates and Flap Gates. Each sluice gate will be removed, reconstructed and reinstalled except the gate stems, stem guides and gate hoists which will be replaced. Each flap gate will be removed, reconstructedand reinstalled.

c. Gatewell Structures. Based on life cycle cost comparisons the recommended plan is to use fiberglass material in lieu of original steel to replace handrails, grating and ladders. The recommended plan for the steel bridge beams is to replace them with new steel beams. For the GW-9 gatewell the recommended plan is the complete removal and replacement of the gatewell structure. No other gatewell structures are recommended for action.

2.04 Probability of Unsatisfactory Performance Under the No Action Alternative. The corrugated metal pipe (CMP) drains were given a theoretical analysis to determine their condition and probability of failure.

(1) Evaluation. The gravity drains evaluated in the system are corrugated metal pipes (CMP) greater than or equal to 12 inches. The probability of unsatisfactory performance (PUP) for these pipes was examined since a pipe failure would result in levee failure. In the Wood River system, there is a total of 41CMP. Table 1 is a list of all CMP and their locations. Since installation, three pipes have failed during a flood. Two 60-inch pipes failed during the 1973 flood at station 124+27 in Upper Wood River at the Alton pump station. The other failure occurred during the 1993 flood and was a 60-inch pipe at station 97+15 in Lower Wood River at the East Alton Pump Station No. 2.

(a) Method of Analysis. The method of reliability analysis used determined the probability of pipe failure with time was a historic frequency of occurrence model. This historic frequency of occurrence model was developed using actual failure data. A probability density function was fitted to the failure data versus time. This method of reliability engineering is based solely on failure data. The Weibull distribution, a probability density function, was used to represent the pipe failure data. Using the Weibull distribution, the hazard function, or rate of failure at time t, was used to calculate the probability of failure for the pipes. The hazard function, h(t), is given in the following equation:

$$h(t) = \frac{b}{\alpha}\left[\frac{t}{\alpha}\right]^{(b-1)} \qquad (1)$$

where,

b is the shape parameter

α is the characteristic life, starting at time equal to the minimum life.

t is time.

Table 1 - List of all Corrugated Metal Pipe in Wood River Levee District

Reach	Station	Pipe Size	Date Installed	Date Failed	Life of Pipe (to present date or failure)
Upper	124+27	60" cmp	1950	1973	23
Upper	124+27	60" cmp	1950	1973	23
Upper	217+75	72" cmp	1948		54
Upper	255+06	18" cmp	1948		54
Upper	257+45	18" cmp	1952		50
Upper	260+30	18" cmp	1952		50
East Fork	33+29	48" cmp	1950		52
East Fork	53+83	24"cmp	1950		52
East Fork	62+63	36" cmp	1950		52
East Fork	72+83	24" cmp	1950		52
East Fork	91+33	42" cmp	1950		52
East Fork	107+19	36" cmp	1950		52
West Fork	124+92	36" cmp	1950		52
West Fork	145+05	12" cmp	1950		52
Lower	11+50	48" cmp	1950		52
Lower	33+16	30" cmp	1950		52
Lower	40+01	42" cmp	1950		52
Lower	47+82	42" cmp	1960		42
Lower	50+50	42" cmp	1952		50
Lower	61+69	36" cmp	1952		50
Lower	73+95	24" cmp	1950		52
Lower	88+78	24" cmp	1948		54
Lower	97+15	60" cmp	1950	1993	43
Lower	104+49	30" cmp	1950		52
Lower	230+63	48" cmp	1953		49
Lower	280+16	24" cmp	1953		49
Lower	304+05	18" cmp	1953		49
Lower	343+25	24" cmp	1953		49
Lower	377+50	24" cmp	1953		49
Lower	398+75	24" cmp	1953		49
Lower	447+18	48" cmp	1956		46
Lower	463+67	48" cmp	1956		46
Lower	490+36	48" cmp	1956		46
Lower	506+06	72" cmp	1956		46
Lower	530+37	42" cmp	1956		46
Lower	557+71	72" cmp	1956		46
Lower	580+28	30" cmp	1956		46
Lower	594+30	72" cmp	1956		46
Lower	617+63	36" cmp	1956		46
Lower	695+00	30" cmp	1961		41
Lower	705+10	30" cmp	1957		45

The Weibull distribution has the following characteristics:
For b = 1, the Weibull distribution becomes the exponential distribution, which gives a constant hazard function with an equal rate of failure in any year. For b = 2, the Weibull distribution becomes the Rayleigh distribution, which gives a linearly increasing hazard function. For b<1, the hazard function decreases with time, giving a decreasing rate of failure with time. For b>1, the hazard function increases with time, giving an increasing rate of failure with time. A b value of 1 would be representative of the occurrence of a random event, such as an accident, a flood, or an earthquake. Deterioration of metal pipe or sheetpiling could be represented by a b value between 1 and 2. For any Weibull distribution, there is a 63.2 percent probability that failure will occur before the characteristic life and a 37.8 percent probability that failure will occur after the characteristic life. Put another way, 63.2 percent of the components will fail by the characteristic life and 37.8 percent will not fail.

(b) Pipe Failure Data. In order to count a pipe as "failing", it had to meet certain criteria. The pipe had to have failed during a flood event. If the pipe failure had gone unnoticed, Wood River Drainage and Levee District would have flooded. Pipes that were fixed during non-flood events were not included in the Weibull distribution.

(c) Weibull Graph. Table 2 lists each unsatisfactory performance event according to the time of occurrence. Also listed in the table for each unsatisfactory performance event is the location, the date the pipe was installed, the date of the event, the time in years to the event and the corrected percentage of the components that have experienced unsatisfactory performance. The corrected percentage of components that have experienced unsatisfactory performance is a median rank correction to the data. The median rank correction, corrects the data such that the probability that the unsatisfactory performance event occurs before time t is 50%. The median rank correction was made using the following equation:

$$\text{Median Rank Correction (\%)} = \left[\frac{j-0.3}{N+0.4}\right]\times 100\% \qquad (2)$$

where,

j is the failure order.

N is the sample size (41 pipes in this case).

Table 2 - Event of Unsatisfactory Performance

Reach	Station	Installed	Failure	life of pipe	%
Upper Wood River	124+27	1950	1973	23	1.7
Upper Wood River	124+27	1950	1973	23	4.1
Lower Wood River	97+15	1950	1993	43	6.5

By plotting the Median Rank Correction and the life of the pipe at failure on Weibull graph paper, a line can be drawn through the data points. From this best fit line, the values for b and α can be found; b is the slope of the line, and α is the time when the line passes through 63.2%. For the CMP data b = 1.4 and α = 280 years. Using the hazard function equation (Equation 1) and the probability of unsatisfactory performance equation for a series system (Equation 3), the probability of a pipe failing in the year 2008 (58 years after installation) given that it has not already failed is 11 percent.

$$P = 1-\left(1-h(t)\right)^{n} \qquad (3)$$

where,

P is the probability of a pipe failing in the year 2008 given that it has not previously failed

h(t) is the hazard function

n is the number of pipes

Table 3 shows the probability of unsatisfactory performance for the Upper Wood River levee, the East and West Fork levee, and the Lower Wood River levee under the No Action Alternative.

Table 3 - Gravity Drains No Action Alternative

	River Stage	Pipe PUP
Upper Wood River		
PFP	442	0.11
PNP	434	0.11
East & West Fork		
PFP	446.6	0.11
PNP	434.5	0.11
Lower Wood River		
PFP	444.4	0.11
PNP	440	0.11

PUP = Probability of Unsatisfactory Performance
PFP = Probable Failure Point
PNP = Probable Non-Failure Point

3. CLOSURE STRUCTURES

3.01 Existing Conditions.

a. Concrete Structures.

(1) Closure Structures Requiring Only Concrete Joint Reconstruction. There are eleven closure structures in this category. The overall concrete condition for these closure structures floodwalls is good with only fine cracking and minor deterioration of the concrete surface. The joint sealant material at each monolith is missing or is no longer effective as a joint sealant.

Road Closure – Sta. 618+84

Road Closure - Sta. 511+20

Road Closure – Sta. 114+11

Road Closure - Sta. 73+17

Road Closure – Sta. 227+32

Road Closure - Sta. 310+67

(2) Closure Structures Requiring Concrete Joint and Gate Monolith Structures Reconstruction. There are three closure structures in this category. The joint sealant material at each monolith is missing or is no longer effective as a joint sealant. The gate monoliths have fine to medium cracking between the hinges and cracking/spalling around the hinges. The following photographs show typical conditions of the joint sealant and gate monoliths at these three closure structures.

Rail Closure – UWRL Sta. 32+64

Road Closure – LWRL Sta. 74+13

(3) Closure Structures Requiring Concrete Joint and Gate Sill Reconstruction. There are four closure structures in this category. The joint sealant material at each monolith is missing or is no longer effective as a joint sealant. The gate sills have broken/chipped edges, exposed steel reinforcing, and missing corner protection and gate seal.

Rail Closure – UWRL Sta. 261+88

Rail Closure – LWRL Sta. 78+43

Rail Closure – UWRL Sta. 261+88

Rail Closure – UWRL Sta. 261+88

(4) Closure Structure Requiring Concrete Joint and Approach Slab Reconstruction. There is a single closure structure in this category. The overall concrete condition for the closure structure

floodwalls is good with only fine cracking and minor deterioration of the concrete surface. The joint sealant material at each monolith is missing or is no longer effective as a joint sealant. The approach slab has numerous random medium to large cracks thru out the slab area. The approach slab concrete has some minor aggregate popouts.

Road Closure – UWRL Sta. 81+14

Road Closure – UWRL Sta. 81+14

(5) Closure Structure Monoliths and Connecting Floodwalls Requiring Reconstruction or Replacement. There are six closure structures in this category. The concrete in these closure structures have developed numerous large cracks 0.25 to 0.50 inch in width and concrete surface spalling of 1 to 3 inches in depth exposing the steel reinforcement. The concrete has expanded in some areas 1 to 2 inches. The following photographs show typical conditions of these concrete closure structures and connecting floodwalls.

Rail Closure - Sta. 104+14


Rail Closure - Sta. 21+09

Rail Closure - Sta. 21+09


Rail Closure - Sta. 21+09

(6) Closure Structures to be Abandoned. There are three closure structures in this category. These rail closure structures are located along abandoned rail lines and have not been operated for many years.

Rail Closure – LWRL Sta. 49+28

Rail Closure – LWRL Sta. 67+97

Rail Closure - LRWL Sta. 273+83

b. Gates/Stoplogs.

(1) Larger Size Closure Structure Gates to be Reconstructed. There are eight gates that fall into this category. The overall structural condition of this group of steel gates (larger damming surface) is good to satisfactory. All primary structural elements are sound but do show some signs of minor deterioration and may even experience a minute amount of section loss. Typical deficiencies for these gates are moderate corrosion of the hinges and hinge pins, hardening and sometimes breaking of the rubber J-seals accompanied by moderate corrosion of the J-seal steel clamp bars. Corrosion of the steel clamp bars typically takes place at the bottom J-seal where it is more exposed to moisture and the road chemicals used as an icing preventative. The overall steel members that make up the framework of these gates are also showing a light amount of corrosion. On the lower portion of these gates, signs of corrosion are somewhat more apparent this is also due to their exposure to the ice preventatives used in the vicinity of these gates.

Typical Large Closure Structure Gate to Rehab

(2) Smaller Size Closure Structure Gates to be Reconstructed. There are three gates that fall into this category. The overall structural condition of this group of steel gates (smaller damming surface) is in good to satisfactory condition. All primary structural elements are sound but do show some signs of minor deterioration and may even experience a minute amount of section loss. Typical deficiencies for these gates are light/moderate corrosion of the hinges and hinge pins, hardening and sometimes breaking of the rubber J-seals accompanied by moderate corrosion of the J-seal steel clamp bars. Corrosion of the steel clamp bars typically takes place at the bottom J-seal where it is more exposed to moisture and the road chemicals used as an icing preventative. The overall steel members that make up the framework of these gates are also showing a light amount of corrosion. For the lower portion of these gates, signs of corrosion are somewhat more apparent. This is also due to their exposure to the ice preventatives used in the vicinity of these gates.

Typical Small Closure Structure Gate to Rehab

(3) Closure Structure Gates to be Replaced. There are a total of five gates that fall into this category. The overall structural condition of this group of steel gates is fair to poor. All primary structural elements are still sound but some are showing minor to advanced signs of section loss. Typical deficiencies for these gates are moderate/heavy corrosion of some primary members, light/moderate corrosion of the hinges and hinge pins, hardening and sometimes breaking of the rubber J-seals accompanied by moderate/heavy corrosion of the J-seal steel clamp bars. Corrosion of the steel clamp bars typically takes place at the bottom J-seal where it is more exposed to moisture and the road chemicals used as an ice preventative. It is the ice preventive chemicals splashing on the lower primary members of the gates that is also causing some of them to have heavy corrosion and section loss. These gates in their present condition are minimally acceptable.

Typical Closure Gate to Replace

(4) Modular Stoplog Structures. There are five closures that fall into this category. These stoplogs were not available for inspection since they are all modular, stored in bunkers and currently not erected. In discussions with Wood River Drainage and Levee District personnel, these structures have operated well in the past, show little to no deterioration and can be erected with no problem

Typical Stoplog Storage Bunker

(5) Closure Structures to Abandon. There are three closures that fall into this category. These structures are along railroad lines that have been abandoned and the tracks removed. It is not a good use of the limited resources of the Wood River Drainage and Levee District to continue to maintain the gates that are used on these closures. The overall structural condition of this group of steel gates is in good to satisfactory condition. All primary structural elements are sound but do show some signs of minor deterioration and may even experience a small amount of section loss. Typical deficiencies for these gates are moderate corrosion of the hinges and hinge pins, hardening and sometimes breaking of the rubber J-seals accompanied by moderate corrosion of the J-seal steel clamp bars. Corrosion of the steel clamp bars typically takes place at the bottom J-seal where it is more exposed to moisture. The overall steel members that make up the framework of these gates are also showing light/moderate amount of corrosion. All three of these closure structures are railroad closures and the rail line has been abandoned at each location. These gates in their present condition are satisfactory.

Typical Closure Gate to Abandon

(6) Closure Structure Gates Previously Rehabilitated. There are two closure structures with gates that fall into this category. The overall structural condition of this group of gates is in good condition. These gates have been significantly repaired and have been fully sandblasted and recoated. Overall, the new paint was in good condition, however, there were some areas of surface corrosion that have formed at random locations on these gates. This light corrosion is probably due to debris, snow and salt being propelled onto these gates. This was the source of the initial deterioration that damaged these gates.

Closure Gate Previously Rehabbed

3.02 Alternatives

a. No Action on the Concrete Closure Structures.

(1) Closure Structures Requiring Concrete Joint Reconstruction Only. There are eleven closure structures in this category. If no action is taken there will be a greater increase in concrete deterioration along the unprotected joints. The joints in the concrete floodwall will create openings, which must be sealed in order to prevent passage of water or other unwanted substances into or through the openings. Moreover, the floodwall structure should be protected against the possibility of damage from freezing and thawing, wetting and drying, leaching or erosion caused by any concentrated or excessive introduction of water at the joints. Foreign solid matter, including ice, must be prevented from collecting in the joints so that the joints can close freely without any restrictions. If the joint does not close freely then high stresses may be generated and damage to the surrounding concrete may occur. The primary function of a joint sealant is to prevent the intrusion of water or solids and to protect the concrete against damage. A joint sealant is required to provide an effective seal and to prevent deterioration to the structure. When damage to the surrounding concrete does occur then the preformed sealants or waterstop may be exposed to a faster weathering cycle from sunlight and possible chemical attack from the soil, and with time the preformed sealants or waterstop could lose its effectiveness. The cover for embedded rebar will be reduced

which may cause increase water and air levels and this in return will cause rusting. The rusting of the rebar will cause the concrete to expand and the concrete will crack or spall, allowing more water and air to attack the rebar cross section. The increase concrete cracking or spalling and the lost cross section of the rebar could make the floodwall structurally unsound during high water events.

(2) Closure Structures Requiring Concrete Joint and Gate Monolith Reconstruction. There are three closure structures where the quality of the concrete aggregate appears to be the cause of the concrete deteriorations along with the possibility of low or no entrained air. The aggregate used in the concrete is soft and appears to be highly absorptive. During the freezing and thawing cycle of the structures, the concrete will expand and contract causing high pressures, from water freezing, within the concrete matrix and cracking, spalls/popouts and concrete expansion will occur. These types of deteriorations of the concrete surface will add to the amount of available water that the aggregate can absorb and the damage will increase at a faster rate. If no action is taken then the rate of deterioration will continue, allowing more water to enter the concrete. The concrete closure structures will become unusable due to lack of structural strength. The size of the gate opening may increase enough allowing the flood protection gates not to close and making the structure unsound during high water events.

(3) Closure Structures Requiring Concrete Joint and Gate Sill Reconstruction. There are four closure structures in this category. If no action is taken to repair the joint sealant material there will be a greater increase in concrete deterioration along the unprotected joint. The joints in the concrete floodwall create openings, which must be sealed in order to prevent passage of liquids or other unwanted substances into or through the openings. Moreover, the floodwall structure should be protected against the possibility of damage from freezing and thawing, wetting and drying, leaching or erosion caused by any concentrated or excessive introduction of water at the joints. Foreign solid matter, including ice, must be prevented from collecting in the joints so that the joints can close freely without any restrictions. If the joint does not close freely then high stresses may be generated and damage to the surrounding concrete can occur. The primary function of a joint sealant is to prevent the intrusion of water or solids and to protect the concrete against damage. A joint sealant is required to provide an effective seal and to prevent deterioration to the structure. When damage to the surrounding concrete does occur then the preformed sealants or waterstop may be exposed to a faster weathering cycle from sunlight and possible chemical attack from the soil, with time the preformed sealants or waterstop could lose its effectiveness. The cover for embedded rebar will be reduced which may cause increase water and air levels and this in return will cause rusting. The rusting of the rebar will cause the concrete to expand and the concrete will crack or spall, allowing more water and air to rebar cross section. The increase concrete cracking or spalling and the lost cross section of the rebar could make the floodwall structurally unsound during high water events. The damaged concrete and missing corner protection along the gate sills may not allow a tight seal for the gate to prevent water leakage when the gates are closed. Extra work and monitoring will have to be performed to ensure that the closure structures are working properly.

(4) Closure Structure Requiring Concrete Joint and Approach Slab Reconstruction. There is one closure structure in this category. If no action is taken to there will a greater increase in concrete deterioration along the unprotected joint. The joints in the concrete floodwall will create openings, which must be sealed in order to prevent passage of liquids or other unwanted substances into or through the openings. Moreover, the floodwall structure should be protected against the possibility of damage from freezing and thawing, wetting and drying, leaching or erosion caused by any concentrated or excessive introduction of water at the joints. Foreign solid matter, including ice, must be prevented from collecting in the joints so that the joints can close freely without any restrictions. If the joint does not close freely then high stresses may be generated and damage to the surrounding concrete may occur. The primary function of a joint sealant is to prevent the intrusion of water or solids and to protect the concrete against damage. A joint sealant is required to provide an effective seal and to prevent deterioration to the structure. When damage to the surrounding concrete does occur then the preformed sealants or waterstop may be exposed to a faster weathering cycle from sunlight and possible chemical attack from the soil, with time the preformed sealants or waterstop could lose its effectiveness. The cover for embedded rebar will be reduced which may cause increase water and air levels and this in return will cause rusting. The rusting of the rebar will cause the concrete to expand and the concrete will crack or spall, allowing more water and air to rebar cross section. The increase concrete cracking or spalling and the lost cross section of the rebar could make the

floodwall structurally unsound during high water events. The medium to large random cracking along with minor aggregate popouts of this one approach slab will allow more water to pond and penetrate the concrete. The steel reinforcement will have a greater possibility for increase corrosion The structure is a road closure and during the winter months salt concentrations will be at a higher level. This condition will increase the rate of corrosion.

(5) Closure Structures Gate Monoliths and Connecting Floodwalls Requiring Replacement. There are three closure structures in this category. If no action is taken to reconstruct these monoliths their continued exposure to freezing and thawing, wetting and drying, leaching or erosion caused by the excessive introduction of water into already existing cracks and spalled areas will continue to deteriorate the concrete and exposed embedded rebar. The increase concrete cracking or spalling and the lost cross section of the rebar could make the floodwall structurally unsound during flood events. The fine to medium cracking between the gate hinges and cracking/spalling around the gate hinges will allow additional moisture and air to penetrate the concrete causing increase corrosion of the gate anchors and steel reinforcement. This increase of corrosion could cause the concrete and embedment items to become structurally unsound.

b. No Action on the Steel Closure Gates.

(1) Larger Size Closure Structure Gates to be Reconstructed. There are eight gates in this category. If no action is taken these steel gates will continue to perform satisfactorily for a period of time. Probably more so than other items mentioned in this report due to the fact that these steel members are more heavy duty. However, over time they will progressively deteriorate. Eventually the gates will be in poor condition showing signs of advanced section loss to some members and a higher degree of corrosion throughout the gate. This will greatly decrease the reliability of these gates during flood events. Failure of one of these gates will result in a levee breach at the site, which would cause widespread flooding of the protected area.

(2) Smaller Size Closure Structure Gates to be Reconstructed. There are three gates in this category. If no action is taken these steel gates will continue to perform satisfactorily for a period of time. Probably more so then other items mentioned in this report due to the fact that these steel members are more heavy duty. However, over time they will progressively deteriorate. Eventually the gates will be in poor condition showing signs of advanced section loss to some members and showing a higher degree of corrosion throughout. This will greatly decrease the reliability of these gates during flood events. Failure of one of these gates will result in a levee breach at the site, which would cause widespread flooding of the protected area.

(3) Closure Structure Gates to be Replaced. There are five gates in this category. If no action is taken to provide some degree of repair to these steel gates; they will continue to perform satisfactorily for a short period of time. However, over time they will progressively deteriorate somewhat quickly considering their condition. Eventually the gates will be in poor/critical condition showing signs of advanced section loss to some members and showing a higher degree of corrosion throughout. At best they will perform at a minimal standard and require frequent inspections. This will greatly decrease the reliability of these gates during flood events. Failure of one of these gates will result in a levee breach at the site, which would cause widespread flooding of the protected area.

(4) Modular Stoplog Structures. There are five closures in this category. Based on the condition and past performance of these structures no alternatives need to be considered. These structures are acceptable in their present condition.

(5) Closure Structures to Abandon. There are three closure structures in this category. If no action is taken to provide some degree of repair to these steel gates; they will continue to perform satisfactorily for a period of time. However, over time they will progressively deteriorate. Eventually the gates will be in poor condition showing signs of advanced section loss to some members and showing a higher degree of corrosion throughout. This will greatly decrease the reliability of these gates during flood

events. Failure of one of these gates will result in a levee breach at the site, which would cause widespread flooding of the protected area. .

(6) Closure Structure Gates Previously Rehabilitated. There are two gates in this category. If no action is taken these steel gates will continue to perform satisfactorily for an extenced period of time since these gates have been recently refurbished and are heavy duty. These gates underwent substantial refurbishment because vehicles propelled debris, snow and salt that caused heavy corrosion damage in the past. This situation would probably repeat itself without further action reducing the performance period of these gates.

c. Reconstruction and/or Replacement of the Concrete Structures.

(1) Closure Structures Requiring Concrete Joint Reconstruction Only. There were two alternatives studied; removing and replacing the joint sealant material in all locations or removing and replacing the joint sealant material only in areas of missing joint material.

(a) Reconstruct by Removal and Replacement of the Joint Sealant Material in All Locations. This alternative will assure the joint between the concrete monoliths will provide an effective seal and lessen the chance of further deterioration to the concrete structure with time. The joint sealant material at all locations should be removed and replaced with new material to a depth of twelve inches below existing ground surface. The use of power and/or hand tools will be required to completely remove the old sealant material. The removal depth of sealant is dependent on the manufacture's recommendation. After removing the old sealant material the concrete surface should be dry sand blasted to remove any foreign material that will affect the installation of the new backer rod and joint sealant material. Edge spalling to concrete joint faces will be addressed with suitable material to improve the required shape factor. The new joint sealant material will be allowed to cure per the manufacture's recommendation and the excavation will be backfill and reseeded. The total estimated linear feet of joints covered by this alternative is approximately 980 feet. The following table shows the location of the closure structures and the linear feet of joints for each.

LOCATION	STATION (NEW)	TYPE of STRUCTURE	EST. JOINT LENGTH (ft.)
UWRL	7+02	RAIL	78
UWRL	7+32	RAIL	80
UWRL	7+58	RAIL	80
LWRL (FLANK)	114+11	RAIL	28
LWRL	237+39	ROAD	112
LWRL	310+67	ROAD	44
LWRL	331+55	ROAD	112
LWRL (CAH. CR.)	511+34	ROAD	112
LWRL (IND. CR.)	618+84	ROAD	132
LWRL (IND. CR.)	673+40	ROAD	122
LWRL (IND. CR.)	674+35	RAIL	80

(b) Reconstruct by Removal and Replacement of the Joint Sealant Material Only in Areas of Missing Joint Material. This alternative will provide an effective seal only in the areas currently showing extensive deterioration through the loss of joint sealant material.. The section of the joint not repaired could allow water and soil to enter the joint, increasing the risk of concrete deterioration. The method to be used is the same as described in paragraph (a) above. The total linear feet of missing joint material is approximately 490 feet. The following table shows the location of the closure structures and the linear feet of joints for each.

LOCATION	STATION (NEW)	TYPE of STRUCTURE	EST. JOINT LENGTH (ft.)
UWRL	7+02	RAIL	39
UWRL	7+32	RAIL	40
UWRL	7+58	RAIL	40
LWRL (FLANK)	114+11	RAIL	14
LWRL	237+39	ROAD	56
LWRL	310+67	ROAD	22
LWRL	331+55	ROAD	56
LWRL (CAH. CR.)	511+34	ROAD	56
LWRL (IND. CR.)	618+84	ROAD	66
LWRL (IND. CR.)	673+40	ROAD	61
LWRL (IND. CR.)	674+35	RAIL	40

(2) Closure Structures Requiring Concrete Joint and Gate Monolith Reconstruction There were two alternatives studied concerning the concrete joint repairs; removing and replacing the joint sealant material in all locations or removing and replacing the joint sealant material only in areas of missing joint material. There were two reconstruction alternatives studied for the monolith structure; removing and replacing the entire gate monolith or the use of chemical injection grouting.

(a) Joint Reconstruction- Remove and Replace the Joint Sealant Material in All Locations. This alternative will assure the joint between the concrete monoliths will provide an effective seal and lessen the chance of further deterioration to the concrete structure with time. The joint sealant material at all locations should be removed and replaced with new material to a depth of twelve inches below existing ground surface. The use of power and/or hand tools will be required to completely remove the old sealant material. The removal depth of sealant is dependent on the manufacture's recommendation. After removing the old sealant material the concrete surface should be dry sand blasted to remove any foreign material that will affect the installation of the new backer rod and joint sealant material. Edge spalling to concrete joint faces will be addressed with suitable material to improve the required shape factor. The new joint sealant material will be allowed to cure per the manufacture's recommendation and the excavation will be backfill and reseeded. The total estimated linear feet of joints covered by this alternativeis approximately 360 feet. The following table shows the location of the closure structures and the linear feet of joints for each.

LOCATION	STATION (NEW)	TYPE of STRUCTURE	FEET of JOINTS EST.
UWRL	32+64	Rail	160
LWRL (Flank)	73+17	Road	100
LWRL (Flank)	74+13	Road	100

(b) Joint Reconstruction - Remove and Replace the Joint Sealant Material Only in Areas of Missing Joint Material. This alternative will provide an effective seal only in the areas currently showing extensive deterioration through the loss of joint sealant material. The section of the joint not repaired could allow water and soil to enter the joint, increasing the risk of concrete deterioration. The recommended method is the same as described in paragraph (a) above. The total linear feet of missing joint material is approximately 180 feet. The table below shows the location of the closure structures and the linear feet of joints for each.

LOCATION	STATION (NEW)	TYPE of STRUCTURE	FEET of JOINTS EST.
UWRL	32+64	Rail	80
LWRL (Flank)	73+17	Road	50
LWRL (Flank)	74+13	Road	50

(c) Gate Monolith Reconstruction– Remove and Replace the Entire Gate Monolith. The complete removal and replacement of the gate monoliths will assure that moisture and air intrusion will be eliminated. This procedure will require removal of the existing gates and the entire concrete gate monolith only, install new waterstops and replace with a new concrete section and anchorages. The table below shows the location of the closure structures and the estimated quantities for each location.

Closure Structure	Concrete removed and replace (cy)	Dowels (lf)	Reinforcing (lbs)	Water Stops (lf)	Joints Sealant (lf)	Bonding Agent (sf)	Gate Removal and Replacement (Ea)
32+64	57	32’	5700	35’	35’	50	1
73+17	22	32’	2200	21’	21’	23	1
74+13	22	32’	2200	21’	21’	23	1

(d) Gate Monolith Reconstruction – Chemical Injection Grouting. The chemical injection grouting method would include use of a high modulus, low viscosity, high strength epoxy grout. The procedure would be to seal the outside of the affected area with a structural epoxy paste adhesive and then injection the chemical grout thru ports under pressure to fill the entire area within the crack. This will assure that little moisture and debris will enter the crack to cause farther damage. The table below shows the location of the closure structures and the estimated quantities for each location.

Closure Structure	Crack Repair (lf)	Chemical Grout Injection (gal)
32+64	30’	20
73+17	8’	10
74+13	8’	10

(3) Closure Structures Requiring Concrete Joint and Gate Sill Reconstruction. There were two alternatives studied concerning the concrete joint reconstruction; removing and replacing the joint sealant material in all locations or removing and replacing the joint sealant material only in areas of missing joint material. There were two alternatives studied for the gate sill repairs; removing and replacing the entire gate sill concrete and all corner protections and gate seal; or patching/replacing the damaged concrete and the corner protection and gate seal.

(a) Joint Reconstruction- Remove and Replace the Joint Sealant Material in All Locations. This alternative will assure the joint between the concrete monoliths will provide an effective seal and lessen the chance of further deterioration to the concrete structure with time. The joint sealant material at all locations should be removed and replaced with new material to a depth of twelve inches below existing ground surface. The use of power and/or hand tools will be required to completely remove the old sealant material. The removal depth of sealant is dependent on the manufacture’s recommendation. After removing the old sealant material the concrete surface should be dry sand blasted to remove any foreign material that will affect the installation of the new backer rod and joint sealant material. Edge spalling to concrete joint faces will be addressed with suitable material to improve the required shape factor. The new joint sealant material will be allowed to cure per the manufacture’s recommendation and the excavation will be backfill and reseeded. The total estimated linear feet of joints covered by this section is approximately 200 feet. The table below shows the location of the closure structures and the linear feet of joints for each.

LOCATION	STATION (NEW)	TYPE of STRUCTURE	FEET of JOINTS EST.
UWRL (Flank)	227+32	RAIL	30

UWRL (Flank)	261+88	RAIL	70
LWRL	283+09	ROAD	60
LWRL (Flank)	78+43	RAIL	40

(b) Joint Reconstruction- Remove and Replace the Joint Sealant Material Only in Areas of Missing Joint Material. This alternative will provide an effective seal only in the areas currently showing extensive deterioration through the loss of joint sealant material.. The section of the joint not addressed could allow water and soil to enter the joint, increasing the risk of concrete deterioration. The method to be used is the same as described in paragraph (a) above. The total linear feet of missing joint material is approximately 90 feet. The table below shows the location of the closure structures and the linear feet of joints for each.

LOCATION	STATION (NEW)	TYPE of STRUCTURE	FEET of JOINTS EST.
UWRL (Flank)	227+32	RAIL	15
UWRL (Flank)	261+88	RAIL	35
LWRL	283+09	ROAD	30
LWRL (Flank)	78+43	RAIL	20

(c) Gate Sill Reconstruction- Remove and Replace Entire Gate Sill Concrete and All Corner Protections and Gate Seal. The gate sill concrete and steel reinforcement would be removed to the top of the concrete slab with the use of hand tools. Anchor dowels would be placed in the slab, the area formed, bonding agent applied, and new concrete placed to obtain the original configuration. New corner protection and gate seals would be embedded in the concrete. This alternative would ensure that the gate, when closed, will have a watertight seal with the sill structurally sound. The table below shows the location of the closure structures and the estimated quantities for each location.

Closure Structure	Concrete removed and replace (cy)	Dowels (lf)	Reinforcing (lbs)	Bonding Agent (sf)	Corner Protection (lf)
227+32	4	20’	40	70	20’
261+88	4	20’	40	70	20’
283+09	3	25’	30	50	25’
78+43	4	20’	40	70	20’

(d) Gate Sill Reconstruction- Patch and Replace the Damaged Concrete and Replace the Corner Protection and Gate Seal. The damage concrete on the gate sill would be patched with an epoxy surface grout. The new corner protection and gate seal would be anchored to the existing concrete surface. A bonding agent would be applied to the concrete surface and exposed steel reinforcement and the epoxy grout applied, in depth as needed to obtain the original configuration. The table below shows the location of the closure structures and the estimated quantities for each location.

Closure Structure	Concrete Patch (cy)	Bonding Agent (sf)	Corner Protection (lf)
227+32	0.5	5	20’
261+88	0.5	5	20’
283+09	0.5	5	25’
78+43	0.5	5	20’

(4) Closure Structure Requiring Concrete Joint and Approach Slab Reconstruction. There were two alternatives studied concerning the concrete joint reconstruction; removing and replacing the joint sealant material in all locations or removing and replacing the joint sealant material only in areas of missing joint material. There were two alternatives studied for the gate sill reconstruction; removing and replacing the entire approach or chemical injection grouting and sealing.

(a) Joint Reconstruction - Remove and Replace the Joint Sealant Material in All Locations. This alternative will assure the joint between the concrete monoliths will provide an effective seal and lessen the chance of further deterioration to the concrete structure with time. The joint sealant material at all locations should be removed and replaced with new material to a depth of twelve inches below existing ground surface. The use of power and/or hand tools will be required to completely remove the old sealant material. The removal depth of sealant is dependent on the manufacture's recommendation. After removing the old sealant material the concrete surface should be dry sand blasted to remove any foreign material that will affect the installation of the new backer rod and joint sealant material. Edge spalling to concrete joint faces will be repaired with suitable repair material to improve the required shape factor. The new joint sealant material will be allowed to cure per the manufacture's recommendation and the excavation will be backfill and reseeded. The total estimated linear feet of joints covered by this section is approximately 80 feet. The table below shows the location of the closure structure and the linear feet of joints.

LOCATION	STATION (NEW)	TYPE of STRUCTURE	FEET of JOINTS
UWRL	81+14	Road	80

(b) Joint Reconstruction- Remove and Replace the Joint Sealant Material Only in Areas of Missing Joint Material. This alternative will provide an effective seal only in the areas currently showing extensive deterioration through the loss of joint sealant material. The section of the joint not addressed could allow water and soil to enter the joint, increasing the risk of concrete deterioration. The recommended method is the same as described in paragraph (a) above. The total linear feet of missing joint material is approximately 40 feet. The table below shows the location of the closure structure and the linear feet of joints.

LOCATION	STATION (NEW)	TYPE of STRUCTURE	FEET of JOINTS
UWRL	81+14	Road	40

(c) Approach Apron Reconstruction- Remove and Replace Entire Approach Apron. This alternative will assure that moisture, salt and air intrusion will be eliminated. The entire cross section of the apron would be removed by use of mechanical means. Once the concrete is removed a new concrete slab will be placed. The table below shows the location of the closure structure and the estimated quantities.

Closure Structure	Concrete removed and replace (cy)	Reinforcing (lbs)
81+14	61	6100

(d) Approach Apron Reconstruction- Chemical Injection Grouting and Sealing. The chemical injection grouting method would include use of a high modulus, low viscosity, high strength epoxy grout. The procedure would be to seal the outside of the affectedarea with a structural epoxy paste adhesive and then injection the chemical grout thru ports under pressure to fill the entire area within the crack. After the grout injection is completed the entire surface area will be sealed with a high molecular weight methacrylate pentetrating sealer. This will assure that little moisture, chloride, and debris will enter

the crack to cause farther damage. The table below shows the location of the closure structure and the estimated quantities.

Closure Structure	Crack Repair (lf)	Chemical Grout Injection (gal)	Surface Sealing (sf)
81+14	50’	30	810

(5) Closure Structures Monoliths and Connecting Floodwalls Requiring Replacement. There were two alternatives studied concerning the concrete structures; removing and replacing the concrete closure structures and connecting floodwalls or encapsulation of the closure structures and connecting floodwalls.

(a) Remove and Replace the Concrete Closure Structures and Connecting Floodwalls. The concrete closure structures will be removed all the way to the foundation and replaced with a similar structure. This alternative will ensure the cause of the deteriorations will no longer be present. The removal process will include excavation of the area, mechanical removal of the old structures, installation of a cutoff wall and cast in place concrete. Upper Wood River Levee, East Fork Station 104+17 and Lower Wood River Levee, Flank Station 21+12 are railroad closure structures that are located on the same active line. Lower Wood River Levee, Flank Station 21+78 is a closure structure located on Powder Mill Road. The reconstruction of these three closure structures will be difficult depending on traffic controls and other restrictions. The table shown below is the estimated quantities for the removal and replacement of the closure structures and connecting floodwalls.

Floodwalls and Closure Structure	Concrete removed and replace (cy)	Waterstops (lf)	Reinforcing (lbs)	Expansion Joints (lf)	Steel Sheetpile (lf)	Guard rail (lf)
Section 1-9 and Closure(Road) 21+78	1138	425’	113800	130’	11370’	300’
Section 10 and Closure(Rail) 21+09	355	97’	35500	23’	3590’	0
Closure(Rail) 104+17	403	194’	40300	46’	3590’	0

(b) Encapsulation of the Closure Structures and Connecting Floodwalls. The encapsulation of the concrete structures involves the removal of at least 12 inches of concrete and steel reinforcement from the surface, dowel in anchors, and placed steel reinforcement and cast in place concrete. The 12-inch depth of removal will decrease the effect of freezing and thawing on the aggregate and concrete. The table shown below is the estimated quantities for encapsulation.

Floodwalls and Closure Structure	Concrete removed and replace (cy)	Dowels (lf)	Reinforcing (lbs)	Joints Sealant (lf)	Bonding Agent (sf)
Section 1-9 and Closure(Road) 21+78	255	2300’	12750	560’	6900
Section 10 and Closure(Rail) 21+09	68	620’	3400	120’	1850
Closure(Rail) 104+17	79	580’	3950	240’	1740

d. Reconstruction and/or Replacement of Steel Gates/Stoplogs.

(1) Larger Size Closure Structure Gates to be Reconstructed.

(a) Gate Reconstruction. Completely sandblast the existing steel gates, replacing rubber J-seals and steel clamping bars and recoating with a quality multi-coat paint system. Provide a steel skinplate (sacrificial plate) on the backside of these gates to act as a weather shield to protect the gates main structural members from deterioration due to the effects of icing preventatives that are used in the vicinity of these gates. These changes will bring these structures back to their intended standards. The inclusion of the weather shield provides a necessary design change that will ensure extension of their life expectancy by protecting them from the unanticipated effect of roadway salts.

(b) Gate Replacement. Remove the existing steel gates. Dispose of the existing gates. Fabricate completely new steel gates along with their appurtenances including a new weather shield as described in paragraph (a) above. Coat these gates with a quality multi-coat paint system. Install the new gates. These changes will bring these structures back to their intended standards. The inclusion of the weather shield provides a necessary design change that will ensure extension of their life expectancy by protecting them from the originally unanticipated effect of roadway salts.

(2) Smaller Size Closure Structure Gates to be Reconstructed.

(a) Gate Reconstruction. Completely sandblast the existing steel gates, replacing rubber J-seals and steel clamping bars and recoating with a quality multi-coat paint system Provide a steel skinplate (sacrificial plate) on the backside of these gates to act as a weather shield to protect the gates main structural members from deterioration due to the effects pf icing preventatives that are used in the vicinity of these gates. These changes will bring these structures back to their intended standards.The inclusion of the weather shield provides a necessary design change that will ensure extension of their life expectancy by protecting them from the unanticipated effect of roadway salts.

(b) Gate Replacement. Remove the existing steel gates. Dispose of the existing gates. Fabricate completely new steel gates along with their appurtenances including a new weather shield as described in paragraph (a) above. Coat these gates with a quality multi-coat paint system. Install the new gates. These changes will bring these structures back to their intended standards. The inclusion of the weather shield provides a necessary design change that will ensure extension of their life expectancy by protecting them from the unanticipated effect of roadway salts.

(3) Modular Stoplog Structures. Based on the condition and past performance of these stoplog structures no alternatives need to be considered. These structures are acceptable in their present condition.

(4) Closure Structures to Abandon.

(a) Gate Rehabilitation. Completely sandblast the existing steel gates. Coat these gates with a quality multi-coat paint system. Replace the existing rubber J-seals and the steel clamping bars that hold them in place. These changes will bring these structures back to their original intended standards.

(b) Remove and Dispose of Gate. Remove the existing steel gate and properly dispose of it. Excavate the soil in the vicinity of the removed gate. Backfill with earth material and compact in the voided area to close off the opening.

(5) Closure Structure Gates Rehabilitated by Sponsor. Considering the condition of these gates the only alternative considered was to place a protective steel cover plate (weather shield) on the backside of these gates. The protective steel cover plate would then be recoated with a quality multi-coat paint system. The inclusion of the weather shield provides a necessary design change that will ensure extension of their life expectancy by protecting them from the previously unanticipated effect of roadway salts.

3.03 Recommended Plan.

a. Concrete Structures.

(1) Closure Structures Floodwalls Requiring Concrete Joint Reconstruction Only. The recommended plan for the floodwalls concrete joints throughout the system is to remove and replace the sealant material in all locations. There is only a 50% increase in estimated quantities required to address the problem in all locations and the fact that this action will leave the system in overall better condition allowing a comprehensive plan to be developed for future maintenance, repair and rehabilitation by the local sponsor made this the best alternative.

(2) Closure Structures Floodwalls Requiring Concrete Joint and Gate Monolith Reconstruction.

(a) Joints. Recommended plan as described in 3.03 a.(1) above.

(b) Gate Monoliths. The recommended plan for the three structures in this category is to completely remove the gate monoliths and replace with new concrete

(3) Closure Structures Requiring Joint and Gate Sill Reconstruction.

(a) Joints. Recommended plan as described in 3.03 a.(1) above.

(b) Gate Sills. The recommended plan for the four structures in this category, is to remove and replace the entire gate sill concrete and replace all embedded corner protections and gate seal.

(4) Closure Structure Requiring Joint and Approach Apron Reconstruction.

(a) Joints. Recommended plan as described in 3.03 a.(1) above.

(b) Approach Apron. The recommended plan for the one approach apron that has manifest a problem is to completely remove the entire concrete approach apron and replace with new concrete.

(5) Closure Structures and Connecting Floodwalls Requiring Replacement. The recommended plan for the three closure structures and connecting floodwalls would be the complete removal and replacement of the structures.

b. Gates and Stoplogs.

(1) Larger Size Closure Structure Gates to be Reconstructed. The recommended plan based on expected performance and cost effectiveness is for these eight gates is to be removed, completely sandblasted, replacing rubber J-seals and steel clamping bars and recoating with a quality multi-coat paint system. A steel skinplate (sacrificial plate) will be placed on the backside of these gates to act as a weather shield to protect the gates main structural members from deterioration due to the effects of icing preventatives that are used in the vicinity of these gates.

(2) Smaller Size Closure Structure Gates to be Reconstructed. The recommended plan based on expected performance and cost effectiveness is for these three gates to be removed, completely sandblasted, replacing rubber J-seals and steel clamping bars and recoating with a quality multi-coat paint system. A steel skinplate (sacrificial plate) will be placed on the backside of these gates to act as a weather shield to protect the gates main structural members from deterioration due to the effects of icing preventatives that are used in the vicinity of these gates.

(3) Closure Structure Gates to be Replaced. Considering the condition of these gates, reliable options were limited. Therefore, the recommended plan is for these five gates to be replaced.

(4) Modular Stoplog Structures. The recommended plan for this group of steel stoplogs is no change. The investigation of these five structures indicated that they are in good condition.

(5) Closure Structures to Abandon. While the alternative to reconstruct the gates as stated in paragraph 3.02d(5)(a) will bring these three closure structures back to their original standard, since they are all on abandoned rail lines this is not the most practical solution. The alternative to remove these three structures eliminates the need for the existing steel closure gates and provides an earthen fill in the gate opening. The integrity of the levee is maintained and future maintenance on the steel gates have been eliminated. The recommended plan is to completely remove and dispose of gates and backfill the resulting opening in the concrete structure with compacted earth material.

(6) Closure Structure Gates Previously Rehabbed. The recommended plan for these gates is to add the protective steel cover plate as stated in paragraph 3.02d(6). A steel cover plate (sacrificial plate) will be placed on the backside of these two gates to act as a weather shield to protect the gates main structural members from deterioration. The inclusion of the weather shield provides a necessary design change that will ensure extension of the gates life expectancy by protecting them from the unanticipated effect of roadway salts.

Table Closure Structures Recommended for Action

Levee Reach	**Abandon**	**Sill Reconstruction**	**Gate Monolith Reconstruction**	**Closure Reconstruction**	**Apron Reconstruction**	**Joint Sealant**
Upper Wood River	1 CS-9	2 CS-7 & CS-8	1 CS-4	0	1 CS-5	6 CS-1,2,3,4 & CS-7 & 8
East West Fork	0	0	0	1 CS-10	0	
Lower Wood River	2 CS-13 & CS-14	2 CS-17 & CS-20	2 CS-15 & CS-16	2 CS-11 & CS-12	0	11 CS-15 - CS-25

Table Gates Recommended for Action

Levee Reach	Replace	Reconstruct	Remove	Install Weather Shield Plate
Upper Wood River	0	6 CS-1-CS-5 & CS-8	1 CS-9	
East West Fork	1 CS-10	0	0	
Lower Wood River	4 CS-11, 12,19, & 26	5 CS-17,19, 21,22,& 24	2 CS-13 & CS-14	2 CS-15 & CS-16

3.04 Probability of Unsatisfactory Performance under the No Action Alternative. The gated closure structures were modeled and given a theoretical analysis to determine their condition and probability of failure.

Evaluation. The closure gates evaluated in the system are steel swing- or miter-gated closure structures. The probability of unsatisfactory performance (PUP) for these gates was examined. In the Wood River system, there is a total of 26 gated closure structures. Table 1 is a list of all gates and their locations and dates of installation. Five of these closure structures are panel closures, and were not included in the sample size for the swing and/or miter gate analysis. Since installation, 2 of the remaining 21 gates have been substantially rehabilitated, and are considered to be "failed" for probability modeling purposes. The five gate structures that are being recommended to be replaced are also being considered "failed" for purpose of modeling and probability analysis.

(a) Method of Analysis. The method of reliability analysis used to determine the probability of gate failure with time is an historic frequency of occurrence model. This historic frequency of occurrence model was developed using actual failure data. A probability density function was fitted to the failure data versus time. This method of reliability engineering is based solely on failure data. The Weibull distribution, a probability density function, was used to represent the gate failure data. Using the Weibull distribution, the hazard function, or rate of failure at time t, was used to calculate the probability of failure for the gates. The hazard function, h(t), is given in the following equation:

$$h(t) = \frac{b}{\alpha}\left[\frac{t}{\alpha}\right]^{(b-1)} \qquad (1)$$

where,

b is the shape parameter

α is the characteristic life, starting at time equal to the minimum life.

t is time.

Table 1 - Wood River - List of Gated Closure Structures

Reach	Station	(G)ated or (P)anel	Road or Rail	Date Installed	Date Failed	Life of Gate (to present date or failure)
Upper	7+02	G	Rail	1982		21
Upper	7+32	G	Rail	1982		21
Upper	7+58	G	Rail	1982		21
Upper	32+64	G	Rail	1964		39
Upper	81+14	G	Road	1982		21
Upper	136+01	P	Road	1992		11
Upper	227+32	P	Rail	1960		43
Upper	261+88	G	Rail	1959		44
Upper	273+83	G	Rail	1959		44
E&W Forks	104+14	G	Rail	1953	2003	50
Lower	21+09	G	Rail	1953	2003	50
Lower	21+78	G	Road	1953	2003	50
Lower	49+28****	G	Rail	1964		39
Lower	67+97****	G	Rail	1959		44
Lower	73+17	G	Road	1960	1996	36
Lower	74+13	G	Road	1960	1996	36
Lower	78+43	G	Rail	1959		44
Lower	114+11	P	Rail	1960		43
Lower	237+39	G	Road	1959		44
Lower	283+09****	G	Road	1959	2003	44
Lower	310+67****	G	Road	1959		44
Lower	331+55****	G	Road	1959		44
Lower	511+34	P	Road	1960		43
Lower	618+84	G	Road	1960		43
Lower	673+40	P	Road	1960		43
Lower	674+35	G	Rail	1960	2003	43

**** - indicates the Initial Stationing

The Weibull distribution has the following characteristics:
For b = 1, the Weibull distribution becomes the exponential distribution, which gives a constant hazard function with an equal rate of failure in any year. For b = 2, the Weibull distribution becomes the Rayleigh distribution, which gives a linearly increasing hazard function. For b<1, the hazard function decreases with time, giving a decreasing rate of failure with time. For b>1, the hazard function increases with time, giving an increasing rate of failure with time. A b value of 1 would be representative of the occurrence of a random event, such as an accident, a flood, or an earthquake. Deterioration of steel gate o could be represented by a b greater than 1. For any Weibull distribution, there is a 63.2 percent probability that failure will occur before the characteristic life and a 37.8 percent probability that failure will occur after the characteristic life. Put another way, 63.2 percent of the components will fail by the characteristic life and 37.8 percent will not fail.

(b) Gate Failure Data. In order to count a gate as "failing", it was considered that substantial rehabilitation or replacement of the gate would constitute "economic failure" due to the risk of poor performance being mitigated.

(c) Weibull Graph. Table 2 lists each unsatisfactory performance event according to the time of occurrence. Also listed in the table for each unsatisfactory performance event is the location, the date the gate was installed, the date of the event, the time in years to the event and the corrected percentage of the components that have experienced unsatisfactory performance. The corrected percentage of components that have experienced unsatisfactory performance is a median rank correction to the data. The median rank correction, corrects the data such that the probability that the unsatisfactory performance event occurs before time t is 50%. The median rank correction was made using the following equation:

$$\text{Median Rank Correction (\%)} = \left[\frac{j-0.3}{N+0.4}\right]\times 100\% \qquad (2)$$

where,

j is the failure order.

N is the sample size (21 gates in this case).

Table 2 - Event of Unsatisfactory Performance

Reach	Station	Installed	Failure	life of gate	%
Lower	73+17	1960	1996	36	3.3
Lower	74+13	1960	1996	36	7.9
E&W Forks	104+14	1953	2003	50	12.6
Lower	21+09	1953	2003	50	17.3
Lower	21+78	1953	2003	50	22.0
Lower	283+09****	1959	2003	44	26.6
Lower	674+35	1960	2003	43	31.3

**** - indicates the Old Stationing

By plotting the Median Rank Correction and the life of the gate at failure on Weibull graph paper, a line can be drawn through the data points. From this best fit line, the values for b and α can be found; b is the slope of the line, and α is the time when the line passes through 63.2%. For the gate data, the shape parameter, b = 5.0 and the characteristic life, α = 63 years.

(d) Probability. Using the hazard function equation (Equation 1) and the probability of unsatisfactory performance equation for a series system (Equation 3), the probability of a gate failing within the system of gates can be determined. Table 3 shows a summary of the probability of unsatisfactory performance for the years 2003 and 2008.

$$P = 1-(1-h(t))^n \qquad (3)$$

where,

P is the probability of a gate failing given that it has not previously failed

h(t) is the hazard function

n is the number of gates

Table 3 - Probability of Unsatisfactory Performance (PUP)

	Overall Gate System PUP	
year	PFP	PNP
2003	0.24	0.24
2008	0.35	0.35

PUP = Probability of Unsatisfactory Performance

PFP = Probable Failure Point

PNP = Probable Non-Failure Point

4. PUMP STATIONS

4.01 Existing Conditions.

a. Inspections. There are seven pump stations within the Wood River Levee and Drainage District. These pump stations are East Alton No. 1 (223cfs), East Alton No. 2 (127cfs), Wood River (300cfs), Hawthorne Street (120cfs), Rand Avenue (70cfs), Lakeside (15cfs) and Home Garden (10cfs). Six of these were built by the U. S. Army Corps of Engineers in the 1950's. The seventh pump station, East Alton No. 1, was built by the U.S Army Corps of Engineers, in the late 1980's, as part of the Lock and Dam 26 (Replacement), Mel Price Project. This pump station replaced the original Alton Pump Station, which was abandoned (and later demolished) due to construction of the Mel Price Project. These pump stations were each inspected as part of this report.

b. Water Quality. Water quality sampling and testing was conducted at the pump stations to determine the presence of hazardous materials. Following is a summary of what the results of the testing indicated.

(1) Sediments within all pump station chambers and outfall/gatewell structures have contaminants present which may require special handling/disposal during any reconstruction of the structures that require removal of sediments. Special worker protection/safety precautions and sediment handling procedures should be made part of any reconstruction process involving soil/sediment movement in and around the pump stations.

(2) Reconstruction related to painted surfaces should incorporate procedures for worker safety with regards to exposure to hazardous levels of heavy metals. In addition, the future minimization of the hazard could be accomplished by encapsulation of the hazardous painted surfaces or complete removal of the hazardous paints with replacement by non-hazardous compounds.

(3) Roofing materials were determined not to have asbestos material present with the exception of one sample, which presented less than one percent (1%) asbestos. Should the roofing material require replacement in future reconstruction projects, no special handling/disposal other than those required for normal/non-asbestos roofing material (i.e. replacement by a licensed roofing contractor, and disposal of all solid wastes in a licensed landfill) is necessary.

c. Gravity Drains. Each of the pump stations has an associated gravity drain.

(1) East Alton No. 1 Pump Station. The gravity drain at this location consists of two 54-inch HDPE Pipes. The gravity drain originally had two 60-inch CMP's that failed during the 1973 Flood. The two 60-inch CMP's were replaced with two 60-inch plastic resin pipes after the 1973 Flood and these 60-inch pipes were lined with 54-inch HDPE pipes in 1988 during construction of the pump station. The annular space between the 54-inch pipe and the 60-inch pipe was grouted after installation. There is no indication of any problems with these gravity drain pipes.

(2) East Alton No. 2 Pump Station. This gravity drain consists of a single 54-inch HDPE Pipe. The original drain, a 60-inch CMP, failed during the Great Flood of 1993. It was repaired by lining the 60-inch CMP with a 54-inch HDPE Pipe and grouting the annular space between the two pipes. There is no indication of any problem with this gravity drain pipe.

(3) Wood River Pump Station. There are two gravity drains at this pump station. One is a 72-inch reinforced concrete pipe (RCP) and the other is an 84-inch RCP. These pipes were camera inspected in 2001 and found to be in good condition.

(4) Rand Avenue Pump Station. There are two gravity drains at this pump station. One is a 36-inch cast iron pipe and the other is a 24-inch cast iron pipe. These pipes have not been inspected though there is no indication of any problems. The condition of these pipes will be determined by a camera inspection during the design of the project.

(5) Hawthorne Street Pump Station. There is a single 4'-0" x 4'-0" concrete box culvert at this location. This culvert was not camera inspected in 2001. Based on the condition of the concrete pipes at the Wood River Pump Station it has been assumed that this concrete culvert is in good condition. The condition of the culvert will be determined by a camera inspection during design of the project.

(6) Lakeside Pump Station. There is a single 48-inch CMP gravity drain at this pump station. This gravity drain is discussed in Section 2 – GRAVITY DRAINS AND GATEWELLS. There will be no further discussion on this drain in this section.

(7) Home Garden Pump Station. There is a single 36-inch CMP gravity drain at this pump station. This gravity drain is discussed in Section 2 – GRAVITY DRAINS AND GATEWELLS. There will be no further discussion of this drain in this section.

d. Pump Station Structures.

(1) East Alton Pump Station No. 1. Since this pump station was completed in 1988 there has been one significant structural problem at this location. The slab-on-grade for the maintenance portion of the pump station experienced extreme settlement, which resulted in significant structural problems. The settlement was due to improper compaction of the material on which the slab was founded. This portion of the structure was demolished, the foundation material excavated, properly compacted fill placed in the excavation and this portion of the building rebuilt. There have been no other structural problems encountered at this pump station and therefore this structure will not be addressed any further.

East Alton No. 1 Pump Station

(2) East Alton Pump Station No. 2. This station, as most of the other stations in this system, is in relatively good overall condition. None of the typically major structural items (beams, columns, concrete foundation, etc.) are in need of repair. The primary structural item showing some need of repair is the galvanized steel trashrack. The trashrack is showing signs of moderate corrosion and damage through extensive use over the years. Other items in need of repair are; the galvanized steel grating, the station's brick/mortar, the roof material and the galvanized steel ladders. The station's grating is showing moderate signs of corrosion and wear. The brick walls are showing varying degrees of efflorescence and mortar loss at an assortment of locations both on the interior and the exterior walls. The roof material is showing marginal signs of wear at various locations. The ladders are also showing signs of moderate corrosion and some minor damage.

East Alton No.2 Pump Station

(3) Wood River Pump Station. This station is in relatively good overall condition except for one area. None of the typically major structural items (beams, columns, concrete foundation, etc.) are in need of repair. All of the necessary repairs are secondary structural items. The station's galvanized steel grating is showing moderate signs of corrosion and wear. The brick walls are showing varying degrees of efflorescence and mortar loss at an assortment of locations both on the interior and the exterior walls. The roof material is showing moderate signs of wear at various locations. The galvanized steel ladders are showing signs of moderate corrosion and intermittent slight damage. The galvanized chain link fence is also showing moderate signs of corrosion and minor damage. The condition of the emergency stoplog slots for the pump discharge flap gates is the area where there is a significant problem. The angles that were originally installed to form the slots have corroded almost completely away. It would be impossible to install stoplogs into these slots in there present condition.

Wood River Pump Station

(4) Rand Avenue Pump Station. This station is in relatively good overall condition. None of the typically major structural items (beams, columns, concrete foundation, etc.) are in need of repair. All of the necessary repairs are secondary structural items. The station's galvanized steel grating is showing moderate signs of corrosion and wear. The brick walls are showing varying degrees of efflorescence and mortar loss at an assortment of locations both on the interior and the exterior walls. The roof material is showing moderate signs of wear at various locations. The galvanized steel ladders are showing signs of moderate corrosion and intermittent slight damage. The galvanized chain link fence is also showing moderate signs of corrosion and minor damage.

Rand Avenue Pump Station

(5) Hawthorne Street Pump Station. This station is in relatively good overall condition. None of the typically major structural items (beams, columns, concrete foundation, etc.) are in need of repair. All of the necessary repairs are secondary structural items. The station's galvanized steel grating is showing moderate signs of corrosion and wear. The brick walls are showing varying degrees of efflorescence and mortar loss at an assortment of locations both on the interior and the exterior walls. The roof material is showing moderate signs of wear at various locations. The galvanized steel ladders are showing signs of moderate corrosion and intermittent minor damage.

Hawthorne Street Pump Station

(6) Lakeside Pump Station. This station is in relatively good condition overall. This station's footprint, relative to the stations discussed above, is small. None of the typically major structural items (concrete walls, concrete foundation, etc.) are in need of repair. All of the necessary repairs are secondary structural items. The station's galvanized steel grating is showing moderate signs of corrosion and wear. The galvanized sheet metal roof is showing moderate to heavy corrosion.

Lakeside Pump Station

(7) Homegarden Pump Station. This station is in relatively good overall condition. This station is of the same grouping as the Lakeside Pump Station. None of the typically major structural items (concrete walls, concrete foundation, etc.) are in need of repair. All of the necessary repairs are secondary structural items. The station's galvanized steel grating is showing moderate signs of corrosion and wear. The galvanized sheet metal roof is showing moderate to heavy corrosion.

Homegarden Pump Station

e. Pumps and Motors. Following is a description of the existing condition for the pumps and motors at each pump station.

(1) East Alton No. 1 Pump Station.

(a) Pumps. There are three Reddy-Buffalo, 36-inch vertical, mixed flow stormwater pumps installed in this pump station. The pumps were installed in 1988 and have been operating satisfactorily since then with one exception. In 1995, Pump No. 2 failed during a flood event. The pump was removed, disassembled and inspected by Fairbanks-Morse Pump Services Group. The reason for failure was determined to be failure of the top pump bearing which caused the bearing to "seize" during pump operation. This caused the pump to destroy the bearing housing and associated lubrication piping. The Reddy-Buffalo Pump Co. repaired this pump and it was reinstalled in 1998 and has been operating satisfactorily since.

(b) Electric Motors. There are three Allis-Chambers, 300-hp, vertical, hollow shaft electric motors installed on the stormwater pumps. These motors were installed in 1988 and have operated without any problems since that time.

Stormwater Pump Electric Motors

(2) East Alton No. 2 Pump Station.

(a) Pumps. There are two Peerless Pump, 42-inch, vertical, mixed flow stormwater pumps installed in this pump station. These pumps were installed in 1952 and have been operating satisfactorily since that time. However, pumps of this type that have been installed for this period of time have been shown to be in need of reconstruction and repair. As part of the Reconstruction of the East St. Louis Flood Protection Project, numerous vertical, axial and mixed flow pumps were removed and inspected. Most of these pumps had been in service for 35+ years in similar type of installations as those found in at this pump station. These inspections indicated severe bearing wear, shaft damage, misalignment, wear of the impeller tips and wear of the inside of the impeller bowls. This type of damage and wear resulted in each of these pumps being given a complete rehabilitation. There are also two, Peerless Pump, dry pit, centrifugal pumps, used for pumping sewage flows, to a local treatment plant. These pumps are rarely needed and have operated satisfactorily in the past according to Wood River D&LD personnel. Therefore these pumps will not be considered as part of this study.

(b) Electric Motors. There are two, 200-hp, vertical, hollow shaft, electric motors installed on the stormwater pumps. These motors were installed in 1952 and have been operating satisfactorily since that time. However, electric motors of this type that have been installed for this period of time have been shown to be in need of reconstruction. As part of the Rehabilitation of the East St. Louis Flood Protection Project, numerous vertical motors were removed and inspected. Most of these motors had been in service for 35+ years in similar type of installations as those found at this pump station. These inspections indicated bearing wear and some deterioration of the winding insulation. This type of damage and wear resulted in each of these motors being given a complete reconstruction. There also are two, 25-hp, vertical, electric motors installed on the sewage lift pumps. As with the sewage pumps that these motors drive, since these motors are rarely needed and have operated satisfactorily in the past, the motors will not be considered as part of this study.

Stormwater Pump Motor

Sewage Pump Motor

(3) Wood River Pump Station.

(a) Pumps. There are three Peerless Pump, 42-inch, vertical, mixed flow stormwater pumps and two Fairbanks-Morse, 30-inch, vertical, mixed flow pumps installed in this pump station. These pumps were installed in 1954 and have been operating satisfactorily since that time. However, pumps of this type that have been installed for this period of time have been shown to be in need of reconstruction and repair. As part of the Rehabilitation of the East St. Louis Flood Protection Project, numerous vertical, axial and mixed flow pumps were removed and inspected. Most of these pumps had been in service for 35+ years in similar type of installations as those found at this pump station. These inspections indicated severe bearing wear, shaft damage, misalignment, wear of the impeller tips and wear of the inside of the impeller bowls. This type of damage and wear resulted in each of these pumps being given a complete reconstruction. There is also a single Fairbanks-Morse centrifugal, baseflow pump. This pump has not been operable for some time.

(b) Electric Motors. There are three 150-hp, vertical, hollow shaft, electric motors installed on the Peerless stormwater pumps and two, 100-hp, vertical, hollow shaft, electric motors installed on the Fairbanks-Morse pumps. These motors were installed in 1954 and have been operating satisfactorily since that time. However, electric motors of this type that have been installed for this period of time have been shown to be in need of reconstruction. As part of the Rehabilitation of the East St. Louis Flood Protection Project, numerous vertical motors were removed and inspected. Most of these motors had been in service for 35+ years in similar type of installations as those found at this pump station. These inspections indicated bearing wear and some deterioration of the winding insulation.

100-hp Electric Motor

150-hp Electric Motor

(4) Rand Avenue Pump Station.

(a) Pumps. There is a Fairbanks-Morse, 24-inch, vertical, mixed flow stormwater pump and a Flygt, 14-inch, submersible stormwater pump installed in this pump station. The Fairbanks-Morse pump was installed in 1995 and the Flygt pump was installed in 2001. These pumps were installed by the Wood River D&LD to replace the original vertical pumps that were installed in 1957. The original pumps needed to be replaced due to severe corrosion, which caused each pump to completely fail. These new pumps have operated satisfactorily since they were installed.

(b) Motors. There is a 100-hp, vertical, hollow shaft electric motor installed on the Fairbanks-Morse pump and a 75-hp submersible electric motor installed integral to the Flygt submersible pump. The 100-hp motor was originally installed in 1957 and has operated satisfactorily since that time. However, electric motors of this type that have been installed for this period of time, have been shown to be in need of reconstruction. As part of the Rehabilitation of the East St. Louis Flood Protection Project, numerous vertical motors were removed and inspected. Most of these motors had been in service for 35+ years in similar type of installations as those found at this pump station. These inspections indicated bearing wear and some deterioration of the winding insulation.

Electric Motor for Pump #2

(6) Hawthorne Street Pump Station.

(a) Pumps. There are two Peerless Pump, 36-inch, vertical, mixed flow stormwater pumps installed in this pump station. These pumps were installed in 1956 and have been operating satisfactorily since that time. However, pumps of this type that have been installed for this period of time have been shown to be in need of reconstruction. As part of the Rehabilitation of the East St. Louis Flood Protection Project, numerous vertical, axial and mixed flow pumps were removed and inspected. Most of these pumps had been in service for 35+ years in similar type of installations as those found at this pump station. These inspections indicated severe bearing wear, shaft damage, misalignment, wear of the impeller tips and wear of the inside of the impeller bowls. This type of damage and wear resulted in each of these pumps being given a complete rehabilitation.

(b) Electric Motors. There are two, 200-hp, vertical, hollow shaft, electric motors installed on the stormwater pumps. These motors were installed in 1952 and have been operating satisfactorily since that time. However, electric motors of this type that have been installed for this period of time, have been shown to be in need of reconstruction. As part of the Rehabilitation of the East St. Louis Flood Protection Project, numerous vertical motors were removed and inspected. Most of these motors had been in service for 35+ years in similar type of installations as those found at this pump station.

These inspections indicated bearing wear and some deterioration of the winding insulation. This type of damage and wear resulted in each of these motors being given a complete rehabilitation.

Electric Motor for Pump No. 1

Electric Motor for Pump No. 2

(7) Lakeside Pump Station.

(a) There is a single, Fairbanks-Morse, 14-inch, vertical, mixed flow stormwater pump installed in this pump station. This pump was installed in 1954 and has been operating satisfactorily since that time. However, pumps of this type that have been installed for this period of time have been shown to be in need of reconstruction. As part of the Rehabilitation of the East St. Louis Flood Protection Project, numerous vertical, axial and mixed flow pumps were removed and inspected. Most of these pumps had been in service for 35+ years in similar type of installations as those found at this pump station. These inspections indicated severe bearing wear, shaft damage, misalignment, wear of the impeller tips and wear of the inside of the impeller bowls. This type of damage and wear resulted in each of these pumps being given a complete reconstruction.

(b) Electric Motors. There is a single 50-hp, vertical, hollow shaft electric motor installed on the stormwater pumps. This motor was installed in 1954 and has been operating satisfactorily since that time. However, electric motors of this type that have been installed for this period of time have been shown to be in need of reconstruction. As part of the Rehabilitation of the East St. Louis Flood Protection Project, numerous vertical motors were removed and inspected. Most of these motors had been in service for 35+ years in similar type of installations as those found at this pump station. These inspections indicated bearing wear and some deterioration of the winding insulation. This type of damage and wear resulted in each of these motors being given a complete reconstruction.

Stormwater Pump Electric Motor

(8) Homegarden Pump Station.

(a) There is a single, Fairbanks-Morse, 12-inch, vertical, mixed flow stormwater pump installed in this pump station. This pump was installed in 1954 and has been operating satisfactorily since that time. However, pumps of this type that have been installed for this period of time have been shown to be in need of reconstruction. As part of the Rehabilitation of the East St. Louis Flood Protection Project, numerous vertical, axial and mixed flow pumps were removed and inspected. Most of these pumps had been in service for 35+ years in similar type of installations as those found at this pump station. These inspections indicated severe bearing wear, shaft damage, misalignment, wear of the impeller tips and wear of the inside of the impeller bowls. This type of damage and wear resulted in each of these pumps being given a complete reconstruction.

(b) Electric Motors. There is a single 30-hp, vertical, hollow shaft electric motor installed on the stormwater pumps. This motor was installed in 1954 and has been operating satisfactorily since that time. However, electric motors of this type that have been installed for this period of time have been shown to be in need of reconstruction. As part of the Rehabilitation of the East St. Louis Flood Protection Project, numerous vertical motors were removed and inspected. Most of these motors had been in service for 35+ years in similar type of installations as those found at this pump station. These inspections indicated bearing wear and some deterioration of the winding insulation. This type of damage and wear resulted in each of these motors being given a complete reconstruction.

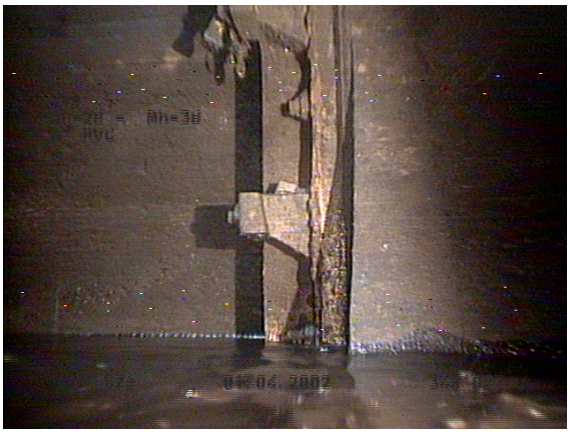
Stormwater Pump Electric Motor

f. Sluice Gates and Flap Gates.

(1) East Alton Pump Station No. 1. There are seven sluice gates associated with this pump station. There are three 108” x 108” cast iron sluice gates with electric motor actuated gate hoists on the entrances to the pump sumps. There are two 60” x 60” cast iron sluice gates with electric motor actuated gate hoists in the discharge chamber to control gravity flow through the pump station. These gates and hoists were installed in 1988. Each of these gates has operated satisfactorily since installation and there is no sign of any wear or excessive corrosion to any of the gate components. There are two 60” x 60” cast iron sluice gates with manually operated gate hoists in the emergency closure structure at the riverside end of the gravity drain. These gates were installed in 1952 and have operated satisfactorily since then. These gates are periodically tested and are to be operated only in an emergency if there is a gate failure at the pump station. There are three 42-inch flap gates installed at this pump station in the discharge chamber. These flap gates are attached at the end of the pump discharge pipes. They were installed in 1988 and have been functioning properly since that time.

(2) East Alton Pump Station No. 2. There are four sluice gates associated with this pump station. There are two 60” x 60” cast iron sluice gates with manually operated gate hoists on the entrances to the pump sump. There is one 60” x 60” cast iron sluice gates with a manually operated gate hoists in the gravity drain gatewell adjacent to the pump station to control gravity flow. These gates were installed in 1952 and have operated satisfactorily since installation. However, the gate frames and slides are beginning to show evidence of moderate to severe corrosion and increased wear on wedges, seals, gate stems and other operating components is becoming evident. There is a one 24” x 24” cast iron sluice gate in the gravity drain gatewell which controls gravity flow through the old sanitary sewer pipe. This sluice gate is no longer operated. This gate is kept in the closed position and the sluice gate hoist has been removed. This gate and hoist were also installed in 1952.

(3) Wood River Pump Station. There are eleven sluice gates associated with this pump station. There are three 60” x 60” cast iron sluice gates with manually operated gate hoists on the entrances to the pump sump. There is one 72” x 72” cast iron sluice gate with a manually operated gate hoist in the south end of the pump station discharge chamber to control gravity flow through the 72-inch drain. There is one 84” x 84” cast iron sluice gate with a manually operated gate hoist in the north end of the pump station discharge chamber to control gravity flow through the 84-inch drain. There is one 72” x 72” cast iron sluice gate with a manually operated gate hoist in the emergency closure structure on the riverside end of the 72-inch drain. This sluice gate was inspected during a camera inspection of the 72” x 72” gravity drain. Pictures from this inspection follow this paragraph. There is one 84” x 84” cast iron sluice gate with a manually operated gate hoist in the emergency structure on the riverside end of the 84-inch drain. All of these gates were installed in 1954 and have operated satisfactorily since installation. However, the gate frames and slides are beginning to show evidence of moderate to severe corrosion and increased wear on wedges, seals, gate stems and other operating components is becoming evident. There is also two 60” x 60” sluice gates with manually operated gate hoists separating the station forebay from the ponding area north of the pump station. These gates were installed in 1954 and are kept in the open position and rarely operated. There is a 36” x 36” cast iron sluice gate with a manually operated gate hoist and a 72” x 72” sluice gate with a manually operated gate hoist in the pump station forebay at the end of the incoming 72-inch and 36-inch sewers. These gates are only operated if there needs to be maintenance performed on the incoming sewer line pipes. There are three 36-inch flap gates, two 24-inch flap gates, and one 12-inch flap gate installed in the discharge chamber of the pump station. These flap gates are installed at the end of each of the pump discharge pipes. These flap gates were installed in 1954 and are showing signs of significant wear. The flaps and hinge arms are severely corroded and the hinge pins show signs of “seizing” which could prevent the flap from properly closing.



Bottom Wedges of 72-inch Sluice Gate 1

Side Wedges of 72-inch Sluice Gate 1

(4) Rand Avenue Pump Station. There are six sluice gates associated with this pump station. There is one 36” x 36” cast iron sluice gate with a manually operated gate hoist in the pump station forebay along the 36-inch sewer. There is one 24” x 24” cast iron sluice gate with a manually operated gate hoist in the pump station forebay along the 24-inch sewer. There is one 36” x 36” cast iron sluice gate with a manually operated gate hoists in the south end of the pump station discharge chamber to control gravity flow through the 36-inch sewer. There is one 24” x 24” cast iron sluice gate with a manually operated gate hoists in the north end of the pump station discharge chamber to control gravity flow through the 24-inch sewer. There is one 36” x 36” cast iron sluice gate with a manually operated gate hoist in the emergency closure structure on the riverside end of the 36-inch sewer. There is one 24” x 24” cast iron sluice gate with a manually operated gate hoist in the emergency structure on the riverside end of the 24-inch drain. All of these gates were installed in 1957 and have operated satisfactorily since installation. However, the gate frames and slides are beginning to show evidence of moderate to severe corrosion and increased wear on wedges, seals, gate stems and other operating components is becoming evident. There is a 24-inch flap gate, a 14-inch flap gate and a 10-inch flap gate installed in the discharge chamber at the end

of the pump discharge pipes. The 14-inch flap gate was installed in 2001 when the Flygt pump was installed. The other flap gates were installed in 1957 and have been operating satisfactorily since that time.

(5) Hawthorne Street Pump Station. There are two sluice gates associated with this pump station. There are four sluice gates associated with this pump station. There are two 60" x 60" cast iron sluice gates with manually operated gate hoists on the entrances to the pump sump. There is one 60" x 60" cast iron sluice gates with a manually operated gate hoists in the gravity drain gatewell adjacent to the pump station to control gravity flow. These gates were installed in 1952 and have operated satisfactorily since installation. However, the gate frames and slides are beginning to show evidence of moderate to severe corrosion and increased wear on wedges, seals, gate stems and other operating components is becoming evident. There are four flap gates associated with this pump station. There is a 48" x 48" rubber flap gate installed to replace the 48" x 48" sluice gate originally installed to shut-off gravity flow through the pump station discharge chamber. This flap gate was installed in 1996 by the City of Hartford to prevent backflow of the Mississippi River into the combined sewer causing increased water treatment requirements. There are two 36-inch flap gates and a single 6-inch flap gate installed in the discharge chamber at the ends of the pump discharge pipes. These flap gates were installed in 1956 and have been operating satisfactorily since that time.

(6) Homegarden and Lakeside Pump Stations. There are no sluice gates or flap gates used at either of these pump stations. There are sluice gates at the end of each gravity drain but these sluice gates are covered under the discussions on the CMP gravity drains in Section 2 - GRAVITY DRAINS AND GATEWELLS.

g. Electrical Equipment. With the exception of the East Alton No. 1 pump station, each of the remaining six pump stations reviewed under this report was constructed during the early 1950's. Replacement parts and/or spare parts are unavailable. It has become extremely difficult to safely perform maintenance and repairs to this equipment. In the near future, it could become necessary to shutoff power to the pump station before making any repairs to the electrical equipment. Some of the motor starters have been replaced with newer surface-mounted units, but parts for the main circuit breaker and other systems are a problem. Each pump station is provided with separate 480-volt and 120/208-volt utility service.

Typical 1950's Vintage Switchgear

Modern Switchgear at East Alton No. 1 PS

h. Miscellaneous Equipment. Each of the pump stations, except Homegarden and Lakeside, has various types of auxiliary equipment; roof ventilators, sump ventilators, overhead cranes and sump pumps. In addition, the East Alton Pump Station No. 1 has three mechanical trash rakes installed to clean debris off of the trash racks at the entrances to the pump sumps. At each of the older pump stations the auxiliary equipment is operable. However, due to the age of this equipment approaching 50 years the future reliability of the equipment becomes questionable. The trash raking equipment at the East Alton Pump Station No. 1 is inoperable. Numerous attempts have been made to repair this equipment but each time the repairs have proved insufficient to keep the equipment operating. The original equipment

manufacturer in no longer manufacturing trash raking equipment and therefore has not participated in any of the repairs.

4.02 Alternatives

a. No Action

(1) Gravity Drains.

(a) East Alton Pump Station No. 1. With the gravity drains being lined with HDPE pipe only 15 years ago there is virtually no chance of any type of failure in the future. This site should be considered as reliable as a new gravity drain. No alternatives will be considered.

(b) East Alton Pump Station No. 2. With the gravity drain being lined with HDPE pipe only 9 years ago there is virtually no chance of any type of failure in the future. This site should be considered as reliable as a new gravity drain. No further alternatives will be considered.

(c) Wood River Pump Station. With these gravity drains having concrete pipes that have been found to be in good condition these is only a slight chance for a problem in the future. If there would be a problem it would most likely occur at joints in the pipes. Problems at the joints could lead to a loss of levee embankment material in the areas of the joints. This could lead to a problem with levee stability in the area of the gravity drain.

(d) Rand Avenue Pump Station. The main concern for these pipes is corrosion. With the age of these pipes approaching 50 years it is important that the condition of the pipes be determined. Failure of these pipes would require the emergency closure sluice gates to be closed which would not allow any further pumping to take place. This would cause localized flooding in the drainage area for this pump station, a refinery shut down at Conoco-Phillips and the backup of sanitary sewer lines in the City of Roxana . Failure of the pipes could also mean a loss of levee embankment material from around the pipes which could lead to a problem with levee stability in the area of the gravity drain.

(e) Hawthorne Pump Station. With this gravity drain having a concrete box culvert it is felt that there is only a slight chance for a problem in the future. If there would be a problem it would most likely occur at joints along the culvert. Failure of these pipes would require the emergency closure sluice gates to be closed which would not allow any further pumping to take place. This would cause localized flooding in the drainage area for this pump station, and the backup of sanitary sewer lines in the City of Hartford. Problems at joints could lead to a loss of levee embankment material in the areas of the joints. This could also lead to a problem with levee stability in the area of the gravity drain.

(2) Pump Station Structures.

(a) East Alton Pump Station No. 2. If no action is taken to repair the items discussed in 4.01d(2), the station will perform satisfactorily for a period of time but these items will continue to deteriorate. Initially that deterioration will be at a slow rate but at a later point in time it will increase to a more moderate rate eventually reaching a point where the degree of deterioration will become significant and require some repair in order for the station to properly function.

(b) Wood River Pump Station. If no action is taken to repair the items discussed in paragraph 4.01d(3), the station could have a problem if there is a flap gate failure during a high water event. If there is a flap gate failure during a high water event it will be impossible to shut-off flow back through this pipe and there will be increased pump operation and the potential for localized flooding if more than one flap gate fails. Other than the situation with the stoplog slots the pump station will perform satisfactorily for a period of time but many of the items discussed will continue to deteriorate. Initially that deterioration will be at a slow rate but at a later point in time it will increase to a more moderate rate eventually reaching a point where the degree of deterioration will become significant and require some repair in order for the station to properly function.

(c) Rand Avenue Pump Station. If no action is taken to repair the items discussed in paragraph 4.01d(4), the station will perform satisfactorily for a period of time but these items will continue to deteriorate. Initially that deterioration will be at a slow rate but at a later point in time it will increase to a more moderate rate eventually reaching a point where the degree of deterioration will become significant and require some repair in order for the station to properly function.

(d) Hawthorne Street Pump Station. If no action is taken to repair the items discussed in paragraph 4.01d(5), the station will perform satisfactorily for a period of time but these items will continue to deteriorate. Initially that deterioration will be at a slow rate but at a later point in time it will increase to a more moderate rate eventually reaching a point where the degree of deterioration will become significant and require some repair in order for the station to properly function.

(e) Lakeside Pump Station. If no action is taken to repair the items discussed in paragraph 4.01d(6), the station will perform satisfactorily for a period of time but these items will continue to deteriorate. Initially that deterioration will be at a slow rate but at a later point in time it will increase to a more moderate rate eventually reaching a point where the degree of deterioration will become significant and require some repair in order for the station to properly function.

(f) Homegarden Pump Station. If no action is taken to repair the items discussed in paragraph 4.01d(7), the station will perform satisfactorily for a period of time but these items will continue to deteriorate. Initially that deterioration will be at a slow rate but at a later point in time it will increase to a more moderate rate eventually reaching a point where the degree of deterioration will become significant and require some repair in order for the station to properly function.

(3) Pumps and Motors.

(a) East Alton Pump Station No. 1. If no action is taken on the vertical pumps and the electric motors there should not be any problems in the near future since this equipment is relatively new (15 years old).

(b) East Alton Pump Station No. 2. If no action is taken on the vertical pumps and electric motors there might not be any problems in the near future (3 –5 years). However, as this equipment reaches 50 years of age there will be an increased probability of failure. A failure of a pump or motor would require a minimum of 5 - 7 days to repair, including removal and reinstallation of the equipment. Since this failure would most probably occur during a high water event the loss of a pump or motor could result in localized flooding in the drainage area served by this pump station.

(c) Wood River Pump Station. If no action is taken on the vertical pumps and electric motors there might not be any problems in the near future (3 –5 years). However, as this equipment reaches 50 years of age there will be an increased probability of failure. A failure of a pump or motor would require a minimum of 5 – 7 days to repair, including removal and reinstallation of the equipment. Since this failure would most probably occur during a high water event the loss of a pump or motor could result in localized flooding in the drainage area served by this pump station.

(d) Rand Avenue Pump Station. With the pumps having all been replaced in the past 8 years there should be no consequence to not taking any actions on the pumps. For the remaining original motor if there is no action taken on the motor there might not be any problems in the near future (3-5 years). However, as this motor reaches 50 years of age there will be an increased probability of failure. A failure of this motor would require a minimum of 3 – 5 days to repair, including removal and reinstallation of the motor. Since this failure would most probably occur during a high water event the loss of the motor would impact the Conoco-Philips refinery and backup of the sanitary sewer in the City of Roxana and could result in localized flooding in the drainage area served by this pump station.

(e) Hawthorne Street Pump Station. If no action is taken on the vertical pumps and electric motors there might not be any problems in the near future (3 –5 years). However, as this

equipment reaches 50 years of age there will be an increased probability of failure. A failure of a pump or motor would require a minimum of 5 – 7 days to repair, including removal and reinstallation of the equipment. Since this failure would most probably occur during a high water event the loss of a pump or motor would result in the backup of the sanitary sewer system in the City of Hartford absent an interior rainfall event and could cause localized flooding in the drainage area served by this pump station during a concurrent interior rainfall event.

(f) Lakeside Pump Station. If no action is taken on the vertical pump and electric motor there might not be any problems in the near future (3 –5 years). However, as this equipment reaches 50 years of age there will be an increased probability of failure. A failure of the pump or motor would require a minimum of 3 – 5 days to repair, including removal and reinstallation of the equipment. Since this failure would most probably occur during a high water event the loss of the pump or motor could result in widespread flooding in the drainage area served by this pump station since there is only this pump installed at the pump station.

(g) Homegarden Pump Station. If no action is taken on the vertical pump and electric motor there might not be any problems in the near future (3 –5 years). However, as this equipment reaches 50 years of age there will be an increased probability of failure. A failure of the pump or motor would require a minimum of 3 – 5 days to repair, including removal and reinstallation of the equipment. Since this failure would most probably occur during a high water event the loss of the pump or motor could result in widespread flooding in the drainage area served by this pump station since there is only this pump installed at the pump station.

(4) Sluice Gates and Flap Gates.

(a) East Alton Pump Station No. 1. Since the sluice gates and flap gates installed in the pump station are not very old (15 years) there should not be any negative result to no action being taken on this equipment. If no action is taken on the sluice gates used in the emergency closure there might not be any problems in the near future (3 – 5 years). However, as this equipment reaches 50 years of age there will be an increased probability of failure. Since these sluice gates are for use only in the event of a failure of one of the gravity drain sluice gates at the pump station there would be little or no consequence from a failure except if it was not repaired for an extended period of time.

(b) East Alton Pump Station No. 2. If no action is taken on the sluice gates and gate hoists there might not be any problems in the near future (3 –5 years). However, as this equipment reaches 50 years of age there will be an increased probability of failure. If the sluice gate in the gravity drain were to fail this could result in significant localized flooding in the drainage area for this pump station. If one of the sluice gates in the pump station forebay were to fail this would cause problems if the sump needed to be dewatered for pump maintenance or repair.

(c) Wood River Pump Station. If no action is taken on the sluice gates and gate hoists there might not be any problems in the near future (3 –5 years). However, as this equipment reaches 50 years of age there will be an increased probability of failure. If the either the 72” x 72” or 84” x 84” gravity drain sluice gates were to fail this could result in significant localized flooding in the drainage area for this pump station. If either the 72” x 72” or 84” x 84” emergency closure sluice gates were to fail there would be little or no consequence since these sluice gates are for use only in the event of a failure of one of the gravity drain sluice gates at the pump station. Problems could occur if these gates were not repaired for an extended period of time. If no action is taken on the sluice gates and gate hoists separating the forebay from the sump there would not be any significant problem. If one of the sluice gates in the pump station forebay were to fail this would only cause problems if the sump needed to be dewatered for pump maintenance or repair. There is not any consequence to not taking any action on the sluice gates separating the ponding area from the pump station. These gates have not been operated for many years and are kept in the open position. The only consequence for not taking any action on the sluice gates at the end of the sewers in the forebay is that future maintenance in these sewers could be affected since the sewer might not be able to be isolated. There could be significant problems in the near future if there is no action on the pump discharge flap gates. If any of these gates were to fail during a high water event the affected pump

would not be able to be started and backflow through that pump would equal or exceed the capacity of one or more of the other pumps thereby decreasing the effective pump capacity of the pump station. This could lead to localized flooding if a significant rainfall event were to occur.

(d) Rand Avenue Pump Station. If no action is taken on the sluice gates and gate hoists there might not be any problems in the near future (3 –5 years). However, as this equipment reaches 50 years of age there will be an increased probability of failure. If the either the 36" x 36" or 24" x 24" gravity drain sluice gates were to fail this would impact the Conoco-Philips refinery processes and the operation of the Roxana water treatment plant and could result in localized flooding in the drainage area for this pump station. If either the 36" x 36" or 24" x 24" emergency closure sluice gates were to fail there would be little or no consequence since these sluice gates are for use only in the event of a failure of one of the gravity drain sluice gates at the pump station. Problems could occur if these gates were not repaired for an extended period of time. If no action is taken on the sluice gates and gate hoists separating the incoming sewers from the forebay there would not be any significant problem. If one of the sluice gates in the pump station forebay were to fail this would only cause problems if the forebay/sump needed to be dewatered for pump maintenance or repair. There should not be any significant problems in the near future if there is no action on the pump discharge flap gates. These flap gates are in good shape and should not pose a problem in the near future.

(e) Hawthorne Street Pump Station. If no action is taken on the sluice gates and gate hoists there might not be any problems in the near future (3 –5 years). However, as this equipment reaches 50 years of age there will be an increased probability of failure. If the 48" x 48" emergency closure sluice gate were to fail there would be little or no consequence since this sluice gate is for use only in the event of a failure of one of the gravity drain flap gate at the pump station. Problems could occur if this gate was not repaired for an extended period of time. If no action is taken on the sluice gate and gate hoist separating the forebay from the sump there would not be any significant problem. If this sluice gate were to fail it would cause problems if the sump needed to be dewatered for pump maintenance or repair. There should not be any significant problems in the near future if there is no action on the gravity drain flap gate or the pump discharge flap gates. These flap gates are in good shape and should not pose a problem in the near future.

(5) Electrical.

(a) East Alton Pump Station No. 1. If no action is taken on the electrical equipment there should not be any problems or decreased reliability due to the relatively young age (15 years) of the switchgear and other electrical equipment.

(b) East Alton Pump Station No. 2. If no action is taken on the electrical switchgear the reliability of this pump station will decrease rapidly in the near future. With the unavailability of spare parts, electrical equipment failures will cause greater downtime as individual components require replacement. A failure of the main circuit breaker would render both of the stormwater pumps useless until a replacement could be located and installed. Repairs would require a minimum of 7-10 days including removal and reinstallation of the equipment. Since this failure would most probably occur during a high water event the loss of a pump or motor would result would result in localized flooding in the drainage area served by this pump station.

(c) Wood River Pump Station. If no action is taken on the electrical switchgear the reliability of this pump station will decrease rapidly in the near future. With the unavailability of spare parts, electrical equipment failures will cause greater downtime as individual components require replacement. A failure of the main circuit breaker would render all of the stormwater pumps useless until replacement equipment could be located and installed. Repairs would require a minimum of 7-10 days including removal and reinstallation of the equipment. Since this failure would most probably occur during a high water event the loss of a pump or motor would result in the back up of sanitary sewer lines in the City of Wood River and if coupled with an interior rain event it would result in localized flooding in the drainage area served by this pump station.

(d) Rand Ave. Pump Station. If no action is taken on the electrical switchgear the reliability of this pump station will decrease rapidly in the near future. With the unavailability of spare parts, electrical equipment failures will cause greater downtime as individual components require replacement. A failure of the main circuit breaker would render the stormwater pumps useless until a replacement could be located and installed. Repairs would require a minimum of 7-10 days including removal and reinstallation of the equipment. Since this failure would most probably occur during a high water event the loss of a pump or motor would result in the back up of sanitary sewer lines in the City of Roxana, the shut down of Conoco-Phillips, and if coupled with an interior rain event it would result in localized flooding in the drainage area served by this pump station.

(e) Hawthorne Street Pump Station. If no action is taken on the electrical switchgear the reliability of this pump station will decrease rapidly in the near future. With the unavailability of spare parts, electrical equipment failures will cause greater downtime as individual components require replacement. A failure of the main circuit breaker would render both of the stormwater pumps useless until a replacement could be located and installed. Repairs would require a minimum of 7-10 days including removal and reinstallation of the equipment. Since this failure would most probably occur during a high water event the loss of a pump or motor would result in the back up of sanitary sewer lines in the City of Hartford and if coupled with an interior rain event it would result in localized flooding in the drainage area served by this pump station.

(f) Lakeside Pump Station. If no action is taken on the motor control center and main breaker the reliability of this pump station will decrease rapidly in the near future. With the unavailability of spare parts, electrical equipment failures will cause greater downtime as individual components require replacement. A failure of the motor starter or main circuit breaker would render the stormwater pump useless until a replacement could be located and installed. Repairs would require a minimum of 7-10 days including removal and reinstallation of the equipment. Since this failure would most probably occur during a high water event the loss of a pump or motor if coupled with an interior rain event it would result in localized flooding in the drainage area served by this pump station.

(g) Homegarden Pump Station. If no action is taken on the motor control center and main breaker the reliability of this pump station will decrease rapidly in the near future. With the unavailability of spare parts, electrical equipment failures will cause greater downtime as individual components require replacement. A failure of the motor starter or main circuit breaker would render the stormwater pump useless until a replacement could be located and installed. Repairs would require a minimum of 7-10 days including removal and reinstallation of the equipment. Since this failure would most probably occur during a high water event the loss of a pump or motor if coupled with an interior rain event it would result in localized flooding in the drainage area served by this pump station.

(6) Miscellaneous Equipment. If no action is taken on the various types of equipment at the older pump stations there will be no immediate result except that the reliability of this equipment will continue to decrease over time. Failure of this equipment will make maintenance at the pump stations increasingly difficult. Failure of a ventilator will require the levee district to bring in portable ventilators in order to do any type of maintenance or pump repairs in the sump. In the case of the East Alton Pump Station No.1 trash rake the result of no action will be that trash and debris that enters the inlet channel will need to be manually removed. With the height of the station operating deck above the forebay water levels this presents work that is extremely difficult to perform safely. If trash and debris clogs up the trash racks the station will not be able to operate correctly.

b. Reconstruction.

(1) Gravity Drains.

(a) Wood River Pump Station. There are two alternatives for reconstruction of the existing 72-inch and 84-inch concrete gravity drain pipes. The first would be to line the pipes with HDPE

pipe similar to that used at the East Alton No. 1 and East Alton No. 2 Pump Stations. The second would be to have each of the pipes lined with Insituform. While this option was not viable for the CMP drains throughout Wood River it would be viable for these concrete pipes since they are structurally sound.

(b) Rand Avenue Pump Station. There are two alternatives for reconstruction of the existing 24-inch and 36-inch cast iron gravity drain pipes. The first would be to line the pipes with HDPE pipe similar to that used at the East Alton No. 1 and East Alton No. 2 Pump Stations. The second would be to have each of the pipes lined with Insituform. While this option was not viable for the CMP drains throughout Wood River it would be viable for these cast iron pipes if they are structurally sound. Camera inspections of these pipes during design of the project will determine the condition of these pipes.

(c) Hawthorne Street Pump Station. There is only one alternative for reconstruction of the existing 48" x 48" box culvert gravity drain. The box culvert would need to be dewatered to allow work crews into the culvert to inspect and/or repair the joints and any other area that has been damaged.

(2) Pump Station Structures.

(a) East Alton Pump Station No. 2. Structural reconstruction of this pump station would consist of replacement of the trashrack, grating, roofing and ladders and tuckpointing the mortar joints. The existing steel trashrack would be removed and replaced with a new galvanized steel trashrack. The existing steel grating would be removed and replaced with new fiberglass grating. The existing roof would be replaced with a new built-up roofing system mopped with gravel. The existing steel ladders would be replaced with new fiberglass ladders. Both the exterior and interior brick mortar joints would be ground clean and tuckpointed. These actions will bring the structural condition of this station up to a more acceptable standard.

(b) Wood River Pump Station. Structural reconstruction of this pump station would consist of replacement of the grating, chain link fence, roofing, ladders and discharge chamber embedded metals and tuckpointing the mortar joints. The existing steel grating would be removed and replaced with new fiberglass grating. The existing chain link fence would be removed and replaced with a new galvanized chain link fence. The existing roof would be replaced with a new built-up roofing system mopped with gravel. The existing steel ladders would be replaced with new fiberglass ladders. Both the exterior and interior brick mortar joints would be ground clean and tuckpointed. These actions will bring the structural condition of this station up to a more acceptable standard.

(c) Rand Avenue Pump Station. Structural reconstruction of this pump station would consist of replacement of the grating, chain link fence, roofing and ladders and tuckpointing the mortar joints. The existing steel grating would be removed and replaced with new fiberglass grating. The existing chain link fence would be removed and replaced with a new galvanized chain link fence. The existing roof would be replaced with a new built-up roofing system mopped with gravel. The existing steel ladders would be replaced with new fiberglass ladders. Both the exterior and interior brick mortar joints would be ground clean and tuckpointed. These actions will bring the structural condition of this station up to a more acceptable standard.

(d) Hawthorne Street Pump Station. Structural reconstruction of this pump station would consist of replacement of the grating, roofing and ladders and tuckpointing the mortar joints. The existing steel grating would be removed and replaced with new fiberglass grating. The existing roof would be replaced with a new built-up roofing system mopped with gravel. The existing steel ladders would be replaced with new fiberglass ladders. Both the exterior and interior brick mortar joints would be ground clean and tuckpointed. These actions will bring the structural condition of this station up to a more acceptable standard.

(e) Lakeside Pump Station. Structural reconstruction of this pump station would consist of replacement of the grating and the sheet metal roof. The existing steel grating would be removed and replaced with new fiberglass grating. The existing sheet metal roof material would be removed and

replaced with a new sheet metal roof. These actions will bring the structural condition of this station up to a more acceptable standard.

(f) Homegarden Pump Station. Structural reconstruction of this pump station would consist of replacement of the grating and the sheet metal roof. The existing steel grating would be removed and replaced with new fiberglass grating. The existing sheet metal roof material would be removed and replaced with a new sheet metal roof. These actions will bring the structural condition of this station up to a more acceptable standard.

(3) Pumps and Motors.

(a) East Alton Pump Station No. 1. Reconstruction of the stormwater pumps will begin with the removal, disassembly, blast cleaning and complete inspection of each pump. The following items will be replaced – all shafts, shaft couplings, bearings, bearing sleeves, lubrication piping. Any other items shown by the inspection to be badly damaged or worn would also be replaced. The impeller will be rebuilt to original dimensions and both statically and dynamically balanced. The impeller bowl will be checked for cavitation damage and if there is damage a removable insert will be fabricated into the bowl. All flange fits will be checked and if out of tolerance the fits will be rebuilt. The entire pump will be recoated. The pumps will then be reinstalled at the pump station. Reconstruction of the vertical electric motors will begin with removal of, disassembly and inspection of each motor. The stator and rotor will be rewound and new insulation placed on the windings. New thrust and guide bearings will also be installed. The motors will then be reinstalled in the pump station.

(b) East Alton Pump Station No. 2. Reconstruction of the stormwater pumps will begin with the removal, disassembly, blast cleaning and complete inspection of each pump. The following items will be replaced – all shafts, shaft couplings, bearings, bearing sleeves, lubrication piping. Any other items shown by the inspection to be badly damaged or worn would also be replaced. The impeller will be rebuilt to original dimensions and both statically and dynamically balanced. The impeller bowl will be checked for cavitation damage and if there is damage a removable insert will be fabricated into the bowl. All flange fits will be checked and if out of tolerance the fits will be rebuilt. The entire pump will be recoated. The pumps will then be reinstalled at the pump station. Reconstruction of the vertical electric motors will begin with removal of, disassembly and inspection of each motor. The stator and rotor will be rewound and new insulation placed on the windings. New thrust and guide bearings will also be installed. Winding heaters will be added to the motors. The motors will then be reinstalled in the pump station.

(c) Wood River Pump Station. Reconstruction of the vertical stormwater pumps will begin with the removal, disassembly, blast cleaning and complete inspection of each pump. The following items will be replaced – all shafts, shaft couplings, bearings, bearing sleeves, lubrication piping. Any other items shown by the inspection to be badly damaged or worn would also be replaced. The impeller will be rebuilt to original dimensions and both statically and dynamically balanced. The impeller bowl will be checked for cavitation damage and if there is damage a removable insert will be fabricated into the bowl. All flange fits will be checked and if out of tolerance the fits will be rebuilt. The entire pump will be recoated. The pumps will then be reinstalled at the pump station. Reconstruction of the centrifugal baseflow pump will consist of removal, disassembly, blast cleaning and complete inspection of the pump. All bearings and shafting will be replaced. The impeller will be completely rebuilt. The impeller wear ring will also be replaced. The pump will be recoated and installed back into the pump station. Reconstruction of the vertical electric motors will begin with removal of, disassembly and inspection of each motor. The stator and rotor will be rewound and new insulation placed on the windings. New thrust and guide bearings will also be installed. Winding heaters will be added to the motors. The motors will then be reinstalled in the pump station.

(d) Rand Avenue Pump Station. With the pumps all being less than 10 years old the alternative of pump reconstruction was not investigated at this station. Reconstruction of the one original vertical electric motor will begin with removal of, disassembly and inspection of the motor. The stator and rotor will be rewound and new insulation placed on the windings. New thrust and guide bearings will also

be installed. Winding heaters will be added to the motor. The motor will then be reinstalled in the pump station.

(e) Hawthorne Street Pump Station. Reconstruction of the vertical stormwater pumps will begin with the removal, disassembly, blast cleaning and complete inspection of each pump. The following items will be replaced – all shafts, shaft couplings, bearings, bearing sleeves, lubrication piping. Any other items shown by the inspection to be badly damaged or worn would also be replaced. The impeller will be rebuilt to original dimensions and both statically and dynamically balanced. The impeller bowl will be checked for cavitation damage and if there is damage a removable insert will be fabricated into the bowl. All flange fits will be checked and if out of tolerance the fits will be rebuilt. The entire pump will be recoated. The pumps will then be reinstalled at the pump station. Reconstruction of the vertical electric motors will begin with removal of, disassembly and inspection of each motor. The stator and rotor will be rewound and new insulation placed on the windings. New thrust and guide bearings will also be installed. Winding heaters will be added to the motor. The motors will then be reinstalled in the pump station.

(f) Lakeside Pump Station. Reconstruction of the vertical stormwater pump will begin with the removal, disassembly, blast cleaning and complete inspection of the pump. The following items will be replaced – all shafts, shaft couplings, bearings, bearing sleeves, lubrication piping. Any other items shown by the inspection to be badly damaged or worn would also be replaced. The impeller will be rebuilt to original dimensions and both statically and dynamically balanced. The impeller bowl will be checked for cavitation damage and if there is damage a removable insert will be fabricated into the bowl. All flange fits will be checked and if out of tolerance the fits will be rebuilt. The entire pump will be recoated. The pump will then be reinstalled at the pump station. Reconstruction of the vertical electric motor will begin with removal of, disassembly and inspection of the motor. The stator and rotor will be rewound and new insulation placed on the windings. New thrust and guide bearings will also be installed. Winding heaters will be added to the motor. The motor will then be reinstalled in the pump station.

(g) Homegarden Pump Station. Reconstruction of the vertical stormwater pump will begin with the removal, disassembly, blast cleaning and complete inspection of the pump. The following items will be replaced – all shafts, shaft couplings, bearings, bearing sleeves, lubrication piping. Any other items shown by the inspection to be badly damaged or worn would also be replaced. The impeller will be rebuilt to original dimensions and both statically and dynamically balanced. The impeller bowl will be checked for cavitation damage and if there is damage a removable insert will be fabricated into the bowl. All flange fits will be checked and if out of tolerance the fits will be rebuilt. The entire pump will be recoated. The pump will then be reinstalled at the pump station. Reconstruction of the vertical electric motor will begin with removal of, disassembly and inspection of the motor. The stator and rotor will be rewound and new insulation placed on the windings. New thrust and guide bearings will also be installed. Winding heaters will be added to the motor. The motor will then be reinstalled in the pump station.

(4) Sluice Gates and Flap Gates.

(a) East Alton Pump Station No. 1. Reconstruction of the five sluice gates at the pump station itself would consist of removal of the slides, gate frames, stems and electric motor actuated gate hoists. The slide and frame would be sand blasted, inspected and recoated. The bronze seals along the slide and frame would be inspected and cleaned. Any damaged wedges would be replaced and all other wedges adjusted. The stems would be cleaned and the stem nut inspected for signs of any unusual wear. The motor actuated gear hoist would have all lubricated gearbox components cleaned and lubricated. The motor would be cleaned and inspected. The sluice gate slides and frames would be completely recoated. The sluice gates and motor actuated gate hoists would then be reinstalled and all limit switches reset. Reconstruction of the two emergency closure sluice gates would consist of removal of the gate hoist, stem and gate slide and frame. The gate slide and frame would be sand blasted, inspected for cracks or other significant damage and then recoated. The bronze seals along the gate slide and frame would be inspected and cleaned. The fasteners on the adjustable wedges would be replaced. The frame and gate slide would be reinstalled with new anchors and fasteners. The gate hoist would be completely disassembled, cleaned, inspected for damage and reassembled with new bearings. The gate stem would be cleaned and then

inspected for damage or severe wear. Reconstruction of the pump discharge flap gates would consist of removal of the flap gate and frame. The flap and frame would be sand blasted, inspected for cracks or other significant damage and then recoated. New hinge bushings would be installed and the flap gates reinstalled.

(b) East Alton Pump Station No. 2. Reconstruction of the three sluice gates would consist of removal of the gate hoist, stem and gate slide and frame. The gate slide and frame would be sand blasted, inspected for cracks or other significant damage and then recoated. The bronze seals along the gate slide and frame would be inspected and cleaned. The fasteners on the adjustable wedges would be replaced. The frame and gate slide would be reinstalled with new anchors and fasteners. The gate hoist would be completely disassembled, cleaned, inspected for damage and reassembled with new bearings. The gate stem would be cleaned and then inspected for damage or severe wear.

(c) Wood River Pump Station. Reconstruction of the sluice gates would consist of removal of each gate hoist, stem and gate slide and frame. The gate slide and frame would be sand blasted, inspected for cracks or other significant damage and then recoated. The bronze seals along the gate slide and frame would be inspected and cleaned. The fasteners on the adjustable wedges would be replaced. The frame and gate slide would be reinstalled with new anchors and fasteners. The gate hoist would be completely disassembled, cleaned, inspected for damage and reassembled with new bearings. The gate stem would be cleaned and then inspected for damage or severe wear. Reconstruction of the pump discharge flap gates would consist of removal of the flap and frame including all hinges and links. The flap and gate frame would be sand blasted, inspected for cracks or other significant damage and then recoated. All seal surfaces would be cleaned. New hinge bushings would be installed and the flap gates reinstalled.

(d) Rand Avenue Pump Station. Reconstruction of the six sluice gates would consist of removal of each gate hoist, stem and gate slide and frame. The gate slide and frame would be sand blasted, inspected for cracks or other significant damage and then recoated. The bronze seals along the gate slide and frame would be inspected and cleaned. The fasteners on the adjustable wedges would be replaced. The frame and gate slide would be reinstalled with new anchors and fasteners. The gate hoist would be completely disassembled, cleaned, inspected for damage and reassembled with new bearings. The gate stem would be cleaned and then inspected for damage or severe wear. Reconstruction of the pump discharge flap gates would consist of removal of the flap and frame including all hinges and links. The flap and gate frame would be sand blasted, inspected for cracks or other significant damage and then recoated. All seal surfaces would be cleaned. New hinge bushings would be installed and the flap gates reinstalled.

(e) Hawthorne Street Pump Station. Reconstruction of the three sluice gates would consist of removal of each gate hoist, stem and gate slide and frame. The gate slide and frame would be sand blasted, inspected for cracks or other significant damage and then recoated. The bronze seals along the gate slide and frame would be inspected and cleaned. The fasteners on the adjustable wedges would be replaced. The frame and gate slide would be reinstalled with new anchors and fasteners. The gate hoist would be completely disassembled, cleaned, inspected for damage and reassembled with new bearings. The gate stem would be cleaned and then inspected for damage or severe wear. Reconstruction of the pump discharge flap gates would consist of removal of the flap and frame including all hinges and links. The flap and gate frame would be sand blasted, inspected for cracks or other significant damage and then recoated. All seal surfaces would be cleaned. New hinge bushings would be installed and the flap gates reinstalled.

(5) Electrical. Given the nature of electrical equipment, reconstruction of the switchgear will require the replacement of the individual components. With the age of this switchgear approaching 50 years parts availability is not a certainty. This makes it much more cost effective to replace the switchgear rather than rehabilitate it.

(6) Miscellaneous Equipment. Reconstruction of equipment such as ventilators, sump pumps, overhead cranes is not feasible as parts for equipment 50+ years old is virtually impossible. For the trash raking equipment at the East Alton Pump Station No. 1 the original manufacturer is no longer in the

trash rake business and has been unwilling to assist is making repairs to the equipment. With the unique nature of this equipment this make it virtually impossible to consider reconstruction.

c. Replacement.

(1) Gravity Drains. Replacement of the gravity drains associated with the pump stations was not considered a viable alternative. The drains at East Alton No. 1 and East Alton No. 2 Pump Stations were lined with HDPE pipe and are therefore in no need of repair, reconstruction or replacement. The drains at Wood River, Rand Avenue and Hawthorne Street Pump Stations cross under Illinois Route 3 and the mainline levee. At the Wood River and Rand Avenue Pump Stations there is effluent continuously in one of the gravity drain lines. Therefore it was determined that any type of replacement would be cost prohibitive and this alternative was no longer pursued.

(2) Pump Station Structures. Replacement of the pump station structures was not considered a viable option. The existing pump station structures are in good condition in terms of the condition of the existing concrete and masonry structures. In addition there is no alternative locations for the pump stations at any of the sites. Therefore it was determined that any replacement of the pump station structure would be cost prohibitive and this alternative was no longer pursued.

(3) Pumps and Motors.

(a) East Alton Pump Station No. 1. With the age of these pumps and motors being less than 15 years the option of replacing them was never considered.

(b) East Alton Pump Station No. 2. There were two options studied for replacement of the existing pumps. The first option was to replace the two stormwater pumps with similar type vertical line-shaft pumps. These pumps would be designed to meet current COE design criteria for pumps of this type. The second option was to replace the pumps with submersible pumps. With this option the complete pump and motor would be replaced with a fabricated vertical discharge tube with a submersible axial flow pump installed in the tube. The discharge tube would be fabricated so that the discharge elbow was aligned with the existing discharge pipe that's embedded in the wall.

(c) Wood River Pump Station. There were two options studied for replacement of the two existing 30-inch pumps. The first option was to replace these two pumps with similar type vertical line-shaft pumps. These pumps would be designed to meet current COE design criteria for pumps of this type. The second option was to replace the pumps with submersible pumps. With this option the complete pump and motor would be replaced with a fabricated vertical discharge tube with a submersible axial flow pump installed in the tube. The discharge tube would be fabricated so that the discharge elbow was aligned with the existing discharge pipe that's embedded in the wall. The only option that was available for replacing the three 42-inch pumps was to replace these pumps with similar type vertical line-shaft pumps. The only option that was considered for the baseflow pump was to replace this pump with a submersible centrifugal pump. This would eliminate the complete existing pump and motor. During reconstruction of the pump stations as part of the Rehabilitation of the East St. Louis Flood Protection Project each baseflow pump was replaced with a submersible centrifugal pump. Pump station operators have been extremely satisfied with how these submersible pumps have operated.

(d) Rand Avenue Pump Station. With all three of the pumps having been replaced in the past eight years it was determined that pump replacement would not be considered for this pump station.

(e) Hawthorne Street Pump Station. There were two options studied for replacement of the two existing stormwater pumps. The first option was to replace these pumps with similar type vertical line-shaft pumps. These pumps would be designed to meet current COE design criteria for pumps of this type. The second option was to replace the pumps with submersible pumps. With this option the complete pump and motor would be replaced with a fabricated vertical discharge tube with a submersible axial flow pump installed in the tube. The discharge tube would be fabricated so that the discharge elbow

was aligned with the existing discharge pipe that's embedded in the wall. The only option that was considered for the baseflow pump was to replace this pump with a submersible centrifugal pump. This would eliminate the complete existing pump and motor. During reconstruction of the pump stations as part of the Rehabilitation of the East St. Louis Flood Protection Project each baseflow pump was replaced with a submersible centrifugal pump. Pump station operators have been extremely satisfied with how these submersible pumps have operated.

(f) Lakeside Pump Station. There were two options studied for replacement of the existing stormwater pump. The first option was to replace this pump with a similar type vertical line-shaft pump. This pump would be designed to meet current COE design criteria for a pump of this type. The second option was to replace the pump with a submersible pump. With this option the complete pump and motor would be replaced with a fabricated vertical discharge tube with a submersible axial flow pump installed in the tube. The discharge tube would be fabricated so that the discharge elbow was aligned with the existing discharge pipe that's embedded in the wall.

(g) Homegarden Pump Station. There were two options studied for replacement of the existing stormwater pump. The first option was to replace this pump with a similar type vertical line-shaft pump. This pump would be designed to meet current COE design criteria for a pump of this type. The second option was to replace the pump with a submersible pump. With this option the complete pump and motor would be replaced with a fabricated vertical discharge tube with a submersible axial flow pump installed in the tube. The discharge tube would be fabricated so that the discharge elbow was aligned with the existing discharge pipe that's embedded in the wall.

(4) Sluice Gates and Flap Gates.

(a) East Alton Pump Station No. 1. With the sluice gates and flap gates being less than 15 years of age and the typical design life of equipment like this being 40+ years it was determined that complete replacement of the sluice gates and flap gates would not be considered for this study.

(b) East Alton Pump Station. The three existing sluice gates would be replaced with similar type cast iron sluice gates and would be provided with stainless steel stems. There were two options considered for the replacement of the existing gate hoists. The first option was to replace with a similarly designed manually operated geared hoist. The second option was to replace with an electric motor actuated gate hoist provided with a complete of position and torque limit switches. This option would require electric power to be provided to the location of each gate hoist.

(c) Wood River Pump Station. All of the existing sluice gates would be replaced with similar type cast iron sluice gates and would be provided with stainless steel stems. There were two options considered for the replacement of the existing gate hoists. The first option was to replace with a similarly designed manually operated geared hoist. The second option was to replace with an electric motor actuated gate hoist provided with a complete of position and torque limit switches. This option would require electric power to be provided to the location of each gate hoist. There were two options considered for replacement of the existing pump discharge flap gates. The first option was to replace with similarly designed cast iron flap gates. The second option was to replace with a rubber "Tideflex" duck-bill type check valve as manufactured by the Red Valve Co.

(d) Rand Avenue Pump Station. The six existing sluice gates would be replaced with similar type cast iron sluice gates and would be provided with stainless steel stems. There were two options considered for the replacement of the existing gate hoists. The first option was to replace with a similarly designed manually operated geared hoist. The second option was to replace with an electric motor actuated gate hoist provided with a complete of position and torque limit switches. This option would require electric power to be provided to the location of each gate hoist. There were two options considered for replacement of the existing pump discharge flap gates. The first option was to replace with similarly designed cast iron flap gates. The second option was to replace with a rubber "Tideflex" duck-bill type check valve as manufactured by the Red Valve Co.

(e) Hawthorne Street Pump Station. The two existing sluice gates would be replaced with similar type cast iron sluice gates and would be provided with stainless steel stems. There were two options considered for the replacement of the existing gate hoists. The first option was to replace with a similarly designed manually operated geared hoist. The second option was to replace with an electric motor actuated gate hoist provided with a complete of position and torque limit switches. This option would require electric power to be provided to the location of each gate hoist. There were two options considered for replacement of the existing pump discharge flap gates. The first option was to replace with similarly designed cast iron flap gates. The second option was to replace with a rubber "TideFlex" duckbill type check valve as manufactured by the Red Valve Co.

(5) Electrical. The existing switchgear would be replaced with a motor control center. With trash and other debris interfering with the operation of the float control in many of the stations the existing float control device would be replaced with a device using radar or sonar level measurement. To reduce operation costs, a lighting transformer fed from the MCC would be installed to eliminate the 120/208-volt service from the utility. The lighting panelboard and other wiring devices will also be replaced.

(6) Miscellaneous Equipment. Replacement of the miscellaneous equipment at the pump stations is fairly simple. Equipment of similar size would be installed in the existing openings and spaces. For the trash raking equipment at the East Alton Pump Station No. 1 an investigation would take place on which type of trash raking equipment to install utilizing the existing configuration of the concrete structure. There are many options in this regard and the selection would be made on the basis of cost, ease of operation, reliability and ease of maintenance.

4.03 Recommended Plan.

a. Gravity Drains.

(1) Wood River Pump Station. The recommended plan is to not take any action with the two concrete gravity drains.

(2) Rand Avenue Pump Station. The recommended plan is to conduct a camera inspection of both cast iron pipe gravity drains. If the inspection indicates severe corrosion in the pipes it will be recommended that the pipes be lined with HDPE pipes.

(3) Hawthorne Street Pump Station. The recommended plan is to conduct a camera inspection of the concrete box culvert. If the inspection indicates that repairs are needed the recommended plan will be to dewater the box culvert and have a work crew enter the culvert and repair the joints or any other areas where problems exist.

b. Pump Station Structures.

(1) East Alton Pump Station No. 2. The recommended plan is to rehabilitate the pump station by replacement of the trashrack, grating, roofing and ladders and tuckpointing the mortar joints. This action will leave the system in overall better condition allowing a comprehensive plan to be developed for future maintenance, repair and rehabilitation by the local sponsor.

(2) Wood River Pump Station. The recommended plan is to rehabilitate the pump station by replacement of the grating, chain link fence, roofing, ladders and discharge chamber embedded metals and tuckpointing the mortar joints. This action will leave the system in overall better condition allowing a comprehensive plan to be developed for future maintenance, repair and rehabilitation by the local sponsor.

(3) Rand Avenue Pump Station. The recommended plan is to rehabilitate the pump station by replacement of the grating, chain link fence, roofing and ladders and tuckpointing the mortar joints.

This action will leave the system in overall better condition allowing a comprehensive plan to be developed for future maintenance, repair and rehabilitation by the local sponsor.

(4) Hawthorne Street Pump Station. The recommended plan is to rehabilitate the pump station by replacement of the grating, roofing and ladders and tuckpointing the mortar joints. This action will leave the system in overall better condition allowing a comprehensive plan to be developed for future maintenance, repair and rehabilitation by the local sponsor.

(5) Lakeside Pump Station. The recommended plan is to rehabilitate the pump station by replacement of the grating and sheet metal roof. This action will leave the system in overall better condition allowing a comprehensive plan to be developed for future maintenance, repair and rehabilitation by the local sponsor.

(6) Homegarden Pump Station. The recommended plan is to rehabilitate the pump station by replacement of the grating and sheet metal roof. This action will leave the system in overall better condition allowing a comprehensive plan to be developed for future maintenance, repair and rehabilitation by the local sponsor.

c. Pumps and Motors.

(1) East Alton Pump Station No. 1. The recommended plan is to reconstruct the two stormwater pumps that have never been worked on as described in paragraph 4.02b(3)(a). No replacement work is recommended for the electric motors.

(2) East Alton Pump Station No. 2. The recommended plan is to reconstruct both of the stormwater pumps and their associated electric motors as described in paragraph 4.02b(3)(b).

(3) Wood River Pump Station. The recommended plan for the vertical stormwater pumps is to reconstruct the pumps and their associated electric motors as described in paragraph 4.02b(3)(c). The recommended plan for the baseflow pump is to replace this pump with a submersible centrifugal pump.

(4) Rand Avenue Pump Station. The recommended plan for this pump station is to reconstruct the one remaining original vertical electric motor as described in 4.02b(3)(d).

(5) Hawthorne Street Pump Station. The recommended plan is to reconstruct both of the stormwater pumps and their associated electric motors as described in paragraph 4.02b(3)(e).

(6) Lakeside Pump Station. The recommended plan is to replace the existing vertical pump with a pump of similar design and to reconstruct the vertical electric motor as described in 4.02b(3)(f).

(7) Homegarden Pump Station. The recommended plan is to replace the existing vertical pump with a pump of similar design and to reconstruct the vertical electric motor as described in 4.02b(3)(g).

d. Sluice Gates and Flap Gates.

(1) East Alton Pump Station No. 1. With the age of the pump station sluice gates, gate hoists and flap gates less than 15 year old it is recommended that no action be taken on this equipment. It is recommended that the emergency closure sluice gates be reconstructed as described in paragraph 4.02b(4)(a).

(2) East Alton Pump Station No. 2. It is recommended that a combination of reconstruction and replacement be used for each of the three sluice gates at this pump station. It is recommended that the gate slide and frame be reconstructed as discussed in paragraph 4.02b(4)(b), the gate

stem and stem guides be replaced and the existing manual operated gate hoists be replaced with electric motor actuated gate hoists as discussed in 4.02c(4)(b).

(3) Wood River Pump Station. With the way the pump station is now operated there are seven of the sluice gates that are recommended for a combination of reconstruction and replacement under this study. The first is the 84" x 84" gravity drain sluice gate located in the pump station discharge chamber. For this sluice gate the recommendation is to reconstruct the sluice gate slide and frame as discussed in paragraph 4.02b(4)(c), the gate stem and stem guides be replaced and the existing manual operated gate hoist replaced with an electric motor actuated gate hoist as discussed in paragraph 4.02c(4)(c). The second sluice gate is the 84" x 84" emergency closure sluice gate located in the riverside emergency gatewell. For this sluice gate the recommendation is to reconstruct the sluice gate slide and frame as discussed in paragraph 4.02b(4)(c), the gate stem and stem guides be replaced and the existing manual operated gate hoist replaced with a similarly designed manually operated gate hoist as discussed in paragraph 4.02c(4)(c). The third and fourth sluice gates are the 72" x 72" gravity drain sluice gate located in the pump station discharge chamber and the 72" x 72" emergency closure sluice gate located in the riverside emergency gatewell. For these two sluice gates the recommendation is to reconstruct the sluice gate slide and frame as discussed in paragraph 4.02b(4)(c), the gate stem and stem guides be replaced and the existing manual operated gate hoist replaced with a similarly designed manually operated gate hoist as discussed in paragraph 4.02c(4)(c). The remaining three sluice gates are the 60" x 60" sluice gate located at the entrance to the pump station sump. For these sluice gates the recommendation is to reconstruct the sluice gate slide and frame as discussed in paragraph 4.02b(4)(c), the gate stem and stem guides be replaced and the existing manual operated gate hoist replaced with an electric motor actuated gate hoist as discussed in paragraph 4.02c(4)(c). Concerning the remaining sluice gates the following reasons are given for not doing any work on them. The two sluice gate separating the pump station from the ponding area to the north are usually not operated and the two sluice gates at the end of the sewers in the pump station forebay are used for maintenance purposes only. For the pump discharge flap gates it is recommended that the flap gates be replaced with "TideFlex" duckbill-type rubber check valves as discussed in 4.02c(4)(c).

(4) Rand Avenue Pump Station. It is recommended that a combination of reconstruction and replacement be used for each of the six sluice gates at this pump station. The first two sluice gates are the 36" x 36" gravity drain sluice gate sluice gate located in the pump station discharge chamber and the 36" x 36" sluice gate located in the pump station forebay. For these sluice gates the recommendation is to reconstruct the sluice gate slide and frame as discussed in paragraph 4.02b(4)(d), the gate stem and stem guides be replaced and the existing manual operated gate hoist replaced with an electric motor actuated gate hoist as discussed in paragraph 4.02c(4)(d). The remaining sluice gates are the 36" x 36" emergency closure sluice gate located in the riverside emergency gatewell, the 24" x 24" gravity drain sluice gate in the pump station discharge chamber, the 24" x 24" emergency closure sluice gate located in the riverside emergency gatewell and the 24" x 24" sluice gate located in the pump station forebay. Since these sluice gates are infrequently operated the recommendation is to reconstruct the sluice gate slide and frame as discussed in paragraph 4.02b(4)(d), the gate stem and stem guides be replaced and the existing manual operated gate hoist replaced with a similarly designed manually operated gate hoist as discussed in paragraph 4.02c(4)(d). For the pump discharge flap gates it is recommended that the flap gates be reconstructed as discussed in 4.02b(4)(c).

(5) Hawthorne Street Pump Station. It is recommended that a combination of reconstruction and replacement be used for each of the two sluice gates at this pump station. The first sluice gate is the 48" x 48" sluice gate at the entrance to the pump station sump. It is recommended to reconstruct the sluice gate slide and frame as discussed in paragraph 4.02b(4)(e), the gate stem and stem guides be replaced and the existing manual operated gate hoist replaced with an electric motor actuated gate hoist as discussed in paragraph 4.02c(4)(e). The second sluice gate is the 48" x 48" emergency closure sluice gate located in the riverside emergency gatewell. For this sluice gate the recommendation is to reconstruct the sluice gate slide and frame as discussed in paragraph 4.02b(4)(e), the gate stem and stem guides be replaced and the existing manual operated gate hoist replaced with a similarly designed manually operated gate hoist as discussed in paragraph 4.02c(4)(e).

e. Electrical. The following recommended plan is applicable to each of the pump stations with the exception of the East Alton Pump Station No. 1. Since this pump station contains modern electrical equipment it is not in need of any type or electrical reconstruction or replacement. The recommended plan for the remaining pump stations is to replace the switchgear in each of the pump stations with a Motor Control Center (MCC). In addition the existing float controls would be replaced with a device using radar or sonar level measurement. Lighting transformers fed from the MCC will be installed to eliminate the 120/208-volt service from the utility. The lighting panelboard and other wiring devices will also be completely replaced.

f. Miscellaneous Equipment. The recommended plan is to completely replace the trash raking equipment at the East Alton Pump Station No. 1. The type of trash rake would be determined after analysis of the various types available. Every effort will be made to not require or minimize the amount of structural revisions required by the new equipment. For the remaining pump stations the only recommendation is to add electric unit heaters to the Wood River, Rand Ave., Hawthorne and East Alton No. 2 Pump Stations. These unit heaters will allow for maintenance to be performed throughout the year on the switchgear, pumps and motors.

4.04 Probability of Unsatisfactory Performance Under the No Action Alternative The mechanical reliability assessment is based upon the procedures defined in ETL 1110-2-560, Engineering and Design, RELIABILITY ANALYSIS OF NAVIGATIONAL LOCK AND DAM MECHANICAL AND ELECTRICAL EQUIPMENT, 30 June 2001. The pumping station mechanical equipment was analyzed with each pump, and associated equipment, treated as a subsystem of the pumping station. The overall reliability of the pumping station is determined as the series product of the reliabilities of the individual pumping units. The "mean time to failure" (MTTF) is the limit state that is based upon the operating time of the equipment. The Characteristic Life, Weibull Factor, Failure Rate and other primary factor data is determined from guidance in ETL 1110-2-560 with input from NPRD database for similar equipment.

Table 4 - Probability of Unsatisfactory Performance (PUP)

	Storm Water Pump No. 1 System Relliability 2008	Storm Water Pump No. 2 System Relliability 2008	Storm Water Pump No. 3 System Relliability 2008	Sewage Pump No. 1 System Relliability 2008	Sewage Pump No. 2 System Relliability 2008	Product of Relliabilities 2008	Probability of Unsatisfactory Performance 2008
East Alton No. 1 Pumping Station	0.8783	0.8783	0.8783			0.6775	0.3225
East Alton No. 2 Pumping Station	0.8783	0.8783		0.7653	0.7653	0.4518	0.5482
Wood River Pumping Station	0.8006	0.8006	0.8006	0.8006		0.4108	0.5892

Rand Pumping Station	0.8006	0.8006		0.8006		0.5132	0.4868
Hawthorne Pumping Station	0.8006	0.8006		0.8006		0.5132	0.4868
Lakeside Pumping Station	0.8006					0.8006	0.1994
Home Garden Pumping Station	0.8006					0.8006	0.1994

5. LEVEE UNDERSEEPAGE SUMMARY

5.01 Existing Conditions.

a. Existing Relief Wells. Approximately 160 relief wells were originally installed in the 1950's, thru 1960's. Additional wells were installed in the early 1980's around the East Alton Pump Station No. 1 which was built to replace the Old Alton Pump Station. During three nonconsecutive periods of time between January 1987 and December 1989, redevelopment procedures of the wells near the Old Alton Pump Station occurred. The redevelopment followed a three-phased approach. Phases I, II and III consisted of varying chemical redevelopment using trisodium phosphate (TSP), HTH (a disinfectant to reduce bacterial impact on the wells), and a Blended Chemical Heat Treatment (BCHT), which consisted of chlorine gas and high-temperature steam being injected into the wells. All three phases are profiled in the Repair, Evaluation, Maintenance, and Reconstruction Research (REMRR) Program Technical Report REMR-GT-16, November 1993. This report shows that this method of relief well re-development was very effective. Unfortunately there was no Corps program developed to undertake a comprehensive rehabilitation of relief wells across the Alton to Gale system based on this new information. During preparation of this report 50 wells were randomly selected to be pump tested under contract to ARDL of Mount Vernon, Illinois in order to gage the overall performance of all wells. This analysis indicated that it should be assumed that 80% of the wells in the Wood River system are not performing adequately and need some type of corrective action or replacement.

b. 1993 Flood. In 1993, the Wood River Levee System experienced its flood of record, estimated to be a 175-year event. In this time, certain portions of the levee experienced unexpected seepage problems that had to be handled on an emergency basis. Following is a description of the measures taken and their approximate location.

(1) Upper Wood River.

(a) Station 22+50 ± to 30+50 ±: This was an area where seepage occurred through the embankment. An 18-inch thick, 2-inch (minus) rock blanket was placed, approximately 450 ft. long by 20 ft. wide. Records do not indicate the exact location of this blanket.

(b) Station 32 ±: This is a railroad closure structure that experienced seepage. Records do not indicate whether the seepage was through the gates, through the ballast, etc. A 6-inch (minus) rock blanket was placed, approximately 60 ft. in length.

(c) Station 49 ± to 57 ±: Through seepage occurred here with some sloughing of embankment material. Records do not indicate the extent of sloughing.

(2) Lower Wood River.

(a) Station 160 to 165+: Area of sand boils. A rock dike was constructed to pond water, approximately 320 ft. long and 7 – 8 ft. high. A 12-inch thick crushed stone roadway was also placed, approximately 150 ft. long by 12 ft. wide. This is in the corner of the levee district, i.e., in the corner of the mouth of Wood River and the Mississippi River. As such, it is prone to seepage concentrations during high water. Also, the landside is a depressed area resulting in higher heads and increased tendency to seep. This area was to have been filled after the flood.

(b) Station 220 to 222+: A 1992 levee slide was monitored throughout the flood event, with no change occurring. Records do not indicate the size or exact location of this slide.

c. Levee Underseepage Design. The Wood River Levee District is divided into 3 main reaches: Upper Wood River, East and West Forks, and Lower Wood River.

No new boring data was determined to be necessary for this evaluation. All geotechnical data was obtained from TM 3-430, "Investigation of Underseepage, Mississippi River, Alton to Gale, Illinois". This document contains underseepage designs for the Upper and Lower Reaches of Wood River. The need for relief wells was based on methods described in the above reference. Relief well design was based on the method described in TM 3-424, "Investigation of Underseepage and Its Control, Lower Mississippi River Levees". Initial project criteria required relief wells when there was an allowable gradient of 0.67, or net allowable head (ha) between wells was equal to 0.67z (z = landside blanket thickness).

The current analysis used the same methods, but with an allowable gradient of 0.50, the current standard. In each of the main reaches, sub-reaches were identified based on stratigraphy, to determine the underseepage characteristics. These characteristics do not necessarily coincide with those identified in the original design. For these reasons, the number and distribution of relief wells do not precisely correlate with the original design. In each case, 2 historical events were evaluated: the 1993 flood, and the design flood.

(1) General Design Summary. The design for Wood River was accomplished in the 1950's. The need for positive underseepage relief measures were determined from guidance in "Investigation of Underseepage, Mississippi River Levees, Alton to Gale, Ill.", TM 3-430, Waterways Experiment Station, April, 1956.

This was a performance-based study of underseepage in Illinois levee districts from approximately Mississippi River Miles 203 to 46. Gradients and heads at the landside toe are based on an idealized section of levee (Figure 1).

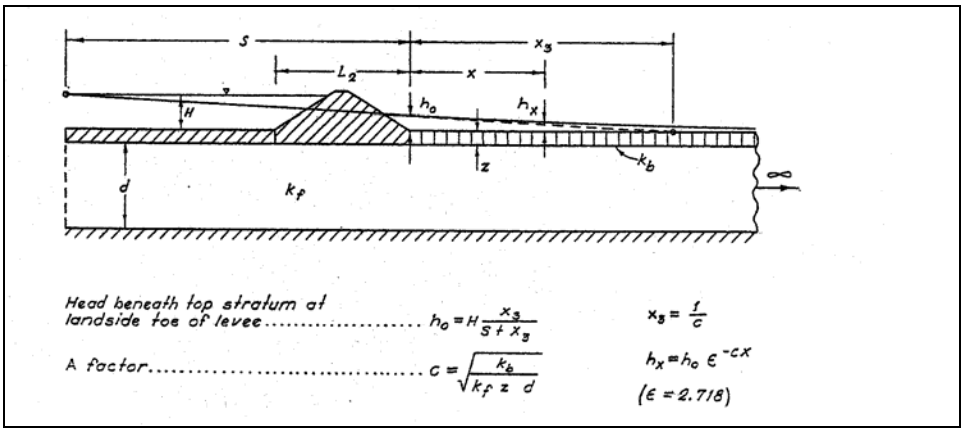


Figure 1: Generalized Cross Section of Levee Foundation and Symbols for Seepage Analysis

The main components of this idealized section are a top stratum or blanket, which is considered to be semi-pervious; an aquifer or pervious substratum that continues to an impervious base (e.g., rock); and an impervious section of levee. Flow is assumed to enter the pervious substratum at the riverbank, riverside borrow pits, or through the top stratum, and is further assumed to be horizontal and laminar; flow through the top stratum is assumed to be vertical and laminar. Of particular interest are the gradients created at the landside toe of the structure, whether it is a levee or floodwall. These are called exit gradients, and are defined as:

$$i_0 = \frac{h_0}{z}$$

Where h_o = the head at the levee toe
z = the effective thickness of the top stratum

These variables are functions of the net head on the levee (H); the vertical permeability (k_b) of the top stratum; the effective thickness (d) and horizontal permeability (k_f) of the pervious substratum; the ratio kf/kb; the distance (s) from the landside toe of the levee to the effective source of seepage; and the distance (x_3) from the landside toe to the effective seepage exit; and the critical gradient (i_c) through the top stratum at the landside toe. The critical gradient is that at which sand boils or heaving of the top stratum occurs, resulting in loss of foundation material, loss of shear strength, or loss of bearing capacity. It is defined as the ratio of the submerged unit weight of the top stratum to the unit weight of water:

$$i_c = \frac{\gamma'}{\gamma_w}$$

Typically the critical gradient for most fine-grained or sandy fine-grained soils is between 0.80 -0.85.

Few, if any, of the above variables can be determined with a substantial degree of accuracy. Even with piezometric data used in the investigation in TM 3-430, the numerical values were considered representative, or average, due to the extreme heterogeneity of the subsurface conditions. Because of this, an overall factor of safety is applied to the design of underseepage control measures.

The idealized levee section above represents a confined, or artesian condition wherein piezometric pressures beneath the top stratum could result in failure by piping or heave. Relief wells are designed to prevent these modes of failure. In the case of Wood River, if the exit gradient was above 0.67, relief wells were required. In the current analysis, relief wells or seepage berms are required if the exit gradient is above 0.50.

To accomplish this, relief wells must reduce uplift pressures to an acceptable, net allowable head, h_a, at the downstream toe, corresponding to an exit gradient of 0.5:

$$FS = \frac{i_c}{i_o} = \frac{\gamma' Z_t}{\gamma_w h_a}$$

$$h_a = \frac{i_c}{FS}(Z_t)$$

Where FS = factor of safety, usually 1.5
Z_t = transformed thickness of the top stratum

The transformed thickness is used to simplify computations in converting a multi-layered top stratum to a single equivalent layer.

Once an allowable head is determined, an iterative procedure is done to determine a well spacing (a) that will accomplish this goal. There are many methods to compute well spacing and flows, based on the type of seepage source, the arrangement of wells, percent penetration of the wells, type of seepage exit, and type of top stratum. For many levees, an appropriate assumption to make is that there is an infinite line source (the river), with an infinite line of wells parallel to the line source, and an infinitely long impervious top stratum.

Mathematical solutions for well flows and head midway between the wells for the typical assumption above were developed by Muskat (1937), and Middlebrooks and Jervis (1947), for the case of no head losses in the wells. These solutions are valid for both fully and partially penetrating wells.

The procedure was originally described in "Investigation of Underseepage and Its Control, Lower Mississippi River Levees", TM 3-424, Waterways Experiment Station, October, 1956, and updated in "Design, Construction, and Maintenance of Relief Wells", EM 1110-2-1914, U.S. Army Corps of Engineers, May, 1992. It begins by assuming no head losses in the well (H_w), and that the head midway between the wells (H_m) should equal the allowable net head, h_a. A well penetration is assumed for the first trial well spacing, and H_m is computed by:

$$H_m = \frac{(H_1 - h_w)\theta_m}{\frac{s}{a} + \theta_a}$$

Where H_1 = total head corresponding to the bottom of the well and the river stage
h_w = the head corresponding to the bottom of the well and the top stratum surface
s = the distance from the center of the well to the effective seepage source
θ_m = an average mid-well uplift factor
= $1/2\pi$ ln $a/\pi r_w$, where r_w = well radius
θ_a = average uplift factor = $1/2\pi$ ln $a/2\pi r_w$

Various trials of well spacing are used until $H_m = h_a$.

Well flows are next computed for the above well spacing and penetration by:

$$Q_w \frac{(H_1 - h_w)kD}{\frac{s}{a} + \theta_m}$$

Where k = horizontal permeability of the pervious foundation
D = thickness of the pervious foundation

Well dimensions are assumed, and hydraulic head losses in the well, H_w, are computed for the calculated flow. These must be added to the head midway between the wells, H_m, and a new iteration to determine an adjusted well spacing is made. The adjustment is made by substituting

$$h_m = H_m - H_w$$

into the equation above for H_m, and a new value of well spacing (a) is determined.

Well flows and well losses are re-calculated for the adjusted well spacing. This process is repeated until a reasonable degree of convergence for well spacing is obtained. The procedure described

is for fully penetrating wells; a similar one is used for partially penetrating wells, using a slightly different assumption for head between the wells.

This is obviously a tedious process, and before the advent of microcomputers, design tables were developed and used to compute well losses, head midway between wells, well spacing, and well flows based on idealized or average geotechnical characteristics of the levee. Today a spreadsheet can be used to do these calculations very quickly. Conroy (1984) has developed a spreadsheet for this purpose.

Based on the new evaluation there were some existing relief well reaches indicating additional wells were needed; other existing relief well reaches indicated no additional wells needed; and some non-relief well reaches where this evaluation concludes they are needed. Assumptions made during this evaluation will be verified during development of design documents. The requirements for new relief wells are summarized in the following paragraphs.

5.02 Alternatives.

a. No Action. No action could result in certain reaches of the levee system becoming unstable during high water events. Levee reaches that presented problems in 1993 will worsen while new reaches will present similar problems. Failure of any reach of levee will result in widespread and catastrophic flooding in the area protected by that levee system and could adversely impact downstream levee systems.

b. Reconstruction of Existing Relief Wells. Two alternatives were considered to correct the performance of existing relief wells in order to meet or exceed 80% of their original specific design capacity. These include well reconstruction and well replacement.

(1) Well Reconstruction is required when the relief well evaluation indicates significant deterioration since installation. Reconstruction consists of a combination of mechanical processes and chemical treatments designed to clean the well and filter pack and restore well performance. Chemical treatments may use various organic acids, chelating agents, surfactants, dispersants, wetting agents, and hot water or steam. Changing environmental concerns regarding the use and concentrations of well cleaning chemicals will have a major effect on the design of a well reconstruction program. This work effort would entail well evaluation, followed by reconstruction and a final pump test.

(2) Replacement of wells consists of the design and construction of new relief wells to take the place of wells which no longer function adequately. It may also include the abandonment of damaged or non-functioning wells.

c. Underseepage Control. There were three alternatives investigated to provide adequate underseepage control for the levee system. These include the installation of new relief wells, installation of cutoff berms and the installation of slurry trenches.

(1) New Relief Wells. The following details the analysis of new relief wells that would be required in order to bring this system up to standards.

(a) Upper Wood River. 25 new wells are recommended in the reaches identified from stations 0+00 to 33+00. This stationing corresponds with seepage problems observed in the 1993 Flood. A similar numbers of wells are identified from reaches 46+20 to 151+80, with respect to As Installed and Current Evaluation. For example, in reach 98+60 to 112+90, there are more existing wells than that indicated in the current analysis. In reach 69+20 to 77+20, four more wells are indicated by this analysis than there are existing wells. In cases like this, where there are a similar number of wells, no additional wells were deemed necessary. No new wells are indicated in reaches 151+80 to 234+25.

Levee Reach	As Installed	Current Evaluation
0+00 - 6+00	0	0
6+00 - 11+00	0	5
11+00 - 17+60	0	0

17+60 - 20+00	0	2
20+00 - 33+00	8 (all plugged)	18
33+00 - 46+20	11 (7 plugged)	0
46+20 - 52+80	1	3
52+80 - 63+40	9	14
63+40 - 66+50	3	2
66+50 - 69+20	3	4
69+20 - 77+20	8	12
77+20 - 81+85	5	7
81+85 - 98+60	20	26
98+60 - 112+90	18	14
112+90 - 120+00	7	7
120+00 - 127+60	5	0
127+60 - 133+00	6 (2 abandoned)	7
133+00 - 142+50	9	7
142+50 - 145+50	2	1
145+50 - 151+80	2	2
151+80 - 217+00	0	0
217+00 - 234+25	3	0

(b) Lower Wood River. A total of 32 new wells are indicated from stations 0+00 to 150+00. Between stations 150+00 to 195+70, there are more wells installed than the total number indicated from the evaluation. The same is true between stations 195+70 and 233+00. Therefore, in these reaches no new wells are judged to be necessary. A total of 11 new wells is indicated between stations 469+50 and 654+80.

Several attempts were made to evaluate the historical event (1993 flood) as well as the original design. The difficulty in duplicating the event as well as the original analysis is due to the inconsistency of features such as soil thickness and type under the levee as well as landside and riverside of the levee. These variables should be further evaluated prior to installing new relief wells. Using the referenced spread sheet will permit completion of this evaluation expeditiously without delaying the project.

Levee Reach	As Installed	Current Evaluation
0+00 - 10+00	0	7
10+00 - 19+00	0	5
19+10 - 24+00	0	3
24+00 - 31+60	0	0
31+60 - 43+30	0	0
43+30 - 48+60	0	3
48+60 - 57+20	0	0
57+20 - 70+00	0	0
70+00 - 80+00	0	14
80+00 - 104+00	0	0
104+00 - 135+60	0	0
135+60 - 150+00	0	0
150+00 - 154+60	3	0
154+60 - 159+00	4	0
159+60 - 171+40	9	0
171+40 - 183+40	10	15
183+40 - 195+70	3	4
195+70 - 201+50	5	7
201+50 - 211+10	3	4
211+50 - 216+40	0	0
216+40 - 229+30	3	0
229+30 - 233+00	2	0
233+00 - 237+00	1	0
237+00 - 287+70	1	0
287+70 - 469+50	0	0
469+50 - 486+30	0	6
486+30 - 643+20	0	0
643+20 - 654+80	0	5
654+80 - 690+00	0	0

(c) East and West Forks. 113 new wells are indicated in this evaluation. However, the evaluation does not match both historical performance (no serious problems in 1993) and design data. During design analysis additional borings will be obtained to further characterize geotechnical conditions before any wells are installed.

Levee Reach	As Installed	Current Evaluation
0+00 - 12+40	0	13
12+40 - 22+20	0	14
22+20 - 34+40	0	11
34+40 - 57+70	0	8
57+70 - 64+50	0	2
64+50 - 70+00	0	4
70+00 - 77+00	0	5
77+00 - 84+20	0	5
84+20 - 91+00	0	27
91+00 - 104+60	0	6
104+60 - 123+60	0	8
123+60 - 130+80	0	3
130+80 - 148+00	0	7

(2). Seepage Berms. Seepage berms can be used to control underseepage instead of relief wells. If seepage berms are used, the following dimensions are required. All dimensions assume that real estate can be acquired at the required locations.

(1) Upper Wood River.

From	To	Thickness (ft)	Length (ft)	Volume (ft^3)
6+00	11+00	1.5	150	4,367
17+60	20+00	10.5	215	11,617
20+00	33+00	13.5	300	110,134

These reaches correspond to those in which relief wells are recommended.

(2) Lower Wood River.

From	To	Thickness (ft)	Length (ft)	Volume (ft^3)
0+00	10+00	11.5	206	51,421
10+00	19+10	5.0	150	17,694
19+10	24+00	5.0	150	9,528
43+30	48+60	5.0	150	10,306
70+00	80+00	5.0	150	19,127
469+50	486+30	5.0	150	32,667
643+20	654+80	5.0	150	22,556

Again, these reaches correspond to those in which relief wells are required.

(3) East and West Forks.

From	To	Thickness (ft)	Length (ft)	Volume (ft^3)
0+00	12+40	11.0	272	78,866
12+40	22+20	5.0	180	21,582
22+20	34+40	5.0	150	24,419
64+50	70+00	5.0	150	10,694
70+00	77+00	5.0	150	13,611
77+00	91+00	11.0	300	98,067
91+00	108+50	5.0	150	34,028
119+00	123+60	5.0	150	8,944
123+60	130+80	5.0	150	14,000

(3). Slurry Walls. Installation of slurry walls to cut off underseepage was evaluated. According to Cedergren, (Seepage, Drainage, and Flownets, Wiley, 1967) the following relationships are:

% Cutoff	% Reduction in Total Flow
33	27
50	45
67	63
90	90
95	95
100	100

It is assumed that any slurry wall will be completed to rock to be effective. For Wood River, it was assumed that the reaches requiring new wells would correspond to those requiring slurry walls. This is summarized below:

	From	To	Length (ft.)	Approx. Depth (ft)	Area (ft^2)
Upper Wood River	0+00	33+00	3,300	110	363,000
Lower Wood River	0+00	150+00	15,000	115	1,725,000
	469+50	654+80	18,530	110	2,038,300
East and West Forks	0+00	148+00	14,800	140	2,072,000
				TOTAL	6,198,300

5.03 Recommended Plan. The recommended plan for restoring performance of existing wells based on experience gained through relief well rehabilitation in other similar projects is reconstruction of the existing relief wells as discussed in paragraph 5.02b. Wells found to be less than 50% of original performance will be replaced. The recommended plan for control of underseepage is to install the new relief wells for the Upper Wood River and Lower Wood River levee systems as discussed in paragraphs 5.02c(1) and 5.02c(2). There will be further analysis done during the design of the project to determine if any work will be needed in the East and West Forks system. While the model would indicate that such wells are required at this time it would seem that no work is needed in this system based on past performance.

5.04 Probability of Unsatisfactory Performance Under the No Action Alternative. The probabilistic evaluation of the Wood River Levee System underwent several iterations before the final analysis. For the final analysis reaches in Upper and Lower Wood River having high gradients but no existing wells were chosen. This scenario is more consistent with the assumptions made by the Technical Manuals referenced in the deterministic underseepage analysis. For Upper Wood River, Sta. 6+00 to 11+00 was selected; in Lower Wood River, Sta. 70+00 to 80+00 was chosen. There are no existing relief wells in the East and West Fork. Based on the deterministic analysis relief wells were required throughout. For this analysis, the reach having the highest deterministic gradient was selected: Sta. 84+00 to 91+00.

A critical gradient of 0.9 was used as the limiting value because this borders on true foundation failure. Of the four methods applied, results of this iteration gave results that were more consistent with design and historical data, as described below and were therefore used in developing the probability of unsatisfactory performance for the no action alternative. Table 4 provides the results of this analysis in table format. This analysis showed that:

1. For Upper Wood River, the PFP exterior stage is elevation 442, with a probability of failure of 0.85. This is the 500-year design event. The PNP elevation is 434 with a probability of failure of 0.15. This is approximately a 45-year flood.

2. For Lower Wood River, the PFP exterior stage is elevation (overtopping), having a probability of failure of 0.78. This is greater than the 500-year flood. The PNP has an exterior elevation of 440, with a probability of failure of 0.15. This is approximately a 500-year event.

3. For the East and West Fork, the PFP exterior stage elevation is 446.5, with a probability of failure of 0.85. The PNP elevation is 434.5, having a probability of failure of 0.15.

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Table 4 - Probability of Unsatisfactory Performance (PUP

	River Stage	Levee PUP
Upper Wood River		
PFP	442	0.85
PNP	434	0.15
East & West Fork		
PFP	446.6	0.85
PNP	434.5	0.15
Lower Wood River		
PFP	446.4	0.78
PNP	440	0.15

PUP = Probability of Unsatisfactory Performance
PFP = Probable Failure Point
PNP = Probable Non-Failure Point

APPENDIX - B

WOOD RIVER DRAINAGE & LEVEE DISTRICT
RE-EVALUATION REPORT
ECONOMIC APPENDIX

01. Introduction

This report addresses the National Economic Development (NED) *incremental* contributions of the Wood River Project components. In accordance with Engineering Regulation (ER) 1105-2-100, dated December 1990, an NED benefit-cost analysis is undertaken to assure that the value of the outputs (the NED benefits) produced by operation of the pump stations exceed the value of the inputs used (the NED cost).

Important assumptions employed in the NED evaluation of pump stations are:

(1) All benefits and costs are expressed in September 2004 price levels;
(2) The project period of evaluation is estimated to be 50 years with the appropriate operation, maintenance, repair, replacement and rehabilitation;
(3) Project discount rate for the evaluation of NED benefits and costs is 5.375 percent;
(4) The project base year is 2008;
(5) All structural computations are based on industrial, commercial and residential depreciated replacement values;
(6) In the event a pump station becomes inoperable due to unsatisfactory performance, a shutdown/repair period of 5 to 7 days would be necessary before the pump station returns to operational status.
(7) Resources have alternative uses and, consequently, opportunity costs;
(8) Individuals are risk neutral and rational economic agents;
(9) All elevations are expressed in feet and are understood to represent “Ft. NGVD” (Feet National Geodetic Vertical Datum).

02. Project Description

The Wood River project area is located in southwestern Illinois on the east bank of the Mississippi River between River Mile (RM) 195 and (RM) 203 above the Ohio River. It is situated in Madison County, Illinois, across the Mississippi River from St. Louis and St. Charles Counties in Missouri, and upstream from the city of East St. Louis. The project area is currently protected from rising waters along the river by an urban design levee system, which is maintained by the Wood River Drainage and Levee District. The levee system includes approximately 21 miles of main line levees and other support structures, and it provides flood protection for residential, commercial, and industrial structures located within a 21.4 square mile area (13,700 acres). The levee system is designed to provide flood protection from stages associated with a 700-year flood event.

The Wood River Drainage and Levee District, Illinois Project authorized by the Flood Control Act of 28 June 1938 provided for raising and enlarging 20.8 miles of levee, and for constructing other related flood control support structures. The Flood Control Act of 27 October

1965 modified the original project by providing for the construction of a pumping station, in the area locally known as Grassy Lake, with collector ditches and the necessary appurtenant facilities designed for the removal of interior water impounded by the existing levee. This pumping plant has not yet been constructed and is not covered by this evaluation. Many of the existing project features have reached or are nearing the end of their project life.

During the periodic inspections conducted after the Great Flood of 1993, several problems concerning the integrity of the flood protection system were documented. These problems, which included seepage in the levee foundation, failures in the gravity drains, leaks in the closure structures, and obsolete equipment in the pump stations, have occurred despite the operation and maintenance procedures routinely provided by the Levee District. If current action is not taken, the seepage problems and failure of appurtenant works will continue to jeopardize the integrity of the levee system, and further degradation of the pumping stations could cause interior flooding and the back up of sanitary sewers in communities across the area.

The purpose of this economic analysis for the Wood River Levee Limited Re-evaluation Report is to address the economic feasibility of a design deficiency correction and reconstruction alternative designed to improve the levee system, pumping stations, and appurtenant works. This will allow the levee system to provide its original degree of protection from Mississippi River floods and to provide for interior drainage of impounded water created by the levee system.

Project components incrementally evaluated to determine economic justification are; for the design deficiency, Relief Wells/Underseepage, and for the reconstruction project; a) Each of the seven project pump stations within the project area (the seven pump stations are East Alton #1, East Alton #2, Wood River, Rand, Hawthorne, Home Garden and Lakeside); b) Gravity Drains, and c) Closure Structures / Gates.

03. Structure Inventory Methodology.

General. In this section of the analysis, the methodology used to compile an inventory of the residential, commercial, and industrial structures in the study area will be discussed. The methods used in the valuation of these structures, their contents, and the vehicles associated with these structures will be presented. Finally, the procedures used to assign elevations to the structures, contents, and vehicles will be provided. The uncertainty inherent in the methods used to estimate each of these economic variables is addressed by the risk-based analysis included in this section of the report.

Structure Inventory and Valuation. The Wood River project area was divided into three (3) study area reaches. Structures at risk were defined as those structures that would flood by the stage associated with a 700-year event provided by the St. Louis District Hydraulics and Hydrology

(H & H) Branch. The structural damage categories included: residential, commercial, industrial, and vehicles. Aerial photographs provided by the St. Louis District were used to identify each of these structural damage categories in the Wood River project area.

Field surveys conducted in 2002 were used to develop a structure inventory for each of the three (3) reaches in the Wood River study area. Data was collected on a ten (10) percent random sample of the residential structures and all of the commercial properties, including apartment buildings, farm buildings and smaller industrial structures within the Wood River study area. Structural information obtained during the field surveys included type of structure, number of stories, type of foundation and construction, structure dimensions, physical condition of the structure, and the location. Based on the structural information collected during the field surveys, the Marshall and Swift Evaluation Service (M&S) was used to calculate the depreciated replacement cost for residential and commercial structures. The value of the land was not included in the analysis.

The inventoried structures were then classified into one of seven (7) residential building types including: residential one-story with and without basement, residential two-story with and without basement, split-level with and without basement, and duplexes or apartments with five (5) units or less. Commercial structures were classified into one of eight (8) building types including: eating and recreation, groceries and gas stations, multi-family complexes greater than five (5) units, professional, public and semi-public, repairs and home use, retail and personal, and warehouses and contractor services.

Large industrial complexes containing several structures within a confined area were inventoried using Office of Management and Budget (OMB) approved survey forms. The survey was used to determine the depreciated replacement value of the structures and their contents, and vehicles. A complete description of the procedures used to value all the residential, commercial and industrial structures is included in the Wood River Inventory Procedures Final Report dated April 2003.

Table 1 shows the number and value of residential, commercial, and industrial structures by each of the three study area reaches.

Table 1
Rehabilitation Alternative
Wood River Limited Re-evaluation Report
STRUCTURE INVENTORY BY STUDY AREA REACH

Reach	Building Category	Number of Buildings	Average Value of Buildings ($)
Lower Wood River (mile 197)	Residential	8,640	66,728
	Commercial	960	212,011
	Industrial	50	3,561,800
	Total	9,650	n/a
East - West Fork (mile 199.4)	Residential	-	-
	Commercial	1	68,320
	Industrial	463	539,957
	Total	464	n/a
Upper Wood River (mile 201)	Residential	-	-
	Commercial	59	1,638,739
	Industrial	29	7,462,300
	Total	88	n/a
TOTAL	Residential	8,640	66,728
	Commercial	1,020	294,396
	Industrial	542	1,189,108
	Total*	10,202	n/a

Note:

1) Total structural value of residential, commercial, and industrial buildings inventoried in the study area is slightly over $1.5 billion.

Estimates of Measurement Uncertainty. In order to determine the uncertainty associated with the residential and commercial structure valuation process discussed previously, detailed field surveys were used to determine the Marshall and Swift (M&S) values for a sample of fifteen (15) residential and fifteen (15) commercial properties in the study area. These precise values were then compared to the M&S values compiled using the square footage of a structure assigned in the GIS database. The uncertainty regarding the square footage of the residential and commercial structures was represented by a normal probability density function with a standard deviation of 11.3 percent for residential structures, and 26.1 percent for commercial structures. An uncertainty range was not assigned to the value of the structures on the industrial complex. The facility operators provided the value of these buildings.

Content Valuation. The value of contents for the residential structures was assigned based on the results of the Corps of Engineers Flood Damage Data Collection Program developed by the Institute of Water Resources (IWR). These values are published in the report entitled Depth-

Damage Functions for Corps of Engineers Flood Damage Reduction Studies. For the IWR study, a standardized questionnaire was used to collect information on approximately 1,000 homes in different regions of the country.

The IWR report did not address commercial content values; therefore information gathered for the New Orleans District in support of recent feasibility studies was utilized. Since the urbanized areas of the Wood River study area contained a similar mix of commercial structures as in Jefferson and Orleans Parishes, these assignments were deemed appropriate. The value of contents for commercial properties was determined from on-site interviews with business operators of eight (8) commercial content categories in Jefferson and Orleans Parishes of southern Louisiana. The content-to-structure value ratios (CSVRs) developed for each of the eight (8) commercial content classifications can be found in the final report dated June 1996 entitled Depth-Damage Relationships for Structures, Contents, and Vehicles and Content-To-Structure Value Ratios (CSVRs) in Support of the Jefferson and Orleans Flood Control Feasibility Studies.

The operators of the industrial facilities located in the Wood River study area provided the value of the contents for each structure located on their industrial complex. The values of the contents of each structure was totaled and then compared to the total value of the structure in order to develop a content-to-structure value ratio. If the content information requested was not provided then an average CSVR for all surveyed warehouses was used and applied to the value of the industrial building in order to calculate the value of the contents.

Estimates of Measurement Uncertainty. A probability distribution function was used to describe the distribution of surveyed content value observations around the expected mean content value. A normal probability density function was used for each of the residential and commercial content categories. The expected values and standard deviations are shown for each of the seven (7) residential categories in the IWR Report. Also, the eight (8) non-residential content categories are shown in the final report dated June 1996 entitled Depth-Damage Relationships for Structures, Contents, and Vehicles and Content-To-Structure Value Ratios (CSVRs) in Support of the Jefferson and Orleans Flood Control Feasibility Studies. An uncertainty range was not assigned to the content value of the structures on the industrial complex. The facility operators provided the value of the contents for these buildings.

Inventory of Vehicles. Damages to vehicles can also result from flooding in the study area. These damages are based on the number of private automobiles directly impacted per household or vehicles such as pick-up trucks and panel trucks associated with large industrial complexes. Based on field observation, collected data, and photographs, it was estimated that the average elevation of automobiles was two feet below the first floor elevation of the structure. Automobile damages are then calculated by correlating depth of flooding, depth-damage per automobile, and damage per inundated automobile.

Based on Census data, it was assumed that there are two automobiles associated with each residential structure. During a flood event, one of these vehicles would be used for evacuation. The average value per automobile was determined to be $9,128, based on the Manheim Used Vehicle Value Index. The index is based on over 4 million transactions annually at Manheim U.S. auctions. The industrial facility operators provided the number and value of pick-up trucks and panel trucks located on the industrial complex on the OMB survey forms.

Estimates of Measurement Uncertainty. A triangular probability distribution function was used to determine the uncertainty surrounding the values assigned to the private automobiles in the inventory. The most likely value is $9,128, based on the Manheim Used Vehicle Value Index. The index is based on over 4 million transactions annually at Manheim U.S. auctions. The maximum value was assumed to be the average value of a new car before taxes, license, and shipping charges ($16,800). The average 10-year depreciation value of an automobile ($2,000) was used as the minimum value. An uncertainty range was not assigned to the value of the vehicles associated with the industrial facilities. The facility operators provided the value of these vehicles.

Structure and Vehicle Elevations. Approximately 600 surveyed spot elevations with (x,y) coordinates were collected throughout the study area. These spot elevations and coordinates were entered into a GIS database together with other available contour information from USGS quad maps. These elevations were used to assign ground elevations to the residential structures in the sample and to each of the commercial and industrial structures. The spot elevations were selected in locations that would enhance the accuracy of the ground elevation assignments. Hand levels were used to estimate the height above ground of the first floor of each surveyed structure. Based on field observation and photographs taken in the field, the elevation of the garage in relation to the structure, it was estimated that the average elevation of automobiles was two feet below the first floor elevation of the structure. Since industrial facility operators did not provide elevations for trucks and heavy vehicles they were assumed to have the same elevation as the adjacent industrial structure.

Estimates of Measurement Uncertainty. Engineering surveys were used to determine the actual first floor elevation for a sample of 30 structures, and these first floor elevations were then compared to the elevations estimated using the procedures discussed in the previous section. Based on this comparison, a normal probability density function was used to describe the uncertainty associated with this variable. A standard deviation of 1.1 feet was calculated for first floor elevation assignments.

04. Stage-Damage Relationships for Residential, Commercial and Industrial Structures with Uncertainty

General. In order to calculate the damages from the inundation of structures, their contents, and vehicles that would occur at each stage, three relationships were developed for this analysis: depth-damage relationships, stage-frequency relationships, and levee system failure

probabilities. The depth-damage relationship is the amount of damage that will occur to structures, their contents, and vehicles as the elevation of the water or stage rises. The stage-frequency relationship is the probability of the water stages reaching various levels for each hydrologic reach. The probability of levee system failure is the probability of the levee system failing as the water level rises.

The uncertainties associated with the development of these relationships are addressed by risk-based analysis. A range of possible values, with a maximum and a minimum value, or a standard deviation, was calculated for each economic variable (structure and content values, first floor elevation, and depth-damage relationships). These statistics were entered into the Hydrologic Engineering Center's Flood Damage Analysis Program (HEC-FDA) named NextGen to calculate the uncertainty or error surrounding the elevation- or stage-damage curves. The program also used the number of years that stages were recorded at a given gage to determine the hydrologic uncertainty surrounding the stage-frequency curves and the probability of levee system failure as the stages increased. The possible occurrences of each variable were derived through the use of Monte Carlo simulation, which used randomly selected numbers to simulate the values of the selected variables from within the established ranges and distributions. For each variable, the computerized Latin Hypercube sampling technique was used to sample from within the range of possible values. With each sample, or iteration, a different value was selected. The number of iterations performed affects the simulation execution time and the quality and accuracy of the results.

The sum of all sampled values divided by the number of samples yielded the expected value, or mean. This process was conducted simultaneously for each economic and hydrologic variable. The resulting mean value and probability distributions formed a comprehensive picture of all possible outcomes.

Depth-Damage Relationships. Depth-damage relationships indicate the percentage of the total structure and content value that would be damaged from various depths of flooding. Damage percentages are determined for each one-half-foot increment from one-half foot below first floor elevation to two feet above first floor, and for each one-foot increment from 2 to 15 feet above first floor elevation. Depth-damage relationships for residential without basement structures and their contents are based on data developed by IWR. The depth-damage relationships for residential with basement structures and their contents are based on data collected from a post flood survey by the Rock Island District. Fresh water depth-damage curves, developed by a panel of building and construction experts for the Jefferson/Orleans Feasibility Studies, are used for the commercial structures and contents in the study area.

The depth-damage relationships developed by the New Orleans District for the commercial structures in the Wood River study area were determined to be appropriate after a field trip by New Orleans economics personnel. The type of commercial structures in the Wood River study area along with the building construction is similar to the Jefferson/Orleans study area. During the field inventory, photographs were taken of all non-residential structures along

with the Marshal and Swift buildings data to value the structure and verify that the proper depth-damage curve was used for the different commercial structure classifications. The photographs were also used to show that both study areas contain Class A and B type buildings with steel frame walls for office buildings and hotels, Class C type buildings with masonry bearing walls for restaurants and strip malls, and the Class D and S buildings with wood frame or metal frame walls as used in fast-food restaurants and warehouses. The Marshal and Swift commercial estimator program was used to calculate site-specific building values.

Since contents for commercial establishments such as fast food franchises, strip malls, medical offices, schools, and service garages throughout the United States are similar, it was deemed appropriate to use the New Orleans commercial survey data. However, for industrial buildings, an individual survey of the contents and their susceptibility to flooding was conducted.

For industrial structures and contents, data provided by the facility operators on OMB survey forms are used to estimate the damages at different increments of flooding. If survey data was not available, the structural depth-damage relationships for warehouses used in the Jefferson/Orleans Feasibility Studies are used for the industrial buildings in the study area. If survey data for contents was not available, a prototypical content depth-damage relationship from other industrial complexes in the Wood River study area was used. Depth-damage relationships from the Jefferson/Orleans Feasibility studies are used for private automobiles, while depth-damage relationships developed as part of the Lake Pontchartrain Hurricane Protection Feasibility Study were used for industrial pick-up trucks and panel trucks.

The costs of implementing emergency measures, cleaning-up flood debris and hazardous materials from industrial facilities, and the decline in revenues per day from lost production by industries was not included in the damage analysis. However, information obtained on each of these items as part of the OMB approved surveys is summarized in the Wood River Inventory Procedures Final Report dated April 2003.

Estimates of Measurement Uncertainty. The uncertainty surrounding the generic residential structure and content depth-damage curves provided by IWR is represented by the standard deviation of the damage calculated for each increment of flooding. A triangular probability density function was used to determine the uncertainty associated with each increment of flooding for the commercial structure and content depth damage relationships. A minimum, maximum and most likely damage estimate was provided for each increment of flooding. The specific range of values regarding probability distributions for the depth-damage curves can be found in the final report dated June 1996 entitled Depth-Damage Relationships For Structures, Contents, and Vehicles and Content-To-Structure Value Ratios (CSVRS) in Support of the Jefferson and Orleans Flood Control Feasibility Studies.

An uncertainty range was not assigned to the damage occurring at each increment of flooding for the industrial structures and contents. The facility operators provided the depth-

damage relationships for the industrial buildings and contents.

Hydrologic/Hydraulic and Geotechnical Data. The St. Louis District Hydraulics and Hydrology (H&H) Branch provided exterior (outside the levee system) stage-frequency relationships for each of the three study area reaches. If the levee system fails, the exterior and interior (inside the levee system) stages are the same. The stages for eight (8) frequency storms (1, 5, 10, 50, 100, 200, 500 and 700-year events) were used to represent the entire range of frequency events. The St. Louis District Geotechnical Branch provided the probability of levee failure for two exterior stage heights for each of the three reaches in the Wood River study area under both the without- and with-project conditions. Between these two stages, the flood damage computer program interpolates the probability that the levee system will fail. The two exterior stage elevations and

the associated probability of failure for the levee system for each of the three Wood River reaches are shown in Table 2. For the with-project condition, there is a 100 percent chance of levee failure when stages reach the net levee grade, or the top of the levee, for each of the three study area reaches.

Estimates of Measurement Uncertainty. H&H used an equivalent record length of 100 years to determine the uncertainty associated with the stage-frequency data. Based on this equivalent record length, the program calculated the confidence limits surrounding the stage-frequency function. The probable failure point (PFP), which is usually greater than or equal to a 85 percent chance of levee system failure, and the probable non-failure point (PNP), which is usually less than or equal to a 15 percent of chance of levee system failure, was provided by the St. Louis District Geotechnical Branch. The District also provided the zero (0) and 100 percent chance of levee system failure. These failure points were used to estimate the uncertainty surrounding each of the variables such as seepage problems that could lead to the failure of the levee system in each of the three study area reaches. It should be noted that the Lower Wood River Reach (RM 197.0) was assigned a 78 percent chance of levee system failure for the probable failure point. Without-project and with-project levee system failure assignments were based on the geotechnical analysis performed by the St. Louis District.

05. Analysis of the Levee System

The recommended solution for underseepage problems experienced by the Wood River Levee include the addition of new relief wells and the reconstruction of existing relief wells. The solution for corrugated metal pipe gravity drains is the lining with HDPE of pipes 30" and larger and the replacement with RCP of drains 24" and smaller. The recommended solution for closure structure problems experienced by the Wood River Levee includes the replacement of 3 closure structure gate monoliths, 3 closure structure gate monoliths and floodwalls, 4 sills, 1 approach apron and 5 gates, and the reconstruction of 11 gates. These three (3) components form the main line of levee protection, and along with the seven (7) pump stations, comprise the Wood River Levee System. Per economic guidance, the gravity drain, relief well, closure

structures and pump station components are also evaluated independently in **Section 06. Incremental Analysis of Alternative Components, Section b.**

Probability of Unsatisfactory Performance (PUP). The structural branch calculated PUPs due to component failure for the Closure Structures Component and the geotechnical branch calculated PUPs due to component failure for the Gravity Drains Component and Relief Wells Component. The PUPs for these components are combined to generate Levee System PUPs, by Reach (Lower Wood River, East-West Fork and Upper Wood River), as presented in Table 2.

The following equation is used in calculating total levee system PUP estimates:

$$P(f)_{ls} = 1 - [(1 - P(r)_{gd})(1 - P(r)_{rw})(1 - P(r)_{cs})]$$

where:

$P(f)_{ls}$ = Probability of Unsatisfactory Performance (PUP) for Levee System

$P(r)_{gd}$ = PUP of the levee system due to Gravity Drain failure in 2008

$P(r)_{rw}$ = PUP of the levee system due to Underseepage (Relief Wells failure) in 2008

$P(r)_{cs}$ = PUP of the levee system due to Closure Structure failure in 2008

For example, for the Lower Wood River Reach, at RM 446.0, the levee system PUP for 2008 equals:

$1 - [1 - 0.11)(1 - 0.78)(1 - 0.35)] = 0.87.$

In other words, there will be an 87 percent probability of levee failure in the year 2008 due to unsatisfactory performance of a component. Given these PUP estimates, all quantifiable benefits are calculated for all relevant benefit categories.

Table 2
PUPs for Components and Levee System
By Reach

Exterior Stage	Gravity Drains PUP*	Relief Wells PUP*	Closure Structures PUP*	Levee System PUP*
Lower Wood River				
435.0	0.00	0.00	0.00	0.00
439.3	0.11	0.07	0.00	0.17
446.0	0.11	0.78	0.35	0.87
446.1	1.00	1.00	1.00	1.00
East-West Fork				
430.0	0.00	0.00	0.00	0.00
433.3	0.11	0.08	0.00	0.18
446.4	0.11	0.84	0.35	0.91
449.2	1.00	1.00	1.00	1.00
Upper Wood River				
432.0	0.00	0.00	0.00	0.00
433.2	0.11	0.08	0.00	0.18
441.9	0.11	0.84	0.35	0.91
443.8	1.00	1.00	1.00	1.00

* Estimates for Year 2008

Benefits. Expected Annual Inundation Damage Reduced and Distributed for the Levee System are presented in Table 3.

Table 3*
Expected Annual Inundation Damage Reduced and Distributed
Levee System

Reach and Total	Expected Annual Damage			Probability Damage Reduced Exceeds Indicated Values		
	Total Without Project	Total With Project	Damage Reduced (Benefits)	0.75	0.50	0.25
Lower Wood River	$3,389,960	$829,460	$2,560,500	$1,715,535	$2,458,080	$4,532,085
East-West Fork	$1,455,730	$122,320	$1,333,410	$893,385	$1,280,074	$2,360,136
Upper Wood River	$2,109,180	$222,340	$1,886,840	$1,264,183	$1,811,366	$3,339,707
Levee System	$6,954,870	$1,174,120	$5,780,750	$3,873,103	$5,549,520	$10,231,928

** Price level: September 2004; Discount Rate: 5.375%; Base Year: 2008; Evaluation Period: 50 years*

For the purpose of this analysis, costs associated with full project implementation were compared to damages that would be experienced by a levee failure. Information contained in Section 6 below documents the incremental benefits of the various system components.

Costs. All project costs for the Levee System are presented, by Reach, in Table 4.

Table 4
Project Costs
By Reach

Lower Wood River	
RM 197.0	
Relief Wells	$2,909,500
Closure Structures	$2,307,600
Gravity Drains	$3,248,700
Pump Stations	$3,883,200
Total	$12,349,000
E&D	$2,253,000
CM	$1,325,000
Total	**$15,927,000**
East-West Fork	
RM 199.4	
Relief Wells	$0
Closure Structures	$589,600
Gravity Drains	$953,300
Pump Stations	$0
Total	$1,542,900
E&D	$317,300
CM	$186,800
Total	**$2,047,000**
Upper Wood River	
RM 201.0	
Relief Wells	$1,567,000
Closure Structures	$253,500
Gravity Drains	$598,900
Pump Stations	$681,800
Total	$3,101,200
E&D	$603,000
CM	$355,000
Total	**$4,059,200**
Project Total	$22,033,200
Lands & Damages	$125,000
Total (MCACES)	**$22,158,200**

The Expected Value and Probabilistic Values of Net Benefits for the Levee System are presented in Table 5. Average Annual Costs, computed from First Costs, Interest During Construction and OMRR&R Costs, are also presented in Table 5. Expected Annual Net Benefits are presented in Table 6.

Table 5
Expected Value and Probabilistic Values of Net Benefits
Levee System

Reach and Total	Expected Annual National Economic Benefit and National Economic Benefit			Probability Net Benefit Exceeds Indicated Amount		
	Average Annual Benefits	Average Annual Costs	Net Benefits	0.75	0.50	0.25
Lower Wood River	$2,560,500	$1,273,650	$1,286,850	$917,800	$1,255,083	$2,424,635
East-West Fork	$1,333,410	$148,690	$1,184,720	$800,911	$1,136,216	$2,115,840
Upper Wood River	$1,886,840	$497,980	$1,388,870	$944,713	$1,342,048	$2,495,735
Total	$5,780,750	$1,920,320	$3,860,440	$2,663,418	$3,808,395	$7,036,193

** Price level: September 2004; Discount Rate: 5.375%; Base Year: 2008; Evaluation Period: 50 years*

Table 6. Expected Annual Net Benefits

ESTIMATE OF EXPECTED ANNUAL NET BENEFITS

ITEM	Design Deficiency Correction 5-5/8%, SEPT. 2004 PRICE LEVEL
Expected Annual Benefits	**$ 5,780,750**
First Costs	**22,158,200**
Interest During Construction	**1,908,840**
Average Annual Construction Costs	**1,588,710**
OMRR&R	**331,600***
Total Average Annual Costs	**1,920,310**
B/C Ratio	**3.01**
Expected Annual Net Benefits	**$ 3,860,440**

**Reflects increased costs to cover OMRR&R*

06. Incremental Analysis of Alternative Components

a. Pump Stations

Benefit categories consist of structural benefits, sewer benefits and economic consequence.

Structural Benefits: Industrial, commercial and residential structural damages (including content and miscellaneous damages) from impounded interior water are computed. Future-without and future-with hydrology conditions are evaluated, by pump station, to compute any structural inundation damages resulting from an inoperable pump station. As noted on page B-8, the depth-damage relationships for residential with basement structures and their contents were based on data collected from a post flood survey by the Rock Island District. Also from page B-8, the depth-damage relationships for commercial structures and contents are based on fresh water depth-damage curves developed by a panel of building and construction experts for the Jefferson/Orleans

Feasibility Studies. From page B-9, the depth-damage relationships for industrial structures and contents are based on data provided by the facility operators on OMB survey forms to estimate the damages at different increments of flooding. Again, if survey data was not available, the structural depth-damage relationships for warehouses used in the Jefferson/Orleans Feasibility Studies are used for the industrial buildings in the study area.

Wastewater/Sewer Benefits: Industrial, commercial and residential structural damages (including content and miscellaneous damages) from wastewater/sewer basement backup are computed. Future-without and future-with hydrology conditions are evaluated, by pump station, to compute any structural inundation damages resulting from an inoperable pump station. The depth-damage curves used in the analysis are from similar Corps of Engineers Flood Damage Reduction Studies.

The following chart depicts basements in the drainage areas analyzed for damages.

Economic Consequence Benefits: Consultation with MVD (Mississippi Valley Division) concluded that a measurable economic value can be calculated from the consequences of an inoperable pump station, in addition to physical damages. Such a loss of pumping ability could have a rapid, significant impact when either the discharge flow from a sewer/water treatment facility to a pump station or the raw effluent flow from the project area structures to the treatment facility is interrupted. A willingness to pay by project area consumers to keep this vital discharge flow system running in the event of an inoperable pump station generates an economic value as well as sanitary and health value to the project area communities affected.

The Probability of Unsatisfactory Performance (PUP) estimates for all pump stations, for 2008, are presented in the Engineering Appendix Section 4.04. The individual System Reliabilities for all *relevant* storm water pumps and sewage pumps for each pump station are combined as a series to determine a total PUP for each pump station. The following equation is used in calculating total system PUP estimates:

$$P(f)_{ps} = 1 - [(P(r)_{swp(1-n)})(P(r)_{sp1(1-n)})]$$

where:

$P(f)_{ps}$ = PUP for pump station

$P(r)_{swp(1-n)}$ = Reliability of Storm Water Pump in 2008 (n=1 to 3 storm water pumps per station)

$P(r)_{sp(1-n)}$ = Reliability of Sewage Pump in 2008 (n=1 to 2 sewage pumps per station)

For example in Section 4.04 of the Engineering Appendix for East Alton #1 Pumping Station, with 3 storm water pumps and zero (0) sewage pumps, the total PUP for 2008 equals:

1-[0.8783)(0.8783)(0.8783)] = 0.3225.

In other words, there will be a 32.25 percent probability of East Alton #1 Pumping Station becoming inoperable due to pump failure in the year 2008. Given these PUP estimates, all quantifiable benefits are calculated for all relevant benefit categories for each pump station.

Levee District and pump station personnel, business owners, and project community representatives participated in meetings and completed detailed questionnaires to provide necessary pump station statistics and consequences in the event of pump station shutdown under both rain and no-rain scenarios. Statistics obtained included: 1. Timeframe between a pump station becoming inoperable and the project area serviced by that pump station becoming affected; 2. Structures affected from an inoperable pump; 3. Daily facility costs to treat wastewater/effluent; 4. Daily amount of wastewater/effluent processed at facility; 4. Costs to clean up effluent damage from an inoperable pump; 5. Project area sewer charges to customers;

7. Consequences of industrial shutdown resulting from an inoperable pump station; 8. Emergency potable water supply; and 9. GIS structural data. For example, the economic consequences of East Alton #2 pump station becoming inoperable are estimated at $13,570. This figure is based on the following: 1. $4,500 daily cost to treat effluent, 2. an estimated 5.5 days pump remains inoperable during repairs, 3. approximately 3,500 houses paying a sewer charge, 4. an estimated PUP of 0.5482 in year 2008 for East Alton #2 pump station.

Results of all benefit category calculations are summarized by pump station and presented in Table 7.

East Alton #1:

The East Alton #1 Pump Station replaced two smaller stations and was authorized and constructed as a utility relocation associated with the design and construction of the Lock and Dam No. 26 Replacement. The increase in river elevation adjacent to the Upper Wood River Levee to elevation 419 resulted in an increase (rise) in the normal level of the groundwater landward of the levee. This created a situation whereby pumping requirements increased surpassing the capability of the existing stations. The majority of pumping required for the 5.81 square mile drainage area was from seepage from the Lock and Dam 26 (Replacement) pool. When the gravity drains must be closed continuous pumping is required. This pump station was justified as a minimum facility required as a result of the Federal action and remains necessary as long as the Federal project continues to operate.

East Alton #2:

Should East Alton #2 pump station become inoperable, 278 structures would be flooded by the 100-year event, resulting in $65,870 in average annual structural damages. An additional 542 structures would be subjected to wastewater basement backup, resulting in $142,970 in average annual wastewater damages. Also, economic consequence damages are estimated at $13,570. All of these damages would be prevented with the pump station in operation. Total damages prevented are estimated at $222,410.

Wood River:

Should Wood River pump station become inoperable, the combined sewer / storm water system would back up within 24-36 hours. An estimated 1,922 structures would be subjected to sewer basement backup, resulting in $379,730 in average annual damages. Also, economic consequence damages are estimated at $42,670. All of these damages would be prevented with the pump station in operation. Total damages prevented are estimated at $422,400.

Rand:

Should Rand pump station become inoperable, the combined sewer / storm water system would back up within 24-36 hours. An estimated 506 structures would be subjected to wastewater basement backup, resulting in $120,650 in average annual wastewater damages. Also, economic consequence damages are estimated at $24,180. All of these damages would be prevented with the pump station in operation. Total damages prevented are estimated at

$144,830.

Hawthorne:

Should Hawthorne pump station become inoperable, the combined sewer / storm water system would back up within 8-12 hours. An estimated 340 structures would be subjected to sanitary sewer basement backup, resulting in $159,440 in average annual damages. Also, economic consequence damages are estimated at $114,960. All of these damages would be prevented with the pump station in operation. Total damages prevented are estimated at $274,400.

Home Garden:

Should Home Garden pump station become inoperable, 33 structures would be flooded by the 100-year event, resulting in $27,350 in average annual flood damages. No wastewater/sewer benefits or economic consequence benefits are accrued since Home Garden is an open drain runoff facility. Also, all of these damages would be prevented with the pump station in operation. Total damages prevented are estimated at $27,350.

Lakeside:

Should Lakeside pump station become inoperable, 46 structures would be flooded by the 100-year event, resulting in $29,230 in average annual flood damages. No wastewater/sewer benefits or economic consequence benefits would be accrued since Lakeside is an open drain runoff facility. Also, all of these damages would be prevented with the pump station in operation. Total damages prevented are estimated at $29,230.

Table 7*
Expected Annual Inundation Damage Under Inoperable Pump Station
Project Area Pump Stations

Pump Station	Expected Annual Damage Under *Inoperable* Pump Station			
	Expected Annual Structural Damages	Expected Annual Wastewater Damages	Expected Economic Consequence Damages	Total Expected Annual Damages
East Alton #1	n / a	n / a	n / a	n / a
East Alton #2	$65,870	$142,970	$13,570	$222,410
Wood River **	$379,730 **	**	$42,670	$422,400
Rand **	$120,650 **	**	$24,180	$144,830
Hawthorne **	$159,440 **	**	$114,960	$274,400
Home Garden	$27,350	$0	$0	$27,350
Lakeside	$29,230	$0	$0	$29,230

** Price level: September 2004; Discount Rate: 5.375%; Base Year: 2008; Evaluation Period: 50 years*
*** Combined sewer/storm water system results in combined average annual structural/wastewater damages*

Expected Annual Inundation Damage Reduced and Distributed for all pump stations are presented in Table 8.

Table 8*
Expected Annual Inundation Damage Reduced and Distributed
Project Area Pump Stations

Pump Station	Expected Annual Damage			Probability Damage Reduced Exceeds Indicated Values		
	Damages Under *Inoperable* Pump Station	Damages Under *Operating* Pump Station	Damage Reduced (Benefits)	0.75	0.50	0.25
East Alton #1	n / a	n / a	n / a	n / a	n / a	n / a
East Alton #2	$222,410	$0	$222,410	$171,256	$217,962	$282,461
Wood River	$422,400	$0	$422,400	$325,248	$413,952	$536,448
Rand	$144,830	$0	$144,830	$111,519	$141,933	$183,934
Hawthorne	$274,400	$0	$274,400	$211,288	$268,912	$348,488
Home Garden	$27,350	$0	$27,350	$21,060	$26,803	$34,735
Lakeside	$29,230	$0	$29,230	$22,507	$28,645	$37,122

** Price level: September 2004; Discount Rate: 5.375%; Base Year: 2008; Evaluation Period: 50 years*

Costs. All construction and investment costs for all pump stations are presented in Table 9. Average annual costs are subsequently calculated for construction first costs and OMRR&R costs.

Table 9*
Construction and Investment Costs
Pump Stations

	East Alton #1	East Alton #2	Wood River	Rand	Hawthorne	Home Garden	Lakeside
Construction First Costs	$681,800	$789,800	$1,315,700	$927,700	$458,200	$195,300	$196,500
Interest During Construction	$59,100	$68,400	$114,000	$80,400	$39,700	$16,900	$17,000
Total Investment	$740,900	$858,200	$1,429,700	$1,008,100	$497,900	$212,200	$213,500
Average Annual Investment	$44,600	$51,600	$86,000	$60,600	$29,900	$12,800	$12,800
Average Annual OMRR&R Costs	$67,100	$41,400	$69,200	$48,800	$24,700	$10,800	$10,900
Total Average Annual Investment	$111,700	$93,000	$155,200	$109,400	$54,600	$23,600	$23,700

** Price level: September 2004; Discount Rate: 5.375%; Base Year: 2008; Evaluation Period: 50 years*

The *Expected Value and Probabilistic Values of Net Benefits* for all project Alternatives are presented in Table 10.

Table 10*
Expected Value and Probabilistic Values of Net Benefits
Pump Stations

Project Alternative	Expected Annual National Economic Benefit and National Economic Benefit				Probability Net Benefit Exceeds Indicated Amount		
	Benefits	Costs	Net Benefits	Benefit-Cost Ratio	0.75	0.50	0.25
East Alton #1	n / a	$111,700	n / a	n / a	$694	984	$694
East Alton #2	$222,410	$93,000	129,410	2.39	$99,646	$126,822	$164,351
Wood River	$422,400	$155,200	$267,200	2.72	$205,744	$261,856	$339,344
Rand	$144,830	$109,400	$35,430	1.32	$27,281	$34,721	$44,996
Hawthorne	$274,400	$54,600	$219,800	5.03	$169,246	$215,404	$279,146
Home Garden	$27,350	$23,600	$3,750	1.16	$2,888	$3,675	$4,763
Lakeside	$29,230	$23,700	$5,530	1.23	$4,258	$5,419	$7,023

** Price level: September 2004; Discount Rate: 5.375%; Base Year: 2008; Evaluation Period: 50 years*

b. Gravity Drains, Relief Wells and Closure Structures

Although the Wood River Levee technically functions as a System, the gravity drains component, relief wells component, and the closure structures component are evaluated incrementally.

- Assumption 1: The Relief Wells and Closure Structures Components are assumed to perform/protect from inundation perfectly, while the Gravity Drains Component is evaluated.
- Assumption 2: The Gravity Drains and Closure Structures Components are assumed to perform/protect from inundation perfectly, while the Relief Wells Component is evaluated.
- Assumption 3: The Gravity Drains and Relief Wells Components are assumed to perform/protect from inundation perfectly, while the Closure Structures Component is evaluated.

Probability of Unsatisfactory Performance (PUP). The structural branch calculated PUPs due to component failure for the Closure Structures Component and the geotechnical branch calculated the PUPs for the Gravity Drains and Relief Wells. All three components were evaluated by Reach (Lower Wood River, East-West Fork and Upper Wood River) are presented in Table 11.

Table 11
PUPs for Levee System Components
By Reach

Exterior Stage	Gravity Drains PUP*	Relief Wells PUP*	Closure Structures PUP*
Lower Wood River			
435.0	0.00	0.00	0.00
439.3	0.11	0.07	0.00
446.0	0.11	0.78	0.35
446.1	1.00	1.00	1.00
East-West Fork			
430.0	0.00	0.00	0.00
433.3	0.11	0.08	0.00
446.4	0.11	0.84	0.35
449.2	1.00	1.00	1.00
Upper Wood River			
432.0	0.00	0.00	0.00
433.2	0.11	0.08	0.00
441.9	0.11	0.84	0.35
443.8	1.00	1.00	1.00

* Estimates for Year 2008

Benefits. Expected Annual Inundation Damage Reduced and Distributed for the Gravity Drains Component, Relief Wells Component, and Closure Structures Component are presented, by Reach, in Tables 12 through 14, respectively.

Table 12*
Expected Annual Inundation Damage Reduced and Distributed
Gravity Drains Component

Project Component: Gravity Drains	Expected Annual Damage			Probability Damage Reduced Exceeds Indicated Values		
	Component Without Project	Component With Project	Damage Reduced (Benefits)	0.75	0.50	0.25
Lower Wood River	$2,037,000	$829,000	$1,208,000	$929,390	$1,182,860	$1,532,890
East-West Fork	$501,000	$122,000	$379,000	$291,830	$371,420	$481,330
Upper Wood River	$895,000	$222,000	$673,000	$518,210	$659,540	$854,710
Total	$3,433,000	$1,173,000	$2,260,000	$1,739,430	$2,213,820	$2,868,930

** Price level: September 2004; Discount Rate: 5.375%; Base Year: 2008; Evaluation Period: 50 years*

Table 13*
Expected Annual Inundation Damage Reduced and Distributed
Relief Wells Component

Project Component: Relief Wells	Expected Annual Damage			Probability Damage Reduced Exceeds Indicated Values		
	Component Without Project	Component With Project	Damage Reduced (Benefits)	0.75	0.50	0.25
Lower Wood River	$2,841,000	$829,000	$2,012,000	$1,549,240	$1,971,760	$2,555,240
East-West Fork	$1,342,000	$122,000	$1,220,000	$939,400	$1,195,600	$1,549,400
Upper Wood River	$1,818,000	$222,000	$1,596,000	$1,228,920	$1,564,080	$2,026,920
Total	$6,001,000	$1,173,000	$4,828,000	$3,717,560	$4,731,440	$6,131,560

** Price level: September 2004; Discount Rate: 5.375%; Base Year: 2008; Evaluation Period: 50 years*

Table 14*
Expected Annual Inundation Damage Reduced and Distributed
Closure Structures Component

Project Component: Closure Structures	Expected Annual Damage			Probability Damage Reduced Exceeds Indicated Values		
	Component Without Project	Component With Project	Damage Reduced (Benefits)	0.75	0.50	0.25
Lower Wood River	$1,870,000	$829,000	$1,041,000	$697,470	$999,360	$1,842,570
East-West Fork	$746,000	$122,000	$624,000	$418,080	$599,040	$1,104,480
Upper Wood River	$1,002,000	$222,000	$780,000	$522,600	$748,800	$1,380,600
Total	$3,618,000	$1,173,000	$2,445,000	$1,638,150	$2,347,200	$4,327,650

** Price level: September 2004; Discount Rate: 5.375%; Base Year: 2008; Evaluation Period: 50 years*

Costs. Costs for Gravity Drains, Relief Wells, and Closure Structures Components are presented in Table 15. Average annual costs are computed by component, by Reach. RR&R costs are presented in Section 2 of the Cost Engineering Appendix.

Table 15
Component Costs
By Reach

Lower Wood River	
RM 197	
Relief Wells	$2,909,500
Closure Structures	$2,307,600
Gravity Drains	$3,248,700
Pump Stations	$3,883,200
Total	$12,349,000
E&D	$2,253,000
CM	$1,325,000
Total	**$15,927,000**
East West Fork	
RM 199.4	
Relief Wells	$0
Closure Structures	$589,600
Gravity Drains	$953,300
Pump Stations	$0
Total	$1,542,900
E&D	$317,300
CM	$186,800
Total	**$2,047,000**
Upper Wood River	
RM 201	
Relief Wells	$1,567,000
Closure Structures	$253,500
Gravity Drains	$598,900
Pump Stations	$681,800
Total	$3,101,200
E&D	$603,000
CM	$355,000
Total	**$4,059,200**
Project Total	$22,033,200
Lands & Damages	$125,000
Total (MCASES)	$22,158,200

The Expected Value and Probabilistic Values of Net Benefits for the Gravity Drains Component, Relief Wells Component, and Closure Structures Component, respectively, are presented, by Reach, in Tables 16 through 18.

Table 16
Expected Value and Probabilistic Values of Net Benefits
Gravity Drains Component

Project Component: Gravity Drains	Expected Annual National Economic Benefit and National Economic Benefit			Probability Net Benefit Exceeds Indicated Amount		
	Average Annual Benefits	Average Annual Costs	Net Benefits	0.75	0.50	0.25
Lower Wood River	$1,207,000	$252,00	$955,000	$639,850	$916,800	$1,690,350
East-West Fork	$379,000	$76,000	$303,000	$203,010	$290,880	$536,310
Upper Wood River	$673,000	$47,000	$626,000	$419,420	$600,960	$1,108,020
Total	$2,259,000	$559,320	$1,699,680	$1,138,786	$1,631,693	$3,008,434

** Price level: September 2004; Discount Rate: 5.375%; Base Year: 2008; Evaluation Period: 50 years*

Table 17
Expected Value and Probabilistic Values of Net Benefits
Relief Wells Component

Project Component: Relief Wells	Expected Annual National Economic Benefit and National Economic Benefit			Probability Net Benefit Exceeds Indicated Amount		
	Average Annual Benefits	Average Annual Costs	Net Benefits	0.75	0.50	0.25
Lower Wood River	$2,012,000	$307,000	$1,705,000	$1,142,350	$1,636,800	$3,017,850
East-West Fork	$1,220,000	$0	$1,220,000	$817,400	$1,171,200	$2,159,400
Upper Wood River	$1,596,000	$205,000	$1,391,000	$931,970	$1,335,360	$2,462,070
Total	$4,828,000	$512,000	$4,316,000	$2,891,720	$4,143,360	$7,639,320

** Price level: September 2004; Discount Rate: 5.375%; Base Year: 2008; Evaluation Period: 50 years*

Table 18
Expected Value and Probabilistic Values of Net Benefits
Closure Structures Component

Project Component: Closure Structures	Expected Annual National Economic Benefit and National Economic Benefit			Probability Net Benefit Exceeds Indicated Amount		
	Average Annual Benefits	Average Annual Costs	Net Benefits	0.75	0.50	0.25
Lower Wood River	$1,041,000	$194,000	$847,000	$567,490	$813,120	$1,499,190
East-West Fork	$624,000	$62,000	$562,000	$376,540	$539,520	$994,740
Upper Wood River	$779,000	$35,000	$744,000	$498,480	$714,240	$1,316,880
Total	$2,445,000	$291,000	$2,154,000	$1,443,180	$2,067,840	$3,812,580

** Price level: September 2004; Discount Rate: 5.375%; Base Year: 2008; Evaluation Period: 50 years*

APPENDIX - C

WOOD RIVER DRAINAGE & LEVEE DISTRICT
RE-EVALUATION REPORT
ENVIRONMENTAL APPENDIX

ENVIRONMENTAL ASSESSMENT
WITH
DRAFT FINDING OF NO SIGNIFICANT IMPACT

PROPOSED RECONSTRUCTION OF THE FLOOD PROTECTION SYSTEM

WOOD RIVER DRAINAGE AND LEVEE DISTRICT, MADISON COUNTY, ILLINOIS

I. Introduction

A. Project Location Wood River Drainage and Levee District (Levee District) lies in southwestern Illinois in Madison County. The Levee District is located on the left bank of the Mississippi River between river miles 195 and 202 above the Ohio River (Figure EA-1). It is across from St. Louis and St. Charles Counties in Missouri, and just upriver of the City of St. Louis. An urban design levee protects about 13,400 acres of bottomland in the Levee District. About 4,700 acres of hill land drain into the bottomland protected by the levee system.

This system provides protection against flooding from the Mississippi River, as well as headwater flooding from Wood River Creek and the Cahokia Creek Diversion Canal. The system also removes drainage from the flood-protected bottomland (the "interior") resulting from rainfall, run-off, and underseepage. The Levee District operates and maintains 21 miles of riverfront and flank levees, 160 relief wells, 26 closure structures, and 41 gravity drains for flood protection. It also operates and maintains 7 pump stations (with ponding areas) for removal of interior drainage to the Mississippi River.

B. Current Problems Most features of the flood protection system were constructed during the 1950's. The levee system is quickly approaching its 50-year design life. Components are aging, some do not function effectively, and others are out-of-date. In addition, the existing system is not in conformance with current flood protection standards.

C. Project Purpose The purpose of the proposed project is to return the levee and pump stations and other appurtenant features to their original degree of protection, and bring the flood protection system into conformance with current flood protection standards.

D. Limits of Scope The geographic scope of the area addressed in this document is the Wood River Drainage and Levee District, including the bottomland and adjacent upland watersheds, and terrestrial and aquatic areas bordering (outside) the area of protection that are along the Mississippi River and Cahokia Creek Diversion Channel.

II. Project Authorization The St. Louis District has been involved with a project in the Levee District area for over 50 years. The original Federal project was authorized by the Flood Control Act of 28 June 1938, Flood Control Committee Document No. 1, 75th Congress, First Session,

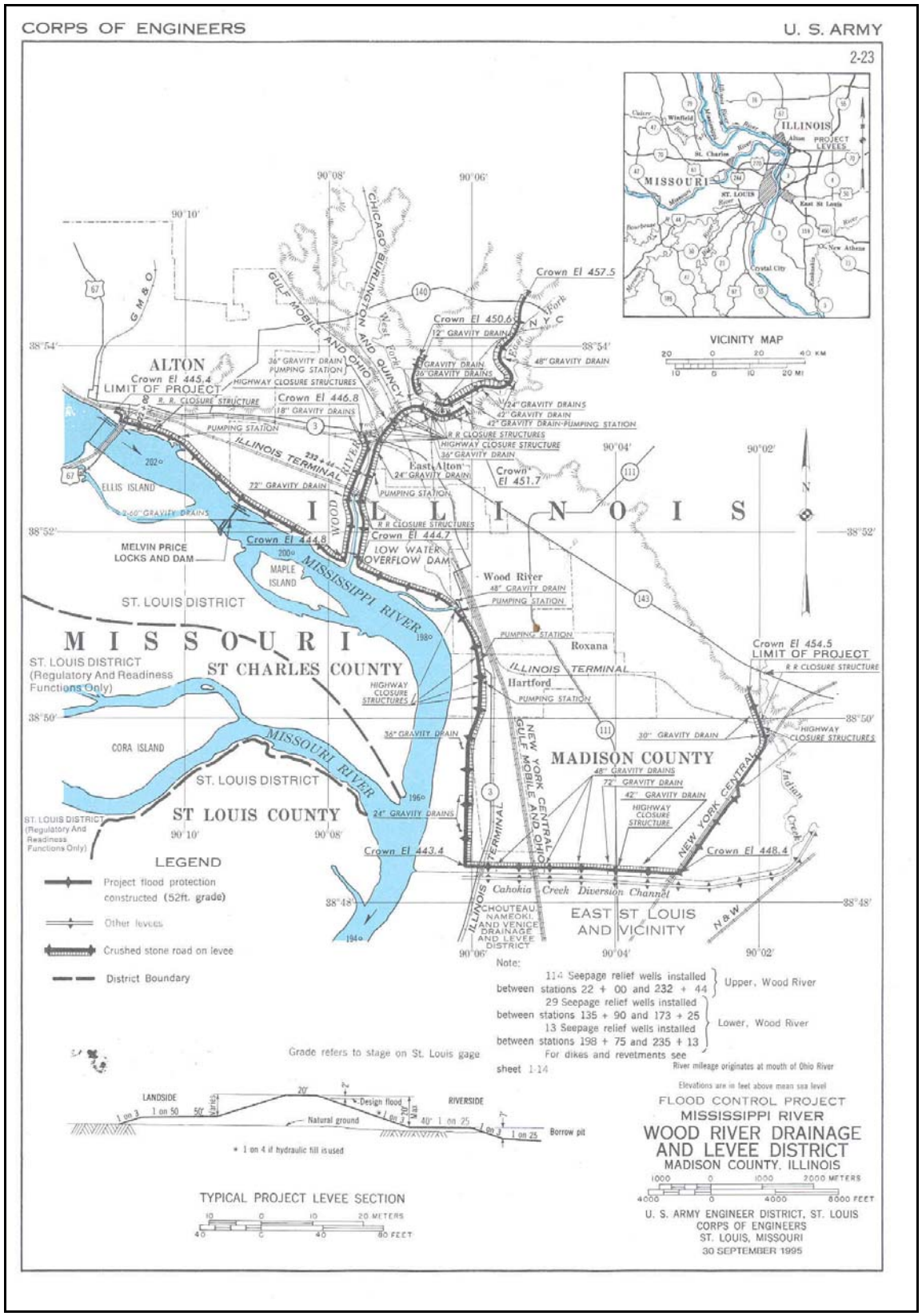

Figure EA-1. Wood River Levee and Drainage District

and construction has been completed. The project was modified by the Flood Control Act, approved 27 October 1965 by Public Law 89-298, House Document No. 150, 88th Congress, First Session, to provide for construction of a pumping station with collector ditches and necessary appurtenant facilities for removal of water impounded by the existing levees.

The Wood River Drainage & Levee District, Illinois - Pump Station Reconnaissance Report, dated January 1998, reaffirmed the need for the 45-cfs pump station authorized in 1965. The purpose of the pump station is to reduce interior flooding near the southern end of Levee District. Construction of this pump station is dependent on future funding. The St. Louis District prepared an Environmental Assessment for this pump station in February 1998. The document was titled "Environmental Assessment, Proposed Pump Station and Ditch Improvements, Grassy Lake Area, Wood River Drainage and Levee District, Madison County, Illinois". This National Environmental Policy Act (NEPA) action was concluded with a Finding of No Significant Impact, signed July 31,1998. The pump station is not yet built because of constrained funding.

III. Description of Existing Environment

A. Topography and Geology The project area envelops two landforms, the Mississippi River floodplain and adjacent uplands. The floodplain area includes two geomorphological regions, the aggraded cut and fill region, and the terrace region (Yarbrough 1974). The former region roughly occupies the southwest half of the project area, and is characterized by level terrain (425 to 430 feet NGVD). The Mississippi River once cut and filled this region, but the land surface later became flat through the accumulation of clays deposited by the adjacent historic Cahokia Creek and Long Lake when they overflowed. The terrace region occurs in the northeast half of the project area, and was not subjected to cutting and filling by the Mississippi. Ground elevations here are higher, and within the project area they range from about 430 to 445 feet NGVD.

The bluffs are as high as 650 feet above sea level, or as much as 225 feet above the floodplain. The line of bluffs that more or less define the eastern boundary of the levee district consist of relatively soft shales and sandstones. However, bedrock is not exposed as the bluffs are mantled with deposits of glacial drift overlain with loess. The drift is commonly an unsorted deposit of pebbly clay, very plastic clay, sandy clay, and occasional lenses of sand or gravelly sand. The loess that blankets the summit and faces of the bluffs consists of windblown silts and lean clays locally 50 feet or more thick. Adjacent to the bluffs a series of sand and gravel deposits form terraces that stand an average of 30 feet above the level of the surrounding plain. These terraces are remnants of an aggraded fill resulting from glacial meltwater deposits.

Wood River, a tributary of the Mississippi River, divides into two branches just west of East Alton, and the valleys of the two forks are coincident with the Mississippi flood plain for several miles upstream. The deepest part of the bedrock surface ranges in depth from 160 to 170 feet beneath the valley fill with an average thickness of 130 feet of overlying alluvial deposits. Immediately above the bedrock surface is a stratum consisting of coarse gravels and sands with occasional boulders. Overlying this stratum is a thick section of medium to fine sands. The surface deposits are complex and varied as they result from filled lakes and swamps, abandoned

meander loops, and flood water deposition. The materials range from heavy plastic clays to fine sands. In addition, industrial waste and artificial deposits are also found as part of the surface deposits.

B. Land Cover Much of the bottomland in the Levee District is developed, and consists of a mix of industrial, commercial, and residential areas. Most of the remainder of the bottomland is agricultural, and is represented by cropland. There are relatively small areas of undeveloped land, consisting primarily of forest and nonwoody wetlands, and these are most often located along the inside of the main levee. In the upland watersheds, urban development consisting chiefly of residential areas occurs in a band adjacent to the bottomland. Cropland is the dominant land cover further up in the upland watersheds. Forested land cover occurs along Wood River Creek in relatively small areas.

C. Socioeconomic Resources Municipalities within the project area include Alton, East Alton, Wood River, Hartford, Roxana, South Roxana, and Bethalto. About 23,000 residents live within the Levee District. Chief industrial facilities include petroleum storage facilities, industrial chemical plants, and metals production plants. Cropland supports the production of mostly row crops but some small grains. The project area is traversed by several railroads that service industrial development. Illinois Routes 3, 111, and 143 provide highway access, and Interstate 255 is on the eastern boundary of the project area.

D. Prime Farmland According to the digital soil survey of Madison County (Natural Resource Conservation Service (NRCS) 2004), prime farmland soils of various kinds occur within the project area, but most are concentrated in the upland watersheds. Roughly 70 percent of the bottomland in the project area consists of soils that are “not prime farmland”, and developed or built-up areas are included in this category. About 20 percent of bottomland consists of soils for which “all areas are prime farmland”. The remaining soils in the bottomland consist of soils that are either “prime farmland if drained”, “prime farmland if drained and protected from flooding”, or “prime farmland if protected from flooding or not frequently flooded during the growing season”. Bottomland soils for which “all areas are prime farmland” occur inside the levee-protected area, and are concentrated in the southwest and southeast corners of the project area, as well as along the flank levees on either side of Wood River Creek. These mapping units include Landes very fine sandy loam, Shaffton clay loam, Onarga sandy loam, Tice silty clay loam, Ridgeway silt loam, and Geff silt loam.

E. Hydrologic Conditions The project is intended to provide protection against a 52 foot Mississippi River stage on the St. Louis Gage, which has a current expected frequency of greater than 500 years. For the design flow of 1,300,000 cfs, the height of protection is based upon confinement by industrial and urban area projects with a design flood profile having a flow-line elevation of 443.4 feet, m.s.l. at the upper end (opposite river-mile 202.7); elevation 442.7 feet, m.s.l, at the mouth of Wood River; and elevation 441.4 feet, m.s.l, at the lower end (Cahokia Creek Diversion Channel) of the District. Levee grade freeboard is 2 feet above water surface profile by design. The flood of record occurred during the summer of 1993 when the St. Louis gage recorded 49.58 ft. River elevations were above flood stage from 3 April to 7 October. Peak flow was estimated at 1,080,000 cfs. The frequency of that event was 175 years. The project endured two other significant flood events; 43.3 feet on the St. Louis gage in 1973, and

41.9 feet on the St. Louis gage in 1995. For the flank levees, a net grade equal to the main stem design flood elevation plus 2-foot freeboard was projected back along the tributaries. The interior drainage system relies on two methods of conveyance, open drainage ditches and combined sewers. Open drainage ditches feed two of the seven pump stations, and these are Lakeside and Homegarden. Sewer fed pump stations must pump effluent irrespective of interior rainfall events whenever gravity flow is impeded by high river stages.

F. Surface Water Resources The project area is within the watershed referred to as the Mississippi South Central River Watershed by the Illinois Environmental Protection Agency (IEPA). Tributaries draining upland watersheds into the bottomland include Wood River Creek (and its west and east branches). The bottomland portion of its channel was straightened long ago to create a more direct connection with the Mississippi River. Wood River Creek discharges into the river near the midpoint of the Levee District's riverfront levee. The Cahokia Creek Diversion Channel bounds the south side of the Levee District. The Mississippi River borders the riverfront levee for its entire length. Small man-made impoundments are scattered in the uplands, and a number of lake-like water bodies occur in the bottomland, most of which are clustered along either side of the main levee.

According to the IEPA (2002a), designated uses for Wood River Creek have been rated as partial support for aquatic life use, and nonsupport for primary contact (swimming). Potential causes of water quality impairment for Wood River Creek include metals contaminants (copper), nutrient enrichment (phosphorus, total ammonia-N), siltation, salinity/total dissolved solids/chlorides, and suspended solids. Potential sources of water quality impairment for Wood River Creek vary widely, and include the following sources: agricultural operations (non-irrigated crop production), urban/stormwater runoff, and hydrologic/habitat modification via channelization.

G. Ground Water Resources The bottomland portion of the study area is underlain by a sand and gravel aquifer that has historically supplied groundwater for industrial purposes. The municipalities of East Alton, Bethalto, Wood River, and Hartford have community water supply facilities that currently withdraw from these groundwater sources. In order to protect groundwater quality in this area, the Southern Groundwater Protection Planning Region was established by the IEPA in Madison County and three adjacent counties to the south. In the vicinity of the East Alton community water supply, there is a plume of groundwater contamination coming from two sites that consist of leaking underground storage tanks, and the contaminants include various volatile organic compounds (IEPA 2002b).

H. Hazardous, Toxic, and Radioactive Waste Some industrial sites in the riverfront area are contaminated with wastes. Those in the State Site Remediation Program include Explorer Pipeline Company, Koch Pipeline Company, The Premcor Refining Group, Inc., Clark Oil Refinery, and Shell Oil Company. Sites under the Resource Conservation and Recovery Act (RCRA) program include BP, Conoco-Phillips, and Olin Corporation. Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, commonly known as Superfund) sites in the area include Laclede Steel Company, Clark Oil Refinery, Owens Illinois Inc., and Chemetco. These combined sites occupy thousands of acres of the floodplain, with Shell Oil being the largest with 2,220 acres.

I. Biological Resources Because much of the project area is developed, existing biological resources are relatively limited, at least those landside of the main levee. There are a variety of aquatic, wetland, and terrestrial natural communities. Aquatic resources include the Mississippi River, Cahokia Creek Diversion Channel, and Wood River Creek, including both the East and West Forks. Some man-made ponds occur in the uplands and on the floodplain. The Mississippi River is an aquatic resource of major significance, and provides habitat to numerous species of invertebrates, fish, and birds.

Wetlands subject to Section 404 of the Clean Water Act are concentrated along the Mississippi River, both riverside and landside of the main levee. Fewer wetlands occur at a distance from the river and are scattered on the Mississippi River floodplain. Wetlands also occur in a narrow band along the Diversion Channel, and they are bordered by the waterway's flank levees. Wetlands consist of forested and herbaceous (nonwoody) habitats. Terrestrial habitats occur in the vicinity of East and West Forks of Wood River Creek, and consist of nonwetland floodplain and upland forests.

Many of these natural communities have limited ecological importance because they are relatively small and fragmented as a result of development. Most wildlife species are adapted to human disturbance, and consist of a variety of amphibians, reptiles, birds, and mammals.

J. Threatened and Endangered Species In compliance with Section 7(c) of the Endangered Species Act of 1973, as amended, the St. Louis District requested that the U.S. Fish and Wildlife Service (USFWS) provide a listing of Federally threatened or endangered species, currently classified or proposed for classification, that may occur in the vicinity of the Wood River Drainage and Levee District. In a telephone conversation dated February 12, 2003 with Joyce A. Collins, assistant field supervisor of the Marion, Illinois, suboffice, the USFWS provided a list of 6 species for the vicinity of the proposed project area. They include the bald eagle (*Haliaeetus leucocephalus*, threatened), Interior Least tern (*Sterna antillarum athalassos,* endangered), gray bat (*Myotis gricescens,* endangered), Indiana bat (*Myotis sodalis,* endangered), pallid sturgeon (*Scaphirhynchus albus,* endangered), and decurrent false aster (*Boltonia decurrens,* threatened). The USFWS did not indicate that any designated critical habitat for any of these species currently occurs in the project area.

In a letter dated April 2, 2003, the Illinois Department of Natural Resources reported that the Illinois Natural Heritage Database includes no records of state-listed threatened or endangered species, natural areas, or nature preserves within the boundaries of the drainage district. Three listed species – the state and federally endangered pallid sturgeon, the state endangered lake sturgeon (*Acipenser fulvescens*), and the state threatened butterfly mussel (*Ellipsaria lineolata*) – are known to inhabit the Mississippi River adjacent to the project area. Information describing these federally- and state-listed species follows.

Bald eagle: Bald eagles winter along the major rivers of Illinois and Missouri, and at scattered locations some remain throughout the year to breed. Perching and feeding occurs along the edge of open water, from which eagles obtain dead fish. The Mississippi River is a focal point for wintering eagles, especially upriver of the project area north of Alton. Nesting has been observed on islands near the confluence with the Illinois River, further upriver from Alton.

Interior least tern: Recent nesting colonies of the Interior least tern have been recorded from southern Illinois in Jackson and Alexander Counties (Herkert 1992). Nesting areas are sparsely vegetated sand and gravel bars within a wide, unobstructed river channel. Nesting locations usually are at the higher elevations and away from the water's edge.

Gray bat: Gray bats are presently known from only several counties in west-central and extreme southern Illinois; the species' historical distribution includes Madison County (Herkert 1992). Gray bats roost in caves year around. Winter caves are deep and vertical, and provide a large volume below the lowest entrance to act as cold air traps. A much wider variety of cave types are used during spring and fall transient periods. In summer, maternity colonies prefer caves that act as warm air traps or that provides restricted rooms or domed ceilings that are capable of trapping the combined body heat from thousands of clustered individuals. Summer caves, especially those used by maternity colonies, are nearly always located within a kilometer of rivers or reservoirs over which they feed. Except for brief periods of inclement weather in early spring and possibly late fall, adult gray bats feed almost exclusively over water along river or reservoir edges.

Indiana bat: Indiana bats also winter in caves or mines, but none of these features are known in the vicinity of Madison County (Herkert 1992). Females use trees in the summer months as nursery roosts, and forage for insects in the tree canopy. Trees preferred for maternity roosting in Illinois have included dead individuals with shaggy or loose bark, and diameters at breast height (dbh) often greater than 10 inches. Species have included slippery elm *Ulmus rubra*), American elm (*Ulmus americana*), northern red oak (*Quercus rubra*), white oak (*Quercus alba*), post oak (*Quercus stellata*), shagbark hickory (*Carya ovata*), bitternut hickory (*Carya cordiformis*), cottonwood (*Populus deltoides*), silver maple (*Acer saccharinum*), green ash (*Fraxinus pennsylvanica*), white ash (*Fraxinus americana*), and sycamore (*Platanus occidentalis*) (Hofmann 1994). Live shagbark hickory trees with loose bark or cavities are also used. Males have been known to roost in shingle oak (*Quercus imbricaria*), sassafras (*Sassafras albidum*), and sugar maple (*Acer saccharum*) (Hofmann 1994).

Pallid sturgeon: This fish is found in the Mississippi River downstream of its confluence with the Missouri River. The entire stretch of river below the mouth of the Missouri River is considered potential habitat. Little is known of its habitat preferences. Pallid sturgeon are most frequently caught over a sand bottom, which is the predominant bottom substrate within the species' range on the Missouri and Mississippi Rivers. Pallid sturgeons have been found in water 1.2 to 7.6 meters deep with velocities of 0.33 to 90 centimeters per second (USFWS 1993). These data probably better reflect where data have been collected rather than actual habitat preferences. Recent tag returns have also shown that the species may be using a range of habitats in off-channel areas, including tributaries, of the Mississippi River.

Decurrent false aster: The decurrent false aster is presently known from scattered localities on the floodplains of the Illinois and Mississippi Rivers; the distribution along the latter extends south from the mouth of the Illinois to the Mississippi's confluence with the Missouri River and Madison County, Illinois. Its natural habitat was the shores of lakes and the banks of streams. It appears to require abundant light. Populations presently grow on stream banks and

lakeshores, but are more common in disturbed lowland areas where they appear to be dependent on human activity for survival (USFWS 1990).

Lake sturgeon: In Illinois, this fish is known from the Mississippi River, and has been recorded since 1980 from the reach adjacent to Madison County (Herkert 1992). The lake sturgeon inhabits lakes and large rivers, and occurs on the bottom usually in relatively deep water (4-9 meters) over substrates consisting of mud, sand, and gravel (Herkert 1992).

Butterfly mussel: This species is known from the Mississippi and Ohio River systems in the Midwest, and inhabits sand and gravel bottoms of large rivers (Cummings and Mayer 1992).

K. Recreation Madison County Transit supports a system of recreational trails in Madison County that are used for walking, running, roller-blading, and cycling. The Confluence Trail follows the top of the main levee along the Mississippi River. In the project area, this trail extends nine miles from the Cahokia Creek Diversion Channel at the south to Alton at the north. A two-mile extension branches off at Wood River Creek and follows the creek upstream to about Illinois Route 3. A second trail, the Watershed Trail, occurs in the southeast portion of the project area and was built along an abandoned rail corridor.

L. Aesthetics Aesthetic resources include the natural channel of the Mississippi River and undeveloped open spaces such as agricultural lands and natural habitats. The project area's industrial areas would not be expected to be aesthetically attractive.

M. Historic Properties The floodplain portion of the project area, called the American Bottom, is arguably the richest, most complex, archaeological region in all of North America. Native American occupation of the project area began at least 12,000 years ago and continued up until the early nineteenth century when the last groups of Native Americans were displaced from the area by ever-increasing numbers of Euro-American settlers. The crown jewel of this archaeological legacy is the Cahokia Mounds World Heritage Site, located about five miles south of the project area. Eight centuries ago this site covered five square miles of the Mississippi River floodplain and was, in turn, surrounded by hundreds of supporting communities. These settlements ranged in size from large towns and villages to individual farmsteads. Research suggests that these settlements were strategically located to garner maximum productivity from the region's ecologically diverse natural resources. Even today, more than six centuries after the last of these prehistoric residents of the Central Mississippi River valley mysteriously abandoned the area, fragments of their discarded tools are commonly observed throughout the project area by the trained eye of archaeologists.

N. Air Quality Six criteria pollutants are addressed in the National Ambient Air Quality Standards, and they include particulate matter, sulfur dioxide, ozone (or smog), carbon monoxide, lead, and nitrogen dioxide. Air quality trends during the period 1992-2001 for the St. Louis MO-IL metropolitan statistical area include a statistically significant decrease in concentration of sulfur dioxide, and no change in the levels of nitrogen dioxide, ozone, or particulates (USEPA 2002). The region is in attainment for all pollutants, with the exception of ozone. From 1991-2003, the entire region was considered to be in "moderate" non-attainment for ozone. In January 2003, the area's status was reclassified as "serious" non-attainment, but in

May 2003 it was determined to meet the one-hour ozone standard (USEPA 2003). In April 2004, the St. Louis area was designated by the USEPA as a moderate non-attainment area for the eight-hour ozone standard (East-West Gateway 2004).

O. Noise Noise is generated at many of the project area's industrial and commercial areas. Transportation-related noise, such as that created at railroads, major highways, and water-borne facilities, is also common.

IV. Future Without Project (No Action) Development is expected to continue in the levee-protected portion of the project area, as a major Interstate Highway (I-255) has recently opened in the Levee District. The connection that this new highway makes to the regional interstate system increases the likelihood of future development in the project area. The surrounding region has become a distribution center and this new interstate spur, which will soon be further expanded, makes the project area attractive for development. New investments by Conoco-Philips and the issuance of another permit for refinery operations during the spring of 2004 by the State would indicate that this base would continue to expand also. This increases the importance of the flood protection system to perform as intended in the future.

However, as the levee system's features continue to degrade as a result of flood events and to exceed their performance life, the system's ability to operate as originally intended under future flood events becomes an even greater concern. If no action is taken, underseepage problems and degradation of gravity drain structures pose a threat to the integrity of the levee, while further degradation to pumping stations and appurtenant works could cause interior flooding that can impact industries, infrastructure and interrupt the transportation system. Future odds increase that a significant failure could occur under the no action alternative. Public safety will continue to be jeopardized. These assessments are reflected in Table EA-1 under the No Action column.

The loss of the Wood River Levee system would not only have devastating economic impacts in the traditional measurement of losses (current estimate $1.5 billion dollars) but would have the added implication of creating an environmental contamination scenario not experienced on any inland waterway system to date. When the U.S. EPA was contacted for information on potential effects, they likened such an occurrence to that experienced as a result of the Exxon Valdez. Not only would the land protected by the levee experience significant contamination from oil, oil byproducts and chemicals used in the refining process, but also the Mississippi River system itself would be impacted. At a conservative estimate of $125,000 per acre of clean up costs, a loss of this levee would result in environmental damages exceeding $2,000,000,000 (two billion dollars), not including the relocation costs of residents and future loss of agriculturally productive land. Effects of a flood protection system failure are not reflected in Table EA-1.

V. Alternatives Considered and Recommended Plan Three avenues of action were used to guide the alternative development process for this study. The No Action alternative assumed nothing would be done to improve the current flood protection system. Under this scenario the Levee District would continue to perform its operation and maintenance responsibilities and maintain their standing in the P.L. 84-99 program, but no Federal action outside of the P.L. 84-99 program would be taken.

Three action alternatives were formulated. The first alternative sought to identify actions that could be taken to correct system design deficiencies through a variety of specific approaches that would bring the system into compliance to ensure it provides its intended level of protection. This alternative related specifically to underseepage concerns (relief wells) (Alternative 1). The second alternative sought to identify system components that had exceeded their design life and required action. These components were analyzed to determine the most cost effective way to ensure the system as a whole provides its intended level of protection into the future. In each instance varying forms of reconstruction or replacement were analyzed in order to determine the preferred method to be undertaken (Alternative 2). A third action alternative (Alternative 3) was formulated and consists of a combination of Alternatives 1 and 2. Costs were associated with these various plans, which were compared for reasonableness, efficiency and effectiveness. An analysis of problems was also made in an attempt to characterize their origin for classification of potential responsibility.

Alternative 3 was selected as the recommended plan. Further details concerning the recommended plan and these alternatives can be found in the main report.

The recommended plan, represented by Alternative 3, consists of 1) rehabilitation of 164 existing relief wells, 2) installation of 67 new relief wells, 3) reconstruction of 38 existing corrugated metal pipe gravity drains, 4) reconstruction of 11 existing closure gates, replacement of 5 existing closure gates, and permanent closure of 3 existing closure gates, 5) and various reconstruction activities at six existing pump stations (East Alton No. 2, Wood River, Rand Avenue, Hawthorne Street, Lakeside, and Homegarden).

New relief wells. Installation of 67 new relief wells would occur in five main locations. These locations are displayed in Figure EA-1.

First, 25 new wells would be installed in Alton adjacent to the Mississippi River in the vicinity of the Alton Marina, along the toe of the landside of the main levee and extending for a distance of about 2,300 feet from Landmarks Road to the bridge carrying U.S. Highway 67.

Second, 15 new relief wells would be installed along the left descending bank of the East Fork of Wood River Creek in East Alton, along the toe of the landside of the levee and extending for a distance of about 2,500 feet from about Cardot Street down to the northwest side of Powder Mill Road. Downstream of the 15 wells, three more relief wells would be installed in East Alton along the left descending bank of Wood River Creek, just downstream of the confluence of the West and East Forks.

Third, downstream of the three wells, 13 new wells would be installed in East Alton along the left descending bank of Wood River Creek, along the toe of the landside of the levee and extending for a distance of about 1,000 feet from about Holt Street to about Pine Street.

Fourth, 6 new relief wells would be installed in Hartford along the right descending bank of the Cahokia Creek diversion channel, on the landside of the levee and north side of Canal Road, and extending for a distance of about 1,500 feet, beginning at a point about 2,500 feet west of State Route 111.

Lastly, 5 new relief wells would be installed along the north side of the flank levee (railroad embankment) along Indian Creek, about 2,900 feet southeast of Wanda, and extending for a distance of about 1,000 feet along the levee.

VI. Environmental Effects of the Alternatives Considered and Recommended Plan

Table EA-1 displays a summary of probable impacts to environmental, social, and economic resources in the project area for the three action alternatives and the no action (future without project) alternative. Note that the three action alternatives differ only slightly with one another with respect to type and degree of impact. Figure EA-1 displays the location of proposed new relief wells and existing relief wells.

Table EA-1. Summary of probable environmental, social, and economic impacts of the No Action and three Action Alternatives. (0 = no change, – = adverse effect, + = beneficial effect; one sign = minor effect, two = moderate effect, three = major effect), * = recommended plan

Impacts	No Action	Alt. 1	Alt. 2	Alt. 3*
ENVIRONMENTAL				
Terrestrial Resources	0	0	0	0
Wetland Resources	0	0	0	0
Aquatic Resources	0	0	0	0
T & E Species	0	0	0	0
Geology and Soils	0	0	0	0
Hydrology	0	0	0	0
Water Quality	0	0	0	0
Climate	0	0	0	0
Erosion and Sedimentation	0	0	0	0
Air Quality	0	–	–	–
Noise	0	–	–	–
Hazardous and Toxic Materials	0	0	0	0
Agricultural Resources	0	0	0	0
SOCIAL				
Land Use	0	0	0	0
Cultural Resources	0	0	0	0
Environmental Justice	0	0	0	0
Flood Damage Reduction	– – –	++	++	+++
Aesthetics	0	–	–	–
Public Facilities	0	0	0	0
Public Services	0	0	0	0
Safety	– –	+	+	++
Recreation	0	0	0	0
ECONOMIC				
Employment	0	+	+	+
Tax Values	0	0	0	0
Property Values	0	0	0	0
Community Cohesion	0	0	0	0
Displacement of People	0	0	0	0
Displacement of Businesses	0	0	0	0
Disrupt of Comm. Growth	0	0	0	0
Disrupt of Regional Growth	0	0	0	0
Operations and Maint.	– –	+	+	++

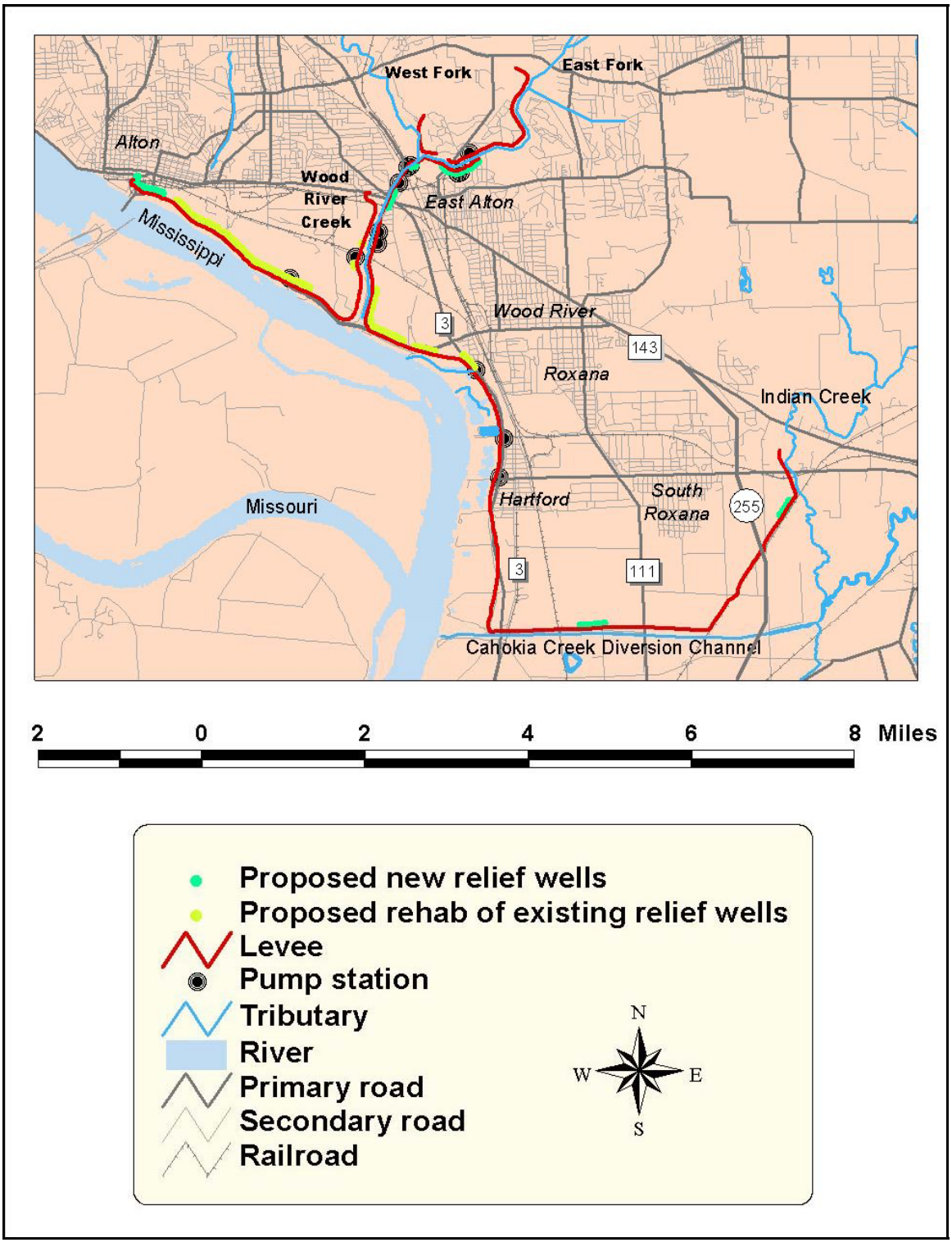

Figure EA-1. Recommended Plan - location of proposed relief well work.

A. Topography and Geology The recommended plan and the other action alternatives would affect topography minimally. Installation of the proposed new relief wells would require the creation of a swale (shallow ditch) or subsurface collector system along the landside toe of the floodwall/levee to direct relief well water to the nearest pump station. No other changes to topography, such as fills, are proposed. Installation of proposed relief wells would require drilling down into unconsolidated alluvial materials and any man-made fills already in place, creating temporary holes.

B. Land Cover Changes to land cover resulting from implementation of the recommended plan would be negligible.

C. Socioeconomic Resources Some of the proposed 68 new relief wells would be installed on properties with industrial, commercial, or residential development located close to the landside toe of the flood protection system. In these cases, the District would minimize construction and operation impacts to the maximum extent practicable by avoiding existing structures and facilities and installing subsurface collector systems with the wells to prevent surface flooding of adjacent properties during future periods of relief well flow. Construction impacts to these properties would be adverse and temporary. With the project, flood damage reduction and safety in the project area would improve, as well as operations and maintenance of the flood protection system. The project would provide temporary employment.

D. Prime Farmland The St. Louis District has coordinated this project with the Springfield, Illinois, office of the NRCS, and that agency has determined that this project is not subject to the Farmland Protection Policy Act (Johnson 2004). The St. Louis District is not required to submit any Farmland Conversion Impact Rating (Form AD-1006) to the NRCS and Illinois Department of Agriculture. The recommended plan and other action alternatives are not expected to impact prime farmland. Similarly, none of the action plans would cause an irreversible conversion of farmland to nonagricultural use.

E. Hydrologic Conditions The recommended plan and the other action alternatives would correct the potential hydrologic problem of floodwaters seeping into the protected area when the Mississippi River is high. On the other hand, during elevated river stages, groundwater would flow up within the existing and proposed new relief wells to the ground's surface. This relief well water would be collected and directed to the nearest pump station. This would be accomplished using a surface swale, or a subsurface collector system, located along the landside toe or base of the floodwall/levee. These measures would prevent relief well water from spreading out into the flood-protected area.

F. Surface Water Resources No work is proposed within the Mississippi River, Wood River Creek, or Cahokia Creek Diversion Channel. The recommended plan and other action alternatives are not expected to adversely affect water quality of any of these waterways.

G. Ground Water Resources All of the action plans would increase the number of relief wells located along the landside toe of the floodwall/levee from 164 to 221. These relief wells would penetrate the ground to a depth of no greater than 90 feet. The bottoms of these wells would be

located in the unconsolidated materials located above bedrock. Installation of the proposed new wells would not affect the groundwater aquifer located in these unconsolidated materials.

H. Hazardous, Toxic, and Radioactive Waste During the installation of the proposed new relief wells, drilling materials would be monitored and tested to determine if any contaminants of concern are present that might require such materials to be considered a special waste. Similarly, during the well installation process and subsequent testing, groundwater obtained during drilling and pumping would be monitored and tested to determine if contaminates of concern are present in the water. The District will apply for and obtain a Section 401 water quality certification from the IEPA for the treatment and disposal of groundwater should contaminants be found in pumped groundwater once construction commences.

I. Biological Resources The recommended plan would not require the removal of any forest. A few trees may need to be cleared in residential areas in conjunction with the installation of new relief wells (in East Alton in the vicinity of Cardot Street along the left descending bank of the East Fork of Wood River Creek, and in the vicinity of Holt Street along the left descending bank of Wood River Creek).

The installation of new relief wells would not affect any wetlands. Since some existing relief wells are located in or adjacent to wetlands subject to Section 404 of the Clean Water Act, rehabilitation of some of these existing wells may involve placement of fill materials. Creation of temporary work pads may be necessary if conditions are wet at the time of construction. Similarly, future testing of well function after rehabilitation may show that rehabilitation of a particular well was not effective in restoring well function, such that a new well needs to be installed to replace the ineffective well. Drilling of a pilot hole for this new well may involve placement of drilling (fill) materials into a wetland. Discharges of clean fill materials associated with these types of construction activities are covered under Nationwide Permits #3 and #6. Section 401 water quality certification has already been issued by the IEPA for these two nationwide permits, with no special conditions. If placement of work pads or drilling materials in wetlands is needed, these actions would be temporary, and fill materials would be removed and affected sites restored to pre-project conditions. Adverse effects to wetlands would be temporary and not significant. No authorization is required under Section 10 of the 1899 Rivers and Harbors Act.

J. Threatened and Endangered Species The following describes the recommended plan's probable effect on federally listed species.

Bald eagle: The few trees that are likely to be removed as part of this proposed project are located in residential areas along Wood River Creek and its tributaries. These trees are not large enough to be used as nesting trees or foraging perches. Therefore, the project is unlikely to affect this species.

Interior least tern: The proposed project is unlikely to affect this species because no known nesting occurs in the adjacent reach of the Mississippi River, and no proposed work would occur in or along the river's channel as part of this project.

Gray bat: As there are no known winter or other seasonal caves in the vicinity of the proposed project area, it is unlikely that this species will be impacted.

Indiana bat: The few trees likely to be cleared in residential areas for the installation of new relief wells are not suitable as roosting habitat (living trees with loose bark, dead trees with cavities). Therefore, the proposed project is unlikely to affect this bat.

Pallid sturgeon: The pallid sturgeon is unlikely to be affected because the proposed project would not occur in or along the Mississippi River's channel.

Decurrent false aster: Habitat for this species does not occur in the proposed areas of new relief well installation, but herbaceous wetlands are in the vicinity of existing relief wells that are proposed for rehabilitation. At the present time no plants have been found in the area of existing relief wells, but because the plant has been appearing in new locations in Madison County, a survey of the area will be done before construction begins to insure that it is not in the project area. At the present time, the project is not expected to affect the decurrent false aster.

Among the state-listed species, the lake sturgeon and butterfly mussel are unlikely to be affected because no work is proposed in the Mississippi River.

It is the St. Louis District's opinion that the proposed project will not adversely impact any of the six federally- and three state-listed threatened or endangered species that might occur in the project area. This conclusion is made, provided that a field survey is conducted to determine the presence of the decurrent false aster prior to commencement of relief well rehabilitation. Likewise, the action will not affect any critical habitat of these species. The USFWS will be given an opportunity to review this EA and comment on this Biological Assessment of expected effects on species of concern.

K. Recreation Proposed closure of the three gates would not affect any recreation trails. Similarly, rehabilitation and replacement of the 16 existing closure gates are not expected to affect any trails.

L. Aesthetics The aesthetics of the project area would be adversely impacted slightly as well as temporarily by construction activities. Areas where barren ground surfaces are created would be seeded and returned to pre-project conditions.

M. Historic Properties Many components of the recommended plan will occur upon previously disturbed ground surfaces, including rehabilitation of existing relief wells, reconstruction of existing corrugated metal pipe gravity drains, reconstruction or replacement of existing closure gates, permanent closure of existing closure gates, and reconstruction activities at existing pump stations. The likelihood of encountering undisturbed archaeological remains during these activities is extremely low. Therefore, these activities will have no effect upon potentially significant historic properties.

Similarly, installation of new relief wells will occur upon previously disturbed ground surfaces at four of the five locations recommended for this activity. The four locations with previously disturbed ground surfaces include 1) in Alton adjacent to the Mississippi River in the vicinity of

the Alton Marina, 2) along the left descending bank of the East Fork of Wood River Creek in East Alton, from about Cardot Street down to the northwest side of Powder Mill Road, and just downstream of the confluence of the West and East Forks, 3) in East Alton along the left descending bank of Wood River Creek, from about Holt Street to about Pine Street, and 4) in Hartford along the right descending bank of the Cahokia Creek diversion channel, on the landside of the levee and south side of Canal Road west of State Route 111. The likelihood of encountering undisturbed archaeological remains during installation of new wells at these four locations is extremely low.

Installation of 5 new wells along the north side of the flank levee (railroad embankment) along Indian Creek, about 2,900 feet southeast of Wanda, appears to be in close proximity to an abandoned historic American cemetery, the Sanders Cemetery, and the reported location of Fort Chouteau, an early 19th Century blockhouse erected during the War of 1812. Design surveys for these wells have not yet been completed to determine if wells would be installed along the toe of the levee embankment, or further away from the levee along the border of adjacent cropland. If the project ultimately recommends relief well placement in adjacent cropland, then additional archival and archaeological investigations will be required within this context.

N. Air Quality The recommended plan would have short-term effects on air quality. The effects would be restricted to exhaust and dust from construction activities. These impacts would cease once construction was completed.

O. Noise The recommended plan is not expected to significantly affect noise levels in the project area. Noise impacts would be temporary and caused by construction activities and machinery. The District would confine construction operations to daylight hours when practicable to minimize noise impacts to residential areas.

P. Relationship of the Proposed Project to Land-Use Plans The proposed project, which is to restore a fully functional flood protection project to the Wood River Levee and Drainage District, is consistent with the original purpose of the project.

Q. Adverse Effects Which Cannot Be Avoided Some new relief wells are proposed to be installed on properties with industrial, commercial, or residential development located close to the landside toe of the flood protection system, where the relief wells would be placed. In siting these wells, existing development would be avoided to the maximum extent practicable; no properties would need to be acquired in order to implement the project. Construction impacts to these properties would be adverse and temporary. Other unavoidable adverse impacts include noise and exhaust generated by heavy equipment.

R. Short-Term Use Versus Long-Term Productivity The recommended plan does not represent a short-term use of the environment, but a long-term or permanent solution to many problems with the original project. Current conditions could lead to a catastrophic levee failure and damage to lives, property, and livelihoods of many people. The areas of impact, for the most part, have been utilized by the original project and the reconstruction of the project would not affect any previously undisturbed areas.

S. Irreversible or Irretrievable Resource Commitments Aside from the commitment of funds, labor and construction materials for construction, there would be no irreversible or irretrievable resource commitments.

T. Cumulative Impacts In addition to proposed work at the Wood River Flood Protection System, the St. Louis District, Corps of Engineers, has undertaken rehabilitation and reconstruction activities of existing flood protection systems at six other locations along the Mississippi River. These include, from north to south, Chain of Rocks (Madison County, Illinois), City of St. Louis (Missouri), East St. Louis (Madison and St. Clair Counties, Illinois), Prairie du Pont (St. Clair and Monroe Counties, Illinois), Bois Brule (Perry County, Missouri), and Cape Girardeau (Cape Girardeau County, Missouri). Construction has started at two projects (Chain of Rocks, East St. Louis), but the others are in the planning/approval stage. Relief well rehabilitation and installation of new relief wells are construction features common to all these projects, except for Cape Girardeau. The Corps is the sole agency or entity doing this kind of work on flood protection systems along the Mississippi River. All projects are expected to give rise to temporary adverse impacts to air quality and noise. Construction work by others in the vicinity of the Wood River Flood Protection System is likely to occur concurrently with the proposed work (if approved and funded), and is likely to include a variety of industrial, commercial, or transportation-related activities at single locations. No significant cumulative impacts on the environment have been identified.

VII. Relationship of Recommended Plan to Environmental Requirements

TABLE EA-2. Relationship of Plan to Environmental Requirements

Guidance	Degree of Compliance
Federal Statutes	
Archaeological and Historic Preservation Act, as Amended, 16 U.S.C. 469, et seq.	PC[1]
Clean Air Act, as Amended, 42 U.S.C. 7609	FC
Clean Water Act, as Amended 33 U.S.C. 466 et seq.	FC
Endangered Species Act, as Amended, 16 U.S.C. 1531. et seq.	FC
Farmland Protection Policy Act, 7 U.S.C. 4201, et seq.	FC
Federal Water Project Recreation Act, as Amended, 16 U.S.C. 4601, et seq.	FC
Fish and Wildlife Coordination Act, as Amended, 16 U.S.C. 4601, et seq.	PC[2]
Land and Water Conservation Fund Act, as Amended, 16 U.S.C. 4601, et seq.	FC
National Environmental Policy Act, as Amended, 42 U.S.C. 4321, et seq.	FC
National Historic Preservation Act, as Amended, 16 U.S.C. 470a, et seq.	PC[1]
Executive Orders	
Flood Plain Management, E.O. 11988 as amended by E.O. 12148	FC
Protection of Wetlands, E.O 11990 as amended by E.O. 12608	FC
Protection and Enhancement of the Cultural Environment, E.O. 11593	PC[1]
Analysis of Impacts on Prime or Unique Agricultural Lands in Implementing NEPA, CEQ Memorandum, August 11, 1980.	FC

FC = Full Compliance, PC = Partial Compliance
1 - Full compliance will be attained after all required archaeological investigations, reports, and coordination have been completed
2 - Full compliance will be attained upon completion of coordination with USFWS

VIII. Issues and Concerns

A. Hazardous and Toxic Wastes There is the potential that contaminants consisting of hazardous and toxic wastes could be encountered in groundwater obtained during the proposed rehabilitation of existing relief wells and installation of new relief wells. During the construction process, groundwater obtained from initial pumping will be monitored and tested to determine if any contaminants of concern are present. Should they be found, the District will apply for and obtain a Section 401 water quality certification from the IEPA for the treatment and disposal of contaminated groundwater.

B. Potential for Fill Activities in Wetlands subject to Section 404 of Clean Water Act Clean fill materials may need to be placed into wetlands to create work pads in association with rehabilitation of existing relief wells, if conditions are wet at the time of construction. Similarly,

drilling of pilot holes for new wells to replace ineffective existing wells may involve placement of drilling (fill) materials into a wetland. Discharges of clean fill materials associated with these types of construction activities are covered under Nationwide Permits #3 and #6. Section 401 water quality certification has already been issued by the IEPA for these two nationwide permits, with no special conditions. These actions would be temporary, and fill materials would be removed and affected sites restored to pre-project conditions. Adverse effects to wetlands would be temporary and not significant.

C. Installation of Some New Wells on Developed Properties Some new relief wells are proposed to be installed on properties with industrial, commercial, or residential development located close to the landside toe of the flood protection system, where the relief wells would be placed. In siting these wells, existing development would be avoided to the maximum extent practicable; no properties would need to be acquired in order to implement the project. Construction impacts to these properties would be adverse and temporary. Other unavoidable adverse impacts include noise and exhaust generated by heavy equipment.

D. Floodplain Management Executive Order 11988 outlines the responsibilities of Federal agencies in the role of floodplain management. Each agency shall evaluate the potential effects of actions on flood plains, and should avoid undertaking actions that directly or indirectly induce growth in the floodplain or adversely affect natural floodplain values. Engineer Regulation 1165-2-26 states:

The Corps is required to provide leadership and take action to

- Avoid development in the base flood plain unless it is the only practicable alternative;
- Reduce the hazard and risk associated with floods;
- Restore and preserve the natural and beneficial values of the base flood plain.

The Corps is required to follow the general procedures listed below to address the requirements of Executive Order 11988.

a. *Determine if the proposed action is in the base flood plain.*

The Wood River Levee and Drainage District is in the base flood plain of the Mississippi River. It protects 13,400 flood plain acres.

b. *If the action is in the base flood plain, identify and evaluate practicable alternatives to the action or to location of the action in the base flood plain.*

Due to the nature of this project, there are no alternatives located outside of the base flood plain. The project involves rehabilitation and reconstruction of a flood control system that is already in place. Therefore all alternatives are located within the base flood plain.

c. *If the action must be in the flood plain, advise the general public in the affected area and obtain their views and comments.*

The general public will be advised about the project and their views and comments will be requested as part of the project's public review process. Comments will be addressed in the reconstruction evaluation report.

d. *Identify beneficial and adverse impacts due to the action and any expected losses of natural and beneficial flood plain values. Where actions proposed to be located outside the base flood plain will affect the base flood plain, impacts resulting from these actions should also be identified.*

Beneficial and adverse impacts have been described in this Environmental Assessment. No actions are proposed outside the base flood plain that would affect the base flood plain.

e. *If the action is likely to induce development in the base flood plain, determine if a practicable non-flood plain alternative for the development exists.*

Improvements to the existing flood protection system are not likely to induce development in the base flood plain beyond what already exists.

f. *As part of the planning process under the Principles and Guidelines, determine viable methods to minimize any adverse impacts of the action including any likely induced development for which there is no practicable alternative and methods to restore and preserve the natural and beneficial flood plain values. This should include reevaluation of the "no action" alternative.*

The "no action" alternative of doing nothing to fix the existing flood control system is possible, but it would not address the problems facing the system and the risk to life, property, and potential environmental contamination of the floodplain and river that would result from flooding if the system were not to perform adequately. The most viable method to minimize adverse impacts is to implement the reconstruction project.

g. *If the final determination is made that no practicable alternative exists to locating the action in the flood plain, advise the general public in the affected area of the findings.*

The Corps of Engineers will advise the general public in the affected area through the public review process.

h. *Recommend the plan most responsive to the planning objectives established by the study and consistent with the requirements of the Executive Order.*

The study's reconstruction evaluation report recommends Alternative 3 as the plan most responsive to the planning objectives.

IX. Literature Cited

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X. Environmental Assessment Preparers

The St. Louis District staff members responsible for preparing this document are as follows:

Mr. Tim George, Ecologist
Dr. Terry Norris, District Archaeologist
Dr. Morris Dirnberger, Geotechnical Engineer
Ms. Kathy Fox, Geotechnical Engineer
Ms. Debbie Roush, Project Manager

XI. Coordination, Public Views, and Responses

The St. Louis District has coordinated with the U.S. Fish and Wildlife Service and Illinois Department of Conservation with respect to species of concern, and the Natural Resources Conservation Service about potential conversions of land to nonagricultural use.

As part of the re-evaluation report, the Environmental Assessment and Draft Unsigned Finding of No Significant Impact are being sent to the following elected officials, agencies, organizations and individuals for review and comment. All responses will be filed with this document.

Elected Officials:

Honorable Richard Durbin	Honorable Alan J. Dunstan
Honorable Peter Fitzgerald	Mayor, City of Roxana & South Roxana
Honorable Jerry Costello	Mayor, Village of Hartford
Honorable John Shimkus	Mayor, City of Wood River
Honorable William R. Haine	Mayor Village of East Alton

Federal Agencies:

Department of Agriculture, Natural Resource Conservation Service
Fish and Wildlife Service
Environmental Protection Agency, Region 5
Federal Emergency Management Agency

Illinois State Agencies:

Department of Conservation
Environmental Protection Agency
Historic Preservation Agency
Department of Agriculture

Industry, Organizations, and Individuals:

Sierra Club
The Nature Conservancy
Wood River Levee District
Olin Corporation
Conoco-Phillips
BP-Amaaco
BOC- Gas, Inc

To assure compliance with the National Environmental Policy Act, Endangered Species Act and other applicable environmental laws and regulations, coordination with these agencies will continue as required throughout the planning and construction phases of the proposed project.

DRAFT FINDING OF NO SIGNIFICANT IMPACT

RECONSTRUCTION OF FLOOD PROTECTION SYSTEM
WOOD RIVER DRAINAGE AND LEVEE DISTRICT
MADISON COUNTY, ILLINOIS

I. I have reviewed and evaluated the documents concerning the reconstruction project for the flood protection system located in the Wood River Drainage and Levee District, Madison County, Illinois.

II. As part of this evaluation, I have considered:

a. Existing Resources and the No-Action Alternative.

b. Impact to Existing Resources with all formulated plans, including the Recommended Plan.

III. The possible consequences of these alternatives have been studied for physical, environmental, cultural, social and economic effects, and engineering feasibility. My evaluation of significant factors have contributed to my finding:

a. The reconstruction project will correct design deficiencies in the original design of the city's flood protection system, will maintain the original level of protection, and will be accomplished by rehabilitation of existing relief wells, installation of new relief wells, reconstruction or replacement of existing drains and closure gates, closure of unneeded gates, and reconstruction at existing pump stations.

b. There would be no significant effects to the geology or topography of the project area.

c. Inducement of development in the flood plain would not result from this project.

d. Federally listed endangered and threatened species would not be adversely impacted.

e. There would be no adverse impacts to cultural resources.

f. There would be no effect to farmland, nor any conversions of land to nonagricultural use.

g. There would be no appreciable degradation to the physical environment (e.g., noise, air quality, and water quality) due directly to the reconstruction project.

h. No significant adverse impacts to the aesthetic value, social, or recreational resources would result. Some developed properties would be affected by installation of new relief wells.

i. Some wetlands may be temporarily impacted by placement of clean fill materials associated with rehabilitation of existing relief wells.

j. No adverse effects to health and safety of the public are expected from potentially contaminated groundwater generated by construction activities.

k. The "no action" alternative was evaluated and determined to be unacceptable as there is a public health and safety issue unless the design deficiencies are corrected.

IV. Based on the disclosure of impacts contained within the Environmental Assessment, I find no significant impacts to the human environment are likely to occur as a result of the proposed project. The proposed action has been coordinated with the appropriate resource agencies and the public, and there are no significant unresolved issues. Therefore, an Environmental Impact Statement will not be prepared prior to proceeding with the proposed reconstruction project for the Wood River Drainage and Levee District's flood protection system, Illinois.

_____ _____

Date

C. Kevin Williams
Colonel, U.S. Army
District Engineer

APPENDIX - D

WOOD RIVER DRAINAGE & LEVEE DISTRICT
RE-EVALUATION REPORT
REAL ESTATE APPENDIX

Draft Real Estate Plan
Wood River Drainage & Levee District (WDLD)
Limited Re-evaluation Report (LRR)

Project Description

Wood River Flood Protection Project was authorized by the Flood Control Act of 28 June 1938. It provided for raising and enlarging 20.8 miles of existing levee, construction of gravity drains, closure structures at railroad and highway crossings, alterations to existing or construction of new pump stations, surfacing a levee road on the crown, seepage control measures and construction of a low-water dam at the mouth of Wood River. The project extends from the City of Alton, Illinois at the northwest and to the Cahokia Diversion Channel on the southeast. It protects the cities of E. Alton, Hartford, Roxanna and Wood River. Construction of Lock and Dam 26 caused increasing seepage to a 2-mile stretch of the levee, requiring an additional pump station. A Reconnaissance Report in April 1999 recommended project rehabilitation be investigated as a result of the 1993 Flood.

1. Purpose

This purpose of this Limited Re-evaluation Report (LRR) is to return the Wood River Levee and flood control features to their original, authorized level of protection. The recommended plan provides for the rehabilitation or reconstruction of the flood control features as follows: reconstruct 160 relief wells as required and install 68 new relief wells to control under-seepage; 11 of the closure structures will be reconstructed by removal and replacement of joint sealant, 4 deteriorated gate sills will be removed and replaced, 1 closure structure will have the approach apron removed and replaced and 3 closure structures will be permanently closed; 11 gates will be reconstructed, 5 gates will be replaced, and 3 gates will be removed as the closure will be permanently closed; reconstruct 38 gravity drains; and reconstruct seven (7) pump stations. The WDLD purchased most of the property required for the reconstruction in the 1940's. WDLD will need to acquire additional property for nine (9) of the 68 new relief wells. None of the other features require additional land be purchased.

2. Lands, Easements, Rights-of-Way (LER) Required for Construction

As a result of constructing nine (9) new relief wells .61 acre of land will be acquired in permanent easement and 1.13 acres will be acquired in temporary easement for access and construction from private landowners. **All land required for the additional 59 relief wells and other flood protection features are owned by WDLD.**

Permanent Easement

a. Permanent easement will be acquired on .33 acres of industrial property and .28 acres of residential property to construct and operate and maintain the 9 new relief wells. The easements will be acquired from seven (7) private landowners and one (1) industrial landowner.

Temporary Construction Easements

b. Temporary easements for construction and access will be acquired on .13 acre of industrial property and 1 acre of residential property. The easements will be acquired from seven private landowners and one industrial landowner.

Corps approved estates are depicted in Exhibit A.

3. LER required that is Owned by Sponsor

The WDLD owns all of the additional property required in the recommended plan. The property was purchased for completion of the Flood Protection Project in the 1940's. The WDLD was required to provide all lands, easements, and right-of-way for the original project.

4. Non-Standard Estate

No non-standard estates are required.

5. Existing Federal Project within the LER Required for the Project

The present flood protection system is a Federal system. It is approximately 21 miles long.

6. Federally Owned Land Required for the Project

No federally owned land is required for the project.

7. Navigation Servitude

Navigation servitude is not applicable to this project.

8. Map depicting the area

A project map of the area is included as Exhibit B.

9. Possibility of Induced Flooding Due to Project

Since this project is a rehab of the present WRDLD flood control system, it will not cause induced flooding to occur.

10. Baseline Cost Estimate

A cost estimate is provided as Exhibit C.

11. Relocation Assistance Benefits under Public Law 91-646

No persons, farms, or businesses will be displaced by this project.

12. Mineral Activity in Project Area

No mineral activity is located in the project area.

13. Sponsors Legal and Professional Capability to Acquire LER

Wood River Drainage and Levee District has not acquired property in the project area since 1948. They have requested that CEMVS-RE might provide acquisition services to them. They will contract for survey information, title evidence and legal services. Should condemnation be required the WRDLD will request this action be conducted by their attorney in state court.

14. Zoning ordinances proposed

No zoning ordinances are proposed.

15. Schedule of Land Acquisition Milestones

A detailed schedule will be developed when the final ROW is determined. Normally, an estimate of one-year is allowed for the sponsor to acquire ROW after receipt of the final ROW limits.

16. Facility or Utility Relocations/Alterations

No facility or utility relocations/alterations are required for the rehab features of the project. The 9 new relief wells, which will be constructed on property to be acquired, will avoid affecting any facilities or utilities.

17. Impacts of Suspected or Known Contaminants

A Phase I HTRW Real Estate Historical Search of the properties has been completed in the areas

where additional land is required. Two areas were investigated. One area identified industrial property owned by Olin Brass & Winchester Corporation since 1941 and the other area contained seven residential properties.

18. Landowner Support or Opposition to the Project

No opposition is known to exist for the project. Protection against flood is the most important factor for the businesses and landowners located behind this flood protection system. It would be a catastrophe for this levee system to fail.

19. Notification to the Non-Federal Sponsor Regarding the Risks Associated Land before Execution of the Project Cooperation Agreement (PCA)

The Sponsor does not intend to acquire any real estate until final ROW drawings are provided and the PCA is signed. As previously stated, the WDLD has requested CEMVS-RE assistance to acquire the property for the project.

20. Other Real Estate Issues Relevant to the Project

None are known to exist.

This Real Estate Plan is recommended for approval as part of the Reconstruction Evaluation Report.

Thomas R. Hewlett
Chief, Real Estate Division

Real Estate Plan-Sharon Wolf-6/7/04
Cost Estimate-Jim Lovelace

EXHIBIT A

1. FLOOD PROTECTION LEVEE EASEMENT. A perpetual and assignable right and easement in (the land described in Schedule A) (Tracts Nos.____, ____ and ____) to construct, maintain, repair, operate, patrol and replace a flood protection levee, including all appurtenances thereto; reserving, however, to the owners, their heirs and assigns, all such rights and privileges in the land as may be used without interfering with or abridging the rights and easement hereby acquired; subject, however, to existing easements for public roads and highways, public utilities, railroads and pipelines.

2. TEMPORARY WORK AREA EASEMENT. A temporary easement and right-of-way in, on, over and across (the land described in Schedule A) (Tracts Nos. ____, ____ and ____),for a period not to exceed _____, beginning with date possession of the land is granted to the Wood River Levee District, for use by the District, its representatives, agents, and contractors as a (work area), including the right to (deposit fill, spoil and waste material thereon) (move, store and remove equipment and supplies, and erect and remove temporary structures on the land and to perform any other work necessary and incident to the construction of the _____ Project, together with the right to trim, cut, fell and remove all trees, underbrush, obstructions, and any other vegetation, structures or obstacles within the limits of the right-of-way; reserving, however, to the landowners, their heirs and assigns, all such rights and privileges as may be used without interfering with or abridging the rights and easement hereby acquired; subject, however, to existing easements for public roads and highways, public utilities, railroads and pipelines.

EXHIBIT B

WOOD RIVER DRAINAGE AND LEVEE DISTRICT MADISON COUNTY, ILLINOIS

SCHEMATIC NOT TO SCALE

U. S. ARMY ENGINEER DISTRICT, ST. LOUIS
MISSISSIPPI VALLEY DIVISION

EXHIBIT C

Summary/Estimate of Costs/Lands & Damages:

Land Acquisitions		
Permanent Easements		
Industrial	(0.33 ac @ $20,000/ac)	$ 6,600
Residential	(0.28 ac @ $52,272/ac)	$ 14,600
Temporary Easements		
Industrial	(0.13 ac @ $20,000/ac x .10)	$ 300
Residential	(1.01 ac @ $52,272/ac x .10)	$ 5,300
Subtotal Land Acquisitions		**$ 26,800**
Severance Damages (10%)		$ 2,680
Subtotal (round)		**$ 29,500**
Contingency (25%)		$ 7,400
Subtotal (round)		**$ 36,900**
Relocation Assistance PL 91-646		
-Title III Payments		
12 Tracts @ $500 per tract		$ 6,000
Acquisition Cost Per Ownership		
Planning	$ 2,000	
Acquisition	$ 6,500	
Appraisal	$ 1,500	
Total	$10,000	
8 Owners @ $10,000 per ownership		$ 80,000
Subtotal		**$122,900**
		=======
TOTAL PROJECT COSTS (ROUND)		**$123,000**

EXHIBIT D

ASSESSMENT OF NON-FEDERAL SPONSOR'S
REAL ESTATE CAPABILITY

I. Legal Authority:

a. Does the sponsor have legal authority to acquire and hold title to real property for project purposes? Wood River Drainage and Levee District was incorporated under Illinois statute 70ILCS605/3-9 for the right to hold title to property.

b. Does the sponsor have the power of eminent domain for this project? Yes, the sponsor has power of eminent domain under Illinois statute 70ILCS605/4-17.

c. Does the sponsor have "quick-take" authority for this project? The Sponsor does not have "quick take" authority.

d. Are any of the lands/interests in land required for the project located outside the sponsor's political boundary? No, all of the lands required for the project are within the Wood River Drainage and Levee District.

II. Human Resource Requirements:

a. Will the sponsor's in-house staff require training to become familiar with the real estate requirements of the Federal project including P.L. 91-646, as amended? No, the sponsor has requested the St. Louis District; RE Acquisition Branch acquire the lands required for the project. The sponsor has not acquired property for the levee since 1948. Illinois Power donated property for a pump station in 1987. After the feasibility report is approved RE Acquisition will meet with the sponsor to discuss the acquisition and provide a cost estimate. If the cost estimate is acceptable, a Memorandum of Agreement can be prepared.

b. If the answer to II.a. is "yes," has a reasonable plan been developed to provided such training? No, as described above.

c. Does the sponsor's in-house staff have sufficient real estate acquisition experience to meet its responsibilities for the project? No, as described above.

d. Is the sponsor's projected in-house staffing levels sufficient considering its other workload, if any, and the project schedule? No, as described above

e. Can the sponsor obtain contractor support, if required in a timely fashion? Yes, the sponsor can provide timely contractor support for engineering, appraisal, title work and legal services, as needed.

f. Will the sponsor likely request USACE assistance in acquiring real estate? Yes, as described above.

III. Other Project Variables:

a. Will the sponsor's staff be located within reasonable proximity to the project site? Not applicable per the above request for USACE assistance.

b. Has the sponsor approved project/real estate schedule/milestones? No, the project schedule has not been provided to the Levee District at this time but the normal timeframe to acquire real estate is one year after the final ROW drawings are provided to the Levee District.

IV. Overall Assessment:

a. Has the sponsor performed satisfactorily on other USACE projects? As previously stated, the Levee District has not purchased property for this project since 1948. Illinois Power donated property in 1987 for a pump station.

b. With regard to this project, the sponsor is considered fully capable and has the ability to contract for acquisition services. The Levee District as previously stated, has requested USACE support for their acquisition program.

APPENDIX - E

WOOD RIVER DRAINAGE & LEVEE DISTRICT
RE-EVALUATION REPORT
COST ENGINEERING APPENDIX

1. Planning Level Cost Estimates. The following tables display cost estimates developed during alternative development and analysis. These estimates were used to determine the most efficient and cost effective solution for identified problems.

a. Closure Structures

Summary of Preliminary Cost Estimates Wood River Drainage and Levee District Revaluation Report				
Closure Structures				
Item	Labor and Mat. Cost	Overhead and Profit	Contingencies	Total
Structural Items -				
Closure Structure Repairs				
CS - 1, 2, 3, 4, 5, 19, 22 & 24				
Clean & paint gate and replace rubber seals	9,550		2,388	$11,900
Replace the gate and rubber seals	61,300		15,325	$76,600
CS - 8, 10, 17 & 21				
Clean & paint gate and replace rubber seals	5,125		1,281	$6,400
Replace the gate and rubber seals	37,225		9,306	$46,500
CS - 11, 12 & 20				
Clean & paint gate and replace rubber seals	7,750		1,938	$9,700
Replace the gate and rubber seals	58,475		14,619	$73,100
CS - 15 & 16				
Place a Cover Plate/Weather Shield on Gate	19,050		4,763	$23,800
(Verify quantity 6500lb ?)				
Abbandon Closure Structures				
CS - 9, 13, 14 & 26				
Remove and Dispose of Gate	19,950		4,988	$24,900
Clean and Paint Gate	5,275		1,319	$6,600

GOVERNMENT ESTIMATE WORK SHEET

ED-C

PROJECT: Wood River D&LD Revaluation Study DATE: 24-Sep-2004

SUBJECT: Closure Structure Repairs FILE: ClosureStuctures-Struct.xls
(CS - 1, 2, 3, 4, 5, 19, 22 & 24)

ITEM	QUANTITY	UNIT	UNIT PRICE	ESTIMATED AMOUNT
Alternative 2 : Clean & paint the gate and replace				
the rubber seals				
Replace Existing Rubber Seals	50	LF	25.00	1,250
Miscellaneous Steel *	2600	LB	2.50	6,500
Sandblast Gate	300	SF	2.00	600
Paint Gate with Multi-Coat System	300	SF	4.00	1,200
SUBTOTAL ALTERNATIVE 2				9,550
Alternative 3 : Replace the gate and rubber seals				
Gate Removal	1	EA	2,500.00	2,500
Gate Disposal - Salvage Value	13000	LB	-0.05	-650
Gate Fabrication	13000	LB	3.50	45,500
Paint Gate with Multi-Coat System	300	SF	4.00	1,200
Gate Installation	1	EA	5,000.00	5,000
Replace Existing Rubber Seals	50	LF	25.00	1,250
Miscellaneous Steel *	2600	LB	2.50	6,500
SUBTOTAL ALTERNATIVE 3				61,300
* Steel bars for seals and steel plate for front of gate				

GOVERNMENT ESTIMATE WORK SHEET

ED-C

PROJECT: Wood River D&LD Revaluation Study DATE: 24-Sep-2004

SUBJECT: Closure Structure Repairs FILE: ClosureStuctures-Struct.xls
(CS - 8, 10, 17 & 21)

ITEM	QUANTITY	UNIT	UNIT PRICE	ESTIMATED AMOUNT
Alternative 2 : Clean & paint the gate and replace				
the rubber seals				
Replace Existing Rubber Seals	40	LF	25.00	1,000
Miscellaneous Steel *	1350	LB	2.50	3,375
Sandblast Gate	150	SF	2.00	300
Paint Gate with Multi-Coat System	150	SF	3.00	450
SUBTOTAL ALTERNATIVE 2				5,125
Alternative 3 : Replace the gate and rubber seals				
Gate Removal	2	EA	2,500.00	5,000
Gate Disposal - Salvage Value	5000	LB	-0.05	-250
Gate Fabrication	5000	LB	3.50	17,500
Paint Gate with Multi-Coat System	150	SF	4.00	600
Gate Installation	2	EA	5,000.00	10,000
Replace Existing Rubber Seals	40	LF	25.00	1,000
Miscellaneous Steel *	1350	LB	2.50	3,375
SUBTOTAL ALTERNATIVE 3				37,225
* Steel bars for seals and steel plate for front of gate				

GOVERNMENT ESTIMATE WORK SHEET

ED-C

PROJECT: Wood River D&LD Revaluation Study DATE: 24-Sep-2004

SUBJECT: Closure Structure Repairs FILE: ClosureStuctures-Struct.xls
(CS - 11, 12 & 20)

ITEM	QUANTITY	UNIT	UNIT PRICE	ESTIMATED AMOUNT
Alternative 2 : Clean & paint the gate and replace				
the rubber seals				
Replace Existing Rubber Seals	50	LF	25.00	1,250
Miscellaneous Steel *	2000	LB	2.50	5,000
Sandblast Gate	250	SF	2.00	500
Paint Gate with Multi-Coat System	250	SF	4.00	1,000
SUBTOTAL ALTERNATIVE 2				7,750
Alternative 3 : Replace the gate and rubber seals				
Gate Removal	2	EA	2,500.00	5,000
Gate Disposal - Salvage Value	10500	LB	-0.05	-525
Gate Fabrication	10500	LB	3.50	36,750
Paint Gate with Multi-Coat System	250	SF	4.00	1,000
Gate Installation	2	EA	5,000.00	10,000
Replace Existing Rubber Seals	50	LF	25.00	1,250
Miscellaneous Steel *	2000	LB	2.50	5,000
SUBTOTAL ALTERNATIVE 3				58,475
* Steel bars for seals and steel plate for front of gate				

GOVERNMENT ESTIMATE WORK SHEET

ED-C

PROJECT: Wood River D&LD Revaluation Study DATE: 24-Sep-2004

SUBJECT: Abandon Closure Structure FILE: ClosureStuctures-Struct.xls
(CS - 9, 13, 14 & 26)

ITEM	QUANTITY	UNIT	UNIT PRICE	ESTIMATED AMOUNT
Alternative 2 : Remove and Dispose of Gate				
Gate Removal	2	EA	2,500.00	5,000
Gate Disposal - Salvage Value	5000	LB	-0.05	-250
Excavation	600	CY	4.00	2,400
Backfill	1600	CY	8.00	12,800
SUBTOTAL ALTERNATIVE 2				19,950
Alternative 3 : Clean & paint the gate				
Replace Existing Rubber Seals	40	LF	25.00	1,000
Miscellaneous Steel	1,350	LB	2.50	3,375
Sandblast Gate	150	SF	2.00	300
Paint Gate with Multi-Coat System	150	SF	4.00	600
SUBTOTAL ALTERNATIVE 3				5,275

GOVERNMENT ESTIMATE WORK SHEET

ED-C

PROJECT: Wood River D&LD Revaluation Study DATE: 24-Sep-2004

SUBJECT: Closure Structure Repairs FILE: ClosureStuctures-Struct.xls
(CS - 15 & 16)

ITEM	QUANTITY	UNIT	UNIT PRICE	ESTIMATED AMOUNT
Alternative 2 : Place a Cover Plate/Weather Shield				
on Gate				
Miscellaneous Steel	6500	LB	2.50	16,250
Paint Misc. Steel with Multi-Coat System	700	SF	4.00	2,800
SUBTOTAL ALTERNATIVE 2				19,050

b. Gravity Drains

GOVERNMENT ESTIMATE WORK SHEET

ED-C

PROJECT: Wood River D&LD Revaluation Study DATE: 24-Sep-2004

SUBJECT: Drainage Structure Repairs - Single Box Units (DS - 1, 2, 6, 7, 8, 10, 11 & 14) FILE: Gravity Drains-Struct.xls

ITEM	QUANTITY	UNIT	UNIT PRICE	ESTIMATED AMOUNT
Alternative 2 : Clean & paint steel handrail and replace				
steel grating				
Prep. Area for Cleaning & Painting	1	LS		100
Clean Existing Handrail	70	LF	1.75	123
Paint Existing Handrail	70	LF	3.50	245
Remove Existing Grating	20	SF	5.00	100
Install New Grating	20	SF	25.00	500
SUBTOTAL ALTERNATIVE 2				1,068
Alternative 3 : Replace the existing steel handrails,				
grating and ladders w/ new fiberglass				
handrails, grating and ladders				
Remove Existing Handrail	70	LF	15.00	1,050
Remove Existing Grating	20	SF	5.00	100
Remove Existing Ladders	10	LF	20.00	200
Install New Fiberglass Handrail	70	LF	65.00	4,550
Install New Fiberglass Grating	20	SF	25.00	500
Install New Fiberglass Ladders	10	LF	125.00	1,250
SUBTOTAL ALTERNATIVE 3				7,650

GOVERNMENT ESTIMATE WORK SHEET

ED-C

PROJECT: Wood River D&LD Revaluation Study DATE: 24-Sep-2004

SUBJECT: Drainage Structure Repairs - Double Box Units FILE: Gravity Drains-Struct.xls
(DS - 3, 4 & 9)

ITEM	QUANTITY	UNIT	UNIT PRICE	ESTIMATED AMOUNT
Alternative 2 : Clean & paint steel handrail and replace				
steel grating				
Prep. Area for Cleaning & Painting	1	LS		200
Clean Existing Handrail	120	LF	1.75	210
Paint Existing Handrail	120	LF	3.50	420
Remove Existing Grating	60	SF	5.00	300
Install New Grating	60	SF	25.00	1,500
SUBTOTAL ALTERNATIVE 2				2,630
Alternative 3 : Replace the existing steel handrails,				
grating and ladders w/ new fiberglass				
handrails, grating and ladders				
Remove Existing Handrail	120	LF	15.00	1,800
Remove Existing Grating	60	SF	5.00	300
Remove Existing Ladders	55	LF	20.00	1,100
Install New Fiberglass Handrail	120	LF	65.00	7,800
Install New Fiberglass Grating	60	SF	25.00	1,500
Install New Fiberglass Ladders	55	LF	125.00	6,875
SUBTOTAL ALTERNATIVE 3				19,375

GOVERNMENT ESTIMATE WORK SHEET

ED-C

PROJECT: Wood River D&LD Revaluation Study DATE: 24-Sep-2004

SUBJECT: Drainage Structure Repairs - Bridge Units FILE: Gravity Drains-Struct.xls
(DS - 5 & 16)

ITEM	QUANTITY	UNIT	UNIT PRICE	ESTIMATED AMOUNT
Alternative 2 : Clean & paint the bridge steel and				
handrail and replace the steel grating				
Prep. Area for Cleaning & Painting	1	LS		200
Clean Existing Handrail	155	LF	1.75	271
Paint Existing Handrail	155	LF	3.50	543
Clean Existing Bridge Steel	1	LS		900
Paint Existing Bridge Steel	1	LS		1,200
Remove Existing Grating	225	SF	5.00	1,125
Install New Grating	225	SF	25.00	5,625
SUBTOTAL ALTERNATIVE 2				9,864
Alternative 3 : Replace the existing bridge steel,				
handrail and grating w/ new bridge				
steel, fiberglass handrails and grating				
Remove Existing Bridge Steel	1	LS		1,200
Remove Existing Handrail	155	LF	15.00	2,325
Remove Existing Grating	225	SF	5.00	1,125
Install New Bridge Steel	1,500	LB	3.50	5,250
Install New Fiberglass Handrail	155	LF	65.00	10,075
Install New Fiberglass Grating	225	SF	25.00	5,625
SUBTOTAL ALTERNATIVE 3				24,400

GOVERNMENT ESTIMATE WORK SHEET

ED-C

PROJECT: Wood River D&LD Revaluation Study DATE: 24-Sep-2004

SUBJECT: Drainage Structure Repairs - Stem Units FILE: Gravity Drains-Struct.xls
(DS - 12, 13 & 15)

ITEM	QUANTITY	UNIT	UNIT PRICE	ESTIMATED AMOUNT
Alternative 2 : Clean & paint steel handrail and replace				
steel grating				
Prep. Area for Cleaning & Painting	1	LS		100
Clean Existing Handrail	60	LF	1.75	105
Paint Existing Handrail	60	LF	3.50	210
Remove Existing Grating	30	SF	5.00	150
Install New Grating	30	SF	25.00	750
SUBTOTAL ALTERNATIVE 2				1,315
Alternative 3 : Replace the existing steel handrails				
and grating w/ new fiberglass				
handrails and grating				
Remove Existing Handrail	60	LF	15.00	900
Remove Existing Grating	30	SF	5.00	150
Install New Fiberglass Handrail	60	LF	65.00	3,900
Install New Fiberglass Grating	30	SF	25.00	750
SUBTOTAL ALTERNATIVE 3				5,700

GOVERNMENT ESTIMATE WORK SHEET

ED-C

PROJECT: Wood River D&LD Revaluation Study DATE: 24-Sep-2004

SUBJECT: Replace Small Drains w/RCP - Civil (12" - 24" CMP's) FILE: Gravity Drains-Civil.xls

ITEM	QUANTITY	UNIT	UNIT PRICE	ESTIMATED AMOUNT
Mobilization and Demobilization	1	LS		8,100
Clearing, Grubbing and Stripping	1.2	ACR	2,500.00	3,000
Care of Water	1	LS		12,000
Pavement Removal	110	SY	6.50	715
Remove Crushed Stone	80	TON	4.00	320
Excavation (stockpile on-site)	6,540	CY	3.50	22,890
Cofferdam (use excavated material)	1,700	CY	4.50	7,650
Remove Existing Pipe (18"CMP)	240	LF	10.00	2,400
Reinforced Concrete Pipe (18")	240	LF	30.00	7,200
Concrete Pipe End Section	1	EA	300.00	300
Concrete Cradle	2	CY	350.00	700
Attach Pipes to Existing Structures	1	EA	400.00	400
Pipe Bedding Material	50	CY	20.00	1,000
Place & Compact On-site Backfill	6,540	CY	4.50	29,430
Place & Compact Off-site Borrow	1,260	CY	6.50	8,190
Crushed Stone Surfacing	80	TON	15.00	1,200
Bitumineous Road Repair	110	SY	18.00	1,980
Establishment of Turf	1.2	ACR	1,200.00	1,440
	SUBTOTAL:			$108,915
	CONTINGENCIES: (in %)----------		0	$85
	SUBTOTAL:----------			$109,000
	P.E. & D. (in %)----------		0	$0
	C.M. (in %)----------		0	$0
	TOTAL COST			**$109,000**

Care of Water - use a laborer, pickup and sump for 4 weeks = say $75/hr x 160hrs = $12,000
Attach Pipe to Struct. - use a crew of 2 w/misc mat. For 4hr/ea = $100/hr x 4hrs = $400/ea

GOVERNMENT ESTIMATE WORK SHEET

ED-C

PROJECT: Wood River D&LD Revaluation Study DATE: 24-Sep-2004

SUBJECT: Line Small Drains w/HDPE - Civil (12" - 24" CMP's) FILE: Gravity Drains-Civil.xls

ITEM	QUANTITY	UNIT	UNIT PRICE	ESTIMATED AMOUNT
Mobilization and Demobilization	1	LS		1,900
Care of Water	1	LS		12,000
Line Existing Pipe (18"CMP) w/HDPE Pipe	240	LF	40.00	9,600
Seal Pipes to Existing Structures	1	EA	400.00	400
Establishment of Turf	1.0	ACR	1,200.00	1,200
	SUBTOTAL:			$25,100
	CONTINGENCIES: (in %)----------		0	$0
	SUBTOTAL:----------			$25,100
	P.E. & D. (in %)----------		0	$0
	C.M. (in %)----------		0	$0
	TOTAL COST			**$25,100**

Care of Water - use a laborer, pickup and sump for 4 weeks = say $75/hr x 160hrs = $12,000
Attach Pipe to Struct. - use a crew of 2 w/misc mat. For 4hr/ea = $100/hr x 4hrs = $400/ea

GOVERNMENT ESTIMATE WORK SHEET

ED-C

PROJECT: Wood River D&LD Revaluation Study DATE: 24-Sep-2004

SUBJECT: Replace Medium Drains w/RCP - Civil (30" - 48" CMP's) FILE: Gravity Drains-Civil.xls

ITEM	QUANTITY	UNIT	UNIT PRICE	ESTIMATED AMOUNT
Mobilization and Demobilization	1	LS		9,600
Clearing, Grubbing and Stripping	1.2	ACR	2,500.00	3,000
Care of Water	1	LS		12,000
Pavement Removal	110	SY	6.50	715
Remove Crushed Stone	80	TON	4.00	320
Excavation (stockpile on-site)	6,550	CY	3.50	22,925
Cofferdam (use excavated material)	1,700	CY	4.50	7,650
Remove Existing Pipe (36" CMP)	240	LF	25.00	6,000
Reinforced Concrete Pipe (36")	240	LF	85.00	20,400
Concrete Pipe End Section	1	EA	600.00	600
Concrete Cradle	5	CY	350.00	1,750
Attach Pipes to Existing Structures	1	EA	400.00	400
Pipe Bedding Material	120	CY	20.00	2,400
Place & Compact On-site Backfill	6,550	CY	4.50	29,475
Place & Compact Off-site Borrow	1,170	CY	6.50	7,605
Crushed Stone Surfacing	80	TON	15.00	1,200
Bitumineous Road Repair	110	SY	18.00	1,980
Establishment of Turf	1.2	ACR	1,200.00	1,440
	SUBTOTAL:			$129,460
	CONTINGENCIES: (in %)----------		0	($460)
	SUBTOTAL:----------			$129,000
	P.E. & D. (in %)----------		0	$0
	C.M. (in %)----------		0	$0
		TOTAL COST		**$129,000**

GOVERNMENT ESTIMATE WORK SHEET

ED-C

PROJECT: Wood River D&LD Revaluation Study DATE: 24-Sep-2004

SUBJECT: Line Medium Drains w/HDPE - Civil (30" - 48" CMP's) FILE: Gravity Drains-Civil.xls

ITEM	QUANTITY	UNIT	UNIT PRICE	ESTIMATED AMOUNT
Mobilization and Demobilization	1	LS		2,800
Care of Water	1	LS		12,000
Line Existing Pipe (18"CMP) w/HDPE Pipe	240	LF	90.00	21,600
Seal Pipes to Existing Structures	1	EA	400.00	400
Establishment of Turf	1.0	ACR	1,200.00	1,200
	SUBTOTAL:			$38,000
	CONTINGENCIES: (in %)----------		0	$0
	SUBTOTAL:----------			$38,000
	P.E. & D. (in %)----------		0	$0
	C.M. (in %)----------		0	$0
		TOTAL COST		**$38,000**

GOVERNMENT ESTIMATE WORK SHEET

ED-C

PROJECT: Wood River D&LD Revaluation Study DATE: 24-Sep-2004

SUBJECT: Replace Large Drains w/RCP - Civil (54" - 84" CMP's) FILE: Gravity Drains-Civil.xls

ITEM	QUANTITY	UNIT	UNIT PRICE	ESTIMATED AMOUNT
Mobilization and Demobilization	1	LS		15,400
Clearing, Grubbing and Stripping	1.2	ACR	2,500.00	3,000
Care of Water	1	LS		12,000
Pavement Removal	110	SY	6.50	715
Remove Crushed Stone	80	TON	4.00	320
Excavation (stockpile on-site)	6,700	CY	3.50	23,450
Cofferdam (use excavated material)	1,700	CY	4.50	7,650
Remove Existing Pipe (72" CMP)	240	LF	75.00	18,000
Reinforced Concrete Pipe (72")	240	LF	250.00	60,000
Concrete Pipe End Section	1	EA	3,000.00	3,000
Concrete Cradle	32	CY	350.00	11,200
Attach Pipes to Existing Structures	3	EA	400.00	1,200
Pipe Bedding Material	460	CY	20.00	9,200
Place & Compact On-site Backfill	6,700	CY	4.50	30,150
Place & Compact Off-site Borrow	1,340	CY	6.50	8,710
Crushed Stone Surfacing	80	TON	15.00	1,200
Bitumineous Road Repair	50	SY	18.00	900
Establishment of Turf	1.2	ACR	1,200.00	1,440

SUBTOTAL:		$207,535
CONTINGENCIES: (in %)----------	0	$465
SUBTOTAL:----------		$208,000
P.E. & D. (in %)----------	0	$0
C.M. (in %)----------	0	$0
TOTAL COST		**$208,000**

GOVERNMENT ESTIMATE WORK SHEET

ED-C

PROJECT: Wood River D&LD Revaluation Study DATE: 24-Sep-2004

SUBJECT: Line Large Drains w/HDPE - Civil FILE: Gravity Drains-Civil.xls

(54" - 84" CMP's)

ITEM	UANTITY	UNIT	UNIT PRICE	ESTIMATED AMOUNT
Mobilization and Demobilization	1	LS		5,900
Care of Water	1	LS		12,000
Line Existing Pipe (18"CMP) w/HDPE Pipe	240	LF	250.00	60,000
Seal Pipes to Existing Structures	1	EA	400.00	400
Establishment of Turf	1.0	ACR	1,200.00	1,200
	SUBTOTAL:			$79,500
	CONTINGENCIES: (in %)----------		0	$0
	SUBTOTAL:----------			$79,500
	P.E. & D. (in %)----------		0	$0
	C.M. (in %)----------		0	$0
		TOTAL COST		**$79,500**

c. Pump Stations

Summary of Preliminary Cost Estimates Wood River Drainage and Levee District Revaluation Report				
East Alton No. 2 Pump Station				
Item	Labor and Mat. Cost	Overhead and Profit	Contingencies	Total
Mechanical Items -				
Replace 60-inch Forebay Sluice Gates	31,248	6,250	7,500	$45,000
and Install Manual Gate Hoists				
Replace 60-Inch Forebay Sluice Gates	43,605	8,721	10,465	$62,800
and Install Electric Motor Gate Hoists				
Rehabilitate 60-inch Forebay Sluice Gates	24,359	4,872	5,846	$35,100
and Install Manual Gate Hoists				
Rehabilitate 60-inch Forebay Sluice Gates	36,716	7,343	8,812	$52,900
and Install Electric Motor Gate Hoists				
Replace 60-inch Gravity Drain Sluice Gate	18,038	3,608	4,329	$26,000
and Install Manual Gate Hoist				
Replace 60-inch Gravity Drain Sluice Gate	24,495	4,899	5,879	$35,300
and Install Electric Motor Gate Hoist				
Rehabilitate 60-inch Gravity Drain Sluice Gate	15,340	3,068	3,682	$22,100
and Install Manual Gate Hoist				
Rehabilitate 60-inch Gravity Drain Sluice Gate	21,797	4,359	5,231	$31,400
and Install Electric Motor Gate Hoist				
Replace Existing Trash rake	478,231	95,646	114,775	$688,700
Replace Pumps No.1 & 2 w/	201,771	40,354	48,425	$290,600
Submersible Pumps				
Replace Pumps No. 1 & 2 w/Similar	237,107	47,421	56,906	$341,400
Line-Shaft Pumps				
Rehabilitate Pumps No. 1 & 2	128,107	25,621	30,746	$184,500
Install Electric Unit Heaters (10KW)	3,420	684	821	$4,900
Electrical Items -				
Replace Motor	82,743	16,549	19,858	$119,200
Rehabilitate Motor	27,776	5,555	6,666	$40,000
Replace MCC	38,617	7,723	9,268	$55,600
Lighting and Power	6,983	1,397	1,676	$10,100
Connect Sluice Gate Operator	993	199	238	$1,400
Ventilation System	735	147	176	$1,100
Lubrication System	2,125	425	510	$3,100
Heater Installation	2,774	555	666	$4,000
Structural Items -				
Replace the Existing Steel Grating	6,000		1,500	$7,500
Tuckpointing	13,200		3,300	$16,500

Summary of Preliminary Cost Estimates Wood River Drainage and Levee District Revaluation Report				
Wood River Pump Station				
Item	Labor and Mat. Cost	Overhead and Profit	Contingencies	Total
Mechanical Items -				
Replace 60-inch Forebay Sluice Gates	45,427	9,085	10,902	$65,400
and Install Manual Gate Hoists				
Replace 60-inch Forebay Sluice Gates	63,784	12,757	15,308	$91,800
and Install Electric Motor Gate Hoists				
Rehabilitate 60-inch Forebay Sluice Gates	34,675	6,935	8,322	$49,900
and Install Manual Gate Hoists				
Rehabilitate 60-inch Forebay Sluice Gates	53,032	10,606	12,728	$76,400
and Install Electric Motor Gate Hoists				
Replace 60-inch Forebay/Pond Sluice Gates	31,248	6,250	7,500	$45,000
and Install Manual Gate Hoists				
Replace 60-inch Forebay/Pond Sluice Gates	43,605	8,721	10,465	$62,800
and Install Electric Motor Gate Hoists				
Rehabilitate 60-inch Forebay/Pond Sluice	24,359	4,872	5,846	$35,100
Gates and Install Manual Gate Hoists				
Rehabilitate 60-inch Forebay/Pond Sluice	36,716	7,343	8,812	$52,900
Gates and Install Electric Motor Gate Hoists				
Replace 72-Inch Discharge Chamber Sluice	22,638	4,528	5,433	$32,600
Gate and Install Manual Gate Hoist				
Replace 72-Inch Discharge Chamber Sluice	28,195	5,639	6,767	$40,600
Gate and Install Electric Motor Gate Hoist				
Rehabilitate 72-inch Discharge Chamber Sluice	16,940	3,388	4,066	$24,400
Gate and Install Manual Gate Hoist				
Rehabilitate 72-inch Discharge Chamber Sluice	22,497	4,499	5,399	$32,400
Gate and Install Electric Motor Gate Hoist				
Replace 72-Inch Emergency Closure Sluice	22,638	4,528	5,433	$32,600
Gate and Install Manual Gate Hoist				
Replace 72-Inch Emergency Closure Sluice	28,195	5,639	6,767	$40,600
Gate and Install Electric Motor Gate Hoist				
Rehabilitate 72-inch Emergency Closure Sluice	16,940	3,388	4,066	$24,400
Gate and Install Manual Gate Hoist				
Rehabilitate 72-inch Emergency Closure Sluice	22,497	4,499	5,399	$32,400
Gate and Install Electric Motor Gate Hoist				
Replace 84-Inch Discharge Chamber Sluice	28,030	5,606	6,727	$40,400
Gate and Install Manual Gate Hoist				
Replace 84-Inch Discharge Chamber Sluice	37,495	7,499	8,999	$54,000
Gate and Install Electric Motor Gate Hoist				
Rehabilitate 84-inch Discharge Chamber Sluice	19,340	3,868	4,642	$27,900
Gate and Install Manual Gate Hoist				
Rehabilitate 84-inch Discharge Chamber Sluice	29,797	5,959	7,151	$42,900
Gate and Install Electric Motor Gate Hoist				

Summary of Preliminary Cost Estimates Wood River Drainage and Levee District Revaluation Report				
Wood River Pump Station				
Item	Labor and Mat. Cost	Overhead and Profit	Contingencies	Total
Mechanical Items - (cont'd)				
Replace 84-Inch Emergency Closure Sluice	28,030	5,606	6,727	$40,400
Gate and Install Manual Gate Hoist				
Replace 84-Inch Emergency Closure Sluice	37,495	7,499	8,999	$54,000
Gate and Install Electric Motor Gate Hoist				
Rehabilitate 84-inch Emergency Closure Sluice	19,340	3,868	4,642	$27,900
Gate and Install Manual Gate Hoist				
Rehabilitate 84-inch Emergency Closure Sluice	29,797	5,959	7,151	$42,900
Gate and Install Electric Motor Gate Hoist				
Replace Baseflow Pump No.1 w/	16,866	3,373	4,048	$24,300
Submersible Pump				
Replace Pumps No.2 & 3 w/	162,041	32,408	38,890	$233,300
Submersible Pumps				
Replace Pumps No. 2 & 3 w/Similar	127,107	25,421	30,506	$183,000
Line-Shaft Pumps				
Replace Pumps No. 4, 5 & 6 w/Similar	190,905	38,181	45,817	$274,900
Line-Shaft Pumps				
Replace Pump Discharge Flap Gates	33,597	6,719	8,063	$48,400
Rehabilitate Pumps No. 2 & 3	114,107	22,821	27,386	$164,300
Rehabilitate Pumps No. 4, 5 & 6	187,858	37,572	45,086	$270,500
Install Electric Unit Heaters (12.5KW)	3,420	684	821	$4,900
Electrical Items -				
Replace Motor	140,115	28,023	33,628	$201,800
Rehabilitate Motor	55,305	11,061	13,273	$79,600
Replace MCC	59,610	11,922	14,306	$85,800
Lighting and Power	6,695	1,339	1,607	$9,600
Connect Sluice Gate Operator	2,624	525	630	$3,800
Ventilation System	735	147	176	$1,100
Lubrication System	5,026	1,005	1,206	$7,200
Heater Installation	3,004	601	721	$4,300
Structural Items -				
Replace the Existing Steel Grating	9,450		2,363	$11,800
Replace Roof (Tar & Gravel)	3,500		875	$4,400
Replace Chain Link Fence	7,500		1,875	$9,400
Tuckpointing	6,600		1,650	$8,300

Summary of Preliminary Cost Estimates Wood River Drainage and Levee District Revaluation Report				
Rand Pump Station				
Item	Labor and Mat. Cost	Overhead and Profit	Contingencies	Total
Mechanical Items -				
Replace 24-inch Forebay Sluice Gate	7,741	1,548	1,858	$11,100
and Install Manual Gate Hoists				
Replace 24-inch Forebay Sluice Gate	10,698	2,140	2,568	$15,400
and Install Electric Motor Gate Hoists				
Rehabilitate 24-inch Forebay Sluice Gate	7,772	1,554	1,865	$11,200
and Install Manual Gate Hoists				
Rehabilitate 24-inch Forebay Sluice Gate	10,729	2,146	2,575	$15,500
and Install Electric Motor Gate Hoists				
Replace 24-Inch Discharge Chamber Sluice	9,185	1,837	2,204	$13,200
Gate and Install Manual Gate Hoist				
Replace 24-Inch Discharge Chamber Sluice	12,142	2,428	2,914	$17,500
Gate and Install Electric Motor Gate Hoist				
Rehabilitate 24-inch Discharge Chamber Sluice	9,216	1,843	2,212	$13,300
Gate and Install Manual Gate Hoist				
Rehabilitate 24-inch Discharge Chamber Sluice	12,173	2,435	2,922	$17,500
Gate and Install Electric Motor Gate Hoist				
Replace 24-Inch Emergency Closure Sluice	9,185	1,837	2,204	$13,200
Gate and Install Manual Gate Hoist				
Replace 24-Inch Emergency Closure Sluice	12,142	2,428	2,914	$17,500
Gate and Install Electric Motor Gate Hoist				
Rehabilitate 24-inch Emergency Closure Sluice	9,216	1,843	2,212	$13,300
Gate and Install Manual Gate Hoist				
Rehabilitate 24-inch Emergency Closure Sluice	12,173	2,435	2,922	$17,500
Gate and Install Electric Motor Gate Hoist				
Replace 36-inch Forebay Sluice Gate	8,471	1,694	2,033	$12,200
and Install Manual Gate Hoists				
Replace 36-inch Forebay Sluice Gate	11,898	2,380	2,856	$17,100
and Install Electric Motor Gate Hoists				
Rehabilitate 36-inch Forebay Sluice Gate	8,282	1,656	1,988	$11,900
and Install Manual Gate Hoists				
Rehabilitate 36-inch Forebay Sluice Gate	11,539	2,308	2,769	$16,600
and Install Electric Motor Gate Hoists				
Replace 36-Inch Discharge Chamber Sluice	10,185	2,037	2,444	$14,700
Gate and Install Manual Gate Hoist				
Replace 36-Inch Discharge Chamber Sluice	13,342	2,668	3,202	$19,200
Gate and Install Electric Motor Gate Hoist				
Rehabilitate 36-inch Discharge Chamber Sluice	9,725	1,945	2,334	$14,000
Gate and Install Manual Gate Hoist				
Rehabilitate 36-inch Discharge Chamber Sluice	12,982	2,596	3,116	$18,700

Gate and Install Electric Motor Gate Hoist				
Replace 36-Inch Emergency Closure Sluice	10,185	2,037	2,444	$14,700
Gate and Install Manual Gate Hoist				

Summary of Preliminary Cost Estimates
Wood River Drainage and Levee District Revaluation Report

Rand Pump Station

Item	Labor and Mat. Cost	Overhead and Profit	Contingencies	Total
Mechanical Items - (cont'd)				
Replace 36-Inch Emergency Closure Sluice	13,342	2,668	3,202	$19,200
Gate and Install Electric Motor Gate Hoist				
Rehabilitate 36-inch Emergency Closure Sluice	9,725	1,945	2,334	$14,000
Gate and Install Manual Gate Hoist				
Rehabilitate 36-inch Emergency Closure Sluice	12,982	2,596	3,116	$18,700
Gate and Install Electric Motor Gate Hoist				
Install Electric Unit Heaters (7.5KW)	2,370	474	569	$3,400
Electrical Items -				
Replace MCC	32,786	6,557	7,869	$47,200
Lighting and Power	5,701	1,140	1,368	$8,200
Connect Sluice Gate Operator	1,094	219	263	$1,600
Ventilation System	461	92	111	$700
Heater Installation	1,692	338	406	$2,400
Structural Items -				
Replace the Existing Steel Grating	7,800		1,950	$9,800
Replace Roof (Tar)	900		225	$1,100
Replace Chain Link Fence	5,000		1,250	$6,300

Summary of Preliminary Cost Estimates Wood River Drainage and Levee District Revaluation Report				
Hawthorne Pump Station				
Item	Labor and Mat. Cost	Overhead and Profit	Contingencies	Total
Mechanical Items -				
Replace 72-inch Forebay Sluice Gate	19,763	3,953	4,743	$28,500
and Install Manual Gate Hoists				
Replace 72-inch Forebay Sluice Gate	25,420	5,084	6,101	$36,600
and Install Electric Motor Gate Hoists				
Rehabilitate 72-inch Forebay Sluice Gate	13,603	2,721	3,265	$19,600
and Install Manual Gate Hoists				
Rehabilitate 72-inch Forebay Sluice Gate	19,261	3,852	4,623	$27,700
and Install Electric Motor Gate Hoists				
Replace 48-Inch Emergency Closure Sluice	111,985	22,397	26,876	$161,300
Gate and Install Manual Gate Hoist				
Replace 48-Inch Emergency Closure Sluice	18,242	3,648	4,378	$26,300
Gate and Install Electric Motor Gate Hoist				
Rehabilitate 48-inch Emergency Closure Sluice	10,625	2,125	2,550	$15,300
Gate and Install Manual Gate Hoist				
Rehabilitate 48-inch Emergency Closure Sluice	16,882	3,376	4,052	$24,300
Gate and Install Electric Motor Gate Hoist				
Replace Baseflow Pump w/Submersible Pump	9,556	1,911	2,293	$13,800
Replace Pumps No.1 & 2 w/	222,041	44,408	53,290	$319,700
Submersible Pumps				
Replace Pumps No. 1 & 2 w/Similar	183,107	36,621	43,946	$263,700
Line-Shaft Pumps				
Replace Pump Discharge Flap Gates	17,471	3,494	4,193	$25,200
Rehabilitate Pumps No. 1 & 2	118,107	23,621	28,346	$170,100
Install Electric Unit Heaters (7.5KW)	2,370	474	569	$3,400
Electrical Items -				
Replace Motor	55,074	11,015	13,218	$79,300
Rehabilitate Motor	22,066	4,413	5,296	$31,800
Replace MCC	33,214	6,643	7,971	$47,800
Lighting and Power	5,987	1,197	1,437	$8,600
Connect Sluice Gate Operator	475	95	114	$700
Ventilation System	461	92	111	$700
Lubrication System	1,830	366	439	$2,600
Heater Installation	1,730	346	415	$2,500
Structural Items -				
Replace the Existing Steel Grating	6,150		1,538	$7,700
Replace Roof (Tar)	1,350		338	$1,700
Tuckpointing	4,813		1,203	$6,000

Summary of Preliminary Cost Estimates
Wood River Drainage and Levee District Revaluation Report

Homegarden Pump Station

Item	Labor and Mat. Cost	Overhead and Profit	Contingencies	Total
Mechanical Items -				
Replace Pump No.1 w/Submersible Pump	36,291	7,258	8,710	$52,300
Replace Pump No. 1 w/Line-Shaft Pump	35,100	7,020	8,424	$50,500
Rehabilitate Pump No. 1	34,991	6,998	8,398	$50,400
Electrical Items -				
Replace Motor	4,305	861	1,033	$6,200
Rehabilitate Motor	2,837	567	681	$4,100
Starter Replacement	7,246	1,449	1,739	$10,400
Lighting and Power	3,649	730	876	$5,300
Structural Items -				
Replace the Existing Steel Grating	1,500		375	$1,900
Replace Sheetmetal Roof Sheathing	585		146	$700

Summary of Preliminary Cost Estimates
Wood River Drainage and Levee District Revaluation Report

Lakeside Pump Station

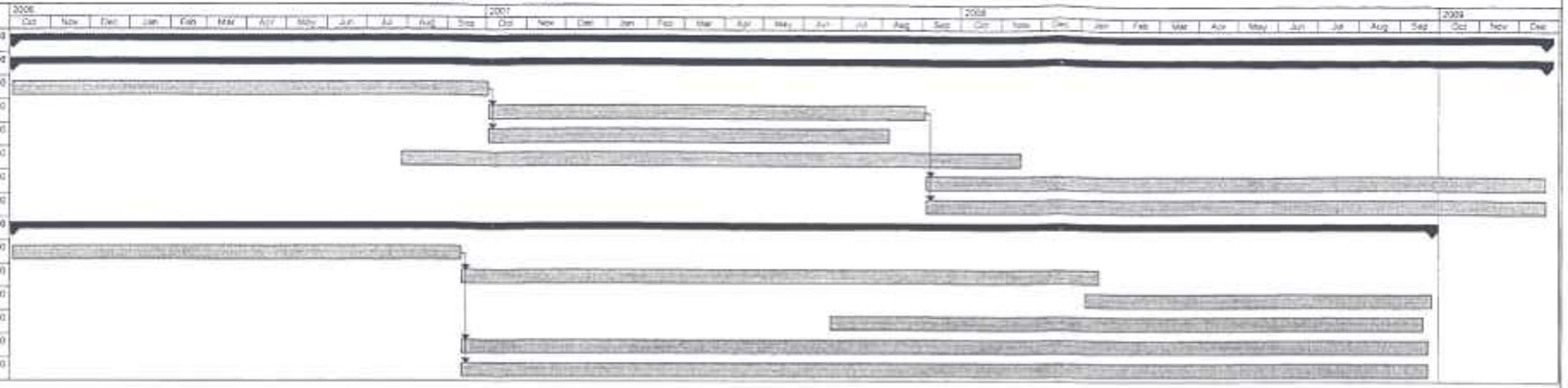
Item	Labor and Mat. Cost	Overhead and Profit	Contingencies	Total
Mechanical Items -				
Replace Pump No.1 w/Submersible Pump	46,291	9,258	11,110	$66,700
Replace Pump No. 1 w/Line-Shaft Pump	41,291	8,258	9,910	$59,500
Rehabilitate Pump No. 1	36,400	7,280	8,736	$52,400
Electrical Items -				
Replace Motor	5,656	1,131	1,357	$8,100
Rehabilitate Motor	3,538	708	849	$5,100
Starter Replacement	7,246	1,449	1,739	$10,400
Lighting and Power	3,609	722	866	$5,200
Structural Items -				
Replace the Existing Steel Grating	1,500		375	$1,900
Replace Sheetmetal Roof Sheathing	585		146	$700

2. OMRR&R Costs. The following table assumes current O&M being done by the Wood River Levee and Drainage District continues. A discussion of current ongoing O&M costs is contained in paragraph 5.1.2.2. This schedule represents new O&M estimates related to system relief wells and new RR&R estimates related to remaining system components.

		Relief Wells	Closure Structures			Pump Stations						
YEARS	TOTAL		New Gates	Rehab Gates	Joint Repair	East Alton No. 1	Wood River	Rand	Hawthorne	East Alton No. 2	Homegarden	Lakeside
1	**$135,000**	$135,000										
2	**$135,000**	$135,000										
3	**$135,000**	$135,000										
4	**$138,000**	$138,000										
5	**$141,000**	$141,000										
6	**$408,000**	$408,000										
7	**$414,500**	$414,500										
8	**$414,500**	$414,500										
9	**$528,000**	$528,000										
10	**$141,000**	$141,000										
11	**$135,000**	$135,000										
12	**$135,000**	$135,000										
13	**$135,000**	$135,000										
14	**$138,000**	$138,000										
15	**$141,000**	$141,000										
16	**$408,000**	$408,000										
17	**$414,500**	$414,500										
18	**$676,500**	$414,500				$262,000						
19	**$790,000**	$528,000				$262,000						
20	**$462,000**	$141,000	$59,000			$262,000						
21	**$476,000**	$135,000	$59,000	$20,000		$262,000						
22	**$476,000**	$135,000	$59,000	$20,000		$262,000						
23	**$543,000**	$135,000	$59,000	$20,000			$329,000					
24	**$546,000**	$138,000	$59,000	$20,000			$329,000					
25	**$549,000**	$141,000	$59,000	$20,000			$329,000					
26	**$796,000**	$408,000	$59,000				$329,000					
27	**$705,500**	$414,500	$59,000					$232,000				
28	**$705,500**	$414,500	$59,000					$232,000				
29	**$819,000**	$528,000	$59,000					$232,000				
30	**$432,000**	$141,000	$59,000					$232,000				
31	**$351,000**	$135,000	$59,000		$5,000				$152,000			
32	**$351,000**	$135,000	$59,000		$5,000				$152,000			
33	**$292,000**	$135,000			$5,000				$152,000			
34	**$340,000**	$138,000			$5,000					$197,000		
35	**$343,000**	$141,000			$5,000					$197,000		
36	**$610,000**	$408,000			$5,000					$197,000		
37	**$616,500**	$414,500			$5,000					$197,000		
38	**$517,500**	$414,500			$5,000						$98,000	
39	**$631,000**	$528,000			$5,000						$98,000	
40	**$244,000**	$141,000			$5,000							$98,000
41	**$238,000**	$135,000			$5,000							$98,000
42	**$140,000**	$135,000			$5,000							
43	**$140,000**	$135,000			$5,000							
44	**$143,000**	$138,000			$5,000							
45	**$146,000**	$141,000			$5,000							
46	**$433,000**	$408,000		$20,000	$5,000							
47	**$439,500**	$414,500		$20,000	$5,000							
48	**$439,500**	$414,500		$20,000	$5,000							
49	**$553,000**	$528,000		$20,000	$5,000							
50	**$166,000**	$141,000		$20,000	$5,000							
TOTAL	**$19,207,000**	**$12,950,000**	**$767,000**	**$200,000**	**$100,000**	**$1,310,000**	**$1,316,000**	**$928,000**	**$456,000**	**$788,000**	**$196,000**	**$196,000**

3. Project Schedule.

ID	Task Name	Duration	Start	Finish	Cost
1	Wood River Levee Project	840 days	10/4/05	12/22/08	$22,198,336.00
2	Design Deficiency Correction	840 days	10/4/05	12/22/08	$5,482,750.00
3	Design Deficiency PED	260 days	10/4/05	10/3/06	$400,000.00
4	Relief Well Reconstruction	240 days	10/3/06	9/3/07	$2,081,700.00
5	Real Estate	220 days	10/3/06	8/6/07	$135,000.00
6	Relief Well Construction	340 days	7/28/06	11/15/07	$2,364,830.00
7	Eng During Constr	340 days	9/4/07	12/22/08	$237,650.00
8	Construction Mgmt	340 days	9/4/07	12/22/08	$253,600.00
9	Reconstruction	778 days	10/4/05	9/25/08	$16,065,433.00
10	Reconstruction PED	240 days	10/4/05	9/1/06	$380,000.00
11	Gravity Drain Construction	350 days	9/1/06	1/14/08	$4,800,990.00
12	Closure Structure Construction	190 days	1/4/08	9/25/08	$3,100,700.00
13	Pump Station Construction	525 days	5/22/07	9/19/08	$4,583,000.00
14	Eng During Constr	530 days	9/1/06	9/22/08	$1,955,630.00
15	Construction Mgmt	530 days	9/1/06	9/22/08	$1,813,280.00



Project: WOOD RIVER, ILLINOIS
Date: 1/26/04

Task · Split · Progress · Milestone · Summary · Rolled Up Task · Rolled Up Split · Rolled Up Milestone · Rolled Up Progress · External Tasks · Project Summary

4. MCACES Cost Estimate. The following MCACES estimate covers the entire recommended project including cost estimates for both the design deficiency and reconstruction needs.

WOOD RIVER
DRAINAGE AND LEVEE DISTRICT
MADISON COUNTY, ILLINOIS
REVALUATION REPORT

Designed By: ST. LOUIS DISTRICT, COE
Estimated By: ST. LOUIS DISTRICT, COE

Prepared By: GREGORY DYN

Preparation Date: 09/14/04
Effective Date of Pricing: 10/01/04

Sales Tax: 0.0%

PROJECT LOCATION -
Wood River Drainage and Levee District (Levee District) lies in southwestern Illinois, on the left bank of the Mississippi River flood plain, within Madison County, Illinois, between river miles 195 and 203 above the Ohio River.The levee district is protected by an urban design levee, across the Mississippi River from St. Louis and St. Charles counties in Missouri. This system includes approximately 21 miles of main line levee, 160 relief wells, 26 closure structures, 41 gravity drains and 7 pump stations. The study area lies in the Mississippi River flood plain of Madison County, Illinois, just upstream of the city of East St. Louis. There are approximately 13,700 acres of bottomland within the District and 4,700 acres of hill land tributary to the levee units.

PROJECT DESCRIPTION -
The Wood River Flood Protection Project provided for raising and enlarging 20.8 miles of existing levee, construction of gravity drainage structures, closure structures at railroad and highway crossings, alterations to existing or construction of new pump stations, surfacing of service road on levee crown, seepage control measures, and construction of a low-water dam at the mouth of Wood River. The project as intended provides protection against a 52 foot Mississippi River stage on the St. Louis Gage, which has a current expected frequency of greater than 500 years.

SCOPE OF WORK -
Additional Relief Wells -
The analysis of underseepage requirements for the Wood River flood projection system indicates that a total of 68 new wells are required to meet original design intent.

Existing Relief Wells -
Relief well re-development requirements were not provided to the local sponsor, therefore, current performance problems should be addressed as a project deficiency. The relief wells will be pump tested and re-developed as required to achieve 80% performance efficiency or replaced.

Reconstruction -
The following items fall into the category of reconstruction.

Gravity Drainage Structures -
Of the thirty-eight corrugated metal pipe gravity drains 25 will be lined with HDPE and 13 will be replaced with RCP.

Closure Structures -
Removal and replacement is recommended for 4 sills and one approach apron. Three closure structures are recommended to be permanently closed. Eleven gates will be reconstructed, 5 gates will be replaced, 3 gates will be removed as the closure will be permanently closed and 2 gates will require no action. No action is required at the 5 stoplog closures. Investigation of three closure structure monoliths, floodwalls and one gatewell structure indicates that while they have been in place for many years, in comparison to other like structures in the system, they are deficient. Since there is no legal recourse against any contractors for any alleged construction deficiencies it is recommended that these items be addressed by the

reconstruction project.

Pump Stations -
East Alton No. 2, Wood River, Rand Avenue and Hawthorne Street Pump Station - Structures will be reconstructed to include trashracks, grating, roofing, ladders, discharge chamber embedded metals, chain link fences and tuckpointing. Lakeside and Homegarden Pump Station structures will have grating and sheet metal roofs replaced. At East Alton No. 2 both stormwater pumps and their associated electric motors will be completely reconstructed and each of the three sluice gates gate slides and frames reconstructed with gate stem and stem guides replaced. At Wood River Pump Station the vertical stormwater pumps and their associated electric motors will be reconstructed, the baseflow pump replaced with a submersible centrifugal pump, and of the eleven sluice gates, seven gate slides and frames are to be reconstructed with gate stem and stem guides replaced with four of these gates having manual operated gate hoists replaced with electric and three being reconstructed but remaining manually operated. At Rand Avenue Pump Station the one remaining original electric motor will be completely reconstructed and each of the six sluice gates gate slides and frames will be reconstructed with gate stem and stem guides replaced with two gates having manually operated gate hoists replaced with electric and four being reconstructed but remaining manually operated. At Hawthorne Street Pump Station both stormwater pumps and their associated electric motors will be completely reconstructed and the two sluice gates gate slides and frames will be reconstructed with gate stem and stem guides replaced with one of these gates having a manual operated gate hoist replaced with electric and one being reconstructed but remaining manually operated. At Lakeside Pump Station the existing vertical pump will be replaced with a pump of similar design and the vertical electric motor completely reconstructed. At Homegarden Pump Station the existing vertical pump will be replaced with a pump of similar design and the vertical electric motor completely reconstructed. At the East Alton No.1 Pump Station the trash rack will be replaced.

* The costs used in the development of this estimate are based on historical information of similar work in the St. Louis District. All costs are considered in-place.

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** PROJECT OWNER SUMMARY - Level 1 (Rounded to 100's) **

		QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
01	Lands and Damages			100,000	25,000	125,000	
11	Levees and Floodwalls			10,521,000	1,907,100	12,428,100	
13	Pumping Plant			3,840,100	725,000	4,565,000	
30	Planning, Engineering, & Design			2,441,000	732,300	3,173,300	
31	Construction Management			1,436,000	430,800	1,866,800	
TOTAL	WOOD RIVER			18,338,100	3,820,100	22,158,200	

	QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
01 Lands and Damages						
01 01 Gross Appraisal Estimate			100,000	25,000	125,000	
TOTAL Lands and Damages			100,000	25,000	125,000	
11 Levees and Floodwalls						
11 01 Levees			4,069,600	407,000	4,476,500	
11 02 Gravity Drainage Structures			3,844,100	956,900	4,800,900	
11 03 Closure Structures			2,607,400	543,300	3,150,700	
TOTAL Levees and Floodwalls			10,521,000	1,907,100	12,428,100	
13 Pumping Plant						
13 01 East Alton No. 1			591,700	90,200	681,800	
13 02 East Alton No. 2			657,700	132,100	789,800	
13 03 Wood River			1,099,200	216,500	1,315,700	
13 04 Rand			777,400	150,400	927,700	
13 05 Hawthorne			392,800	65,400	458,200	
13 06 Homegarden			160,500	34,900	195,300	
13 07 Lakeside			160,900	35,500	196,500	
TOTAL Pumping Plant			3,840,100	725,000	4,565,000	
30 Planning, Engineering, & Design						
30 01 Planning, Engineering, & Design			2,441,000	732,300	3,173,300	
TOTAL Planning, Engineering, & Design			2,441,000	732,300	3,173,300	
31 Construction Management						
31 01 Construction Management			1,436,000	430,800	1,866,800	
TOTAL Construction Management			1,436,000	430,800	1,866,800	
TOTAL WOOD RIVER			18,338,100	3,820,100	22,158,200	

	QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
01 Lands and Damages						
01 01 Gross Appraisal Estimate						
01 01 1 Lands and Damages			100,000	25,000	125,000	
TOTAL Gross Appraisal Estimate			100,000	25,000	125,000	
TOTAL Lands and Damages			100,000	25,000	125,000	
11 Levees and Floodwalls						
11 01 Levees						
11 01 01 Levees and Berms			4,069,600	407,000	4,476,500	
TOTAL Levees			4,069,600	407,000	4,476,500	
11 02 Gravity Drainage Structures						
11 02 01 Upper Wood River Levee (UWRL)			486,100	112,800	598,900	
11 02 02 East and West Fork Levee			766,900	186,300	953,300	
11 02 03 Lower Wood River Levee (LWRL)			2,591,000	657,700	3,248,700	
TOTAL Gravity Drainage Structures			3,844,100	956,900	4,800,900	
11 03 Closure Structures						
11 03 01 Upper Wood River Levee (UWRL)			204,000	49,600	253,500	
11 03 02 East and West Fork Levee			491,000	98,500	589,600	
11 03 03 Lower Wood River Levee (LWRL)			1,912,400	395,200	2,307,600	
TOTAL Closure Structures			2,607,400	543,300	3,150,700	
TOTAL Levees and Floodwalls			10,521,000	1,907,100	12,428,100	
13 Pumping Plant						
13 01 East Alton No. 1						
13 01 01 Mob, Demob & Preparatory Work			3,800	800	4,600	
13 01 03 Care and Diversion of Water			12,300	3,100	15,400	
13 01 78 Auxiliary Equipment			575,500	86,300	661,800	
TOTAL East Alton No. 1			591,700	90,200	681,800	

	QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
13 02 East Alton No. 2						
13 02 01 Mob, Demob & Preparatory Work			3,800	800	4,600	
13 02 02 Sitework			85,100	25,500	110,600	
13 02 03 Care and Diversion of Water			12,300	3,100	15,400	
13 02 75 Pumping Plant Superstructure			107,300	21,500	128,700	
13 02 76 Pumping Machinery & Appurtenance			333,600	50,000	383,600	
13 02 77 Gates and Valves			92,400	27,700	120,200	
13 02 99 Associated General Items			23,200	3,500	26,700	
TOTAL East Alton No. 2			657,700	132,100	789,800	
13 03 Wood River						
13 03 01 Mob, Demob & Preparatory Work			3,800	800	4,600	
13 03 03 Care and Diversion of Water			12,300	3,100	15,400	
13 03 75 Pumping Plant Superstructure			147,600	29,500	177,100	
13 03 76 Pumping Machinery & Appurtenance			636,600	95,500	732,100	
13 03 77 Gates and Valves			286,200	85,900	372,100	
13 03 99 Associated General Items			12,600	1,800	14,400	
TOTAL Wood River			1,099,200	216,500	1,315,700	
13 04 Rand						
13 04 01 Mob, Demob & Preparatory Work			3,800	800	4,600	
13 04 02 Sitework			100,100	30,000	130,100	
13 04 03 Care and Diversion of Water			12,300	3,100	15,400	
13 04 75 Pumping Plant Superstructure			80,400	16,100	96,500	
13 04 76 Pumping Machinery & Appurtenance			483,300	72,500	555,800	
13 04 77 Gates and Valves			88,800	26,600	115,400	
13 04 99 Associated General Items			8,700	1,300	10,000	
TOTAL Rand			777,400	150,400	927,700	
13 05 Hawthorne						
13 05 01 Mob, Demob & Preparatory Work			3,800	800	4,600	
13 05 03 Care and Diversion of Water			12,300	3,100	15,400	
13 05 75 Pumping Plant Superstructure			75,900	11,400	87,300	
13 05 76 Pumping Machinery & Appurtenance			266,700	40,000	306,700	
13 05 77 Gates and Valves			34,000	10,200	44,200	
TOTAL Hawthorne			392,800	65,400	458,200	
13 06 Homegarden						

	QUANTY UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
13 06 01 Mob, Demob & Preparatory Work		3,700	700	4,500	
13 06 02 Sitework		44,500	13,300	57,800	
13 06 03 Care and Diversion of Water		12,300	3,100	15,400	
13 06 75 Pumping Plant Superstructure		15,800	3,200	19,000	
13 06 76 Pumping Machinery & Appurtenance		71,300	10,700	82,000	
13 06 77 Gates and Valves		12,800	3,800	16,700	
TOTAL Homegarden		160,500	34,900	195,300	
13 07 Lakeside					
13 07 01 Mob, Demob & Preparatory Work		3,700	700	4,500	
13 07 02 Sitework		44,500	13,300	57,800	
13 07 03 Care and Diversion of Water		12,300	3,100	15,400	
13 07 75 Pumping Plant Superstructure		15,800	3,200	18,900	
13 07 76 Pumping Machinery & Appurtenance		67,800	10,200	78,000	
13 07 77 Gates and Valves		16,800	5,000	21,900	
TOTAL Lakeside		160,900	35,500	196,500	
TOTAL Pumping Plant		3,840,100	725,000	4,565,000	
30 Planning, Engineering, & Design					
30 01 Planning, Engineering, & Design					
30 01 1 Planning, Engineering, & Design		2,441,000	732,300	3,173,300	
TOTAL Planning, Engineering, & Design		2,441,000	732,300	3,173,300	
TOTAL Planning, Engineering, & Design		2,441,000	732,300	3,173,300	
31 Construction Management					
31 01 Construction Management					
31 01 1 Construction Management		1,436,000	430,800	1,866,800	
TOTAL Construction Management		1,436,000	430,800	1,866,800	
TOTAL Construction Management		1,436,000	430,800	1,866,800	
TOTAL WOOD RIVER		18,338,100	3,820,100	22,158,200	

	QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
01 Lands and Damages						
01 01 Gross Appraisal Estimate						
01 01 1 Lands and Damages			100,000	25,000	125,000	
TOTAL Gross Appraisal Estimate			100,000	25,000	125,000	
TOTAL Lands and Damages			100,000	25,000	125,000	
11 Levees and Floodwalls						
11 01 Levees						
11 01 01 Levees and Berms						
11 01 01 01 Rehab/Replace Exist Relief Wells			1,892,400	189,200	2,081,700	
11 01 01 02 New Relief Wells			2,177,100	217,700	2,394,800	
TOTAL Levees and Berms			4,069,600	407,000	4,476,500	
TOTAL Levees			4,069,600	407,000	4,476,500	
11 02 Gravity Drainage Structures						
11 02 01 Upper Wood River Levee (UWRL)						
11 02 01 2 GW-2, 72" Drain (Flank)			147,000	41,700	188,700	
11 02 01 3 GW-3, 18" Drain (Flank)			113,000	23,700	136,800	
11 02 01 4 GW-4, 18" Drain (Flank)			113,000	23,700	136,800	
11 02 01 5 GW-5, 18" Drain (Flank)			113,000	23,700	136,800	
TOTAL Upper Wood River Levee (UWRL)			486,100	112,800	598,900	
11 02 02 East and West Fork Levee						
11 02 02 1 GW-6, 48" Drain (East Fork)			85,800	23,300	109,100	
11 02 02 2 GW-7, 24" Drain (East Fork)			118,200	24,800	143,000	
11 02 02 3 GW-8, 36" Drain (East Fork)			82,400	22,300	104,600	
11 02 02 4 GW-9, 24" Drain (East Fork)			118,200	24,800	143,000	
11 02 02 5 GW-10, 42" Drain (East Fork)			84,800	23,000	107,800	
11 02 02 6 GW-11, 36" Drain (East Fork)			82,400	22,300	104,600	
11 02 02 7 GW-12, 36" Drain (West Fork)			84,100	22,600	106,700	
11 02 02 8 GW-13, 12" Drain (West Fork)			111,100	23,200	134,400	
TOTAL East and West Fork Levee			766,900	186,300	953,300	

		QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
11 02 03	Lower Wood River Levee (LWRL)						
11 02 03 1	GW-14, 48" Drain (Flank)			85,800	23,300	109,100	
11 02 03 2	GW-15, 30" Drain (Flank)			83,600	22,400	106,000	
11 02 03 3	GW-16, 42" Drain (Flank)			86,500	23,300	109,800	
11 02 03 4	GW-17, 42" Drain (Flank)			96,500	26,300	122,900	
11 02 03 5	GW-18, 42" Drain (Flank)			84,800	23,000	107,800	
11 02 03 6	GW-19, 36" Drain (Flank)			82,400	22,300	104,600	
11 02 03 7	GW-20, 24" Drain (Flank)			118,200	24,800	143,000	
11 02 03 8	GW-21, 24" Drain (Flank)			118,200	24,800	143,000	
11 02 03 10	GW-23, 30" Drain (Flank)			81,900	22,100	104,000	
11 02 03 11	GW-24, 48" Drain (Riverfront)			98,300	27,000	125,400	
11 02 03 14	GW-27, 24" Drain (Riverfront)			118,200	24,800	143,000	
11 02 03 16	GW-29, 18" Drain (Riverfront)			113,000	23,700	136,800	
11 02 03 18	GW-31, 24" Drain (Riverfront)			118,200	24,800	143,000	
11 02 03 19	GW-32, 24" Drain (Riverfront)			118,200	24,800	143,000	
11 02 03 20	GW-33, 24" Drain (Riverfront)			124,300	26,700	151,000	
11 02 03 21	GW-34, 48" Drain (Cahokia Creek)			85,800	23,300	109,100	
11 02 03 22	GW-35, 48" Drain (Cahokia Creek)			85,800	23,300	109,100	
11 02 03 23	GW-36, 48" Drain (Cahokia Creek)			85,800	23,300	109,100	
11 02 03 24	GW-37, 72" Drain (Cahokia Creek)			166,100	46,200	212,400	
11 02 03 25	GW-38, 42" Drain (Cahokia Creek)			94,800	26,000	120,800	
11 02 03 26	GW-39, 72" Drain (Cahokia Creek)			108,600	31,300	139,900	
11 02 03 27	GW-40, 30" Drain (Indian Creek)			81,900	22,100	104,000	
11 02 03 28	GW-41, 72" Drain (Indian Creek)			158,400	43,900	202,300	
11 02 03 29	GW-42, 36" Drain (Indian Creek)			82,400	22,300	104,600	
11 02 03 30	GW-43, 30" Drain (Indian Creek)			56,700	15,800	72,500	
11 02 03 31	GW-44, 30" Drain (Indian Creek)			56,700	15,800	72,500	
	TOTAL Lower Wood River Levee (LWRL)			2,591,000	657,700	3,248,700	
	TOTAL Gravity Drainage Structures			3,844,100	956,900	4,800,900	
11 03	Closure Structures						
11 03 01	Upper Wood River Levee (UWRL)						
11 03 01 1	CS-1, Rail Closure (Riverfront)			15,400	4,600	20,000	
11 03 01 2	CS-2, Rail Closure (Riverfront)			15,400	4,600	20,000	
11 03 01 3	CS-3, Rail Closure (Riverfront)			15,400	4,600	20,000	
11 03 01 4	CS-4, Rail Closure (Riverfront)			72,600	16,000	88,600	
11 03 01 5	CS-5, Road Closure (Riverfront)			44,600	10,400	55,000	
11 03 01 7	CS-7, Rail Closure (Flank)			4,800	1,000	5,700	
11 03 01 8	CS-8, Rail Closure (Flank)			15,900	4,300	20,100	
11 03 01 9	CS-9, Rail Closure (Flank)			19,900	4,300	24,200	
	TOTAL Upper Wood River Levee (UWRL)			204,000	49,600	253,500	
11 03 02	East and West Fork Levee						

	QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
11 03 02 1 CS-10, Rail Closure (East Fork)			491,000	98,500	589,600	
TOTAL East and West Fork Levee			491,000	98,500	589,600	
11 03 03 Lower Wood River Levee (LWRL)						
11 03 03 1 CS-11, Rail Closure (Flank)			484,500	97,200	581,700	
11 03 03 2 CS-12, Road Closure (Flank)			1,147,300	229,800	1,377,100	
11 03 03 3 CS-13, Rail Closure (Flank)			14,300	3,200	17,500	
11 03 03 4 CS-14, Rail Closure (Flank)			19,900	4,300	24,200	
11 03 03 5 CS-15, Road Closure (Flank)			43,700	10,900	54,600	
11 03 03 6 CS-16, Road Closure (Flank)			43,700	10,900	54,600	
11 03 03 7 CS-17, Rail Closure (Flank)			15,600	4,200	19,800	
11 03 03 8 CS-18, Rail Closure (Flank)			200	0	200	
11 03 03 9 CS-19, Road Closure (Riverfront)			15,600	4,600	20,200	
11 03 03 10 CS-20, Road Closure (Riverfront)			54,000	11,100	65,100	
11 03 03 11 CS-21 Road Closure (Riverfront)			11,100	3,300	14,400	
11 03 03 12 CS-22, Road Closure (Riverfront)			15,600	4,600	20,200	
11 03 03 13 CS-23, Road Closure(Cahokia Crk)			900	200	1,000	
11 03 03 14 CS-24, Road Closure (Indian Crk)			15,800	4,600	20,400	
11 03 03 15 CS-25, Road Closure (Indian Crk)			900	200	1,100	
11 03 03 16 CS-26, Rail Closure (Indian Crk)			29,200	6,200	35,400	
TOTAL Lower Wood River Levee (LWRL)			1,912,400	395,200	2,307,600	
TOTAL Closure Structures			2,607,400	543,300	3,150,700	
TOTAL Levees and Floodwalls			10,521,000	1,907,100	12,428,100	
13 Pumping Plant						
13 01 East Alton No. 1						
13 01 01 Mob, Demob & Preparatory Work						
13 01 01 01 Mobilization and Demobilization			3,800	800	4,600	
TOTAL Mob, Demob & Preparatory Work			3,800	800	4,600	
13 01 03 Care and Diversion of Water						
13 01 03 02 Site Work			7,000	1,800	8,800	
13 01 03 15 Mechanical			5,300	1,300	6,600	
TOTAL Care and Diversion of Water			12,300	3,100	15,400	
13 01 78 Auxiliary Equipment						

	QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
13 01 78 15 Mechanical			575,500	86,300	661,800	
TOTAL Auxiliary Equipment			575,500	86,300	661,800	
TOTAL East Alton No. 1			591,700	90,200	681,800	
13 02 East Alton No. 2						
13 02 01 Mob, Demob & Preparatory Work						
13 02 01 01 Mobilization and Demobilization			3,800	800	4,600	
TOTAL Mob, Demob & Preparatory Work			3,800	800	4,600	
13 02 02 Sitework						
13 02 02 5 Site Preparation			1,300	400	1,700	
13 02 02 10 Line Existing Pipe w/ HDPE Pipe	2.00	EA	81,200	24,400	105,600	52783
13 02 02 15 Site Restoration			2,500	800	3,300	
TOTAL Sitework			85,100	25,500	110,600	
13 02 03 Care and Diversion of Water						
13 02 03 02 Site Work			7,000	1,800	8,800	
13 02 03 15 Mechanical			5,300	1,300	6,600	
TOTAL Care and Diversion of Water			12,300	3,100	15,400	
13 02 75 Pumping Plant Superstructure						
13 02 75 04 Masonry			36,400	7,300	43,700	
13 02 75 06 Wood and Plastic			40,500	8,100	48,600	
13 02 75 07 Thermal & Moisture Protection			2,800	600	3,400	
13 02 75 15 Mechanical			12,300	2,500	14,700	
13 02 75 16 Electrical			15,300	3,100	18,400	
TOTAL Pumping Plant Superstructure			107,300	21,500	128,700	
13 02 76 Pumping Machinery & Appurtenance						
13 02 76 15 Mechanical			184,100	27,600	211,700	
13 02 76 16 Electrical			149,500	22,400	171,900	
TOTAL Pumping Machinery & Appurtenance			333,600	50,000	383,600	

	QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
13 02 77 Gates and Valves						
13 02 77 15 Mechanical			92,400	27,700	120,200	
TOTAL Gates and Valves			92,400	27,700	120,200	
13 02 99 Associated General Items						
13 02 99 01 Trashrack			23,200	3,500	26,700	
TOTAL Associated General Items			23,200	3,500	26,700	
TOTAL East Alton No. 2			657,700	132,100	789,800	
13 03 Wood River						
13 03 01 Mob, Demob & Preparatory Work						
13 03 01 01 Mobilization and Demobilization			3,800	800	4,600	
TOTAL Mob, Demob & Preparatory Work			3,800	800	4,600	
13 03 03 Care and Diversion of Water						
13 03 03 02 Site Work			7,000	1,800	8,800	
13 03 03 15 Mechanical			5,300	1,300	6,600	
TOTAL Care and Diversion of Water			12,300	3,100	15,400	
13 03 75 Pumping Plant Superstructure						
13 03 75 04 Masonry			39,900	8,000	47,800	
13 03 75 06 Wood and Plastic			76,500	15,300	91,800	
13 03 75 07 Thermal & Moisture Protection			3,500	700	4,200	
13 03 75 15 Mechanical			12,500	2,500	15,000	
13 03 75 16 Electrical			15,200	3,000	18,300	
TOTAL Pumping Plant Superstructure			147,600	29,500	177,100	
13 03 76 Pumping Machinery & Appurtenance						
13 03 76 15 Mechanical			457,800	68,700	526,500	
13 03 76 16 Electrical			178,800	26,800	205,600	
TOTAL Pumping Machinery & Appurtenance			636,600	95,500	732,100	

	QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
13 03 77 Gates and Valves						
13 03 77 15 Mechanical			286,200	85,900	372,100	
TOTAL Gates and Valves			286,200	85,900	372,100	
13 03 99 Associated General Items						
13 03 99 01 Chain Link Fence			12,600	1,800	14,400	
TOTAL Associated General Items			12,600	1,800	14,400	
TOTAL Wood River			1,099,200	216,500	1,315,700	
13 04 Rand						
13 04 01 Mob, Demob & Preparatory Work						
13 04 01 01 Mobilization and Demobilization			3,800	800	4,600	
TOTAL Mob, Demob & Preparatory Work			3,800	800	4,600	
13 04 02 Sitework						
13 04 02 5 Site Preparation			1,300	400	1,700	
13 04 02 10 Line Existing Pipe w/Insituform			96,200	28,900	125,100	
13 04 02 15 Site Restoration			2,500	800	3,300	
TOTAL Sitework			100,100	30,000	130,100	
13 04 03 Care and Diversion of Water						
13 04 03 02 Site Work			7,000	1,800	8,800	
13 04 03 15 Mechanical			5,300	1,300	6,600	
TOTAL Care and Diversion of Water			12,300	3,100	15,400	
13 04 75 Pumping Plant Superstructure						
13 04 75 04 Masonry			19,000	3,800	22,800	
13 04 75 06 Wood and Plastic			41,100	8,200	49,300	
13 04 75 07 Thermal & Moisture Protection			1,100	200	1,300	
13 04 75 15 Mechanical			7,800	1,600	9,400	
13 04 75 16 Electrical			11,500	2,300	13,800	
TOTAL Pumping Plant Superstructure			80,400	16,100	96,500	

	QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
13 04 76 Pumping Machinery & Appurtenance						
13 04 76 15 Mechanical			433,800	65,100	498,900	
13 04 76 16 Electrical			49,400	7,400	56,900	
TOTAL Pumping Machinery & Appurtenance			483,300	72,500	555,800	
13 04 77 Gates and Valves						
13 04 77 15 Mechanical			88,800	26,600	115,400	
TOTAL Gates and Valves			88,800	26,600	115,400	
13 04 99 Associated General Items						
13 04 99 01 Chain Link Fence			8,700	1,300	10,000	
TOTAL Associated General Items			8,700	1,300	10,000	
TOTAL Rand			777,400	150,400	927,700	
13 05 Hawthorne						
13 05 01 Mob, Demob & Preparatory Work						
13 05 01 01 Mobilization and Demobilization			3,800	800	4,600	
TOTAL Mob, Demob & Preparatory Work			3,800	800	4,600	
13 05 03 Care and Diversion of Water						
13 05 03 02 Site Work			7,000	1,800	8,800	
13 05 03 15 Mechanical			5,300	1,300	6,600	
TOTAL Care and Diversion of Water			12,300	3,100	15,400	
13 05 75 Pumping Plant Superstructure						
13 05 75 04 Masonry			26,600	4,000	30,600	
13 05 75 06 Wood and Plastic			28,000	4,200	32,200	
13 05 75 07 Thermal & Moisture Protection			1,600	200	1,800	
13 05 75 15 Mechanical			7,800	1,200	9,000	
13 05 75 16 Electrical			11,900	1,800	13,700	
TOTAL Pumping Plant Superstructure			75,900	11,400	87,300	

	QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
13 05 76 Pumping Machinery & Appurtenance						
13 05 76 15 Mechanical			182,700	27,400	210,100	
13 05 76 16 Electrical			84,000	12,600	96,600	
TOTAL Pumping Machinery & Appurtenance			266,700	40,000	306,700	
13 05 77 Gates and Valves						
13 05 77 15 Mechanical			34,000	10,200	44,200	
TOTAL Gates and Valves			34,000	10,200	44,200	
TOTAL Hawthorne			392,800	65,400	458,200	
13 06 Homegarden						
13 06 01 Mob, Demob & Preparatory Work						
13 06 01 01 Mobilization and Demobilization			3,700	700	4,500	
TOTAL Mob, Demob & Preparatory Work			3,700	700	4,500	
13 06 02 Sitework						
13 06 02 5 Site Preparation			1,300	400	1,700	
13 06 02 10 Line Existing Pipe w/ HDPE Pipe			40,600	12,200	52,800	
13 06 02 15 Site Restoration			2,500	800	3,300	
TOTAL Sitework			44,500	13,300	57,800	
13 06 03 Care and Diversion of Water						
13 06 03 02 Site Work			7,000	1,800	8,800	
13 06 03 15 Mechanical			5,300	1,300	6,600	
TOTAL Care and Diversion of Water			12,300	3,100	15,400	
13 06 75 Pumping Plant Superstructure						
13 06 75 06 Wood and Plastic			9,900	2,000	11,900	
13 06 75 07 Thermal & Moisture Protection			600	100	700	
13 06 75 16 Electrical			5,300	1,100	6,400	
TOTAL Pumping Plant Superstructure			15,800	3,200	19,000	

	QUANTY UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
13 06 76 Pumping Machinery & Appurtenance					
13 06 76 15 Mechanical		50,200	7,500	57,700	
13 06 76 16 Electrical		21,100	3,200	24,300	
TOTAL Pumping Machinery & Appurtenance		71,300	10,700	82,000	
13 06 77 Gates and Valves					
13 06 77 15 Mechanical		12,800	3,800	16,700	
TOTAL Gates and Valves		12,800	3,800	16,700	
TOTAL Homegarden		160,500	34,900	195,300	
13 07 Lakeside					
13 07 01 Mob, Demob & Preparatory Work					
13 07 01 01 Mobilization and Demobilization		3,700	700	4,500	
TOTAL Mob, Demob & Preparatory Work		3,700	700	4,500	
13 07 02 Sitework					
13 07 02 5 Site Preparation		1,300	400	1,700	
13 07 02 10 Line Existing Pipe w/ HDPE Pipe		40,600	12,200	52,800	
13 07 02 15 Site Restoration		2,500	800	3,300	
TOTAL Sitework		44,500	13,300	57,800	
13 07 03 Care and Diversion of Water					
13 07 03 02 Site Work		7,000	1,800	8,800	
13 07 03 15 Mechanical		5,300	1,300	6,600	
TOTAL Care and Diversion of Water		12,300	3,100	15,400	
13 07 75 Pumping Plant Superstructure					
13 07 75 06 Wood and Plastic		9,900	2,000	11,900	
13 07 75 07 Thermal & Moisture Protection		600	100	700	
13 07 75 16 Electrical		5,300	1,100	6,300	
TOTAL Pumping Plant Superstructure		15,800	3,200	18,900	

	QUANTY UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
13 07 76 Pumping Machinery & Appurtenance					
13 07 76 15 Mechanical		52,100	7,800	59,900	
13 07 76 16 Electrical		15,700	2,400	18,100	
TOTAL Pumping Machinery & Appurtenance		67,800	10,200	78,000	
13 07 77 Gates and Valves					
13 07 77 15 Mechanical		16,800	5,000	21,900	
TOTAL Gates and Valves		16,800	5,000	21,900	
TOTAL Lakeside		160,900	35,500	196,500	
TOTAL Pumping Plant		3,840,100	725,000	4,565,000	
30 Planning, Engineering, & Design					
30 01 Planning, Engineering, & Design					
30 01 1 Planning, Engineering, & Design		2,441,000	732,300	3,173,300	
TOTAL Planning, Engineering, & Design		2,441,000	732,300	3,173,300	
TOTAL Planning, Engineering, & Design		2,441,000	732,300	3,173,300	
31 Construction Management					
31 01 Construction Management					
31 01 1 Construction Management		1,436,000	430,800	1,866,800	
TOTAL Construction Management		1,436,000	430,800	1,866,800	
TOTAL Construction Management		1,436,000	430,800	1,866,800	
TOTAL WOOD RIVER		18,338,100	3,820,100	22,158,200	

	QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
01 Lands and Damages						
01 01 Gross Appraisal Estimate						
01 01 1 Lands and Damages			100,000	25,000	125,000	
TOTAL Gross Appraisal Estimate			100,000	25,000	125,000	
TOTAL Lands and Damages			100,000	25,000	125,000	
11 Levees and Floodwalls						
11 01 Levees						
11 01 01 Levees and Berms						
11 01 01 01 Rehab/Replace Exist Relief Wells						
11 01 01 01 1 Well Evaluation	153.00	EA	459,000	45,900	504,900	3300.00
11 01 01 01 2 Well Reconstruction	122.00	EA	793,100	79,300	872,400	7151.12
11 01 01 01 4 Replace Wells	20.00	EA	540,100	54,000	594,100	29707
11 01 01 01 5 Pilot Holes for New Wells	20.00	EA	100,200	10,000	110,200	5511.20
TOTAL Rehab/Replace Exist Relief Wells			1,892,400	189,200	2,081,700	
11 01 01 02 New Relief Wells						
11 01 01 02 1 New Relief Wells	68.00	EA	1,836,400	183,600	2,020,100	29707
11 01 01 02 2 Pilot Holes for New Wells	68.00	EA	340,700	34,100	374,800	5511.20
TOTAL New Relief Wells			2,177,100	217,700	2,394,800	
TOTAL Levees and Berms			4,069,600	407,000	4,476,500	
TOTAL Levees			4,069,600	407,000	4,476,500	
11 02 Gravity Drainage Structures						
11 02 01 Upper Wood River Levee (UWRL)						
11 02 01 2 GW-2, 72" Drain (Flank)						
11 02 01 2 01 Mob, Demob & Preparatory Work						
11 02 01 2 01 1 Mobilization and Demobilization			3,800	800	4,600	
TOTAL Mob, Demob & Preparatory Work			3,800	800	4,600	

		QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
11 02 01 2 02	Care and Diversion of Water						
11 02 01 2 02 1	Fabricate Bulkheads			3,100	600	3,700	
11 02 01 2 02 2	Install Temporary Bulkheads	2.00	DAY	2,600	500	3,200	1580.09
11 02 01 2 02 3	Remove Temporary Bulkheads	1.00	DAY	1,300	300	1,600	1580.09
11 02 01 2 02 4	Unwatering Pumps			5,300	1,100	6,400	
	TOTAL Care and Diversion of Water			12,300	2,500	14,800	
11 02 01 2 03	Sitework						
11 02 01 2 03 1	Site Preparation			1,300	400	1,700	
11 02 01 2 03 2	Line Existing Pipe w/ HDPE Pipe			92,500	27,700	120,200	
11 02 01 2 03 3	Site Restoration			2,500	800	3,300	
	TOTAL Sitework			96,300	28,900	125,200	
11 02 01 2 04	Drainage Structure						
11 02 01 2 04 1	Replace Handrail			6,600	1,300	7,900	
11 02 01 2 04 2	Replace Grating			600	100	700	
11 02 01 2 04 3	Replace Ladders			1,200	200	1,500	
	TOTAL Drainage Structure			8,400	1,700	10,100	
11 02 01 2 05	Gates						
11 02 01 2 05 1	Remove Existing Gate	1.00	EA	4,200	1,300	5,400	5425.15
11 02 01 2 05 2	Rehab Gate	1.00	EA	15,100	4,500	19,600	19599
11 02 01 2 05 3	Install/Test Rehabbed Gate	1.00	EA	6,900	2,100	9,000	8982.92
	TOTAL Gates			26,200	7,800	34,000	
	TOTAL GW-2, 72" Drain (Flank)			147,000	41,700	188,700	
11 02 01 3	GW-3, 18" Drain (Flank)						
11 02 01 3 01	Mob, Demob & Preparatory Work						
11 02 01 3 01 1	Mobilization and Demobilization			3,800	800	4,600	
	TOTAL Mob, Demob & Preparatory Work			3,800	800	4,600	
11 02 01 3 02	Care and Diversion of Water						
11 02 01 3 02 1	Fabricate Bulkheads			3,100	600	3,700	

		QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
11 02 01 3 02 2	Install Temporary Bulkheads	2.00	DAY	2,600	500	3,200	1580.09
11 02 01 3 02 3	Remove Temporary Bulkheads	1.00	DAY	1,300	300	1,600	1580.09
11 02 01 3 02 4	Unwatering Pumps			5,300	1,100	6,400	
TOTAL	Care and Diversion of Water			12,300	2,500	14,800	
11 02 01 3 03	Sitework						
11 02 01 3 03 1	Clearing, Grubbing and Stripping	1.20	ACR	2,100	400	2,500	2109.91
11 02 01 3 03 2	Pavement Removal	110.00	SY	700	100	900	8.02
11 02 01 3 03 3	Remove Crushed Stone	80.00	TON	300	100	400	5.12
11 02 01 3 03 4	Excavation	6540.00	CY	19,700	3,900	23,600	3.61
11 02 01 3 03 5	Cofferdam	1700.00	CY	5,900	1,200	7,100	4.18
11 02 01 3 03 6	Remove Existing Pipe	250.00	LF	2,000	400	2,400	9.64
11 02 01 3 03 7	Install New RCP	250.00	LF	10,500	2,100	12,600	50.43
11 02 01 3 03 8	Place and Compact Backfill	7800.00	CY	33,400	6,700	40,100	5.14
11 02 01 3 03 9	Crushed Stone Surfacing	80.00	TON	1,000	200	1,200	15.05
11 02 01 3 03 10	Bitumineous Road Repair	110.00	SY	600	100	800	7.03
11 02 01 3 03 11	Establishment of Turf	1.20	ACR	1,100	200	1,400	1141.60
TOTAL	Sitework			77,500	15,500	93,000	
11 02 01 3 04	Drainage Structure						
11 02 01 3 04 1	Replace Handrail			6,600	1,300	7,900	
11 02 01 3 04 2	Replace Grating			600	100	700	
11 02 01 3 04 3	Replace Ladders			1,200	200	1,500	
TOTAL	Drainage Structure			8,400	1,700	10,100	
11 02 01 3 05	Gates						
11 02 01 3 05 1	Remove Existing Gate	1.00	EA	1,900	600	2,500	2488.97
11 02 01 3 05 2	Rehab Gate	1.00	EA	5,600	1,700	7,300	7314.00
11 02 01 3 05 3	Install/Test Rehabbed Gate	1.00	EA	3,500	1,000	4,500	4524.76
TOTAL	Gates			11,000	3,300	14,300	
TOTAL	GW-3, 18" Drain (Flank)			113,000	23,700	136,800	
11 02 01 4	GW-4, 18" Drain (Flank)						
11 02 01 4 01	Mob, Demob & Preparatory Work						
11 02 01 4 01 1	Mobilization and Demobilization			3,800	800	4,600	
TOTAL	Mob, Demob & Preparatory Work			3,800	800	4,600	

		QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
11 02 01 4 02	Care and Diversion of Water						
11 02 01 4 02 1	Fabricate Bulkheads			3,100	600	3,700	
11 02 01 4 02 2	Install Temporary Bulkheads	2.00	DAY	2,600	500	3,200	1580.09
11 02 01 4 02 3	Remove Temporary Bulkheads	1.00	DAY	1,300	300	1,600	1580.09
11 02 01 4 02 4	Unwatering Pumps			5,300	1,100	6,400	
	TOTAL Care and Diversion of Water			12,300	2,500	14,800	
11 02 01 4 03	Sitework						
11 02 01 4 03 1	Clearing, Grubbing and Stripping	1.20	ACR	2,100	400	2,500	2109.91
11 02 01 4 03 2	Pavement Removal	110.00	SY	700	100	900	8.02
11 02 01 4 03 3	Remove Crushed Stone	80.00	TON	300	100	400	5.12
11 02 01 4 03 4	Excavation	6540.00	CY	19,700	3,900	23,600	3.61
11 02 01 4 03 5	Cofferdam	1700.00	CY	5,900	1,200	7,100	4.18
11 02 01 4 03 6	Remove Existing Pipe	250.00	LF	2,000	400	2,400	9.64
11 02 01 4 03 7	Install New RCP	250.00	LF	10,500	2,100	12,600	50.43
11 02 01 4 03 8	Place and Compact Backfill	7800.00	CY	33,400	6,700	40,100	5.14
11 02 01 4 03 9	Crushed Stone Surfacing	80.00	TON	1,000	200	1,200	15.05
11 02 01 4 03 10	Bitumineous Road Repair	110.00	SY	600	100	800	7.03
11 02 01 4 03 11	Establishment of Turf	1.20	ACR	1,100	200	1,400	1141.60
	TOTAL Sitework			77,500	15,500	93,000	
11 02 01 4 04	Drainage Structure						
11 02 01 4 04 1	Replace Handrail			6,600	1,300	7,900	
11 02 01 4 04 2	Replace Grating			600	100	700	
11 02 01 4 04 3	Replace Ladders			1,200	200	1,500	
	TOTAL Drainage Structure			8,400	1,700	10,100	
11 02 01 4 05	Gates						
11 02 01 4 05 1	Remove Existing Gate	1.00	EA	1,900	600	2,500	2488.97
11 02 01 4 05 2	Rehab Gate	1.00	EA	5,600	1,700	7,300	7314.00
11 02 01 4 05 3	Install/Test Rehabbed Gate	1.00	EA	3,500	1,000	4,500	4524.76
	TOTAL Gates			11,000	3,300	14,300	
	TOTAL GW-4, 18" Drain (Flank)			113,000	23,700	136,800	
11 02 01 5	GW-5, 18" Drain (Flank)						
11 02 01 5 01	Mob, Demob & Preparatory Work						

		QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
11 02 01 5 01 1	Mobilization and Demobilization			3,800	800	4,600	
	TOTAL Mob, Demob & Preparatory Work			3,800	800	4,600	
11 02 01 5 02	Care and Diversion of Water						
11 02 01 5 02 1	Fabricate Bulkheads			3,100	600	3,700	
11 02 01 5 02 2	Install Temporary Bulkheads	2.00	DAY	2,600	500	3,200	1580.09
11 02 01 5 02 3	Remove Temporary Bulkheads	1.00	DAY	1,300	300	1,600	1580.09
11 02 01 5 02 4	Unwatering Pumps			5,300	1,100	6,400	
	TOTAL Care and Diversion of Water			12,300	2,500	14,800	
11 02 01 5 03	Sitework						
11 02 01 5 03 1	Clearing, Grubbing and Stripping	1.20	ACR	2,100	400	2,500	2109.91
11 02 01 5 03 2	Pavement Removal	110.00	SY	700	100	900	8.02
11 02 01 5 03 3	Remove Crushed Stone	80.00	TON	300	100	400	5.12
11 02 01 5 03 4	Excavation	6540.00	CY	19,700	3,900	23,600	3.61
11 02 01 5 03 5	Cofferdam	1700.00	CY	5,900	1,200	7,100	4.18
11 02 01 5 03 6	Remove Existing Pipe	250.00	LF	2,000	400	2,400	9.64
11 02 01 5 03 7	Install New RCP	250.00	LF	10,500	2,100	12,600	50.43
11 02 01 5 03 8	Place and Compact Backfill	7800.00	CY	33,400	6,700	40,100	5.14
11 02 01 5 03 9	Crushed Stone Surfacing	80.00	TON	1,000	200	1,200	15.05
11 02 01 5 03 10	Bitumineous Road Repair	110.00	SY	600	100	800	7.03
11 02 01 5 03 11	Establishment of Turf	1.20	ACR	1,100	200	1,400	1141.60
	TOTAL Sitework			77,500	15,500	93,000	
11 02 01 5 04	Drainage Structure						
11 02 01 5 04 1	Replace Handrail			6,600	1,300	7,900	
11 02 01 5 04 2	Replace Grating			600	100	700	
11 02 01 5 04 3	Replace Ladders			1,200	200	1,500	
	TOTAL Drainage Structure			8,400	1,700	10,100	
11 02 01 5 05	Gates						
11 02 01 5 05 1	Remove Existing Gate	1.00	EA	1,900	600	2,500	2488.97
11 02 01 5 05 2	Rehab Gate	1.00	EA	5,600	1,700	7,300	7314.00
11 02 01 5 05 3	Install/Test Rehabbed Gate	1.00	EA	3,500	1,000	4,500	4524.76
	TOTAL Gates			11,000	3,300	14,300	
	TOTAL GW-5, 18" Drain (Flank)			113,000	23,700	136,800	

		QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
	TOTAL Upper Wood River Levee (UWRL)			486,100	112,800	598,900	
11 02 02	East and West Fork Levee						
11 02 02 1	GW-6, 48" Drain (East Fork)						
11 02 02 1 01	Mob, Demob & Preparatory Work						
11 02 02 1 01 1	Mobilization and Demobilization			3,800	800	4,600	
	TOTAL Mob, Demob & Preparatory Work			3,800	800	4,600	
11 02 02 1 02	Care and Diversion of Water						
11 02 02 1 02 1	Fabricate Bulkheads			3,100	600	3,700	
11 02 02 1 02 2	Install Temporary Bulkheads	2.00	DAY	2,600	500	3,200	1580.09
11 02 02 1 02 3	Remove Temporary Bulkheads	1.00	DAY	1,300	300	1,600	1580.09
11 02 02 1 02 4	Unwatering Pumps			5,300	1,100	6,400	
	TOTAL Care and Diversion of Water			12,300	2,500	14,800	
11 02 02 1 03	Sitework						
11 02 02 1 03 1	Site Preparation			1,300	400	1,700	
11 02 02 1 03 2	Line Existing Pipe w/ HDPE Pipe			40,600	12,200	52,800	
11 02 02 1 03 3	Site Restoration			2,500	800	3,300	
	TOTAL Sitework			44,500	13,300	57,800	
11 02 02 1 04	Drainage Structure						
11 02 02 1 04 1	Replace Handrail			6,600	1,300	7,900	
11 02 02 1 04 2	Replace Grating			600	100	700	
11 02 02 1 04 3	Replace Ladders			1,200	200	1,500	
	TOTAL Drainage Structure			8,400	1,700	10,100	
11 02 02 1 05	Gates						
11 02 02 1 05 1	Remove Existing Gate	1.00	EA	3,400	1,000	4,500	4458.59
11 02 02 1 05 2	Rehab Gate	1.00	EA	8,600	2,600	11,100	11121
11 02 02 1 05 3	Install/Test Rehabbed Gate	1.00	EA	4,800	1,500	6,300	6288.59
	TOTAL Gates			16,800	5,000	21,900	
	TOTAL GW-6, 48" Drain (East Fork)			85,800	23,300	109,100	

		QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
11 02 02 2	GW-7, 24" Drain (East Fork)						
11 02 02 2 01	Mob, Demob & Preparatory Work						
11 02 02 2 01 1	Mobilization and Demobilization			3,800	800	4,600	
	TOTAL Mob, Demob & Preparatory Work			3,800	800	4,600	
11 02 02 2 02	Care and Diversion of Water						
11 02 02 2 02 1	Fabricate Bulkheads			3,100	600	3,700	
11 02 02 2 02 2	Install Temporary Bulkheads	2.00	DAY	2,600	500	3,200	1580.09
11 02 02 2 02 3	Remove Temporary Bulkheads	1.00	DAY	1,300	300	1,600	1580.09
11 02 02 2 02 4	Unwatering Pumps			5,300	1,100	6,400	
	TOTAL Care and Diversion of Water			12,300	2,500	14,800	
11 02 02 2 03	Sitework						
11 02 02 2 03 1	Clearing, Grubbing and Stripping	1.20	ACR	2,100	400	2,500	2109.91
11 02 02 2 03 2	Pavement Removal	110.00	SY	700	100	900	8.02
11 02 02 2 03 3	Remove Crushed Stone	80.00	TON	300	100	400	5.12
11 02 02 2 03 4	Excavation	6540.00	CY	19,700	3,900	23,600	3.61
11 02 02 2 03 5	Cofferdam	1700.00	CY	5,900	1,200	7,100	4.18
11 02 02 2 03 6	Remove Existing Pipe	250.00	LF	2,500	500	3,000	12.05
11 02 02 2 03 7	Install New RCP	250.00	LF	14,000	2,800	16,800	67.17
11 02 02 2 03 8	Place and Compact Backfill	7800.00	CY	33,400	6,700	40,100	5.14
11 02 02 2 03 9	Crushed Stone Surfacing	80.00	TON	1,000	200	1,200	15.05
11 02 02 2 03 10	Bitumineous Road Repair	110.00	SY	600	100	800	7.03
11 02 02 2 03 11	Establishment of Turf	1.20	ACR	1,100	200	1,400	1141.60
	TOTAL Sitework			81,500	16,300	97,800	
11 02 02 2 04	Drainage Structure						
11 02 02 2 04 1	Replace Handrail			6,600	1,300	7,900	
11 02 02 2 04 2	Replace Grating			600	100	700	
11 02 02 2 04 3	Replace Ladders			1,200	200	1,500	
	TOTAL Drainage Structure			8,400	1,700	10,100	
11 02 02 2 05	Gates						
11 02 02 2 05 1	Remove Existing Gate	1.00	EA	2,500	700	3,200	3214.11
11 02 02 2 05 2	Rehab Gate	1.00	EA	6,200	1,900	8,100	8068.83
11 02 02 2 05 3	Install/Test Rehabbed Gate	1.00	EA	3,500	1,000	4,500	4524.76

		QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
	TOTAL Gates			12,200	3,600	15,800	
	TOTAL GW-7, 24" Drain (East Fork)			118,200	24,800	143,000	
11 02 02 3	GW-8, 36" Drain (East Fork)						
11 02 02 3 01	Mob, Demob & Preparatory Work						
11 02 02 3 01 1	Mobilization and Demobilization			3,800	800	4,600	
	TOTAL Mob, Demob & Preparatory Work			3,800	800	4,600	
11 02 02 3 02	Care and Diversion of Water						
11 02 02 3 02 1	Fabricate Bulkheads			3,100	600	3,700	
11 02 02 3 02 2	Install Temporary Bulkheads	2.00	DAY	2,600	500	3,200	1580.09
11 02 02 3 02 3	Remove Temporary Bulkheads	1.00	DAY	1,300	300	1,600	1580.09
11 02 02 3 02 4	Unwatering Pumps			5,300	1,100	6,400	
	TOTAL Care and Diversion of Water			12,300	2,500	14,800	
11 02 02 3 03	Sitework						
11 02 02 3 03 1	Site Preparation			1,300	400	1,700	
11 02 02 3 03 2	Line Existing Pipe w/ HDPE Pipe			40,600	12,200	52,800	
11 02 02 3 03 3	Site Restoration			2,500	800	3,300	
	TOTAL Sitework			44,500	13,300	57,800	
11 02 02 3 04	Drainage Structure						
11 02 02 3 04 1	Replace Handrail			6,600	1,300	7,900	
11 02 02 3 04 2	Replace Grating			600	100	700	
11 02 02 3 04 3	Replace Ladders			1,200	200	1,500	
	TOTAL Drainage Structure			8,400	1,700	10,100	
11 02 02 3 05	Gates						
11 02 02 3 05 1	Remove Existing Gate	1.00	EA	2,500	700	3,200	3214.11
11 02 02 3 05 2	Rehab Gate	1.00	EA	7,000	2,100	9,100	9122.97
11 02 02 3 05 3	Install/Test Rehabbed Gate	1.00	EA	3,900	1,200	5,000	5044.11
	TOTAL Gates			13,400	4,000	17,400	
	TOTAL GW-8, 36" Drain (East Fork)			82,400	22,300	104,600	

		QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
11 02 02 4	GW-9, 24" Drain (East Fork)						
11 02 02 4 01	Mob, Demob & Preparatory Work						
11 02 02 4 01 1	Mobilization and Demobilization			3,800	800	4,600	
	TOTAL Mob, Demob & Preparatory Work			3,800	800	4,600	
11 02 02 4 02	Care and Diversion of Water						
11 02 02 4 02 1	Fabricate Bulkheads			3,100	600	3,700	
11 02 02 4 02 2	Install Temporary Bulkheads	2.00	DAY	2,600	500	3,200	1580.09
11 02 02 4 02 3	Remove Temporary Bulkheads	1.00	DAY	1,300	300	1,600	1580.09
11 02 02 4 02 4	Unwatering Pumps			5,300	1,100	6,400	
	TOTAL Care and Diversion of Water			12,300	2,500	14,800	
11 02 02 4 03	Sitework						
11 02 02 4 03 1	Clearing, Grubbing and Stripping	1.20	ACR	2,100	400	2,500	2109.91
11 02 02 4 03 2	Pavement Removal	110.00	SY	700	100	900	8.02
11 02 02 4 03 3	Remove Crushed Stone	80.00	TON	300	100	400	5.12
11 02 02 4 03 4	Excavation	6540.00	CY	19,700	3,900	23,600	3.61
11 02 02 4 03 5	Cofferdam	1700.00	CY	5,900	1,200	7,100	4.18
11 02 02 4 03 6	Remove Existing Pipe	250.00	LF	2,500	500	3,000	12.05
11 02 02 4 03 7	Install New RCP	250.00	LF	14,000	2,800	16,800	67.17
11 02 02 4 03 8	Place and Compact Backfill	7800.00	CY	33,400	6,700	40,100	5.14
11 02 02 4 03 9	Crushed Stone Surfacing	80.00	TON	1,000	200	1,200	15.05
11 02 02 4 03 10	Bitumineous Road Repair	110.00	SY	600	100	800	7.03
11 02 02 4 03 11	Establishment of Turf	1.20	ACR	1,100	200	1,400	1141.60
	TOTAL Sitework			81,500	16,300	97,800	
11 02 02 4 04	Drainage Structure						
11 02 02 4 04 1	Replace Handrail			6,600	1,300	7,900	
11 02 02 4 04 2	Replace Grating			600	100	700	
11 02 02 4 04 3	Replace Ladders			1,200	200	1,500	
	TOTAL Drainage Structure			8,400	1,700	10,100	
11 02 02 4 05	Gates						
11 02 02 4 05 1	Remove Existing Gate	1.00	EA	2,500	700	3,200	3214.11
11 02 02 4 05 2	Rehab Gate	1.00	EA	6,200	1,900	8,100	8068.83
11 02 02 4 05 3	Install/Test Rehabbed Gate	1.00	EA	3,500	1,000	4,500	4524.76

		QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
	TOTAL Gates			12,200	3,600	15,800	
	TOTAL GW-9, 24" Drain (East Fork)			118,200	24,800	143,000	
11 02 02 5	GW-10, 42" Drain (East Fork)						
11 02 02 5 01	Mob, Demob & Preparatory Work						
11 02 02 5 01 1	Mobilization and Demobilization			3,800	800	4,600	
	TOTAL Mob, Demob & Preparatory Work			3,800	800	4,600	
11 02 02 5 02	Care and Diversion of Water						
11 02 02 5 02 1	Fabricate Bulkheads			3,100	600	3,700	
11 02 02 5 02 2	Install Temporary Bulkheads	2.00	DAY	2,600	500	3,200	1580.09
11 02 02 5 02 3	Remove Temporary Bulkheads	1.00	DAY	1,300	300	1,600	1580.09
11 02 02 5 02 4	Unwatering Pumps			5,300	1,100	6,400	
	TOTAL Care and Diversion of Water			12,300	2,500	14,800	
11 02 02 5 03	Sitework						
11 02 02 5 03 1	Site Preparation			1,300	400	1,700	
11 02 02 5 03 2	Line Existing Pipe w/ HDPE Pipe			40,600	12,200	52,800	
11 02 02 5 03 3	Site Restoration			2,500	800	3,300	
	TOTAL Sitework			44,500	13,300	57,800	
11 02 02 5 04	Drainage Structure						
11 02 02 5 04 1	Replace Handrail			6,600	1,300	7,900	
11 02 02 5 04 2	Replace Grating			600	100	700	
11 02 02 5 04 3	Replace Ladders			1,200	200	1,500	
	TOTAL Drainage Structure			8,400	1,700	10,100	
11 02 02 5 05	Gates						
11 02 02 5 05 1	Remove Existing Gate	1.00	EA	3,400	1,000	4,500	4458.59
11 02 02 5 05 2	Rehab Gate	1.00	EA	7,500	2,300	9,800	9799.69
11 02 02 5 05 3	Install/Test Rehabbed Gate	1.00	EA	4,800	1,500	6,300	6288.59
	TOTAL Gates			15,800	4,700	20,500	
	TOTAL GW-10, 42" Drain (East Fork)			84,800	23,000	107,800	

		QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
11 02 02 6	GW-11, 36" Drain (East Fork)						
11 02 02 6 01	Mob, Demob & Preparatory Work						
11 02 02 6 01 1	Mobilization and Demobilization			3,800	800	4,600	
	TOTAL Mob, Demob & Preparatory Work			3,800	800	4,600	
11 02 02 6 02	Care and Diversion of Water						
11 02 02 6 02 1	Fabricate Bulkheads			3,100	600	3,700	
11 02 02 6 02 2	Install Temporary Bulkheads	2.00	DAY	2,600	500	3,200	1580.09
11 02 02 6 02 3	Remove Temporary Bulkheads	1.00	DAY	1,300	300	1,600	1580.09
11 02 02 6 02 4	Unwatering Pumps			5,300	1,100	6,400	
	TOTAL Care and Diversion of Water			12,300	2,500	14,800	
11 02 02 6 03	Sitework						
11 02 02 6 03 1	Site Preparation			1,300	400	1,700	
11 02 02 6 03 2	Line Existing Pipe w/ HDPE Pipe			40,600	12,200	52,800	
11 02 02 6 03 3	Site Restoration			2,500	800	3,300	
	TOTAL Sitework			44,500	13,300	57,800	
11 02 02 6 04	Drainage Structure						
11 02 02 6 04 1	Replace Handrail			6,600	1,300	7,900	
11 02 02 6 04 2	Replace Grating			600	100	700	
11 02 02 6 04 3	Replace Ladders			1,200	200	1,500	
	TOTAL Drainage Structure			8,400	1,700	10,100	
11 02 02 6 05	Gates						
11 02 02 6 05 1	Remove Existing Gate	1.00	EA	2,500	700	3,200	3214.11
11 02 02 6 05 2	Rehab Gate	1.00	EA	7,000	2,100	9,100	9122.97
11 02 02 6 05 3	Install/Test Rehabbed Gate	1.00	EA	3,900	1,200	5,000	5044.11
	TOTAL Gates			13,400	4,000	17,400	
	TOTAL GW-11, 36" Drain (East Fork)			82,400	22,300	104,600	
11 02 02 7	GW-12, 36" Drain (West Fork)						
11 02 02 7 01	Mob, Demob & Preparatory Work						

		QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
11 02 02 7 01 1	Mobilization and Demobilization			3,800	800	4,600	
	TOTAL Mob, Demob & Preparatory Work			3,800	800	4,600	
11 02 02 7 02	Care and Diversion of Water						
11 02 02 7 02 1	Fabricate Bulkheads			3,100	600	3,700	
11 02 02 7 02 2	Install Temporary Bulkheads	2.00	DAY	2,600	500	3,200	1580.09
11 02 02 7 02 3	Remove Temporary Bulkheads	1.00	DAY	1,300	300	1,600	1580.09
11 02 02 7 02 4	Unwatering Pumps			5,300	1,100	6,400	
	TOTAL Care and Diversion of Water			12,300	2,500	14,800	
11 02 02 7 03	Sitework						
11 02 02 7 03 1	Site Preparation			1,300	400	1,700	
11 02 02 7 03 2	Line Existing Pipe w/ HDPE Pipe			40,600	12,200	52,800	
11 02 02 7 03 3	Site Restoration			2,500	800	3,300	
	TOTAL Sitework			44,500	13,300	57,800	
11 02 02 7 04	Drainage Structure						
11 02 02 7 04 1	Replace Handrail			6,600	1,300	7,900	
11 02 02 7 04 2	Replace Grating			600	100	700	
11 02 02 7 04 3	Replace Ladders			1,200	200	1,500	
	TOTAL Drainage Structure			8,400	1,700	10,100	
11 02 02 7 05	Gates						
11 02 02 7 05 1	Remove Existing Gate	1.00	EA	2,500	700	3,200	3214.11
11 02 02 7 05 2	Rehab Gate	1.00	EA	7,000	2,100	9,100	9122.97
11 02 02 7 05 3	Install/Test Rehabbed Gate	1.00	EA	3,900	1,200	5,000	5044.11
	TOTAL Gates			13,400	4,000	17,400	
11 02 02 7 06	Olin Property Security						
11 02 02 7 06 1	Security Personel			1,700	300	2,000	
	TOTAL Olin Property Security			1,700	300	2,000	
	TOTAL GW-12, 36" Drain (West Fork)			84,100	22,600	106,700	

		QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
11 02 02 8	GW-13, 12" Drain (West Fork)						
11 02 02 8 01	Mob, Demob & Preparatory Work						
11 02 02 8 01 1	Mobilization and Demobilization			3,800	800	4,600	
	TOTAL Mob, Demob & Preparatory Work			3,800	800	4,600	
11 02 02 8 02	Care and Diversion of Water						
11 02 02 8 02 1	Fabricate Bulkheads			3,100	600	3,700	
11 02 02 8 02 2	Install Temporary Bulkheads	2.00	DAY	2,600	500	3,200	1580.09
11 02 02 8 02 3	Remove Temporary Bulkheads	1.00	DAY	1,300	300	1,600	1580.09
11 02 02 8 02 4	Unwatering Pumps			5,300	1,100	6,400	
	TOTAL Care and Diversion of Water			12,300	2,500	14,800	
11 02 02 8 03	Sitework						
11 02 02 8 03 1	Clearing, Grubbing and Stripping	1.20	ACR	2,100	400	2,500	2109.91
11 02 02 8 03 2	Pavement Removal	110.00	SY	700	100	900	8.02
11 02 02 8 03 3	Remove Crushed Stone	80.00	TON	300	100	400	5.12
11 02 02 8 03 4	Excavation	6540.00	CY	19,700	3,900	23,600	3.61
11 02 02 8 03 5	Cofferdam	1700.00	CY	5,900	1,200	7,100	4.18
11 02 02 8 03 6	Remove Existing Pipe	250.00	LF	2,000	400	2,400	9.64
11 02 02 8 03 7	Install New RCP	250.00	LF	7,700	1,500	9,300	37.04
11 02 02 8 03 8	Place and Compact Backfill	7800.00	CY	33,400	6,700	40,100	5.14
11 02 02 8 03 9	Crushed Stone Surfacing	80.00	TON	1,000	200	1,200	15.05
11 02 02 8 03 10	Bitumineous Road Repair	110.00	SY	600	100	800	7.03
11 02 02 8 03 11	Establishment of Turf	1.20	ACR	1,100	200	1,400	1141.60
	TOTAL Sitework			74,700	14,900	89,600	
11 02 02 8 04	Drainage Structure						
11 02 02 8 04 1	Replace Handrail			6,600	1,300	7,900	
11 02 02 8 04 2	Replace Grating			600	100	700	
11 02 02 8 04 3	Replace Ladders			1,200	200	1,500	
	TOTAL Drainage Structure			8,400	1,700	10,100	
11 02 02 8 05	Gates						
11 02 02 8 05 1	Remove Existing Gate	1.00	EA	1,900	600	2,500	2488.97
11 02 02 8 05 2	Rehab Gate	1.00	EA	4,800	1,400	6,300	6259.86
11 02 02 8 05 3	Install/Test Rehabbed Gate	1.00	EA	3,500	1,000	4,500	4524.76

		QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
	TOTAL Gates			10,200	3,100	13,300	
11 02 02 8 06	Olin Property Security						
11 02 02 8 06 1	Security Personel			1,700	300	2,000	
	TOTAL Olin Property Security			1,700	300	2,000	
	TOTAL GW-13, 12" Drain (West Fork)			111,100	23,200	134,400	
	TOTAL East and West Fork Levee			766,900	186,300	953,300	
11 02 03	Lower Wood River Levee (LWRL)						
11 02 03 1	GW-14, 48" Drain (Flank)						
11 02 03 1 01	Mob, Demob & Preparatory Work						
11 02 03 1 01 1	Mobilization and Demobilization			3,800	800	4,600	
	TOTAL Mob, Demob & Preparatory Work			3,800	800	4,600	
11 02 03 1 02	Care and Diversion of Water						
11 02 03 1 02 1	Fabricate Bulkheads			3,100	600	3,700	
11 02 03 1 02 2	Install Temporary Bulkheads	2.00	DAY	2,600	500	3,200	1580.09
11 02 03 1 02 3	Remove Temporary Bulkheads	1.00	DAY	1,300	300	1,600	1580.09
11 02 03 1 02 4	Unwatering Pumps			5,300	1,100	6,400	
	TOTAL Care and Diversion of Water			12,300	2,500	14,800	
11 02 03 1 03	Sitework						
11 02 03 1 03 1	Site Preparation			1,300	400	1,700	
11 02 03 1 03 2	Line Existing Pipe w/ HDPE Pipe			40,600	12,200	52,800	
11 02 03 1 03 3	Site Restoration			2,500	800	3,300	
	TOTAL Sitework			44,500	13,300	57,800	
11 02 03 1 04	Drainage Structure						
11 02 03 1 04 1	Replace Handrail			6,600	1,300	7,900	
11 02 03 1 04 2	Replace Grating			600	100	700	
11 02 03 1 04 3	Replace Ladders			1,200	200	1,500	
	TOTAL Drainage Structure			8,400	1,700	10,100	

	QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
11 02 03 1 05 Gates						
11 02 03 1 05 1 Remove Existing Gate	1.00	EA	3,400	1,000	4,500	4458.59
11 02 03 1 05 2 Rehab Gate	1.00	EA	8,600	2,600	11,100	11121
11 02 03 1 05 3 Install/Test Rehabbed Gate	1.00	EA	4,800	1,500	6,300	6288.59
TOTAL Gates			16,800	5,000	21,900	
TOTAL GW-14, 48" Drain (Flank)			85,800	23,300	109,100	
11 02 03 2 GW-15, 30" Drain (Flank)						
11 02 03 2 01 Mob, Demob & Preparatory Work						
11 02 03 2 01 1 Mobilization and Demobilization			3,800	800	4,600	
TOTAL Mob, Demob & Preparatory Work			3,800	800	4,600	
11 02 03 2 02 Care and Diversion of Water						
11 02 03 2 02 1 Fabricate Bulkheads			3,100	600	3,700	
11 02 03 2 02 2 Install Temporary Bulkheads	2.00	DAY	2,600	500	3,200	1580.09
11 02 03 2 02 3 Remove Temporary Bulkheads	1.00	DAY	1,300	300	1,600	1580.09
11 02 03 2 02 4 Unwatering Pumps			5,300	1,100	6,400	
TOTAL Care and Diversion of Water			12,300	2,500	14,800	
11 02 03 2 03 Sitework						
11 02 03 2 03 1 Site Preparation			1,300	400	1,700	
11 02 03 2 03 2 Line Existing Pipe w/ HDPE Pipe			40,600	12,200	52,800	
11 02 03 2 03 3 Site Restoration			2,500	800	3,300	
TOTAL Sitework			44,500	13,300	57,800	
11 02 03 2 04 Drainage Structure						
11 02 03 2 04 1 Replace Handrail			6,600	1,300	7,900	
11 02 03 2 04 2 Replace Grating			600	100	700	
11 02 03 2 04 3 Replace Ladders			1,200	200	1,500	
TOTAL Drainage Structure			8,400	1,700	10,100	
11 02 03 2 05 Gates						
11 02 03 2 05 1 Remove Existing Gate	1.00	EA	2,500	700	3,200	3214.11

		QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
11 02 03 2 05 2	Rehab Gate	1.00	EA	6,500	1,900	8,400	8446.25
11 02 03 2 05 3	Install/Test Rehabbed Gate	1.00	EA	3,900	1,200	5,000	5044.11
	TOTAL Gates			12,800	3,900	16,700	
11 02 03 2 06	Olin Property Security						
11 02 03 2 06 1	Security Personel			1,700	300	2,000	
	TOTAL Olin Property Security			1,700	300	2,000	
	TOTAL GW-15, 30" Drain (Flank)			83,600	22,400	106,000	
11 02 03 3	GW-16, 42" Drain (Flank)						
11 02 03 3 01	Mob, Demob & Preparatory Work						
11 02 03 3 01 1	Mobilization and Demobilization			3,800	800	4,600	
	TOTAL Mob, Demob & Preparatory Work			3,800	800	4,600	
11 02 03 3 02	Care and Diversion of Water						
11 02 03 3 02 1	Fabricate Bulkheads			3,100	600	3,700	
11 02 03 3 02 2	Install Temporary Bulkheads	2.00	DAY	2,600	500	3,200	1580.09
11 02 03 3 02 3	Remove Temporary Bulkheads	1.00	DAY	1,300	300	1,600	1580.09
11 02 03 3 02 4	Unwatering Pumps			5,300	1,100	6,400	
	TOTAL Care and Diversion of Water			12,300	2,500	14,800	
11 02 03 3 03	Sitework						
11 02 03 3 03 1	Site Preparation			1,300	400	1,700	
11 02 03 3 03 2	Line Existing Pipe w/ HDPE Pipe			40,600	12,200	52,800	
11 02 03 3 03 3	Site Restoration			2,500	800	3,300	
	TOTAL Sitework			44,500	13,300	57,800	
11 02 03 3 04	Drainage Structure						
11 02 03 3 04 1	Replace Handrail			6,600	1,300	7,900	
11 02 03 3 04 2	Replace Grating			600	100	700	
11 02 03 3 04 3	Replace Ladders			1,200	200	1,500	
	TOTAL Drainage Structure			8,400	1,700	10,100	

		QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
11 02 03 3 05	Gates						
11 02 03 3 05 1	Remove Existing Gate	1.00	EA	3,400	1,000	4,500	4458.59
11 02 03 3 05 2	Rehab Gate	1.00	EA	7,500	2,300	9,800	9799.69
11 02 03 3 05 3	Install/Test Rehabbed Gate	1.00	EA	4,800	1,500	6,300	6288.59
	TOTAL Gates			15,800	4,700	20,500	
11 02 03 3 06	Olin Property Security						
11 02 03 3 06 1	Security Personel			1,700	300	2,000	
	TOTAL Olin Property Security			1,700	300	2,000	
	TOTAL GW-16, 42" Drain (Flank)			86,500	23,300	109,800	
11 02 03 4	GW-17, 42" Drain (Flank)						
11 02 03 4 01	Mob, Demob & Preparatory Work						
11 02 03 4 01 1	Mobilization and Demobilization			3,800	800	4,600	
	TOTAL Mob, Demob & Preparatory Work			3,800	800	4,600	
11 02 03 4 02	Care and Diversion of Water						
11 02 03 4 02 1	Fabricate Bulkheads			3,100	600	3,700	
11 02 03 4 02 2	Install Temporary Bulkheads	2.00	DAY	2,600	500	3,200	1580.09
11 02 03 4 02 3	Remove Temporary Bulkheads	1.00	DAY	1,300	300	1,600	1580.09
11 02 03 4 02 4	Unwatering Pumps			5,300	1,100	6,400	
	TOTAL Care and Diversion of Water			12,300	2,500	14,800	
11 02 03 4 03	Sitework						
11 02 03 4 03 1	Site Preparation			1,300	400	1,700	
11 02 03 4 03 2	Line Existing Pipe w/ HDPE Pipe			40,600	12,200	52,800	
11 02 03 4 03 3	Site Restoration			2,500	800	3,300	
	TOTAL Sitework			44,500	13,300	57,800	
11 02 03 4 04	Drainage Structure						
11 02 03 4 04 1	Replace Handrail			6,600	1,300	7,900	
11 02 03 4 04 2	Replace Grating			600	100	700	

		QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
11 02 03 4 04 3	Replace Ladders			1,200	200	1,500	
	TOTAL Drainage Structure			8,400	1,700	10,100	
11 02 03 4 05	Gates						
11 02 03 4 05 1	Remove Existing Gate	1.00	EA	3,400	1,000	4,500	4458.59
11 02 03 4 05 2	Replace Gate	1.00	EA	17,600	5,300	22,800	22834
11 02 03 4 05 3	Install/Test New Gate	1.00	EA	4,800	1,500	6,300	6288.59
	TOTAL Gates			25,800	7,700	33,600	
11 02 03 4 06	Olin Property Security						
11 02 03 4 06 1	Security Personel			1,700	300	2,000	
	TOTAL Olin Property Security			1,700	300	2,000	
	TOTAL GW-17, 42" Drain (Flank)			96,500	26,300	122,900	
11 02 03 5	GW-18, 42" Drain (Flank)						
11 02 03 5 01	Mob, Demob & Preparatory Work						
11 02 03 5 01 1	Mobilization and Demobilization			3,800	800	4,600	
	TOTAL Mob, Demob & Preparatory Work			3,800	800	4,600	
11 02 03 5 02	Care and Diversion of Water						
11 02 03 5 02 1	Fabricate Bulkheads			3,100	600	3,700	
11 02 03 5 02 2	Install Temporary Bulkheads	2.00	DAY	2,600	500	3,200	1580.09
11 02 03 5 02 3	Remove Temporary Bulkheads	1.00	DAY	1,300	300	1,600	1580.09
11 02 03 5 02 4	Unwatering Pumps			5,300	1,100	6,400	
	TOTAL Care and Diversion of Water			12,300	2,500	14,800	
11 02 03 5 03	Sitework						
11 02 03 5 03 1	Site Preparation			1,300	400	1,700	
11 02 03 5 03 2	Line Existing Pipe w/ HDPE Pipe			40,600	12,200	52,800	
11 02 03 5 03 3	Site Restoration			2,500	800	3,300	
	TOTAL Sitework			44,500	13,300	57,800	

		QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
11 02 03 5 04	Drainage Structure						
11 02 03 5 04 1	Replace Handrail			6,600	1,300	7,900	
11 02 03 5 04 2	Replace Grating			600	100	700	
11 02 03 5 04 3	Replace Ladders			1,200	200	1,500	
	TOTAL Drainage Structure			8,400	1,700	10,100	
11 02 03 5 05	Gates						
11 02 03 5 05 1	Remove Existing Gate	1.00	EA	3,400	1,000	4,500	4458.59
11 02 03 5 05 2	Rehab Gate	1.00	EA	7,500	2,300	9,800	9799.69
11 02 03 5 05 3	Install/Test Rehabbed Gate	1.00	EA	4,800	1,500	6,300	6288.59
	TOTAL Gates			15,800	4,700	20,500	
	TOTAL GW-18, 42" Drain (Flank)			84,800	23,000	107,800	
11 02 03 6	GW-19, 36" Drain (Flank)						
11 02 03 6 01	Mob, Demob & Preparatory Work						
11 02 03 6 01 1	Mobilization and Demobilization			3,800	800	4,600	
	TOTAL Mob, Demob & Preparatory Work			3,800	800	4,600	
11 02 03 6 02	Care and Diversion of Water						
11 02 03 6 02 1	Fabricate Bulkheads			3,100	600	3,700	
11 02 03 6 02 2	Install Temporary Bulkheads	2.00	DAY	2,600	500	3,200	1580.09
11 02 03 6 02 3	Remove Temporary Bulkheads	1.00	DAY	1,300	300	1,600	1580.09
11 02 03 6 02 4	Unwatering Pumps			5,300	1,100	6,400	
	TOTAL Care and Diversion of Water			12,300	2,500	14,800	
11 02 03 6 03	Sitework						
11 02 03 6 03 1	Site Preparation			1,300	400	1,700	
11 02 03 6 03 2	Line Existing Pipe w/ HDPE Pipe			40,600	12,200	52,800	
11 02 03 6 03 3	Site Restoration			2,500	800	3,300	
	TOTAL Sitework			44,500	13,300	57,800	
11 02 03 6 04	Drainage Structure						
11 02 03 6 04 1	Replace Handrail			6,600	1,300	7,900	

		QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
11 02 03 6 04 2	Replace Grating			600	100	700	
11 02 03 6 04 3	Replace Ladders			1,200	200	1,500	
	TOTAL Drainage Structure			8,400	1,700	10,100	
11 02 03 6 05	Gates						
11 02 03 6 05 1	Remove Existing Gate	1.00	EA	2,500	700	3,200	3214.11
11 02 03 6 05 2	Rehab Gate	1.00	EA	7,000	2,100	9,100	9122.97
11 02 03 6 05 3	Install/Test Rehabbed Gate	1.00	EA	3,900	1,200	5,000	5044.11
	TOTAL Gates			13,400	4,000	17,400	
	TOTAL GW-19, 36" Drain (Flank)			82,400	22,300	104,600	
11 02 03 7	GW-20, 24" Drain (Flank)						
11 02 03 7 01	Mob, Demob & Preparatory Work						
11 02 03 7 01 1	Mobilization and Demobilization			3,800	800	4,600	
	TOTAL Mob, Demob & Preparatory Work			3,800	800	4,600	
11 02 03 7 02	Care and Diversion of Water						
11 02 03 7 02 1	Fabricate Bulkheads			3,100	600	3,700	
11 02 03 7 02 2	Install Temporary Bulkheads	2.00	DAY	2,600	500	3,200	1580.09
11 02 03 7 02 3	Remove Temporary Bulkheads	1.00	DAY	1,300	300	1,600	1580.09
11 02 03 7 02 4	Unwatering Pumps			5,300	1,100	6,400	
	TOTAL Care and Diversion of Water			12,300	2,500	14,800	
11 02 03 7 03	Sitework						
11 02 03 7 03 1	Clearing, Grubbing and Stripping	1.20	ACR	2,100	400	2,500	2109.91
11 02 03 7 03 2	Pavement Removal	110.00	SY	700	100	900	8.02
11 02 03 7 03 3	Remove Crushed Stone	80.00	TON	300	100	400	5.12
11 02 03 7 03 4	Excavation	6540.00	CY	19,700	3,900	23,600	3.61
11 02 03 7 03 5	Cofferdam	1700.00	CY	5,900	1,200	7,100	4.18
11 02 03 7 03 6	Remove Existing Pipe	250.00	LF	2,500	500	3,000	12.05
11 02 03 7 03 7	Install New RCP	250.00	LF	14,000	2,800	16,800	67.17
11 02 03 7 03 8	Place and Compact Backfill	7800.00	CY	33,400	6,700	40,100	5.14
11 02 03 7 03 9	Crushed Stone Surfacing	80.00	TON	1,000	200	1,200	15.05
11 02 03 7 03 10	Bitumineous Road Repair	110.00	SY	600	100	800	7.03
11 02 03 7 03 11	Establishment of Turf	1.20	ACR	1,100	200	1,400	1141.60
	TOTAL Sitework			81,500	16,300	97,800	

		QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
11 02 03 7 04	Drainage Structure						
11 02 03 7 04 1	Replace Handrail			6,600	1,300	7,900	
11 02 03 7 04 2	Replace Grating			600	100	700	
11 02 03 7 04 3	Replace Ladders			1,200	200	1,500	
	TOTAL Drainage Structure			8,400	1,700	10,100	
11 02 03 7 05	Gates						
11 02 03 7 05 1	Remove Existing Gate	1.00	EA	2,500	700	3,200	3214.11
11 02 03 7 05 2	Rehab Gate	1.00	EA	6,200	1,900	8,100	8068.83
11 02 03 7 05 3	Install/Test Rehabbed Gate	1.00	EA	3,500	1,000	4,500	4524.76
	TOTAL Gates			12,200	3,600	15,800	
	TOTAL GW-20, 24" Drain (Flank)			118,200	24,800	143,000	
11 02 03 8	GW-21, 24" Drain (Flank)						
11 02 03 8 01	Mob, Demob & Preparatory Work						
11 02 03 8 01 1	Mobilization and Demobilization			3,800	800	4,600	
	TOTAL Mob, Demob & Preparatory Work			3,800	800	4,600	
11 02 03 8 02	Care and Diversion of Water						
11 02 03 8 02 1	Fabricate Bulkheads			3,100	600	3,700	
11 02 03 8 02 2	Install Temporary Bulkheads	2.00	DAY	2,600	500	3,200	1580.09
11 02 03 8 02 3	Remove Temporary Bulkheads	1.00	DAY	1,300	300	1,600	1580.09
11 02 03 8 02 4	Unwatering Pumps			5,300	1,100	6,400	
	TOTAL Care and Diversion of Water			12,300	2,500	14,800	
11 02 03 8 03	Sitework						
11 02 03 8 03 1	Clearing, Grubbing and Stripping	1.20	ACR	2,100	400	2,500	2109.91
11 02 03 8 03 2	Pavement Removal	110.00	SY	700	100	900	8.02
11 02 03 8 03 3	Remove Crushed Stone	80.00	TON	300	100	400	5.12
11 02 03 8 03 4	Excavation	6540.00	CY	19,700	3,900	23,600	3.61
11 02 03 8 03 5	Cofferdam	1700.00	CY	5,900	1,200	7,100	4.18
11 02 03 8 03 6	Remove Existing Pipe	250.00	LF	2,500	500	3,000	12.05
11 02 03 8 03 7	Install New RCP	250.00	LF	14,000	2,800	16,800	67.17
11 02 03 8 03 8	Place and Compact Backfill	7800.00	CY	33,400	6,700	40,100	5.14
11 02 03 8 03 9	Crushed Stone Surfacing	80.00	TON	1,000	200	1,200	15.05
11 02 03 8 03 10	Bitumineous Road Repair	110.00	SY	600	100	800	7.03

		QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
11 02 03 8 03 11	Establishment of Turf	1.20	ACR	1,100	200	1,400	1141.60
	TOTAL Sitework			81,500	16,300	97,800	
11 02 03 8 04	Drainage Structure						
11 02 03 8 04 1	Replace Handrail			6,600	1,300	7,900	
11 02 03 8 04 2	Replace Grating			600	100	700	
11 02 03 8 04 3	Replace Ladders			1,200	200	1,500	
	TOTAL Drainage Structure			8,400	1,700	10,100	
11 02 03 8 05	Gates						
11 02 03 8 05 1	Remove Existing Gate	1.00	EA	2,500	700	3,200	3214.11
11 02 03 8 05 2	Rehab Gate	1.00	EA	6,200	1,900	8,100	8068.83
11 02 03 8 05 3	Install/Test Rehabbed Gate	1.00	EA	3,500	1,000	4,500	4524.76
	TOTAL Gates			12,200	3,600	15,800	
	TOTAL GW-21, 24" Drain (Flank)			118,200	24,800	143,000	
11 02 03 10	GW-23, 30" Drain (Flank)						
11 02 03 10 01	Mob, Demob & Preparatory Work						
11 02 03 10 01 1	Mobilization and Demobilization			3,800	800	4,600	
	TOTAL Mob, Demob & Preparatory Work			3,800	800	4,600	
11 02 03 10 02	Care and Diversion of Water						
11 02 03 10 02 1	Fabricate Bulkheads			3,100	600	3,700	
11 02 03 10 02 2	Install Temporary Bulkheads	2.00	DAY	2,600	500	3,200	1580.09
11 02 03 10 02 3	Remove Temporary Bulkheads	1.00	DAY	1,300	300	1,600	1580.09
11 02 03 10 02 4	Unwatering Pumps			5,300	1,100	6,400	
	TOTAL Care and Diversion of Water			12,300	2,500	14,800	
11 02 03 10 03	Sitework						
11 02 03 10 03 1	Site Preparation			1,300	400	1,700	
11 02 03 10 03 2	Line Existing Pipe w/ HDPE Pipe			40,600	12,200	52,800	
11 02 03 10 03 3	Site Restoration			2,500	800	3,300	
	TOTAL Sitework			44,500	13,300	57,800	

		QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
11 02 03 10 04	Drainage Structure						
11 02 03 10 04 1	Replace Handrail			6,600	1,300	7,900	
11 02 03 10 04 2	Replace Grating			600	100	700	
11 02 03 10 04 3	Replace Ladders			1,200	200	1,500	
	TOTAL Drainage Structure			8,400	1,700	10,100	
11 02 03 10 05	Gates						
11 02 03 10 05 1	Remove Existing Gate	1.00	EA	2,500	700	3,200	3214.11
11 02 03 10 05 2	Rehab Gate	1.00	EA	6,500	1,900	8,400	8446.25
11 02 03 10 05 3	Install/Test Rehabbed Gate	1.00	EA	3,900	1,200	5,000	5044.11
	TOTAL Gates			12,800	3,900	16,700	
	TOTAL GW-23, 30" Drain (Flank)			81,900	22,100	104,000	
11 02 03 11	GW-24, 48" Drain (Riverfront)						
11 02 03 11 01	Mob, Demob & Preparatory Work						
11 02 03 11 01 1	Mobilization and Demobilization			3,800	800	4,600	
	TOTAL Mob, Demob & Preparatory Work			3,800	800	4,600	
11 02 03 11 02	Care and Diversion of Water						
11 02 03 11 02 1	Fabricate Bulkheads			3,100	600	3,700	
11 02 03 11 02 2	Install Temporary Bulkheads	2.00	DAY	2,600	500	3,200	1580.09
11 02 03 11 02 3	Remove Temporary Bulkheads	1.00	DAY	1,300	300	1,600	1580.09
11 02 03 11 02 4	Unwatering Pumps			5,300	1,100	6,400	
	TOTAL Care and Diversion of Water			12,300	2,500	14,800	
11 02 03 11 03	Sitework						
11 02 03 11 03 1	Site Preparation			1,300	400	1,700	
11 02 03 11 03 2	Line Existing Pipe w/ HDPE Pipe			40,600	12,200	52,800	
11 02 03 11 03 3	Site Restoration			2,500	800	3,300	
	TOTAL Sitework			44,500	13,300	57,800	
11 02 03 11 04	Drainage Structure						
11 02 03 11 04 1	Replace Handrail			6,600	1,300	7,900	

		QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
11 02 03 11 04 2	Replace Grating			600	100	700	
11 02 03 11 04 3	Replace Ladders			1,200	200	1,500	
	TOTAL Drainage Structure			8,400	1,700	10,100	
11 02 03 11 05	Gates						
11 02 03 11 05 1	Remove Existing Gate	1.00	EA	3,400	1,000	4,500	4458.59
11 02 03 11 05 2	Replace Gate	1.00	EA	21,000	6,300	27,400	27363
11 02 03 11 05 3	Install/Test New Gate	1.00	EA	4,800	1,500	6,300	6288.59
	TOTAL Gates			29,300	8,800	38,100	
	TOTAL GW-24, 48" Drain (Riverfront)			98,300	27,000	125,400	
11 02 03 14	GW-27, 24" Drain (Riverfront)						
11 02 03 14 01	Mob, Demob & Preparatory Work						
11 02 03 14 01 1	Mobilization and Demobilization			3,800	800	4,600	
	TOTAL Mob, Demob & Preparatory Work			3,800	800	4,600	
11 02 03 14 02	Care and Diversion of Water						
11 02 03 14 02 1	Fabricate Bulkheads			3,100	600	3,700	
11 02 03 14 02 2	Install Temporary Bulkheads	2.00	DAY	2,600	500	3,200	1580.09
11 02 03 14 02 3	Remove Temporary Bulkheads	1.00	DAY	1,300	300	1,600	1580.09
11 02 03 14 02 4	Unwatering Pumps			5,300	1,100	6,400	
	TOTAL Care and Diversion of Water			12,300	2,500	14,800	
11 02 03 14 03	Sitework						
11 02 03 14 03 1	Clearing, Grubbing and Stripping	1.20	ACR	2,100	400	2,500	2109.91
11 02 03 14 03 2	Pavement Removal	110.00	SY	700	100	900	8.02
11 02 03 14 03 3	Remove Crushed Stone	80.00	TON	300	100	400	5.12
11 02 03 14 03 4	Excavation	6540.00	CY	19,700	3,900	23,600	3.61
11 02 03 14 03 5	Cofferdam	1700.00	CY	5,900	1,200	7,100	4.18
11 02 03 14 03 6	Remove Existing Pipe	250.00	LF	2,500	500	3,000	12.05
11 02 03 14 03 7	Install New RCP	250.00	LF	14,000	2,800	16,800	67.17
11 02 03 14 03 8	Place and Compact Backfill	7800.00	CY	33,400	6,700	40,100	5.14
11 02 03 14 03 9	Crushed Stone Surfacing	80.00	TON	1,000	200	1,200	15.05
11 02 03 14 03 10	Bitumineous Road Repair	110.00	SY	600	100	800	7.03
11 02 03 14 03 11	Establishment of Turf	1.20	ACR	1,100	200	1,400	1141.60
	TOTAL Sitework			81,500	16,300	97,800	

		QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
11 02 03 14 04	Drainage Structure						
11 02 03 14 04 1	Replace Handrail			6,600	1,300	7,900	
11 02 03 14 04 2	Replace Grating			600	100	700	
11 02 03 14 04 3	Replace Ladders			1,200	200	1,500	
	TOTAL Drainage Structure			8,400	1,700	10,100	
11 02 03 14 05	Gates						
11 02 03 14 05 1	Remove Existing Gate	1.00	EA	2,500	700	3,200	3214.11
11 02 03 14 05 2	Rehab Gate	1.00	EA	6,200	1,900	8,100	8068.83
11 02 03 14 05 3	Install/Test Rehabbed Gate	1.00	EA	3,500	1,000	4,500	4524.76
	TOTAL Gates			12,200	3,600	15,800	
	TOTAL GW-27, 24" Drain (Riverfront)			118,200	24,800	143,000	
11 02 03 16	GW-29, 18" Drain (Riverfront)						
11 02 03 16 01	Mob, Demob & Preparatory Work						
11 02 03 16 01 1	Mobilization and Demobilization			3,800	800	4,600	
	TOTAL Mob, Demob & Preparatory Work			3,800	800	4,600	
11 02 03 16 02	Care and Diversion of Water						
11 02 03 16 02 1	Fabricate Bulkheads			3,100	600	3,700	
11 02 03 16 02 2	Install Temporary Bulkheads	2.00	DAY	2,600	500	3,200	1580.09
11 02 03 16 02 3	Remove Temporary Bulkheads	1.00	DAY	1,300	300	1,600	1580.09
11 02 03 16 02 4	Unwatering Pumps			5,300	1,100	6,400	
	TOTAL Care and Diversion of Water			12,300	2,500	14,800	
11 02 03 16 03	Sitework						
11 02 03 16 03 1	Clearing, Grubbing and Stripping	1.20	ACR	2,100	400	2,500	2109.91
11 02 03 16 03 2	Pavement Removal	110.00	SY	700	100	900	8.02
11 02 03 16 03 3	Remove Crushed Stone	80.00	TON	300	100	400	5.12
11 02 03 16 03 4	Excavation	6540.00	CY	19,700	3,900	23,600	3.61
11 02 03 16 03 5	Cofferdam	1700.00	CY	5,900	1,200	7,100	4.18
11 02 03 16 03 6	Remove Existing Pipe	250.00	LF	2,000	400	2,400	9.64
11 02 03 16 03 7	Install New RCP	250.00	LF	10,500	2,100	12,600	50.43
11 02 03 16 03 8	Place and Compact Backfill	7800.00	CY	33,400	6,700	40,100	5.14
11 02 03 16 03 9	Crushed Stone Surfacing	80.00	TON	1,000	200	1,200	15.05
11 02 03 16 03 10	Bitumineous Road Repair	110.00	SY	600	100	800	7.03

		QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
11 02 03 16 03 11	Establishment of Turf	1.20	ACR	1,100	200	1,400	1141.60
	TOTAL Sitework			77,500	15,500	93,000	
11 02 03 16 04	Drainage Structure						
11 02 03 16 04 1	Replace Handrail			6,600	1,300	7,900	
11 02 03 16 04 2	Replace Grating			600	100	700	
11 02 03 16 04 3	Replace Ladders			1,200	200	1,500	
	TOTAL Drainage Structure			8,400	1,700	10,100	
11 02 03 16 05	Gates						
11 02 03 16 05 1	Remove Existing Gate	1.00	EA	1,900	600	2,500	2488.97
11 02 03 16 05 2	Rehab Gate	1.00	EA	5,600	1,700	7,300	7314.00
11 02 03 16 05 3	Install/Test Rehabbed Gate	1.00	EA	3,500	1,000	4,500	4524.76
	TOTAL Gates			11,000	3,300	14,300	
	TOTAL GW-29, 18" Drain (Riverfront)			113,000	23,700	136,800	
11 02 03 18	GW-31, 24" Drain (Riverfront)						
11 02 03 18 01	Mob, Demob & Preparatory Work						
11 02 03 18 01 1	Mobilization and Demobilization			3,800	800	4,600	
	TOTAL Mob, Demob & Preparatory Work			3,800	800	4,600	
11 02 03 18 02	Care and Diversion of Water						
11 02 03 18 02 1	Fabricate Bulkheads			3,100	600	3,700	
11 02 03 18 02 2	Install Temporary Bulkheads	2.00	DAY	2,600	500	3,200	1580.09
11 02 03 18 02 3	Remove Temporary Bulkheads	1.00	DAY	1,300	300	1,600	1580.09
11 02 03 18 02 4	Unwatering Pumps			5,300	1,100	6,400	
	TOTAL Care and Diversion of Water			12,300	2,500	14,800	
11 02 03 18 03	Sitework						
11 02 03 18 03 1	Clearing, Grubbing and Stripping	1.20	ACR	2,100	400	2,500	2109.91
11 02 03 18 03 2	Pavement Removal	110.00	SY	700	100	900	8.02
11 02 03 18 03 3	Remove Crushed Stone	80.00	TON	300	100	400	5.12
11 02 03 18 03 4	Excavation	6540.00	CY	19,700	3,900	23,600	3.61
11 02 03 18 03 5	Cofferdam	1700.00	CY	5,900	1,200	7,100	4.18

		QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
11 02 03 18 03 6	Remove Existing Pipe	250.00	LF	2,500	500	3,000	12.05
11 02 03 18 03 7	Install New RCP	250.00	LF	14,000	2,800	16,800	67.17
11 02 03 18 03 8	Place and Compact Backfill	7800.00	CY	33,400	6,700	40,100	5.14
11 02 03 18 03 9	Crushed Stone Surfacing	80.00	TON	1,000	200	1,200	15.05
11 02 03 18 03 10	Bitumineous Road Repair	110.00	SY	600	100	800	7.03
11 02 03 18 03 11	Establishment of Turf	1.20	ACR	1,100	200	1,400	1141.60
TOTAL	Sitework			81,500	16,300	97,800	
11 02 03 18 04	Drainage Structure						
11 02 03 18 04 1	Replace Handrail			6,600	1,300	7,900	
11 02 03 18 04 2	Replace Grating			600	100	700	
11 02 03 18 04 3	Replace Ladders			1,200	200	1,500	
TOTAL	Drainage Structure			8,400	1,700	10,100	
11 02 03 18 05	Gates						
11 02 03 18 05 1	Remove Existing Gate	1.00	EA	2,500	700	3,200	3214.11
11 02 03 18 05 2	Rehab Gate	1.00	EA	6,200	1,900	8,100	8068.83
11 02 03 18 05 3	Install/Test Rehabbed Gate	1.00	EA	3,500	1,000	4,500	4524.76
TOTAL	Gates			12,200	3,600	15,800	
TOTAL	GW-31, 24" Drain (Riverfront)			118,200	24,800	143,000	
11 02 03 19	GW-32, 24" Drain (Riverfront)						
11 02 03 19 01	Mob, Demob & Preparatory Work						
11 02 03 19 01 1	Mobilization and Demobilization			3,800	800	4,600	
TOTAL	Mob, Demob & Preparatory Work			3,800	800	4,600	
11 02 03 19 02	Care and Diversion of Water						
11 02 03 19 02 1	Fabricate Bulkheads			3,100	600	3,700	
11 02 03 19 02 2	Install Temporary Bulkheads	2.00	DAY	2,600	500	3,200	1580.09
11 02 03 19 02 3	Remove Temporary Bulkheads	1.00	DAY	1,300	300	1,600	1580.09
11 02 03 19 02 4	Unwatering Pumps			5,300	1,100	6,400	
TOTAL	Care and Diversion of Water			12,300	2,500	14,800	
11 02 03 19 03	Sitework						

		QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
11 02 03 19 03 1	Clearing, Grubbing and Stripping	1.20	ACR	2,100	400	2,500	2109.91
11 02 03 19 03 2	Pavement Removal	110.00	SY	700	100	900	8.02
11 02 03 19 03 3	Remove Crushed Stone	80.00	TON	300	100	400	5.12
11 02 03 19 03 4	Excavation	6540.00	CY	19,700	3,900	23,600	3.61
11 02 03 19 03 5	Cofferdam	1700.00	CY	5,900	1,200	7,100	4.18
11 02 03 19 03 6	Remove Existing Pipe	250.00	LF	2,500	500	3,000	12.05
11 02 03 19 03 7	Install New RCP	250.00	LF	14,000	2,800	16,800	67.17
11 02 03 19 03 8	Place and Compact Backfill	7800.00	CY	33,400	6,700	40,100	5.14
11 02 03 19 03 9	Crushed Stone Surfacing	80.00	TON	1,000	200	1,200	15.05
11 02 03 19 03 10	Bitumineous Road Repair	110.00	SY	600	100	800	7.03
11 02 03 19 03 11	Establishment of Turf	1.20	ACR	1,100	200	1,400	1141.60
TOTAL Sitework				81,500	16,300	97,800	
11 02 03 19 04	Drainage Structure						
11 02 03 19 04 1	Replace Handrail			6,600	1,300	7,900	
11 02 03 19 04 2	Replace Grating			600	100	700	
11 02 03 19 04 3	Replace Ladders			1,200	200	1,500	
TOTAL Drainage Structure				8,400	1,700	10,100	
11 02 03 19 05	Gates						
11 02 03 19 05 1	Remove Existing Gate	1.00	EA	2,500	700	3,200	3214.11
11 02 03 19 05 2	Rehab Gate	1.00	EA	6,200	1,900	8,100	8068.83
11 02 03 19 05 3	Install/Test Rehabbed Gate	1.00	EA	3,500	1,000	4,500	4524.76
TOTAL Gates				12,200	3,600	15,800	
TOTAL GW-32, 24" Drain (Riverfront)				118,200	24,800	143,000	
11 02 03 20	GW-33, 24" Drain (Riverfront)						
11 02 03 20 01	Mob, Demob & Preparatory Work						
11 02 03 20 01 1	Mobilization and Demobilization			3,800	800	4,600	
TOTAL Mob, Demob & Preparatory Work				3,800	800	4,600	
11 02 03 20 02	Care and Diversion of Water						
11 02 03 20 02 1	Fabricate Bulkheads			3,100	600	3,700	
11 02 03 20 02 2	Install Temporary Bulkheads	2.00	DAY	2,600	500	3,200	1580.09
11 02 03 20 02 3	Remove Temporary Bulkheads	1.00	DAY	1,300	300	1,600	1580.09
11 02 03 20 02 4	Unwatering Pumps			5,300	1,100	6,400	

		QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
	TOTAL Care and Diversion of Water			12,300	2,500	14,800	
11 02 03 20 03	Sitework						
11 02 03 20 03 1	Clearing, Grubbing and Stripping	1.20	ACR	2,100	400	2,500	2109.91
11 02 03 20 03 2	Pavement Removal	110.00	SY	700	100	900	8.02
11 02 03 20 03 3	Remove Crushed Stone	80.00	TON	300	100	400	5.12
11 02 03 20 03 4	Excavation	6540.00	CY	19,700	3,900	23,600	3.61
11 02 03 20 03 5	Cofferdam	1700.00	CY	5,900	1,200	7,100	4.18
11 02 03 20 03 6	Remove Existing Pipe	250.00	LF	2,500	500	3,000	12.05
11 02 03 20 03 7	Install New RCP	250.00	LF	14,000	2,800	16,800	67.17
11 02 03 20 03 8	Place and Compact Backfill	7800.00	CY	33,400	6,700	40,100	5.14
11 02 03 20 03 9	Crushed Stone Surfacing	80.00	TON	1,000	200	1,200	15.05
11 02 03 20 03 10	Bitumineous Road Repair	110.00	SY	600	100	800	7.03
11 02 03 20 03 11	Establishment of Turf	1.20	ACR	1,100	200	1,400	1141.60
	TOTAL Sitework			81,500	16,300	97,800	
11 02 03 20 04	Drainage Structure						
11 02 03 20 04 1	Replace Handrail			6,600	1,300	7,900	
11 02 03 20 04 2	Replace Grating			600	100	700	
11 02 03 20 04 3	Replace Ladders			1,200	200	1,500	
	TOTAL Drainage Structure			8,400	1,700	10,100	
11 02 03 20 05	Gates						
11 02 03 20 05 1	Remove Existing Gate	1.00	EA	2,500	700	3,200	3214.11
11 02 03 20 05 2	Replace Gate	1.00	EA	12,300	3,700	16,000	16040
11 02 03 20 05 3	Install/Test New Gate	1.00	EA	3,500	1,000	4,500	4524.76
	TOTAL Gates			18,300	5,500	23,800	
	TOTAL GW-33, 24" Drain (Riverfront)			124,300	26,700	151,000	
11 02 03 21	GW-34, 48" Drain (Cahokia Creek)						
11 02 03 21 01	Mob, Demob & Preparatory Work						
11 02 03 21 01 1	Mobilization and Demobilization			3,800	800	4,600	
	TOTAL Mob, Demob & Preparatory Work			3,800	800	4,600	
11 02 03 21 02	Care and Diversion of Water						

		QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
11 02 03 21 02 1	Fabricate Bulkheads			3,100	600	3,700	
11 02 03 21 02 2	Install Temporary Bulkheads	2.00	DAY	2,600	500	3,200	1580.09
11 02 03 21 02 3	Remove Temporary Bulkheads	1.00	DAY	1,300	300	1,600	1580.09
11 02 03 21 02 4	Unwatering Pumps			5,300	1,100	6,400	
	TOTAL Care and Diversion of Water			12,300	2,500	14,800	
11 02 03 21 03	Sitework						
11 02 03 21 03 1	Site Preparation			1,300	400	1,700	
11 02 03 21 03 2	Line Existing Pipe w/ HDPE Pipe			40,600	12,200	52,800	
11 02 03 21 03 3	Site Restoration			2,500	800	3,300	
	TOTAL Sitework			44,500	13,300	57,800	
11 02 03 21 04	Drainage Structure						
11 02 03 21 04 1	Replace Handrail			6,600	1,300	7,900	
11 02 03 21 04 2	Replace Grating			600	100	700	
11 02 03 21 04 3	Replace Ladders			1,200	200	1,500	
	TOTAL Drainage Structure			8,400	1,700	10,100	
11 02 03 21 05	Gates						
11 02 03 21 05 1	Remove Existing Gate	1.00	EA	3,400	1,000	4,500	4458.59
11 02 03 21 05 2	Rehab Gate	1.00	EA	8,600	2,600	11,100	11121
11 02 03 21 05 3	Install/Test Rehabbed Gate	1.00	EA	4,800	1,500	6,300	6288.59
	TOTAL Gates			16,800	5,000	21,900	
	TOTAL GW-34, 48" Drain (Cahokia Creek)			85,800	23,300	109,100	
11 02 03 22	GW-35, 48" Drain (Cahokia Creek)						
11 02 03 22 01	Mob, Demob & Preparatory Work						
11 02 03 22 01 1	Mobilization and Demobilization			3,800	800	4,600	
	TOTAL Mob, Demob & Preparatory Work			3,800	800	4,600	
11 02 03 22 02	Care and Diversion of Water						
11 02 03 22 02 1	Fabricate Bulkheads			3,100	600	3,700	
11 02 03 22 02 2	Install Temporary Bulkheads	2.00	DAY	2,600	500	3,200	1580.09
11 02 03 22 02 3	Remove Temporary Bulkheads	1.00	DAY	1,300	300	1,600	1580.09

		QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
11 02 03 22 02 4	Unwatering Pumps			5,300	1,100	6,400	
	TOTAL Care and Diversion of Water			12,300	2,500	14,800	
11 02 03 22 03	Sitework						
11 02 03 22 03 1	Site Preparation			1,300	400	1,700	
11 02 03 22 03 2	Line Existing Pipe w/ HDPE Pipe			40,600	12,200	52,800	
11 02 03 22 03 3	Site Restoration			2,500	800	3,300	
	TOTAL Sitework			44,500	13,300	57,800	
11 02 03 22 04	Drainage Structure						
11 02 03 22 04 1	Replace Handrail			6,600	1,300	7,900	
11 02 03 22 04 2	Replace Grating			600	100	700	
11 02 03 22 04 3	Replace Ladders			1,200	200	1,500	
	TOTAL Drainage Structure			8,400	1,700	10,100	
11 02 03 22 05	Gates						
11 02 03 22 05 1	Remove Existing Gate	1.00	EA	3,400	1,000	4,500	4458.59
11 02 03 22 05 2	Rehab Gate	1.00	EA	8,600	2,600	11,100	11121
11 02 03 22 05 3	Install/Test Rehabbed Gate	1.00	EA	4,800	1,500	6,300	6288.59
	TOTAL Gates			16,800	5,000	21,900	
	TOTAL GW-35, 48" Drain (Cahokia Creek)			85,800	23,300	109,100	
11 02 03 23	GW-36, 48" Drain (Cahokia Creek)						
11 02 03 23 01	Mob, Demob & Preparatory Work						
11 02 03 23 01 1	Mobilization and Demobilization			3,800	800	4,600	
	TOTAL Mob, Demob & Preparatory Work			3,800	800	4,600	
11 02 03 23 02	Care and Diversion of Water						
11 02 03 23 02 1	Fabricate Bulkheads			3,100	600	3,700	
11 02 03 23 02 2	Install Temporary Bulkheads	2.00	DAY	2,600	500	3,200	1580.09
11 02 03 23 02 3	Remove Temporary Bulkheads	1.00	DAY	1,300	300	1,600	1580.09
11 02 03 23 02 4	Unwatering Pumps			5,300	1,100	6,400	
	TOTAL Care and Diversion of Water			12,300	2,500	14,800	

		QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
11 02 03 23 03	Sitework						
11 02 03 23 03 1	Site Preparation			1,300	400	1,700	
11 02 03 23 03 2	Line Existing Pipe w/ HDPE Pipe			40,600	12,200	52,800	
11 02 03 23 03 3	Site Restoration			2,500	800	3,300	
	TOTAL Sitework			44,500	13,300	57,800	
11 02 03 23 04	Drainage Structure						
11 02 03 23 04 1	Replace Handrail			6,600	1,300	7,900	
11 02 03 23 04 2	Replace Grating			600	100	700	
11 02 03 23 04 3	Replace Ladders			1,200	200	1,500	
	TOTAL Drainage Structure			8,400	1,700	10,100	
11 02 03 23 05	Gates						
11 02 03 23 05 1	Remove Existing Gate	1.00	EA	3,400	1,000	4,500	4458.59
11 02 03 23 05 2	Rehab Gate	1.00	EA	8,600	2,600	11,100	11121
11 02 03 23 05 3	Install/Test Rehabbed Gate	1.00	EA	4,800	1,500	6,300	6288.59
	TOTAL Gates			16,800	5,000	21,900	
	TOTAL GW-36, 48" Drain (Cahokia Creek)			85,800	23,300	109,100	
11 02 03 24	GW-37, 72" Drain (Cahokia Creek)						
11 02 03 24 01	Mob, Demob & Preparatory Work						
11 02 03 24 01 1	Mobilization and Demobilization			3,800	800	4,600	
	TOTAL Mob, Demob & Preparatory Work			3,800	800	4,600	
11 02 03 24 02	Care and Diversion of Water						
11 02 03 24 02 1	Fabricate Bulkheads			3,100	600	3,700	
11 02 03 24 02 2	Install Temporary Bulkheads	2.00	DAY	2,600	500	3,200	1580.09
11 02 03 24 02 3	Remove Temporary Bulkheads	1.00	DAY	1,300	300	1,600	1580.09
11 02 03 24 02 4	Unwatering Pumps			5,300	1,100	6,400	
	TOTAL Care and Diversion of Water			12,300	2,500	14,800	
11 02 03 24 03	Sitework						
11 02 03 24 03 1	Site Preparation			1,300	400	1,700	

		QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
11 02 03 24 03 2	Line Existing Pipe w/ HDPE Pipe			92,500	27,700	120,200	
11 02 03 24 03 3	Site Restoration			2,500	800	3,300	
	TOTAL Sitework			96,300	28,900	125,200	
11 02 03 24 04	Drainage Structure						
11 02 03 24 04 1	Replace Handrail			11,300	2,300	13,500	
11 02 03 24 04 2	Replace Grating			1,800	400	2,200	
11 02 03 24 04 3	Replace Ladders			6,700	1,300	8,000	
	TOTAL Drainage Structure			19,800	4,000	23,700	
11 02 03 24 05	Gates						
11 02 03 24 05 1	Remove Existing Gate	1.00	EA	4,200	1,300	5,400	5425.15
11 02 03 24 05 2	Replace Gate	1.00	EA	24,000	7,200	31,100	31137
11 02 03 24 05 3	Install/Test New Gate	1.00	EA	5,800	1,700	7,500	7496.79
	TOTAL Gates			33,900	10,200	44,100	
	TOTAL GW-37, 72" Drain (Cahokia Creek)			166,100	46,200	212,400	
11 02 03 25	GW-38, 42" Drain (Cahokia Creek)						
11 02 03 25 01	Mob, Demob & Preparatory Work						
11 02 03 25 01 1	Mobilization and Demobilization			3,800	800	4,600	
	TOTAL Mob, Demob & Preparatory Work			3,800	800	4,600	
11 02 03 25 02	Care and Diversion of Water						
11 02 03 25 02 1	Fabricate Bulkheads			3,100	600	3,700	
11 02 03 25 02 2	Install Temporary Bulkheads	2.00	DAY	2,600	500	3,200	1580.09
11 02 03 25 02 3	Remove Temporary Bulkheads	1.00	DAY	1,300	300	1,600	1580.09
11 02 03 25 02 4	Unwatering Pumps			5,300	1,100	6,400	
	TOTAL Care and Diversion of Water			12,300	2,500	14,800	
11 02 03 25 03	Sitework						
11 02 03 25 03 1	Site Preparation			1,300	400	1,700	
11 02 03 25 03 2	Line Existing Pipe w/ HDPE Pipe			40,600	12,200	52,800	
11 02 03 25 03 3	Site Restoration			2,500	800	3,300	

		QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
	TOTAL Sitework			44,500	13,300	57,800	
11 02 03 25 04	Drainage Structure						
11 02 03 25 04 1	Replace Handrail			6,600	1,300	7,900	
11 02 03 25 04 2	Replace Grating			600	100	700	
11 02 03 25 04 3	Replace Ladders			1,200	200	1,500	
	TOTAL Drainage Structure			8,400	1,700	10,100	
11 02 03 25 05	Gates						
11 02 03 25 05 1	Remove Existing Gate	1.00	EA	3,400	1,000	4,500	4458.59
11 02 03 25 05 2	Replace Gate	1.00	EA	17,600	5,300	22,800	22834
11 02 03 25 05 3	Install/Test New Gate	1.00	EA	4,800	1,500	6,300	6288.59
	TOTAL Gates			25,800	7,700	33,600	
	TOTAL GW-38, 42" Drain (Cahokia Creek)			94,800	26,000	120,800	
11 02 03 26	GW-39, 72" Drain (Cahokia Creek)						
11 02 03 26 01	Mob, Demob & Preparatory Work						
11 02 03 26 01 1	Mobilization and Demobilization			3,800	800	4,600	
	TOTAL Mob, Demob & Preparatory Work			3,800	800	4,600	
11 02 03 26 03	Sitework						
11 02 03 26 03 1	Site Preparation			1,300	400	1,700	
11 02 03 26 03 2	Line Existing Pipe w/ HDPE Pipe			92,500	27,700	120,200	
11 02 03 26 03 3	Site Restoration			2,500	800	3,300	
	TOTAL Sitework			96,300	28,900	125,200	
11 02 03 26 04	Drainage Structure						
11 02 03 26 04 1	Replace Handrail			6,600	1,300	7,900	
11 02 03 26 04 2	Replace Grating			600	100	700	
11 02 03 26 04 3	Replace Ladders			1,200	200	1,500	
	TOTAL Drainage Structure			8,400	1,700	10,100	
	TOTAL GW-39, 72" Drain (Cahokia Creek)			108,600	31,300	139,900	

		QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
11 02 03 27	GW-40, 30" Drain (Indian Creek)						
11 02 03 27 01	Mob, Demob & Preparatory Work						
11 02 03 27 01 1	Mobilization and Demobilization			3,800	800	4,600	
	TOTAL Mob, Demob & Preparatory Work			3,800	800	4,600	
11 02 03 27 02	Care and Diversion of Water						
11 02 03 27 02 1	Fabricate Bulkheads			3,100	600	3,700	
11 02 03 27 02 2	Install Temporary Bulkheads	2.00	DAY	2,600	500	3,200	1580.09
11 02 03 27 02 3	Remove Temporary Bulkheads	1.00	DAY	1,300	300	1,600	1580.09
11 02 03 27 02 4	Unwatering Pumps			5,300	1,100	6,400	
	TOTAL Care and Diversion of Water			12,300	2,500	14,800	
11 02 03 27 03	Sitework						
11 02 03 27 03 1	Site Preparation			1,300	400	1,700	
11 02 03 27 03 2	Line Existing Pipe w/ HDPE Pipe			40,600	12,200	52,800	
11 02 03 27 03 3	Site Restoration			2,500	800	3,300	
	TOTAL Sitework			44,500	13,300	57,800	
11 02 03 27 04	Drainage Structure						
11 02 03 27 04 1	Replace Handrail			6,600	1,300	7,900	
11 02 03 27 04 2	Replace Grating			600	100	700	
11 02 03 27 04 3	Replace Ladders			1,200	200	1,500	
	TOTAL Drainage Structure			8,400	1,700	10,100	
11 02 03 27 05	Gates						
11 02 03 27 05 1	Remove Existing Gate	1.00	EA	2,500	700	3,200	3214.11
11 02 03 27 05 2	Rehab Gate	1.00	EA	6,500	1,900	8,400	8446.25
11 02 03 27 05 3	Install/Test Rehabbed Gate	1.00	EA	3,900	1,200	5,000	5044.11
	TOTAL Gates			12,800	3,900	16,700	
	TOTAL GW-40, 30" Drain (Indian Creek)			81,900	22,100	104,000	
11 02 03 28	GW-41, 72" Drain (Indian Creek)						
11 02 03 28 01	Mob, Demob & Preparatory Work						

		QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
11 02 03 28 01 1	Mobilization and Demobilization			3,800	800	4,600	
	TOTAL Mob, Demob & Preparatory Work			3,800	800	4,600	
11 02 03 28 02	Care and Diversion of Water						
11 02 03 28 02 1	Fabricate Bulkheads			3,100	600	3,700	
11 02 03 28 02 2	Install Temporary Bulkheads	2.00	DAY	2,600	500	3,200	1580.09
11 02 03 28 02 3	Remove Temporary Bulkheads	1.00	DAY	1,300	300	1,600	1580.09
11 02 03 28 02 4	Unwatering Pumps			5,300	1,100	6,400	
	TOTAL Care and Diversion of Water			12,300	2,500	14,800	
11 02 03 28 03	Sitework						
11 02 03 28 03 1	Site Preparation			1,300	400	1,700	
11 02 03 28 03 2	Line Existing Pipe w/ HDPE Pipe			92,500	27,700	120,200	
11 02 03 28 03 3	Site Restoration			2,500	800	3,300	
	TOTAL Sitework			96,300	28,900	125,200	
11 02 03 28 04	Drainage Structure						
11 02 03 28 04 1	Replace Handrail			11,300	2,300	13,500	
11 02 03 28 04 2	Replace Grating			1,800	400	2,200	
11 02 03 28 04 3	Replace Ladders			6,700	1,300	8,000	
	TOTAL Drainage Structure			19,800	4,000	23,700	
11 02 03 28 05	Gates						
11 02 03 28 05 1	Remove Existing Gate	1.00	EA	4,200	1,300	5,400	5425.15
11 02 03 28 05 2	Rehab Gate	1.00	EA	15,100	4,500	19,600	19599
11 02 03 28 05 3	Install/Test Rehabbed Gate	1.00	EA	6,900	2,100	9,000	8982.92
	TOTAL Gates			26,200	7,800	34,000	
	TOTAL GW-41, 72" Drain (Indian Creek)			158,400	43,900	202,300	
11 02 03 29	GW-42, 36" Drain (Indian Creek)						
11 02 03 29 01	Mob, Demob & Preparatory Work						
11 02 03 29 01 1	Mobilization and Demobilization			3,800	800	4,600	
	TOTAL Mob, Demob & Preparatory Work			3,800	800	4,600	

		QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
11 02 03 29 02	Care and Diversion of Water						
11 02 03 29 02 1	Fabricate Bulkheads			3,100	600	3,700	
11 02 03 29 02 2	Install Temporary Bulkheads	2.00	DAY	2,600	500	3,200	1580.09
11 02 03 29 02 3	Remove Temporary Bulkheads	1.00	DAY	1,300	300	1,600	1580.09
11 02 03 29 02 4	Unwatering Pumps			5,300	1,100	6,400	
	TOTAL Care and Diversion of Water			12,300	2,500	14,800	
11 02 03 29 03	Sitework						
11 02 03 29 03 1	Site Preparation			1,300	400	1,700	
11 02 03 29 03 2	Line Existing Pipe w/ HDPE Pipe			40,600	12,200	52,800	
11 02 03 29 03 3	Site Restoration			2,500	800	3,300	
	TOTAL Sitework			44,500	13,300	57,800	
11 02 03 29 04	Drainage Structure						
11 02 03 29 04 1	Replace Handrail			6,600	1,300	7,900	
11 02 03 29 04 2	Replace Grating			600	100	700	
11 02 03 29 04 3	Replace Ladders			1,200	200	1,500	
	TOTAL Drainage Structure			8,400	1,700	10,100	
11 02 03 29 05	Gates						
11 02 03 29 05 1	Remove Existing Gate	1.00	EA	2,500	700	3,200	3214.11
11 02 03 29 05 2	Rehab Gate	1.00	EA	7,000	2,100	9,100	9122.97
11 02 03 29 05 3	Install/Test Rehabbed Gate	1.00	EA	3,900	1,200	5,000	5044.11
	TOTAL Gates			13,400	4,000	17,400	
	TOTAL GW-42, 36" Drain (Indian Creek)			82,400	22,300	104,600	
11 02 03 30	GW-43, 30" Drain (Indian Creek)						
11 02 03 30 01	Mob, Demob & Preparatory Work						
11 02 03 30 01 1	Mobilization and Demobilization			3,800	800	4,600	
	TOTAL Mob, Demob & Preparatory Work			3,800	800	4,600	
11 02 03 30 03	Sitework						
11 02 03 30 03 1	Site Preparation			1,300	400	1,700	

	QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
11 02 03 30 03 2 Line Existing Pipe w/ HDPE Pipe	40,600		12,200		52,800	
11 02 03 30 03 3 Site Restoration	2,500		800		3,300	
TOTAL Sitework	44,500		13,300		57,800	
11 02 03 30 04 Drainage Structure						
11 02 03 30 04 1 Replace Handrail	6,600		1,300		7,900	
11 02 03 30 04 2 Replace Grating	600		100		700	
11 02 03 30 04 3 Replace Ladders	1,200		200		1,500	
TOTAL Drainage Structure	8,400		1,700		10,100	
TOTAL GW-43, 30" Drain (Indian Creek)	56,700		15,800		72,500	
11 02 03 31 GW-44, 30" Drain (Indian Creek)						
11 02 03 31 01 Mob, Demob & Preparatory Work						
11 02 03 31 01 1 Mobilization and Demobilization	3,800		800		4,600	
TOTAL Mob, Demob & Preparatory Work	3,800		800		4,600	
11 02 03 31 03 Sitework						
11 02 03 31 03 1 Site Preparation	1,300		400		1,700	
11 02 03 31 03 2 Line Existing Pipe w/ HDPE Pipe	40,600		12,200		52,800	
11 02 03 31 03 3 Site Restoration	2,500		800		3,300	
TOTAL Sitework	44,500		13,300		57,800	
11 02 03 31 04 Drainage Structure						
11 02 03 31 04 1 Replace Handrail	6,600		1,300		7,900	
11 02 03 31 04 2 Replace Grating	600		100		700	
11 02 03 31 04 3 Replace Ladders	1,200		200		1,500	
TOTAL Drainage Structure	8,400		1,700		10,100	
TOTAL GW-44, 30" Drain (Indian Creek)	56,700		15,800		72,500	
TOTAL Lower Wood River Levee (LWRL)	2,591,000		657,700		3,248,700	
TOTAL Gravity Drainage Structures	3,844,100		956,900		4,800,900	
11 03 Closure Structures						

		QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
11 03 01	Upper Wood River Levee (UWRL)						
11 03 01 1	CS-1, Rail Closure (Riverfront)						
11 03 01 1 01	Replace Concrete Joint Sealant						
11 03 01 1 01 1	Remove Exist Joint Sealant	80.00	LF	300	100	400	4.92
11 03 01 1 01 2	New Joint Sealant	80.00	LF	300	100	400	4.53
	TOTAL Replace Concrete Joint Sealant			600	100	800	
11 03 01 1 02	Rehab Closure Structure Gate						
11 03 01 1 02 1	Remove Exist Gate			2,700	800	3,500	
11 03 01 1 02 2	Rehab Gate			7,900	2,400	10,200	
11 03 01 1 02 3	Install/Test Rehabbed Gate			4,200	1,300	5,500	
	TOTAL Rehab Closure Structure Gate			14,800	4,400	19,200	
	TOTAL CS-1, Rail Closure (Riverfront)			15,400	4,600	20,000	
11 03 01 2	CS-2, Rail Closure (Riverfront)						
11 03 01 2 01	Replace Concrete Joint Sealant						
11 03 01 2 01 1	Remove Exist Joint Sealant	80.00	LF	300	100	400	4.92
11 03 01 2 01 2	New Joint Sealant	80.00	LF	300	100	400	4.53
	TOTAL Replace Concrete Joint Sealant			600	100	800	
11 03 01 2 02	Rehab Closure Structure Gate						
11 03 01 2 02 1	Remove Exist Gate			2,700	800	3,500	
11 03 01 2 02 2	Rehab Gate			7,900	2,400	10,200	
11 03 01 2 02 3	Install/Test Rehabbed Gate			4,200	1,300	5,500	
	TOTAL Rehab Closure Structure Gate			14,800	4,400	19,200	
	TOTAL CS-2, Rail Closure (Riverfront)			15,400	4,600	20,000	
11 03 01 3	CS-3, Rail Closure (Riverfront)						
11 03 01 3 01	Replace Concrete Joint Sealant						
11 03 01 3 01 1	Remove Exist Joint Sealant	80.00	LF	300	100	400	4.92
11 03 01 3 01 2	New Joint Sealant	80.00	LF	300	100	400	4.53

		QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
	TOTAL Replace Concrete Joint Sealant			600	100	800	
11 03 01 3 02	Rehab Closure Structure Gate						
11 03 01 3 02 1	Remove Exist Gate			2,700	800	3,500	
11 03 01 3 02 2	Rehab Gate			7,900	2,400	10,200	
11 03 01 3 02 3	Install/Test Rehabbed Gate			4,200	1,300	5,500	
	TOTAL Rehab Closure Structure Gate			14,800	4,400	19,200	
	TOTAL CS-3, Rail Closure (Riverfront)			15,400	4,600	20,000	
11 03 01 4	CS-4, Rail Closure (Riverfront)						
11 03 01 4 01	Replace Concrete Joint Sealant						
11 03 01 4 01 1	Remove Exist Joint Sealant	160.00	LF	700	100	800	4.92
11 03 01 4 01 2	New Joint Sealant	160.00	LF	600	100	700	4.53
	TOTAL Replace Concrete Joint Sealant			1,300	300	1,500	
11 03 01 4 02	Rehab Closure Structure Gate						
11 03 01 4 02 1	Remove Exist Gate			2,700	800	3,500	
11 03 01 4 02 2	Rehab Gate			7,900	2,400	10,200	
11 03 01 4 02 3	Install/Test Rehabbed Gate			4,200	1,300	5,500	
	TOTAL Rehab Closure Structure Gate			14,800	4,400	19,200	
11 03 01 4 03	Demo of Exist Gate Monolith						
11 03 01 4 03 1	Remove & Dispose of Exist Conc.			11,300	2,300	13,500	
	TOTAL Demo of Exist Gate Monolith			11,300	2,300	13,500	
11 03 01 4 04	New Gate Monolith						
11 03 01 4 04 1	Mobilization and Demobilization			3,700	700	4,400	
11 03 01 4 04 2	Structural Excavation & Backfill			3,100	600	3,700	
11 03 01 4 04 3	Concrete	60.00	CY	18,300	3,700	22,000	366.60
11 03 01 4 04 4	Reinforcing Steel	5700.00	LB	3,400	700	4,100	0.72
11 03 01 4 04 5	Dowels	16.00	EA	300	100	400	23.59
11 03 01 4 04 6	Misc. Appurtenances			400	100	500	
11 03 01 4 04 7	Railroad Traffic Control			5,400	1,100	6,500	
11 03 01 4 04 8	Railroad Insurance Requirements			9,200	1,800	11,000	

		QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
11 03 01 4 04 9	Site Restoration			1,500	300	1,800	
	TOTAL New Gate Monolith			45,300	9,100	54,300	
	TOTAL CS-4, Rail Closure (Riverfront)			72,600	16,000	88,600	
11 03 01 5	CS-5, Road Closure (Riverfront)						
11 03 01 5 01	Replace Concrete Joint Sealant						
11 03 01 5 01 1	Remove Exist Joint Sealant	80.00	LF	300	100	400	4.92
11 03 01 5 01 2	New Joint Sealant	80.00	LF	300	100	400	4.53
	TOTAL Replace Concrete Joint Sealant			600	100	800	
11 03 01 5 02	Rehab Closure Structure Gate						
11 03 01 5 02 1	Remove Exist Gate			2,700	800	3,500	
11 03 01 5 02 2	Rehab Gate			7,900	2,400	10,200	
11 03 01 5 02 3	Install/Test Rehabbed Gate			4,200	1,300	5,500	
	TOTAL Rehab Closure Structure Gate			14,800	4,400	19,200	
11 03 01 5 03	Demo of Exist Aproach Slab						
11 03 01 5 03 1	Remove & Dispose of Exist Conc.			11,500	2,300	13,800	
	TOTAL Demo of Exist Aproach Slab			11,500	2,300	13,800	
11 03 01 5 04	New Aproach Slab						
11 03 01 5 04 1	Mobilization and Demobilization			600	100	700	
11 03 01 5 04 2	Structural Excavation & Backfill			600	100	700	
11 03 01 5 04 3	Concrete	61.00	CY	11,200	2,200	13,400	219.96
11 03 01 5 04 4	Reinforcing Steel	6100.00	LB	3,700	700	4,400	0.72
11 03 01 5 04 7	Traffic Control			1,100	200	1,300	
11 03 01 5 04 9	Site Restoration			600	100	700	
	TOTAL New Aproach Slab			17,800	3,600	21,300	
	TOTAL CS-5, Road Closure (Riverfront)			44,600	10,400	55,000	
11 03 01 7	CS-7, Rail Closure (Flank)						
11 03 01 7 01	Replace Concrete Joint Sealant						

		QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
11 03 01 7 01 1	Remove Exist Joint Sealant	30.00	LF	100	0	100	4.92
11 03 01 7 01 2	New Joint Sealant	30.00	LF	100	0	100	4.53
	TOTAL Replace Concrete Joint Sealant			200	0	300	
11 03 01 7 02	Demo of Exist Sill Monolith						
11 03 01 7 02 1	Remove & Dispose of Exist Conc.			800	200	900	
	TOTAL Demo of Exist Sill Monolith			800	200	900	
11 03 01 7 03	New Sill Monolith						
11 03 01 7 03 1	Mobilization and Demobilization			600	100	700	
11 03 01 7 03 2	Structural Excavation & Backfill			600	100	700	
11 03 01 7 03 3	Concrete	4.00	CY	700	100	900	219.96
11 03 01 7 03 4	Reinforcing Steel	40.00	LB	0	0	0	0.72
11 03 01 7 03 5	Dowels	10.00	EA	200	0	200	23.59
11 03 01 7 03 6	Misc. Appurtenances			300	100	300	
11 03 01 7 03 7	Traffic Control			700	100	900	
11 03 01 7 03 9	Site Restoration			600	100	700	
	TOTAL New Sill Monolith			3,800	800	4,500	
	TOTAL CS-7, Rail Closure (Flank)			4,800	1,000	5,700	
11 03 01 8	CS-8, Rail Closure (Flank)						
11 03 01 8 01	Replace Concrete Joint Sealant						
11 03 01 8 01 1	Remove Exist Joint Sealant	70.00	LF	300	100	300	4.92
11 03 01 8 01 2	New Joint Sealant	70.00	LF	300	100	300	4.53
	TOTAL Replace Concrete Joint Sealant			600	100	700	
11 03 01 8 02	Rehab Closure Structure Gate						
11 03 01 8 02 1	Remove Exist Gate			2,700	800	3,500	
11 03 01 8 02 2	Rehab Gate			4,700	1,400	6,100	
11 03 01 8 02 3	Install/Test Rehabbed Gate			3,400	1,000	4,400	
	TOTAL Rehab Closure Structure Gate			10,800	3,200	14,000	
11 03 01 8 03	Demo of Exist Sill Monolith						

		QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
11 03 01 8 03 1	Remove & Dispose of Exist Conc.			800	200	900	
	TOTAL Demo of Exist Sill Monolith			800	200	900	
11 03 01 8 04	New Sill Monolith						
11 03 01 8 04 1	Mobilization and Demobilization			600	100	700	
11 03 01 8 04 2	Structural Excavation & Backfill			600	100	700	
11 03 01 8 04 3	Concrete	4.00	CY	700	100	900	219.96
11 03 01 8 04 4	Reinforcing Steel	40.00	LB	0	0	0	0.72
11 03 01 8 04 5	Dowels	10.00	EA	200	0	200	23.59
11 03 01 8 04 6	Misc. Appurtenances			300	100	300	
11 03 01 8 04 7	Traffic Control			700	100	900	
11 03 01 8 04 9	Site Restoration			600	100	700	
	TOTAL New Sill Monolith			3,800	800	4,500	
	TOTAL CS-8, Rail Closure (Flank)			15,900	4,300	20,100	
11 03 01 9	CS-9, Rail Closure (Flank)						
11 03 01 9 01	Remove Closure Structure Gate						
11 03 01 9 01 1	Remove & Dispose of Exist Gate			3,100	900	4,000	
	TOTAL Remove Closure Structure Gate			3,100	900	4,000	
11 03 01 9 02	Remove RR Ballast Etc....						
11 03 01 9 02 1	Excavation and Removal	550.00	CY	7,800	1,600	9,400	17.04
	TOTAL Remove RR Ballast Etc....			7,800	1,600	9,400	
11 03 01 9 03	Abandon Structure/Close Opening						
11 03 01 9 03 1	Place and Compact Embankment	1300.00	CY	9,100	1,800	10,900	8.35
	TOTAL Abandon Structure/Close Opening			9,100	1,800	10,900	
	TOTAL CS-9, Rail Closure (Flank)			19,900	4,300	24,200	
	TOTAL Upper Wood River Levee (UWRL)			204,000	49,600	253,500	
11 03 02	East and West Fork Levee						
11 03 02 1	CS-10, Rail Closure (East Fork)						

		QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
11 03 02 1 01	Demolition of Existing Structure						
11 03 02 1 01 1	Remove & Dispose of Exist Gate			3,100	900	4,000	
11 03 02 1 01 2	Remove & Dispose of Exist Conc.			75,200	15,000	90,300	
11 03 02 1 01 3	Remove Ballast & RR Bedding			4,000	800	4,800	
	TOTAL Demolition of Existing Structure			82,300	16,800	99,000	
11 03 02 1 02	New Closure Structure						
11 03 02 1 02 1	Mobilization and Demobilization			24,100	4,800	28,900	
11 03 02 1 02 2	Structural Excavation & Backfill			6,100	1,200	7,300	
11 03 02 1 02 3	Concrete	400.00	CY	122,200	24,400	146,600	366.60
11 03 02 1 02 4	Reinforcing Steel	40300	LB	24,200	4,800	29,000	0.72
11 03 02 1 02 5	Steel Sheetpile	6582.00	SF	122,000	24,400	146,400	22.25
11 03 02 1 02 6	Misc. Appurtenances			1,500	300	1,800	
11 03 02 1 02 7	Railroad Work			61,100	12,200	73,300	
11 03 02 1 02 8	Railroad Insurance Requirements			18,300	3,700	22,000	
11 03 02 1 02 9	Fabricate New Gate			22,000	4,400	26,400	
11 03 02 1 02 10	Install/Test New Gate			4,200	800	5,100	
11 03 02 1 02 11	Site Restoration			3,100	600	3,700	
	TOTAL New Closure Structure			408,800	81,800	490,500	
	TOTAL CS-10, Rail Closure (East Fork)			491,000	98,500	589,600	
	TOTAL East and West Fork Levee			491,000	98,500	589,600	
11 03 03	Lower Wood River Levee (LWRL)						
11 03 03 1	CS-11, Rail Closure (Flank)						
11 03 03 1 01	Demolition of Existing Structure						
11 03 03 1 01 1	Remove & Dispose of Exist Gate			2,900	900	3,700	
11 03 03 1 01 2	Remove & Dispose of Exist Conc.			66,800	13,400	80,100	
11 03 03 1 01 3	Remove Ballast & RR Bedding			4,000	800	4,800	
	TOTAL Demolition of Existing Structure			73,700	15,000	88,700	
11 03 03 1 02	New Closure Structure						
11 03 03 1 02 1	Mobilization and Demobilization			23,300	4,700	28,000	
11 03 03 1 02 2	Structural Excavation & Backfill			6,100	1,200	7,300	
11 03 03 1 02 3	Concrete	355.00	CY	108,500	21,700	130,100	366.60
11 03 03 1 02 4	Reinforcing Steel	35500	LB	21,300	4,300	25,500	0.72
11 03 03 1 02 5	Steel Sheetpile	6582.00	SF	122,000	24,400	146,400	22.25
11 03 03 1 02 6	Misc. Appurtenances			800	200	900	

		QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
11 03 03 1 02 7	Railroad Work			61,100	12,200	73,300	
11 03 03 1 02 8	Railroad Insurance Requirements			18,300	3,700	22,000	
11 03 03 1 02 9	Fabricate New Gate			42,100	8,400	50,600	
11 03 03 1 02 10	Install/Test New Gate			4,200	800	5,100	
11 03 03 1 02 11	Site Restoration			3,100	600	3,700	
TOTAL	New Closure Structure			410,800	82,200	493,000	
TOTAL	CS-11, Rail Closure (Flank)			484,500	97,200	581,700	
11 03 03 2	CS-12, Road Closure (Flank)						
11 03 03 2 01	Demolition of Existing Structure						
11 03 03 2 01 1	Remove & Dispose of Exist Gate			2,900	900	3,700	
11 03 03 2 01 2	Remove & Dispose of Exist Conc.			214,400	42,900	257,200	
11 03 03 2 01 3	Remove Ballast & RR Bedding			4,000	800	4,800	
TOTAL	Demolition of Existing Structure			221,300	44,500	265,800	
11 03 03 2 02	New Closure Structure						
11 03 03 2 02 1	Mobilization and Demobilization			47,500	9,500	57,000	
11 03 03 2 02 2	Structural Excavation & Backfill			12,200	2,400	14,700	
11 03 03 2 02 3	Concrete	1140.00	CY	348,300	69,700	417,900	366.60
11 03 03 2 02 4	Reinforcing Steel	113800	LB	68,300	13,700	81,900	0.72
11 03 03 2 02 5	Steel Sheetpile	20845	SF	386,500	77,300	463,700	22.25
11 03 03 2 02 6	Misc. Appurtenances			6,700	1,300	8,000	
11 03 03 2 02 7	Traffic Control			7,200	1,400	8,700	
11 03 03 2 02 9	Fabricate New Gate			42,100	8,400	50,600	
11 03 03 2 02 10	Install/Test New Gate			4,200	800	5,100	
11 03 03 2 02 11	Site Restoration			3,100	600	3,700	
TOTAL	New Closure Structure			926,100	185,200	1,111,300	
TOTAL	CS-12, Road Closure (Flank)			1,147,300	229,800	1,377,100	
11 03 03 3	CS-13, Rail Closure (Flank)						
11 03 03 3 01	Remove Closure Structure Gate						
11 03 03 3 01 1	Remove & Dispose of Exist Gate			3,100	900	4,000	
TOTAL	Remove Closure Structure Gate			3,100	900	4,000	
11 03 03 3 02	Remove RR Ballast Etc....						

		QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
11 03 03 3 02 1	Excavation and Removal	400.00	CY	5,700	1,100	6,800	17.04
	TOTAL Remove RR Ballast Etc....			5,700	1,100	6,800	
11 03 03 3 03	Abandon Structure/Close Opening						
11 03 03 3 03 1	Place and Compact Embankment	800.00	CY	5,600	1,100	6,700	8.35
	TOTAL Abandon Structure/Close Opening			5,600	1,100	6,700	
	TOTAL CS-13, Rail Closure (Flank)			14,300	3,200	17,500	
11 03 03 4	CS-14, Rail Closure (Flank)						
11 03 03 4 01	Remove Closure Structure Gate						
11 03 03 4 01 1	Remove & Dispose of Exist Gate			3,100	900	4,000	
	TOTAL Remove Closure Structure Gate			3,100	900	4,000	
11 03 03 4 02	Remove RR Ballast Etc....						
11 03 03 4 02 1	Excavation and Removal	550.00	CY	7,800	1,600	9,400	17.04
	TOTAL Remove RR Ballast Etc....			7,800	1,600	9,400	
11 03 03 4 03	Abandon Structure/Close Opening						
11 03 03 4 03 1	Place and Compact Embankment	1300.00	CY	9,100	1,800	10,900	8.35
	TOTAL Abandon Structure/Close Opening			9,100	1,800	10,900	
	TOTAL CS-14, Rail Closure (Flank)			19,900	4,300	24,200	
11 03 03 5	CS-15, Road Closure (Flank)						
11 03 03 5 01	Replace Concrete Joint Sealant						
11 03 03 5 01 1	Remove Exist Joint Sealant	100.00	LF	400	100	500	4.92
11 03 03 5 01 2	New Joint Sealant	100.00	LF	400	100	500	4.53
	TOTAL Replace Concrete Joint Sealant			800	200	900	
11 03 03 5 02	Closure Struct. Gate Cover Plate						

		QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
11 03 03 5 02 1	Weather Shield			21,600	6,500	28,100	
	TOTAL Closure Struct. Gate Cover Plate			21,600	6,500	28,100	
11 03 03 5 03	Demo of Exist Gate Monolith						
11 03 03 5 03 1	Remove & Dispose of Exist Conc.			4,100	800	5,000	
	TOTAL Demo of Exist Gate Monolith			4,100	800	5,000	
11 03 03 5 04	New Gate Monolith						
11 03 03 5 04 1	Mobilization and Demobilization			2,400	500	2,900	
11 03 03 5 04 2	Structural Excavation & Backfill			1,800	400	2,200	
11 03 03 5 04 3	Concrete	22.00	CY	6,700	1,300	8,100	366.60
11 03 03 5 04 4	Reinforcing Steel	2200.00	LB	1,300	300	1,600	0.72
11 03 03 5 04 5	Dowels	16.00	EA	300	100	400	23.59
11 03 03 5 04 6	Misc. Appurtenances			200	0	300	
11 03 03 5 04 7	Traffic Control			2,700	500	3,300	
11 03 03 5 04 9	Site Restoration			1,500	300	1,800	
	TOTAL New Gate Monolith			17,100	3,400	20,500	
	TOTAL CS-15, Road Closure (Flank)			43,700	10,900	54,600	
11 03 03 6	CS-16, Road Closure (Flank)						
11 03 03 6 01	Replace Concrete Joint Sealant						
11 03 03 6 01 1	Remove Exist Joint Sealant	100.00	LF	400	100	500	4.92
11 03 03 6 01 2	New Joint Sealant	100.00	LF	400	100	500	4.53
	TOTAL Replace Concrete Joint Sealant			800	200	900	
11 03 03 6 02	Closure Struct. Gate Cover Plate						
11 03 03 6 02 1	Weather Shield			21,600	6,500	28,100	
	TOTAL Closure Struct. Gate Cover Plate			21,600	6,500	28,100	
11 03 03 6 03	Demo of Exist Gate Monolith						
11 03 03 6 03 1	Remove & Dispose of Exist Conc.			4,100	800	5,000	
	TOTAL Demo of Exist Gate Monolith			4,100	800	5,000	

		QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
11 03 03 6 04	New Gate Monolith						
11 03 03 6 04 1	Mobilization and Demobilization			2,400	500	2,900	
11 03 03 6 04 2	Structural Excavation & Backfill			1,800	400	2,200	
11 03 03 6 04 3	Concrete	22.00	CY	6,700	1,300	8,100	366.60
11 03 03 6 04 4	Reinforcing Steel	2200.00	LB	1,300	300	1,600	0.72
11 03 03 6 04 5	Dowels	16.00	EA	300	100	400	23.59
11 03 03 6 04 6	Misc. Appurtenances			200	0	300	
11 03 03 6 04 7	Traffic Control			2,700	500	3,300	
11 03 03 6 04 9	Site Restoration			1,500	300	1,800	
	TOTAL New Gate Monolith			17,100	3,400	20,500	
	TOTAL CS-16, Road Closure (Flank)			43,700	10,900	54,600	
11 03 03 7	CS-17, Rail Closure (Flank)						
11 03 03 7 01	Replace Concrete Joint Sealant						
11 03 03 7 01 1	Remove Exist Joint Sealant	40.00	LF	200	0	200	4.92
11 03 03 7 01 2	New Joint Sealant	40.00	LF	200	0	200	4.53
	TOTAL Replace Concrete Joint Sealant			300	100	400	
11 03 03 7 02	Rehab Closure Structure Gate						
11 03 03 7 02 1	Remove Exist Gate			2,700	800	3,500	
11 03 03 7 02 2	Rehab Gate			4,700	1,400	6,100	
11 03 03 7 02 3	Install/Test Rehabbed Gate			3,400	1,000	4,400	
	TOTAL Rehab Closure Structure Gate			10,800	3,200	14,000	
11 03 03 7 03	Demo of Exist Sill Monolith						
11 03 03 7 03 1	Remove & Dispose of Exist Conc.			800	200	900	
	TOTAL Demo of Exist Sill Monolith			800	200	900	
11 03 03 7 04	New Sill Monolith						
11 03 03 7 04 1	Mobilization and Demobilization			600	100	700	
11 03 03 7 04 2	Structural Excavation & Backfill			600	100	700	
11 03 03 7 04 3	Concrete	4.00	CY	700	100	900	219.96
11 03 03 7 04 4	Reinforcing Steel	40.00	LB	0	0	0	0.72
11 03 03 7 04 5	Dowels	10.00	EA	200	0	200	23.59
11 03 03 7 04 6	Misc. Appurtenances			300	100	300	
11 03 03 7 04 7	Traffic Control			700	100	900	

		QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
11 03 03 7 04 9	Site Restoration			600	100	700	
	TOTAL New Sill Monolith			3,800	800	4,500	
	TOTAL CS-17, Rail Closure (Flank)			15,600	4,200	19,800	
11 03 03 8	CS-18, Rail Closure (Flank)						
11 03 03 8 01	Replace Concrete Joint Sealant						
11 03 03 8 01 1	Remove Exist Joint Sealant	25.00	LF	100	0	100	4.92
11 03 03 8 01 2	New Joint Sealant	25.00	LF	100	0	100	4.53
	TOTAL Replace Concrete Joint Sealant			200	0	200	
	TOTAL CS-18, Rail Closure (Flank)			200	0	200	
11 03 03 9	CS-19, Road Closure (Riverfront)						
11 03 03 9 01	Replace Concrete Joint Sealant						
11 03 03 9 01 1	Remove Exist Joint Sealant	110.00	LF	500	100	500	4.92
11 03 03 9 01 2	New Joint Sealant	110.00	LF	400	100	500	4.53
	TOTAL Replace Concrete Joint Sealant			900	200	1,000	
11 03 03 9 02	Rehab Closure Structure Gate						
11 03 03 9 02 1	Remove Exist Gate			2,700	800	3,500	
11 03 03 9 02 2	Rehab Gate			7,900	2,400	10,200	
11 03 03 9 02 3	Install/Test Rehabbed Gate			4,200	1,300	5,500	
	TOTAL Rehab Closure Structure Gate			14,800	4,400	19,200	
	TOTAL CS-19, Road Closure (Riverfront)			15,600	4,600	20,200	
11 03 03 10	CS-20, Road Closure (Riverfront)						
11 03 03 10 01	Replace Concrete Joint Sealant						
11 03 03 10 01 1	Remove Exist Joint Sealant	60.00	LF	200	0	300	4.92
11 03 03 10 01 2	New Joint Sealant	60.00	LF	200	0	300	4.53
	TOTAL Replace Concrete Joint Sealant			500	100	600	
11 03 03 10 02	Replace Closure Structure Gate						

		QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
11 03 03 10 02 1	Remove & Dispose of Exist Gate			2,900	900	3,700	
11 03 03 10 02 2	Fabricate New Gate			42,100	8,400	50,600	
11 03 03 10 02 3	Install/Test New Gate			4,200	800	5,100	
	TOTAL Replace Closure Structure Gate			49,200	10,100	59,400	
11 03 03 10 03	Demo of Exist Sill Monolith						
11 03 03 10 03 1	Remove & Dispose of Exist Conc.			600	100	700	
	TOTAL Demo of Exist Sill Monolith			600	100	700	
11 03 03 10 04	New Sill Monolith						
11 03 03 10 04 1	Mobilization and Demobilization			600	100	700	
11 03 03 10 04 2	Structural Excavation & Backfill			600	100	700	
11 03 03 10 04 3	Concrete	3.00	CY	500	100	700	219.96
11 03 03 10 04 4	Reinforcing Steel	30.00	LB	0	0	0	0.72
11 03 03 10 04 5	Dowels	13.00	EA	300	100	300	23.59
11 03 03 10 04 6	Misc. Appurtenances			300	100	400	
11 03 03 10 04 7	Traffic Control			700	100	900	
11 03 03 10 04 9	Site Restoration			600	100	700	
	TOTAL New Sill Monolith			3,700	700	4,400	
	TOTAL CS-20, Road Closure (Riverfront)			54,000	11,100	65,100	
11 03 03 11	CS-21 Road Closure (Riverfront)						
11 03 03 11 01	Replace Concrete Joint Sealant						
11 03 03 11 01 1	Remove Exist Joint Sealant	45.00	LF	200	0	200	4.92
11 03 03 11 01 2	New Joint Sealant	45.00	LF	200	0	200	4.53
	TOTAL Replace Concrete Joint Sealant			400	100	400	
11 03 03 11 02	Rehab Closure Structure Gate						
11 03 03 11 02 1	Remove Exist Gate			2,700	800	3,500	
11 03 03 11 02 2	Rehab Gate			4,700	1,400	6,100	
11 03 03 11 02 3	Install/Test Rehabbed Gate			3,400	1,000	4,400	
	TOTAL Rehab Closure Structure Gate			10,800	3,200	14,000	
	TOTAL CS-21 Road Closure (Riverfront)			11,100	3,300	14,400	

		QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
11 03 03 12	CS-22, Road Closure (Riverfront)						
11 03 03 12 01	Replace Concrete Joint Sealant						
11 03 03 12 01 1	Remove Exist Joint Sealant	110.00	LF	500	100	500	4.92
11 03 03 12 01 2	New Joint Sealant	110.00	LF	400	100	500	4.53
	TOTAL Replace Concrete Joint Sealant			900	200	1,000	
11 03 03 12 02	Rehab Closure Structure Gate						
11 03 03 12 02 1	Remove Exist Gate			2,700	800	3,500	
11 03 03 12 02 2	Rehab Gate			7,900	2,400	10,200	
11 03 03 12 02 3	Install/Test Rehabbed Gate			4,200	1,300	5,500	
	TOTAL Rehab Closure Structure Gate			14,800	4,400	19,200	
	TOTAL CS-22, Road Closure (Riverfront)			15,600	4,600	20,200	
11 03 03 13	CS-23, Road Closure(Cahokia Crk)						
11 03 03 13 01	Replace Concrete Joint Sealant						
11 03 03 13 01 1	Remove Exist Joint Sealant	110.00	LF	500	100	500	4.92
11 03 03 13 01 2	New Joint Sealant	110.00	LF	400	100	500	4.53
	TOTAL Replace Concrete Joint Sealant			900	200	1,000	
	TOTAL CS-23, Road Closure(Cahokia Crk)			900	200	1,000	
11 03 03 14	CS-24, Road Closure (Indian Crk)						
11 03 03 14 01	Replace Concrete Joint Sealant						
11 03 03 14 01 1	Remove Exist Joint Sealant	130.00	LF	500	100	600	4.92
11 03 03 14 01 2	New Joint Sealant	130.00	LF	500	100	600	4.53
	TOTAL Replace Concrete Joint Sealant			1,000	200	1,200	
11 03 03 14 02	Rehab Closure Structure Gate						
11 03 03 14 02 1	Remove Exist Gate			2,700	800	3,500	
11 03 03 14 02 2	Rehab Gate			7,900	2,400	10,200	
11 03 03 14 02 3	Install/Test Rehabbed Gate			4,200	1,300	5,500	
	TOTAL Rehab Closure Structure Gate			14,800	4,400	19,200	

		QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
	TOTAL CS-24, Road Closure (Indian Crk)			15,800	4,600	20,400	
11 03 03 15	CS-25, Road Closure (Indian Crk)						
11 03 03 15 01	Replace Concrete Joint Sealant						
11 03 03 15 01 1	Remove Exist Joint Sealant	120.00	LF	500	100	600	4.92
11 03 03 15 01 2	New Joint Sealant	120.00	LF	500	100	500	4.53
	TOTAL Replace Concrete Joint Sealant			900	200	1,100	
	TOTAL CS-25, Road Closure (Indian Crk)			900	200	1,100	
11 03 03 16	CS-26, Rail Closure (Indian Crk)						
11 03 03 16 01	Replace Closure Structure Gate						
11 03 03 16 01 1	Remove & Dispose of Exist Gate			3,100	900	4,000	
11 03 03 16 01 2	Fabricate New Gate			22,000	4,400	26,400	
11 03 03 16 01 3	Install/Test New Gate			4,200	800	5,100	
	TOTAL Replace Closure Structure Gate			29,200	6,200	35,400	
	TOTAL CS-26, Rail Closure (Indian Crk)			29,200	6,200	35,400	
	TOTAL Lower Wood River Levee (LWRL)			1,912,400	395,200	2,307,600	
	TOTAL Closure Structures			2,607,400	543,300	3,150,700	
	TOTAL Levees and Floodwalls			10,521,000	1,907,100	12,428,100	
13	Pumping Plant						
13 01	East Alton No. 1						
13 01 01	Mob, Demob & Preparatory Work						
13 01 01 01	Mobilization and Demobilization						
13 01 01 01 1	Mobilization and Demobilization			3,800	800	4,600	
	TOTAL Mobilization and Demobilization			3,800	800	4,600	
	TOTAL Mob, Demob & Preparatory Work			3,800	800	4,600	
13 01 03	Care and Diversion of Water						

		QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
13 01 03 02	Site Work						
13 01 03 02 1	Fabricate Bulkheads			3,100	800	3,800	
13 01 03 02 2	Install Temporary Bulkheads	2.00	DAY	2,600	700	3,300	1645.93
13 01 03 02 3	Remove Temporary Bulkheads	1.00	DAY	1,300	300	1,600	1645.93
	TOTAL Site Work			7,000	1,800	8,800	
13 01 03 15	Mechanical						
13 01 03 15 1	Unwatering Pumps			5,300	1,300	6,600	
	TOTAL Mechanical			5,300	1,300	6,600	
	TOTAL Care and Diversion of Water			12,300	3,100	15,400	
13 01 78	Auxiliary Equipment						
13 01 78 15	Mechanical						
13 01 78 15 1	Remove Existing Trash Rakes			13,200	2,000	15,200	
13 01 78 15 2	New Trash Rakes	3.00	EA	554,800	83,200	638,000	212668
13 01 78 15 3	Install and Test New Trash Rakes	3.00	EA	7,500	1,100	8,600	2867.37
	TOTAL Mechanical			575,500	86,300	661,800	
	TOTAL Auxiliary Equipment			575,500	86,300	661,800	
	TOTAL East Alton No. 1			591,700	90,200	681,800	
13 02	East Alton No. 2						
13 02 01	Mob, Demob & Preparatory Work						
13 02 01 01	Mobilization and Demobilization						
13 02 01 01 1	Mobilization and Demobilization			3,800	800	4,600	
	TOTAL Mobilization and Demobilization			3,800	800	4,600	
	TOTAL Mob, Demob & Preparatory Work			3,800	800	4,600	
13 02 02	Sitework						
13 02 02 5	Site Preparation			1,300	400	1,700	
13 02 02 10	Line Existing Pipe w/ HDPE Pipe	2.00	EA	81,200	24,400	105,600	52783

		QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
13 02 02 15	Site Restoration			2,500	800	3,300	
	TOTAL Sitework			85,100	25,500	110,600	
13 02 03	Care and Diversion of Water						
13 02 03 02	Site Work						
13 02 03 02 1	Fabricate Bulkheads			3,100	800	3,800	
13 02 03 02 2	Install Temporary Bulkheads	2.00	DAY	2,600	700	3,300	1645.93
13 02 03 02 3	Remove Temporary Bulkheads	1.00	DAY	1,300	300	1,600	1645.93
	TOTAL Site Work			7,000	1,800	8,800	
13 02 03 15	Mechanical						
13 02 03 15 1	Unwatering Pumps			5,300	1,300	6,600	
	TOTAL Mechanical			5,300	1,300	6,600	
	TOTAL Care and Diversion of Water			12,300	3,100	15,400	
13 02 75	Pumping Plant Superstructure						
13 02 75 04	Masonry						
13 02 75 04 01	Masonry Restoration						
13 02 75 04 01 1	Clean Brick			11,000	2,200	13,200	
13 02 75 04 01 2	Tuckpointing			25,400	5,100	30,500	
	TOTAL Masonry Restoration			36,400	7,300	43,700	
	TOTAL Masonry			36,400	7,300	43,700	
13 02 75 06	Wood and Plastic						
13 02 75 06 01	Fiberglass Grating (PS)						
13 02 75 06 01 1	Remove Existing Grating	200.00	SF	600	100	700	3.40
13 02 75 06 01 2	Install New Grating	200.00	SF	5,600	1,100	6,700	33.49
	TOTAL Fiberglass Grating (PS)			6,100	1,200	7,400	
13 02 75 06 02	Fiberglass Ladders - 5ea (PS)						

		QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
13 02 75 06 02 1	Remove Existing Ladders	120.00	LF	2,200	400	2,700	22.45
13 02 75 06 02 2	Install New Ladders	120.00	LF	12,300	2,500	14,700	122.90
	TOTAL Fiberglass Ladders - 5ea (PS)			14,500	2,900	17,400	
13 02 75 06 03	Fiberglass Grating (GW)						
13 02 75 06 03 1	Remove Existing Grating	60.00	SF	200	0	200	3.40
13 02 75 06 03 2	Install New Grating	60.00	SF	1,700	300	2,000	33.49
	TOTAL Fiberglass Grating (GW)			1,800	400	2,200	
13 02 75 06 04	Fiberglass Ladders (GW)						
13 02 75 06 04 1	Remove Existing Ladders	55.00	LF	1,000	200	1,200	22.45
13 02 75 06 04 2	Install New Ladders	55.00	LF	5,600	1,100	6,800	122.90
	TOTAL Fiberglass Ladders (GW)			6,700	1,300	8,000	
13 02 75 06 05	Fiberglass Railing (GW)						
13 02 75 06 05 1	Remove Existing Railing	120.00	LF	1,700	300	2,000	16.99
13 02 75 06 05 2	Install New Railing	120.00	LF	9,600	1,900	11,500	95.86
	TOTAL Fiberglass Railing (GW)			11,300	2,300	13,500	
	TOTAL Wood and Plastic			40,500	8,100	48,600	
13 02 75 07	Thermal & Moisture Protection						
13 02 75 07 01	Roofing						
13 02 75 07 01 1	Remove Existing Roof	8.00	CSF	1,100	200	1,300	167.13
13 02 75 07 01 2	Install New Roof	8.00	CSF	1,700	300	2,000	252.92
	TOTAL Roofing			2,800	600	3,400	
	TOTAL Thermal & Moisture Protection			2,800	600	3,400	
13 02 75 15	Mechanical						
13 02 75 15 01	HVAC						
13 02 75 15 01 1	Electric Unit Heaters	3.00	EA	5,000	1,000	6,000	1999.14
13 02 75 15 01 2	Ventilation System			7,300	1,500	8,700	

		QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
	TOTAL HVAC			12,300	2,500	14,700	
	TOTAL Mechanical			12,300	2,500	14,700	
13 02 75 16	Electrical						
13 02 75 16 01	HVAC						
13 02 75 16 01 1	Electric Unit Heaters			4,000	800	4,800	
13 02 75 16 01 2	Ventilation System			1,100	200	1,300	
	TOTAL HVAC			5,100	1,000	6,100	
13 02 75 16 02	Lighting and Power			10,200	2,000	12,200	
	TOTAL Electrical			15,300	3,100	18,400	
	TOTAL Pumping Plant Superstructure			107,300	21,500	128,700	
13 02 76	Pumping Machinery & Appurtenance						
13 02 76 15	Mechanical						
13 02 76 15 01	Rehab Stormwater Pumps No 1 & 2						
13 02 76 15 01 1	Remove Existing Pumps	2.00	EA	4,600	700	5,300	2629.30
13 02 76 15 01 2	Rehab Pumps	2.00	EA	172,000	25,800	197,800	98909
13 02 76 15 01 3	Install and Test Rehabbed Pumps	2.00	EA	7,500	1,100	8,600	4301.06
	TOTAL Rehab Stormwater Pumps No 1 & 2	2.00	EA	184,100	27,600	211,700	105839
	TOTAL Mechanical			184,100	27,600	211,700	
13 02 76 16	Electrical						
13 02 76 16 01	Motor Rehabilitation			40,500	6,100	46,600	
13 02 76 16 02	MCC Replacement			104,400	15,700	120,100	
13 02 76 16 03	Sluice Gate Operator			1,400	200	1,700	
13 02 76 16 04	Lubrication System			3,100	500	3,600	
	TOTAL Electrical			149,500	22,400	171,900	
	TOTAL Pumping Machinery & Appurtenance			333,600	50,000	383,600	
13 02 77	Gates and Valves						
13 02 77 15	Mechanical						

	QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
13 02 77 15 01 Rehab Forebay Sluice Gates						
13 02 77 15 01 1 Remove Existing Gates	2.00	EA	13,200	4,000	17,200	8608.14
13 02 77 15 01 2 Rehab Gates	2.00	EA	40,700	12,200	53,000	26484
13 02 77 15 01 3 Install/Test Rehabbed Gates	2.00	EA	7,800	2,300	10,200	5088.65
TOTAL Rehab Forebay Sluice Gates	2.00	EA	61,800	18,500	80,400	40181
13 02 77 15 02 Rehab Gravity Drain Sluice Gate						
13 02 77 15 02 1 Remove Existing Gates	2.00	EA	3,400	1,000	4,500	2229.19
13 02 77 15 02 2 Rehab Gates	2.00	EA	21,700	6,500	28,200	14108
13 02 77 15 02 3 Install/Test Rehabbed Gates	2.00	EA	5,500	1,600	7,100	3557.76
TOTAL Rehab Gravity Drain Sluice Gate	1.00	EA	30,600	9,200	39,800	39789
TOTAL Mechanical			92,400	27,700	120,200	
TOTAL Gates and Valves			92,400	27,700	120,200	
13 02 99 Associated General Items						
13 02 99 01 Trashrack						
13 02 99 01 1 Remove Existing Trashrack Steel			4,300	600	4,900	
13 02 99 01 2 Install New Trashrack Steel			19,000	2,800	21,800	
TOTAL Trashrack			23,200	3,500	26,700	
TOTAL Associated General Items			23,200	3,500	26,700	
TOTAL East Alton No. 2			657,700	132,100	789,800	
13 03 Wood River						
13 03 01 Mob, Demob & Preparatory Work						
13 03 01 01 Mobilization and Demobilization						
13 03 01 01 1 Mobilization and Demobilization			3,800	800	4,600	
TOTAL Mobilization and Demobilization			3,800	800	4,600	
TOTAL Mob, Demob & Preparatory Work			3,800	800	4,600	
13 03 03 Care and Diversion of Water						

	QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
13 03 03 02 Site Work						
13 03 03 02 1 Fabricate Bulkheads			3,100	800	3,800	
13 03 03 02 2 Install Temporary Bulkheads	2.00	DAY	2,600	700	3,300	1645.93
13 03 03 02 3 Remove Temporary Bulkheads	1.00	DAY	1,300	300	1,600	1645.93
TOTAL Site Work			7,000	1,800	8,800	
13 03 03 15 Mechanical						
13 03 03 15 1 Unwatering Pumps			5,300	1,300	6,600	
TOTAL Mechanical			5,300	1,300	6,600	
TOTAL Care and Diversion of Water			12,300	3,100	15,400	
13 03 75 Pumping Plant Superstructure						
13 03 75 04 Masonry						
13 03 75 04 01 Masonry Restoration						
13 03 75 04 01 1 Clean Brick			12,000	2,400	14,400	
13 03 75 04 01 2 Tuckpointing			27,800	5,600	33,400	
TOTAL Masonry Restoration			39,900	8,000	47,800	
TOTAL Masonry			39,900	8,000	47,800	
13 03 75 06 Wood and Plastic						
13 03 75 06 01 Fiberglass Grating (PS)						
13 03 75 06 01 1 Remove Existing Grating	315.00	SF	900	200	1,100	3.40
13 03 75 06 01 2 Install New Grating	315.00	SF	8,800	1,800	10,500	33.49
TOTAL Fiberglass Grating (PS)			9,700	1,900	11,600	
13 03 75 06 02 Fiberglass Ladders - 14ea (PS)						
13 03 75 06 02 1 Remove Existing Ladders	225.00	LF	4,200	800	5,100	22.45
13 03 75 06 02 2 Install New Ladders	225.00	LF	23,000	4,600	27,700	122.90
TOTAL Fiberglass Ladders - 14ea (PS)			27,300	5,500	32,700	
13 03 75 06 03 Fiberglass Grating (GW)						

		QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
13 03 75 06 03 1	Remove Existing Grating	120.00	SF	300	100	400	3.40
13 03 75 06 03 2	Install New Grating	120.00	SF	3,300	700	4,000	33.49
	TOTAL Fiberglass Grating (GW)			3,700	700	4,400	
13 03 75 06 04	Fiberglass Ladders (GW)						
13 03 75 06 04 1	Remove Existing Ladders	110.00	LF	2,100	400	2,500	22.45
13 03 75 06 04 2	Install New Ladders	110.00	LF	11,300	2,300	13,500	122.90
	TOTAL Fiberglass Ladders (GW)			13,300	2,700	16,000	
13 03 75 06 05	Fiberglass Railing (GW)						
13 03 75 06 05 1	Remove Existing Railing	240.00	LF	3,400	700	4,100	16.99
13 03 75 06 05 2	Install New Railing	240.00	LF	19,200	3,800	23,000	95.86
	TOTAL Fiberglass Railing (GW)			22,600	4,500	27,100	
	TOTAL Wood and Plastic			76,500	15,300	91,800	
13 03 75 07	Thermal & Moisture Protection						
13 03 75 07 01	Roofing						
13 03 75 07 01 1	Remove Existing Roof	10.00	CSF	1,400	300	1,700	167.13
13 03 75 07 01 2	Install New Roof	10.00	CSF	2,100	400	2,500	252.92
	TOTAL Roofing			3,500	700	4,200	
	TOTAL Thermal & Moisture Protection			3,500	700	4,200	
13 03 75 15	Mechanical						
13 03 75 15 01	HVAC						
13 03 75 15 01 1	Electric Unit Heaters	3.00	EA	5,200	1,000	6,300	2086.24
13 03 75 15 01 2	Ventilation System			7,300	1,500	8,700	
	TOTAL HVAC			12,500	2,500	15,000	
	TOTAL Mechanical			12,500	2,500	15,000	
13 03 75 16	Electrical						
13 03 75 16 01	HVAC						

		QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
13 03 75 16 01 1	Electric Unit Heaters			4,400	900	5,300	
13 03 75 16 01 2	Ventilation System			1,100	200	1,300	
	TOTAL HVAC			5,400	1,100	6,500	
13 03 75 16 02	Lighting and Power			9,800	2,000	11,700	
	TOTAL Electrical			15,200	3,000	18,300	
	TOTAL Pumping Plant Superstructure			147,600	29,500	177,100	
13 03 76	Pumping Machinery & Appurtenance						
13 03 76 15	Mechanical						
13 03 76 15 01	Replace Baseflow Pump No. 1						
13 03 76 15 01 1	Remove Existing Pump	1.00	EA	1,500	200	1,700	1716.08
13 03 76 15 01 2	New Submersible Pump	1.00	EA	19,600	2,900	22,500	22536
13 03 76 15 01 3	Install and Test New Pump	1.00	EA	2,600	400	3,000	2965.75
	TOTAL Replace Baseflow Pump No. 1	1.00	EA	23,700	3,600	27,200	27218
13 03 76 15 02	Rehab Stormwater Pumps No 2 & 3						
13 03 76 15 02 1	Remove Existing Pumps	2.00	EA	4,600	700	5,300	2629.30
13 03 76 15 02 2	Rehab Pumps	2.00	EA	151,700	22,800	174,400	87223
13 03 76 15 02 3	Install and Test Rehabbed Pumps	2.00	EA	7,500	1,100	8,600	4301.06
	TOTAL Rehab Stormwater Pumps No 2 & 3	2.00	EA	163,700	24,600	188,300	94154
13 03 76 15 03	Rehab Stormwater Pumps No 4,5&6						
13 03 76 15 03 1	Remove Existing Pumps	3.00	EA	4,600	700	5,300	1752.86
13 03 76 15 03 2	Rehab Pumps	3.00	EA	256,200	38,400	294,600	98213
13 03 76 15 03 3	Install and Test Rehabbed Pumps	3.00	EA	9,600	1,400	11,100	3690.19
	TOTAL Rehab Stormwater Pumps No 4,5&6	3.00	EA	270,400	40,600	311,000	103656
	TOTAL Mechanical			457,800	68,700	526,500	
13 03 76 16	Electrical						
13 03 76 16 01	Motor Rehabilitation			80,700	12,100	92,800	
13 03 76 16 02	MCC Replacement			86,900	13,000	100,000	
13 03 76 16 03	Sluice Gate Operator			3,800	600	4,400	

		QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
13 03 76 16 04	Lubrication System			7,300	1,100	8,400	
	TOTAL Electrical			178,800	26,800	205,600	
	TOTAL Pumping Machinery & Appurtenance			636,600	95,500	732,100	
13 03 77	Gates and Valves						
13 03 77 15	Mechanical						
13 03 77 15 01	Rehab Forebay Sluice Gates						
13 03 77 15 01 1	Remove Existing Gates	3.00	EA	5,700	1,700	7,400	2476.87
13 03 77 15 01 2	Rehab Gates	3.00	EA	60,100	18,000	78,100	26044
13 03 77 15 01 3	Install/Test Rehabbed Gates	3.00	EA	9,400	2,800	12,200	4082.98
	TOTAL Rehab Forebay Sluice Gates	3.00	EA	75,200	22,600	97,800	32604
13 03 77 15 02	Rehab Forebay/Pond Sluice Gate						
13 03 77 15 02 1	Remove Existing Gates	2.00	EA	3,400	1,000	4,500	2229.19
13 03 77 15 02 2	Rehab Gates	2.00	EA	23,000	6,900	29,900	14973
13 03 77 15 02 3	Install/Test Rehabbed Gates	2.00	EA	7,600	2,300	9,900	4964.65
	TOTAL Rehab Forebay/Pond Sluice Gate	2.00	EA	34,100	10,200	44,300	22167
13 03 77 15 03	Rehab Dischg Chamber Sluice Gate						
13 03 77 15 03 1	Remove Existing Gate	1.00	EA	3,400	1,000	4,500	4458.37
13 03 77 15 03 2	Rehab Gate	1.00	EA	14,900	4,500	19,300	19346
13 03 77 15 03 3	Install/Test Rehabbed Gate	1.00	EA	5,300	1,600	6,900	6867.53
	TOTAL Rehab Dischg Chamber Sluice Gate	1.00	EA	23,600	7,100	30,700	30672
13 03 77 15 04	Rehab Emerg. Closure Sluice Gate						
13 03 77 15 04 1	Remove Existing Gate	1.00	EA	3,400	1,000	4,500	4458.37
13 03 77 15 04 2	Rehab Gate	1.00	EA	14,900	4,500	19,300	19346
13 03 77 15 04 3	Install/Test Rehabbed Gate	1.00	EA	5,300	1,600	6,900	6867.53
	TOTAL Rehab Emerg. Closure Sluice Gate	1.00	EA	23,600	7,100	30,700	30672
13 03 77 15 05	Replace Dischg Chamber Sluice						
13 03 77 15 05 1	Remove Existing Gate	1.00	EA	3,400	1,000	4,500	4458.37
13 03 77 15 05 2	New Gate	1.00	EA	45,700	13,700	59,400	59443

		QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
13 03 77 15 05 3	Install/Test New Gate	1.00	EA	4,300	1,300	5,600	5629.40
	TOTAL Replace Dischg Chamber Sluice	1.00	EA	53,500	16,000	69,500	69531
13 03 77 15 06	Rehab Emerg. Closure Sluice Gate						
13 03 77 15 06 1	Remove Existing Gate	1.00	EA	3,400	1,000	4,500	4458.37
13 03 77 15 06 2	Rehab Gate	1.00	EA	18,400	5,500	23,900	23875
13 03 77 15 06 3	Install/Test Rehabbed Gate	1.00	EA	5,500	1,600	7,100	7115.53
	TOTAL Rehab Emerg. Closure Sluice Gate	1.00	EA	27,300	8,200	35,400	35449
13 03 77 15 07	Replace Pump Dischg Flap Gates						
13 03 77 15 07 1	Remove Existing Gates	1.00	EA	6,900	2,100	8,900	8916.75
13 03 77 15 07 2	New Gates	1.00	EA	37,000	11,100	48,100	48121
13 03 77 15 07 3	Install/Test New Gates	1.00	EA	5,100	1,500	6,600	6619.54
	TOTAL Replace Pump Dischg Flap Gates			49,000	14,700	63,700	
	TOTAL Mechanical			286,200	85,900	372,100	
	TOTAL Gates and Valves			286,200	85,900	372,100	
13 03 99	Associated General Items						
13 03 99 01	Chain Link Fence						
13 03 99 01 1	Remove Existing Chainlink Fence			800	0	800	
13 03 99 01 2	Install New Chain Link Fence			11,800	1,800	13,600	
	TOTAL Chain Link Fence			12,600	1,800	14,400	
	TOTAL Associated General Items			12,600	1,800	14,400	
	TOTAL Wood River			1,099,200	216,500	1,315,700	
13 04	Rand						
13 04 01	Mob, Demob & Preparatory Work						
13 04 01 01	Mobilization and Demobilization						
13 04 01 01 1	Mobilization and Demobilization			3,800	800	4,600	
	TOTAL Mobilization and Demobilization			3,800	800	4,600	

		QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
	TOTAL Mob, Demob & Preparatory Work			3,800	800	4,600	
13 04 02	Sitework						
13 04 02 5	Site Preparation			1,300	400	1,700	
13 04 02 10	Line Existing Pipe w/Insituform			96,200	28,900	125,100	
13 04 02 15	Site Restoration			2,500	800	3,300	
	TOTAL Sitework			100,100	30,000	130,100	
13 04 03	Care and Diversion of Water						
13 04 03 02	Site Work						
13 04 03 02 1	Fabricate Bulkheads			3,100	800	3,800	
13 04 03 02 2	Install Temporary Bulkheads	2.00	DAY	2,600	700	3,300	1645.93
13 04 03 02 3	Remove Temporary Bulkheads	1.00	DAY	1,300	300	1,600	1645.93
	TOTAL Site Work			7,000	1,800	8,800	
13 04 03 15	Mechanical						
13 04 03 15 1	Unwatering Pumps			5,300	1,300	6,600	
	TOTAL Mechanical			5,300	1,300	6,600	
	TOTAL Care and Diversion of Water			12,300	3,100	15,400	
13 04 75	Pumping Plant Superstructure						
13 04 75 04	Masonry						
13 04 75 04 01	Masonry Restoration						
13 04 75 04 01 1	Clean Brick			5,700	1,100	6,900	
13 04 75 04 01 2	Tuckpointing			13,300	2,700	15,900	
	TOTAL Masonry Restoration			19,000	3,800	22,800	
	TOTAL Masonry			19,000	3,800	22,800	
13 04 75 06	Wood and Plastic						
13 04 75 06 01	Fiberglass Grating (PS)						
13 04 75 06 01 1	Remove Existing Grating	260.00	SF	700	100	900	3.40

	QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
13 04 75 06 01 2 Install New Grating	260.00	SF	7,300	1,500	8,700	33.49
TOTAL Fiberglass Grating (PS)			8,000	1,600	9,600	
13 04 75 06 02 Fiberglass Ladders - 7ea (PS)						
13 04 75 06 02 1 Remove Existing Ladders	110.00	LF	2,100	400	2,500	22.45
13 04 75 06 02 2 Install New Ladders	110.00	LF	11,300	2,300	13,500	122.90
TOTAL Fiberglass Ladders - 7ea (PS)			13,300	2,700	16,000	
13 04 75 06 03 Fiberglass Grating (GW)						
13 04 75 06 03 1 Remove Existing Grating	60.00	SF	200	0	200	3.40
13 04 75 06 03 2 Install New Grating	60.00	SF	1,700	300	2,000	33.49
TOTAL Fiberglass Grating (GW)			1,800	400	2,200	
13 04 75 06 04 Fiberglass Ladders (GW)						
13 04 75 06 04 1 Remove Existing Ladders	55.00	LF	1,000	200	1,200	22.45
13 04 75 06 04 2 Install New Ladders	55.00	LF	5,600	1,100	6,800	122.90
TOTAL Fiberglass Ladders (GW)			6,700	1,300	8,000	
13 04 75 06 05 Fiberglass Railing (GW)						
13 04 75 06 05 1 Remove Existing Railing	120.00	LF	1,700	300	2,000	16.99
13 04 75 06 05 2 Install New Railing	120.00	LF	9,600	1,900	11,500	95.86
TOTAL Fiberglass Railing (GW)			11,300	2,300	13,500	
TOTAL Wood and Plastic			41,100	8,200	49,300	
13 04 75 07 Thermal & Moisture Protection						
13 04 75 07 01 Roofing						
13 04 75 07 01 1 Remove Existing Roof	3.00	CSF	400	100	500	167.13
13 04 75 07 01 2 Install New Roof	3.00	CSF	600	100	800	252.92
TOTAL Roofing			1,100	200	1,300	
TOTAL Thermal & Moisture Protection			1,100	200	1,300	

	QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
13 04 75 15 Mechanical						
13 04 75 15 01 HVAC						
13 04 75 15 01 1 Electric Unit Heaters	2.00	EA	3,500	700	4,200	2084.20
13 04 75 15 01 2 Ventilation System			4,400	900	5,200	
TOTAL HVAC			7,800	1,600	9,400	
TOTAL Mechanical			7,800	1,600	9,400	
13 04 75 16 Electrical						
13 04 75 16 01 HVAC						
13 04 75 16 01 1 Electric Unit Heaters			2,500	500	3,000	
13 04 75 16 01 2 Ventilation System			700	100	800	
TOTAL HVAC			3,200	600	3,800	
13 04 75 16 02 Lighting and Power			8,300	1,700	10,000	
TOTAL Electrical			11,500	2,300	13,800	
TOTAL Pumping Plant Superstructure			80,400	16,100	96,500	
13 04 76 Pumping Machinery & Appurtenance						
13 04 76 15 Mechanical						
13 04 76 15 01 Replace Baseflow Pump No. 1						
13 04 76 15 01 1 Remove Existing Pump	1.00	EA	1,500	200	1,700	1716.08
13 04 76 15 01 2 New Submersible Pump	1.00	EA	19,600	2,900	22,500	22536
13 04 76 15 01 3 Install and Test New Pump	1.00	EA	2,600	400	3,000	2965.75
TOTAL Replace Baseflow Pump No. 1	1.00	EA	23,700	3,600	27,200	27218
13 04 76 15 02 Rehab Stormwater Pumps No 2 & 3						
13 04 76 15 02 1 Remove Existing Pumps	2.00	EA	4,600	700	5,300	2629.30
13 04 76 15 02 2 Rehab Pumps	2.00	EA	127,700	19,200	146,900	73427
13 04 76 15 02 3 Install and Test Rehabbed Pumps	2.00	EA	7,500	1,100	8,600	4301.06
TOTAL Rehab Stormwater Pumps No 2 & 3	2.00	EA	139,800	21,000	160,700	80357
13 04 76 15 03 Rehab Stormwater Pumps No 4,5&6						

		QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
13 04 76 15 03 1	Remove Existing Pumps	3.00	EA	4,600	700	5,300	1752.86
13 04 76 15 03 2	Rehab Pumps	3.00	EA	256,200	38,400	294,600	98213
13 04 76 15 03 3	Install and Test Rehabbed Pumps	3.00	EA	9,600	1,400	11,100	3690.19
TOTAL	Rehab Stormwater Pumps No 4,5&6	3.00	EA	270,400	40,600	311,000	103656
TOTAL	Mechanical			433,800	65,100	498,900	
13 04 76 16	Electrical						
13 04 76 16 02	MCC Replacement			47,800	7,200	55,000	
13 04 76 16 03	Sluice Gate Operator			1,600	200	1,800	
TOTAL	Electrical			49,400	7,400	56,900	
TOTAL	Pumping Machinery & Appurtenance			483,300	72,500	555,800	
13 04 77	Gates and Valves						
13 04 77 15	Mechanical						
13 04 77 15 01	Rehab Forebay Sluice Gate						
13 04 77 15 01 1	Remove Existing Gate	1.00	EA	1,000	300	1,200	1244.48
13 04 77 15 01 2	Rehab Gate	1.00	EA	6,600	2,000	8,500	8524.36
13 04 77 15 01 3	Install/Test Rehabbed Gate	1.00	EA	3,300	1,000	4,300	4318.96
TOTAL	Rehab Forebay Sluice Gate	1.00	EA	10,800	3,300	14,100	14088
13 04 77 15 02	Rehab Dischg Chamber Sluice Gate						
13 04 77 15 02 1	Remove Existing Gate	1.00	EA	1,900	600	2,500	2488.97
13 04 77 15 02 2	Rehab Gate	1.00	EA	10,600	3,200	13,800	13808
13 04 77 15 02 3	Install/Test Rehabbed Gate	1.00	EA	4,500	1,300	5,800	5811.44
TOTAL	Rehab Dischg Chamber Sluice Gate	1.00	EA	17,000	5,100	22,100	22109
13 04 77 15 03	Rehab Emerg. Closure Sluice Gate						
13 04 77 15 03 1	Remove Existing Gate	1.00	EA	1,900	600	2,500	2488.97
13 04 77 15 03 2	Rehab Gate	1.00	EA	6,600	2,000	8,500	8524.36
13 04 77 15 03 3	Install/Test Rehabbed Gate	1.00	EA	4,500	1,300	5,800	5811.44
TOTAL	Rehab Emerg. Closure Sluice Gate	1.00	EA	12,900	3,900	16,800	16825
13 04 77 15 04	Rehab Forebay Sluice Gate						

		QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
13 04 77 15 04 1	Remove Existing Gate	1.00	EA	1,000	300	1,200	1244.48
13 04 77 15 04 2	Rehab Gate	1.00	EA	11,800	3,500	15,400	15350
13 04 77 15 04 3	Install/Test Rehabbed Gate	1.00	EA	3,500	1,100	4,600	4566.96
TOTAL	Rehab Forebay Sluice Gate	1.00	EA	16,300	4,900	21,200	21162
13 04 77 15 05	Rehab Dischg Chamber Sluice Gate						
13 04 77 15 05 1	Remove Existing Gate	1.00	EA	1,900	600	2,500	2488.97
13 04 77 15 05 2	Rehab Gate	1.00	EA	11,800	3,500	15,400	15350
13 04 77 15 05 3	Install/Test Rehabbed Gate	1.00	EA	4,500	1,300	5,800	5811.44
TOTAL	Rehab Dischg Chamber Sluice Gate	1.00	EA	18,200	5,500	23,700	23651
13 04 77 15 06	Rehab Emerg. Closure Sluice Gate						
13 04 77 15 06 1	Remove Existing Gate	1.00	EA	1,900	600	2,500	2488.97
13 04 77 15 06 2	Rehab Gate	1.00	EA	7,300	2,200	9,500	9500.38
13 04 77 15 06 3	Install/Test Rehabbed Gate	1.00	EA	4,300	1,300	5,600	5563.45
TOTAL	Rehab Emerg. Closure Sluice Gate	1.00	EA	13,500	4,100	17,600	17553
TOTAL	Mechanical			88,800	26,600	115,400	
TOTAL	Gates and Valves			88,800	26,600	115,400	
13 04 99	Associated General Items						
13 04 99 01	Chain Link Fence						
13 04 99 01 1	Remove Existing Chainlink Fence			500	100	600	
13 04 99 01 2	Install New Chain Link Fence			8,100	1,200	9,400	
TOTAL	Chain Link Fence			8,700	1,300	10,000	
TOTAL	Associated General Items			8,700	1,300	10,000	
TOTAL	Rand			777,400	150,400	927,700	
13 05	Hawthorne						
13 05 01	Mob, Demob & Preparatory Work						
13 05 01 01	Mobilization and Demobilization						
13 05 01 01 1	Mobilization and Demobilization			3,800	800	4,600	

		QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
	TOTAL Mobilization and Demobilization			3,800	800	4,600	
	TOTAL Mob, Demob & Preparatory Work			3,800	800	4,600	
13 05 03	Care and Diversion of Water						
13 05 03 02	Site Work						
13 05 03 02 1	Fabricate Bulkheads			3,100	800	3,800	
13 05 03 02 2	Install Temporary Bulkheads	2.00	DAY	2,600	700	3,300	1645.93
13 05 03 02 3	Remove Temporary Bulkheads	1.00	DAY	1,300	300	1,600	1645.93
	TOTAL Site Work			7,000	1,800	8,800	
13 05 03 15	Mechanical						
13 05 03 15 1	Unwatering Pumps			5,300	1,300	6,600	
	TOTAL Mechanical			5,300	1,300	6,600	
	TOTAL Care and Diversion of Water			12,300	3,100	15,400	
13 05 75	Pumping Plant Superstructure						
13 05 75 04	Masonry						
13 05 75 04 01	Masonry Restoration						
13 05 75 04 01 1	Clean Brick			8,000	1,200	9,200	
13 05 75 04 01 2	Tuckpointing			18,600	2,800	21,300	
	TOTAL Masonry Restoration			26,600	4,000	30,600	
	TOTAL Masonry			26,600	4,000	30,600	
13 05 75 06	Wood and Plastic						
13 05 75 06 01	Fiberglass Grating (PS)						
13 05 75 06 01 1	Remove Existing Grating	205.00	SF	600	100	700	3.26
13 05 75 06 01 2	Install New Grating	205.00	SF	5,700	900	6,600	32.09
	TOTAL Fiberglass Grating (PS)			6,300	900	7,200	
13 05 75 06 02	Fiberglass Ladders - 9ea (PS)						

		QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
13 05 75 06 02 1	Remove Existing Ladders	110.00	LF	2,100	300	2,400	21.51
13 05 75 06 02 2	Install New Ladders	110.00	LF	11,300	1,700	13,000	117.78
	TOTAL Fiberglass Ladders - 9ea (PS)			13,300	2,000	15,300	
13 05 75 06 03	Fiberglass Grating (GW)						
13 05 75 06 03 1	Remove Existing Grating	20.00	SF	100	0	100	3.26
13 05 75 06 03 2	Install New Grating	20.00	SF	600	100	600	32.09
	TOTAL Fiberglass Grating (GW)			600	100	700	
13 05 75 06 04	Fiberglass Ladders (GW)						
13 05 75 06 04 1	Remove Existing Ladders	10.00	LF	200	0	200	21.51
13 05 75 06 04 2	Install New Ladders	10.00	LF	1,000	200	1,200	117.78
	TOTAL Fiberglass Ladders (GW)			1,200	200	1,400	
13 05 75 06 05	Fiberglass Railing (GW)						
13 05 75 06 05 1	Remove Existing Railing	70.00	LF	1,000	100	1,100	16.28
13 05 75 06 05 2	Install New Railing	70.00	LF	5,600	800	6,400	91.86
	TOTAL Fiberglass Railing (GW)			6,600	1,000	7,600	
	TOTAL Wood and Plastic			28,000	4,200	32,200	
13 05 75 07	Thermal & Moisture Protection						
13 05 75 07 01	Roofing						
13 05 75 07 01 1	Remove Existing Roof	4.50	CSF	600	100	700	160.17
13 05 75 07 01 2	Install New Roof	4.50	CSF	900	100	1,100	242.38
	TOTAL Roofing			1,600	200	1,800	
	TOTAL Thermal & Moisture Protection			1,600	200	1,800	
13 05 75 15	Mechanical						
13 05 75 15 01	HVAC						
13 05 75 15 01 1	Electric Unit Heaters	2.00	EA	3,500	500	4,000	1997.36
13 05 75 15 01 2	Ventilation System			4,400	700	5,000	

		QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
	TOTAL HVAC			7,800	1,200	9,000	
	TOTAL Mechanical			7,800	1,200	9,000	
13 05 75 16	Electrical						
13 05 75 16 01	HVAC						
13 05 75 16 01 1	Electric Unit Heaters			2,500	400	2,900	
13 05 75 16 01 2	Ventilation System			700	100	800	
	TOTAL HVAC			3,200	500	3,600	
13 05 75 16 02	Lighting and Power			8,800	1,300	10,100	
	TOTAL Electrical			11,900	1,800	13,700	
	TOTAL Pumping Plant Superstructure			75,900	11,400	87,300	
13 05 76	Pumping Machinery & Appurtenance						
13 05 76 15	Mechanical						
13 05 76 15 01	Replace Baseflow Pump						
13 05 76 15 01 1	Remove Existing Pump	1.00	EA	1,100	200	1,300	1282.94
13 05 76 15 01 2	New Submersible Pump	1.00	EA	9,400	1,400	10,900	10851
13 05 76 15 01 3	Install and Test New Pump	1.00	EA	2,600	400	3,000	2965.75
	TOTAL Replace Baseflow Pump	1.00	EA	13,100	2,000	15,100	15099
13 05 76 15 02	Rehab Stormwater Pumps No 1 & 2						
13 05 76 15 02 1	Remove Existing Pumps	2.00	EA	4,600	700	5,300	2629.30
13 05 76 15 02 2	Rehab Pumps	2.00	EA	157,500	23,600	181,100	90562
13 05 76 15 02 3	Install and Test Rehabbed Pumps	2.00	EA	7,500	1,100	8,600	4301.06
	TOTAL Rehab Stormwater Pumps No 1 & 2	2.00	EA	169,600	25,400	195,000	97492
	TOTAL Mechanical			182,700	27,400	210,100	
13 05 76 16	Electrical						
13 05 76 16 01	Motor Rehabilitation			32,200	4,800	37,100	
13 05 76 16 02	MCC Replacement			48,400	7,300	55,700	
13 05 76 16 03	Sluice Gate Operator			700	100	800	

	QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
13 05 76 16 04 Lubrication System			2,700	400	3,100	
TOTAL Electrical			84,000	12,600	96,600	
TOTAL Pumping Machinery & Appurtenance			266,700	40,000	306,700	
13 05 77 Gates and Valves						
13 05 77 15 Mechanical						
13 05 77 15 01 Rehab Forebay Sluice Gates						
13 05 77 15 01 1 Remove Existing Gate	1.00	EA	1,900	600	2,500	2488.97
13 05 77 15 01 2 Rehab Gate	1.00	EA	14,000	4,200	18,200	18181
13 05 77 15 01 3 Install/Test Rehabbed Gate	1.00	EA	3,300	1,000	4,300	4318.96
TOTAL Rehab Forebay Sluice Gates	3.00	EA	19,200	5,800	25,000	8329.64
13 05 77 15 02 Rehab Forebay/Pond Sluice Gate						
13 05 77 15 02 1 Remove Existing Gate	1.00	EA	1,900	600	2,500	2488.97
13 05 77 15 02 2 Rehab Gate	1.00	EA	8,600	2,600	11,200	11199
13 05 77 15 02 3 Install/Test Rehabbed Gate	1.00	EA	4,300	1,300	5,600	5563.45
TOTAL Rehab Forebay/Pond Sluice Gate	2.00	EA	14,800	4,400	19,300	9625.59
TOTAL Mechanical			34,000	10,200	44,200	
TOTAL Gates and Valves			34,000	10,200	44,200	
TOTAL Hawthorne			392,800	65,400	458,200	
13 06 Homegarden						
13 06 01 Mob, Demob & Preparatory Work						
13 06 01 01 Mobilization and Demobilization						
13 06 01 01 1 Mobilization and Demobilization			3,700	700	4,500	
TOTAL Mobilization and Demobilization			3,700	700	4,500	
TOTAL Mob, Demob & Preparatory Work			3,700	700	4,500	
13 06 02 Sitework						
13 06 02 5 Site Preparation			1,300	400	1,700	

		QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
13 06 02 10	Line Existing Pipe w/ HDPE Pipe			40,600	12,200	52,800	
13 06 02 15	Site Restoration			2,500	800	3,300	
	TOTAL Sitework			44,500	13,300	57,800	
13 06 03	Care and Diversion of Water						
13 06 03 02	Site Work						
13 06 03 02 1	Fabricate Bulkheads			3,100	800	3,800	
13 06 03 02 2	Install Temporary Bulkheads	2.00	DAY	2,600	700	3,300	1645.93
13 06 03 02 3	Remove Temporary Bulkheads	1.00	DAY	1,300	300	1,600	1645.93
	TOTAL Site Work			7,000	1,800	8,800	
13 06 03 15	Mechanical						
13 06 03 15 1	Unwatering Pumps			5,300	1,300	6,600	
	TOTAL Mechanical			5,300	1,300	6,600	
	TOTAL Care and Diversion of Water			12,300	3,100	15,400	
13 06 75	Pumping Plant Superstructure						
13 06 75 06	Wood and Plastic						
13 06 75 06 01	Fiberglass Grating (PS)						
13 06 75 06 01 1	Remove Existing Grating	50.00	SF	100	0	200	3.40
13 06 75 06 01 2	Install New Grating	50.00	SF	1,400	300	1,700	33.49
	TOTAL Fiberglass Grating (PS)			1,500	300	1,800	
13 06 75 06 02	Fiberglass Grating (GW)						
13 06 75 06 02 1	Remove Existing Grating	20.00	SF	100	0	100	3.40
13 06 75 06 02 2	Install New Grating	20.00	SF	600	100	700	33.49
	TOTAL Fiberglass Grating (GW)			600	100	700	
13 06 75 06 03	Fiberglass Ladders (GW)						
13 06 75 06 03 1	Remove Existing Ladders	10.00	LF	200	0	200	22.45
13 06 75 06 03 2	Install New Ladders	10.00	LF	1,000	200	1,200	122.90

	QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
TOTAL Fiberglass Ladders (GW)			1,200	200	1,500	
13 06 75 06 04 Fiberglass Railing (GW)						
13 06 75 06 04 1 Remove Existing Railing	70.00	LF	1,000	200	1,200	16.99
13 06 75 06 04 2 Install New Railing	70.00	LF	5,600	1,100	6,700	95.86
TOTAL Fiberglass Railing (GW)			6,600	1,300	7,900	
TOTAL Wood and Plastic			9,900	2,000	11,900	
13 06 75 07 Thermal & Moisture Protection						
13 06 75 07 01 Roofing						
13 06 75 07 01 1 Remove Existing Roof	130.00	SF	200	0	200	1.91
13 06 75 07 01 2 Install New Roof	130.00	SF	400	100	400	3.24
TOTAL Roofing			600	100	700	
TOTAL Thermal & Moisture Protection			600	100	700	
13 06 75 16 Electrical						
13 06 75 16 02 Lighting and Power			5,300	1,100	6,400	
TOTAL Electrical			5,300	1,100	6,400	
TOTAL Pumping Plant Superstructure			15,800	3,200	19,000	
13 06 76 Pumping Machinery & Appurtenance						
13 06 76 15 Mechanical						
13 06 76 15 01 Rehab Stormwater Pumps No 1						
13 06 76 15 01 1 Remove Existing Pump	1.00	EA	1,900	300	2,200	2201.78
13 06 76 15 01 2 Rehab Pump	1.00	EA	45,300	6,800	52,100	52084
13 06 76 15 01 3 Install and Test Rehabbed Pump	1.00	EA	3,000	500	3,500	3451.45
TOTAL Rehab Stormwater Pumps No 1	1.00	EA	50,200	7,500	57,700	57737
TOTAL Mechanical			50,200	7,500	57,700	
13 06 76 16 Electrical						

		QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
13 06 76 16 01	Motor Rehabilitation			4,100	600	4,800	
13 06 76 16 02	Starter Replacement			17,000	2,500	19,500	
	TOTAL Electrical			21,100	3,200	24,300	
	TOTAL Pumping Machinery & Appurtenance			71,300	10,700	82,000	
13 06 77	Gates and Valves						
13 06 77 15	Mechanical						
13 06 77 15 01	Rehab Gate Well Sluice Gate						
13 06 77 15 01 1	Remove Existing Gate	1.00	EA	2,500	700	3,200	3214.11
13 06 77 15 01 2	Rehab Gate	1.00	EA	7,000	2,100	9,100	9122.97
13 06 77 15 01 3	Install/Test Rehabbed Gate	1.00	EA	3,300	1,000	4,300	4318.96
	TOTAL Rehab Gate Well Sluice Gate	1.00	EA	12,800	3,800	16,700	16656
	TOTAL Mechanical			12,800	3,800	16,700	
	TOTAL Gates and Valves			12,800	3,800	16,700	
	TOTAL Homegarden			160,500	34,900	195,300	
13 07	Lakeside						
13 07 01	Mob, Demob & Preparatory Work						
13 07 01 01	Mobilization and Demobilization						
13 07 01 01 1	Mobilization and Demobilization			3,700	700	4,500	
	TOTAL Mobilization and Demobilization			3,700	700	4,500	
	TOTAL Mob, Demob & Preparatory Work			3,700	700	4,500	
13 07 02	Sitework						
13 07 02 5	Site Preparation			1,300	400	1,700	
13 07 02 10	Line Existing Pipe w/ HDPE Pipe			40,600	12,200	52,800	
13 07 02 15	Site Restoration			2,500	800	3,300	
	TOTAL Sitework			44,500	13,300	57,800	
13 07 03	Care and Diversion of Water						

		QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
13 07 03 02	Site Work						
13 07 03 02 1	Fabricate Bulkheads			3,100	800	3,800	
13 07 03 02 2	Install Temporary Bulkheads	2.00	DAY	2,600	700	3,300	1645.93
13 07 03 02 3	Remove Temporary Bulkheads	1.00	DAY	1,300	300	1,600	1645.93
	TOTAL Site Work			7,000	1,800	8,800	
13 07 03 15	Mechanical						
13 07 03 15 1	Unwatering Pumps			5,300	1,300	6,600	
	TOTAL Mechanical			5,300	1,300	6,600	
	TOTAL Care and Diversion of Water			12,300	3,100	15,400	
13 07 75	Pumping Plant Superstructure						
13 07 75 06	Wood and Plastic						
13 07 75 06 01	Fiberglass Grating						
13 07 75 06 01 1	Remove Existing Grating	50.00	SF	100	0	200	3.40
13 07 75 06 01 2	Install New Grating	50.00	SF	1,400	300	1,700	33.49
	TOTAL Fiberglass Grating			1,500	300	1,800	
13 07 75 06 02	Fiberglass Grating (GW)						
13 07 75 06 02 1	Remove Existing Grating	20.00	SF	100	0	100	3.40
13 07 75 06 02 2	Install New Grating	20.00	SF	600	100	700	33.49
	TOTAL Fiberglass Grating (GW)			600	100	700	
13 07 75 06 03	Fiberglass Ladders (GW)						
13 07 75 06 03 1	Remove Existing Ladders	10.00	LF	200	0	200	22.45
13 07 75 06 03 2	Install New Ladders	10.00	LF	1,000	200	1,200	122.90
	TOTAL Fiberglass Ladders (GW)			1,200	200	1,500	
13 07 75 06 04	Fiberglass Railing (GW)						
13 07 75 06 04 1	Remove Existing Railing	70.00	LF	1,000	200	1,200	16.99
13 07 75 06 04 2	Install New Railing	70.00	LF	5,600	1,100	6,700	95.86

		QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
	TOTAL Fiberglass Railing (GW)			6,600	1,300	7,900	
	TOTAL Wood and Plastic			9,900	2,000	11,900	
13 07 75 07	Thermal & Moisture Protection						
13 07 75 07 01	Roofing						
13 07 75 07 01 1	Remove Existing Roof	130.00	SF	200	0	200	1.91
13 07 75 07 01 2	Install New Roof	130.00	SF	400	100	400	3.24
	TOTAL Roofing			600	100	700	
	TOTAL Thermal & Moisture Protection			600	100	700	
13 07 75 16	Electrical						
13 07 75 16 02	Lighting and Power			5,300	1,100	6,300	
	TOTAL Electrical			5,300	1,100	6,300	
	TOTAL Pumping Plant Superstructure			15,800	3,200	18,900	
13 07 76	Pumping Machinery & Appurtenance						
13 07 76 15	Mechanical						
13 07 76 15 01	Rehab Stormwater Pumps No 1						
13 07 76 15 01 1	Remove Existing Pump	1.00	EA	1,900	300	2,200	2201.78
13 07 76 15 01 2	Rehab Pump	1.00	EA	47,200	7,100	54,300	54254
13 07 76 15 01 3	Install and Test Rehabbed Pump	1.00	EA	3,000	500	3,500	3451.45
	TOTAL Rehab Stormwater Pumps No 1	1.00	EA	52,100	7,800	59,900	59907
	TOTAL Mechanical			52,100	7,800	59,900	
13 07 76 16	Electrical						
13 07 76 16 01	Motor Rehabilitation			5,200	800	5,900	
13 07 76 16 02	Starter Replacement			10,600	1,600	12,200	
	TOTAL Electrical			15,700	2,400	18,100	
	TOTAL Pumping Machinery & Appurtenance			67,800	10,200	78,000	

	QUANTY	UOM	CONTRACT	CONTINGN	TOTAL COST	UNIT
13 07 77 Gates and Valves						
13 07 77 15 Mechanical						
13 07 77 15 01 Rehab Gate Well Sluice Gate						
13 07 77 15 01 1 Remove Existing Gate	1.00	EA	3,400	1,000	4,500	4458.59
13 07 77 15 01 2 Rehab Gate	1.00	EA	8,600	2,600	11,100	11121
13 07 77 15 01 3 Install/Test Rehabbed Gate	1.00	EA	4,800	1,500	6,300	6288.59
TOTAL Rehab Gate Well Sluice Gate	1.00	EA	16,800	5,000	21,900	21868
TOTAL Mechanical			16,800	5,000	21,900	
TOTAL Gates and Valves			16,800	5,000	21,900	
TOTAL Lakeside			160,900	35,500	196,500	
TOTAL Pumping Plant			3,840,100	725,000	4,565,000	
30 Planning, Engineering, & Design						
30 01 Planning, Engineering, & Design						
30 01 1 Planning, Engineering, & Design			2,441,000	732,300	3,173,300	
TOTAL Planning, Engineering, & Design			2,441,000	732,300	3,173,300	
TOTAL Planning, Engineering, & Design			2,441,000	732,300	3,173,300	
31 Construction Management						
31 01 Construction Management						
31 01 1 Construction Management			1,436,000	430,800	1,866,800	
TOTAL Construction Management			1,436,000	430,800	1,866,800	
TOTAL Construction Management			1,436,000	430,800	1,866,800	
TOTAL WOOD RIVER			18,338,100	3,820,100	22,158,200	

** PROJECT INDIRECT SUMMARY - Level 1 (Rounded to 100's) **

	QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
01 Lands and Damages			100,000	0	0	0	0	100,000	
11 Levees and Floodwalls			8,611,300	430,100	451,600	948,500	79,500	10,521,000	
13 Pumping Plant			3,142,500	157,100	165,000	346,500	29,100	3,840,100	
30 Planning, Engineering, & Design			2,441,000	0	0	0	0	2,441,000	
31 Construction Management			1,436,000	0	0	0	0	1,436,000	
WOOD RIVER			15,730,700	587,300	616,600	1,294,900	108,600	18,338,100	
Contingency								3,820,100	
TOTAL INCL OWNER COSTS								22,158,200	

** PROJECT INDIRECT SUMMARY - Level 2 (Rounded to 100's) **

	QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
01 Lands and Damages									
01 01 Gross Appraisal Estimate			100,000	0	0	0	0	100,000	
TOTAL Lands and Damages			100,000	0	0	0	0	100,000	
11 Levees and Floodwalls									
11 01 Levees			3,330,300	166,500	174,800	367,200	30,800	4,069,600	
11 02 Gravity Drainage Structures			3,147,300	156,900	164,800	346,000	29,000	3,844,100	
11 03 Closure Structures			2,133,700	106,700	112,000	235,200	19,700	2,607,400	
TOTAL Levees and Floodwalls			8,611,300	430,100	451,600	948,500	79,500	10,521,000	
13 Pumping Plant									
13 01 East Alton No. 1			484,200	24,200	25,400	53,400	4,500	591,700	
13 02 East Alton No. 2			538,200	26,900	28,300	59,300	5,000	657,700	
13 03 Wood River			899,500	45,000	47,200	99,200	8,300	1,099,200	
13 04 Rand			636,200	31,800	33,400	70,100	5,900	777,400	
13 05 Hawthorne			321,400	16,100	16,900	35,400	3,000	392,800	
13 06 Homegarden			131,300	6,600	6,900	14,500	1,200	160,500	
13 07 Lakeside			131,700	6,600	6,900	14,500	1,200	160,900	
TOTAL Pumping Plant			3,142,500	157,100	165,000	346,500	29,100	3,840,100	
30 Planning, Engineering, & Design									
30 01 Planning, Engineering, & Design			2,441,000	0	0	0	0	2,441,000	
TOTAL Planning, Engineering, & Design			2,441,000	0	0	0	0	2,441,000	
31 Construction Management									
31 01 Construction Management			1,436,000	0	0	0	0	1,436,000	
TOTAL Construction Management			1,436,000	0	0	0	0	1,436,000	
TOTAL WOOD RIVER			15,730,700	587,300	616,600	1,294,900	108,600	18,338,100	
Contingency								3,820,100	
TOTAL INCL OWNER COSTS								22,158,200	

	QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
01 Lands and Damages									
01 01 Gross Appraisal Estimate									
01 01 1 Lands and Damages			100,000	0	0	0	0	100,000	
TOTAL Gross Appraisal Estimate			100,000	0	0	0	0	100,000	
TOTAL Lands and Damages			100,000	0	0	0	0	100,000	
11 Levees and Floodwalls									
11 01 Levees									
11 01 01 Levees and Berms			3,330,300	166,500	174,800	367,200	30,800	4,069,600	
TOTAL Levees			3,330,300	166,500	174,800	367,200	30,800	4,069,600	
11 02 Gravity Drainage Structures									
11 02 01 Upper Wood River Levee (UWRL)			397,800	19,900	20,900	43,900	3,700	486,100	
11 02 02 East and West Fork Levee			628,200	31,200	32,800	68,900	5,800	766,900	
11 02 03 Lower Wood River Levee (LWRL)			2,121,200	105,800	111,100	233,300	19,600	2,591,000	
TOTAL Gravity Drainage Structures			3,147,300	156,900	164,800	346,000	29,000	3,844,100	
11 03 Closure Structures									
11 03 01 Upper Wood River Levee (UWRL)			166,900	8,300	8,800	18,400	1,500	204,000	
11 03 02 East and West Fork Levee			401,800	20,100	21,100	44,300	3,700	491,000	
11 03 03 Lower Wood River Levee (LWRL)			1,565,000	78,200	82,200	172,500	14,500	1,912,400	
TOTAL Closure Structures			2,133,700	106,700	112,000	235,200	19,700	2,607,400	
TOTAL Levees and Floodwalls			8,611,300	430,100	451,600	948,500	79,500	10,521,000	
13 Pumping Plant									
13 01 East Alton No. 1									
13 01 01 Mob, Demob & Preparatory Work			3,100	200	200	300	0	3,800	
13 01 03 Care and Diversion of Water			10,100	500	500	1,100	100	12,300	
13 01 78 Auxiliary Equipment			471,000	23,500	24,700	51,900	4,400	575,500	
TOTAL East Alton No. 1			484,200	24,200	25,400	53,400	4,500	591,700	

	QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
13 02 East Alton No. 2									
13 02 01 Mob, Demob & Preparatory Work			3,100	200	200	300	0	3,800	
13 02 02 Sitework			69,600	3,500	3,700	7,700	600	85,100	
13 02 03 Care and Diversion of Water			10,100	500	500	1,100	100	12,300	
13 02 75 Pumping Plant Superstructure			87,800	4,400	4,600	9,700	800	107,300	
13 02 76 Pumping Machinery & Appurtenance			273,000	13,600	14,300	30,100	2,500	333,600	
13 02 77 Gates and Valves			75,600	3,800	4,000	8,300	700	92,400	
13 02 99 Associated General Items			19,000	1,000	1,000	2,100	200	23,200	
TOTAL East Alton No. 2			538,200	26,900	28,300	59,300	5,000	657,700	
13 03 Wood River									
13 03 01 Mob, Demob & Preparatory Work			3,100	200	200	300	0	3,800	
13 03 03 Care and Diversion of Water			10,100	500	500	1,100	100	12,300	
13 03 75 Pumping Plant Superstructure			120,800	6,000	6,300	13,300	1,100	147,600	
13 03 76 Pumping Machinery & Appurtenance			520,900	26,000	27,300	57,400	4,800	636,600	
13 03 77 Gates and Valves			234,200	11,700	12,300	25,800	2,200	286,200	
13 03 99 Associated General Items			10,300	500	500	1,100	100	12,600	
TOTAL Wood River			899,500	45,000	47,200	99,200	8,300	1,099,200	
13 04 Rand									
13 04 01 Mob, Demob & Preparatory Work			3,100	200	200	300	0	3,800	
13 04 02 Sitework			81,900	4,100	4,300	9,000	800	100,100	
13 04 03 Care and Diversion of Water			10,100	500	500	1,100	100	12,300	
13 04 75 Pumping Plant Superstructure			65,800	3,300	3,500	7,300	600	80,400	
13 04 76 Pumping Machinery & Appurtenance			395,500	19,800	20,800	43,600	3,700	483,300	
13 04 77 Gates and Valves			72,600	3,600	3,800	8,000	700	88,800	
13 04 99 Associated General Items			7,100	400	400	800	100	8,700	
TOTAL Rand			636,200	31,800	33,400	70,100	5,900	777,400	
13 05 Hawthorne									
13 05 01 Mob, Demob & Preparatory Work			3,100	200	200	300	0	3,800	
13 05 03 Care and Diversion of Water			10,100	500	500	1,100	100	12,300	
13 05 75 Pumping Plant Superstructure			62,100	3,100	3,300	6,800	600	75,900	
13 05 76 Pumping Machinery & Appurtenance			218,200	10,900	11,500	24,100	2,000	266,700	
13 05 77 Gates and Valves			27,800	1,400	1,500	3,100	300	34,000	
TOTAL Hawthorne			321,400	16,100	16,900	35,400	3,000	392,800	
13 06 Homegarden									

	QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
13 06 01 Mob, Demob & Preparatory Work			3,100	200	200	300	0	3,700	
13 06 02 Sitework			36,400	1,800	1,900	4,000	300	44,500	
13 06 03 Care and Diversion of Water			10,100	500	500	1,100	100	12,300	
13 06 75 Pumping Plant Superstructure			13,000	600	700	1,400	100	15,800	
13 06 76 Pumping Machinery & Appurtenance			58,400	2,900	3,100	6,400	500	71,300	
13 06 77 Gates and Valves			10,500	500	600	1,200	100	12,800	
TOTAL Homegarden			131,300	6,600	6,900	14,500	1,200	160,500	
13 07 Lakeside									
13 07 01 Mob, Demob & Preparatory Work			3,100	200	200	300	0	3,700	
13 07 02 Sitework			36,400	1,800	1,900	4,000	300	44,500	
13 07 03 Care and Diversion of Water			10,100	500	500	1,100	100	12,300	
13 07 75 Pumping Plant Superstructure			12,900	600	700	1,400	100	15,800	
13 07 76 Pumping Machinery & Appurtenance			55,500	2,800	2,900	6,100	500	67,800	
13 07 77 Gates and Valves			13,800	700	700	1,500	100	16,800	
TOTAL Lakeside			131,700	6,600	6,900	14,500	1,200	160,900	
TOTAL Pumping Plant			3,142,500	157,100	165,000	346,500	29,100	3,840,100	
30 Planning, Engineering, & Design									
30 01 Planning, Engineering, & Design									
30 01 1 Planning, Engineering, & Design			2,441,000	0	0	0	0	2,441,000	
TOTAL Planning, Engineering, & Design			2,441,000	0	0	0	0	2,441,000	
TOTAL Planning, Engineering, & Design			2,441,000	0	0	0	0	2,441,000	
31 Construction Management									
31 01 Construction Management									
31 01 1 Construction Management			1,436,000	0	0	0	0	1,436,000	
TOTAL Construction Management			1,436,000	0	0	0	0	1,436,000	
TOTAL Construction Management			1,436,000	0	0	0	0	1,436,000	
TOTAL WOOD RIVER			15,730,700	587,300	616,600	1,294,900	108,600	18,338,100	
Contingency								3,820,100	
TOTAL INCL OWNER COSTS								22,158,200	

	QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
01 Lands and Damages									
01 01 Gross Appraisal Estimate									
01 01 1 Lands and Damages			100,000	0	0	0	0	100,000	
TOTAL Gross Appraisal Estimate			100,000	0	0	0	0	100,000	
TOTAL Lands and Damages			100,000	0	0	0	0	100,000	
11 Levees and Floodwalls									
11 01 Levees									
11 01 01 Levees and Berms									
11 01 01 01 Rehab/Replace Exist Relief Wel			1,548,700	77,400	81,300	170,700	14,300	1,892,400	
11 01 01 02 New Relief Wells			1,781,600	89,100	93,500	196,400	16,500	2,177,100	
TOTAL Levees and Berms			3,330,300	166,500	174,800	367,200	30,800	4,069,600	
TOTAL Levees			3,330,300	166,500	174,800	367,200	30,800	4,069,600	
11 02 Gravity Drainage Structures									
11 02 01 Upper Wood River Levee (UWRL)									
11 02 01 2 GW-2, 72" Drain (Flank)			120,300	6,000	6,300	13,300	1,100	147,000	
11 02 01 3 GW-3, 18" Drain (Flank)			92,500	4,600	4,900	10,200	900	113,000	
11 02 01 4 GW-4, 18" Drain (Flank)			92,500	4,600	4,900	10,200	900	113,000	
11 02 01 5 GW-5, 18" Drain (Flank)			92,500	4,600	4,900	10,200	900	113,000	
TOTAL Upper Wood River Levee (UWRL)			397,800	19,900	20,900	43,900	3,700	486,100	
11 02 02 East and West Fork Levee									
11 02 02 1 GW-6, 48" Drain (East Fork)			70,200	3,500	3,700	7,700	600	85,800	
11 02 02 2 GW-7, 24" Drain (East Fork)			96,700	4,800	5,100	10,700	900	118,200	
11 02 02 3 GW-8, 36" Drain (East Fork)			67,400	3,400	3,500	7,400	600	82,400	
11 02 02 4 GW-9, 24" Drain (East Fork)			96,700	4,800	5,100	10,700	900	118,200	
11 02 02 5 GW-10, 42" Drain (East Fork)			69,400	3,500	3,600	7,700	600	84,800	
11 02 02 6 GW-11, 36" Drain (East Fork)			67,400	3,400	3,500	7,400	600	82,400	
11 02 02 7 GW-12, 36" Drain (West Fork)			69,100	3,400	3,500	7,400	600	84,100	
11 02 02 8 GW-13, 12" Drain (West Fork)			91,300	4,500	4,700	9,900	800	111,100	
TOTAL East and West Fork Levee			628,200	31,200	32,800	68,900	5,800	766,900	

		QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
11 02 03	Lower Wood River Levee (LWRL)									
11 02 03 1	GW-14, 48" Drain (Flank)			70,200	3,500	3,700	7,700	600	85,800	
11 02 03 2	GW-15, 30" Drain (Flank)			68,700	3,300	3,500	7,400	600	83,600	
11 02 03 3	GW-16, 42" Drain (Flank)			71,100	3,500	3,600	7,700	600	86,500	
11 02 03 4	GW-17, 42" Drain (Flank)			79,300	3,900	4,100	8,600	700	96,500	
11 02 03 5	GW-18, 42" Drain (Flank)			69,400	3,500	3,600	7,700	600	84,800	
11 02 03 6	GW-19, 36" Drain (Flank)			67,400	3,400	3,500	7,400	600	82,400	
11 02 03 7	GW-20, 24" Drain (Flank)			96,700	4,800	5,100	10,700	900	118,200	
11 02 03 8	GW-21, 24" Drain (Flank)			96,700	4,800	5,100	10,700	900	118,200	
11 02 03 10	GW-23, 30" Drain (Flank)			67,000	3,300	3,500	7,400	600	81,900	
11 02 03 11	GW-24, 48" Drain (Riverfront)			80,500	4,000	4,200	8,900	700	98,300	
11 02 03 14	GW-27, 24" Drain (Riverfront)			96,700	4,800	5,100	10,700	900	118,200	
11 02 03 16	GW-29, 18" Drain (Riverfront)			92,500	4,600	4,900	10,200	900	113,000	
11 02 03 18	GW-31, 24" Drain (Riverfront)			96,700	4,800	5,100	10,700	900	118,200	
11 02 03 19	GW-32, 24" Drain (Riverfront)			96,700	4,800	5,100	10,700	900	118,200	
11 02 03 20	GW-33, 24" Drain (Riverfront)			101,700	5,100	5,300	11,200	900	124,300	
11 02 03 21	GW-34, 48" Drain (Cahokia Cree			70,200	3,500	3,700	7,700	600	85,800	
11 02 03 22	GW-35, 48" Drain (Cahokia Cree			70,200	3,500	3,700	7,700	600	85,800	
11 02 03 23	GW-36, 48" Drain (Cahokia Cree			70,200	3,500	3,700	7,700	600	85,800	
11 02 03 24	GW-37, 72" Drain (Cahokia Cree			136,000	6,800	7,100	15,000	1,300	166,100	
11 02 03 25	GW-38, 42" Drain (Cahokia Cree			77,600	3,900	4,100	8,600	700	94,800	
11 02 03 26	GW-39, 72" Drain (Cahokia Cree			88,800	4,400	4,700	9,800	800	108,600	
11 02 03 27	GW-40, 30" Drain (Indian Creek			67,000	3,300	3,500	7,400	600	81,900	
11 02 03 28	GW-41, 72" Drain (Indian Creek			129,600	6,500	6,800	14,300	1,200	158,400	
11 02 03 29	GW-42, 36" Drain (Indian Creek			67,400	3,400	3,500	7,400	600	82,400	
11 02 03 30	GW-43, 30" Drain (Indian Creek			46,400	2,300	2,400	5,100	400	56,700	
11 02 03 31	GW-44, 30" Drain (Indian Creek			46,400	2,300	2,400	5,100	400	56,700	
	TOTAL Lower Wood River Levee (LWRL)			2,121,200	105,800	111,100	233,300	19,600	2,591,000	
	TOTAL Gravity Drainage Structures			3,147,300	156,900	164,800	346,000	29,000	3,844,100	
11 03	Closure Structures									
11 03 01	Upper Wood River Levee (UWRL)									
11 03 01 1	CS-1, Rail Closure (Riverfront			12,600	600	700	1,400	100	15,400	
11 03 01 2	CS-2, Rail Closure (Riverfront			12,600	600	700	1,400	100	15,400	
11 03 01 3	CS-3, Rail Closure (Riverfront			12,600	600	700	1,400	100	15,400	
11 03 01 4	CS-4, Rail Closure (Riverfront			59,400	3,000	3,100	6,600	500	72,600	
11 03 01 5	CS-5, Road Closure (Riverfront			36,500	1,800	1,900	4,000	300	44,600	
11 03 01 7	CS-7, Rail Closure (Flank)			3,900	200	200	400	0	4,800	
11 03 01 8	CS-8, Rail Closure (Flank)			13,000	600	700	1,400	100	15,900	
11 03 01 9	CS-9, Rail Closure (Flank)			16,300	800	900	1,800	200	19,900	
	TOTAL Upper Wood River Levee (UWRL)			166,900	8,300	8,800	18,400	1,500	204,000	
11 03 02	East and West Fork Levee									

	QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
11 03 02 1 CS-10, Rail Closure (East Fork			401,800	20,100	21,100	44,300	3,700	491,000	
TOTAL East and West Fork Levee			401,800	20,100	21,100	44,300	3,700	491,000	
11 03 03 Lower Wood River Levee (LWRL)									
11 03 03 1 CS-11, Rail Closure (Flank)			396,500	19,800	20,800	43,700	3,700	484,500	
11 03 03 2 CS-12, Road Closure (Flank)			938,900	46,900	49,300	103,500	8,700	1,147,300	
11 03 03 3 CS-13, Rail Closure (Flank)			11,700	600	600	1,300	100	14,300	
11 03 03 4 CS-14, Rail Closure (Flank)			16,300	800	900	1,800	200	19,900	
11 03 03 5 CS-15, Road Closure (Flank)			35,700	1,800	1,900	3,900	300	43,700	
11 03 03 6 CS-16, Road Closure (Flank)			35,700	1,800	1,900	3,900	300	43,700	
11 03 03 7 CS-17, Rail Closure (Flank)			12,800	600	700	1,400	100	15,600	
11 03 03 8 CS-18, Rail Closure (Flank)			200	0	0	0	0	200	
11 03 03 9 CS-19, Road Closure (Riverfron			12,800	600	700	1,400	100	15,600	
11 03 03 10 CS-20, Road Closure (Riverfron			44,200	2,200	2,300	4,900	400	54,000	
11 03 03 11 CS-21 Road Closure (Riverfront			9,100	500	500	1,000	100	11,100	
11 03 03 12 CS-22, Road Closure (Riverfron			12,800	600	700	1,400	100	15,600	
11 03 03 13 CS-23, Road Closure(Cahokia Cr			700	0	0	100	0	900	
11 03 03 14 CS-24, Road Closure (Indian Cr			12,900	600	700	1,400	100	15,800	
11 03 03 15 CS-25, Road Closure (Indian Cr			800	0	0	100	0	900	
11 03 03 16 CS-26, Rail Closure (Indian Cr			23,900	1,200	1,300	2,600	200	29,200	
TOTAL Lower Wood River Levee (LWRL)			1,565,000	78,200	82,200	172,500	14,500	1,912,400	
TOTAL Closure Structures			2,133,700	106,700	112,000	235,200	19,700	2,607,400	
TOTAL Levees and Floodwalls			8,611,300	430,100	451,600	948,500	79,500	10,521,000	
13 Pumping Plant									
13 01 East Alton No. 1									
13 01 01 Mob, Demob & Preparatory Work									
13 01 01 01 Mobilization and Demobilizatio			3,100	200	200	300	0	3,800	
TOTAL Mob, Demob & Preparatory Work			3,100	200	200	300	0	3,800	
13 01 03 Care and Diversion of Water									
13 01 03 02 Site Work			5,700	300	300	600	100	7,000	
13 01 03 15 Mechanical			4,300	200	200	500	0	5,300	
TOTAL Care and Diversion of Water			10,100	500	500	1,100	100	12,300	
13 01 78 Auxiliary Equipment									

** PROJECT INDIRECT SUMMARY - Level 4 (Rounded to 100's) **

	QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
13 01 78 15 Mechanical			471,000	23,500	24,700	51,900	4,400	575,500	
TOTAL Auxiliary Equipment			471,000	23,500	24,700	51,900	4,400	575,500	
TOTAL East Alton No. 1			484,200	24,200	25,400	53,400	4,500	591,700	
13 02 East Alton No. 2									
13 02 01 Mob, Demob & Preparatory Work									
13 02 01 01 Mobilization and Demobilizatio			3,100	200	200	300	0	3,800	
TOTAL Mob, Demob & Preparatory Work			3,100	200	200	300	0	3,800	
13 02 02 Sitework									
13 02 02 5 Site Preparation			1,100	100	100	100	0	1,300	
13 02 02 10 Line Existing Pipe w/ HDPE Pip	2.00	EA	66,500	3,300	3,500	7,300	600	81,200	40602
13 02 02 15 Site Restoration			2,100	100	100	200	0	2,500	
TOTAL Sitework			69,600	3,500	3,700	7,700	600	85,100	
13 02 03 Care and Diversion of Water									
13 02 03 02 Site Work			5,700	300	300	600	100	7,000	
13 02 03 15 Mechanical			4,300	200	200	500	0	5,300	
TOTAL Care and Diversion of Water			10,100	500	500	1,100	100	12,300	
13 02 75 Pumping Plant Superstructure									
13 02 75 04 Masonry			29,800	1,500	1,600	3,300	300	36,400	
13 02 75 06 Wood and Plastic			33,100	1,700	1,700	3,700	300	40,500	
13 02 75 07 Thermal & Moisture Protection			2,300	100	100	300	0	2,800	
13 02 75 15 Mechanical			10,000	500	500	1,100	100	12,300	
13 02 75 16 Electrical			12,500	600	700	1,400	100	15,300	
TOTAL Pumping Plant Superstructure			87,800	4,400	4,600	9,700	800	107,300	
13 02 76 Pumping Machinery & Appurtenance									
13 02 76 15 Mechanical			150,600	7,500	7,900	16,600	1,400	184,100	
13 02 76 16 Electrical			122,400	6,100	6,400	13,500	1,100	149,500	
TOTAL Pumping Machinery & Appurtenan			273,000	13,600	14,300	30,100	2,500	333,600	

	QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
13 02 77 Gates and Valves									
13 02 77 15 Mechanical			75,600	3,800	4,000	8,300	700	92,400	
TOTAL Gates and Valves			75,600	3,800	4,000	8,300	700	92,400	
13 02 99 Associated General Items									
13 02 99 01 Trashrack			19,000	1,000	1,000	2,100	200	23,200	
TOTAL Associated General Items			19,000	1,000	1,000	2,100	200	23,200	
TOTAL East Alton No. 2			538,200	26,900	28,300	59,300	5,000	657,700	
13 03 Wood River									
13 03 01 Mob, Demob & Preparatory Work									
13 03 01 01 Mobilization and Demobilizatio			3,100	200	200	300	0	3,800	
TOTAL Mob, Demob & Preparatory Work			3,100	200	200	300	0	3,800	
13 03 03 Care and Diversion of Water									
13 03 03 02 Site Work			5,700	300	300	600	100	7,000	
13 03 03 15 Mechanical			4,300	200	200	500	0	5,300	
TOTAL Care and Diversion of Water			10,100	500	500	1,100	100	12,300	
13 03 75 Pumping Plant Superstructure									
13 03 75 04 Masonry			32,600	1,600	1,700	3,600	300	39,900	
13 03 75 06 Wood and Plastic			62,600	3,100	3,300	6,900	600	76,500	
13 03 75 07 Thermal & Moisture Protection			2,900	100	200	300	0	3,500	
13 03 75 15 Mechanical			10,200	500	500	1,100	100	12,500	
13 03 75 16 Electrical			12,500	600	700	1,400	100	15,200	
TOTAL Pumping Plant Superstructure			120,800	6,000	6,300	13,300	1,100	147,600	
13 03 76 Pumping Machinery & Appurtenance									
13 03 76 15 Mechanical			374,700	18,700	19,700	41,300	3,500	457,800	
13 03 76 16 Electrical			146,300	7,300	7,700	16,100	1,400	178,800	
TOTAL Pumping Machinery & Appurtenan			520,900	26,000	27,300	57,400	4,800	636,600	

	QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
13 03 77 Gates and Valves									
13 03 77 15 Mechanical			234,200	11,700	12,300	25,800	2,200	286,200	
TOTAL Gates and Valves			234,200	11,700	12,300	25,800	2,200	286,200	
13 03 99 Associated General Items									
13 03 99 01 Chain Link Fence			10,300	500	500	1,100	100	12,600	
TOTAL Associated General Items			10,300	500	500	1,100	100	12,600	
TOTAL Wood River			899,500	45,000	47,200	99,200	8,300	1,099,200	
13 04 Rand									
13 04 01 Mob, Demob & Preparatory Work									
13 04 01 01 Mobilization and Demobilizatio			3,100	200	200	300	0	3,800	
TOTAL Mob, Demob & Preparatory Work			3,100	200	200	300	0	3,800	
13 04 02 Sitework									
13 04 02 5 Site Preparation			1,100	100	100	100	0	1,300	
13 04 02 10 Line Existing Pipe w/Insitufor			78,800	3,900	4,100	8,700	700	96,200	
13 04 02 15 Site Restoration			2,100	100	100	200	0	2,500	
TOTAL Sitework			81,900	4,100	4,300	9,000	800	100,100	
13 04 03 Care and Diversion of Water									
13 04 03 02 Site Work			5,700	300	300	600	100	7,000	
13 04 03 15 Mechanical			4,300	200	200	500	0	5,300	
TOTAL Care and Diversion of Water			10,100	500	500	1,100	100	12,300	
13 04 75 Pumping Plant Superstructure									
13 04 75 04 Masonry			15,500	800	800	1,700	100	19,000	
13 04 75 06 Wood and Plastic			33,600	1,700	1,800	3,700	300	41,100	
13 04 75 07 Thermal & Moisture Protection			900	0	0	100	0	1,100	
13 04 75 15 Mechanical			6,400	300	300	700	100	7,800	
13 04 75 16 Electrical			9,400	500	500	1,000	100	11,500	
TOTAL Pumping Plant Superstructure			65,800	3,300	3,500	7,300	600	80,400	

	QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
13 04 76 Pumping Machinery & Appurtenance									
13 04 76 15 Mechanical			355,000	17,800	18,600	39,100	3,300	433,800	
13 04 76 16 Electrical			40,500	2,000	2,100	4,500	400	49,400	
TOTAL Pumping Machinery & Appurtenan			395,500	19,800	20,800	43,600	3,700	483,300	
13 04 77 Gates and Valves									
13 04 77 15 Mechanical			72,600	3,600	3,800	8,000	700	88,800	
TOTAL Gates and Valves			72,600	3,600	3,800	8,000	700	88,800	
13 04 99 Associated General Items									
13 04 99 01 Chain Link Fence			7,100	400	400	800	100	8,700	
TOTAL Associated General Items			7,100	400	400	800	100	8,700	
TOTAL Rand			636,200	31,800	33,400	70,100	5,900	777,400	
13 05 Hawthorne									
13 05 01 Mob, Demob & Preparatory Work									
13 05 01 01 Mobilization and Demobilizatio			3,100	200	200	300	0	3,800	
TOTAL Mob, Demob & Preparatory Work			3,100	200	200	300	0	3,800	
13 05 03 Care and Diversion of Water									
13 05 03 02 Site Work			5,700	300	300	600	100	7,000	
13 05 03 15 Mechanical			4,300	200	200	500	0	5,300	
TOTAL Care and Diversion of Water			10,100	500	500	1,100	100	12,300	
13 05 75 Pumping Plant Superstructure									
13 05 75 04 Masonry			21,700	1,100	1,100	2,400	200	26,600	
13 05 75 06 Wood and Plastic			22,900	1,100	1,200	2,500	200	28,000	
13 05 75 07 Thermal & Moisture Protection			1,300	100	100	100	0	1,600	
13 05 75 15 Mechanical			6,400	300	300	700	100	7,800	
13 05 75 16 Electrical			9,700	500	500	1,100	100	11,900	
TOTAL Pumping Plant Superstructure			62,100	3,100	3,300	6,800	600	75,900	

	QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
13 05 76 Pumping Machinery & Appurtenance									
13 05 76 15 Mechanical			149,500	7,500	7,800	16,500	1,400	182,700	
13 05 76 16 Electrical			68,800	3,400	3,600	7,600	600	84,000	
TOTAL Pumping Machinery & Appurtenan			218,200	10,900	11,500	24,100	2,000	266,700	
13 05 77 Gates and Valves									
13 05 77 15 Mechanical			27,800	1,400	1,500	3,100	300	34,000	
TOTAL Gates and Valves			27,800	1,400	1,500	3,100	300	34,000	
TOTAL Hawthorne			321,400	16,100	16,900	35,400	3,000	392,800	
13 06 Homegarden									
13 06 01 Mob, Demob & Preparatory Work									
13 06 01 01 Mobilization and Demobilizatio			3,100	200	200	300	0	3,700	
TOTAL Mob, Demob & Preparatory Work			3,100	200	200	300	0	3,700	
13 06 02 Sitework									
13 06 02 5 Site Preparation			1,100	100	100	100	0	1,300	
13 06 02 10 Line Existing Pipe w/ HDPE Pip			33,200	1,700	1,700	3,700	300	40,600	
13 06 02 15 Site Restoration			2,100	100	100	200	0	2,500	
TOTAL Sitework			36,400	1,800	1,900	4,000	300	44,500	
13 06 03 Care and Diversion of Water									
13 06 03 02 Site Work			5,700	300	300	600	100	7,000	
13 06 03 15 Mechanical			4,300	200	200	500	0	5,300	
TOTAL Care and Diversion of Water			10,100	500	500	1,100	100	12,300	
13 06 75 Pumping Plant Superstructure									
13 06 75 06 Wood and Plastic			8,100	400	400	900	100	9,900	
13 06 75 07 Thermal & Moisture Protection			500	0	0	100	0	600	
13 06 75 16 Electrical			4,400	200	200	500	0	5,300	
TOTAL Pumping Plant Superstructure			13,000	600	700	1,400	100	15,800	

	QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
13 06 76 Pumping Machinery & Appurtenance									
13 06 76 15 Mechanical			41,100	2,100	2,200	4,500	400	50,200	
13 06 76 16 Electrical			17,300	900	900	1,900	200	21,100	
TOTAL Pumping Machinery & Appurtenan			58,400	2,900	3,100	6,400	500	71,300	
13 06 77 Gates and Valves									
13 06 77 15 Mechanical			10,500	500	600	1,200	100	12,800	
TOTAL Gates and Valves			10,500	500	600	1,200	100	12,800	
TOTAL Homegarden			131,300	6,600	6,900	14,500	1,200	160,500	
13 07 Lakeside									
13 07 01 Mob, Demob & Preparatory Work									
13 07 01 01 Mobilization and Demobilizatio			3,100	200	200	300	0	3,700	
TOTAL Mob, Demob & Preparatory Work			3,100	200	200	300	0	3,700	
13 07 02 Sitework									
13 07 02 5 Site Preparation			1,100	100	100	100	0	1,300	
13 07 02 10 Line Existing Pipe w/ HDPE Pip			33,200	1,700	1,700	3,700	300	40,600	
13 07 02 15 Site Restoration			2,100	100	100	200	0	2,500	
TOTAL Sitework			36,400	1,800	1,900	4,000	300	44,500	
13 07 03 Care and Diversion of Water									
13 07 03 02 Site Work			5,700	300	300	600	100	7,000	
13 07 03 15 Mechanical			4,300	200	200	500	0	5,300	
TOTAL Care and Diversion of Water			10,100	500	500	1,100	100	12,300	
13 07 75 Pumping Plant Superstructure									
13 07 75 06 Wood and Plastic			8,100	400	400	900	100	9,900	
13 07 75 07 Thermal & Moisture Protection			500	0	0	100	0	600	
13 07 75 16 Electrical			4,300	200	200	500	0	5,300	
TOTAL Pumping Plant Superstructure			12,900	600	700	1,400	100	15,800	

	QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
13 07 76 Pumping Machinery & Appurtenance									
13 07 76 15 Mechanical			42,600	2,100	2,200	4,700	400	52,100	
13 07 76 16 Electrical			12,900	600	700	1,400	100	15,700	
TOTAL Pumping Machinery & Appurtenan			55,500	2,800	2,900	6,100	500	67,800	
13 07 77 Gates and Valves									
13 07 77 15 Mechanical			13,800	700	700	1,500	100	16,800	
TOTAL Gates and Valves			13,800	700	700	1,500	100	16,800	
TOTAL Lakeside			131,700	6,600	6,900	14,500	1,200	160,900	
TOTAL Pumping Plant			3,142,500	157,100	165,000	346,500	29,100	3,840,100	
30 Planning, Engineering, & Design									
30 01 Planning, Engineering, & Design									
30 01 1 Planning, Engineering, & Design			2,441,000	0	0	0	0	2,441,000	
TOTAL Planning, Engineering, & Desig			2,441,000	0	0	0	0	2,441,000	
TOTAL Planning, Engineering, & Desig			2,441,000	0	0	0	0	2,441,000	
31 Construction Management									
31 01 Construction Management									
31 01 1 Construction Management			1,436,000	0	0	0	0	1,436,000	
TOTAL Construction Management			1,436,000	0	0	0	0	1,436,000	
TOTAL Construction Management			1,436,000	0	0	0	0	1,436,000	
TOTAL WOOD RIVER			15,730,700	587,300	616,600	1,294,900	108,600	18,338,100	
Contingency								3,820,100	
TOTAL INCL OWNER COSTS								22,158,200	

** PROJECT INDIRECT SUMMARY - Level 6 (Rounded to 100's) **

	QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
01 Lands and Damages									
01 01 Gross Appraisal Estimate									
01 01 1 Lands and Damages			100,000	0	0	0	0	100,000	
TOTAL Gross Appraisal Estima			100,000	0	0	0	0	100,000	
TOTAL Lands and Damages			100,000	0	0	0	0	100,000	
11 Levees and Floodwalls									
11 01 Levees									
11 01 01 Levees and Berms									
11 01 01 01 Rehab/Replace Exist Relief Wel									
11 01 01 01 1 Well Evaluation	153.00	EA	375,600	18,800	19,700	41,400	3,500	459,000	3000.00
11 01 01 01 2 Well Reconstruction	122.00	EA	649,000	32,500	34,100	71,600	6,000	793,100	6501.01
11 01 01 01 4 Replace Wells	20.00	EA	442,000	22,100	23,200	48,700	4,100	540,100	27006
11 01 01 01 5 Pilot Holes for New Wells	20.00	EA	82,000	4,100	4,300	9,000	800	100,200	5010.18
TOTAL Rehab/Replace Exist Re			1,548,700	77,400	81,300	170,700	14,300	1,892,400	
11 01 01 02 New Relief Wells									
11 01 01 02 1 New Relief Wells	68.00	EA	1,502,800	75,100	78,900	165,700	13,900	1,836,400	27006
11 01 01 02 2 Pilot Holes for New Wells	68.00	EA	278,800	13,900	14,600	30,700	2,600	340,700	5010.18
TOTAL New Relief Wells			1,781,600	89,100	93,500	196,400	16,500	2,177,100	
TOTAL Levees and Berms			3,330,300	166,500	174,800	367,200	30,800	4,069,600	
TOTAL Levees			3,330,300	166,500	174,800	367,200	30,800	4,069,600	
11 02 Gravity Drainage Structures									
11 02 01 Upper Wood River Levee (UWRL)									
11 02 01 2 GW-2, 72" Drain (Flank)									
11 02 01 2 01 Mob, Demob & Preparatory W									
11 02 01 2 01 1 Mobilization and Demob			3,100	200	200	300	0	3,800	
TOTAL Mob, Demob & Preparato			3,100	200	200	300	0	3,800	

** PROJECT INDIRECT SUMMARY - Level 6 (Rounded to 100's) **

		QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
11 02 01 2 02	Care and Diversion of Wate									
11 02 01 2 02 1	Fabricate Bulkheads			2,500	100	100	300	0	3,100	
11 02 01 2 02 2	Install Temporary Bulk	2.00	DAY	2,200	100	100	200	0	2,600	1316.74
11 02 01 2 02 3	Remove Temporary Bulkh	1.00	DAY	1,100	100	100	100	0	1,300	1316.74
11 02 01 2 02 4	Unwatering Pumps			4,300	200	200	500	0	5,300	
	TOTAL Care and Diversion of			10,100	500	500	1,100	100	12,300	
11 02 01 2 03	Sitework									
11 02 01 2 03 1	Site Preparation			1,100	100	100	100	0	1,300	
11 02 01 2 03 2	Line Existing Pipe w/			75,700	3,800	4,000	8,300	700	92,500	
11 02 01 2 03 3	Site Restoration			2,100	100	100	200	0	2,500	
	TOTAL Sitework			78,800	3,900	4,100	8,700	700	96,300	
11 02 01 2 04	Drainage Structure									
11 02 01 2 04 1	Replace Handrail			5,400	300	300	600	0	6,600	
11 02 01 2 04 2	Replace Grating			500	0	0	100	0	600	
11 02 01 2 04 3	Replace Ladders			1,000	0	100	100	0	1,200	
	TOTAL Drainage Structure			6,900	300	400	800	100	8,400	
11 02 01 2 05	Gates									
11 02 01 2 05 1	Remove Existing Gate	1.00	EA	3,400	200	200	400	0	4,200	4173.20
11 02 01 2 05 2	Rehab Gate	1.00	EA	12,300	600	600	1,400	100	15,100	15076
11 02 01 2 05 3	Install/Test Rehabbed	1.00	EA	5,700	300	300	600	100	6,900	6909.94
	TOTAL Gates			21,400	1,100	1,100	2,400	200	26,200	
	TOTAL GW-2, 72" Drain (Flank			120,300	6,000	6,300	13,300	1,100	147,000	
11 02 01 3	GW-3, 18" Drain (Flank)									
11 02 01 3 01	Mob, Demob & Preparatory W									
11 02 01 3 01 1	Mobilization and Demob			3,100	200	200	300	0	3,800	
	TOTAL Mob, Demob & Preparato			3,100	200	200	300	0	3,800	
11 02 01 3 02	Care and Diversion of Wate									
11 02 01 3 02 1	Fabricate Bulkheads			2,500	100	100	300	0	3,100	

** PROJECT INDIRECT SUMMARY - Level 6 (Rounded to 100's) **

		QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
11 02 01 3 02 2	Install Temporary Bulk	2.00	DAY	2,200	100	100	200	0	2,600	1316.74
11 02 01 3 02 3	Remove Temporary Bulkh	1.00	DAY	1,100	100	100	100	0	1,300	1316.74
11 02 01 3 02 4	Unwatering Pumps			4,300	200	200	500	0	5,300	
TOTAL	Care and Diversion of			10,100	500	500	1,100	100	12,300	
11 02 01 3 03	Sitework									
11 02 01 3 03 1	Clearing, Grubbing and	1.20	ACR	1,700	100	100	200	0	2,100	1758.26
11 02 01 3 03 2	Pavement Removal	110.00	SY	600	0	0	100	0	700	6.68
11 02 01 3 03 3	Remove Crushed Stone	80.00	TON	300	0	0	0	0	300	4.27
11 02 01 3 03 4	Excavation	6540.00	CY	16,100	800	800	1,800	100	19,700	3.01
11 02 01 3 03 5	Cofferdam	1700.00	CY	4,800	200	300	500	0	5,900	3.49
11 02 01 3 03 6	Remove Existing Pipe	250.00	LF	1,600	100	100	200	0	2,000	8.04
11 02 01 3 03 7	Install New RCP	250.00	LF	8,600	400	500	900	100	10,500	42.03
11 02 01 3 03 8	Place and Compact Back	7800.00	CY	27,300	1,400	1,400	3,000	300	33,400	4.28
11 02 01 3 03 9	Crushed Stone Surfacin	80.00	TON	800	0	0	100	0	1,000	12.54
11 02 01 3 03 10	Bitumineous Road Repai	110.00	SY	500	0	0	100	0	600	5.86
11 02 01 3 03 11	Establishment of Turf	1.20	ACR	900	0	0	100	0	1,100	951.33
TOTAL	Sitework			63,400	3,200	3,300	7,000	600	77,500	
11 02 01 3 04	Drainage Structure									
11 02 01 3 04 1	Replace Handrail			5,400	300	300	600	0	6,600	
11 02 01 3 04 2	Replace Grating			500	0	0	100	0	600	
11 02 01 3 04 3	Replace Ladders			1,000	0	100	100	0	1,200	
TOTAL	Drainage Structure			6,900	300	400	800	100	8,400	
11 02 01 3 05	Gates									
11 02 01 3 05 1	Remove Existing Gate	1.00	EA	1,600	100	100	200	0	1,900	1914.59
11 02 01 3 05 2	Rehab Gate	1.00	EA	4,600	200	200	500	0	5,600	5626.15
11 02 01 3 05 3	Install/Test Rehabbed	1.00	EA	2,800	100	100	300	0	3,500	3480.59
TOTAL	Gates			9,000	500	500	1,000	100	11,000	
TOTAL	GW-3, 18" Drain (Flank			92,500	4,600	4,900	10,200	900	113,000	
11 02 01 4	GW-4, 18" Drain (Flank)									
11 02 01 4 01	Mob, Demob & Preparatory W									
11 02 01 4 01 1	Mobilization and Demob			3,100	200	200	300	0	3,800	
TOTAL	Mob, Demob & Preparato			3,100	200	200	300	0	3,800	

** PROJECT INDIRECT SUMMARY - Level 6 (Rounded to 100's) **

	QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
11 02 01 4 02 Care and Diversion of Wate									
11 02 01 4 02 1 Fabricate Bulkheads			2,500	100	100	300	0	3,100	
11 02 01 4 02 2 Install Temporary Bulk	2.00	DAY	2,200	100	100	200	0	2,600	1316.74
11 02 01 4 02 3 Remove Temporary Bulkh	1.00	DAY	1,100	100	100	100	0	1,300	1316.74
11 02 01 4 02 4 Unwatering Pumps			4,300	200	200	500	0	5,300	
TOTAL Care and Diversion of			10,100	500	500	1,100	100	12,300	
11 02 01 4 03 Sitework									
11 02 01 4 03 1 Clearing, Grubbing and	1.20	ACR	1,700	100	100	200	0	2,100	1758.26
11 02 01 4 03 2 Pavement Removal	110.00	SY	600	0	0	100	0	700	6.68
11 02 01 4 03 3 Remove Crushed Stone	80.00	TON	300	0	0	0	0	300	4.27
11 02 01 4 03 4 Excavation	6540.00	CY	16,100	800	800	1,800	100	19,700	3.01
11 02 01 4 03 5 Cofferdam	1700.00	CY	4,800	200	300	500	0	5,900	3.49
11 02 01 4 03 6 Remove Existing Pipe	250.00	LF	1,600	100	100	200	0	2,000	8.04
11 02 01 4 03 7 Install New RCP	250.00	LF	8,600	400	500	900	100	10,500	42.03
11 02 01 4 03 8 Place and Compact Back	7800.00	CY	27,300	1,400	1,400	3,000	300	33,400	4.28
11 02 01 4 03 9 Crushed Stone Surfacin	80.00	TON	800	0	0	100	0	1,000	12.54
11 02 01 4 03 10 Bitumineous Road Repai	110.00	SY	500	0	0	100	0	600	5.86
11 02 01 4 03 11 Establishment of Turf	1.20	ACR	900	0	0	100	0	1,100	951.33
TOTAL Sitework			63,400	3,200	3,300	7,000	600	77,500	
11 02 01 4 04 Drainage Structure									
11 02 01 4 04 1 Replace Handrail			5,400	300	300	600	0	6,600	
11 02 01 4 04 2 Replace Grating			500	0	0	100	0	600	
11 02 01 4 04 3 Replace Ladders			1,000	0	100	100	0	1,200	
TOTAL Drainage Structure			6,900	300	400	800	100	8,400	
11 02 01 4 05 Gates									
11 02 01 4 05 1 Remove Existing Gate	1.00	EA	1,600	100	100	200	0	1,900	1914.59
11 02 01 4 05 2 Rehab Gate	1.00	EA	4,600	200	200	500	0	5,600	5626.15
11 02 01 4 05 3 Install/Test Rehabbed	1.00	EA	2,800	100	100	300	0	3,500	3480.59
TOTAL Gates			9,000	500	500	1,000	100	11,000	
TOTAL GW-4, 18" Drain (Flank			92,500	4,600	4,900	10,200	900	113,000	
11 02 01 5 GW-5, 18" Drain (Flank)									
11 02 01 5 01 Mob, Demob & Preparatory W									

** PROJECT INDIRECT SUMMARY - Level 6 (Rounded to 100's) **

		QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
11 02 01 5 01 1	Mobilization and Demob			3,100	200	200	300	0	3,800	
	TOTAL Mob, Demob & Preparato			3,100	200	200	300	0	3,800	
11 02 01 5 02	Care and Diversion of Wate									
11 02 01 5 02 1	Fabricate Bulkheads			2,500	100	100	300	0	3,100	
11 02 01 5 02 2	Install Temporary Bulk	2.00	DAY	2,200	100	100	200	0	2,600	1316.74
11 02 01 5 02 3	Remove Temporary Bulkh	1.00	DAY	1,100	100	100	100	0	1,300	1316.74
11 02 01 5 02 4	Unwatering Pumps			4,300	200	200	500	0	5,300	
	TOTAL Care and Diversion of			10,100	500	500	1,100	100	12,300	
11 02 01 5 03	Sitework									
11 02 01 5 03 1	Clearing, Grubbing and	1.20	ACR	1,700	100	100	200	0	2,100	1758.26
11 02 01 5 03 2	Pavement Removal	110.00	SY	600	0	0	100	0	700	6.68
11 02 01 5 03 3	Remove Crushed Stone	80.00	TON	300	0	0	0	0	300	4.27
11 02 01 5 03 4	Excavation	6540.00	CY	16,100	800	800	1,800	100	19,700	3.01
11 02 01 5 03 5	Cofferdam	1700.00	CY	4,800	200	300	500	0	5,900	3.49
11 02 01 5 03 6	Remove Existing Pipe	250.00	LF	1,600	100	100	200	0	2,000	8.04
11 02 01 5 03 7	Install New RCP	250.00	LF	8,600	400	500	900	100	10,500	42.03
11 02 01 5 03 8	Place and Compact Back	7800.00	CY	27,300	1,400	1,400	3,000	300	33,400	4.28
11 02 01 5 03 9	Crushed Stone Surfacin	80.00	TON	800	0	0	100	0	1,000	12.54
11 02 01 5 03 10	Bitumineous Road Repai	110.00	SY	500	0	0	100	0	600	5.86
11 02 01 5 03 11	Establishment of Turf	1.20	ACR	900	0	0	100	0	1,100	951.33
	TOTAL Sitework			63,400	3,200	3,300	7,000	600	77,500	
11 02 01 5 04	Drainage Structure									
11 02 01 5 04 1	Replace Handrail			5,400	300	300	600	0	6,600	
11 02 01 5 04 2	Replace Grating			500	0	0	100	0	600	
11 02 01 5 04 3	Replace Ladders			1,000	0	100	100	0	1,200	
	TOTAL Drainage Structure			6,900	300	400	800	100	8,400	
11 02 01 5 05	Gates									
11 02 01 5 05 1	Remove Existing Gate	1.00	EA	1,600	100	100	200	0	1,900	1914.59
11 02 01 5 05 2	Rehab Gate	1.00	EA	4,600	200	200	500	0	5,600	5626.15
11 02 01 5 05 3	Install/Test Rehabbed	1.00	EA	2,800	100	100	300	0	3,500	3480.59
	TOTAL Gates			9,000	500	500	1,000	100	11,000	
	TOTAL GW-5, 18" Drain (Flank			92,500	4,600	4,900	10,200	900	113,000	

		QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
	TOTAL Upper Wood River Levee			397,800	19,900	20,900	43,900	3,700	486,100	
11 02 02	East and West Fork Levee									
11 02 02 1	GW-6, 48" Drain (East Fork)									
11 02 02 1 01	Mob, Demob & Preparatory W									
11 02 02 1 01 1	Mobilization and Demob			3,100	200	200	300	0	3,800	
	TOTAL Mob, Demob & Preparato			3,100	200	200	300	0	3,800	
11 02 02 1 02	Care and Diversion of Wate									
11 02 02 1 02 1	Fabricate Bulkheads			2,500	100	100	300	0	3,100	
11 02 02 1 02 2	Install Temporary Bulk	2.00	DAY	2,200	100	100	200	0	2,600	1316.74
11 02 02 1 02 3	Remove Temporary Bulkh	1.00	DAY	1,100	100	100	100	0	1,300	1316.74
11 02 02 1 02 4	Unwatering Pumps			4,300	200	200	500	0	5,300	
	TOTAL Care and Diversion of			10,100	500	500	1,100	100	12,300	
11 02 02 1 03	Sitework									
11 02 02 1 03 1	Site Preparation			1,100	100	100	100	0	1,300	
11 02 02 1 03 2	Line Existing Pipe w/			33,200	1,700	1,700	3,700	300	40,600	
11 02 02 1 03 3	Site Restoration			2,100	100	100	200	0	2,500	
	TOTAL Sitework			36,400	1,800	1,900	4,000	300	44,500	
11 02 02 1 04	Drainage Structure									
11 02 02 1 04 1	Replace Handrail			5,400	300	300	600	0	6,600	
11 02 02 1 04 2	Replace Grating			500	0	0	100	0	600	
11 02 02 1 04 3	Replace Ladders			1,000	0	100	100	0	1,200	
	TOTAL Drainage Structure			6,900	300	400	800	100	8,400	
11 02 02 1 05	Gates									
11 02 02 1 05 1	Remove Existing Gate	1.00	EA	2,800	100	100	300	0	3,400	3429.69
11 02 02 1 05 2	Rehab Gate	1.00	EA	7,000	400	400	800	100	8,600	8554.34
11 02 02 1 05 3	Install/Test Rehabbed	1.00	EA	4,000	200	200	400	0	4,800	4837.38
	TOTAL Gates			13,800	700	700	1,500	100	16,800	
	TOTAL GW-6, 48" Drain (East			70,200	3,500	3,700	7,700	600	85,800	

** PROJECT INDIRECT SUMMARY - Level 6 (Rounded to 100's) **

	QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
11 02 02 2 GW-7, 24" Drain (East Fork)									
11 02 02 2 01 Mob, Demob & Preparatory W									
11 02 02 2 01 1 Mobilization and Demob			3,100	200	200	300	0	3,800	
TOTAL Mob, Demob & Preparato			3,100	200	200	300	0	3,800	
11 02 02 2 02 Care and Diversion of Wate									
11 02 02 2 02 1 Fabricate Bulkheads			2,500	100	100	300	0	3,100	
11 02 02 2 02 2 Install Temporary Bulk	2.00	DAY	2,200	100	100	200	0	2,600	1316.74
11 02 02 2 02 3 Remove Temporary Bulkh	1.00	DAY	1,100	100	100	100	0	1,300	1316.74
11 02 02 2 02 4 Unwatering Pumps			4,300	200	200	500	0	5,300	
TOTAL Care and Diversion of			10,100	500	500	1,100	100	12,300	
11 02 02 2 03 Sitework									
11 02 02 2 03 1 Clearing, Grubbing and	1.20	ACR	1,700	100	100	200	0	2,100	1758.26
11 02 02 2 03 2 Pavement Removal	110.00	SY	600	0	0	100	0	700	6.68
11 02 02 2 03 3 Remove Crushed Stone	80.00	TON	300	0	0	0	0	300	4.27
11 02 02 2 03 4 Excavation	6540.00	CY	16,100	800	800	1,800	100	19,700	3.01
11 02 02 2 03 5 Cofferdam	1700.00	CY	4,800	200	300	500	0	5,900	3.49
11 02 02 2 03 6 Remove Existing Pipe	250.00	LF	2,100	100	100	200	0	2,500	10.05
11 02 02 2 03 7 Install New RCP	250.00	LF	11,500	600	600	1,300	100	14,000	55.97
11 02 02 2 03 8 Place and Compact Back	7800.00	CY	27,300	1,400	1,400	3,000	300	33,400	4.28
11 02 02 2 03 9 Crushed Stone Surfacin	80.00	TON	800	0	0	100	0	1,000	12.54
11 02 02 2 03 10 Bitumineous Road Repai	110.00	SY	500	0	0	100	0	600	5.86
11 02 02 2 03 11 Establishment of Turf	1.20	ACR	900	0	0	100	0	1,100	951.33
TOTAL Sitework			66,700	3,300	3,500	7,300	600	81,500	
11 02 02 2 04 Drainage Structure									
11 02 02 2 04 1 Replace Handrail			5,400	300	300	600	0	6,600	
11 02 02 2 04 2 Replace Grating			500	0	0	100	0	600	
11 02 02 2 04 3 Replace Ladders			1,000	0	100	100	0	1,200	
TOTAL Drainage Structure			6,900	300	400	800	100	8,400	
11 02 02 2 05 Gates									
11 02 02 2 05 1 Remove Existing Gate	1.00	EA	2,000	100	100	200	0	2,500	2472.39
11 02 02 2 05 2 Rehab Gate	1.00	EA	5,100	300	300	600	0	6,200	6206.79
11 02 02 2 05 3 Install/Test Rehabbed	1.00	EA	2,800	100	100	300	0	3,500	3480.59

		QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
	TOTAL Gates			10,000	500	500	1,100	100	12,200	
	TOTAL GW-7, 24" Drain (East			96,700	4,800	5,100	10,700	900	118,200	
11 02 02 3	GW-8, 36" Drain (East Fork)									
11 02 02 3 01	Mob, Demob & Preparatory W									
11 02 02 3 01 1	Mobilization and Demob			3,100	200	200	300	0	3,800	
	TOTAL Mob, Demob & Preparato			3,100	200	200	300	0	3,800	
11 02 02 3 02	Care and Diversion of Wate									
11 02 02 3 02 1	Fabricate Bulkheads			2,500	100	100	300	0	3,100	
11 02 02 3 02 2	Install Temporary Bulk	2.00	DAY	2,200	100	100	200	0	2,600	1316.74
11 02 02 3 02 3	Remove Temporary Bulkh	1.00	DAY	1,100	100	100	100	0	1,300	1316.74
11 02 02 3 02 4	Unwatering Pumps			4,300	200	200	500	0	5,300	
	TOTAL Care and Diversion of			10,100	500	500	1,100	100	12,300	
11 02 02 3 03	Sitework									
11 02 02 3 03 1	Site Preparation			1,100	100	100	100	0	1,300	
11 02 02 3 03 2	Line Existing Pipe w/			33,200	1,700	1,700	3,700	300	40,600	
11 02 02 3 03 3	Site Restoration			2,100	100	100	200	0	2,500	
	TOTAL Sitework			36,400	1,800	1,900	4,000	300	44,500	
11 02 02 3 04	Drainage Structure									
11 02 02 3 04 1	Replace Handrail			5,400	300	300	600	0	6,600	
11 02 02 3 04 2	Replace Grating			500	0	0	100	0	600	
11 02 02 3 04 3	Replace Ladders			1,000	0	100	100	0	1,200	
	TOTAL Drainage Structure			6,900	300	400	800	100	8,400	
11 02 02 3 05	Gates									
11 02 02 3 05 1	Remove Existing Gate	1.00	EA	2,000	100	100	200	0	2,500	2472.39
11 02 02 3 05 2	Rehab Gate	1.00	EA	5,700	300	300	600	100	7,000	7017.67
11 02 02 3 05 3	Install/Test Rehabbed	1.00	EA	3,200	200	200	400	0	3,900	3880.08
	TOTAL Gates			10,900	500	600	1,200	100	13,400	
	TOTAL GW-8, 36" Drain (East			67,400	3,400	3,500	7,400	600	82,400	

** PROJECT INDIRECT SUMMARY - Level 6 (Rounded to 100's) **

	QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
11 02 02 4 GW-9, 24" Drain (East Fork)									
11 02 02 4 01 Mob, Demob & Preparatory W									
11 02 02 4 01 1 Mobilization and Demob			3,100	200	200	300	0	3,800	
TOTAL Mob, Demob & Preparato			3,100	200	200	300	0	3,800	
11 02 02 4 02 Care and Diversion of Wate									
11 02 02 4 02 1 Fabricate Bulkheads			2,500	100	100	300	0	3,100	
11 02 02 4 02 2 Install Temporary Bulk	2.00	DAY	2,200	100	100	200	0	2,600	1316.74
11 02 02 4 02 3 Remove Temporary Bulkh	1.00	DAY	1,100	100	100	100	0	1,300	1316.74
11 02 02 4 02 4 Unwatering Pumps			4,300	200	200	500	0	5,300	
TOTAL Care and Diversion of			10,100	500	500	1,100	100	12,300	
11 02 02 4 03 Sitework									
11 02 02 4 03 1 Clearing, Grubbing and	1.20	ACR	1,700	100	100	200	0	2,100	1758.26
11 02 02 4 03 2 Pavement Removal	110.00	SY	600	0	0	100	0	700	6.68
11 02 02 4 03 3 Remove Crushed Stone	80.00	TON	300	0	0	0	0	300	4.27
11 02 02 4 03 4 Excavation	6540.00	CY	16,100	800	800	1,800	100	19,700	3.01
11 02 02 4 03 5 Cofferdam	1700.00	CY	4,800	200	300	500	0	5,900	3.49
11 02 02 4 03 6 Remove Existing Pipe	250.00	LF	2,100	100	100	200	0	2,500	10.05
11 02 02 4 03 7 Install New RCP	250.00	LF	11,500	600	600	1,300	100	14,000	55.97
11 02 02 4 03 8 Place and Compact Back	7800.00	CY	27,300	1,400	1,400	3,000	300	33,400	4.28
11 02 02 4 03 9 Crushed Stone Surfacin	80.00	TON	800	0	0	100	0	1,000	12.54
11 02 02 4 03 10 Bitumineous Road Repai	110.00	SY	500	0	0	100	0	600	5.86
11 02 02 4 03 11 Establishment of Turf	1.20	ACR	900	0	0	100	0	1,100	951.33
TOTAL Sitework			66,700	3,300	3,500	7,300	600	81,500	
11 02 02 4 04 Drainage Structure									
11 02 02 4 04 1 Replace Handrail			5,400	300	300	600	0	6,600	
11 02 02 4 04 2 Replace Grating			500	0	0	100	0	600	
11 02 02 4 04 3 Replace Ladders			1,000	0	100	100	0	1,200	
TOTAL Drainage Structure			6,900	300	400	800	100	8,400	
11 02 02 4 05 Gates									
11 02 02 4 05 1 Remove Existing Gate	1.00	EA	2,000	100	100	200	0	2,500	2472.39
11 02 02 4 05 2 Rehab Gate	1.00	EA	5,100	300	300	600	0	6,200	6206.79
11 02 02 4 05 3 Install/Test Rehabbed	1.00	EA	2,800	100	100	300	0	3,500	3480.59

		QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
	TOTAL Gates			10,000	500	500	1,100	100	12,200	
	TOTAL GW-9, 24" Drain (East			96,700	4,800	5,100	10,700	900	118,200	
11 02 02 5	GW-10, 42" Drain (East Fork)									
11 02 02 5 01	Mob, Demob & Preparatory W									
11 02 02 5 01 1	Mobilization and Demob			3,100	200	200	300	0	3,800	
	TOTAL Mob, Demob & Preparato			3,100	200	200	300	0	3,800	
11 02 02 5 02	Care and Diversion of Wate									
11 02 02 5 02 1	Fabricate Bulkheads			2,500	100	100	300	0	3,100	
11 02 02 5 02 2	Install Temporary Bulk	2.00	DAY	2,200	100	100	200	0	2,600	1316.74
11 02 02 5 02 3	Remove Temporary Bulkh	1.00	DAY	1,100	100	100	100	0	1,300	1316.74
11 02 02 5 02 4	Unwatering Pumps			4,300	200	200	500	0	5,300	
	TOTAL Care and Diversion of			10,100	500	500	1,100	100	12,300	
11 02 02 5 03	Sitework									
11 02 02 5 03 1	Site Preparation			1,100	100	100	100	0	1,300	
11 02 02 5 03 2	Line Existing Pipe w/			33,200	1,700	1,700	3,700	300	40,600	
11 02 02 5 03 3	Site Restoration			2,100	100	100	200	0	2,500	
	TOTAL Sitework			36,400	1,800	1,900	4,000	300	44,500	
11 02 02 5 04	Drainage Structure									
11 02 02 5 04 1	Replace Handrail			5,400	300	300	600	0	6,600	
11 02 02 5 04 2	Replace Grating			500	0	0	100	0	600	
11 02 02 5 04 3	Replace Ladders			1,000	0	100	100	0	1,200	
	TOTAL Drainage Structure			6,900	300	400	800	100	8,400	
11 02 02 5 05	Gates									
11 02 02 5 05 1	Remove Existing Gate	1.00	EA	2,800	100	100	300	0	3,400	3429.69
11 02 02 5 05 2	Rehab Gate	1.00	EA	6,200	300	300	700	100	7,500	7538.22
11 02 02 5 05 3	Install/Test Rehabbed	1.00	EA	4,000	200	200	400	0	4,800	4837.38
	TOTAL Gates			12,900	600	700	1,400	100	15,800	
	TOTAL GW-10, 42" Drain (East			69,400	3,500	3,600	7,700	600	84,800	

	QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
11 02 02 6 GW-11, 36" Drain (East Fork)									
11 02 02 6 01 Mob, Demob & Preparatory W									
11 02 02 6 01 1 Mobilization and Demob			3,100	200	200	300	0	3,800	
TOTAL Mob, Demob & Preparato			3,100	200	200	300	0	3,800	
11 02 02 6 02 Care and Diversion of Wate									
11 02 02 6 02 1 Fabricate Bulkheads			2,500	100	100	300	0	3,100	
11 02 02 6 02 2 Install Temporary Bulk	2.00	DAY	2,200	100	100	200	0	2,600	1316.74
11 02 02 6 02 3 Remove Temporary Bulkh	1.00	DAY	1,100	100	100	100	0	1,300	1316.74
11 02 02 6 02 4 Unwatering Pumps			4,300	200	200	500	0	5,300	
TOTAL Care and Diversion of			10,100	500	500	1,100	100	12,300	
11 02 02 6 03 Sitework									
11 02 02 6 03 1 Site Preparation			1,100	100	100	100	0	1,300	
11 02 02 6 03 2 Line Existing Pipe w/			33,200	1,700	1,700	3,700	300	40,600	
11 02 02 6 03 3 Site Restoration			2,100	100	100	200	0	2,500	
TOTAL Sitework			36,400	1,800	1,900	4,000	300	44,500	
11 02 02 6 04 Drainage Structure									
11 02 02 6 04 1 Replace Handrail			5,400	300	300	600	0	6,600	
11 02 02 6 04 2 Replace Grating			500	0	0	100	0	600	
11 02 02 6 04 3 Replace Ladders			1,000	0	100	100	0	1,200	
TOTAL Drainage Structure			6,900	300	400	800	100	8,400	
11 02 02 6 05 Gates									
11 02 02 6 05 1 Remove Existing Gate	1.00	EA	2,000	100	100	200	0	2,500	2472.39
11 02 02 6 05 2 Rehab Gate	1.00	EA	5,700	300	300	600	100	7,000	7017.67
11 02 02 6 05 3 Install/Test Rehabbed	1.00	EA	3,200	200	200	400	0	3,900	3880.08
TOTAL Gates			10,900	500	600	1,200	100	13,400	
TOTAL GW-11, 36" Drain (East			67,400	3,400	3,500	7,400	600	82,400	
11 02 02 7 GW-12, 36" Drain (West Fork)									
11 02 02 7 01 Mob, Demob & Preparatory W									

** PROJECT INDIRECT SUMMARY - Level 6 (Rounded to 100's) **

		QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
11 02 02 7 01 1	Mobilization and Demob			3,100	200	200	300	0	3,800	
	TOTAL Mob, Demob & Preparato			3,100	200	200	300	0	3,800	
11 02 02 7 02	Care and Diversion of Wate									
11 02 02 7 02 1	Fabricate Bulkheads			2,500	100	100	300	0	3,100	
11 02 02 7 02 2	Install Temporary Bulk	2.00	DAY	2,200	100	100	200	0	2,600	1316.74
11 02 02 7 02 3	Remove Temporary Bulkh	1.00	DAY	1,100	100	100	100	0	1,300	1316.74
11 02 02 7 02 4	Unwatering Pumps			4,300	200	200	500	0	5,300	
	TOTAL Care and Diversion of			10,100	500	500	1,100	100	12,300	
11 02 02 7 03	Sitework									
11 02 02 7 03 1	Site Preparation			1,100	100	100	100	0	1,300	
11 02 02 7 03 2	Line Existing Pipe w/			33,200	1,700	1,700	3,700	300	40,600	
11 02 02 7 03 3	Site Restoration			2,100	100	100	200	0	2,500	
	TOTAL Sitework			36,400	1,800	1,900	4,000	300	44,500	
11 02 02 7 04	Drainage Structure									
11 02 02 7 04 1	Replace Handrail			5,400	300	300	600	0	6,600	
11 02 02 7 04 2	Replace Grating			500	0	0	100	0	600	
11 02 02 7 04 3	Replace Ladders			1,000	0	100	100	0	1,200	
	TOTAL Drainage Structure			6,900	300	400	800	100	8,400	
11 02 02 7 05	Gates									
11 02 02 7 05 1	Remove Existing Gate	1.00	EA	2,000	100	100	200	0	2,500	2472.39
11 02 02 7 05 2	Rehab Gate	1.00	EA	5,700	300	300	600	100	7,000	7017.67
11 02 02 7 05 3	Install/Test Rehabbed	1.00	EA	3,200	200	200	400	0	3,900	3880.08
	TOTAL Gates			10,900	500	600	1,200	100	13,400	
11 02 02 7 06	Olin Property Security									
11 02 02 7 06 1	Security Personel			1,700	0	0	0	0	1,700	
	TOTAL Olin Property Security			1,700	0	0	0	0	1,700	
	TOTAL GW-12, 36" Drain (West			69,100	3,400	3,500	7,400	600	84,100	

		QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
11 02 02 8	GW-13, 12" Drain (West Fork)									
11 02 02 8 01	Mob, Demob & Preparatory W									
11 02 02 8 01 1	Mobilization and Demob			3,100	200	200	300	0	3,800	
	TOTAL Mob, Demob & Preparato			3,100	200	200	300	0	3,800	
11 02 02 8 02	Care and Diversion of Wate									
11 02 02 8 02 1	Fabricate Bulkheads			2,500	100	100	300	0	3,100	
11 02 02 8 02 2	Install Temporary Bulk	2.00	DAY	2,200	100	100	200	0	2,600	1316.74
11 02 02 8 02 3	Remove Temporary Bulkh	1.00	DAY	1,100	100	100	100	0	1,300	1316.74
11 02 02 8 02 4	Unwatering Pumps			4,300	200	200	500	0	5,300	
	TOTAL Care and Diversion of			10,100	500	500	1,100	100	12,300	
11 02 02 8 03	Sitework									
11 02 02 8 03 1	Clearing, Grubbing and	1.20	ACR	1,700	100	100	200	0	2,100	1758.26
11 02 02 8 03 2	Pavement Removal	110.00	SY	600	0	0	100	0	700	6.68
11 02 02 8 03 3	Remove Crushed Stone	80.00	TON	300	0	0	0	0	300	4.27
11 02 02 8 03 4	Excavation	6540.00	CY	16,100	800	800	1,800	100	19,700	3.01
11 02 02 8 03 5	Cofferdam	1700.00	CY	4,800	200	300	500	0	5,900	3.49
11 02 02 8 03 6	Remove Existing Pipe	250.00	LF	1,600	100	100	200	0	2,000	8.04
11 02 02 8 03 7	Install New RCP	250.00	LF	6,300	300	300	700	100	7,700	30.87
11 02 02 8 03 8	Place and Compact Back	7800.00	CY	27,300	1,400	1,400	3,000	300	33,400	4.28
11 02 02 8 03 9	Crushed Stone Surfacin	80.00	TON	800	0	0	100	0	1,000	12.54
11 02 02 8 03 10	Bitumineous Road Repai	110.00	SY	500	0	0	100	0	600	5.86
11 02 02 8 03 11	Establishment of Turf	1.20	ACR	900	0	0	100	0	1,100	951.33
	TOTAL Sitework			61,100	3,100	3,200	6,700	600	74,700	
11 02 02 8 04	Drainage Structure									
11 02 02 8 04 1	Replace Handrail			5,400	300	300	600	0	6,600	
11 02 02 8 04 2	Replace Grating			500	0	0	100	0	600	
11 02 02 8 04 3	Replace Ladders			1,000	0	100	100	0	1,200	
	TOTAL Drainage Structure			6,900	300	400	800	100	8,400	
11 02 02 8 05	Gates									
11 02 02 8 05 1	Remove Existing Gate	1.00	EA	1,600	100	100	200	0	1,900	1914.59
11 02 02 8 05 2	Rehab Gate	1.00	EA	3,900	200	200	400	0	4,800	4815.28
11 02 02 8 05 3	Install/Test Rehabbed	1.00	EA	2,800	100	100	300	0	3,500	3480.59

	QUANTY UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
TOTAL Gates		8,400	400	400	900	100	10,200	
11 02 02 8 06 Olin Property Security								
11 02 02 8 06 1 Security Personel		1,700	0	0	0	0	1,700	
TOTAL Olin Property Security		1,700	0	0	0	0	1,700	
TOTAL GW-13, 12" Drain (West		91,300	4,500	4,700	9,900	800	111,100	
TOTAL East and West Fork Lev		628,200	31,200	32,800	68,900	5,800	766,900	
11 02 03 Lower Wood River Levee (LWRL)								
11 02 03 1 GW-14, 48" Drain (Flank)								
11 02 03 1 01 Mob, Demob & Preparatory W								
11 02 03 1 01 1 Mobilization and Demob		3,100	200	200	300	0	3,800	
TOTAL Mob, Demob & Preparato		3,100	200	200	300	0	3,800	
11 02 03 1 02 Care and Diversion of Wate								
11 02 03 1 02 1 Fabricate Bulkheads		2,500	100	100	300	0	3,100	
11 02 03 1 02 2 Install Temporary Bulk	2.00 DAY	2,200	100	100	200	0	2,600	1316.74
11 02 03 1 02 3 Remove Temporary Bulkh	1.00 DAY	1,100	100	100	100	0	1,300	1316.74
11 02 03 1 02 4 Unwatering Pumps		4,300	200	200	500	0	5,300	
TOTAL Care and Diversion of		10,100	500	500	1,100	100	12,300	
11 02 03 1 03 Sitework								
11 02 03 1 03 1 Site Preparation		1,100	100	100	100	0	1,300	
11 02 03 1 03 2 Line Existing Pipe w/		33,200	1,700	1,700	3,700	300	40,600	
11 02 03 1 03 3 Site Restoration		2,100	100	100	200	0	2,500	
TOTAL Sitework		36,400	1,800	1,900	4,000	300	44,500	
11 02 03 1 04 Drainage Structure								
11 02 03 1 04 1 Replace Handrail		5,400	300	300	600	0	6,600	
11 02 03 1 04 2 Replace Grating		500	0	0	100	0	600	
11 02 03 1 04 3 Replace Ladders		1,000	0	100	100	0	1,200	
TOTAL Drainage Structure		6,900	300	400	800	100	8,400	

** PROJECT INDIRECT SUMMARY - Level 6 (Rounded to 100's) **

	QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
11 02 03 1 05 Gates									
11 02 03 1 05 1 Remove Existing Gate	1.00	EA	2,800	100	100	300	0	3,400	3429.69
11 02 03 1 05 2 Rehab Gate	1.00	EA	7,000	400	400	800	100	8,600	8554.34
11 02 03 1 05 3 Install/Test Rehabbed	1.00	EA	4,000	200	200	400	0	4,800	4837.38
TOTAL Gates			13,800	700	700	1,500	100	16,800	
TOTAL GW-14, 48" Drain (Flan			70,200	3,500	3,700	7,700	600	85,800	
11 02 03 2 GW-15, 30" Drain (Flank)									
11 02 03 2 01 Mob, Demob & Preparatory W									
11 02 03 2 01 1 Mobilization and Demob			3,100	200	200	300	0	3,800	
TOTAL Mob, Demob & Preparato			3,100	200	200	300	0	3,800	
11 02 03 2 02 Care and Diversion of Wate									
11 02 03 2 02 1 Fabricate Bulkheads			2,500	100	100	300	0	3,100	
11 02 03 2 02 2 Install Temporary Bulk	2.00	DAY	2,200	100	100	200	0	2,600	1316.74
11 02 03 2 02 3 Remove Temporary Bulkh	1.00	DAY	1,100	100	100	100	0	1,300	1316.74
11 02 03 2 02 4 Unwatering Pumps			4,300	200	200	500	0	5,300	
TOTAL Care and Diversion of			10,100	500	500	1,100	100	12,300	
11 02 03 2 03 Sitework									
11 02 03 2 03 1 Site Preparation			1,100	100	100	100	0	1,300	
11 02 03 2 03 2 Line Existing Pipe w/			33,200	1,700	1,700	3,700	300	40,600	
11 02 03 2 03 3 Site Restoration			2,100	100	100	200	0	2,500	
TOTAL Sitework			36,400	1,800	1,900	4,000	300	44,500	
11 02 03 2 04 Drainage Structure									
11 02 03 2 04 1 Replace Handrail			5,400	300	300	600	0	6,600	
11 02 03 2 04 2 Replace Grating			500	0	0	100	0	600	
11 02 03 2 04 3 Replace Ladders			1,000	0	100	100	0	1,200	
TOTAL Drainage Structure			6,900	300	400	800	100	8,400	
11 02 03 2 05 Gates									
11 02 03 2 05 1 Remove Existing Gate	1.00	EA	2,000	100	100	200	0	2,500	2472.39

** PROJECT INDIRECT SUMMARY - Level 6 (Rounded to 100's) **

	QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
11 02 03 2 05 2 Rehab Gate	1.00	EA	5,300	300	300	600	0	6,500	6497.11
11 02 03 2 05 3 Install/Test Rehabbed	1.00	EA	3,200	200	200	400	0	3,900	3880.08
TOTAL Gates			10,500	500	600	1,200	100	12,800	
11 02 03 2 06 Olin Property Security									
11 02 03 2 06 1 Security Personel			1,700	0	0	0	0	1,700	
TOTAL Olin Property Security			1,700	0	0	0	0	1,700	
TOTAL GW-15, 30" Drain (Flan			68,700	3,300	3,500	7,400	600	83,600	
11 02 03 3 GW-16, 42" Drain (Flank)									
11 02 03 3 01 Mob, Demob & Preparatory W									
11 02 03 3 01 1 Mobilization and Demob			3,100	200	200	300	0	3,800	
TOTAL Mob, Demob & Preparato			3,100	200	200	300	0	3,800	
11 02 03 3 02 Care and Diversion of Wate									
11 02 03 3 02 1 Fabricate Bulkheads			2,500	100	100	300	0	3,100	
11 02 03 3 02 2 Install Temporary Bulk	2.00	DAY	2,200	100	100	200	0	2,600	1316.74
11 02 03 3 02 3 Remove Temporary Bulkh	1.00	DAY	1,100	100	100	100	0	1,300	1316.74
11 02 03 3 02 4 Unwatering Pumps			4,300	200	200	500	0	5,300	
TOTAL Care and Diversion of			10,100	500	500	1,100	100	12,300	
11 02 03 3 03 Sitework									
11 02 03 3 03 1 Site Preparation			1,100	100	100	100	0	1,300	
11 02 03 3 03 2 Line Existing Pipe w/			33,200	1,700	1,700	3,700	300	40,600	
11 02 03 3 03 3 Site Restoration			2,100	100	100	200	0	2,500	
TOTAL Sitework			36,400	1,800	1,900	4,000	300	44,500	
11 02 03 3 04 Drainage Structure									
11 02 03 3 04 1 Replace Handrail			5,400	300	300	600	0	6,600	
11 02 03 3 04 2 Replace Grating			500	0	0	100	0	600	
11 02 03 3 04 3 Replace Ladders			1,000	0	100	100	0	1,200	
TOTAL Drainage Structure			6,900	300	400	800	100	8,400	

		QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
11 02 03 3 05	Gates									
11 02 03 3 05 1	Remove Existing Gate	1.00	EA	2,800	100	100	300	0	3,400	3429.69
11 02 03 3 05 2	Rehab Gate	1.00	EA	6,200	300	300	700	100	7,500	7538.22
11 02 03 3 05 3	Install/Test Rehabbed	1.00	EA	4,000	200	200	400	0	4,800	4837.38
	TOTAL Gates			12,900	600	700	1,400	100	15,800	
11 02 03 3 06	Olin Property Security									
11 02 03 3 06 1	Security Personel			1,700	0	0	0	0	1,700	
	TOTAL Olin Property Security			1,700	0	0	0	0	1,700	
	TOTAL GW-16, 42" Drain (Flan			71,100	3,500	3,600	7,700	600	86,500	
11 02 03 4	GW-17, 42" Drain (Flank)									
11 02 03 4 01	Mob, Demob & Preparatory W									
11 02 03 4 01 1	Mobilization and Demob			3,100	200	200	300	0	3,800	
	TOTAL Mob, Demob & Preparato			3,100	200	200	300	0	3,800	
11 02 03 4 02	Care and Diversion of Wate									
11 02 03 4 02 1	Fabricate Bulkheads			2,500	100	100	300	0	3,100	
11 02 03 4 02 2	Install Temporary Bulk	2.00	DAY	2,200	100	100	200	0	2,600	1316.74
11 02 03 4 02 3	Remove Temporary Bulkh	1.00	DAY	1,100	100	100	100	0	1,300	1316.74
11 02 03 4 02 4	Unwatering Pumps			4,300	200	200	500	0	5,300	
	TOTAL Care and Diversion of			10,100	500	500	1,100	100	12,300	
11 02 03 4 03	Sitework									
11 02 03 4 03 1	Site Preparation			1,100	100	100	100	0	1,300	
11 02 03 4 03 2	Line Existing Pipe w/			33,200	1,700	1,700	3,700	300	40,600	
11 02 03 4 03 3	Site Restoration			2,100	100	100	200	0	2,500	
	TOTAL Sitework			36,400	1,800	1,900	4,000	300	44,500	
11 02 03 4 04	Drainage Structure									
11 02 03 4 04 1	Replace Handrail			5,400	300	300	600	0	6,600	
11 02 03 4 04 2	Replace Grating			500	0	0	100	0	600	

		QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
11 02 03 4 04 3	Replace Ladders			1,000	0	100	100	0	1,200	
	TOTAL Drainage Structure			6,900	300	400	800	100	8,400	
11 02 03 4 05	Gates									
11 02 03 4 05 1	Remove Existing Gate	1.00	EA	2,800	100	100	300	0	3,400	3429.69
11 02 03 4 05 2	Replace Gate	1.00	EA	14,400	700	800	1,600	100	17,600	17564
11 02 03 4 05 3	Install/Test New Gate	1.00	EA	4,000	200	200	400	0	4,800	4837.38
	TOTAL Gates			21,100	1,100	1,100	2,300	200	25,800	
11 02 03 4 06	Olin Property Security									
11 02 03 4 06 1	Security Personel			1,700	0	0	0	0	1,700	
	TOTAL Olin Property Security			1,700	0	0	0	0	1,700	
	TOTAL GW-17, 42" Drain (Flan			79,300	3,900	4,100	8,600	700	96,500	
11 02 03 5	GW-18, 42" Drain (Flank)									
11 02 03 5 01	Mob, Demob & Preparatory W									
11 02 03 5 01 1	Mobilization and Demob			3,100	200	200	300	0	3,800	
	TOTAL Mob, Demob & Preparato			3,100	200	200	300	0	3,800	
11 02 03 5 02	Care and Diversion of Wate									
11 02 03 5 02 1	Fabricate Bulkheads			2,500	100	100	300	0	3,100	
11 02 03 5 02 2	Install Temporary Bulk	2.00	DAY	2,200	100	100	200	0	2,600	1316.74
11 02 03 5 02 3	Remove Temporary Bulkh	1.00	DAY	1,100	100	100	100	0	1,300	1316.74
11 02 03 5 02 4	Unwatering Pumps			4,300	200	200	500	0	5,300	
	TOTAL Care and Diversion of			10,100	500	500	1,100	100	12,300	
11 02 03 5 03	Sitework									
11 02 03 5 03 1	Site Preparation			1,100	100	100	100	0	1,300	
11 02 03 5 03 2	Line Existing Pipe w/			33,200	1,700	1,700	3,700	300	40,600	
11 02 03 5 03 3	Site Restoration			2,100	100	100	200	0	2,500	
	TOTAL Sitework			36,400	1,800	1,900	4,000	300	44,500	

	QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
11 02 03 5 04 Drainage Structure									
11 02 03 5 04 1 Replace Handrail			5,400	300	300	600	0	6,600	
11 02 03 5 04 2 Replace Grating			500	0	0	100	0	600	
11 02 03 5 04 3 Replace Ladders			1,000	0	100	100	0	1,200	
TOTAL Drainage Structure			6,900	300	400	800	100	8,400	
11 02 03 5 05 Gates									
11 02 03 5 05 1 Remove Existing Gate	1.00	EA	2,800	100	100	300	0	3,400	3429.69
11 02 03 5 05 2 Rehab Gate	1.00	EA	6,200	300	300	700	100	7,500	7538.22
11 02 03 5 05 3 Install/Test Rehabbed	1.00	EA	4,000	200	200	400	0	4,800	4837.38
TOTAL Gates			12,900	600	700	1,400	100	15,800	
TOTAL GW-18, 42" Drain (Flan			69,400	3,500	3,600	7,700	600	84,800	
11 02 03 6 GW-19, 36" Drain (Flank)									
11 02 03 6 01 Mob, Demob & Preparatory W									
11 02 03 6 01 1 Mobilization and Demob			3,100	200	200	300	0	3,800	
TOTAL Mob, Demob & Preparato			3,100	200	200	300	0	3,800	
11 02 03 6 02 Care and Diversion of Wate									
11 02 03 6 02 1 Fabricate Bulkheads			2,500	100	100	300	0	3,100	
11 02 03 6 02 2 Install Temporary Bulk	2.00	DAY	2,200	100	100	200	0	2,600	1316.74
11 02 03 6 02 3 Remove Temporary Bulkh	1.00	DAY	1,100	100	100	100	0	1,300	1316.74
11 02 03 6 02 4 Unwatering Pumps			4,300	200	200	500	0	5,300	
TOTAL Care and Diversion of			10,100	500	500	1,100	100	12,300	
11 02 03 6 03 Sitework									
11 02 03 6 03 1 Site Preparation			1,100	100	100	100	0	1,300	
11 02 03 6 03 2 Line Existing Pipe w/			33,200	1,700	1,700	3,700	300	40,600	
11 02 03 6 03 3 Site Restoration			2,100	100	100	200	0	2,500	
TOTAL Sitework			36,400	1,800	1,900	4,000	300	44,500	
11 02 03 6 04 Drainage Structure									
11 02 03 6 04 1 Replace Handrail			5,400	300	300	600	0	6,600	

** PROJECT INDIRECT SUMMARY - Level 6 (Rounded to 100's) **

		QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
11 02 03 6 04 2	Replace Grating			500	0	0	100	0	600	
11 02 03 6 04 3	Replace Ladders			1,000	0	100	100	0	1,200	
TOTAL	Drainage Structure			6,900	300	400	800	100	8,400	
11 02 03 6 05	Gates									
11 02 03 6 05 1	Remove Existing Gate	1.00	EA	2,000	100	100	200	0	2,500	2472.39
11 02 03 6 05 2	Rehab Gate	1.00	EA	5,700	300	300	600	100	7,000	7017.67
11 02 03 6 05 3	Install/Test Rehabbed	1.00	EA	3,200	200	200	400	0	3,900	3880.08
TOTAL	Gates			10,900	500	600	1,200	100	13,400	
TOTAL	GW-19, 36" Drain (Flan			67,400	3,400	3,500	7,400	600	82,400	
11 02 03 7	GW-20, 24" Drain (Flank)									
11 02 03 7 01	Mob, Demob & Preparatory W									
11 02 03 7 01 1	Mobilization and Demob			3,100	200	200	300	0	3,800	
TOTAL	Mob, Demob & Preparato			3,100	200	200	300	0	3,800	
11 02 03 7 02	Care and Diversion of Wate									
11 02 03 7 02 1	Fabricate Bulkheads			2,500	100	100	300	0	3,100	
11 02 03 7 02 2	Install Temporary Bulk	2.00	DAY	2,200	100	100	200	0	2,600	1316.74
11 02 03 7 02 3	Remove Temporary Bulkh	1.00	DAY	1,100	100	100	100	0	1,300	1316.74
11 02 03 7 02 4	Unwatering Pumps			4,300	200	200	500	0	5,300	
TOTAL	Care and Diversion of			10,100	500	500	1,100	100	12,300	
11 02 03 7 03	Sitework									
11 02 03 7 03 1	Clearing, Grubbing and	1.20	ACR	1,700	100	100	200	0	2,100	1758.26
11 02 03 7 03 2	Pavement Removal	110.00	SY	600	0	0	100	0	700	6.68
11 02 03 7 03 3	Remove Crushed Stone	80.00	TON	300	0	0	0	0	300	4.27
11 02 03 7 03 4	Excavation	6540.00	CY	16,100	800	800	1,800	100	19,700	3.01
11 02 03 7 03 5	Cofferdam	1700.00	CY	4,800	200	300	500	0	5,900	3.49
11 02 03 7 03 6	Remove Existing Pipe	250.00	LF	2,100	100	100	200	0	2,500	10.05
11 02 03 7 03 7	Install New RCP	250.00	LF	11,500	600	600	1,300	100	14,000	55.97
11 02 03 7 03 8	Place and Compact Back	7800.00	CY	27,300	1,400	1,400	3,000	300	33,400	4.28
11 02 03 7 03 9	Crushed Stone Surfacin	80.00	TON	800	0	0	100	0	1,000	12.54
11 02 03 7 03 10	Bitumineous Road Repai	110.00	SY	500	0	0	100	0	600	5.86
11 02 03 7 03 11	Establishment of Turf	1.20	ACR	900	0	0	100	0	1,100	951.33
TOTAL	Sitework			66,700	3,300	3,500	7,300	600	81,500	

** PROJECT INDIRECT SUMMARY - Level 6 (Rounded to 100's) **

	QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
11 02 03 7 04 Drainage Structure									
11 02 03 7 04 1 Replace Handrail			5,400	300	300	600	0	6,600	
11 02 03 7 04 2 Replace Grating			500	0	0	100	0	600	
11 02 03 7 04 3 Replace Ladders			1,000	0	100	100	0	1,200	
TOTAL Drainage Structure			6,900	300	400	800	100	8,400	
11 02 03 7 05 Gates									
11 02 03 7 05 1 Remove Existing Gate	1.00	EA	2,000	100	100	200	0	2,500	2472.39
11 02 03 7 05 2 Rehab Gate	1.00	EA	5,100	300	300	600	0	6,200	6206.79
11 02 03 7 05 3 Install/Test Rehabbed	1.00	EA	2,800	100	100	300	0	3,500	3480.59
TOTAL Gates			10,000	500	500	1,100	100	12,200	
TOTAL GW-20, 24" Drain (Flan			96,700	4,800	5,100	10,700	900	118,200	
11 02 03 8 GW-21, 24" Drain (Flank)									
11 02 03 8 01 Mob, Demob & Preparatory W									
11 02 03 8 01 1 Mobilization and Demob			3,100	200	200	300	0	3,800	
TOTAL Mob, Demob & Preparato			3,100	200	200	300	0	3,800	
11 02 03 8 02 Care and Diversion of Wate									
11 02 03 8 02 1 Fabricate Bulkheads			2,500	100	100	300	0	3,100	
11 02 03 8 02 2 Install Temporary Bulk	2.00	DAY	2,200	100	100	200	0	2,600	1316.74
11 02 03 8 02 3 Remove Temporary Bulkh	1.00	DAY	1,100	100	100	100	0	1,300	1316.74
11 02 03 8 02 4 Unwatering Pumps			4,300	200	200	500	0	5,300	
TOTAL Care and Diversion of			10,100	500	500	1,100	100	12,300	
11 02 03 8 03 Sitework									
11 02 03 8 03 1 Clearing, Grubbing and	1.20	ACR	1,700	100	100	200	0	2,100	1758.26
11 02 03 8 03 2 Pavement Removal	110.00	SY	600	0	0	100	0	700	6.68
11 02 03 8 03 3 Remove Crushed Stone	80.00	TON	300	0	0	0	0	300	4.27
11 02 03 8 03 4 Excavation	6540.00	CY	16,100	800	800	1,800	100	19,700	3.01
11 02 03 8 03 5 Cofferdam	1700.00	CY	4,800	200	300	500	0	5,900	3.49
11 02 03 8 03 6 Remove Existing Pipe	250.00	LF	2,100	100	100	200	0	2,500	10.05
11 02 03 8 03 7 Install New RCP	250.00	LF	11,500	600	600	1,300	100	14,000	55.97
11 02 03 8 03 8 Place and Compact Back	7800.00	CY	27,300	1,400	1,400	3,000	300	33,400	4.28
11 02 03 8 03 9 Crushed Stone Surfacin	80.00	TON	800	0	0	100	0	1,000	12.54
11 02 03 8 03 10 Bitumineous Road Repai	110.00	SY	500	0	0	100	0	600	5.86

** PROJECT INDIRECT SUMMARY - Level 6 (Rounded to 100's) **

		QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
11 02 03 8 03 11	Establishment of Turf	1.20	ACR	900	0	0	100	0	1,100	951.33
	TOTAL Sitework			66,700	3,300	3,500	7,300	600	81,500	
11 02 03 8 04	Drainage Structure									
11 02 03 8 04 1	Replace Handrail			5,400	300	300	600	0	6,600	
11 02 03 8 04 2	Replace Grating			500	0	0	100	0	600	
11 02 03 8 04 3	Replace Ladders			1,000	0	100	100	0	1,200	
	TOTAL Drainage Structure			6,900	300	400	800	100	8,400	
11 02 03 8 05	Gates									
11 02 03 8 05 1	Remove Existing Gate	1.00	EA	2,000	100	100	200	0	2,500	2472.39
11 02 03 8 05 2	Rehab Gate	1.00	EA	5,100	300	300	600	0	6,200	6206.79
11 02 03 8 05 3	Install/Test Rehabbed	1.00	EA	2,800	100	100	300	0	3,500	3480.59
	TOTAL Gates			10,000	500	500	1,100	100	12,200	
	TOTAL GW-21, 24" Drain (Flan			96,700	4,800	5,100	10,700	900	118,200	
11 02 03 10	GW-23, 30" Drain (Flank)									
11 02 03 10 01	Mob, Demob & Preparatory W									
11 02 03 10 01 1	Mobilization and Demob			3,100	200	200	300	0	3,800	
	TOTAL Mob, Demob & Preparato			3,100	200	200	300	0	3,800	
11 02 03 10 02	Care and Diversion of Wate									
11 02 03 10 02 1	Fabricate Bulkheads			2,500	100	100	300	0	3,100	
11 02 03 10 02 2	Install Temporary Bulk	2.00	DAY	2,200	100	100	200	0	2,600	1316.74
11 02 03 10 02 3	Remove Temporary Bulkh	1.00	DAY	1,100	100	100	100	0	1,300	1316.74
11 02 03 10 02 4	Unwatering Pumps			4,300	200	200	500	0	5,300	
	TOTAL Care and Diversion of			10,100	500	500	1,100	100	12,300	
11 02 03 10 03	Sitework									
11 02 03 10 03 1	Site Preparation			1,100	100	100	100	0	1,300	
11 02 03 10 03 2	Line Existing Pipe w/			33,200	1,700	1,700	3,700	300	40,600	
11 02 03 10 03 3	Site Restoration			2,100	100	100	200	0	2,500	
	TOTAL Sitework			36,400	1,800	1,900	4,000	300	44,500	

** PROJECT INDIRECT SUMMARY - Level 6 (Rounded to 100's) **

	QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
11 02 03 10 04 Drainage Structure									
11 02 03 10 04 1 Replace Handrail			5,400	300	300	600	0	6,600	
11 02 03 10 04 2 Replace Grating			500	0	0	100	0	600	
11 02 03 10 04 3 Replace Ladders			1,000	0	100	100	0	1,200	
TOTAL Drainage Structure			6,900	300	400	800	100	8,400	
11 02 03 10 05 Gates									
11 02 03 10 05 1 Remove Existing Gate	1.00	EA	2,000	100	100	200	0	2,500	2472.39
11 02 03 10 05 2 Rehab Gate	1.00	EA	5,300	300	300	600	0	6,500	6497.11
11 02 03 10 05 3 Install/Test Rehabbed	1.00	EA	3,200	200	200	400	0	3,900	3880.08
TOTAL Gates			10,500	500	600	1,200	100	12,800	
TOTAL GW-23, 30" Drain (Flan			67,000	3,300	3,500	7,400	600	81,900	
11 02 03 11 GW-24, 48" Drain (Riverfront)									
11 02 03 11 01 Mob, Demob & Preparatory W									
11 02 03 11 01 1 Mobilization and Demob			3,100	200	200	300	0	3,800	
TOTAL Mob, Demob & Preparato			3,100	200	200	300	0	3,800	
11 02 03 11 02 Care and Diversion of Wate									
11 02 03 11 02 1 Fabricate Bulkheads			2,500	100	100	300	0	3,100	
11 02 03 11 02 2 Install Temporary Bulk	2.00	DAY	2,200	100	100	200	0	2,600	1316.74
11 02 03 11 02 3 Remove Temporary Bulkh	1.00	DAY	1,100	100	100	100	0	1,300	1316.74
11 02 03 11 02 4 Unwatering Pumps			4,300	200	200	500	0	5,300	
TOTAL Care and Diversion of			10,100	500	500	1,100	100	12,300	
11 02 03 11 03 Sitework									
11 02 03 11 03 1 Site Preparation			1,100	100	100	100	0	1,300	
11 02 03 11 03 2 Line Existing Pipe w/			33,200	1,700	1,700	3,700	300	40,600	
11 02 03 11 03 3 Site Restoration			2,100	100	100	200	0	2,500	
TOTAL Sitework			36,400	1,800	1,900	4,000	300	44,500	
11 02 03 11 04 Drainage Structure									
11 02 03 11 04 1 Replace Handrail			5,400	300	300	600	0	6,600	

		QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
11 02 03 11 04 2	Replace Grating			500	0	0	100	0	600	
11 02 03 11 04 3	Replace Ladders			1,000	0	100	100	0	1,200	
TOTAL	Drainage Structure			6,900	300	400	800	100	8,400	
11 02 03 11 05	Gates									
11 02 03 11 05 1	Remove Existing Gate	1.00	EA	2,800	100	100	300	0	3,400	3429.69
11 02 03 11 05 2	Replace Gate	1.00	EA	17,200	900	900	1,900	200	21,000	21048
11 02 03 11 05 3	Install/Test New Gate	1.00	EA	4,000	200	200	400	0	4,800	4837.38
TOTAL	Gates			24,000	1,200	1,300	2,600	200	29,300	
TOTAL	GW-24, 48" Drain (Rive			80,500	4,000	4,200	8,900	700	98,300	
11 02 03 14	GW-27, 24" Drain (Riverfront)									
11 02 03 14 01	Mob, Demob & Preparatory W									
11 02 03 14 01 1	Mobilization and Demob			3,100	200	200	300	0	3,800	
TOTAL	Mob, Demob & Preparato			3,100	200	200	300	0	3,800	
11 02 03 14 02	Care and Diversion of Wate									
11 02 03 14 02 1	Fabricate Bulkheads			2,500	100	100	300	0	3,100	
11 02 03 14 02 2	Install Temporary Bulk	2.00	DAY	2,200	100	100	200	0	2,600	1316.74
11 02 03 14 02 3	Remove Temporary Bulkh	1.00	DAY	1,100	100	100	100	0	1,300	1316.74
11 02 03 14 02 4	Unwatering Pumps			4,300	200	200	500	0	5,300	
TOTAL	Care and Diversion of			10,100	500	500	1,100	100	12,300	
11 02 03 14 03	Sitework									
11 02 03 14 03 1	Clearing, Grubbing and	1.20	ACR	1,700	100	100	200	0	2,100	1758.26
11 02 03 14 03 2	Pavement Removal	110.00	SY	600	0	0	100	0	700	6.68
11 02 03 14 03 3	Remove Crushed Stone	80.00	TON	300	0	0	0	0	300	4.27
11 02 03 14 03 4	Excavation	6540.00	CY	16,100	800	800	1,800	100	19,700	3.01
11 02 03 14 03 5	Cofferdam	1700.00	CY	4,800	200	300	500	0	5,900	3.49
11 02 03 14 03 6	Remove Existing Pipe	250.00	LF	2,100	100	100	200	0	2,500	10.05
11 02 03 14 03 7	Install New RCP	250.00	LF	11,500	600	600	1,300	100	14,000	55.97
11 02 03 14 03 8	Place and Compact Back	7800.00	CY	27,300	1,400	1,400	3,000	300	33,400	4.28
11 02 03 14 03 9	Crushed Stone Surfacin	80.00	TON	800	0	0	100	0	1,000	12.54
11 02 03 14 03 10	Bitumineous Road Repai	110.00	SY	500	0	0	100	0	600	5.86
11 02 03 14 03 11	Establishment of Turf	1.20	ACR	900	0	0	100	0	1,100	951.33
TOTAL	Sitework			66,700	3,300	3,500	7,300	600	81,500	

** PROJECT INDIRECT SUMMARY - Level 6 (Rounded to 100's) **

	QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
11 02 03 14 04 Drainage Structure									
11 02 03 14 04 1 Replace Handrail			5,400	300	300	600	0	6,600	
11 02 03 14 04 2 Replace Grating			500	0	0	100	0	600	
11 02 03 14 04 3 Replace Ladders			1,000	0	100	100	0	1,200	
TOTAL Drainage Structure			6,900	300	400	800	100	8,400	
11 02 03 14 05 Gates									
11 02 03 14 05 1 Remove Existing Gate	1.00	EA	2,000	100	100	200	0	2,500	2472.39
11 02 03 14 05 2 Rehab Gate	1.00	EA	5,100	300	300	600	0	6,200	6206.79
11 02 03 14 05 3 Install/Test Rehabbed	1.00	EA	2,800	100	100	300	0	3,500	3480.59
TOTAL Gates			10,000	500	500	1,100	100	12,200	
TOTAL GW-27, 24" Drain (Rive			96,700	4,800	5,100	10,700	900	118,200	
11 02 03 16 GW-29, 18" Drain (Riverfront)									
11 02 03 16 01 Mob, Demob & Preparatory W									
11 02 03 16 01 1 Mobilization and Demob			3,100	200	200	300	0	3,800	
TOTAL Mob, Demob & Preparato			3,100	200	200	300	0	3,800	
11 02 03 16 02 Care and Diversion of Wate									
11 02 03 16 02 1 Fabricate Bulkheads			2,500	100	100	300	0	3,100	
11 02 03 16 02 2 Install Temporary Bulk	2.00	DAY	2,200	100	100	200	0	2,600	1316.74
11 02 03 16 02 3 Remove Temporary Bulkh	1.00	DAY	1,100	100	100	100	0	1,300	1316.74
11 02 03 16 02 4 Unwatering Pumps			4,300	200	200	500	0	5,300	
TOTAL Care and Diversion of			10,100	500	500	1,100	100	12,300	
11 02 03 16 03 Sitework									
11 02 03 16 03 1 Clearing, Grubbing and	1.20	ACR	1,700	100	100	200	0	2,100	1758.26
11 02 03 16 03 2 Pavement Removal	110.00	SY	600	0	0	100	0	700	6.68
11 02 03 16 03 3 Remove Crushed Stone	80.00	TON	300	0	0	0	0	300	4.27
11 02 03 16 03 4 Excavation	6540.00	CY	16,100	800	800	1,800	100	19,700	3.01
11 02 03 16 03 5 Cofferdam	1700.00	CY	4,800	200	300	500	0	5,900	3.49
11 02 03 16 03 6 Remove Existing Pipe	250.00	LF	1,600	100	100	200	0	2,000	8.04
11 02 03 16 03 7 Install New RCP	250.00	LF	8,600	400	500	900	100	10,500	42.03
11 02 03 16 03 8 Place and Compact Back	7800.00	CY	27,300	1,400	1,400	3,000	300	33,400	4.28
11 02 03 16 03 9 Crushed Stone Surfacin	80.00	TON	800	0	0	100	0	1,000	12.54
11 02 03 16 03 10 Bitumineous Road Repai	110.00	SY	500	0	0	100	0	600	5.86

** PROJECT INDIRECT SUMMARY - Level 6 (Rounded to 100's) **

		QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
11 02 03 16 03 11	Establishment of Turf	1.20	ACR	900	0	0	100	0	1,100	951.33
	TOTAL Sitework			63,400	3,200	3,300	7,000	600	77,500	
11 02 03 16 04	Drainage Structure									
11 02 03 16 04 1	Replace Handrail			5,400	300	300	600	0	6,600	
11 02 03 16 04 2	Replace Grating			500	0	0	100	0	600	
11 02 03 16 04 3	Replace Ladders			1,000	0	100	100	0	1,200	
	TOTAL Drainage Structure			6,900	300	400	800	100	8,400	
11 02 03 16 05	Gates									
11 02 03 16 05 1	Remove Existing Gate	1.00	EA	1,600	100	100	200	0	1,900	1914.59
11 02 03 16 05 2	Rehab Gate	1.00	EA	4,600	200	200	500	0	5,600	5626.15
11 02 03 16 05 3	Install/Test Rehabbed	1.00	EA	2,800	100	100	300	0	3,500	3480.59
	TOTAL Gates			9,000	500	500	1,000	100	11,000	
	TOTAL GW-29, 18" Drain (Rive			92,500	4,600	4,900	10,200	900	113,000	
11 02 03 18	GW-31, 24" Drain (Riverfront)									
11 02 03 18 01	Mob, Demob & Preparatory W									
11 02 03 18 01 1	Mobilization and Demob			3,100	200	200	300	0	3,800	
	TOTAL Mob, Demob & Preparato			3,100	200	200	300	0	3,800	
11 02 03 18 02	Care and Diversion of Wate									
11 02 03 18 02 1	Fabricate Bulkheads			2,500	100	100	300	0	3,100	
11 02 03 18 02 2	Install Temporary Bulk	2.00	DAY	2,200	100	100	200	0	2,600	1316.74
11 02 03 18 02 3	Remove Temporary Bulkh	1.00	DAY	1,100	100	100	100	0	1,300	1316.74
11 02 03 18 02 4	Unwatering Pumps			4,300	200	200	500	0	5,300	
	TOTAL Care and Diversion of			10,100	500	500	1,100	100	12,300	
11 02 03 18 03	Sitework									
11 02 03 18 03 1	Clearing, Grubbing and	1.20	ACR	1,700	100	100	200	0	2,100	1758.26
11 02 03 18 03 2	Pavement Removal	110.00	SY	600	0	0	100	0	700	6.68
11 02 03 18 03 3	Remove Crushed Stone	80.00	TON	300	0	0	0	0	300	4.27
11 02 03 18 03 4	Excavation	6540.00	CY	16,100	800	800	1,800	100	19,700	3.01
11 02 03 18 03 5	Cofferdam	1700.00	CY	4,800	200	300	500	0	5,900	3.49

** PROJECT INDIRECT SUMMARY - Level 6 (Rounded to 100's) **

		QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
11 02 03 18 03 6	Remove Existing Pipe	250.00	LF	2,100	100	100	200	0	2,500	10.05
11 02 03 18 03 7	Install New RCP	250.00	LF	11,500	600	600	1,300	100	14,000	55.97
11 02 03 18 03 8	Place and Compact Back	7800.00	CY	27,300	1,400	1,400	3,000	300	33,400	4.28
11 02 03 18 03 9	Crushed Stone Surfacin	80.00	TON	800	0	0	100	0	1,000	12.54
11 02 03 18 03 10	Bitumineous Road Repai	110.00	SY	500	0	0	100	0	600	5.86
11 02 03 18 03 11	Establishment of Turf	1.20	ACR	900	0	0	100	0	1,100	951.33
TOTAL Sitework				66,700	3,300	3,500	7,300	600	81,500	
11 02 03 18 04	Drainage Structure									
11 02 03 18 04 1	Replace Handrail			5,400	300	300	600	0	6,600	
11 02 03 18 04 2	Replace Grating			500	0	0	100	0	600	
11 02 03 18 04 3	Replace Ladders			1,000	0	100	100	0	1,200	
TOTAL Drainage Structure				6,900	300	400	800	100	8,400	
11 02 03 18 05	Gates									
11 02 03 18 05 1	Remove Existing Gate	1.00	EA	2,000	100	100	200	0	2,500	2472.39
11 02 03 18 05 2	Rehab Gate	1.00	EA	5,100	300	300	600	0	6,200	6206.79
11 02 03 18 05 3	Install/Test Rehabbed	1.00	EA	2,800	100	100	300	0	3,500	3480.59
TOTAL Gates				10,000	500	500	1,100	100	12,200	
TOTAL GW-31, 24" Drain (Rive				96,700	4,800	5,100	10,700	900	118,200	
11 02 03 19	GW-32, 24" Drain (Riverfront)									
11 02 03 19 01	Mob, Demob & Preparatory W									
11 02 03 19 01 1	Mobilization and Demob			3,100	200	200	300	0	3,800	
TOTAL Mob, Demob & Preparato				3,100	200	200	300	0	3,800	
11 02 03 19 02	Care and Diversion of Wate									
11 02 03 19 02 1	Fabricate Bulkheads			2,500	100	100	300	0	3,100	
11 02 03 19 02 2	Install Temporary Bulk	2.00	DAY	2,200	100	100	200	0	2,600	1316.74
11 02 03 19 02 3	Remove Temporary Bulkh	1.00	DAY	1,100	100	100	100	0	1,300	1316.74
11 02 03 19 02 4	Unwatering Pumps			4,300	200	200	500	0	5,300	
TOTAL Care and Diversion of				10,100	500	500	1,100	100	12,300	
11 02 03 19 03	Sitework									

** PROJECT INDIRECT SUMMARY - Level 6 (Rounded to 100's) **

		QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
11 02 03 19 03 1	Clearing, Grubbing and	1.20	ACR	1,700	100	100	200	0	2,100	1758.26
11 02 03 19 03 2	Pavement Removal	110.00	SY	600	0	0	100	0	700	6.68
11 02 03 19 03 3	Remove Crushed Stone	80.00	TON	300	0	0	0	0	300	4.27
11 02 03 19 03 4	Excavation	6540.00	CY	16,100	800	800	1,800	100	19,700	3.01
11 02 03 19 03 5	Cofferdam	1700.00	CY	4,800	200	300	500	0	5,900	3.49
11 02 03 19 03 6	Remove Existing Pipe	250.00	LF	2,100	100	100	200	0	2,500	10.05
11 02 03 19 03 7	Install New RCP	250.00	LF	11,500	600	600	1,300	100	14,000	55.97
11 02 03 19 03 8	Place and Compact Back	7800.00	CY	27,300	1,400	1,400	3,000	300	33,400	4.28
11 02 03 19 03 9	Crushed Stone Surfacin	80.00	TON	800	0	0	100	0	1,000	12.54
11 02 03 19 03 10	Bitumineous Road Repai	110.00	SY	500	0	0	100	0	600	5.86
11 02 03 19 03 11	Establishment of Turf	1.20	ACR	900	0	0	100	0	1,100	951.33
TOTAL Sitework				66,700	3,300	3,500	7,300	600	81,500	
11 02 03 19 04	Drainage Structure									
11 02 03 19 04 1	Replace Handrail			5,400	300	300	600	0	6,600	
11 02 03 19 04 2	Replace Grating			500	0	0	100	0	600	
11 02 03 19 04 3	Replace Ladders			1,000	0	100	100	0	1,200	
TOTAL Drainage Structure				6,900	300	400	800	100	8,400	
11 02 03 19 05	Gates									
11 02 03 19 05 1	Remove Existing Gate	1.00	EA	2,000	100	100	200	0	2,500	2472.39
11 02 03 19 05 2	Rehab Gate	1.00	EA	5,100	300	300	600	0	6,200	6206.79
11 02 03 19 05 3	Install/Test Rehabbed	1.00	EA	2,800	100	100	300	0	3,500	3480.59
TOTAL Gates				10,000	500	500	1,100	100	12,200	
TOTAL GW-32, 24" Drain (Rive				96,700	4,800	5,100	10,700	900	118,200	
11 02 03 20	GW-33, 24" Drain (Riverfront)									
11 02 03 20 01	Mob, Demob & Preparatory W									
11 02 03 20 01 1	Mobilization and Demob			3,100	200	200	300	0	3,800	
TOTAL Mob, Demob & Preparato				3,100	200	200	300	0	3,800	
11 02 03 20 02	Care and Diversion of Wate									
11 02 03 20 02 1	Fabricate Bulkheads			2,500	100	100	300	0	3,100	
11 02 03 20 02 2	Install Temporary Bulk	2.00	DAY	2,200	100	100	200	0	2,600	1316.74
11 02 03 20 02 3	Remove Temporary Bulkh	1.00	DAY	1,100	100	100	100	0	1,300	1316.74
11 02 03 20 02 4	Unwatering Pumps			4,300	200	200	500	0	5,300	

** PROJECT INDIRECT SUMMARY - Level 6 (Rounded to 100's) **

		QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
	TOTAL Care and Diversion of			10,100	500	500	1,100	100	12,300	
11 02 03 20 03	Sitework									
11 02 03 20 03 1	Clearing, Grubbing and	1.20	ACR	1,700	100	100	200	0	2,100	1758.26
11 02 03 20 03 2	Pavement Removal	110.00	SY	600	0	0	100	0	700	6.68
11 02 03 20 03 3	Remove Crushed Stone	80.00	TON	300	0	0	0	0	300	4.27
11 02 03 20 03 4	Excavation	6540.00	CY	16,100	800	800	1,800	100	19,700	3.01
11 02 03 20 03 5	Cofferdam	1700.00	CY	4,800	200	300	500	0	5,900	3.49
11 02 03 20 03 6	Remove Existing Pipe	250.00	LF	2,100	100	100	200	0	2,500	10.05
11 02 03 20 03 7	Install New RCP	250.00	LF	11,500	600	600	1,300	100	14,000	55.97
11 02 03 20 03 8	Place and Compact Back	7800.00	CY	27,300	1,400	1,400	3,000	300	33,400	4.28
11 02 03 20 03 9	Crushed Stone Surfacin	80.00	TON	800	0	0	100	0	1,000	12.54
11 02 03 20 03 10	Bitumineous Road Repai	110.00	SY	500	0	0	100	0	600	5.86
11 02 03 20 03 11	Establishment of Turf	1.20	ACR	900	0	0	100	0	1,100	951.33
	TOTAL Sitework			66,700	3,300	3,500	7,300	600	81,500	
11 02 03 20 04	Drainage Structure									
11 02 03 20 04 1	Replace Handrail			5,400	300	300	600	0	6,600	
11 02 03 20 04 2	Replace Grating			500	0	0	100	0	600	
11 02 03 20 04 3	Replace Ladders			1,000	0	100	100	0	1,200	
	TOTAL Drainage Structure			6,900	300	400	800	100	8,400	
11 02 03 20 05	Gates									
11 02 03 20 05 1	Remove Existing Gate	1.00	EA	2,000	100	100	200	0	2,500	2472.39
11 02 03 20 05 2	Replace Gate	1.00	EA	10,100	500	500	1,100	100	12,300	12339
11 02 03 20 05 3	Install/Test New Gate	1.00	EA	2,800	100	100	300	0	3,500	3480.59
	TOTAL Gates			15,000	700	800	1,700	100	18,300	
	TOTAL GW-33, 24" Drain (Rive			101,700	5,100	5,300	11,200	900	124,300	
11 02 03 21	GW-34, 48" Drain (Cahokia Cree									
11 02 03 21 01	Mob, Demob & Preparatory W									
11 02 03 21 01 1	Mobilization and Demob			3,100	200	200	300	0	3,800	
	TOTAL Mob, Demob & Preparato			3,100	200	200	300	0	3,800	
11 02 03 21 02	Care and Diversion of Wate									

** PROJECT INDIRECT SUMMARY - Level 6 (Rounded to 100's) **

		QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
11 02 03 21 02 1	Fabricate Bulkheads			2,500	100	100	300	0	3,100	
11 02 03 21 02 2	Install Temporary Bulk	2.00	DAY	2,200	100	100	200	0	2,600	1316.74
11 02 03 21 02 3	Remove Temporary Bulkh	1.00	DAY	1,100	100	100	100	0	1,300	1316.74
11 02 03 21 02 4	Unwatering Pumps			4,300	200	200	500	0	5,300	
TOTAL	Care and Diversion of			10,100	500	500	1,100	100	12,300	
11 02 03 21 03	Sitework									
11 02 03 21 03 1	Site Preparation			1,100	100	100	100	0	1,300	
11 02 03 21 03 2	Line Existing Pipe w/			33,200	1,700	1,700	3,700	300	40,600	
11 02 03 21 03 3	Site Restoration			2,100	100	100	200	0	2,500	
TOTAL	Sitework			36,400	1,800	1,900	4,000	300	44,500	
11 02 03 21 04	Drainage Structure									
11 02 03 21 04 1	Replace Handrail			5,400	300	300	600	0	6,600	
11 02 03 21 04 2	Replace Grating			500	0	0	100	0	600	
11 02 03 21 04 3	Replace Ladders			1,000	0	100	100	0	1,200	
TOTAL	Drainage Structure			6,900	300	400	800	100	8,400	
11 02 03 21 05	Gates									
11 02 03 21 05 1	Remove Existing Gate	1.00	EA	2,800	100	100	300	0	3,400	3429.69
11 02 03 21 05 2	Rehab Gate	1.00	EA	7,000	400	400	800	100	8,600	8554.34
11 02 03 21 05 3	Install/Test Rehabbed	1.00	EA	4,000	200	200	400	0	4,800	4837.38
TOTAL	Gates			13,800	700	700	1,500	100	16,800	
TOTAL	GW-34, 48" Drain (Caho			70,200	3,500	3,700	7,700	600	85,800	
11 02 03 22	GW-35, 48" Drain (Cahokia Cree									
11 02 03 22 01	Mob, Demob & Preparatory W									
11 02 03 22 01 1	Mobilization and Demob			3,100	200	200	300	0	3,800	
TOTAL	Mob, Demob & Preparato			3,100	200	200	300	0	3,800	
11 02 03 22 02	Care and Diversion of Wate									
11 02 03 22 02 1	Fabricate Bulkheads			2,500	100	100	300	0	3,100	
11 02 03 22 02 2	Install Temporary Bulk	2.00	DAY	2,200	100	100	200	0	2,600	1316.74
11 02 03 22 02 3	Remove Temporary Bulkh	1.00	DAY	1,100	100	100	100	0	1,300	1316.74

	QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
11 02 03 22 02 4 Unwatering Pumps			4,300	200	200	500	0	5,300	
TOTAL Care and Diversion of			10,100	500	500	1,100	100	12,300	
11 02 03 22 03 Sitework									
11 02 03 22 03 1 Site Preparation			1,100	100	100	100	0	1,300	
11 02 03 22 03 2 Line Existing Pipe w/			33,200	1,700	1,700	3,700	300	40,600	
11 02 03 22 03 3 Site Restoration			2,100	100	100	200	0	2,500	
TOTAL Sitework			36,400	1,800	1,900	4,000	300	44,500	
11 02 03 22 04 Drainage Structure									
11 02 03 22 04 1 Replace Handrail			5,400	300	300	600	0	6,600	
11 02 03 22 04 2 Replace Grating			500	0	0	100	0	600	
11 02 03 22 04 3 Replace Ladders			1,000	0	100	100	0	1,200	
TOTAL Drainage Structure			6,900	300	400	800	100	8,400	
11 02 03 22 05 Gates									
11 02 03 22 05 1 Remove Existing Gate	1.00	EA	2,800	100	100	300	0	3,400	3429.69
11 02 03 22 05 2 Rehab Gate	1.00	EA	7,000	400	400	800	100	8,600	8554.34
11 02 03 22 05 3 Install/Test Rehabbed	1.00	EA	4,000	200	200	400	0	4,800	4837.38
TOTAL Gates			13,800	700	700	1,500	100	16,800	
TOTAL GW-35, 48" Drain (Caho			70,200	3,500	3,700	7,700	600	85,800	
11 02 03 23 GW-36, 48" Drain (Cahokia Cree									
11 02 03 23 01 Mob, Demob & Preparatory W									
11 02 03 23 01 1 Mobilization and Demob			3,100	200	200	300	0	3,800	
TOTAL Mob, Demob & Preparato			3,100	200	200	300	0	3,800	
11 02 03 23 02 Care and Diversion of Wate									
11 02 03 23 02 1 Fabricate Bulkheads			2,500	100	100	300	0	3,100	
11 02 03 23 02 2 Install Temporary Bulk	2.00	DAY	2,200	100	100	200	0	2,600	1316.74
11 02 03 23 02 3 Remove Temporary Bulkh	1.00	DAY	1,100	100	100	100	0	1,300	1316.74
11 02 03 23 02 4 Unwatering Pumps			4,300	200	200	500	0	5,300	
TOTAL Care and Diversion of			10,100	500	500	1,100	100	12,300	

** PROJECT INDIRECT SUMMARY - Level 6 (Rounded to 100's) **

	QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
11 02 03 23 03 Sitework									
11 02 03 23 03 1 Site Preparation			1,100	100	100	100	0	1,300	
11 02 03 23 03 2 Line Existing Pipe w/			33,200	1,700	1,700	3,700	300	40,600	
11 02 03 23 03 3 Site Restoration			2,100	100	100	200	0	2,500	
TOTAL Sitework			36,400	1,800	1,900	4,000	300	44,500	
11 02 03 23 04 Drainage Structure									
11 02 03 23 04 1 Replace Handrail			5,400	300	300	600	0	6,600	
11 02 03 23 04 2 Replace Grating			500	0	0	100	0	600	
11 02 03 23 04 3 Replace Ladders			1,000	0	100	100	0	1,200	
TOTAL Drainage Structure			6,900	300	400	800	100	8,400	
11 02 03 23 05 Gates									
11 02 03 23 05 1 Remove Existing Gate	1.00	EA	2,800	100	100	300	0	3,400	3429.69
11 02 03 23 05 2 Rehab Gate	1.00	EA	7,000	400	400	800	100	8,600	8554.34
11 02 03 23 05 3 Install/Test Rehabbed	1.00	EA	4,000	200	200	400	0	4,800	4837.38
TOTAL Gates			13,800	700	700	1,500	100	16,800	
TOTAL GW-36, 48" Drain (Caho			70,200	3,500	3,700	7,700	600	85,800	
11 02 03 24 GW-37, 72" Drain (Cahokia Cree									
11 02 03 24 01 Mob, Demob & Preparatory W									
11 02 03 24 01 1 Mobilization and Demob			3,100	200	200	300	0	3,800	
TOTAL Mob, Demob & Preparato			3,100	200	200	300	0	3,800	
11 02 03 24 02 Care and Diversion of Wate									
11 02 03 24 02 1 Fabricate Bulkheads			2,500	100	100	300	0	3,100	
11 02 03 24 02 2 Install Temporary Bulk	2.00	DAY	2,200	100	100	200	0	2,600	1316.74
11 02 03 24 02 3 Remove Temporary Bulkh	1.00	DAY	1,100	100	100	100	0	1,300	1316.74
11 02 03 24 02 4 Unwatering Pumps			4,300	200	200	500	0	5,300	
TOTAL Care and Diversion of			10,100	500	500	1,100	100	12,300	
11 02 03 24 03 Sitework									
11 02 03 24 03 1 Site Preparation			1,100	100	100	100	0	1,300	

** PROJECT INDIRECT SUMMARY - Level 6 (Rounded to 100's) **

	QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
11 02 03 24 03 2 Line Existing Pipe w/			75,700	3,800	4,000	8,300	700	92,500	
11 02 03 24 03 3 Site Restoration			2,100	100	100	200	0	2,500	
TOTAL Sitework			78,800	3,900	4,100	8,700	700	96,300	
11 02 03 24 04 Drainage Structure									
11 02 03 24 04 1 Replace Handrail			9,200	500	500	1,000	100	11,300	
11 02 03 24 04 2 Replace Grating			1,500	100	100	200	0	1,800	
11 02 03 24 04 3 Replace Ladders			5,500	300	300	600	100	6,700	
TOTAL Drainage Structure			16,200	800	900	1,800	100	19,800	
11 02 03 24 05 Gates									
11 02 03 24 05 1 Remove Existing Gate	1.00	EA	3,400	200	200	400	0	4,200	4173.20
11 02 03 24 05 2 Replace Gate	1.00	EA	19,600	1,000	1,000	2,200	200	24,000	23951
11 02 03 24 05 3 Install/Test New Gate	1.00	EA	4,700	200	200	500	0	5,800	5766.76
TOTAL Gates			27,700	1,400	1,500	3,100	300	33,900	
TOTAL GW-37, 72" Drain (Caho			136,000	6,800	7,100	15,000	1,300	166,100	
11 02 03 25 GW-38, 42" Drain (Cahokia Cree									
11 02 03 25 01 Mob, Demob & Preparatory W									
11 02 03 25 01 1 Mobilization and Demob			3,100	200	200	300	0	3,800	
TOTAL Mob, Demob & Preparato			3,100	200	200	300	0	3,800	
11 02 03 25 02 Care and Diversion of Wate									
11 02 03 25 02 1 Fabricate Bulkheads			2,500	100	100	300	0	3,100	
11 02 03 25 02 2 Install Temporary Bulk	2.00	DAY	2,200	100	100	200	0	2,600	1316.74
11 02 03 25 02 3 Remove Temporary Bulkh	1.00	DAY	1,100	100	100	100	0	1,300	1316.74
11 02 03 25 02 4 Unwatering Pumps			4,300	200	200	500	0	5,300	
TOTAL Care and Diversion of			10,100	500	500	1,100	100	12,300	
11 02 03 25 03 Sitework									
11 02 03 25 03 1 Site Preparation			1,100	100	100	100	0	1,300	
11 02 03 25 03 2 Line Existing Pipe w/			33,200	1,700	1,700	3,700	300	40,600	
11 02 03 25 03 3 Site Restoration			2,100	100	100	200	0	2,500	

	QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
TOTAL Sitework			36,400	1,800	1,900	4,000	300	44,500	
11 02 03 25 04 Drainage Structure									
11 02 03 25 04 1 Replace Handrail			5,400	300	300	600	0	6,600	
11 02 03 25 04 2 Replace Grating			500	0	0	100	0	600	
11 02 03 25 04 3 Replace Ladders			1,000	0	100	100	0	1,200	
TOTAL Drainage Structure			6,900	300	400	800	100	8,400	
11 02 03 25 05 Gates									
11 02 03 25 05 1 Remove Existing Gate	1.00	EA	2,800	100	100	300	0	3,400	3429.69
11 02 03 25 05 2 Replace Gate	1.00	EA	14,400	700	800	1,600	100	17,600	17564
11 02 03 25 05 3 Install/Test New Gate	1.00	EA	4,000	200	200	400	0	4,800	4837.38
TOTAL Gates			21,100	1,100	1,100	2,300	200	25,800	
TOTAL GW-38, 42" Drain (Caho			77,600	3,900	4,100	8,600	700	94,800	
11 02 03 26 GW-39, 72" Drain (Cahokia Cree									
11 02 03 26 01 Mob, Demob & Preparatory W									
11 02 03 26 01 1 Mobilization and Demob			3,100	200	200	300	0	3,800	
TOTAL Mob, Demob & Preparato			3,100	200	200	300	0	3,800	
11 02 03 26 03 Sitework									
11 02 03 26 03 1 Site Preparation			1,100	100	100	100	0	1,300	
11 02 03 26 03 2 Line Existing Pipe w/			75,700	3,800	4,000	8,300	700	92,500	
11 02 03 26 03 3 Site Restoration			2,100	100	100	200	0	2,500	
TOTAL Sitework			78,800	3,900	4,100	8,700	700	96,300	
11 02 03 26 04 Drainage Structure									
11 02 03 26 04 1 Replace Handrail			5,400	300	300	600	0	6,600	
11 02 03 26 04 2 Replace Grating			500	0	0	100	0	600	
11 02 03 26 04 3 Replace Ladders			1,000	0	100	100	0	1,200	
TOTAL Drainage Structure			6,900	300	400	800	100	8,400	
TOTAL GW-39, 72" Drain (Caho			88,800	4,400	4,700	9,800	800	108,600	

** PROJECT INDIRECT SUMMARY - Level 6 (Rounded to 100's) **

		QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
11 02 03 27	GW-40, 30" Drain (Indian Creek									
11 02 03 27 01	Mob, Demob & Preparatory W									
11 02 03 27 01 1	Mobilization and Demob			3,100	200	200	300	0	3,800	
	TOTAL Mob, Demob & Preparato			3,100	200	200	300	0	3,800	
11 02 03 27 02	Care and Diversion of Wate									
11 02 03 27 02 1	Fabricate Bulkheads			2,500	100	100	300	0	3,100	
11 02 03 27 02 2	Install Temporary Bulk	2.00	DAY	2,200	100	100	200	0	2,600	1316.74
11 02 03 27 02 3	Remove Temporary Bulkh	1.00	DAY	1,100	100	100	100	0	1,300	1316.74
11 02 03 27 02 4	Unwatering Pumps			4,300	200	200	500	0	5,300	
	TOTAL Care and Diversion of			10,100	500	500	1,100	100	12,300	
11 02 03 27 03	Sitework									
11 02 03 27 03 1	Site Preparation			1,100	100	100	100	0	1,300	
11 02 03 27 03 2	Line Existing Pipe w/			33,200	1,700	1,700	3,700	300	40,600	
11 02 03 27 03 3	Site Restoration			2,100	100	100	200	0	2,500	
	TOTAL Sitework			36,400	1,800	1,900	4,000	300	44,500	
11 02 03 27 04	Drainage Structure									
11 02 03 27 04 1	Replace Handrail			5,400	300	300	600	0	6,600	
11 02 03 27 04 2	Replace Grating			500	0	0	100	0	600	
11 02 03 27 04 3	Replace Ladders			1,000	0	100	100	0	1,200	
	TOTAL Drainage Structure			6,900	300	400	800	100	8,400	
11 02 03 27 05	Gates									
11 02 03 27 05 1	Remove Existing Gate	1.00	EA	2,000	100	100	200	0	2,500	2472.39
11 02 03 27 05 2	Rehab Gate	1.00	EA	5,300	300	300	600	0	6,500	6497.11
11 02 03 27 05 3	Install/Test Rehabbed	1.00	EA	3,200	200	200	400	0	3,900	3880.08
	TOTAL Gates			10,500	500	600	1,200	100	12,800	
	TOTAL GW-40, 30" Drain (Indi			67,000	3,300	3,500	7,400	600	81,900	
11 02 03 28	GW-41, 72" Drain (Indian Creek									
11 02 03 28 01	Mob, Demob & Preparatory W									

** PROJECT INDIRECT SUMMARY - Level 6 (Rounded to 100's) **

	QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
11 02 03 28 01 1 Mobilization and Demob			3,100	200	200	300	0	3,800	
TOTAL Mob, Demob & Preparato			3,100	200	200	300	0	3,800	
11 02 03 28 02 Care and Diversion of Wate									
11 02 03 28 02 1 Fabricate Bulkheads			2,500	100	100	300	0	3,100	
11 02 03 28 02 2 Install Temporary Bulk	2.00	DAY	2,200	100	100	200	0	2,600	1316.74
11 02 03 28 02 3 Remove Temporary Bulkh	1.00	DAY	1,100	100	100	100	0	1,300	1316.74
11 02 03 28 02 4 Unwatering Pumps			4,300	200	200	500	0	5,300	
TOTAL Care and Diversion of			10,100	500	500	1,100	100	12,300	
11 02 03 28 03 Sitework									
11 02 03 28 03 1 Site Preparation			1,100	100	100	100	0	1,300	
11 02 03 28 03 2 Line Existing Pipe w/			75,700	3,800	4,000	8,300	700	92,500	
11 02 03 28 03 3 Site Restoration			2,100	100	100	200	0	2,500	
TOTAL Sitework			78,800	3,900	4,100	8,700	700	96,300	
11 02 03 28 04 Drainage Structure									
11 02 03 28 04 1 Replace Handrail			9,200	500	500	1,000	100	11,300	
11 02 03 28 04 2 Replace Grating			1,500	100	100	200	0	1,800	
11 02 03 28 04 3 Replace Ladders			5,500	300	300	600	100	6,700	
TOTAL Drainage Structure			16,200	800	900	1,800	100	19,800	
11 02 03 28 05 Gates									
11 02 03 28 05 1 Remove Existing Gate	1.00	EA	3,400	200	200	400	0	4,200	4173.20
11 02 03 28 05 2 Rehab Gate	1.00	EA	12,300	600	600	1,400	100	15,100	15076
11 02 03 28 05 3 Install/Test Rehabbed	1.00	EA	5,700	300	300	600	100	6,900	6909.94
TOTAL Gates			21,400	1,100	1,100	2,400	200	26,200	
TOTAL GW-41, 72" Drain (Indi			129,600	6,500	6,800	14,300	1,200	158,400	
11 02 03 29 GW-42, 36" Drain (Indian Creek									
11 02 03 29 01 Mob, Demob & Preparatory W									
11 02 03 29 01 1 Mobilization and Demob			3,100	200	200	300	0	3,800	
TOTAL Mob, Demob & Preparato			3,100	200	200	300	0	3,800	

** PROJECT INDIRECT SUMMARY - Level 6 (Rounded to 100's) **

	QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
11 02 03 29 02 Care and Diversion of Wate									
11 02 03 29 02 1 Fabricate Bulkheads			2,500	100	100	300	0	3,100	
11 02 03 29 02 2 Install Temporary Bulk	2.00	DAY	2,200	100	100	200	0	2,600	1316.74
11 02 03 29 02 3 Remove Temporary Bulkh	1.00	DAY	1,100	100	100	100	0	1,300	1316.74
11 02 03 29 02 4 Unwatering Pumps			4,300	200	200	500	0	5,300	
TOTAL Care and Diversion of			10,100	500	500	1,100	100	12,300	
11 02 03 29 03 Sitework									
11 02 03 29 03 1 Site Preparation			1,100	100	100	100	0	1,300	
11 02 03 29 03 2 Line Existing Pipe w/			33,200	1,700	1,700	3,700	300	40,600	
11 02 03 29 03 3 Site Restoration			2,100	100	100	200	0	2,500	
TOTAL Sitework			36,400	1,800	1,900	4,000	300	44,500	
11 02 03 29 04 Drainage Structure									
11 02 03 29 04 1 Replace Handrail			5,400	300	300	600	0	6,600	
11 02 03 29 04 2 Replace Grating			500	0	0	100	0	600	
11 02 03 29 04 3 Replace Ladders			1,000	0	100	100	0	1,200	
TOTAL Drainage Structure			6,900	300	400	800	100	8,400	
11 02 03 29 05 Gates									
11 02 03 29 05 1 Remove Existing Gate	1.00	EA	2,000	100	100	200	0	2,500	2472.39
11 02 03 29 05 2 Rehab Gate	1.00	EA	5,700	300	300	600	100	7,000	7017.67
11 02 03 29 05 3 Install/Test Rehabbed	1.00	EA	3,200	200	200	400	0	3,900	3880.08
TOTAL Gates			10,900	500	600	1,200	100	13,400	
TOTAL GW-42, 36" Drain (Indi			67,400	3,400	3,500	7,400	600	82,400	
11 02 03 30 GW-43, 30" Drain (Indian Creek									
11 02 03 30 01 Mob, Demob & Preparatory W									
11 02 03 30 01 1 Mobilization and Demob			3,100	200	200	300	0	3,800	
TOTAL Mob, Demob & Preparato			3,100	200	200	300	0	3,800	
11 02 03 30 03 Sitework									
11 02 03 30 03 1 Site Preparation			1,100	100	100	100	0	1,300	

	QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
11 02 03 30 03 2 Line Existing Pipe w/			33,200	1,700	1,700	3,700	300	40,600	
11 02 03 30 03 3 Site Restoration			2,100	100	100	200	0	2,500	
TOTAL Sitework			36,400	1,800	1,900	4,000	300	44,500	
11 02 03 30 04 Drainage Structure									
11 02 03 30 04 1 Replace Handrail			5,400	300	300	600	0	6,600	
11 02 03 30 04 2 Replace Grating			500	0	0	100	0	600	
11 02 03 30 04 3 Replace Ladders			1,000	0	100	100	0	1,200	
TOTAL Drainage Structure			6,900	300	400	800	100	8,400	
TOTAL GW-43, 30" Drain (Indi			46,400	2,300	2,400	5,100	400	56,700	
11 02 03 31 GW-44, 30" Drain (Indian Creek									
11 02 03 31 01 Mob, Demob & Preparatory W									
11 02 03 31 01 1 Mobilization and Demob			3,100	200	200	300	0	3,800	
TOTAL Mob, Demob & Preparato			3,100	200	200	300	0	3,800	
11 02 03 31 03 Sitework									
11 02 03 31 03 1 Site Preparation			1,100	100	100	100	0	1,300	
11 02 03 31 03 2 Line Existing Pipe w/			33,200	1,700	1,700	3,700	300	40,600	
11 02 03 31 03 3 Site Restoration			2,100	100	100	200	0	2,500	
TOTAL Sitework			36,400	1,800	1,900	4,000	300	44,500	
11 02 03 31 04 Drainage Structure									
11 02 03 31 04 1 Replace Handrail			5,400	300	300	600	0	6,600	
11 02 03 31 04 2 Replace Grating			500	0	0	100	0	600	
11 02 03 31 04 3 Replace Ladders			1,000	0	100	100	0	1,200	
TOTAL Drainage Structure			6,900	300	400	800	100	8,400	
TOTAL GW-44, 30" Drain (Indi			46,400	2,300	2,400	5,100	400	56,700	
TOTAL Lower Wood River Levee			2,121,200	105,800	111,100	233,300	19,600	2,591,000	
TOTAL Gravity Drainage Struc			3,147,300	156,900	164,800	346,000	29,000	3,844,100	
11 03 Closure Structures									

	QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
11 03 01 Upper Wood River Levee (UWRL)									
11 03 01 1 CS-1, Rail Closure (Riverfront									
11 03 01 1 01 Replace Concrete Joint Sea									
11 03 01 1 01 1 Remove Exist Joint Sea	80.00	LF	300	0	0	0	0	300	4.10
11 03 01 1 01 2 New Joint Sealant	80.00	LF	200	0	0	0	0	300	3.77
TOTAL Replace Concrete Joint			500	0	0	100	0	600	
11 03 01 1 02 Rehab Closure Structure Ga									
11 03 01 1 02 1 Remove Exist Gate			2,200	100	100	200	0	2,700	
11 03 01 1 02 2 Rehab Gate			6,400	300	300	700	100	7,900	
11 03 01 1 02 3 Install/Test Rehabbed			3,400	200	200	400	0	4,200	
TOTAL Rehab Closure Structur			12,100	600	600	1,300	100	14,800	
TOTAL CS-1, Rail Closure (Ri			12,600	600	700	1,400	100	15,400	
11 03 01 2 CS-2, Rail Closure (Riverfront									
11 03 01 2 01 Replace Concrete Joint Sea									
11 03 01 2 01 1 Remove Exist Joint Sea	80.00	LF	300	0	0	0	0	300	4.10
11 03 01 2 01 2 New Joint Sealant	80.00	LF	200	0	0	0	0	300	3.77
TOTAL Replace Concrete Joint			500	0	0	100	0	600	
11 03 01 2 02 Rehab Closure Structure Ga									
11 03 01 2 02 1 Remove Exist Gate			2,200	100	100	200	0	2,700	
11 03 01 2 02 2 Rehab Gate			6,400	300	300	700	100	7,900	
11 03 01 2 02 3 Install/Test Rehabbed			3,400	200	200	400	0	4,200	
TOTAL Rehab Closure Structur			12,100	600	600	1,300	100	14,800	
TOTAL CS-2, Rail Closure (Ri			12,600	600	700	1,400	100	15,400	
11 03 01 3 CS-3, Rail Closure (Riverfront									
11 03 01 3 01 Replace Concrete Joint Sea									
11 03 01 3 01 1 Remove Exist Joint Sea	80.00	LF	300	0	0	0	0	300	4.10
11 03 01 3 01 2 New Joint Sealant	80.00	LF	200	0	0	0	0	300	3.77

		QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
	TOTAL Replace Concrete Joint			500	0	0	100	0	600	
11 03 01 3 02	Rehab Closure Structure Ga									
11 03 01 3 02 1	Remove Exist Gate			2,200	100	100	200	0	2,700	
11 03 01 3 02 2	Rehab Gate			6,400	300	300	700	100	7,900	
11 03 01 3 02 3	Install/Test Rehabbed			3,400	200	200	400	0	4,200	
	TOTAL Rehab Closure Structur			12,100	600	600	1,300	100	14,800	
	TOTAL CS-3, Rail Closure (Ri			12,600	600	700	1,400	100	15,400	
11 03 01 4	CS-4, Rail Closure (Riverfront									
11 03 01 4 01	Replace Concrete Joint Sea									
11 03 01 4 01 1	Remove Exist Joint Sea	160.00	LF	500	0	0	100	0	700	4.10
11 03 01 4 01 2	New Joint Sealant	160.00	LF	500	0	0	100	0	600	3.77
	TOTAL Replace Concrete Joint			1,000	100	100	100	0	1,300	
11 03 01 4 02	Rehab Closure Structure Ga									
11 03 01 4 02 1	Remove Exist Gate			2,200	100	100	200	0	2,700	
11 03 01 4 02 2	Rehab Gate			6,400	300	300	700	100	7,900	
11 03 01 4 02 3	Install/Test Rehabbed			3,400	200	200	400	0	4,200	
	TOTAL Rehab Closure Structur			12,100	600	600	1,300	100	14,800	
11 03 01 4 03	Demo of Exist Gate Monolit									
11 03 01 4 03 1	Remove & Dispose of Ex			9,200	500	500	1,000	100	11,300	
	TOTAL Demo of Exist Gate Mon			9,200	500	500	1,000	100	11,300	
11 03 01 4 04	New Gate Monolith									
11 03 01 4 04 1	Mobilization and Demob			3,000	200	200	300	0	3,700	
11 03 01 4 04 2	Structural Excavation			2,500	100	100	300	0	3,100	
11 03 01 4 04 3	Concrete	60.00	CY	15,000	800	800	1,700	100	18,300	305.50
11 03 01 4 04 4	Reinforcing Steel	5700.00	LB	2,800	100	100	300	0	3,400	0.60
11 03 01 4 04 5	Dowels	16.00	EA	300	0	0	0	0	300	19.66
11 03 01 4 04 6	Misc. Appurtenances			300	0	0	0	0	400	
11 03 01 4 04 7	Railroad Traffic Contr			4,400	200	200	500	0	5,400	
11 03 01 4 04 8	Railroad Insurance Req			7,500	400	400	800	100	9,200	

		QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
11 03 01 4 04 9	Site Restoration			1,300	100	100	100	0	1,500	
TOTAL	New Gate Monolith			37,100	1,900	1,900	4,100	300	45,300	
TOTAL	CS-4, Rail Closure (Ri			59,400	3,000	3,100	6,600	500	72,600	
11 03 01 5	CS-5, Road Closure (Riverfront									
11 03 01 5 01	Replace Concrete Joint Sea									
11 03 01 5 01 1	Remove Exist Joint Sea	80.00	LF	300	0	0	0	0	300	4.10
11 03 01 5 01 2	New Joint Sealant	80.00	LF	200	0	0	0	0	300	3.77
TOTAL	Replace Concrete Joint			500	0	0	100	0	600	
11 03 01 5 02	Rehab Closure Structure Ga									
11 03 01 5 02 1	Remove Exist Gate			2,200	100	100	200	0	2,700	
11 03 01 5 02 2	Rehab Gate			6,400	300	300	700	100	7,900	
11 03 01 5 02 3	Install/Test Rehabbed			3,400	200	200	400	0	4,200	
TOTAL	Rehab Closure Structur			12,100	600	600	1,300	100	14,800	
11 03 01 5 03	Demo of Exist Aproach Slab									
11 03 01 5 03 1	Remove & Dispose of Ex			9,400	500	500	1,000	100	11,500	
TOTAL	Demo of Exist Aproach			9,400	500	500	1,000	100	11,500	
11 03 01 5 04	New Aproach Slab									
11 03 01 5 04 1	Mobilization and Demob			500	0	0	100	0	600	
11 03 01 5 04 2	Structural Excavation			500	0	0	100	0	600	
11 03 01 5 04 3	Concrete	61.00	CY	9,200	500	500	1,000	100	11,200	183.30
11 03 01 5 04 4	Reinforcing Steel	6100.00	LB	3,000	100	200	300	0	3,700	0.60
11 03 01 5 04 7	Traffic Control			900	0	0	100	0	1,100	
11 03 01 5 04 9	Site Restoration			500	0	0	100	0	600	
TOTAL	New Aproach Slab			14,500	700	800	1,600	100	17,800	
TOTAL	CS-5, Road Closure (Ri			36,500	1,800	1,900	4,000	300	44,600	
11 03 01 7	CS-7, Rail Closure (Flank)									
11 03 01 7 01	Replace Concrete Joint Sea									

** PROJECT INDIRECT SUMMARY - Level 6 (Rounded to 100's) **

		QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
11 03 01 7 01 1	Remove Exist Joint Sea	30.00	LF	100	0	0	0	0	100	4.10
11 03 01 7 01 2	New Joint Sealant	30.00	LF	100	0	0	0	0	100	3.77
TOTAL	Replace Concrete Joint			200	0	0	0	0	200	
11 03 01 7 02	Demo of Exist Sill Monolit									
11 03 01 7 02 1	Remove & Dispose of Ex			600	0	0	100	0	800	
TOTAL	Demo of Exist Sill Mon			600	0	0	100	0	800	
11 03 01 7 03	New Sill Monolith									
11 03 01 7 03 1	Mobilization and Demob			500	0	0	100	0	600	
11 03 01 7 03 2	Structural Excavation			500	0	0	100	0	600	
11 03 01 7 03 3	Concrete	4.00	CY	600	0	0	100	0	700	183.30
11 03 01 7 03 4	Reinforcing Steel	40.00	LB	0	0	0	0	0	0	0.60
11 03 01 7 03 5	Dowels	10.00	EA	200	0	0	0	0	200	19.66
11 03 01 7 03 6	Misc. Appurtenances			200	0	0	0	0	300	
11 03 01 7 03 7	Traffic Control			600	0	0	100	0	700	
11 03 01 7 03 9	Site Restoration			500	0	0	100	0	600	
TOTAL	New Sill Monolith			3,100	200	200	300	0	3,800	
TOTAL	CS-7, Rail Closure (Fl			3,900	200	200	400	0	4,800	
11 03 01 8	CS-8, Rail Closure (Flank)									
11 03 01 8 01	Replace Concrete Joint Sea									
11 03 01 8 01 1	Remove Exist Joint Sea	70.00	LF	200	0	0	0	0	300	4.10
11 03 01 8 01 2	New Joint Sealant	70.00	LF	200	0	0	0	0	300	3.77
TOTAL	Replace Concrete Joint			500	0	0	0	0	600	
11 03 01 8 02	Rehab Closure Structure Ga									
11 03 01 8 02 1	Remove Exist Gate			2,200	100	100	200	0	2,700	
11 03 01 8 02 2	Rehab Gate			3,800	200	200	400	0	4,700	
11 03 01 8 02 3	Install/Test Rehabbed			2,800	100	100	300	0	3,400	
TOTAL	Rehab Closure Structur			8,800	400	500	1,000	100	10,800	
11 03 01 8 03	Demo of Exist Sill Monolit									

		QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
11 03 01 8 03 1	Remove & Dispose of Ex			600	0	0	100	0	800	
	TOTAL Demo of Exist Sill Mon			600	0	0	100	0	800	
11 03 01 8 04	New Sill Monolith									
11 03 01 8 04 1	Mobilization and Demob			500	0	0	100	0	600	
11 03 01 8 04 2	Structural Excavation			500	0	0	100	0	600	
11 03 01 8 04 3	Concrete	4.00	CY	600	0	0	100	0	700	183.30
11 03 01 8 04 4	Reinforcing Steel	40.00	LB	0	0	0	0	0	0	0.60
11 03 01 8 04 5	Dowels	10.00	EA	200	0	0	0	0	200	19.66
11 03 01 8 04 6	Misc. Appurtenances			200	0	0	0	0	300	
11 03 01 8 04 7	Traffic Control			600	0	0	100	0	700	
11 03 01 8 04 9	Site Restoration			500	0	0	100	0	600	
	TOTAL New Sill Monolith			3,100	200	200	300	0	3,800	
	TOTAL CS-8, Rail Closure (Fl			13,000	600	700	1,400	100	15,900	
11 03 01 9	CS-9, Rail Closure (Flank)									
11 03 01 9 01	Remove Closure Structure G									
11 03 01 9 01 1	Remove & Dispose of Ex			2,500	100	100	300	0	3,100	
	TOTAL Remove Closure Structu			2,500	100	100	300	0	3,100	
11 03 01 9 02	Remove RR Ballast Etc....									
11 03 01 9 02 1	Excavation and Removal	550.00	CY	6,400	300	300	700	100	7,800	14.20
	TOTAL Remove RR Ballast Etc.			6,400	300	300	700	100	7,800	
11 03 01 9 03	Abandon Structure/Close Op									
11 03 01 9 03 1	Place and Compact Emba	1300.00	CY	7,400	400	400	800	100	9,100	6.96
	TOTAL Abandon Structure/Clos			7,400	400	400	800	100	9,100	
	TOTAL CS-9, Rail Closure (Fl			16,300	800	900	1,800	200	19,900	
	TOTAL Upper Wood River Levee			166,900	8,300	8,800	18,400	1,500	204,000	
11 03 02	East and West Fork Levee									
11 03 02 1	CS-10, Rail Closure (East Fork									

** PROJECT INDIRECT SUMMARY - Level 6 (Rounded to 100's) **

		QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
11 03 02 1 01	Demolition of Existing Str									
11 03 02 1 01 1	Remove & Dispose of Ex			2,500	100	100	300	0	3,100	
11 03 02 1 01 2	Remove & Dispose of Ex			61,600	3,100	3,200	6,800	600	75,200	
11 03 02 1 01 3	Remove Ballast & RR Be			3,300	200	200	400	0	4,000	
	TOTAL Demolition of Existing			67,300	3,400	3,500	7,400	600	82,300	
11 03 02 1 02	New Closure Structure									
11 03 02 1 02 1	Mobilization and Demob			19,700	1,000	1,000	2,200	200	24,100	
11 03 02 1 02 2	Structural Excavation			5,000	300	300	600	0	6,100	
11 03 02 1 02 3	Concrete	400.00	CY	100,000	5,000	5,300	11,000	900	122,200	305.50
11 03 02 1 02 4	Reinforcing Steel	40300	LB	19,800	1,000	1,000	2,200	200	24,200	0.60
11 03 02 1 02 5	Steel Sheetpile	6582.00	SF	99,900	5,000	5,200	11,000	900	122,000	18.54
11 03 02 1 02 6	Misc. Appurtenances			1,200	100	100	100	0	1,500	
11 03 02 1 02 7	Railroad Work			50,000	2,500	2,600	5,500	500	61,100	
11 03 02 1 02 8	Railroad Insurance Req			15,000	800	800	1,700	100	18,300	
11 03 02 1 02 9	Fabricate New Gate			18,000	900	900	2,000	200	22,000	
11 03 02 1 02 10	Install/Test New Gate			3,400	200	200	400	0	4,200	
11 03 02 1 02 11	Site Restoration			2,500	100	100	300	0	3,100	
	TOTAL New Closure Structure			334,500	16,700	17,600	36,900	3,100	408,800	
	TOTAL CS-10, Rail Closure (E			401,800	20,100	21,100	44,300	3,700	491,000	
	TOTAL East and West Fork Lev			401,800	20,100	21,100	44,300	3,700	491,000	
11 03 03	Lower Wood River Levee (LWRL)									
11 03 03 1	CS-11, Rail Closure (Flank)									
11 03 03 1 01	Demolition of Existing Str									
11 03 03 1 01 1	Remove & Dispose of Ex			2,400	100	100	300	0	2,900	
11 03 03 1 01 2	Remove & Dispose of Ex			54,600	2,700	2,900	6,000	500	66,800	
11 03 03 1 01 3	Remove Ballast & RR Be			3,300	200	200	400	0	4,000	
	TOTAL Demolition of Existing			60,300	3,000	3,200	6,600	600	73,700	
11 03 03 1 02	New Closure Structure									
11 03 03 1 02 1	Mobilization and Demob			19,100	1,000	1,000	2,100	200	23,300	
11 03 03 1 02 2	Structural Excavation			5,000	300	300	600	0	6,100	
11 03 03 1 02 3	Concrete	355.00	CY	88,800	4,400	4,700	9,800	800	108,500	305.50
11 03 03 1 02 4	Reinforcing Steel	35500	LB	17,400	900	900	1,900	200	21,300	0.60
11 03 03 1 02 5	Steel Sheetpile	6582.00	SF	99,900	5,000	5,200	11,000	900	122,000	18.54
11 03 03 1 02 6	Misc. Appurtenances			600	0	0	100	0	800	

** PROJECT INDIRECT SUMMARY - Level 6 (Rounded to 100's) **

		QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
11 03 03 1 02 7	Railroad Work			50,000	2,500	2,600	5,500	500	61,100	
11 03 03 1 02 8	Railroad Insurance Req			15,000	800	800	1,700	100	18,300	
11 03 03 1 02 9	Fabricate New Gate			34,500	1,700	1,800	3,800	300	42,100	
11 03 03 1 02 10	Install/Test New Gate			3,400	200	200	400	0	4,200	
11 03 03 1 02 11	Site Restoration			2,500	100	100	300	0	3,100	
TOTAL	New Closure Structure			336,200	16,800	17,600	37,100	3,100	410,800	
TOTAL	CS-11, Rail Closure (F			396,500	19,800	20,800	43,700	3,700	484,500	
11 03 03 2	CS-12, Road Closure (Flank)									
11 03 03 2 01	Demolition of Existing Str									
11 03 03 2 01 1	Remove & Dispose of Ex			2,400	100	100	300	0	2,900	
11 03 03 2 01 2	Remove & Dispose of Ex			175,400	8,800	9,200	19,300	1,600	214,400	
11 03 03 2 01 3	Remove Ballast & RR Be			3,300	200	200	400	0	4,000	
TOTAL	Demolition of Existing			181,100	9,100	9,500	20,000	1,700	221,300	
11 03 03 2 02	New Closure Structure									
11 03 03 2 02 1	Mobilization and Demob			38,900	1,900	2,000	4,300	400	47,500	
11 03 03 2 02 2	Structural Excavation			10,000	500	500	1,100	100	12,200	
11 03 03 2 02 3	Concrete	1140.00	CY	285,000	14,300	15,000	31,400	2,600	348,300	305.50
11 03 03 2 02 4	Reinforcing Steel	113800	LB	55,900	2,800	2,900	6,200	500	68,300	0.60
11 03 03 2 02 5	Steel Sheetpile	20845	SF	316,300	15,800	16,600	34,900	2,900	386,500	18.54
11 03 03 2 02 6	Misc. Appurtenances			5,500	300	300	600	100	6,700	
11 03 03 2 02 7	Traffic Control			5,900	300	300	700	100	7,200	
11 03 03 2 02 9	Fabricate New Gate			34,500	1,700	1,800	3,800	300	42,100	
11 03 03 2 02 10	Install/Test New Gate			3,400	200	200	400	0	4,200	
11 03 03 2 02 11	Site Restoration			2,500	100	100	300	0	3,100	
TOTAL	New Closure Structure			757,800	37,900	39,800	83,500	7,000	926,100	
TOTAL	CS-12, Road Closure (F			938,900	46,900	49,300	103,500	8,700	1,147,300	
11 03 03 3	CS-13, Rail Closure (Flank)									
11 03 03 3 01	Remove Closure Structure G									
11 03 03 3 01 1	Remove & Dispose of Ex			2,500	100	100	300	0	3,100	
TOTAL	Remove Closure Structu			2,500	100	100	300	0	3,100	
11 03 03 3 02	Remove RR Ballast Etc....									

	QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
11 03 03 3 02 1 Excavation and Removal	400.00	CY	4,600	200	200	500	0	5,700	14.20
TOTAL Remove RR Ballast Etc.			4,600	200	200	500	0	5,700	
11 03 03 3 03 Abandon Structure/Close Op									
11 03 03 3 03 1 Place and Compact Emba	800.00	CY	4,600	200	200	500	0	5,600	6.96
TOTAL Abandon Structure/Clos			4,600	200	200	500	0	5,600	
TOTAL CS-13, Rail Closure (F			11,700	600	600	1,300	100	14,300	
11 03 03 4 CS-14, Rail Closure (Flank)									
11 03 03 4 01 Remove Closure Structure G									
11 03 03 4 01 1 Remove & Dispose of Ex			2,500	100	100	300	0	3,100	
TOTAL Remove Closure Structu			2,500	100	100	300	0	3,100	
11 03 03 4 02 Remove RR Ballast Etc....									
11 03 03 4 02 1 Excavation and Removal	550.00	CY	6,400	300	300	700	100	7,800	14.20
TOTAL Remove RR Ballast Etc.			6,400	300	300	700	100	7,800	
11 03 03 4 03 Abandon Structure/Close Op									
11 03 03 4 03 1 Place and Compact Emba	1300.00	CY	7,400	400	400	800	100	9,100	6.96
TOTAL Abandon Structure/Clos			7,400	400	400	800	100	9,100	
TOTAL CS-14, Rail Closure (F			16,300	800	900	1,800	200	19,900	
11 03 03 5 CS-15, Road Closure (Flank)									
11 03 03 5 01 Replace Concrete Joint Sea									
11 03 03 5 01 1 Remove Exist Joint Sea	100.00	LF	300	0	0	0	0	400	4.10
11 03 03 5 01 2 New Joint Sealant	100.00	LF	300	0	0	0	0	400	3.77
TOTAL Replace Concrete Joint			600	0	0	100	0	800	
11 03 03 5 02 Closure Struct. Gate Cover									

** PROJECT INDIRECT SUMMARY - Level 6 (Rounded to 100's) **

	QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
11 03 03 5 02 1 Weather Shield			17,700	900	900	2,000	200	21,600	
TOTAL Closure Struct. Gate C			17,700	900	900	2,000	200	21,600	
11 03 03 5 03 Demo of Exist Gate Monolit									
11 03 03 5 03 1 Remove & Dispose of Ex			3,400	200	200	400	0	4,100	
TOTAL Demo of Exist Gate Mon			3,400	200	200	400	0	4,100	
11 03 03 5 04 New Gate Monolith									
11 03 03 5 04 1 Mobilization and Demob			2,000	100	100	200	0	2,400	
11 03 03 5 04 2 Structural Excavation			1,500	100	100	200	0	1,800	
11 03 03 5 04 3 Concrete	22.00	CY	5,500	300	300	600	100	6,700	305.50
11 03 03 5 04 4 Reinforcing Steel	2200.00	LB	1,100	100	100	100	0	1,300	0.60
11 03 03 5 04 5 Dowels	16.00	EA	300	0	0	0	0	300	19.66
11 03 03 5 04 6 Misc. Appurtenances			200	0	0	0	0	200	
11 03 03 5 04 7 Traffic Control			2,200	100	100	200	0	2,700	
11 03 03 5 04 9 Site Restoration			1,300	100	100	100	0	1,500	
TOTAL New Gate Monolith			14,000	700	700	1,500	100	17,100	
TOTAL CS-15, Road Closure (F			35,700	1,800	1,900	3,900	300	43,700	
11 03 03 6 CS-16, Road Closure (Flank)									
11 03 03 6 01 Replace Concrete Joint Sea									
11 03 03 6 01 1 Remove Exist Joint Sea	100.00	LF	300	0	0	0	0	400	4.10
11 03 03 6 01 2 New Joint Sealant	100.00	LF	300	0	0	0	0	400	3.77
TOTAL Replace Concrete Joint			600	0	0	100	0	800	
11 03 03 6 02 Closure Struct. Gate Cover									
11 03 03 6 02 1 Weather Shield			17,700	900	900	2,000	200	21,600	
TOTAL Closure Struct. Gate C			17,700	900	900	2,000	200	21,600	
11 03 03 6 03 Demo of Exist Gate Monolit									
11 03 03 6 03 1 Remove & Dispose of Ex			3,400	200	200	400	0	4,100	
TOTAL Demo of Exist Gate Mon			3,400	200	200	400	0	4,100	

		QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
11 03 03 6 04	New Gate Monolith									
11 03 03 6 04 1	Mobilization and Demob			2,000	100	100	200	0	2,400	
11 03 03 6 04 2	Structural Excavation			1,500	100	100	200	0	1,800	
11 03 03 6 04 3	Concrete	22.00	CY	5,500	300	300	600	100	6,700	305.50
11 03 03 6 04 4	Reinforcing Steel	2200.00	LB	1,100	100	100	100	0	1,300	0.60
11 03 03 6 04 5	Dowels	16.00	EA	300	0	0	0	0	300	19.66
11 03 03 6 04 6	Misc. Appurtenances			200	0	0	0	0	200	
11 03 03 6 04 7	Traffic Control			2,200	100	100	200	0	2,700	
11 03 03 6 04 9	Site Restoration			1,300	100	100	100	0	1,500	
	TOTAL New Gate Monolith			14,000	700	700	1,500	100	17,100	
	TOTAL CS-16, Road Closure (F			35,700	1,800	1,900	3,900	300	43,700	
11 03 03 7	CS-17, Rail Closure (Flank)									
11 03 03 7 01	Replace Concrete Joint Sea									
11 03 03 7 01 1	Remove Exist Joint Sea	40.00	LF	100	0	0	0	0	200	4.10
11 03 03 7 01 2	New Joint Sealant	40.00	LF	100	0	0	0	0	200	3.77
	TOTAL Replace Concrete Joint			300	0	0	0	0	300	
11 03 03 7 02	Rehab Closure Structure Ga									
11 03 03 7 02 1	Remove Exist Gate			2,200	100	100	200	0	2,700	
11 03 03 7 02 2	Rehab Gate			3,800	200	200	400	0	4,700	
11 03 03 7 02 3	Install/Test Rehabbed			2,800	100	100	300	0	3,400	
	TOTAL Rehab Closure Structur			8,800	400	500	1,000	100	10,800	
11 03 03 7 03	Demo of Exist Sill Monolit									
11 03 03 7 03 1	Remove & Dispose of Ex			600	0	0	100	0	800	
	TOTAL Demo of Exist Sill Mon			600	0	0	100	0	800	
11 03 03 7 04	New Sill Monolith									
11 03 03 7 04 1	Mobilization and Demob			500	0	0	100	0	600	
11 03 03 7 04 2	Structural Excavation			500	0	0	100	0	600	
11 03 03 7 04 3	Concrete	4.00	CY	600	0	0	100	0	700	183.30
11 03 03 7 04 4	Reinforcing Steel	40.00	LB	0	0	0	0	0	0	0.60
11 03 03 7 04 5	Dowels	10.00	EA	200	0	0	0	0	200	19.66
11 03 03 7 04 6	Misc. Appurtenances			200	0	0	0	0	300	
11 03 03 7 04 7	Traffic Control			600	0	0	100	0	700	

** PROJECT INDIRECT SUMMARY - Level 6 (Rounded to 100's) **

		QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
11 03 03 7 04 9	Site Restoration			500	0	0	100	0	600	
	TOTAL New Sill Monolith			3,100	200	200	300	0	3,800	
	TOTAL CS-17, Rail Closure (F			12,800	600	700	1,400	100	15,600	
11 03 03 8	CS-18, Rail Closure (Flank)									
11 03 03 8 01	Replace Concrete Joint Sea									
11 03 03 8 01 1	Remove Exist Joint Sea	25.00	LF	100	0	0	0	0	100	4.10
11 03 03 8 01 2	New Joint Sealant	25.00	LF	100	0	0	0	0	100	3.77
	TOTAL Replace Concrete Joint			200	0	0	0	0	200	
	TOTAL CS-18, Rail Closure (F			200	0	0	0	0	200	
11 03 03 9	CS-19, Road Closure (Riverfron									
11 03 03 9 01	Replace Concrete Joint Sea									
11 03 03 9 01 1	Remove Exist Joint Sea	110.00	LF	400	0	0	0	0	500	4.10
11 03 03 9 01 2	New Joint Sealant	110.00	LF	300	0	0	0	0	400	3.77
	TOTAL Replace Concrete Joint			700	0	0	100	0	900	
11 03 03 9 02	Rehab Closure Structure Ga									
11 03 03 9 02 1	Remove Exist Gate			2,200	100	100	200	0	2,700	
11 03 03 9 02 2	Rehab Gate			6,400	300	300	700	100	7,900	
11 03 03 9 02 3	Install/Test Rehabbed			3,400	200	200	400	0	4,200	
	TOTAL Rehab Closure Structur			12,100	600	600	1,300	100	14,800	
	TOTAL CS-19, Road Closure (R			12,800	600	700	1,400	100	15,600	
11 03 03 10	CS-20, Road Closure (Riverfron									
11 03 03 10 01	Replace Concrete Joint Sea									
11 03 03 10 01 1	Remove Exist Joint Sea	60.00	LF	200	0	0	0	0	200	4.10
11 03 03 10 01 2	New Joint Sealant	60.00	LF	200	0	0	0	0	200	3.77
	TOTAL Replace Concrete Joint			400	0	0	0	0	500	
11 03 03 10 02	Replace Closure Structure									

** PROJECT INDIRECT SUMMARY - Level 6 (Rounded to 100's) **

		QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
11 03 03 10 02 1	Remove & Dispose of Ex			2,400	100	100	300	0	2,900	
11 03 03 10 02 2	Fabricate New Gate			34,500	1,700	1,800	3,800	300	42,100	
11 03 03 10 02 3	Install/Test New Gate			3,400	200	200	400	0	4,200	
TOTAL	Replace Closure Struct			40,300	2,000	2,100	4,400	400	49,200	
11 03 03 10 03	Demo of Exist Sill Monolit									
11 03 03 10 03 1	Remove & Dispose of Ex			500	0	0	100	0	600	
TOTAL	Demo of Exist Sill Mon			500	0	0	100	0	600	
11 03 03 10 04	New Sill Monolith									
11 03 03 10 04 1	Mobilization and Demob			500	0	0	100	0	600	
11 03 03 10 04 2	Structural Excavation			500	0	0	100	0	600	
11 03 03 10 04 3	Concrete	3.00	CY	500	0	0	0	0	500	183.30
11 03 03 10 04 4	Reinforcing Steel	30.00	LB	0	0	0	0	0	0	0.60
11 03 03 10 04 5	Dowels	13.00	EA	200	0	0	0	0	300	19.66
11 03 03 10 04 6	Misc. Appurtenances			300	0	0	0	0	300	
11 03 03 10 04 7	Traffic Control			600	0	0	100	0	700	
11 03 03 10 04 9	Site Restoration			500	0	0	100	0	600	
TOTAL	New Sill Monolith			3,000	200	200	300	0	3,700	
TOTAL	CS-20, Road Closure (R			44,200	2,200	2,300	4,900	400	54,000	
11 03 03 11	CS-21 Road Closure (Riverfront									
11 03 03 11 01	Replace Concrete Joint Sea									
11 03 03 11 01 1	Remove Exist Joint Sea	45.00	LF	200	0	0	0	0	200	4.10
11 03 03 11 01 2	New Joint Sealant	45.00	LF	100	0	0	0	0	200	3.77
TOTAL	Replace Concrete Joint			300	0	0	0	0	400	
11 03 03 11 02	Rehab Closure Structure Ga									
11 03 03 11 02 1	Remove Exist Gate			2,200	100	100	200	0	2,700	
11 03 03 11 02 2	Rehab Gate			3,800	200	200	400	0	4,700	
11 03 03 11 02 3	Install/Test Rehabbed			2,800	100	100	300	0	3,400	
TOTAL	Rehab Closure Structur			8,800	400	500	1,000	100	10,800	
TOTAL	CS-21 Road Closure (Ri			9,100	500	500	1,000	100	11,100	

		QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
11 03 03 12	CS-22, Road Closure (Riverfron									
11 03 03 12 01	Replace Concrete Joint Sea									
11 03 03 12 01 1	Remove Exist Joint Sea	110.00	LF	400	0	0	0	0	500	4.10
11 03 03 12 01 2	New Joint Sealant	110.00	LF	300	0	0	0	0	400	3.77
	TOTAL Replace Concrete Joint			700	0	0	100	0	900	
11 03 03 12 02	Rehab Closure Structure Ga									
11 03 03 12 02 1	Remove Exist Gate			2,200	100	100	200	0	2,700	
11 03 03 12 02 2	Rehab Gate			6,400	300	300	700	100	7,900	
11 03 03 12 02 3	Install/Test Rehabbed			3,400	200	200	400	0	4,200	
	TOTAL Rehab Closure Structur			12,100	600	600	1,300	100	14,800	
	TOTAL CS-22, Road Closure (R			12,800	600	700	1,400	100	15,600	
11 03 03 13	CS-23, Road Closure(Cahokia Cr									
11 03 03 13 01	Replace Concrete Joint Sea									
11 03 03 13 01 1	Remove Exist Joint Sea	110.00	LF	400	0	0	0	0	500	4.10
11 03 03 13 01 2	New Joint Sealant	110.00	LF	300	0	0	0	0	400	3.77
	TOTAL Replace Concrete Joint			700	0	0	100	0	900	
	TOTAL CS-23, Road Closure(Ca			700	0	0	100	0	900	
11 03 03 14	CS-24, Road Closure (Indian Cr									
11 03 03 14 01	Replace Concrete Joint Sea									
11 03 03 14 01 1	Remove Exist Joint Sea	130.00	LF	400	0	0	0	0	500	4.10
11 03 03 14 01 2	New Joint Sealant	130.00	LF	400	0	0	0	0	500	3.77
	TOTAL Replace Concrete Joint			800	0	0	100	0	1,000	
11 03 03 14 02	Rehab Closure Structure Ga									
11 03 03 14 02 1	Remove Exist Gate			2,200	100	100	200	0	2,700	
11 03 03 14 02 2	Rehab Gate			6,400	300	300	700	100	7,900	
11 03 03 14 02 3	Install/Test Rehabbed			3,400	200	200	400	0	4,200	
	TOTAL Rehab Closure Structur			12,100	600	600	1,300	100	14,800	

	QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
TOTAL CS-24, Road Closure (I			12,900	600	700	1,400	100	15,800	
11 03 03 15 CS-25, Road Closure (Indian Cr									
11 03 03 15 01 Replace Concrete Joint Sea									
11 03 03 15 01 1 Remove Exist Joint Sea	120.00	LF	400	0	0	0	0	500	4.10
11 03 03 15 01 2 New Joint Sealant	120.00	LF	400	0	0	0	0	500	3.77
TOTAL Replace Concrete Joint			800	0	0	100	0	900	
TOTAL CS-25, Road Closure (I			800	0	0	100	0	900	
11 03 03 16 CS-26, Rail Closure (Indian Cr									
11 03 03 16 01 Replace Closure Structure									
11 03 03 16 01 1 Remove & Dispose of Ex			2,500	100	100	300	0	3,100	
11 03 03 16 01 2 Fabricate New Gate			18,000	900	900	2,000	200	22,000	
11 03 03 16 01 3 Install/Test New Gate			3,400	200	200	400	0	4,200	
TOTAL Replace Closure Struct			23,900	1,200	1,300	2,600	200	29,200	
TOTAL CS-26, Rail Closure (I			23,900	1,200	1,300	2,600	200	29,200	
TOTAL Lower Wood River Levee			1,565,000	78,200	82,200	172,500	14,500	1,912,400	
TOTAL Closure Structures			2,133,700	106,700	112,000	235,200	19,700	2,607,400	
TOTAL Levees and Floodwalls			8,611,300	430,100	451,600	948,500	79,500	10,521,000	
13 Pumping Plant									
13 01 East Alton No. 1									
13 01 01 Mob, Demob & Preparatory Work									
13 01 01 01 Mobilization and Demobilizatio									
13 01 01 01 1 Mobilization and Demobiliz			3,100	200	200	300	0	3,800	
TOTAL Mobilization and Demob			3,100	200	200	300	0	3,800	
TOTAL Mob, Demob & Preparato			3,100	200	200	300	0	3,800	
13 01 03 Care and Diversion of Water									

** PROJECT INDIRECT SUMMARY - Level 6 (Rounded to 100's) **

		QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
13 01 03 02	Site Work									
13 01 03 02 1	Fabricate Bulkheads			2,500	100	100	300	0	3,100	
13 01 03 02 2	Install Temporary Bulkhead	2.00	DAY	2,200	100	100	200	0	2,600	1316.74
13 01 03 02 3	Remove Temporary Bulkheads	1.00	DAY	1,100	100	100	100	0	1,300	1316.74
	TOTAL Site Work			5,700	300	300	600	100	7,000	
13 01 03 15	Mechanical									
13 01 03 15 1	Unwatering Pumps			4,300	200	200	500	0	5,300	
	TOTAL Mechanical			4,300	200	200	500	0	5,300	
	TOTAL Care and Diversion of			10,100	500	500	1,100	100	12,300	
13 01 78	Auxiliary Equipment									
13 01 78 15	Mechanical									
13 01 78 15 1	Remove Existing Trash Rake			10,800	500	600	1,200	100	13,200	
13 01 78 15 2	New Trash Rakes	3.00	EA	454,000	22,700	23,800	50,100	4,200	554,800	184929
13 01 78 15 3	Install and Test New Trash	3.00	EA	6,100	300	300	700	100	7,500	2493.37
	TOTAL Mechanical			471,000	23,500	24,700	51,900	4,400	575,500	
	TOTAL Auxiliary Equipment			471,000	23,500	24,700	51,900	4,400	575,500	
	TOTAL East Alton No. 1			484,200	24,200	25,400	53,400	4,500	591,700	
13 02	East Alton No. 2									
13 02 01	Mob, Demob & Preparatory Work									
13 02 01 01	Mobilization and Demobilizatio									
13 02 01 01 1	Mobilization and Demobiliz			3,100	200	200	300	0	3,800	
	TOTAL Mobilization and Demob			3,100	200	200	300	0	3,800	
	TOTAL Mob, Demob & Preparato			3,100	200	200	300	0	3,800	
13 02 02	Sitework									
13 02 02 5	Site Preparation			1,100	100	100	100	0	1,300	
13 02 02 10	Line Existing Pipe w/ HDPE Pip	2.00	EA	66,500	3,300	3,500	7,300	600	81,200	40602

		QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
13 02 02 15	Site Restoration			2,100	100	100	200	0	2,500	
	TOTAL Sitework			69,600	3,500	3,700	7,700	600	85,100	
13 02 03	Care and Diversion of Water									
13 02 03 02	Site Work									
13 02 03 02 1	Fabricate Bulkheads			2,500	100	100	300	0	3,100	
13 02 03 02 2	Install Temporary Bulkhead	2.00	DAY	2,200	100	100	200	0	2,600	1316.74
13 02 03 02 3	Remove Temporary Bulkheads	1.00	DAY	1,100	100	100	100	0	1,300	1316.74
	TOTAL Site Work			5,700	300	300	600	100	7,000	
13 02 03 15	Mechanical									
13 02 03 15 1	Unwatering Pumps			4,300	200	200	500	0	5,300	
	TOTAL Mechanical			4,300	200	200	500	0	5,300	
	TOTAL Care and Diversion of			10,100	500	500	1,100	100	12,300	
13 02 75	Pumping Plant Superstructure									
13 02 75 04	Masonry									
13 02 75 04 01	Masonry Restoration									
13 02 75 04 01 1	Clean Brick			9,000	400	500	1,000	100	11,000	
13 02 75 04 01 2	Tuckpointing			20,800	1,000	1,100	2,300	200	25,400	
	TOTAL Masonry Restoration			29,800	1,500	1,600	3,300	300	36,400	
	TOTAL Masonry			29,800	1,500	1,600	3,300	300	36,400	
13 02 75 06	Wood and Plastic									
13 02 75 06 01	Fiberglass Grating (PS)									
13 02 75 06 01 1	Remove Existing Gratin	200.00	SF	500	0	0	100	0	600	2.83
13 02 75 06 01 2	Install New Grating	200.00	SF	4,600	200	200	500	0	5,600	27.91
	TOTAL Fiberglass Grating (PS			5,000	300	300	600	0	6,100	
13 02 75 06 02	Fiberglass Ladders - 5ea (									

** PROJECT INDIRECT SUMMARY - Level 6 (Rounded to 100's) **

		QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
13 02 75 06 02 1	Remove Existing Ladder	120.00	LF	1,800	100	100	200	0	2,200	18.70
13 02 75 06 02 2	Install New Ladders	120.00	LF	10,100	500	500	1,100	100	12,300	102.42
TOTAL	Fiberglass Ladders - 5			11,900	600	600	1,300	100	14,500	
13 02 75 06 03	Fiberglass Grating (GW)									
13 02 75 06 03 1	Remove Existing Gratin	60.00	SF	100	0	0	0	0	200	2.83
13 02 75 06 03 2	Install New Grating	60.00	SF	1,400	100	100	200	0	1,700	27.91
TOTAL	Fiberglass Grating (GW			1,500	100	100	200	0	1,800	
13 02 75 06 04	Fiberglass Ladders (GW)									
13 02 75 06 04 1	Remove Existing Ladder	55.00	LF	800	0	0	100	0	1,000	18.70
13 02 75 06 04 2	Install New Ladders	55.00	LF	4,600	200	200	500	0	5,600	102.42
TOTAL	Fiberglass Ladders (GW			5,500	300	300	600	100	6,700	
13 02 75 06 05	Fiberglass Railing (GW)									
13 02 75 06 05 1	Remove Existing Railin	120.00	LF	1,400	100	100	200	0	1,700	14.16
13 02 75 06 05 2	Install New Railing	120.00	LF	7,800	400	400	900	100	9,600	79.88
TOTAL	Fiberglass Railing (GW			9,200	500	500	1,000	100	11,300	
TOTAL	Wood and Plastic			33,100	1,700	1,700	3,700	300	40,500	
13 02 75 07	Thermal & Moisture Protection									
13 02 75 07 01	Roofing									
13 02 75 07 01 1	Remove Existing Roof	8.00	CSF	900	0	0	100	0	1,100	139.28
13 02 75 07 01 2	Install New Roof	8.00	CSF	1,400	100	100	200	0	1,700	210.76
TOTAL	Roofing			2,300	100	100	300	0	2,800	
TOTAL	Thermal & Moisture Pro			2,300	100	100	300	0	2,800	
13 02 75 15	Mechanical									
13 02 75 15 01	HVAC									
13 02 75 15 01 1	Electric Unit Heaters	3.00	EA	4,100	200	200	500	0	5,000	1665.95
13 02 75 15 01 2	Ventilation System			5,900	300	300	700	100	7,300	

	QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
TOTAL HVAC			10,000	500	500	1,100	100	12,300	
TOTAL Mechanical			10,000	500	500	1,100	100	12,300	
13 02 75 16 Electrical									
13 02 75 16 01 HVAC									
13 02 75 16 01 1 Electric Unit Heaters			3,300	200	200	400	0	4,000	
13 02 75 16 01 2 Ventilation System			900	0	0	100	0	1,100	
TOTAL HVAC			4,200	200	200	500	0	5,100	
13 02 75 16 02 Lighting and Power			8,300	400	400	900	100	10,200	
TOTAL Electrical			12,500	600	700	1,400	100	15,300	
TOTAL Pumping Plant Superstr			87,800	4,400	4,600	9,700	800	107,300	
13 02 76 Pumping Machinery & Appurtenance									
13 02 76 15 Mechanical									
13 02 76 15 01 Rehab Stormwater Pumps No									
13 02 76 15 01 1 Remove Existing Pumps	2.00	EA	3,700	200	200	400	0	4,600	2286.35
13 02 76 15 01 2 Rehab Pumps	2.00	EA	140,800	7,000	7,400	15,500	1,300	172,000	86008
13 02 76 15 01 3 Install and Test Rehab	2.00	EA	6,100	300	300	700	100	7,500	3740.05
TOTAL Rehab Stormwater Pumps	2.00	EA	150,600	7,500	7,900	16,600	1,400	184,100	92034
TOTAL Mechanical			150,600	7,500	7,900	16,600	1,400	184,100	
13 02 76 16 Electrical									
13 02 76 16 01 Motor Rehabilitation			33,200	1,700	1,700	3,700	300	40,500	
13 02 76 16 02 MCC Replacement			85,500	4,300	4,500	9,400	800	104,400	
13 02 76 16 03 Sluice Gate Operator			1,200	100	100	100	0	1,400	
13 02 76 16 04 Lubrication System			2,500	100	100	300	0	3,100	
TOTAL Electrical			122,400	6,100	6,400	13,500	1,100	149,500	
TOTAL Pumping Machinery & Ap			273,000	13,600	14,300	30,100	2,500	333,600	
13 02 77 Gates and Valves									
13 02 77 15 Mechanical									

	QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
13 02 77 15 01 Rehab Forebay Sluice Gates									
13 02 77 15 01 1 Remove Existing Gates	2.00	EA	10,800	500	600	1,200	100	13,200	6621.65
13 02 77 15 01 2 Rehab Gates	2.00	EA	33,300	1,700	1,800	3,700	300	40,700	20372
13 02 77 15 01 3 Install/Test Rehabbed	2.00	EA	6,400	300	300	700	100	7,800	3914.35
TOTAL Rehab Forebay Sluice G	2.00	EA	50,600	2,500	2,700	5,600	500	61,800	30908
13 02 77 15 02 Rehab Gravity Drain Sluice									
13 02 77 15 02 1 Remove Existing Gates	2.00	EA	2,800	100	100	300	0	3,400	1714.76
13 02 77 15 02 2 Rehab Gates	2.00	EA	17,800	900	900	2,000	200	21,700	10852
13 02 77 15 02 3 Install/Test Rehabbed	2.00	EA	4,500	200	200	500	0	5,500	2736.74
TOTAL Rehab Gravity Drain Sl	1.00	EA	25,000	1,300	1,300	2,800	200	30,600	30607
TOTAL Mechanical			75,600	3,800	4,000	8,300	700	92,400	
TOTAL Gates and Valves			75,600	3,800	4,000	8,300	700	92,400	
13 02 99 Associated General Items									
13 02 99 01 Trashrack									
13 02 99 01 1 Remove Existing Trashrack			3,500	200	200	400	0	4,300	
13 02 99 01 2 Install New Trashrack Stee			15,500	800	800	1,700	100	19,000	
TOTAL Trashrack			19,000	1,000	1,000	2,100	200	23,200	
TOTAL Associated General Ite			19,000	1,000	1,000	2,100	200	23,200	
TOTAL East Alton No. 2			538,200	26,900	28,300	59,300	5,000	657,700	
13 03 Wood River									
13 03 01 Mob, Demob & Preparatory Work									
13 03 01 01 Mobilization and Demobilizatio									
13 03 01 01 1 Mobilization and Demobiliz			3,100	200	200	300	0	3,800	
TOTAL Mobilization and Demob			3,100	200	200	300	0	3,800	
TOTAL Mob, Demob & Preparato			3,100	200	200	300	0	3,800	
13 03 03 Care and Diversion of Water									

		QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
13 03 03 02	Site Work									
13 03 03 02 1	Fabricate Bulkheads			2,500	100	100	300	0	3,100	
13 03 03 02 2	Install Temporary Bulkhead	2.00	DAY	2,200	100	100	200	0	2,600	1316.74
13 03 03 02 3	Remove Temporary Bulkheads	1.00	DAY	1,100	100	100	100	0	1,300	1316.74
	TOTAL Site Work			5,700	300	300	600	100	7,000	
13 03 03 15	Mechanical									
13 03 03 15 1	Unwatering Pumps			4,300	200	200	500	0	5,300	
	TOTAL Mechanical			4,300	200	200	500	0	5,300	
	TOTAL Care and Diversion of			10,100	500	500	1,100	100	12,300	
13 03 75	Pumping Plant Superstructure									
13 03 75 04	Masonry									
13 03 75 04 01	Masonry Restoration									
13 03 75 04 01 1	Clean Brick			9,800	500	500	1,100	100	12,000	
13 03 75 04 01 2	Tuckpointing			22,800	1,100	1,200	2,500	200	27,800	
	TOTAL Masonry Restoration			32,600	1,600	1,700	3,600	300	39,900	
	TOTAL Masonry			32,600	1,600	1,700	3,600	300	39,900	
13 03 75 06	Wood and Plastic									
13 03 75 06 01	Fiberglass Grating (PS)									
13 03 75 06 01 1	Remove Existing Gratin	315.00	SF	700	0	0	100	0	900	2.83
13 03 75 06 01 2	Install New Grating	315.00	SF	7,200	400	400	800	100	8,800	27.91
	TOTAL Fiberglass Grating (PS			7,900	400	400	900	100	9,700	
13 03 75 06 02	Fiberglass Ladders - 14ea									
13 03 75 06 02 1	Remove Existing Ladder	225.00	LF	3,400	200	200	400	0	4,200	18.70
13 03 75 06 02 2	Install New Ladders	225.00	LF	18,900	900	1,000	2,100	200	23,000	102.42
	TOTAL Fiberglass Ladders - 1			22,300	1,100	1,200	2,500	200	27,300	
13 03 75 06 03	Fiberglass Grating (GW)									

** PROJECT INDIRECT SUMMARY - Level 6 (Rounded to 100's) **

		QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
13 03 75 06 03 1	Remove Existing Gratin	120.00	SF	300	0	0	0	0	300	2.83
13 03 75 06 03 2	Install New Grating	120.00	SF	2,700	100	100	300	0	3,300	27.91
TOTAL	Fiberglass Grating (GW			3,000	200	200	300	0	3,700	
13 03 75 06 04	Fiberglass Ladders (GW)									
13 03 75 06 04 1	Remove Existing Ladder	110.00	LF	1,700	100	100	200	0	2,100	18.70
13 03 75 06 04 2	Install New Ladders	110.00	LF	9,200	500	500	1,000	100	11,300	102.42
TOTAL	Fiberglass Ladders (GW			10,900	500	600	1,200	100	13,300	
13 03 75 06 05	Fiberglass Railing (GW)									
13 03 75 06 05 1	Remove Existing Railin	240.00	LF	2,800	100	100	300	0	3,400	14.16
13 03 75 06 05 2	Install New Railing	240.00	LF	15,700	800	800	1,700	100	19,200	79.88
TOTAL	Fiberglass Railing (GW			18,500	900	1,000	2,000	200	22,600	
TOTAL	Wood and Plastic			62,600	3,100	3,300	6,900	600	76,500	
13 03 75 07	Thermal & Moisture Protection									
13 03 75 07 01	Roofing									
13 03 75 07 01 1	Remove Existing Roof	10.00	CSF	1,100	100	100	100	0	1,400	139.28
13 03 75 07 01 2	Install New Roof	10.00	CSF	1,700	100	100	200	0	2,100	210.76
TOTAL	Roofing			2,900	100	200	300	0	3,500	
TOTAL	Thermal & Moisture Pro			2,900	100	200	300	0	3,500	
13 03 75 15	Mechanical									
13 03 75 15 01	HVAC									
13 03 75 15 01 1	Electric Unit Heaters	3.00	EA	4,300	200	200	500	0	5,200	1738.53
13 03 75 15 01 2	Ventilation System			5,900	300	300	700	100	7,300	
TOTAL	HVAC			10,200	500	500	1,100	100	12,500	
TOTAL	Mechanical			10,200	500	500	1,100	100	12,500	
13 03 75 16	Electrical									
13 03 75 16 01	HVAC									

	QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
13 03 75 16 01 1 Electric Unit Heaters			3,600	200	200	400	0	4,400	
13 03 75 16 01 2 Ventilation System			900	0	0	100	0	1,100	
TOTAL HVAC			4,500	200	200	500	0	5,400	
13 03 75 16 02 Lighting and Power			8,000	400	400	900	100	9,800	
TOTAL Electrical			12,500	600	700	1,400	100	15,200	
TOTAL Pumping Plant Superstr			120,800	6,000	6,300	13,300	1,100	147,600	
13 03 76 Pumping Machinery & Appurtenance									
13 03 76 15 Mechanical									
13 03 76 15 01 Replace Baseflow Pump No.									
13 03 76 15 01 1 Remove Existing Pump	1.00	EA	1,200	100	100	100	0	1,500	1492.24
13 03 76 15 01 2 New Submersible Pump	1.00	EA	16,000	800	800	1,800	100	19,600	19597
13 03 76 15 01 3 Install and Test New P	1.00	EA	2,100	100	100	200	0	2,600	2578.91
TOTAL Replace Baseflow Pump	1.00	EA	19,400	1,000	1,000	2,100	200	23,700	23668
13 03 76 15 02 Rehab Stormwater Pumps No									
13 03 76 15 02 1 Remove Existing Pumps	2.00	EA	3,700	200	200	400	0	4,600	2286.35
13 03 76 15 02 2 Rehab Pumps	2.00	EA	124,100	6,200	6,500	13,700	1,100	151,700	75846
13 03 76 15 02 3 Install and Test Rehab	2.00	EA	6,100	300	300	700	100	7,500	3740.05
TOTAL Rehab Stormwater Pumps	2.00	EA	134,000	6,700	7,000	14,800	1,200	163,700	81873
13 03 76 15 03 Rehab Stormwater Pumps No									
13 03 76 15 03 1 Remove Existing Pumps	3.00	EA	3,700	200	200	400	0	4,600	1524.23
13 03 76 15 03 2 Rehab Pumps	3.00	EA	209,700	10,500	11,000	23,100	1,900	256,200	85403
13 03 76 15 03 3 Install and Test Rehab	3.00	EA	7,900	400	400	900	100	9,600	3208.86
TOTAL Rehab Stormwater Pumps	3.00	EA	221,300	11,100	11,600	24,400	2,000	270,400	90136
TOTAL Mechanical			374,700	18,700	19,700	41,300	3,500	457,800	
13 03 76 16 Electrical									
13 03 76 16 01 Motor Rehabilitation			66,000	3,300	3,500	7,300	600	80,700	
13 03 76 16 02 MCC Replacement			71,100	3,600	3,700	7,800	700	86,900	
13 03 76 16 03 Sluice Gate Operator			3,100	200	200	300	0	3,800	

	QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
13 03 76 16 04 Lubrication System			6,000	300	300	700	100	7,300	
TOTAL Electrical			146,300	7,300	7,700	16,100	1,400	178,800	
TOTAL Pumping Machinery & Ap			520,900	26,000	27,300	57,400	4,800	636,600	
13 03 77 Gates and Valves									
13 03 77 15 Mechanical									
13 03 77 15 01 Rehab Forebay Sluice Gates									
13 03 77 15 01 1 Remove Existing Gates	3.00	EA	4,700	200	200	500	0	5,700	1905.29
13 03 77 15 01 2 Rehab Gates	3.00	EA	49,200	2,500	2,600	5,400	500	60,100	20034
13 03 77 15 01 3 Install/Test Rehabbed	3.00	EA	7,700	400	400	900	100	9,400	3140.75
TOTAL Rehab Forebay Sluice G	3.00	EA	61,600	3,100	3,200	6,800	600	75,200	25080
13 03 77 15 02 Rehab Forebay/Pond Sluice									
13 03 77 15 02 1 Remove Existing Gates	2.00	EA	2,800	100	100	300	0	3,400	1714.76
13 03 77 15 02 2 Rehab Gates	2.00	EA	18,900	900	1,000	2,100	200	23,000	11518
13 03 77 15 02 3 Install/Test Rehabbed	2.00	EA	6,300	300	300	700	100	7,600	3818.96
TOTAL Rehab Forebay/Pond Slu	2.00	EA	27,900	1,400	1,500	3,100	300	34,100	17051
13 03 77 15 03 Rehab Dischg Chamber Sluic									
13 03 77 15 03 1 Remove Existing Gate	1.00	EA	2,800	100	100	300	0	3,400	3429.52
13 03 77 15 03 2 Rehab Gate	1.00	EA	12,200	600	600	1,300	100	14,900	14881
13 03 77 15 03 3 Install/Test Rehabbed	1.00	EA	4,300	200	200	500	0	5,300	5282.72
TOTAL Rehab Dischg Chamber S	1.00	EA	19,300	1,000	1,000	2,100	200	23,600	23594
13 03 77 15 04 Rehab Emerg. Closure Sluic									
13 03 77 15 04 1 Remove Existing Gate	1.00	EA	2,800	100	100	300	0	3,400	3429.52
13 03 77 15 04 2 Rehab Gate	1.00	EA	12,200	600	600	1,300	100	14,900	14881
13 03 77 15 04 3 Install/Test Rehabbed	1.00	EA	4,300	200	200	500	0	5,300	5282.72
TOTAL Rehab Emerg. Closure S	1.00	EA	19,300	1,000	1,000	2,100	200	23,600	23594
13 03 77 15 05 Replace Dischg Chamber Slu									
13 03 77 15 05 1 Remove Existing Gate	1.00	EA	2,800	100	100	300	0	3,400	3429.52
13 03 77 15 05 2 New Gate	1.00	EA	37,400	1,900	2,000	4,100	300	45,700	45726

		QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
13 03 77 15 05 3	Install/Test New Gate	1.00	EA	3,500	200	200	400	0	4,300	4330.31
TOTAL	Replace Dischg Chamber	1.00	EA	43,800	2,200	2,300	4,800	400	53,500	53485
13 03 77 15 06	Rehab Emerg. Closure Sluic									
13 03 77 15 06 1	Remove Existing Gate	1.00	EA	2,800	100	100	300	0	3,400	3429.52
13 03 77 15 06 2	Rehab Gate	1.00	EA	15,000	800	800	1,700	100	18,400	18365
13 03 77 15 06 3	Install/Test Rehabbed	1.00	EA	4,500	200	200	500	0	5,500	5473.48
TOTAL	Rehab Emerg. Closure S	1.00	EA	22,300	1,100	1,200	2,500	200	27,300	27268
13 03 77 15 07	Replace Pump Dischg Flap G									
13 03 77 15 07 1	Remove Existing Gates	1.00	EA	5,600	300	300	600	100	6,900	6859.04
13 03 77 15 07 2	New Gates	1.00	EA	30,300	1,500	1,600	3,300	300	37,000	37016
13 03 77 15 07 3	Install/Test New Gates	1.00	EA	4,200	200	200	500	0	5,100	5091.95
TOTAL	Replace Pump Dischg Fl			40,100	2,000	2,100	4,400	400	49,000	
TOTAL	Mechanical			234,200	11,700	12,300	25,800	2,200	286,200	
TOTAL	Gates and Valves			234,200	11,700	12,300	25,800	2,200	286,200	
13 03 99	Associated General Items									
13 03 99 01	Chain Link Fence									
13 03 99 01 1	Remove Existing Chainlink			700	0	0	100	0	800	
13 03 99 01 2	Install New Chain Link Fen			9,700	500	500	1,100	100	11,800	
TOTAL	Chain Link Fence			10,300	500	500	1,100	100	12,600	
TOTAL	Associated General Ite			10,300	500	500	1,100	100	12,600	
TOTAL	Wood River			899,500	45,000	47,200	99,200	8,300	1,099,200	
13 04	Rand									
13 04 01	Mob, Demob & Preparatory Work									
13 04 01 01	Mobilization and Demobilizatio									
13 04 01 01 1	Mobilization and Demobiliz			3,100	200	200	300	0	3,800	
TOTAL	Mobilization and Demob			3,100	200	200	300	0	3,800	

	QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
TOTAL Mob, Demob & Preparato			3,100	200	200	300	0	3,800	
13 04 02 Sitework									
13 04 02 5 Site Preparation			1,100	100	100	100	0	1,300	
13 04 02 10 Line Existing Pipe w/Insitufor			78,800	3,900	4,100	8,700	700	96,200	
13 04 02 15 Site Restoration			2,100	100	100	200	0	2,500	
TOTAL Sitework			81,900	4,100	4,300	9,000	800	100,100	
13 04 03 Care and Diversion of Water									
13 04 03 02 Site Work									
13 04 03 02 1 Fabricate Bulkheads			2,500	100	100	300	0	3,100	
13 04 03 02 2 Install Temporary Bulkhead	2.00	DAY	2,200	100	100	200	0	2,600	1316.74
13 04 03 02 3 Remove Temporary Bulkheads	1.00	DAY	1,100	100	100	100	0	1,300	1316.74
TOTAL Site Work			5,700	300	300	600	100	7,000	
13 04 03 15 Mechanical									
13 04 03 15 1 Unwatering Pumps			4,300	200	200	500	0	5,300	
TOTAL Mechanical			4,300	200	200	500	0	5,300	
TOTAL Care and Diversion of			10,100	500	500	1,100	100	12,300	
13 04 75 Pumping Plant Superstructure									
13 04 75 04 Masonry									
13 04 75 04 01 Masonry Restoration									
13 04 75 04 01 1 Clean Brick			4,700	200	200	500	0	5,700	
13 04 75 04 01 2 Tuckpointing			10,800	500	600	1,200	100	13,300	
TOTAL Masonry Restoration			15,500	800	800	1,700	100	19,000	
TOTAL Masonry			15,500	800	800	1,700	100	19,000	
13 04 75 06 Wood and Plastic									
13 04 75 06 01 Fiberglass Grating (PS)									
13 04 75 06 01 1 Remove Existing Gratin	260.00	SF	600	0	0	100	0	700	2.83

** PROJECT INDIRECT SUMMARY - Level 6 (Rounded to 100's) **

	QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
13 04 75 06 01 2 Install New Grating	260.00	SF	5,900	300	300	700	100	7,300	27.91
TOTAL Fiberglass Grating (PS			6,500	300	300	700	100	8,000	
13 04 75 06 02 Fiberglass Ladders - 7ea (									
13 04 75 06 02 1 Remove Existing Ladder	110.00	LF	1,700	100	100	200	0	2,100	18.70
13 04 75 06 02 2 Install New Ladders	110.00	LF	9,200	500	500	1,000	100	11,300	102.42
TOTAL Fiberglass Ladders - 7			10,900	500	600	1,200	100	13,300	
13 04 75 06 03 Fiberglass Grating (GW)									
13 04 75 06 03 1 Remove Existing Gratin	60.00	SF	100	0	0	0	0	200	2.83
13 04 75 06 03 2 Install New Grating	60.00	SF	1,400	100	100	200	0	1,700	27.91
TOTAL Fiberglass Grating (GW			1,500	100	100	200	0	1,800	
13 04 75 06 04 Fiberglass Ladders (GW)									
13 04 75 06 04 1 Remove Existing Ladder	55.00	LF	800	0	0	100	0	1,000	18.70
13 04 75 06 04 2 Install New Ladders	55.00	LF	4,600	200	200	500	0	5,600	102.42
TOTAL Fiberglass Ladders (GW			5,500	300	300	600	100	6,700	
13 04 75 06 05 Fiberglass Railing (GW)									
13 04 75 06 05 1 Remove Existing Railin	120.00	LF	1,400	100	100	200	0	1,700	14.16
13 04 75 06 05 2 Install New Railing	120.00	LF	7,800	400	400	900	100	9,600	79.88
TOTAL Fiberglass Railing (GW			9,200	500	500	1,000	100	11,300	
TOTAL Wood and Plastic			33,600	1,700	1,800	3,700	300	41,100	
13 04 75 07 Thermal & Moisture Protection									
13 04 75 07 01 Roofing									
13 04 75 07 01 1 Remove Existing Roof	3.00	CSF	300	0	0	0	0	400	139.28
13 04 75 07 01 2 Install New Roof	3.00	CSF	500	0	0	100	0	600	210.76
TOTAL Roofing			900	0	0	100	0	1,100	
TOTAL Thermal & Moisture Pro			900	0	0	100	0	1,100	

	QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
13 04 75 15 Mechanical									
13 04 75 15 01 HVAC									
13 04 75 15 01 1 Electric Unit Heaters	2.00	EA	2,800	100	100	300	0	3,500	1736.84
13 04 75 15 01 2 Ventilation System			3,600	200	200	400	0	4,400	
TOTAL HVAC			6,400	300	300	700	100	7,800	
TOTAL Mechanical			6,400	300	300	700	100	7,800	
13 04 75 16 Electrical									
13 04 75 16 01 HVAC									
13 04 75 16 01 1 Electric Unit Heaters			2,000	100	100	200	0	2,500	
13 04 75 16 01 2 Ventilation System			500	0	0	100	0	700	
TOTAL HVAC			2,600	100	100	300	0	3,200	
13 04 75 16 02 Lighting and Power			6,800	300	400	800	100	8,300	
TOTAL Electrical			9,400	500	500	1,000	100	11,500	
TOTAL Pumping Plant Superstr			65,800	3,300	3,500	7,300	600	80,400	
13 04 76 Pumping Machinery & Appurtenance									
13 04 76 15 Mechanical									
13 04 76 15 01 Replace Baseflow Pump No.									
13 04 76 15 01 1 Remove Existing Pump	1.00	EA	1,200	100	100	100	0	1,500	1492.24
13 04 76 15 01 2 New Submersible Pump	1.00	EA	16,000	800	800	1,800	100	19,600	19597
13 04 76 15 01 3 Install and Test New P	1.00	EA	2,100	100	100	200	0	2,600	2578.91
TOTAL Replace Baseflow Pump	1.00	EA	19,400	1,000	1,000	2,100	200	23,700	23668
13 04 76 15 02 Rehab Stormwater Pumps No									
13 04 76 15 02 1 Remove Existing Pumps	2.00	EA	3,700	200	200	400	0	4,600	2286.35
13 04 76 15 02 2 Rehab Pumps	2.00	EA	104,500	5,200	5,500	11,500	1,000	127,700	63849
13 04 76 15 02 3 Install and Test Rehab	2.00	EA	6,100	300	300	700	100	7,500	3740.05
TOTAL Rehab Stormwater Pumps	2.00	EA	114,400	5,700	6,000	12,600	1,100	139,800	69876
13 04 76 15 03 Rehab Stormwater Pumps No									

		QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
13 04 76 15 03 1	Remove Existing Pumps	3.00	EA	3,700	200	200	400	0	4,600	1524.23
13 04 76 15 03 2	Rehab Pumps	3.00	EA	209,700	10,500	11,000	23,100	1,900	256,200	85403
13 04 76 15 03 3	Install and Test Rehab	3.00	EA	7,900	400	400	900	100	9,600	3208.86
TOTAL	Rehab Stormwater Pumps	3.00	EA	221,300	11,100	11,600	24,400	2,000	270,400	90136
TOTAL	Mechanical			355,000	17,800	18,600	39,100	3,300	433,800	
13 04 76 16	Electrical									
13 04 76 16 02	MCC Replacement			39,200	2,000	2,100	4,300	400	47,800	
13 04 76 16 03	Sluice Gate Operator			1,300	100	100	100	0	1,600	
TOTAL	Electrical			40,500	2,000	2,100	4,500	400	49,400	
TOTAL	Pumping Machinery & Ap			395,500	19,800	20,800	43,600	3,700	483,300	
13 04 77	Gates and Valves									
13 04 77 15	Mechanical									
13 04 77 15 01	Rehab Forebay Sluice Gate									
13 04 77 15 01 1	Remove Existing Gate	1.00	EA	800	0	0	100	0	1,000	957.29
13 04 77 15 01 2	Rehab Gate	1.00	EA	5,400	300	300	600	0	6,600	6557.20
13 04 77 15 01 3	Install/Test Rehabbed	1.00	EA	2,700	100	100	300	0	3,300	3322.28
TOTAL	Rehab Forebay Sluice G	1.00	EA	8,900	400	500	1,000	100	10,800	10837
13 04 77 15 02	Rehab Dischg Chamber Sluic									
13 04 77 15 02 1	Remove Existing Gate	1.00	EA	1,600	100	100	200	0	1,900	1914.59
13 04 77 15 02 2	Rehab Gate	1.00	EA	8,700	400	500	1,000	100	10,600	10622
13 04 77 15 02 3	Install/Test Rehabbed	1.00	EA	3,700	200	200	400	0	4,500	4470.34
TOTAL	Rehab Dischg Chamber S	1.00	EA	13,900	700	700	1,500	100	17,000	17007
13 04 77 15 03	Rehab Emerg. Closure Sluic									
13 04 77 15 03 1	Remove Existing Gate	1.00	EA	1,600	100	100	200	0	1,900	1914.59
13 04 77 15 03 2	Rehab Gate	1.00	EA	5,400	300	300	600	0	6,600	6557.20
13 04 77 15 03 3	Install/Test Rehabbed	1.00	EA	3,700	200	200	400	0	4,500	4470.34
TOTAL	Rehab Emerg. Closure S	1.00	EA	10,600	500	600	1,200	100	12,900	12942
13 04 77 15 04	Rehab Forebay Sluice Gate									

	QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
13 04 77 15 04 1 Remove Existing Gate	1.00	EA	800	0	0	100	0	1,000	957.29
13 04 77 15 04 2 Rehab Gate	1.00	EA	9,700	500	500	1,100	100	11,800	11808
13 04 77 15 04 3 Install/Test Rehabbed	1.00	EA	2,900	100	200	300	0	3,500	3513.05
TOTAL Rehab Forebay Sluice G	1.00	EA	13,300	700	700	1,500	100	16,300	16278
13 04 77 15 05 Rehab Dischg Chamber Sluic									
13 04 77 15 05 1 Remove Existing Gate	1.00	EA	1,600	100	100	200	0	1,900	1914.59
13 04 77 15 05 2 Rehab Gate	1.00	EA	9,700	500	500	1,100	100	11,800	11808
13 04 77 15 05 3 Install/Test Rehabbed	1.00	EA	3,700	200	200	400	0	4,500	4470.34
TOTAL Rehab Dischg Chamber S	1.00	EA	14,900	700	800	1,600	100	18,200	18193
13 04 77 15 06 Rehab Emerg. Closure Sluic									
13 04 77 15 06 1 Remove Existing Gate	1.00	EA	1,600	100	100	200	0	1,900	1914.59
13 04 77 15 06 2 Rehab Gate	1.00	EA	6,000	300	300	700	100	7,300	7307.99
13 04 77 15 06 3 Install/Test Rehabbed	1.00	EA	3,500	200	200	400	0	4,300	4279.58
TOTAL Rehab Emerg. Closure S	1.00	EA	11,000	600	600	1,200	100	13,500	13502
TOTAL Mechanical			72,600	3,600	3,800	8,000	700	88,800	
TOTAL Gates and Valves			72,600	3,600	3,800	8,000	700	88,800	
13 04 99 Associated General Items									
13 04 99 01 Chain Link Fence									
13 04 99 01 1 Remove Existing Chainlink			400	0	0	0	0	500	
13 04 99 01 2 Install New Chain Link Fen			6,700	300	300	700	100	8,100	
TOTAL Chain Link Fence			7,100	400	400	800	100	8,700	
TOTAL Associated General Ite			7,100	400	400	800	100	8,700	
TOTAL Rand			636,200	31,800	33,400	70,100	5,900	777,400	
13 05 Hawthorne									
13 05 01 Mob, Demob & Preparatory Work									
13 05 01 01 Mobilization and Demobilizatio									
13 05 01 01 1 Mobilization and Demobiliz			3,100	200	200	300	0	3,800	

		QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
	TOTAL Mobilization and Demob			3,100	200	200	300	0	3,800	
	TOTAL Mob, Demob & Preparato			3,100	200	200	300	0	3,800	
13 05 03	Care and Diversion of Water									
13 05 03 02	Site Work									
13 05 03 02 1	Fabricate Bulkheads			2,500	100	100	300	0	3,100	
13 05 03 02 2	Install Temporary Bulkhead	2.00	DAY	2,200	100	100	200	0	2,600	1316.74
13 05 03 02 3	Remove Temporary Bulkheads	1.00	DAY	1,100	100	100	100	0	1,300	1316.74
	TOTAL Site Work			5,700	300	300	600	100	7,000	
13 05 03 15	Mechanical									
13 05 03 15 1	Unwatering Pumps			4,300	200	200	500	0	5,300	
	TOTAL Mechanical			4,300	200	200	500	0	5,300	
	TOTAL Care and Diversion of			10,100	500	500	1,100	100	12,300	
13 05 75	Pumping Plant Superstructure									
13 05 75 04	Masonry									
13 05 75 04 01	Masonry Restoration									
13 05 75 04 01 1	Clean Brick			6,600	300	300	700	100	8,000	
13 05 75 04 01 2	Tuckpointing			15,200	800	800	1,700	100	18,600	
	TOTAL Masonry Restoration			21,700	1,100	1,100	2,400	200	26,600	
	TOTAL Masonry			21,700	1,100	1,100	2,400	200	26,600	
13 05 75 06	Wood and Plastic									
13 05 75 06 01	Fiberglass Grating (PS)									
13 05 75 06 01 1	Remove Existing Gratin	205.00	SF	500	0	0	100	0	600	2.83
13 05 75 06 01 2	Install New Grating	205.00	SF	4,700	200	200	500	0	5,700	27.91
	TOTAL Fiberglass Grating (PS			5,200	300	300	600	0	6,300	
13 05 75 06 02	Fiberglass Ladders - 9ea									

** PROJECT INDIRECT SUMMARY - Level 6 (Rounded to 100's) **

	QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
13 05 75 06 02 1 Remove Existing Ladder	110.00	LF	1,700	100	100	200	0	2,100	18.70
13 05 75 06 02 2 Install New Ladders	110.00	LF	9,200	500	500	1,000	100	11,300	102.42
TOTAL Fiberglass Ladders - 9			10,900	500	600	1,200	100	13,300	
13 05 75 06 03 Fiberglass Grating (GW)									
13 05 75 06 03 1 Remove Existing Gratin	20.00	SF	0	0	0	0	0	100	2.83
13 05 75 06 03 2 Install New Grating	20.00	SF	500	0	0	100	0	600	27.91
TOTAL Fiberglass Grating (GW			500	0	0	100	0	600	
13 05 75 06 04 Fiberglass Ladders (GW)									
13 05 75 06 04 1 Remove Existing Ladder	10.00	LF	200	0	0	0	0	200	18.70
13 05 75 06 04 2 Install New Ladders	10.00	LF	800	0	0	100	0	1,000	102.42
TOTAL Fiberglass Ladders (GW			1,000	0	100	100	0	1,200	
13 05 75 06 05 Fiberglass Railing (GW)									
13 05 75 06 05 1 Remove Existing Railin	70.00	LF	800	0	0	100	0	1,000	14.16
13 05 75 06 05 2 Install New Railing	70.00	LF	4,600	200	200	500	0	5,600	79.88
TOTAL Fiberglass Railing (GW			5,400	300	300	600	0	6,600	
TOTAL Wood and Plastic			22,900	1,100	1,200	2,500	200	28,000	
13 05 75 07 Thermal & Moisture Protection									
13 05 75 07 01 Roofing									
13 05 75 07 01 1 Remove Existing Roof	4.50	CSF	500	0	0	100	0	600	139.28
13 05 75 07 01 2 Install New Roof	4.50	CSF	800	0	0	100	0	900	210.76
TOTAL Roofing			1,300	100	100	100	0	1,600	
TOTAL Thermal & Moisture Pro			1,300	100	100	100	0	1,600	
13 05 75 15 Mechanical									
13 05 75 15 01 HVAC									
13 05 75 15 01 1 Electric Unit Heaters	2.00	EA	2,800	100	100	300	0	3,500	1736.84
13 05 75 15 01 2 Ventilation System			3,600	200	200	400	0	4,400	

	QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
TOTAL HVAC			6,400	300	300	700	100	7,800	
TOTAL Mechanical			6,400	300	300	700	100	7,800	
13 05 75 16 Electrical									
13 05 75 16 01 HVAC									
13 05 75 16 01 1 Electric Unit Heaters			2,000	100	100	200	0	2,500	
13 05 75 16 01 2 Ventilation System			500	0	0	100	0	700	
TOTAL HVAC			2,600	100	100	300	0	3,200	
13 05 75 16 02 Lighting and Power			7,200	400	400	800	100	8,800	
TOTAL Electrical			9,700	500	500	1,100	100	11,900	
TOTAL Pumping Plant Superstr			62,100	3,100	3,300	6,800	600	75,900	
13 05 76 Pumping Machinery & Appurtenance									
13 05 76 15 Mechanical									
13 05 76 15 01 Replace Baseflow Pump									
13 05 76 15 01 1 Remove Existing Pump	1.00	EA	900	0	0	100	0	1,100	1115.60
13 05 76 15 01 2 New Submersible Pump	1.00	EA	7,700	400	400	900	100	9,400	9435.43
13 05 76 15 01 3 Install and Test New P	1.00	EA	2,100	100	100	200	0	2,600	2578.91
TOTAL Replace Baseflow Pump	1.00	EA	10,700	500	600	1,200	100	13,100	13130
13 05 76 15 02 Rehab Stormwater Pumps No									
13 05 76 15 02 1 Remove Existing Pumps	2.00	EA	3,700	200	200	400	0	4,600	2286.35
13 05 76 15 02 2 Rehab Pumps	2.00	EA	128,900	6,400	6,800	14,200	1,200	157,500	78750
13 05 76 15 02 3 Install and Test Rehab	2.00	EA	6,100	300	300	700	100	7,500	3740.05
TOTAL Rehab Stormwater Pumps	2.00	EA	138,700	6,900	7,300	15,300	1,300	169,600	84776
TOTAL Mechanical			149,500	7,500	7,800	16,500	1,400	182,700	
13 05 76 16 Electrical									
13 05 76 16 01 Motor Rehabilitation			26,400	1,300	1,400	2,900	200	32,200	
13 05 76 16 02 MCC Replacement			39,600	2,000	2,100	4,400	400	48,400	
13 05 76 16 03 Sluice Gate Operator			600	0	0	100	0	700	

	QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
13 05 76 16 04 Lubrication System			2,200	100	100	200	0	2,700	
TOTAL Electrical			68,800	3,400	3,600	7,600	600	84,000	
TOTAL Pumping Machinery & Ap			218,200	10,900	11,500	24,100	2,000	266,700	
13 05 77 Gates and Valves									
13 05 77 15 Mechanical									
13 05 77 15 01 Rehab Forebay Sluice Gates									
13 05 77 15 01 1 Remove Existing Gate	1.00	EA	1,600	100	100	200	0	1,900	1914.59
13 05 77 15 01 2 Rehab Gate	1.00	EA	11,400	600	600	1,300	100	14,000	13985
13 05 77 15 01 3 Install/Test Rehabbed	1.00	EA	2,700	100	100	300	0	3,300	3322.28
TOTAL Rehab Forebay Sluice G	3.00	EA	15,700	800	800	1,700	100	19,200	6407.41
13 05 77 15 02 Rehab Forebay/Pond Sluice									
13 05 77 15 02 1 Remove Existing Gate	1.00	EA	1,600	100	100	200	0	1,900	1914.59
13 05 77 15 02 2 Rehab Gate	1.00	EA	7,000	400	400	800	100	8,600	8614.43
13 05 77 15 02 3 Install/Test Rehabbed	1.00	EA	3,500	200	200	400	0	4,300	4279.58
TOTAL Rehab Forebay/Pond Slu	2.00	EA	12,100	600	600	1,300	100	14,800	7404.30
TOTAL Mechanical			27,800	1,400	1,500	3,100	300	34,000	
TOTAL Gates and Valves			27,800	1,400	1,500	3,100	300	34,000	
TOTAL Hawthorne			321,400	16,100	16,900	35,400	3,000	392,800	
13 06 Homegarden									
13 06 01 Mob, Demob & Preparatory Work									
13 06 01 01 Mobilization and Demobilizatio									
13 06 01 01 1 Mobilization and Demobiliz			3,100	200	200	300	0	3,700	
TOTAL Mobilization and Demob			3,100	200	200	300	0	3,700	
TOTAL Mob, Demob & Preparato			3,100	200	200	300	0	3,700	
13 06 02 Sitework									
13 06 02 5 Site Preparation			1,100	100	100	100	0	1,300	

		QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
13 06 02 10	Line Existing Pipe w/ HDPE Pip			33,200	1,700	1,700	3,700	300	40,600	
13 06 02 15	Site Restoration			2,100	100	100	200	0	2,500	
	TOTAL Sitework			36,400	1,800	1,900	4,000	300	44,500	
13 06 03	Care and Diversion of Water									
13 06 03 02	Site Work									
13 06 03 02 1	Fabricate Bulkheads			2,500	100	100	300	0	3,100	
13 06 03 02 2	Install Temporary Bulkhead	2.00	DAY	2,200	100	100	200	0	2,600	1316.74
13 06 03 02 3	Remove Temporary Bulkheads	1.00	DAY	1,100	100	100	100	0	1,300	1316.74
	TOTAL Site Work			5,700	300	300	600	100	7,000	
13 06 03 15	Mechanical									
13 06 03 15 1	Unwatering Pumps			4,300	200	200	500	0	5,300	
	TOTAL Mechanical			4,300	200	200	500	0	5,300	
	TOTAL Care and Diversion of			10,100	500	500	1,100	100	12,300	
13 06 75	Pumping Plant Superstructure									
13 06 75 06	Wood and Plastic									
13 06 75 06 01	Fiberglass Grating (PS)									
13 06 75 06 01 1	Remove Existing Gratin	50.00	SF	100	0	0	0	0	100	2.83
13 06 75 06 01 2	Install New Grating	50.00	SF	1,100	100	100	100	0	1,400	27.91
	TOTAL Fiberglass Grating (PS			1,300	100	100	100	0	1,500	
13 06 75 06 02	Fiberglass Grating (GW)									
13 06 75 06 02 1	Remove Existing Gratin	20.00	SF	0	0	0	0	0	100	2.83
13 06 75 06 02 2	Install New Grating	20.00	SF	500	0	0	100	0	600	27.91
	TOTAL Fiberglass Grating (GW			500	0	0	100	0	600	
13 06 75 06 03	Fiberglass Ladders (GW)									
13 06 75 06 03 1	Remove Existing Ladder	10.00	LF	200	0	0	0	0	200	18.70
13 06 75 06 03 2	Install New Ladders	10.00	LF	800	0	0	100	0	1,000	102.42

	QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
TOTAL Fiberglass Ladders (GW			1,000	0	100	100	0	1,200	
13 06 75 06 04 Fiberglass Railing (GW)									
13 06 75 06 04 1 Remove Existing Railin	70.00	LF	800	0	0	100	0	1,000	14.16
13 06 75 06 04 2 Install New Railing	70.00	LF	4,600	200	200	500	0	5,600	79.88
TOTAL Fiberglass Railing (GW			5,400	300	300	600	0	6,600	
TOTAL Wood and Plastic			8,100	400	400	900	100	9,900	
13 06 75 07 Thermal & Moisture Protection									
13 06 75 07 01 Roofing									
13 06 75 07 01 1 Remove Existing Roof	130.00	SF	200	0	0	0	0	200	1.60
13 06 75 07 01 2 Install New Roof	130.00	SF	300	0	0	0	0	400	2.70
TOTAL Roofing			500	0	0	100	0	600	
TOTAL Thermal & Moisture Pro			500	0	0	100	0	600	
13 06 75 16 Electrical									
13 06 75 16 02 Lighting and Power			4,400	200	200	500	0	5,300	
TOTAL Electrical			4,400	200	200	500	0	5,300	
TOTAL Pumping Plant Superstr			13,000	600	700	1,400	100	15,800	
13 06 76 Pumping Machinery & Appurtenance									
13 06 76 15 Mechanical									
13 06 76 15 01 Rehab Stormwater Pumps No									
13 06 76 15 01 1 Remove Existing Pump	1.00	EA	1,600	100	100	200	0	1,900	1914.59
13 06 76 15 01 2 Rehab Pump	1.00	EA	37,100	1,900	1,900	4,100	300	45,300	45290
13 06 76 15 01 3 Install and Test Rehab	1.00	EA	2,500	100	100	300	0	3,000	3001.26
TOTAL Rehab Stormwater Pumps	1.00	EA	41,100	2,100	2,200	4,500	400	50,200	50206
TOTAL Mechanical			41,100	2,100	2,200	4,500	400	50,200	
13 06 76 16 Electrical									

	QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
13 06 76 16 01 Motor Rehabilitation			3,400	200	200	400	0	4,100	
13 06 76 16 02 Starter Replacement			13,900	700	700	1,500	100	17,000	
TOTAL Electrical			17,300	900	900	1,900	200	21,100	
TOTAL Pumping Machinery & Ap			58,400	2,900	3,100	6,400	500	71,300	
13 06 77 Gates and Valves									
13 06 77 15 Mechanical									
13 06 77 15 01 Rehab Gate Well Sluice Gat									
13 06 77 15 01 1 Remove Existing Gate	1.00	EA	2,000	100	100	200	0	2,500	2472.39
13 06 77 15 01 2 Rehab Gate	1.00	EA	5,700	300	300	600	100	7,000	7017.67
13 06 77 15 01 3 Install/Test Rehabbed	1.00	EA	2,700	100	100	300	0	3,300	3322.28
TOTAL Rehab Gate Well Sluice	1.00	EA	10,500	500	600	1,200	100	12,800	12812
TOTAL Mechanical			10,500	500	600	1,200	100	12,800	
TOTAL Gates and Valves			10,500	500	600	1,200	100	12,800	
TOTAL Homegarden			131,300	6,600	6,900	14,500	1,200	160,500	
13 07 Lakeside									
13 07 01 Mob, Demob & Preparatory Work									
13 07 01 01 Mobilization and Demobilizatio									
13 07 01 01 1 Mobilization and Demobiliz			3,100	200	200	300	0	3,700	
TOTAL Mobilization and Demob			3,100	200	200	300	0	3,700	
TOTAL Mob, Demob & Preparato			3,100	200	200	300	0	3,700	
13 07 02 Sitework									
13 07 02 5 Site Preparation			1,100	100	100	100	0	1,300	
13 07 02 10 Line Existing Pipe w/ HDPE Pip			33,200	1,700	1,700	3,700	300	40,600	
13 07 02 15 Site Restoration			2,100	100	100	200	0	2,500	
TOTAL Sitework			36,400	1,800	1,900	4,000	300	44,500	
13 07 03 Care and Diversion of Water									

		QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
13 07 03 02	Site Work									
13 07 03 02 1	Fabricate Bulkheads			2,500	100	100	300	0	3,100	
13 07 03 02 2	Install Temporary Bulkhead	2.00	DAY	2,200	100	100	200	0	2,600	1316.74
13 07 03 02 3	Remove Temporary Bulkheads	1.00	DAY	1,100	100	100	100	0	1,300	1316.74
	TOTAL Site Work			5,700	300	300	600	100	7,000	
13 07 03 15	Mechanical									
13 07 03 15 1	Unwatering Pumps			4,300	200	200	500	0	5,300	
	TOTAL Mechanical			4,300	200	200	500	0	5,300	
	TOTAL Care and Diversion of			10,100	500	500	1,100	100	12,300	
13 07 75	Pumping Plant Superstructure									
13 07 75 06	Wood and Plastic									
13 07 75 06 01	Fiberglass Grating									
13 07 75 06 01 1	Remove Existing Gratin	50.00	SF	100	0	0	0	0	100	2.83
13 07 75 06 01 2	Install New Grating	50.00	SF	1,100	100	100	100	0	1,400	27.91
	TOTAL Fiberglass Grating			1,300	100	100	100	0	1,500	
13 07 75 06 02	Fiberglass Grating (GW)									
13 07 75 06 02 1	Remove Existing Gratin	20.00	SF	0	0	0	0	0	100	2.83
13 07 75 06 02 2	Install New Grating	20.00	SF	500	0	0	100	0	600	27.91
	TOTAL Fiberglass Grating (GW			500	0	0	100	0	600	
13 07 75 06 03	Fiberglass Ladders (GW)									
13 07 75 06 03 1	Remove Existing Ladder	10.00	LF	200	0	0	0	0	200	18.70
13 07 75 06 03 2	Install New Ladders	10.00	LF	800	0	0	100	0	1,000	102.42
	TOTAL Fiberglass Ladders (GW			1,000	0	100	100	0	1,200	
13 07 75 06 04	Fiberglass Railing (GW)									
13 07 75 06 04 1	Remove Existing Railin	70.00	LF	800	0	0	100	0	1,000	14.16
13 07 75 06 04 2	Install New Railing	70.00	LF	4,600	200	200	500	0	5,600	79.88

	QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
TOTAL Fiberglass Railing (GW			5,400	300	300	600	0	6,600	
TOTAL Wood and Plastic			8,100	400	400	900	100	9,900	
13 07 75 07 Thermal & Moisture Protection									
13 07 75 07 01 Roofing									
13 07 75 07 01 1 Remove Existing Roof	130.00	SF	200	0	0	0	0	200	1.60
13 07 75 07 01 2 Install New Roof	130.00	SF	300	0	0	0	0	400	2.70
TOTAL Roofing			500	0	0	100	0	600	
TOTAL Thermal & Moisture Pro			500	0	0	100	0	600	
13 07 75 16 Electrical									
13 07 75 16 02 Lighting and Power			4,300	200	200	500	0	5,300	
TOTAL Electrical			4,300	200	200	500	0	5,300	
TOTAL Pumping Plant Superstr			12,900	600	700	1,400	100	15,800	
13 07 76 Pumping Machinery & Appurtenance									
13 07 76 15 Mechanical									
13 07 76 15 01 Rehab Stormwater Pumps No									
13 07 76 15 01 1 Remove Existing Pump	1.00	EA	1,600	100	100	200	0	1,900	1914.59
13 07 76 15 01 2 Rehab Pump	1.00	EA	38,600	1,900	2,000	4,300	400	47,200	47177
13 07 76 15 01 3 Install and Test Rehab	1.00	EA	2,500	100	100	300	0	3,000	3001.26
TOTAL Rehab Stormwater Pumps	1.00	EA	42,600	2,100	2,200	4,700	400	52,100	52093
TOTAL Mechanical			42,600	2,100	2,200	4,700	400	52,100	
13 07 76 16 Electrical									
13 07 76 16 01 Motor Rehabilitation			4,200	200	200	500	0	5,200	
13 07 76 16 02 Starter Replacement			8,700	400	500	1,000	100	10,600	
TOTAL Electrical			12,900	600	700	1,400	100	15,700	
TOTAL Pumping Machinery & Ap			55,500	2,800	2,900	6,100	500	67,800	

	QUANTY	UOM	DIRECT	FIELDOFC	HOME OFC	PROFIT	BOND	TOTAL COST	UNIT
13 07 77 Gates and Valves									
13 07 77 15 Mechanical									
13 07 77 15 01 Rehab Gate Well Sluice Gat									
13 07 77 15 01 1 Remove Existing Gate	1.00	EA	2,800	100	100	300	0	3,400	3429.69
13 07 77 15 01 2 Rehab Gate	1.00	EA	7,000	400	400	800	100	8,600	8554.34
13 07 77 15 01 3 Install/Test Rehabbed	1.00	EA	4,000	200	200	400	0	4,800	4837.38
TOTAL Rehab Gate Well Sluice	1.00	EA	13,800	700	700	1,500	100	16,800	16821
TOTAL Mechanical			13,800	700	700	1,500	100	16,800	
TOTAL Gates and Valves			13,800	700	700	1,500	100	16,800	
TOTAL Lakeside			131,700	6,600	6,900	14,500	1,200	160,900	
TOTAL Pumping Plant			3,142,500	157,100	165,000	346,500	29,100	3,840,100	
30 Planning, Engineering, & Design									
30 01 Planning, Engineering, & Design									
30 01 1 Planning, Engineering, & Design			2,441,000	0	0	0	0	2,441,000	
TOTAL Planning, Engineering,			2,441,000	0	0	0	0	2,441,000	
TOTAL Planning, Engineering,			2,441,000	0	0	0	0	2,441,000	
31 Construction Management									
31 01 Construction Management									
31 01 1 Construction Management			1,436,000	0	0	0	0	1,436,000	
TOTAL Construction Managemen			1,436,000	0	0	0	0	1,436,000	
TOTAL Construction Managemen			1,436,000	0	0	0	0	1,436,000	
TOTAL WOOD RIVER			15,730,700	587,300	616,600	1,294,900	108,600	18,338,100	
Contingency								3,820,100	
TOTAL INCL OWNER COSTS								22,158,200	

01 01. Gross Appraisal Est	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
01. Lands and Damages											
01 01. Gross Appraisal Estimate											
TOTAL Lands and Damage					0	0	0	0	100,000	100,000	
TOTAL Gross Appraisal					0	0	0	0	100,000	100,000	
TOTAL Lands and Damage					0	0	0	0	100,000	100,000	

11 01. Levees	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
11. Levees and Floodwalls											
11 01. Levees											
11 01 01. Levees and Berms											
11 01 01 01. Rehab/Replace Exist Relief Wells											
Assumptions: There are 163 wells in the drainage district of which 10 wells are destroyed or damaged and will have to be replaced. ADRL pump tested 50 of the remaining 153 wells. Test results indicate 40 of the 50 wells require rehab. Based on the results assume 80% of the remaining wells to be reconstructed. (122 wells) In addition to the 10 wells that are damaged assume 10 more will not function after testing and will also need to be replaced for a total of 20 wells to be replaced. Stainless steel wells are 8" diameter and avgerage 90 deep. Based on the average depth the well makeup consists of 70' of well screen with a 20' riser pipe. *Costs for these items are based on the current Geotech AE contract with Brotke Well and Pump, DACW43--01-D-0520 as well as other recent contracts awarded in the St. Louis District.											
11 01 01 01 1. Well Evaluation Well evaluation includes redevelopment and pump testing. Wells to be tested = 153 wells											
TOTAL Well Evaluation	153.00	EA			0	0	0	0	375,615	375,615	2455.00
11 01 01 01 2. Well Reconstruction Wells to be rehabbed = 153 wells to be tested x 80% = 122 wells											
TOTAL Well Reconstruct	122.00	EA			0	0	0	0	649,040	649,040	5320.00
11 01 01 01 4. Replace Wells New wells = 10 + 10 = 20 new wells											
TOTAL Replace Wells	20.00	EA			0	0	0	0	442,000	442,000	22100
TOTAL Pilot Holes for	20.00	EA			0	0	0	0	82,000	82,000	4100.00
TOTAL Rehab/Replace Ex					0	0	0	0	1,548,655	1,548,655	

11 01. Levees	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
11 01 01 02. New Relief Wells											
These new relief wells were recommended based on a underseepage evaluation that was preformed due to problems that ocurred in 1993.											
*Costs for these items are based on the current Geotech AE contract with Brotke Well and Pump, DACW43--01-D-0520 as well as other recent contracts awarded in the St. Louis District.											
TOTAL New Relief Wells	68.00	EA			0	0	0	0	1,502,800	1,502,800	22100
TOTAL Pilot Holes for	68.00	EA			0	0	0	0	278,800	278,800	4100.00
TOTAL New Relief Wells					0	0	0	0	1,781,600	1,781,600	
TOTAL Levees and Berms					0	0	0	0	3,330,255	3,330,255	
TOTAL Levees					0	0	0	0	3,330,255	3,330,255	

11 02. Gravity Drainage Structures

There is no conclusive evidence that several of the existing Gatewell Structures were part of the original levee system. The following Gatewell structures are identified as possibly being built by others;

GW-4, Bethalto Water Dept
GW-18, Olin
GW-23, Olin
GW-27, Shell Oil or Triad
GW-29, Clark Oil

In addition to the above there are five gatewell structures that were built as part of the original levee system but are located on Olin property. Restrictions have been placed on access of these areas and must first be coordinated with Olin personel. Because of the difficulty in coordinating access to these structures it is assumed that Olin security personel will be onsite during all rehab construction on Olin property. Assume one Olin security person for the rehab. of the following structures; GW-12, GW-13, GW-15, GW-16, and GW-17. Use 3-weeks for each location.

	11 02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
	11 02 01. Upper Wood River Levee (UWRL)											
	11 02 01 2. GW-2, 72" Drain (Flank)											
	11 02 01 2 01. Mob, Demob & Preparatory Work Use the following crew for to mobilize equipment to the jobsite. Assume the same time for demobilzation. Use 2hrs operating time for each way. (Mob.& Demob.) Crew - -------- Truck w/Lowboy — Truck Driver Mechanics Truck — Operator Laborer											
	11 02 01 2 01 1. Mobilization and Demobilization Asume 8hrs to mobilize equipment. Use 1hr operating time for loading and 1hr operating time for unloading equipment. Assume the same for demobilization.											
UPB PM	AIR COMPR, 1,600 CFM, 100 PSI REF. EP 1110-1-8 1600 CFM QUIET, 100 PSI (ADD HOSE)	4.00	HR	A15XX017	1.00	0	183	0	0	0	183	45.70
UPB PM	GENERATOR, 5.5 KW, 120/240V,PORT REF. EP 1110-1-8 5.5 KW	4.00	HR	G10HO004	0.00	0	7	0	0	0	7	1.64
MIL PM	PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRASH	4.00	HR	P50HO005	1.00	0	12	0	0	0	12	2.94
MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	4.00	HR	C75GV002	1.00	0	153	0	0	0	153	38.16
MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	4.00	HR	L50CS003	0.00	0	68	0	0	0	68	17.00
UPB PM	WELDER, 300 AMP, SKID,ELEC DRIVE	4.00	HR	W35XX009	0.00	0	6	0	0	0	6	1.59
L UPB PM	TRK,HWY, 46,000 GVW, 6X4, 3 AXLE	16.00	HR	T50FO018	1.00	0	558	0	0	0	558	34.90
L MIL PM	TRLR,LOWBOY, 60T, 3 AXLE (ADD TOWING TRUCK)	16.00	HR	T45XX017	1.00	0	134	0	0	0	134	8.38
L MIL PM	TRK,HWY,10,000GVW,4X2, 1T-PICKUP	16.00	HR	T50FO005	1.00	0	126	0	0	0	126	7.88
MIL PM	Outside Truck Drivers, Heavy *	16.00	HR	X-TRKDVRHV	1.00	607	0	0	0	0	607	37.92

11 02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT	
MIL PM Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57	
MIL PM Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06	
TOTAL Mobilization and					1,897	1,247	0	0	0	3,143		
TOTAL Mob, Demob & Pre					1,897	1,247	0	0	0	3,143		
11 02 01 2 02. Care and Diversion of Water												
Care of water consists of the installation of temporary bulkheads. Assume small trash pump and operator for any required pumping. Operator is assumed to be on-site for 10 working days for the purpose of dewatering.												
11 02 01 2 02 1. Fabricate Bulkheads												
B MIL PM Fabricate Bulkheads	1.00	LS		0.00	0	0	2,500	0	0	2,500	2500.00	
TOTAL Fabricate Bulkhe					0	0	2,500	0	0	2,500		
11 02 01 2 02 2. Install Temporary Bulkheads												
MIL PM LDR,BH,WH, 1.00CY FE BKT, 24"DIP	16.00	HR	L50CS003	0.00	0	272	0	0	0	272	17.00	
MIL PM Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57	
MIL PM Outside Laborers, (Semi-Skilled)	32.00	HR	X-LABORER	1.00	1,186	0	0	0	0	1,186	37.06	
TOTAL Install Temporar	2.00	DAY			1,883	272	0	0	0	2,155	1077.53	
11 02 01 2 02 3. Remove Temporary Bulkheads												
MIL PM LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS003	0.00	0	136	0	0	0	136	17.00	
MIL PM Outside Equip. Operators, Heavy *	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57	
MIL PM Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06	
TOTAL Remove Temporary	1.00	DAY			942	136	0	0	0	1,078	1077.53	

11 02. Gravity Drainage St			QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
		11 02 01 2 02 4. Unwatering Pumps											
MIL	PM	Outside Equip. Operators, Heavy	80.00	HR	X-EQOPRHVY	1.00	3,485	0	0	0	0	3,485	43.57
MIL	PM	PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRASH	80.00	HR	P50HO005	1.00	0	235	0	0	0	235	2.94
UPB	PM	TRK,HWY, 8,800GVW,4X4, 3/4T-PKUP REF. EP 1110-1-8 4X4 3/4-TON PICK-UP, 8800 GVW	80.00	HR	T50FO004	1.00	0	613	0	0	0	613	7.66
TOTAL		Unwatering Pumps					3,485	848	0	0	0	4,333	
TOTAL		Care and Diversi					6,310	1,256	2,500	0	0	10,066	
		11 02 01 2 03. Sitework											
		11 02 01 2 03 1. Site Preparation											
EP	PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS005	1.00	0	134	0	0	0	134	16.71
MIL	PM	Outside Equip. Operators, Heavy	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL	PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL		Site Preparation					942	134	0	0	0	1,075	
		11 02 01 2 03 2. Line Existing Pipe w/ HDPE Pipe There are 2-pipes to be lined at this location (quantities are multiplied by two)											
USR	PM	HDPE Liner	250.00	LF		0.00	0	0	0	0	62,500	62,500	250.00
B CIV	PM	Grouting, pressure, place grout between pipes	800.00	CF	XXQEB47B	17.50	8,517	2,245	2,400	0	0	13,162	16.45
TOTAL		Line Existing Pi					8,517	2,245	2,400	0	62,500	75,662	
		11 02 01 2 03 3. Site Restoration											
EP	PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS005	1.00	0	134	0	0	0	134	16.71
MIL	PM	Outside Equip. Operators, Heavy	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL	PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
USR	PM	Seeding	1.00	ACR		0.00	0	0	0	0	1,000	1,000	1000.00

	11 02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL	Site Restoration					942	134	0	0	1,000	2,075	
TOTAL	Sitework					10,400	2,513	2,400	0	63,500	78,813	
	11 02 01 2 04. Drainage Structure											
	11 02 01 2 04 1. Replace Handrail											
B CIV PM	Remove Existing Handrail handrail	70.00	LF	SIWSSSWK2	8.00	811	0	0	0	0	811	11.58
CIV PM	Castings fibergl ass, 2" dia rails pickets 5' OC, 42" high, handrail	70.00	LF	SIWSSSWK2	4.00	1,622	0	2,954	0	0	4,576	65.37
TOTAL	Replace Handrail					2,433	0	2,954	0	0	5,387	
	11 02 01 2 04 2. Replace Grating											
B CIV PM	Remove Grating	20.00	SF	SIWSSSWK2	40.00	46	0	0	0	0	46	2.32
CIV PM	Grating fbgls, m olded, 2" T, 2" sq mesh, grn (mod crsv env)	20.00	SF	SIWSSSWK2	40.00	46	0	410	0	0	457	22.84
TOTAL	Replace Grating					93	0	410	0	0	503	
	11 02 01 2 04 3. Replace Ladders											
B MIL PM	Remove Ladders	10.00	VLF	SIWSE4	12.50	149	4	0	0	0	153	15.31
MIL PM	Ladder, 20" wide , bolted to conc, w/safety equip	10.00	VLF	SIWSE4	6.25	298	8	532	0	0	838	83.81
TOTAL	Replace Ladders					447	12	532	0	0	991	
TOTAL	Drainage Structu					2,973	12	3,896	0	0	6,881	
	11 02 01 2 05. Gates											
	11 02 01 2 05 1. Remove Existing Gate											
MIL PM	Steam/Pipefitter s Foreman	16.00	HR	B-STM/PIPE	1.00	624	0	0	0	0	624	39.03
MIL PM	Steam/Pipefitter s	32.00	HR	B-STM/PIPE	1.00	1,217	0	0	0	0	1,217	38.03
MIL PM	Laborers, (Semi- Skilled)	16.00	HR	B-LABORER	1.00	593	0	0	0	0	593	37.06
MIL PM	Equip. Operators , Crane/Shovel	12.00	HR	B-EQOPRCRN	1.00	523	0	0	0	0	523	43.57

11 02. Gravity Drainage St			QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
MAP	PM	CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	12.00	HR	C75GV002	1.00	0	458	0	0	0	458	38.16
TOTAL		Remove Existing	1.00	EA			2,957	458	0	0	0	3,415	3415.07
		11 02 01 2 05 2. Rehab Gate											
		Manufacturers Rep/Erection Engineer is considered for field assistance.											
USR	ME	Rehab 72" Gate w / New Manual Operator	1.00	EA		0.00	0	0	0	0	9,503	9,503	9503.17
USR	ME	Erection Enginee r	1.00	LS		0.00	950	0	0	0	0	950	950.32
MIL	ME	Painters, Struct ural Steel	40.00	HR	B-PAINTSS	1.00	1,884	0	0	0	0	1,884	47.10
TOTAL		Rehab Gate	1.00	EA			2,834	0	0	0	9,503	12,338	12338
		11 02 01 2 05 3. Install/Test Rehabbed Gate											
MIL	PM	Steam/Pipefitter s Foreman	28.00	HR	B-STM/PIPE	1.00	1,093	0	0	0	0	1,093	39.03
MIL	PM	Steam/Pipefitter s	48.00	HR	B-STM/PIPE	1.00	1,825	0	0	0	0	1,825	38.03
MIL	PM	Laborers, (Semi- Skilled)	24.00	HR	B-LABORER	1.00	889	0	0	0	0	889	37.06
MIL	PM	Equip. Operators , Crane/Shovel	20.00	HR	B-EQOPRCRN	1.00	871	0	0	0	0	871	43.57
MAP	PM	CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	20.00	HR	C75GV002	1.00	0	763	0	0	0	763	38.16
MIL	PM	Outside Truck Dr ivers, Heavy	4.00	HR	X-TRKDVRHV	1.00	152	0	0	0	0	152	37.92
MAP	PM	FLATBED, 8'x 16. 0', W/SIDE RACKS (ADD TRUCK)	4.00	HR	T40KF016	1.00	0	3	0	0	0	3	0.84
EP	PM	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	4.00	HR	T50FO006	1.00	0	57	0	0	0	57	14.36
TOTAL		Install/Test Reh	1.00	EA			4,831	824	0	0	0	5,655	5654.64
TOTAL		Gates					10,622	1,282	0	0	9,503	21,407	
TOTAL		GW-2, 72" Drain					32,201	6,309	8,796	0	73,003	120,310	

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
11 02 01 3. GW-3, 18" Drain (Flank)												
11 02 01 3 01. Mob, Demob & Preparatory Work Use the following crew for to mobilize equipment to the jobsite. Assume the same time for demobilzation. Use 2hrs operating time for each way. (Mob.& Demob.) Crew - -------- Truck w/Lowboy Truck Driver Mechanics Truck Operator Laborer												
11 02 01 3 01 1. Mobilization and Demobilization Asume 8hrs to mobilize equipment. Use 1hr operating time for loading and 1hr operating time for unloading equipment. Assume the same for demobilization.												
	UPB	PM	AIR COMPR, 1,600 CFM, 100 PSI REF. EP 1110-1-8 1600 CFM QUIET, 100 PSI (ADD HOSE)	4.00	HR	A15XX017	1.00	0	183	0	0	0	183	45.70
	UPB	PM	GENERATOR, 5.5 KW, 120/240V,PORT REF. EP 1110-1-8 5.5 KW	4.00	HR	G10HO004	0.00	0	7	0	0	0	7	1.64
	MIL	PM	PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRASH	4.00	HR	P50HO005	1.00	0	12	0	0	0	12	2.94
	MAP	PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	4.00	HR	C75GV002	1.00	0	153	0	0	0	153	38.16
	MIL	PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	4.00	HR	L50CS003	0.00	0	68	0	0	0	68	17.00
	UPB	PM	WELDER, 300 AMP, SKID,ELEC DRIVE	4.00	HR	W35XX009	0.00	0	6	0	0	0	6	1.59
L	UPB	PM	TRK,HWY, 46,000 GVW, 6X4, 3 AXLE	16.00	HR	T50FO018	1.00	0	558	0	0	0	558	34.90
L	MIL	PM	TRLR,LOWBOY, 60T, 3 AXLE (ADD TOWING TRUCK)	16.00	HR	T45XX017	1.00	0	134	0	0	0	134	8.38
L	MIL	PM	TRK,HWY,10,000GVW,4X2, 1T-PICKUP	16.00	HR	T50FO005	1.00	0	126	0	0	0	126	7.88
	MIL	PM	Outside Truck Drivers, Heavy *	16.00	HR	X-TRKDVRHV	1.00	607	0	0	0	0	607	37.92
	MIL	PM	Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL	Mobilization and					1,897	1,247	0	0	0	3,143	
TOTAL	Mob, Demob & Pre					1,897	1,247	0	0	0	3,143	
	11 02 01 3 02. Care and Diversion of Water											
	Care of water consists of the installation of temporary bulkheads. Assume small trash pump and operator for any required pumping. Operator is assumed to be on-site for 10 working days for the purpose of dewatering.											
	11 02 01 3 02 1. Fabricate Bulkheads											
B MIL PM	Fabricate Bulkheads	1.00	LS		0.00	0	0	2,500	0	0	2,500	2500.00
TOTAL	Fabricate Bulkhe					0	0	2,500	0	0	2,500	
	11 02 01 3 02 2. Install Temporary Bulkheads											
MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	16.00	HR	L50CS003	0.00	0	272	0	0	0	272	17.00
MIL PM	Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57
MIL PM	Outside Laborers, (Semi-Skilled)	32.00	HR	X-LABORER	1.00	1,186	0	0	0	0	1,186	37.06
TOTAL	Install Temporar	2.00	DAY			1,883	272	0	0	0	2,155	1077.53
	11 02 01 3 02 3. Remove Temporary Bulkheads											
MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS003	0.00	0	136	0	0	0	136	17.00
MIL PM	Outside Equip. Operators, Heavy *	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL	Remove Temporary	1.00	DAY			942	136	0	0	0	1,078	1077.53
	11 02 01 3 02 4. Unwatering Pumps											
MIL PM	Outside Equip. Operators, Heavy	80.00	HR	X-EQOPRHVY	1.00	3,485	0	0	0	0	3,485	43.57

11	02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT	
MIL	PM PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRA SH	80.00	HR	P50HO005	1.00	0	235	0	0	0	235	2.94	
UPB	PM TRK,HWY, 8,800GVW,4X4, 3/4T-PKUP REF. EP 1110-1-8 4X4 3/4-TON PICK-UP, 8800 GVW	80.00	HR	T50FO004	1.00	0	613	0	0	0	613	7.66	
TOTAL	Unwatering Pumps					3,485	848	0	0	0	4,333		
TOTAL	Care and Diversi					6,310	1,256	2,500	0	0	10,066		
	11 02 01 3 03. Sitework												
	11 02 01 3 03 1. Clearing, Grubbing and Stripping												
AF	PM Felling trees & piling, chipping, medium brush	1.20	ACR	CODFB7	0.22	1,223	504	0	0	0	1,727	1438.84	
TOTAL	Clearing, Grubbi	1.20	ACR			1,223	504	0	0	0	1,727	1438.84	
	11 02 01 3 03 2. Pavement Removal												
L MIL	PM Site dml, bituminous, pavement removal, roads, 3" thick	110.00	SY	CLADB38	50.00	408	184	0	0	0	592	5.38	
MIL	PM Excavate & load, hydr excavator, 2 CY, medium matl	9.20	CY	CODEB12C	130.00	6	4	0	0	0	10	1.08	
TOTAL	Pavement Removal	110.00	SY			413	188	0	0	0	602	5.47	
	11 02 01 3 03 3. Remove Crushed Stone												
USR	PM Remove Crushed Stone and Stockpile	80.00	TON	CODFB10P	36.00	123	157	0	0	0	279	3.49	
TOTAL	Remove Crushed S	80.00	TON			123	157	0	0	0	279	3.49	
	11 02 01 3 03 4. Excavation												
L MIL	PM Excavate & load, hydr excavator, 2 CY, medium matl	6540.00	CY	CODEB12C	150.00	3,471	2,659	0	0	0	6,130	0.94	

11	02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
L	MIL PM Hauling, hwy hau lers, 12 CY, 1 mi round trip @ 20 MPH (4.2 cyc/hr)	6540.00	CY	COEIB34B	50.40	4,920	5,037	0	0	0	9,957	1.52
	TOTAL Excavation	6540.00	CY			8,391	7,696	0	0	0	16,087	2.46
	11 02 01 3 03 5. Cofferdam											
L	MIL PM Excavate & load, hydr excavator, 2 CY, medium matl	1700.00	CY	CODEB12C	150.00	902	691	0	0	0	1,593	0.94
L	MIL PM Hauling, hwy hau lers, 12 CY, 1 mi round trip @ 20 MPH (4.2 cyc/hr)	1700.00	CY	COEIB34B	50.40	1,279	1,309	0	0	0	2,588	1.52
	MIL PM Spread & compact , 8" lift, embankment, 300 HP tractor	1700.00	CY	CODTB10C	312.50	300	367	0	0	0	667	0.39
	TOTAL Cofferdam	1700.00	CY			2,481	2,367	0	0	0	4,848	2.85
	11 02 01 3 03 6. Remove Existing Pipe											
	CIV PM Site dml, pipe r emoval, 18" dia,conc, water/sewer, no	250.00	LF	CODLB6	18.75	1,474	170	0	0	0	1,644	6.58
	TOTAL Remove Existing	250.00	LF			1,474	170	0	0	0	1,644	6.58
	11 02 01 3 03 7. Install New RCP											
	MIL PM Backfill, sand b edding trenches, front-end loader, 1.5 CY	30.00	CY	CODFB10N	47.50	35	20	642	0	0	697	23.24
	MIL PM Piping, drainage & sewage, 18" dia, RCP, class 3, no gaskets	250.00	LF	CLABB14	16.25	3,427	196	2,893	0	0	6,515	26.06
	CIV PM Piping, drainage & sewage, RCP, precast end section, 18" dia	1.00	EA	CLABB14	3.13	71	4	210	0	0	285	285.24
	USR PM Concrete Cradle for Pipe	2.00	CY		0.00	0	0	0	0	600	600	300.00
	USR PM Connect Pipe to Existing Structure	1.00	EA		0.00	0	0	0	0	500	500	500.00
	TOTAL Install New RCP	250.00	LF			3,533	220	3,745	0	1,100	8,598	34.39

11 02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
11 02 01 3 03 8. Place and Compact Backfill											
L MIL PM Excavate & load, hydr excavator, 2 CY, medium matl	7800.00	CY	CODEB12C	150.00	4,139	3,171	0	0	0	7,311	0.94
L MIL PM Hauling, hwy haulers, 12 CY, 1 mi round trip @ 20 MPH (4.2 cyc/hr)	7800.00	CY	COEIB34B	50.40	5,868	6,008	0	0	0	11,876	1.52
L AF PM Fill, spread borrow w/dozer	7800.00	CY	CODTB10B	150.00	2,869	2,825	0	0	0	5,694	0.73
AF PM Compaction, ridi ng, 8" lifts, 2 passes, sheepsfoot/wobbly wheel roller	7800.00	CY	COFCB32F	600.00	1,451	998	0	0	0	2,448	0.31
TOTAL Place and Compac	7800.00	CY			14,327	13,002	0	0	0	27,329	3.50
11 02 01 3 03 9. Crushed Stone Surfacing											
B MIL PM Base course, 3/4 " maximum size, 3" deep, crushed stone, large areas	50.00	CY	COFGB36B	75.00	198	136	488	0	0	821	16.42
TOTAL Crushed Stone Su	80.00	TON			198	136	488	0	0	821	10.26
11 02 01 3 03 10. Bituminous Road Repair											
MIL PM Surface treatmen t, prime coat, bituminous, 0.28 gal/SY	9.90	CSF	COKBB45	300.00	2	2	32	0	0	36	3.66
MIL PM Asphaltic conc pavement, highway, wearing course, 3" thick	14.00	TON	COKCB25B	100.00	62	23	406	0	0	491	35.07
TOTAL Bitumineous Road	110.00	SY			65	24	438	0	0	527	4.79
11 02 01 3 03 11. Establishment of Turf											
MIL PM Seeding, athleti c field mix, mechanical seeding, 450#/acre	1.20	ACR	COELB66	0.24	186	80	659	0	0	925	771.05
AF PM Seeding, apply f ertilizer, 1# nitrogen/MSF, spray from truck	1.20	MSF	COFWB59	35.00	1	2	6	0	0	9	7.46
TOTAL Establishment of	1.20	ACR			187	81	666	0	0	934	778.50

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL	Sitework					32,415	24,545	5,336	0	1,100	63,396	
	11 02 01 3 04. Drainage Structure											
	11 02 01 3 04 1. Replace Handrail											
B CIV PM	Remove Existing Handrail handrail	70.00	LF	SIWSSSWK2	8.00	811	0	0	0	0	811	11.58
CIV PM	Castings fibergl ass, 2" dia rails pickets 5' OC, 42" high, handrail	70.00	LF	SIWSSSWK2	4.00	1,622	0	2,954	0	0	4,576	65.37
TOTAL	Replace Handrail					2,433	0	2,954	0	0	5,387	
	11 02 01 3 04 2. Replace Grating											
B CIV PM	Remove Grating	20.00	SF	SIWSSSWK2	40.00	46	0	0	0	0	46	2.32
CIV PM	Grating fbgls, m olded, 2" T, 2" sq mesh, grn (mod crsv env)	20.00	SF	SIWSSSWK2	40.00	46	0	410	0	0	457	22.84
TOTAL	Replace Grating					93	0	410	0	0	503	
	11 02 01 3 04 3. Replace Ladders											
B MIL PM	Remove Ladders	10.00	VLF	SIWSE4	12.50	149	4	0	0	0	153	15.31
MIL PM	Ladder, 20" wide , bolted to conc, w/safety equip	10.00	VLF	SIWSE4	6.25	298	8	532	0	0	838	83.81
TOTAL	Replace Ladders					447	12	532	0	0	991	
TOTAL	Drainage Structu					2,973	12	3,896	0	0	6,881	
	11 02 01 3 05. Gates											
	11 02 01 3 05 1. Remove Existing Gate											
MIL PM	Steam/Pipefitter s Foreman	8.00	HR	B-STM/PIPE	1.00	312	0	0	0	0	312	39.03
MIL PM	Steam/Pipefitter s	8.00	HR	B-STM/PIPE	1.00	304	0	0	0	0	304	38.03
MIL PM	Laborers, (Semi- Skilled)	8.00	HR	B-LABORER	1.00	296	0	0	0	0	296	37.06
MIL PM	Equip. Operators , Crane/Shovel	8.00	HR	B-EQOPRCRN	1.00	349	0	0	0	0	349	43.57
MAP PM	CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL	Remove Existing	1.00	EA			1,261	305	0	0	0	1,567	1566.77
	11 02 01 3 05 2. Rehab Gate											
	Manufacturers Rep/Erection Engineer is considered for field assistance.											
USR ME	Rehab 18" Gate w / New Manual Operator	1.00	EA		0.00	0	0	0	0	3,089	3,089	3088.53
USR ME	Erection Enginee r	1.00	LS		0.00	950	0	0	0	0	950	950.32
MIL ME	Painters, Struct ural Steel	12.00	HR	B-PAINTSS	1.00	565	0	0	0	0	565	47.10
TOTAL	Rehab Gate	1.00	EA			1,516	0	0	0	3,089	4,604	4604.07
	11 02 01 3 05 3. Install/Test Rehabbed Gate											
MIL PM	Steam/Pipefitter s Foreman	20.00	HR	B-STM/PIPE	1.00	781	0	0	0	0	781	39.03
MIL PM	Steam/Pipefitter s	16.00	HR	B-STM/PIPE	1.00	608	0	0	0	0	608	38.03
MIL PM	Laborers, (Semi- Skilled)	16.00	HR	B-LABORER	1.00	593	0	0	0	0	593	37.06
MIL PM	Equip. Operators , Crane/Shovel	8.00	HR	B-EQOPRCRN	1.00	349	0	0	0	0	349	43.57
MAP PM	CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16
MIL PM	Outside Truck Dr ivers, Heavy	4.00	HR	X-TRKDVRHV	1.00	152	0	0	0	0	152	37.92
MAP PM	FLATBED, 8'x 16. 0', W/SIDE RACKS (ADD TRUCK)	4.00	HR	T40KF016	1.00	0	3	0	0	0	3	0.84
EP PM	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	4.00	HR	T50FO006	1.00	0	57	0	0	0	57	14.36
TOTAL	Install/Test Reh	1.00	EA			2,482	366	0	0	0	2,848	2848.28
TOTAL	Gates					5,259	671	0	0	3,089	9,019	
TOTAL	GW-3, 18" Drain					48,853	27,731	11,732	0	4,189	92,505	

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
11 02 01 4. GW-4, 18" Drain (Flank)												
11 02 01 4 01. Mob, Demob & Preparatory Work Use the following crew for to mobilize equipment to the jobsite. Assume the same time for demobilzation. Use 2hrs operating time for each way. (Mob.& Demob.) Crew - -------- Truck w/Lowboy — Truck Driver Mechanics Truck — Operator Laborer												
11 02 01 4 01 1. Mobilization and Demobilization Asume 8hrs to mobilize equipment. Use 1hr operating time for loading and 1hr operating time for unloading equipment. Assume the same for demobilization.												
	UPB PM	AIR COMPR, 1,600 CFM, 100 PSI REF. EP 1110-1-8 1600 CFM QUIET, 100 PSI (ADD HOSE)	4.00	HR	A15XX017	1.00	0	183	0	0	0	183	45.70
	UPB PM	GENERATOR, 5.5 KW, 120/240V,PORT REF. EP 1110-1-8 5.5 KW	4.00	HR	G10HO004	0.00	0	7	0	0	0	7	1.64
	MIL PM	PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRASH	4.00	HR	P50HO005	1.00	0	12	0	0	0	12	2.94
	MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	4.00	HR	C75GV002	1.00	0	153	0	0	0	153	38.16
	MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	4.00	HR	L50CS003	0.00	0	68	0	0	0	68	17.00
	UPB PM	WELDER, 300 AMP, SKID,ELEC DRIVE	4.00	HR	W35XX009	0.00	0	6	0	0	0	6	1.59
L	UPB PM	TRK,HWY, 46,000 GVW, 6X4, 3 AXLE	16.00	HR	T50FO018	1.00	0	558	0	0	0	558	34.90
L	MIL PM	TRLR,LOWBOY, 60T, 3 AXLE (ADD TOWING TRUCK)	16.00	HR	T45XX017	1.00	0	134	0	0	0	134	8.38
L	MIL PM	TRK,HWY,10,000GVW,4X2, 1T-PICKUP	16.00	HR	T50FO005	1.00	0	126	0	0	0	126	7.88
	MIL PM	Outside Truck Drivers, Heavy *	16.00	HR	X-TRKDVRHV	1.00	607	0	0	0	0	607	37.92
	MIL PM	Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL	Mobilization and					1,897	1,247	0	0	0	3,143	
TOTAL	Mob, Demob & Pre					1,897	1,247	0	0	0	3,143	

11 02 01 4 02. Care and Diversion of Water

Care of water consists of the installation of temporary bulkheads. Assume small trash pump and operator for any required pumping. Operator is assumed to be on-site for 10 working days for the purpose of dewatering.

11 02 01 4 02 1. Fabricate Bulkheads

B MIL PM	Fabricate Bulkheads	1.00	LS		0.00	0	0	2,500	0	0	2,500	2500.00
TOTAL	Fabricate Bulkhe					0	0	2,500	0	0	2,500	

11 02 01 4 02 2. Install Temporary Bulkheads

MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	16.00	HR	L50CS003	0.00	0	272	0	0	0	272	17.00
MIL PM	Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57
MIL PM	Outside Laborers, (Semi-Skilled)	32.00	HR	X-LABORER	1.00	1,186	0	0	0	0	1,186	37.06
TOTAL	Install Temporar	2.00	DAY			1,883	272	0	0	0	2,155	1077.53

11 02 01 4 02 3. Remove Temporary Bulkheads

MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS003	0.00	0	136	0	0	0	136	17.00
MIL PM	Outside Equip. Operators, Heavy *	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL	Remove Temporary	1.00	DAY			942	136	0	0	0	1,078	1077.53

11 02 01 4 02 4. Unwatering Pumps

MIL PM	Outside Equip. Operators, Heavy	80.00	HR	X-EQOPRHVY	1.00	3,485	0	0	0	0	3,485	43.57

11	02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT	
MIL	PM PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRA SH	80.00	HR	P50HO005	1.00	0	235	0	0	0	235	2.94	
UPB	PM TRK,HWY, 8,800GVW,4X4, 3/4T-PKUP REF. EP 1110-1-8 4X4 3/4-TON PICK-UP, 8800 GVW	80.00	HR	T50FO004	1.00	0	613	0	0	0	613	7.66	
TOTAL	Unwatering Pumps					3,485	848	0	0	0	4,333		
TOTAL	Care and Diversi					6,310	1,256	2,500	0	0	10,066		
	11 02 01 4 03. Sitework												
	11 02 01 4 03 1. Clearing, Grubbing and Stripping												
AF	PM Felling trees & piling, chipping, medium brush	1.20	ACR	CODFB7	0.22	1,223	504	0	0	0	1,727	1438.84	
TOTAL	Clearing, Grubbi	1.20	ACR			1,223	504	0	0	0	1,727	1438.84	
	11 02 01 4 03 2. Pavement Removal												
L MIL	PM Site dml, bituminous, pavement removal, roads, 3" thick	110.00	SY	CLADB38	50.00	408	184	0	0	0	592	5.38	
MIL	PM Excavate & load, hydr excavator, 2 CY, medium matl	9.20	CY	CODEB12C	130.00	6	4	0	0	0	10	1.08	
TOTAL	Pavement Removal	110.00	SY			413	188	0	0	0	602	5.47	
	11 02 01 4 03 3. Remove Crushed Stone												
USR	PM Remove Crushed Stone and Stockpile	80.00	TON	CODFB10P	36.00	123	157	0	0	0	279	3.49	
TOTAL	Remove Crushed S	80.00	TON			123	157	0	0	0	279	3.49	
	11 02 01 4 03 4. Excavation												
L MIL	PM Excavate & load, hydr excavator, 2 CY, medium matl	6540.00	CY	CODEB12C	150.00	3,471	2,659	0	0	0	6,130	0.94	

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
L	MIL PM	Hauling, hwy haulers, 12 CY, 1 mi round trip @ 20 MPH (4.2 cyc/hr)	6540.00	CY	COEIB34B	50.40	4,920	5,037	0	0	0	9,957	1.52
	TOTAL	Excavation	6540.00	CY			8,391	7,696	0	0	0	16,087	2.46
		11 02 01 4 03 5. Cofferdam											
L	MIL PM	Excavate & load, hydr excavator, 2 CY, medium matl	1700.00	CY	CODEB12C	150.00	902	691	0	0	0	1,593	0.94
L	MIL PM	Hauling, hwy haulers, 12 CY, 1 mi round trip @ 20 MPH (4.2 cyc/hr)	1700.00	CY	COEIB34B	50.40	1,279	1,309	0	0	0	2,588	1.52
	MIL PM	Spread & compact, 8" lift, embankment, 300 HP tractor	1700.00	CY	CODTB10C	312.50	300	367	0	0	0	667	0.39
	TOTAL	Cofferdam	1700.00	CY			2,481	2,367	0	0	0	4,848	2.85
		11 02 01 4 03 6. Remove Existing Pipe											
	CIV PM	Site dml, pipe removal, 18" dia,conc, water/sewer, no excavation	250.00	LF	CODLB6	18.75	1,474	170	0	0	0	1,644	6.58
	TOTAL	Remove Existing	250.00	LF			1,474	170	0	0	0	1,644	6.58
		11 02 01 4 03 7. Install New RCP											
	MIL PM	Backfill, sand bedding trenches, front-end loader, 1.5 CY	30.00	CY	CODFB10N	47.50	35	20	642	0	0	697	23.24
	MIL PM	Piping, drainage & sewage, 18" dia, RCP, class 3, no gaskets	250.00	LF	CLABB14	16.25	3,427	196	2,893	0	0	6,515	26.06
	CIV PM	Piping, drainage & sewage, RCP, precast end section, 18" dia	1.00	EA	CLABB14	3.13	71	4	210	0	0	285	285.24
	USR PM	Concrete Cradle for Pipe	2.00	CY		0.00	0	0	0	0	600	600	300.00
	USR PM	Connect Pipe to Existing Structure	1.00	EA		0.00	0	0	0	0	500	500	500.00
	TOTAL	Install New RCP	250.00	LF			3,533	220	3,745	0	1,100	8,598	34.39

11 02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
11 02 01 4 03 8. Place and Compact Backfill											
L MIL PM Excavate & load, hydr excavator, 2 CY, medium matl	7800.00	CY	CODEB12C	150.00	4,139	3,171	0	0	0	7,311	0.94
L MIL PM Hauling, hwy haulers, 12 CY, 1 mi round trip @ 20 MPH (4.2 cyc/hr)	7800.00	CY	COEIB34B	50.40	5,868	6,008	0	0	0	11,876	1.52
L AF PM Fill, spread borrow w/dozer	7800.00	CY	CODTB10B	150.00	2,869	2,825	0	0	0	5,694	0.73
AF PM Compaction, ridi ng, 8" lifts, 2 passes, sheepsfoot/wobbly wheel roller	7800.00	CY	COFCB32F	600.00	1,451	998	0	0	0	2,448	0.31
TOTAL Place and Compac	7800.00	CY			14,327	13,002	0	0	0	27,329	3.50
11 02 01 4 03 9. Crushed Stone Surfacing											
B MIL PM Base course, 3/4 " maximum size, 3" deep, crushed stone, large areas	50.00	CY	COFGB36B	75.00	198	136	488	0	0	821	16.42
TOTAL Crushed Stone Su	80.00	TON			198	136	488	0	0	821	10.26
11 02 01 4 03 10. Bituminous Road Repair											
MIL PM Surface treatmen t, prime coat, bituminous, 0.28 gal/SY	9.90	CSF	COKBB45	300.00	2	2	32	0	0	36	3.66
MIL PM Asphaltic conc pavement, highway, wearing course, 3" thick	14.00	TON	COKCB25B	100.00	62	23	406	0	0	491	35.07
TOTAL Bituminous Road	110.00	SY			65	24	438	0	0	527	4.79
11 02 01 4 03 11. Establishment of Turf											
MIL PM Seeding, athleti c field mix, mechanical seeding, 450#/acre	1.20	ACR	COELB66	0.24	186	80	659	0	0	925	771.05
AF PM Seeding, apply f ertilizer, 1# nitrogen/MSF, spray from truck	1.20	MSF	COFWB59	35.00	1	2	6	0	0	9	7.46
TOTAL Establishment of	1.20	ACR			187	81	666	0	0	934	778.50

11	02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
	TOTAL Sitework					32,415	24,545	5,336	0	1,100	63,396	
	11 02 01 4 04. Drainage Structure											
	11 02 01 4 04 1. Replace Handrail											
B	CIV PM Remove Existing Handrail handrail	70.00	LF	SIWSSSWK2	8.00	811	0	0	0	0	811	11.58
	CIV PM Castings fibergl ass, 2" dia rails pickets 5' OC, 42" high, handrail	70.00	LF	SIWSSSWK2	4.00	1,622	0	2,954	0	0	4,576	65.37
	TOTAL Replace Handrail					2,433	0	2,954	0	0	5,387	
	11 02 01 4 04 2. Replace Grating											
B	CIV PM Remove Grating	20.00	SF	SIWSSSWK2	40.00	46	0	0	0	0	46	2.32
	CIV PM Grating fbgls, m olded, 2" T, 2" sq mesh, grn (mod crsv env)	20.00	SF	SIWSSSWK2	40.00	46	0	410	0	0	457	22.84
	TOTAL Replace Grating					93	0	410	0	0	503	
	11 02 01 4 04 3. Replace Ladders											
B	MIL PM Remove Ladders	10.00	VLF	SIWSE4	12.50	149	4	0	0	0	153	15.31
	MIL PM Ladder, 20" wide , bolted to conc, w/safety equip	10.00	VLF	SIWSE4	6.25	298	8	532	0	0	838	83.81
	TOTAL Replace Ladders					447	12	532	0	0	991	
	TOTAL Drainage Structu					2,973	12	3,896	0	0	6,881	
	11 02 01 4 05. Gates											
	11 02 01 4 05 1. Remove Existing Gate											
	MIL PM Steam/Pipefitter s Foreman	8.00	HR	B-STM/PIPE	1.00	312	0	0	0	0	312	39.03
	MIL PM Steam/Pipefitter s	8.00	HR	B-STM/PIPE	1.00	304	0	0	0	0	304	38.03
	MIL PM Laborers, (Semi- Skilled)	8.00	HR	B-LABORER	1.00	296	0	0	0	0	296	37.06
	MIL PM Equip. Operators , Crane/Shovel	8.00	HR	B-EQOPRCRN	1.00	349	0	0	0	0	349	43.57
	MAP PM CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL	Remove Existing	1.00	EA			1,261	305	0	0	0	1,567	1566.77
	11 02 01 4 05 2. Rehab Gate											
	Manufacturers Rep/Erection Engineer is considered for field assistance.											
USR ME	Rehab 18" Gate w / New Manual Operator	1.00	EA		0.00	0	0	0	0	3,089	3,089	3088.53
USR ME	Erection Enginee r	1.00	LS		0.00	950	0	0	0	0	950	950.32
MIL ME	Painters, Struct ural Steel	12.00	HR	B-PAINTSS	1.00	565	0	0	0	0	565	47.10
TOTAL	Rehab Gate	1.00	EA			1,516	0	0	0	3,089	4,604	4604.07
	11 02 01 4 05 3. Install/Test Rehabbed Gate											
MIL PM	Steam/Pipefitter s Foreman	20.00	HR	B-STM/PIPE	1.00	781	0	0	0	0	781	39.03
MIL PM	Steam/Pipefitter s	16.00	HR	B-STM/PIPE	1.00	608	0	0	0	0	608	38.03
MIL PM	Laborers, (Semi- Skilled)	16.00	HR	B-LABORER	1.00	593	0	0	0	0	593	37.06
MIL PM	Equip. Operators , Crane/Shovel	8.00	HR	B-EQOPRCRN	1.00	349	0	0	0	0	349	43.57
MAP PM	CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16
MIL PM	Outside Truck Dr ivers, Heavy	4.00	HR	X-TRKDVRHV	1.00	152	0	0	0	0	152	37.92
MAP PM	FLATBED, 8'x 16. 0', W/SIDE RACKS (ADD TRUCK)	4.00	HR	T40KF016	1.00	0	3	0	0	0	3	0.84
EP PM	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	4.00	HR	T50FO006	1.00	0	57	0	0	0	57	14.36
TOTAL	Install/Test Reh	1.00	EA			2,482	366	0	0	0	2,848	2848.28
TOTAL	Gates					5,259	671	0	0	3,089	9,019	
TOTAL	GW-4, 18" Drain					48,853	27,731	11,732	0	4,189	92,505	

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
11 02 01 5. GW-5, 18" Drain (Flank)												
11 02 01 5 01. Mob, Demob & Preparatory Work Use the following crew for to mobilize equipment to the jobsite. Assume the same time for demobilzation. Use 2hrs operating time for each way. (Mob.& Demob.) Crew - -------- Truck w/Lowboy — Truck Driver Mechanics Truck — Operator Laborer												
11 02 01 5 01 1. Mobilization and Demobilization Asume 8hrs to mobilize equipment. Use 1hr operating time for loading and 1hr operating time for unloading equipment. Assume the same for demobilization.												
	UPB PM	AIR COMPR, 1,600 CFM, 100 PSI REF. EP 1110-1-8 1600 CFM QUIET, 100 PSI (ADD HOSE)	4.00	HR	A15XX017	1.00	0	183	0	0	0	183	45.70
	UPB PM	GENERATOR, 5.5 KW, 120/240V,PORT REF. EP 1110-1-8 5.5 KW	4.00	HR	G10HO004	0.00	0	7	0	0	0	7	1.64
	MIL PM	PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRASH	4.00	HR	P50HO005	1.00	0	12	0	0	0	12	2.94
	MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	4.00	HR	C75GV002	1.00	0	153	0	0	0	153	38.16
	MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	4.00	HR	L50CS003	0.00	0	68	0	0	0	68	17.00
	UPB PM	WELDER, 300 AMP, SKID,ELEC DRIVE	4.00	HR	W35XX009	0.00	0	6	0	0	0	6	1.59
L	UPB PM	TRK,HWY, 46,000 GVW, 6X4, 3 AXLE	16.00	HR	T50FO018	1.00	0	558	0	0	0	558	34.90
L	MIL PM	TRLR,LOWBOY, 60T, 3 AXLE (ADD TOWING TRUCK)	16.00	HR	T45XX017	1.00	0	134	0	0	0	134	8.38
L	MIL PM	TRK,HWY,10,000GVW,4X2, 1T-PICKUP	16.00	HR	T50FO005	1.00	0	126	0	0	0	126	7.88
	MIL PM	Outside Truck Drivers, Heavy *	16.00	HR	X-TRKDVRHV	1.00	607	0	0	0	0	607	37.92
	MIL PM	Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57

11 02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
MIL PM Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL Mobilization and					1,897	1,247	0	0	0	3,143	
TOTAL Mob, Demob & Pre					1,897	1,247	0	0	0	3,143	

11 02 01 5 02. Care and Diversion of Water

Care of water consists of the installation of temporary bulkheads. Assume small trash pump and operator for any required pumping. Operator is assumed to be on-site for 10 working days for the purpose of dewatering.

11 02 01 5 02 1. Fabricate Bulkheads

B MIL PM Fabricate Bulkheads	1.00	LS		0.00	0	0	2,500	0	0	2,500	2500.00
TOTAL Fabricate Bulkhe					0	0	2,500	0	0	2,500	

11 02 01 5 02 2. Install Temporary Bulkheads

MIL PM LDR,BH,WH, 1.00CY FE BKT, 24"DIP	16.00	HR	L50CS003	0.00	0	272	0	0	0	272	17.00
MIL PM Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57
MIL PM Outside Laborers, (Semi-Skilled)	32.00	HR	X-LABORER	1.00	1,186	0	0	0	0	1,186	37.06
TOTAL Install Temporar	2.00	DAY			1,883	272	0	0	0	2,155	1077.53

11 02 01 5 02 3. Remove Temporary Bulkheads

MIL PM LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS003	0.00	0	136	0	0	0	136	17.00
MIL PM Outside Equip. Operators, Heavy *	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL PM Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL Remove Temporary	1.00	DAY			942	136	0	0	0	1,078	1077.53

11 02 01 5 02 4. Unwatering Pumps

MIL PM Outside Equip. Operators, Heavy	80.00	HR	X-EQOPRHVY	1.00	3,485	0	0	0	0	3,485	43.57

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
MIL PM	PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRA SH	80.00	HR	P50HO005	1.00	0	235	0	0	0	235	2.94
UPB PM	TRK,HWY, 8,800GVW,4X4, 3/4T-PKUP REF. EP 1110-1-8 4X4 3/4-TON PICK-UP, 8800 GVW	80.00	HR	T50FO004	1.00	0	613	0	0	0	613	7.66
TOTAL	Unwatering Pumps					3,485	848	0	0	0	4,333	
TOTAL	Care and Diversi					6,310	1,256	2,500	0	0	10,066	
	11 02 01 5 03. Sitework											
	11 02 01 5 03 1. Clearing, Grubbing and Stripping											
AF PM	Felling trees & piling, chipping, medium brush	1.20	ACR	CODFB7	0.22	1,223	504	0	0	0	1,727	1438.84
TOTAL	Clearing, Grubbi	1.20	ACR			1,223	504	0	0	0	1,727	1438.84
	11 02 01 5 03 2. Pavement Removal											
L MIL PM	Site dml, bituminous, pavement removal, roads, 3" thick	110.00	SY	CLADB38	50.00	408	184	0	0	0	592	5.38
MIL PM	Excavate & load, hydr excavator, 2 CY, medium matl	9.20	CY	CODEB12C	130.00	6	4	0	0	0	10	1.08
TOTAL	Pavement Removal	110.00	SY			413	188	0	0	0	602	5.47
	11 02 01 5 03 3. Remove Crushed Stone											
USR PM	Remove Crushed Stone and Stockpile	80.00	TON	CODFB10P	36.00	123	157	0	0	0	279	3.49
TOTAL	Remove Crushed S	80.00	TON			123	157	0	0	0	279	3.49
	11 02 01 5 03 4. Excavation											
L MIL PM	Excavate & load, hydr excavator, 2 CY, medium matl	6540.00	CY	CODEB12C	150.00	3,471	2,659	0	0	0	6,130	0.94

11	02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
L	MIL PM Hauling, hwy hau lers, 12 CY, 1 mi round trip @ 20 MPH (4.2 cyc/hr)	6540.00	CY	COEIB34B	50.40	4,920	5,037	0	0	0	9,957	1.52
	TOTAL Excavation	6540.00	CY			8,391	7,696	0	0	0	16,087	2.46
	11 02 01 5 03 5. Cofferdam											
L	MIL PM Excavate & load, hydr excavator, 2 CY, medium matl	1700.00	CY	CODEB12C	150.00	902	691	0	0	0	1,593	0.94
L	MIL PM Hauling, hwy hau lers, 12 CY, 1 mi round trip @ 20 MPH (4.2 cyc/hr)	1700.00	CY	COEIB34B	50.40	1,279	1,309	0	0	0	2,588	1.52
	MIL PM Spread & compact , 8" lift, embankment, 300 HP tractor	1700.00	CY	CODTB10C	312.50	300	367	0	0	0	667	0.39
	TOTAL Cofferdam	1700.00	CY			2,481	2,367	0	0	0	4,848	2.85
	11 02 01 5 03 6. Remove Existing Pipe											
	CIV PM Site dml, pipe r emoval, 18" dia,conc, water/sewer, no excavation	250.00	LF	CODLB6	18.75	1,474	170	0	0	0	1,644	6.58
	TOTAL Remove Existing	250.00	LF			1,474	170	0	0	0	1,644	6.58
	11 02 01 5 03 7. Install New RCP											
	MIL PM Backfill, sand b edding trenches, front-end loader, 1.5 CY	30.00	CY	CODFB10N	47.50	35	20	642	0	0	697	23.24
	MIL PM Piping, drainage & sewage, 18" dia, RCP, class 3, no gaskets	250.00	LF	CLABB14	16.25	3,427	196	2,893	0	0	6,515	26.06
	CIV PM Piping, drainage & sewage, RCP, precast end section, 18" dia	1.00	EA	CLABB14	3.13	71	4	210	0	0	285	285.24
	USR PM Concrete Cradle for Pipe	2.00	CY		0.00	0	0	0	0	600	600	300.00
	USR PM Connect Pipe to Existing Structure	1.00	EA		0.00	0	0	0	0	500	500	500.00
	TOTAL Install New RCP	250.00	LF			3,533	220	3,745	0	1,100	8,598	34.39

11 02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
11 02 01 5 03 8. Place and Compact Backfill											
L MIL PM Excavate & load, hydr excavator, 2 CY, medium matl	7800.00	CY	CODEB12C	150.00	4,139	3,171	0	0	0	7,311	0.94
L MIL PM Hauling, hwy haulers, 12 CY, 1 mi round trip @ 20 MPH (4.2 cyc/hr)	7800.00	CY	COEIB34B	50.40	5,868	6,008	0	0	0	11,876	1.52
L AF PM Fill, spread borrow w/dozer	7800.00	CY	CODTB10B	150.00	2,869	2,825	0	0	0	5,694	0.73
AF PM Compaction, riding, 8" lifts, 2 passes, sheepsfoot/wobbly wheel roller	7800.00	CY	COFCB32F	600.00	1,451	998	0	0	0	2,448	0.31
TOTAL Place and Compac	7800.00	CY			14,327	13,002	0	0	0	27,329	3.50
11 02 01 5 03 9. Crushed Stone Surfacing											
B MIL PM Base course, 3/4 " maximum size, 3" deep, crushed stone, large areas	50.00	CY	COFGB36B	75.00	198	136	488	0	0	821	16.42
TOTAL Crushed Stone Su	80.00	TON			198	136	488	0	0	821	10.26
11 02 01 5 03 10. Bituminous Road Repair											
MIL PM Surface treatment, prime coat, bituminous, 0.28 gal/SY	9.90	CSF	COKBB45	300.00	2	2	32	0	0	36	3.66
MIL PM Asphaltic conc pavement, highway, wearing course, 3" thick	14.00	TON	COKCB25B	100.00	62	23	406	0	0	491	35.07
TOTAL Bitumineous Road	110.00	SY			65	24	438	0	0	527	4.79
11 02 01 5 03 11. Establishment of Turf											
MIL PM Seeding, athletic field mix, mechanical seeding, 450#/acre	1.20	ACR	COELB66	0.24	186	80	659	0	0	925	771.05
AF PM Seeding, apply fertilizer, 1# nitrogen/MSF, spray from truck	1.20	MSF	COFWB59	35.00	1	2	6	0	0	9	7.46
TOTAL Establishment of	1.20	ACR			187	81	666	0	0	934	778.50

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL	Sitework					32,415	24,545	5,336	0	1,100	63,396	
	11 02 01 5 04. Drainage Structure											
	11 02 01 5 04 1. Replace Handrail											
B CIV PM	Remove Existing Handrail handrail	70.00	LF	SIWSSSWK2	8.00	811	0	0	0	0	811	11.58
CIV PM	Castings fibergl ass, 2" dia rails pickets 5' OC, 42" high, handrail	70.00	LF	SIWSSSWK2	4.00	1,622	0	2,954	0	0	4,576	65.37
TOTAL	Replace Handrail					2,433	0	2,954	0	0	5,387	
	11 02 01 5 04 2. Replace Grating											
B CIV PM	Remove Grating	20.00	SF	SIWSSSWK2	40.00	46	0	0	0	0	46	2.32
CIV PM	Grating fbgls, m olded, 2" T, 2" sq mesh, grn (mod crsv env)	20.00	SF	SIWSSSWK2	40.00	46	0	410	0	0	457	22.84
TOTAL	Replace Grating					93	0	410	0	0	503	
	11 02 01 5 04 3. Replace Ladders											
B MIL PM	Remove Ladders	10.00	VLF	SIWSE4	12.50	149	4	0	0	0	153	15.31
MIL PM	Ladder, 20" wide , bolted to conc, w/safety equip	10.00	VLF	SIWSE4	6.25	298	8	532	0	0	838	83.81
TOTAL	Replace Ladders					447	12	532	0	0	991	
TOTAL	Drainage Structu					2,973	12	3,896	0	0	6,881	
	11 02 01 5 05. Gates											
	11 02 01 5 05 1. Remove Existing Gate											
MIL PM	Steam/Pipefitter s Foreman	8.00	HR	B-STM/PIPE	1.00	312	0	0	0	0	312	39.03
MIL PM	Steam/Pipefitter s	8.00	HR	B-STM/PIPE	1.00	304	0	0	0	0	304	38.03
MIL PM	Laborers, (Semi- Skilled)	8.00	HR	B-LABORER	1.00	296	0	0	0	0	296	37.06
MIL PM	Equip. Operators , Crane/Shovel	8.00	HR	B-EQOPRCRN	1.00	349	0	0	0	0	349	43.57
MAP PM	CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL	Remove Existing	1.00	EA			1,261	305	0	0	0	1,567	1566.77
	11 02 01 5 05 2. Rehab Gate											
	Manufacturers Rep/Erection Engineer is considered for field assistance.											
USR ME	Rehab 18" Gate w / New Manual Operator	1.00	EA		0.00	0	0	0	0	3,089	3,089	3088.53
USR ME	Erection Enginee r	1.00	LS		0.00	950	0	0	0	0	950	950.32
MIL ME	Painters, Struct ural Steel	12.00	HR	B-PAINTSS	1.00	565	0	0	0	0	565	47.10
TOTAL	Rehab Gate	1.00	EA			1,516	0	0	0	3,089	4,604	4604.07
	11 02 01 5 05 3. Install/Test Rehabbed Gate											
MIL PM	Steam/Pipefitter s Foreman	20.00	HR	B-STM/PIPE	1.00	781	0	0	0	0	781	39.03
MIL PM	Steam/Pipefitter s	16.00	HR	B-STM/PIPE	1.00	608	0	0	0	0	608	38.03
MIL PM	Laborers, (Semi- Skilled)	16.00	HR	B-LABORER	1.00	593	0	0	0	0	593	37.06
MIL PM	Equip. Operators , Crane/Shovel	8.00	HR	B-EQOPRCRN	1.00	349	0	0	0	0	349	43.57
MAP PM	CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16
MIL PM	Outside Truck Dr ivers, Heavy	4.00	HR	X-TRKDVRHV	1.00	152	0	0	0	0	152	37.92
MAP PM	FLATBED, 8'x 16. 0', W/SIDE RACKS (ADD TRUCK)	4.00	HR	T40KF016	1.00	0	3	0	0	0	3	0.84
EP PM	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	4.00	HR	T50FO006	1.00	0	57	0	0	0	57	14.36
TOTAL	Install/Test Reh	1.00	EA			2,482	366	0	0	0	2,848	2848.28
TOTAL	Gates					5,259	671	0	0	3,089	9,019	
TOTAL	GW-5, 18" Drain					48,853	27,731	11,732	0	4,189	92,505	
TOTAL	Upper Wood River					178,761	89,503	43,993	0	85,569	397,826	

	11 02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
	11 02 02. East and West Fork Levee											
	11 02 02 1. GW-6, 48" Drain (East Fork)											
	11 02 02 1 01. Mob, Demob & Preparatory Work											
	Use the following crew for to mobilize equipment to the jobsite. Assume the same time for demobilzation. Use 2hrs operating time for each way. (Mob.& Demob.)											
	Crew -											

	Truck w/Lowboy					Truck Driver						
	Mechanics Truck					Operator						
	Laborer											
	11 02 02 1 01 1. Mobilization and Demobilization											
	Asume 8hrs to mobilize equipment. Use 1hr operating time for loading and 1hr operating time for unloading equipment. Assume the same for demobilization.											
UPB PM	AIR COMPR, 1,600 CFM, 100 PSI REF. EP 1110-1-8 1600 CFM QUIET, 100 PSI (ADD HOSE)	4.00	HR	A15XX017	1.00	0	183	0	0	0	183	45.70
UPB PM	GENERATOR, 5.5 KW, 120/240V,PORT REF. EP 1110-1-8 5.5 KW	4.00	HR	G10HO004	0.00	0	7	0	0	0	7	1.64
MIL PM	PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRASH	4.00	HR	P50HO005	1.00	0	12	0	0	0	12	2.94
MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	4.00	HR	C75GV002	1.00	0	153	0	0	0	153	38.16
MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	4.00	HR	L50CS003	0.00	0	68	0	0	0	68	17.00
UPB PM	WELDER, 300 AMP, SKID,ELEC DRIVE	4.00	HR	W35XX009	0.00	0	6	0	0	0	6	1.59
L UPB PM	TRK,HWY, 46,000 GVW, 6X4, 3 AXLE	16.00	HR	T50FO018	1.00	0	558	0	0	0	558	34.90
L MIL PM	TRLR,LOWBOY, 60T, 3 AXLE (ADD TOWING TRUCK)	16.00	HR	T45XX017	1.00	0	134	0	0	0	134	8.38
L MIL PM	TRK,HWY,10,000GVW,4X2, 1T-PICKUP	16.00	HR	T50FO005	1.00	0	126	0	0	0	126	7.88
MIL PM	Outside Truck Drivers, Heavy *	16.00	HR	X-TRKDVRHV	1.00	607	0	0	0	0	607	37.92

11 02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT	
MIL PM Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57	
MIL PM Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06	
TOTAL Mobilization and					1,897	1,247	0	0	0	3,143		
TOTAL Mob, Demob & Pre					1,897	1,247	0	0	0	3,143		
11 02 02 1 02. Care and Diversion of Water												
Care of water consists of the installation of temporary bulkheads. Assume small trash pump and operator for any required pumping. Operator is assumed to be on-site for 10 working days for the purpose of dewatering.												
11 02 02 1 02 1. Fabricate Bulkheads												
B MIL PM Fabricate Bulkheads	1.00	LS		0.00	0	0	2,500	0	0	2,500	2500.00	
TOTAL Fabricate Bulkhe					0	0	2,500	0	0	2,500		
11 02 02 1 02 2. Install Temporary Bulkheads												
MIL PM LDR,BH,WH, 1.00CY FE BKT, 24"DIP	16.00	HR	L50CS003	0.00	0	272	0	0	0	272	17.00	
MIL PM Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57	
MIL PM Outside Laborers, (Semi-Skilled)	32.00	HR	X-LABORER	1.00	1,186	0	0	0	0	1,186	37.06	
TOTAL Install Temporar	2.00	DAY			1,883	272	0	0	0	2,155	1077.53	
11 02 02 1 02 3. Remove Temporary Bulkheads												
MIL PM LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS003	0.00	0	136	0	0	0	136	17.00	
MIL PM Outside Equip. Operators, Heavy *	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57	
MIL PM Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06	
TOTAL Remove Temporary	1.00	DAY			942	136	0	0	0	1,078	1077.53	

11 02. Gravity Drainage St			QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
		11 02 02 1 02 4. Unwatering Pumps											
MIL	PM	Outside Equip. Operators, Heavy	80.00	HR	X-EQOPRHVY	1.00	3,485	0	0	0	0	3,485	43.57
MIL	PM	PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRASH	80.00	HR	P50HO005	1.00	0	235	0	0	0	235	2.94
UPB	PM	TRK,HWY, 8,800GVW,4X4, 3/4T-PKUP REF. EP 1110-1-8 4X4 3/4-TON PICK-UP, 8800 GVW	80.00	HR	T50FO004	1.00	0	613	0	0	0	613	7.66
TOTAL		Unwatering Pumps					3,485	848	0	0	0	4,333	
TOTAL		Care and Diversi					6,310	1,256	2,500	0	0	10,066	
		11 02 02 1 03. Sitework											
		11 02 02 1 03 1. Site Preparation											
EP	PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS005	1.00	0	134	0	0	0	134	16.71
MIL	PM	Outside Equip. Operators, Heavy	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL	PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL		Site Preparation					942	134	0	0	0	1,075	
		11 02 02 1 03 2. Line Existing Pipe w/ HDPE Pipe There are 2-pipes to be lined at this location (quantities are multiplied by two)											
USR	PM	HDPE Liner	250.00	LF		0.00	0	0	0	0	25,000	25,000	100.00
B CIV	PM	Grouting, pressure, place grout between pipes	500.00	CF	XXQEB47B	17.50	5,323	1,403	1,500	0	0	8,226	16.45
TOTAL		Line Existing Pi					5,323	1,403	1,500	0	25,000	33,226	
		11 02 02 1 03 3. Site Restoration											
EP	PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS005	1.00	0	134	0	0	0	134	16.71
MIL	PM	Outside Equip. Operators, Heavy	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL	PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
USR	PM	Seeding	1.00	ACR		0.00	0	0	0	0	1,000	1,000	1000.00

11 02. Gravity Drainage St			QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL	Site Restoration						942	134	0	0	1,000	2,075	
TOTAL	Sitework						7,206	1,671	1,500	0	26,000	36,377	
	11 02 02 1 04. Drainage Structure												
	11 02 02 1 04 1. Replace Handrail												
B CIV PM	Remove Existing Handrail handrail		70.00	LF	SIWSSSWK2	8.00	811	0	0	0	0	811	11.58
CIV PM	Castings fibergl ass, 2" dia rails pickets 5' OC, 42" high, handrail		70.00	LF	SIWSSSWK2	4.00	1,622	0	2,954	0	0	4,576	65.37
TOTAL	Replace Handrail						2,433	0	2,954	0	0	5,387	
	11 02 02 1 04 2. Replace Grating												
B CIV PM	Remove Grating		20.00	SF	SIWSSSWK2	40.00	46	0	0	0	0	46	2.32
CIV PM	Grating fbgls, m olded, 2" T, 2" sq mesh, grn (mod crsv env)		20.00	SF	SIWSSSWK2	40.00	46	0	410	0	0	457	22.84
TOTAL	Replace Grating						93	0	410	0	0	503	
	11 02 02 1 04 3. Replace Ladders												
B MIL PM	Remove Ladders		10.00	VLF	SIWSE4	12.50	149	4	0	0	0	153	15.31
MIL PM	Ladder, 20" wide , bolted to conc, w/safety equip		10.00	VLF	SIWSE4	6.25	298	8	532	0	0	838	83.81
TOTAL	Replace Ladders						447	12	532	0	0	991	
TOTAL	Drainage Structu						2,973	12	3,896	0	0	6,881	
	11 02 02 1 05. Gates												
	11 02 02 1 05 1. Remove Existing Gate												
MIL PM	Steam/Pipefitter s Foreman		16.00	HR	B-STM/PIPE	1.00	624	0	0	0	0	624	39.03
MIL PM	Steam/Pipefitter s		16.00	HR	B-STM/PIPE	1.00	608	0	0	0	0	608	38.03
MIL PM	Laborers, (Semi- Skilled)		16.00	HR	B-LABORER	1.00	593	0	0	0	0	593	37.06
MIL PM	Equip. Operators , Crane/Shovel		12.00	HR	B-EQOPRCRN	1.00	523	0	0	0	0	523	43.57

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
MAP	PM	CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	12.00	HR	C75GV002	1.00	0	458	0	0	0	458	38.16
TOTAL		Remove Existing	1.00	EA			2,349	458	0	0	0	2,807	2806.63
		11 02 02 1 05 2. Rehab Gate											
		Manufacturers Rep/Erection Engineer is considered for field assistance.											
USR	ME	Rehab 48" Gate w / New Manual Operator	1.00	EA		0.00	0	0	0	0	5,108	5,108	5107.96
USR	ME	Erection Enginee r	1.00	LS		0.00	950	0	0	0	0	950	950.32
MIL	ME	Painters, Struct ural Steel	20.00	HR	B-PAINTSS	1.00	942	0	0	0	0	942	47.10
TOTAL		Rehab Gate	1.00	EA			1,892	0	0	0	5,108	7,000	7000.31
		11 02 02 1 05 3. Install/Test Rehabbed Gate											
MIL	PM	Steam/Pipefitter s Foreman	24.00	HR	B-STM/PIPE	1.00	937	0	0	0	0	937	39.03
MIL	PM	Steam/Pipefitter s	20.00	HR	B-STM/PIPE	1.00	761	0	0	0	0	761	38.03
MIL	PM	Laborers, (Semi- Skilled)	20.00	HR	B-LABORER	1.00	741	0	0	0	0	741	37.06
MIL	PM	Equip. Operators , Crane/Shovel	16.00	HR	B-EQOPRCRN	1.00	697	0	0	0	0	697	43.57
MAP	PM	CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	16.00	HR	C75GV002	1.00	0	611	0	0	0	611	38.16
MIL	PM	Outside Truck Dr ivers, Heavy	4.00	HR	X-TRKDVRHV	1.00	152	0	0	0	0	152	37.92
MAP	PM	FLATBED, 8'x 16. 0', W/SIDE RACKS (ADD TRUCK)	4.00	HR	T40KF016	1.00	0	3	0	0	0	3	0.84
EP	PM	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	4.00	HR	T50FO006	1.00	0	57	0	0	0	57	14.36
TOTAL		Install/Test Reh	1.00	EA			3,287	671	0	0	0	3,959	3958.59
TOTAL		Gates					7,528	1,129	0	0	5,108	13,766	
TOTAL		GW-6, 48" Drain					25,913	5,315	7,896	0	31,108	70,232	

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
11 02 02 2. GW-7, 24" Drain (East Fork)												
11 02 02 2 01. Mob, Demob & Preparatory Work Use the following crew for to mobilize equipment to the jobsite. Assume the same time for demobilzation. Use 2hrs operating time for each way. (Mob.& Demob.) Crew - -------- Truck w/Lowboy Truck Driver Mechanics Truck Operator Laborer												
11 02 02 2 01 1. Mobilization and Demobilization Asume 8hrs to mobilize equipment. Use 1hr operating time for loading and 1hr operating time for unloading equipment. Assume the same for demobilization.												
	UPB	PM	AIR COMPR, 1,600 CFM, 100 PSI REF. EP 1110-1-8 1600 CFM QUIET, 100 PSI (ADD HOSE)	4.00	HR	A15XX017	1.00	0	183	0	0	0	183	45.70
	UPB	PM	GENERATOR, 5.5 KW, 120/240V,PORT REF. EP 1110-1-8 5.5 KW	4.00	HR	G10HO004	0.00	0	7	0	0	0	7	1.64
	MIL	PM	PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRASH	4.00	HR	P50HO005	1.00	0	12	0	0	0	12	2.94
	MAP	PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	4.00	HR	C75GV002	1.00	0	153	0	0	0	153	38.16
	MIL	PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	4.00	HR	L50CS003	0.00	0	68	0	0	0	68	17.00
	UPB	PM	WELDER, 300 AMP, SKID,ELEC DRIVE	4.00	HR	W35XX009	0.00	0	6	0	0	0	6	1.59
L	UPB	PM	TRK,HWY, 46,000 GVW, 6X4, 3 AXLE	16.00	HR	T50FO018	1.00	0	558	0	0	0	558	34.90
L	MIL	PM	TRLR,LOWBOY, 60T, 3 AXLE (ADD TOWING TRUCK)	16.00	HR	T45XX017	1.00	0	134	0	0	0	134	8.38
L	MIL	PM	TRK,HWY,10,000GVW,4X2, 1T-PICKUP	16.00	HR	T50FO005	1.00	0	126	0	0	0	126	7.88
	MIL	PM	Outside Truck Drivers, Heavy *	16.00	HR	X-TRKDVRHV	1.00	607	0	0	0	0	607	37.92
	MIL	PM	Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57

11 02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT	
MIL PM Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06	
TOTAL Mobilization and					1,897	1,247	0	0	0	3,143		
TOTAL Mob, Demob & Pre					1,897	1,247	0	0	0	3,143		
11 02 02 2 02. Care and Diversion of Water												
Care of water consists of the installation of temporary bulkheads. Assume small trash pump and operator for any required pumping. Operator is assumed to be on-site for 10 working days for the purpose of dewatering.												
11 02 02 2 02 1. Fabricate Bulkheads												
B MIL PM Fabricate Bulkheads	1.00	LS		0.00	0	0	2,500	0	0	2,500	2500.00	
TOTAL Fabricate Bulkhe					0	0	2,500	0	0	2,500		
11 02 02 2 02 2. Install Temporary Bulkheads												
MIL PM LDR,BH,WH, 1.00CY FE BKT, 24"DIP	16.00	HR	L50CS003	0.00	0	272	0	0	0	272	17.00	
MIL PM Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57	
MIL PM Outside Laborers, (Semi-Skilled)	32.00	HR	X-LABORER	1.00	1,186	0	0	0	0	1,186	37.06	
TOTAL Install Temporar	2.00	DAY			1,883	272	0	0	0	2,155	1077.53	
11 02 02 2 02 3. Remove Temporary Bulkheads												
MIL PM LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS003	0.00	0	136	0	0	0	136	17.00	
MIL PM Outside Equip. Operators, Heavy *	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57	
MIL PM Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06	
TOTAL Remove Temporary	1.00	DAY			942	136	0	0	0	1,078	1077.53	
11 02 02 2 02 4. Unwatering Pumps												
MIL PM Outside Equip. Operators, Heavy	80.00	HR	X-EQOPRHVY	1.00	3,485	0	0	0	0	3,485	43.57	

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT	
MIL PM	PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRA SH	80.00	HR	P50HO005	1.00	0	235	0	0	0	235	2.94	
UPB PM	TRK,HWY, 8,800GVW,4X4, 3/4T-PKUP REF. EP 1110-1-8 4X4 3/4-TON PICK-UP, 8800 GVW	80.00	HR	T50FO004	1.00	0	613	0	0	0	613	7.66	
TOTAL	Unwatering Pumps					3,485	848	0	0	0	4,333		
TOTAL	Care and Diversi					6,310	1,256	2,500	0	0	10,066		
	11 02 02 2 03. Sitework												
	11 02 02 2 03 1. Clearing, Grubbing and Stripping												
AF PM	Felling trees & piling, chipping, medium brush	1.20	ACR	CODFB7	0.22	1,223	504	0	0	0	1,727	1438.84	
TOTAL	Clearing, Grubbi	1.20	ACR			1,223	504	0	0	0	1,727	1438.84	
	11 02 02 2 03 2. Pavement Removal												
L MIL PM	Site dml, bituminous, pavement removal, roads, 3" thick	110.00	SY	CLADB38	50.00	408	184	0	0	0	592	5.38	
MIL PM	Excavate & load, hydr excavator, 2 CY, medium matl	9.20	CY	CODEB12C	130.00	6	4	0	0	0	10	1.08	
TOTAL	Pavement Removal	110.00	SY			413	188	0	0	0	602	5.47	
	11 02 02 2 03 3. Remove Crushed Stone												
USR PM	Remove Crushed Stone and Stockpile	80.00	TON	CODFB10P	36.00	123	157	0	0	0	279	3.49	
TOTAL	Remove Crushed S	80.00	TON			123	157	0	0	0	279	3.49	
	11 02 02 2 03 4. Excavation												
L MIL PM	Excavate & load, hydr excavator, 2 CY, medium matl	6540.00	CY	CODEB12C	150.00	3,471	2,659	0	0	0	6,130	0.94	

11	02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
L	MIL PM Hauling, hwy hau lers, 12 CY, 1 mi round trip @ 20 MPH (4.2 cyc/hr)	6540.00	CY	COEIB34B	50.40	4,920	5,037	0	0	0	9,957	1.52
	TOTAL Excavation	6540.00	CY			8,391	7,696	0	0	0	16,087	2.46
	11 02 02 2 03 5. Cofferdam											
L	MIL PM Excavate & load, hydr excavator, 2 CY, medium matl	1700.00	CY	CODEB12C	150.00	902	691	0	0	0	1,593	0.94
L	MIL PM Hauling, hwy hau lers, 12 CY, 1 mi round trip @ 20 MPH (4.2 cyc/hr)	1700.00	CY	COEIB34B	50.40	1,279	1,309	0	0	0	2,588	1.52
	MIL PM Spread & compact , 8" lift, embankment, 300 HP tractor	1700.00	CY	CODTB10C	312.50	300	367	0	0	0	667	0.39
	TOTAL Cofferdam	1700.00	CY			2,481	2,367	0	0	0	4,848	2.85
	11 02 02 2 03 6. Remove Existing Pipe											
	CIV PM Site dml, pipe r emoval, 24" dia, conc, water/sewer, no excavation	250.00	LF	CODLB6	15.00	1,843	212	0	0	0	2,055	8.22
	TOTAL Remove Existing	250.00	LF			1,843	212	0	0	0	2,055	8.22
	11 02 02 2 03 7. Install New RCP											
	MIL PM Backfill, sand b edding trenches, front-end loader, 1.5 CY	30.00	CY	CODFB10N	47.50	35	20	642	0	0	697	23.24
	MIL PM Piping, drainage & sewage, 24" dia, RCP, class 3, no gaskets	250.00	LF	CLABB14	12.50	4,455	254	4,583	0	0	9,292	37.17
	CIV PM Piping, drainage & sewage, RCP, precast end section, 24" dia	1.00	EA	CLABB14	2.50	89	5	268	0	0	362	361.70
	USR PM Concrete Cradle for Pipe	2.00	CY		0.00	0	0	0	0	600	600	300.00
	USR PM Connect Pipe to Existing Structure	1.00	EA		0.00	0	0	0	0	500	500	500.00
	TOTAL Install New RCP	250.00	LF			4,579	280	5,492	0	1,100	11,451	45.81

11 02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
11 02 02 2 03 8. Place and Compact Backfill											
L MIL PM Excavate & load, hydr excavator, 2 CY, medium matl	7800.00	CY	CODEB12C	150.00	4,139	3,171	0	0	0	7,311	0.94
L MIL PM Hauling, hwy haulers, 12 CY, 1 mi round trip @ 20 MPH (4.2 cyc/hr)	7800.00	CY	COEIB34B	50.40	5,868	6,008	0	0	0	11,876	1.52
L AF PM Fill, spread borrow w/dozer	7800.00	CY	CODTB10B	150.00	2,869	2,825	0	0	0	5,694	0.73
AF PM Compaction, ridging, 8" lifts, 2 passes, sheepsfoot/wobbly wheel roller	7800.00	CY	COFCB32F	600.00	1,451	998	0	0	0	2,448	0.31
TOTAL Place and Compac	7800.00	CY			14,327	13,002	0	0	0	27,329	3.50
11 02 02 2 03 9. Crushed Stone Surfacing											
B MIL PM Base course, 3/4 " maximum size, 3" deep, crushed stone, large areas	50.00	CY	COFGB36B	75.00	198	136	488	0	0	821	16.42
TOTAL Crushed Stone Su	80.00	TON			198	136	488	0	0	821	10.26
11 02 02 2 03 10. Bituminous Road Repair											
MIL PM Surface treatment, prime coat, bituminous, 0.28 gal/SY	9.90	CSF	COKBB45	300.00	2	2	32	0	0	36	3.66
MIL PM Asphaltic conc pavement, highway, wearing course, 3" thick	14.00	TON	COKCB25B	100.00	62	23	406	0	0	491	35.07
TOTAL Bitumineous Road	110.00	SY			65	24	438	0	0	527	4.79
11 02 02 2 03 11. Establishment of Turf											
MIL PM Seeding, athletic field mix, mechanical seeding, 450#/acre	1.20	ACR	COELB66	0.24	186	80	659	0	0	925	771.05
AF PM Seeding, apply fertilizer, 1# nitrogen/MSF, spray from truck	1.20	MSF	COFWB59	35.00	1	2	6	0	0	9	7.46
TOTAL Establishment of	1.20	ACR			187	81	666	0	0	934	778.50

	11 02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL	Sitework					33,830	24,648	7,083	0	1,100	66,660	
	11 02 02 2 04. Drainage Structure											
	11 02 02 2 04 1. Replace Handrail											
B CIV PM	Remove Existing Handrail handrail	70.00	LF	SIWSSSWK2	8.00	811	0	0	0	0	811	11.58
CIV PM	Castings fibergl ass, 2" dia rails pickets 5' OC, 42" high, handrail	70.00	LF	SIWSSSWK2	4.00	1,622	0	2,954	0	0	4,576	65.37
TOTAL	Replace Handrail					2,433	0	2,954	0	0	5,387	
	11 02 02 2 04 2. Replace Grating											
B CIV PM	Remove Grating	20.00	SF	SIWSSSWK2	40.00	46	0	0	0	0	46	2.32
CIV PM	Grating fbgls, m olded, 2" T, 2" sq mesh, grn (mod crsv env)	20.00	SF	SIWSSSWK2	40.00	46	0	410	0	0	457	22.84
TOTAL	Replace Grating					93	0	410	0	0	503	
	11 02 02 2 04 3. Replace Ladders											
B MIL PM	Remove Ladders	10.00	VLF	SIWSE4	12.50	149	4	0	0	0	153	15.31
MIL PM	Ladder, 20" wide , bolted to conc, w/safety equip	10.00	VLF	SIWSE4	6.25	298	8	532	0	0	838	83.81
TOTAL	Replace Ladders					447	12	532	0	0	991	
TOTAL	Drainage Structu					2,973	12	3,896	0	0	6,881	
	11 02 02 2 05. Gates											
	11 02 02 2 05 1. Remove Existing Gate											
MIL PM	Steam/Pipefitter s Foreman	12.00	HR	B-STM/PIPE	1.00	468	0	0	0	0	468	39.03
MIL PM	Steam/Pipefitter s	12.00	HR	B-STM/PIPE	1.00	456	0	0	0	0	456	38.03
MIL PM	Laborers, (Semi- Skilled)	12.00	HR	B-LABORER	1.00	445	0	0	0	0	445	37.06
MIL PM	Equip. Operators , Crane/Shovel	8.00	HR	B-EQOPRCRN	1.00	349	0	0	0	0	349	43.57
MAP PM	CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16

11 02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL Remove Existing	1.00	EA			1,718	305	0	0	0	2,023	2023.24
11 02 02 2 05 2. Rehab Gate											
Manufacturers Rep/Erection Engineer is considered for field assistance.											
USR ME Rehab 24" Gate w / New Manual Operator	1.00	EA		0.00	0	0	0	0	3,564	3,564	3563.69
USR ME Erection Enginee r	1.00	LS		0.00	950	0	0	0	0	950	950.32
MIL ME Painters, Struct ural Steel	12.00	HR	B-PAINTSS	1.00	565	0	0	0	0	565	47.10
TOTAL Rehab Gate	1.00	EA			1,516	0	0	0	3,564	5,079	5079.23
11 02 02 2 05 3. Install/Test Rehabbed Gate											
MIL PM Steam/Pipefitter s Foreman	20.00	HR	B-STM/PIPE	1.00	781	0	0	0	0	781	39.03
MIL PM Steam/Pipefitter s	16.00	HR	B-STM/PIPE	1.00	608	0	0	0	0	608	38.03
MIL PM Laborers, (Semi- Skilled)	16.00	HR	B-LABORER	1.00	593	0	0	0	0	593	37.06
MIL PM Equip. Operators , Crane/Shovel	8.00	HR	B-EQOPRCRN	1.00	349	0	0	0	0	349	43.57
MAP PM CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16
MIL PM Outside Truck Dr ivers, Heavy	4.00	HR	X-TRKDVRHV	1.00	152	0	0	0	0	152	37.92
MAP PM FLATBED, 8'x 16. 0', W/SIDE RACKS (ADD TRUCK)	4.00	HR	T40KF016	1.00	0	3	0	0	0	3	0.84
EP PM TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	4.00	HR	T50FO006	1.00	0	57	0	0	0	57	14.36
TOTAL Install/Test Reh	1.00	EA			2,482	366	0	0	0	2,848	2848.28
TOTAL Gates					5,716	671	0	0	3,564	9,951	
TOTAL GW-7, 24" Drain					50,725	27,834	13,480	0	4,664	96,701	

11 02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
11 02 02 3. GW-8, 36" Drain (East Fork)											
11 02 02 3 01. Mob, Demob & Preparatory Work Use the following crew for to mobilize equipment to the jobsite. Assume the same time for demobilzation. Use 2hrs operating time for each way. (Mob.& Demob.) Crew - -------- Truck w/Lowboy — Truck Driver Mechanics Truck — Operator Laborer											
11 02 02 3 01 1. Mobilization and Demobilization Asume 8hrs to mobilize equipment. Use 1hr operating time for loading and 1hr operating time for unloading equipment. Assume the same for demobilization.											
UPB PM AIR COMPR, 1,600 CFM, 100 PSI REF. EP 1110-1-8 1600 CFM QUIET, 100 PSI (ADD HOSE)	4.00	HR	A15XX017	1.00	0	183	0	0	0	183	45.70
UPB PM GENERATOR, 5.5 KW, 120/240V,PORT REF. EP 1110-1-8 5.5 KW	4.00	HR	G10HO004	0.00	0	7	0	0	0	7	1.64
MIL PM PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRASH	4.00	HR	P50HO005	1.00	0	12	0	0	0	12	2.94
MAP PM CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	4.00	HR	C75GV002	1.00	0	153	0	0	0	153	38.16
MIL PM LDR,BH,WH, 1.00CY FE BKT, 24"DIP	4.00	HR	L50CS003	0.00	0	68	0	0	0	68	17.00
UPB PM WELDER, 300 AMP, SKID,ELEC DRIVE	4.00	HR	W35XX009	0.00	0	6	0	0	0	6	1.59
L UPB PM TRK,HWY, 46,000 GVW, 6X4, 3 AXLE	16.00	HR	T50FO018	1.00	0	558	0	0	0	558	34.90
L MIL PM TRLR,LOWBOY, 60T, 3 AXLE (ADD TOWING TRUCK)	16.00	HR	T45XX017	1.00	0	134	0	0	0	134	8.38
L MIL PM TRK,HWY,10,000GVW,4X2, 1T-PICKUP	16.00	HR	T50FO005	1.00	0	126	0	0	0	126	7.88
MIL PM Outside Truck Drivers, Heavy *	16.00	HR	X-TRKDVRHV	1.00	607	0	0	0	0	607	37.92
MIL PM Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57

11 02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
MIL PM Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL Mobilization and					1,897	1,247	0	0	0	3,143	
TOTAL Mob, Demob & Pre					1,897	1,247	0	0	0	3,143	

11 02 02 3 02. Care and Diversion of Water

Care of water consists of the installation of temporary bulkheads. Assume small trash pump and operator for any required pumping. Operator is assumed to be on-site for 10 working days for the purpose of dewatering.

11 02 02 3 02 1. Fabricate Bulkheads

B MIL PM Fabricate Bulkheads	1.00	LS		0.00	0	0	2,500	0	0	2,500	2500.00
TOTAL Fabricate Bulkhe					0	0	2,500	0	0	2,500	

11 02 02 3 02 2. Install Temporary Bulkheads

MIL PM LDR,BH,WH, 1.00CY FE BKT, 24"DIP	16.00	HR	L50CS003	0.00	0	272	0	0	0	272	17.00
MIL PM Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57
MIL PM Outside Laborers, (Semi-Skilled)	32.00	HR	X-LABORER	1.00	1,186	0	0	0	0	1,186	37.06
TOTAL Install Temporar	2.00	DAY			1,883	272	0	0	0	2,155	1077.53

11 02 02 3 02 3. Remove Temporary Bulkheads

MIL PM LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS003	0.00	0	136	0	0	0	136	17.00
MIL PM Outside Equip. Operators, Heavy *	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL PM Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL Remove Temporary	1.00	DAY			942	136	0	0	0	1,078	1077.53

11 02 02 3 02 4. Unwatering Pumps

MIL PM Outside Equip. Operators, Heavy	80.00	HR	X-EQOPRHVY	1.00	3,485	0	0	0	0	3,485	43.57

		11 02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
MIL	PM	PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRA SH	80.00	HR	P50HO005	1.00	0	235	0	0	0	235	2.94
UPB	PM	TRK,HWY, 8,800GVW,4X4, 3/4T-PKUP REF. EP 1110-1-8 4X4 3/4-TON PICK-UP, 8800 GVW	80.00	HR	T50FO004	1.00	0	613	0	0	0	613	7.66
TOTAL		Unwatering Pumps					3,485	848	0	0	0	4,333	
TOTAL		Care and Diversi					6,310	1,256	2,500	0	0	10,066	
		11 02 02 3 03. Sitework											
		11 02 02 3 03 1. Site Preparation											
EP	PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS005	1.00	0	134	0	0	0	134	16.71
MIL	PM	Outside Equip. Operators, Heavy	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL	PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL		Site Preparation					942	134	0	0	0	1,075	
		11 02 02 3 03 2. Line Existing Pipe w/ HDPE Pipe There are 2-pipes to be lined at this location (quantities are multiplied by two)											
USR	PM	HDPE Liner	250.00	LF		0.00	0	0	0	0	25,000	25,000	100.00
B CIV	PM	Grouting, pressure, place grout between pipes	500.00	CF	XXQEB47B	17.50	5,323	1,403	1,500	0	0	8,226	16.45
TOTAL		Line Existing Pi					5,323	1,403	1,500	0	25,000	33,226	
		11 02 02 3 03 3. Site Restoration											
EP	PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS005	1.00	0	134	0	0	0	134	16.71
MIL	PM	Outside Equip. Operators, Heavy	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL	PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
USR	PM	Seeding	1.00	ACR		0.00	0	0	0	0	1,000	1,000	1000.00
TOTAL		Site Restoration					942	134	0	0	1,000	2,075	

			QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
11 02. Gravity Drainage St													
TOTAL	Sitework						7,206	1,671	1,500	0	26,000	36,377	
	11 02 02 3 04. Drainage Structure												
	11 02 02 3 04 1. Replace Handrail												
B CIV PM	Remove Existing Handrail handrail		70.00	LF	SIWSSSWK2	8.00	811	0	0	0	0	811	11.58
CIV PM	Castings fibergl ass, 2" dia rails pickets 5' OC, 42" high, handrail		70.00	LF	SIWSSSWK2	4.00	1,622	0	2,954	0	0	4,576	65.37
TOTAL	Replace Handrail						2,433	0	2,954	0	0	5,387	
	11 02 02 3 04 2. Replace Grating												
B CIV PM	Remove Grating		20.00	SF	SIWSSSWK2	40.00	46	0	0	0	0	46	2.32
CIV PM	Grating fbgls, m olded, 2" T, 2" sq mesh, grn (mod crsv env)		20.00	SF	SIWSSSWK2	40.00	46	0	410	0	0	457	22.84
TOTAL	Replace Grating						93	0	410	0	0	503	
	11 02 02 3 04 3. Replace Ladders												
B MIL PM	Remove Ladders		10.00	VLF	SIWSE4	12.50	149	4	0	0	0	153	15.31
MIL PM	Ladder, 20" wide , bolted to conc, w/safety equip		10.00	VLF	SIWSE4	6.25	298	8	532	0	0	838	83.81
TOTAL	Replace Ladders						447	12	532	0	0	991	
TOTAL	Drainage Structu						2,973	12	3,896	0	0	6,881	
	11 02 02 3 05. Gates												
	11 02 02 3 05 1. Remove Existing Gate												
MIL PM	Steam/Pipefitter s Foreman		12.00	HR	B-STM/PIPE	1.00	468	0	0	0	0	468	39.03
MIL PM	Steam/Pipefitter s		12.00	HR	B-STM/PIPE	1.00	456	0	0	0	0	456	38.03
MIL PM	Laborers, (Semi- Skilled)		12.00	HR	B-LABORER	1.00	445	0	0	0	0	445	37.06
MIL PM	Equip. Operators , Crane/Shovel		8.00	HR	B-EQOPRCRN	1.00	349	0	0	0	0	349	43.57
MAP PM	CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM		8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL	Remove Existing	1.00	EA			1,718	305	0	0	0	2,023	2023.24
	11 02 02 3 05 2. Rehab Gate											
	Manufacturers Rep/Erection Engineer is considered for field assistance.											
USR ME	Rehab 36" Gate w / New Manual Operator	1.00	EA		0.00	0	0	0	0	4,039	4,039	4038.85
USR ME	Erection Enginee r	1.00	LS		0.00	950	0	0	0	0	950	950.32
MIL ME	Painters, Struct ural Steel	16.00	HR	B-PAINTSS	1.00	754	0	0	0	0	754	47.10
TOTAL	Rehab Gate	1.00	EA			1,704	0	0	0	4,039	5,743	5742.79
	11 02 02 3 05 3. Install/Test Rehabbed Gate											
MIL PM	Steam/Pipefitter s Foreman	20.00	HR	B-STM/PIPE	1.00	781	0	0	0	0	781	39.03
MIL PM	Steam/Pipefitter s	16.00	HR	B-STM/PIPE	1.00	608	0	0	0	0	608	38.03
MIL PM	Laborers, (Semi- Skilled)	16.00	HR	B-LABORER	1.00	593	0	0	0	0	593	37.06
MIL PM	Equip. Operators , Crane/Shovel	12.00	HR	B-EQOPRCRN	1.00	523	0	0	0	0	523	43.57
MAP PM	CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	12.00	HR	C75GV002	1.00	0	458	0	0	0	458	38.16
MIL PM	Outside Truck Dr ivers, Heavy	4.00	HR	X-TRKDVRHV	1.00	152	0	0	0	0	152	37.92
MAP PM	FLATBED, 8'x 16. 0', W/SIDE RACKS (ADD TRUCK)	4.00	HR	T40KF016	1.00	0	3	0	0	0	3	0.84
EP PM	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	4.00	HR	T50FO006	1.00	0	57	0	0	0	57	14.36
TOTAL	Install/Test Reh	1.00	EA			2,656	519	0	0	0	3,175	3175.20
TOTAL	Gates					6,078	824	0	0	4,039	10,941	
TOTAL	GW-8, 36" Drain					24,464	5,009	7,896	0	30,039	67,408	

11 02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
11 02 02 4. GW-9, 24" Drain (East Fork)											
11 02 02 4 01. Mob, Demob & Preparatory Work Use the following crew for to mobilize equipment to the jobsite. Assume the same time for demobilzation. Use 2hrs operating time for each way. (Mob.& Demob.) Crew - -------- Truck w/Lowboy — Truck Driver Mechanics Truck — Operator Laborer											
11 02 02 4 01 1. Mobilization and Demobilization Asume 8hrs to mobilize equipment. Use 1hr operating time for loading and 1hr operating time for unloading equipment. Assume the same for demobilization.											
UPB PM AIR COMPR, 1,600 CFM, 100 PSI REF. EP 1110-1-8 1600 CFM QUIET, 100 PSI (ADD HOSE)	4.00	HR	A15XX017	1.00	0	183	0	0	0	183	45.70
UPB PM GENERATOR, 5.5 KW, 120/240V,PORT REF. EP 1110-1-8 5.5 KW	4.00	HR	G10HO004	0.00	0	7	0	0	0	7	1.64
MIL PM PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRASH	4.00	HR	P50HO005	1.00	0	12	0	0	0	12	2.94
MAP PM CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	4.00	HR	C75GV002	1.00	0	153	0	0	0	153	38.16
MIL PM LDR,BH,WH, 1.00CY FE BKT, 24"DIP	4.00	HR	L50CS003	0.00	0	68	0	0	0	68	17.00
UPB PM WELDER, 300 AMP, SKID,ELEC DRIVE	4.00	HR	W35XX009	0.00	0	6	0	0	0	6	1.59
L UPB PM TRK,HWY, 46,000 GVW, 6X4, 3 AXLE	16.00	HR	T50FO018	1.00	0	558	0	0	0	558	34.90
L MIL PM TRLR,LOWBOY, 60T, 3 AXLE (ADD TOWING TRUCK)	16.00	HR	T45XX017	1.00	0	134	0	0	0	134	8.38
L MIL PM TRK,HWY,10,000GVW,4X2, 1T-PICKUP	16.00	HR	T50FO005	1.00	0	126	0	0	0	126	7.88
MIL PM Outside Truck Drivers, Heavy *	16.00	HR	X-TRKDVRHV	1.00	607	0	0	0	0	607	37.92
MIL PM Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL	Mobilization and					1,897	1,247	0	0	0	3,143	
TOTAL	Mob, Demob & Pre					1,897	1,247	0	0	0	3,143	

11 02 02 4 02. Care and Diversion of Water

Care of water consists of the installation of temporary bulkheads. Assume small trash pump and operator for any required pumping. Operator is assumed to be on-site for 10 working days for the purpose of dewatering.

11 02 02 4 02 1. Fabricate Bulkheads

B MIL PM	Fabricate Bulkheads	1.00	LS		0.00	0	0	2,500	0	0	2,500	2500.00
TOTAL	Fabricate Bulkhe					0	0	2,500	0	0	2,500	

11 02 02 4 02 2. Install Temporary Bulkheads

MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	16.00	HR	L50CS003	0.00	0	272	0	0	0	272	17.00
MIL PM	Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57
MIL PM	Outside Laborers, (Semi-Skilled)	32.00	HR	X-LABORER	1.00	1,186	0	0	0	0	1,186	37.06
TOTAL	Install Temporar	2.00	DAY			1,883	272	0	0	0	2,155	1077.53

11 02 02 4 02 3. Remove Temporary Bulkheads

MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS003	0.00	0	136	0	0	0	136	17.00
MIL PM	Outside Equip. Operators, Heavy *	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL	Remove Temporary	1.00	DAY			942	136	0	0	0	1,078	1077.53

11 02 02 4 02 4. Unwatering Pumps

MIL PM	Outside Equip. Operators, Heavy	80.00	HR	X-EQOPRHVY	1.00	3,485	0	0	0	0	3,485	43.57

11	02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT	
MIL	PM PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRA SH	80.00	HR	P50HO005	1.00	0	235	0	0	0	235	2.94	
UPB	PM TRK,HWY, 8,800GVW,4X4, 3/4T-PKUP REF. EP 1110-1-8 4X4 3/4-TON PICK-UP, 8800 GVW	80.00	HR	T50FO004	1.00	0	613	0	0	0	613	7.66	
TOTAL	Unwatering Pumps					3,485	848	0	0	0	4,333		
TOTAL	Care and Diversi					6,310	1,256	2,500	0	0	10,066		
	11 02 02 4 03. Sitework												
	11 02 02 4 03 1. Clearing, Grubbing and Stripping												
AF	PM Felling trees & piling, chipping, medium brush	1.20	ACR	CODFB7	0.22	1,223	504	0	0	0	1,727	1438.84	
TOTAL	Clearing, Grubbi	1.20	ACR			1,223	504	0	0	0	1,727	1438.84	
	11 02 02 4 03 2. Pavement Removal												
L MIL	PM Site dml, bituminous, pavement removal, roads, 3" thick	110.00	SY	CLADB38	50.00	408	184	0	0	0	592	5.38	
MIL	PM Excavate & load, hydr excavator, 2 CY, medium matl	9.20	CY	CODEB12C	130.00	6	4	0	0	0	10	1.08	
TOTAL	Pavement Removal	110.00	SY			413	188	0	0	0	602	5.47	
	11 02 02 4 03 3. Remove Crushed Stone												
USR	PM Remove Crushed Stone and Stockpile	80.00	TON	CODFB10P	36.00	123	157	0	0	0	279	3.49	
TOTAL	Remove Crushed S	80.00	TON			123	157	0	0	0	279	3.49	
	11 02 02 4 03 4. Excavation												
L MIL	PM Excavate & load, hydr excavator, 2 CY, medium matl	6540.00	CY	CODEB12C	150.00	3,471	2,659	0	0	0	6,130	0.94	

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
L	MIL PM	Hauling, hwy haulers, 12 CY, 1 mi round trip @ 20 MPH (4.2 cyc/hr)	6540.00	CY	COEIB34B	50.40	4,920	5,037	0	0	0	9,957	1.52
	TOTAL	Excavation	6540.00	CY			8,391	7,696	0	0	0	16,087	2.46
		11 02 02 4 03 5. Cofferdam											
L	MIL PM	Excavate & load, hydr excavator, 2 CY, medium matl	1700.00	CY	CODEB12C	150.00	902	691	0	0	0	1,593	0.94
L	MIL PM	Hauling, hwy haulers, 12 CY, 1 mi round trip @ 20 MPH (4.2 cyc/hr)	1700.00	CY	COEIB34B	50.40	1,279	1,309	0	0	0	2,588	1.52
	MIL PM	Spread & compact, 8" lift, embankment, 300 HP tractor	1700.00	CY	CODTB10C	312.50	300	367	0	0	0	667	0.39
	TOTAL	Cofferdam	1700.00	CY			2,481	2,367	0	0	0	4,848	2.85
		11 02 02 4 03 6. Remove Existing Pipe											
	CIV PM	Site dml, pipe removal, 24" dia, conc, water/sewer, no excavation	250.00	LF	CODLB6	15.00	1,843	212	0	0	0	2,055	8.22
	TOTAL	Remove Existing	250.00	LF			1,843	212	0	0	0	2,055	8.22
		11 02 02 4 03 7. Install New RCP											
	MIL PM	Backfill, sand bedding trenches, front-end loader, 1.5 CY	30.00	CY	CODFB10N	47.50	35	20	642	0	0	697	23.24
	MIL PM	Piping, drainage & sewage, 24" dia, RCP, class 3, no gaskets	250.00	LF	CLABB14	12.50	4,455	254	4,583	0	0	9,292	37.17
	CIV PM	Piping, drainage & sewage, RCP, precast end section, 24" dia	1.00	EA	CLABB14	2.50	89	5	268	0	0	362	361.70
	USR PM	Concrete Cradle for Pipe	2.00	CY		0.00	0	0	0	0	600	600	300.00
	USR PM	Connect Pipe to Existing Structure	1.00	EA		0.00	0	0	0	0	500	500	500.00
	TOTAL	Install New RCP	250.00	LF			4,579	280	5,492	0	1,100	11,451	45.81

11 02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
11 02 02 4 03 8. Place and Compact Backfill											
L MIL PM Excavate & load, hydr excavator, 2 CY, medium matl	7800.00	CY	CODEB12C	150.00	4,139	3,171	0	0	0	7,311	0.94
L MIL PM Hauling, hwy haulers, 12 CY, 1 mi round trip @ 20 MPH (4.2 cyc/hr)	7800.00	CY	COEIB34B	50.40	5,868	6,008	0	0	0	11,876	1.52
L AF PM Fill, spread borrow w/dozer	7800.00	CY	CODTB10B	150.00	2,869	2,825	0	0	0	5,694	0.73
AF PM Compaction, ridi ng, 8" lifts, 2 passes, sheepsfoot/wobbly wheel roller	7800.00	CY	COFCB32F	600.00	1,451	998	0	0	0	2,448	0.31
TOTAL Place and Compac	7800.00	CY			14,327	13,002	0	0	0	27,329	3.50
11 02 02 4 03 9. Crushed Stone Surfacing											
B MIL PM Base course, 3/4 " maximum size, 3" deep, crushed stone, large areas	50.00	CY	COFGB36B	75.00	198	136	488	0	0	821	16.42
TOTAL Crushed Stone Su	80.00	TON			198	136	488	0	0	821	10.26
11 02 02 4 03 10. Bituminous Road Repair											
MIL PM Surface treatmen t, prime coat, bituminous, 0.28 gal/SY	9.90	CSF	COKBB45	300.00	2	2	32	0	0	36	3.66
MIL PM Asphaltic conc p avement, highway, wearing course, 3" thick	14.00	TON	COKCB25B	100.00	62	23	406	0	0	491	35.07
TOTAL Bitumineous Road	110.00	SY			65	24	438	0	0	527	4.79
11 02 02 4 03 11. Establishment of Turf											
MIL PM Seeding, athleti c field mix, mechanical seeding, 450#/acre	1.20	ACR	COELB66	0.24	186	80	659	0	0	925	771.05
AF PM Seeding, apply f ertilizer, 1# nitrogen/MSF, spray from truck	1.20	MSF	COFWB59	35.00	1	2	6	0	0	9	7.46
TOTAL Establishment of	1.20	ACR			187	81	666	0	0	934	778.50

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL	Sitework					33,830	24,648	7,083	0	1,100	66,660	
	11 02 02 4 04. Drainage Structure											
	11 02 02 4 04 1. Replace Handrail											
B CIV PM	Remove Existing Handrail handrail	70.00	LF	SIWSSSWK2	8.00	811	0	0	0	0	811	11.58
CIV PM	Castings fibergl ass, 2" dia rails pickets 5' OC, 42" high, handrail	70.00	LF	SIWSSSWK2	4.00	1,622	0	2,954	0	0	4,576	65.37
TOTAL	Replace Handrail					2,433	0	2,954	0	0	5,387	
	11 02 02 4 04 2. Replace Grating											
B CIV PM	Remove Grating	20.00	SF	SIWSSSWK2	40.00	46	0	0	0	0	46	2.32
CIV PM	Grating fbgls, m olded, 2" T, 2" sq mesh, grn (mod crsv env)	20.00	SF	SIWSSSWK2	40.00	46	0	410	0	0	457	22.84
TOTAL	Replace Grating					93	0	410	0	0	503	
	11 02 02 4 04 3. Replace Ladders											
B MIL PM	Remove Ladders	10.00	VLF	SIWSE4	12.50	149	4	0	0	0	153	15.31
MIL PM	Ladder, 20" wide , bolted to conc, w/safety equip	10.00	VLF	SIWSE4	6.25	298	8	532	0	0	838	83.81
TOTAL	Replace Ladders					447	12	532	0	0	991	
TOTAL	Drainage Structu					2,973	12	3,896	0	0	6,881	
	11 02 02 4 05. Gates											
	11 02 02 4 05 1. Remove Existing Gate											
MIL PM	Steam/Pipefitter s Foreman	12.00	HR	B-STM/PIPE	1.00	468	0	0	0	0	468	39.03
MIL PM	Steam/Pipefitter s	12.00	HR	B-STM/PIPE	1.00	456	0	0	0	0	456	38.03
MIL PM	Laborers, (Semi- Skilled)	12.00	HR	B-LABORER	1.00	445	0	0	0	0	445	37.06
MIL PM	Equip. Operators , Crane/Shovel	8.00	HR	B-EQOPRCRN	1.00	349	0	0	0	0	349	43.57
MAP PM	CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16

11 02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL Remove Existing	1.00	EA			1,718	305	0	0	0	2,023	2023.24
11 02 02 4 05 2. Rehab Gate											
Manufacturers Rep/Erection Engineer is considered for field assistance.											
USR ME Rehab 24" Gate w / New Manual Operator	1.00	EA		0.00	0	0	0	0	3,564	3,564	3563.69
USR ME Erection Enginee r	1.00	LS		0.00	950	0	0	0	0	950	950.32
MIL ME Painters, Struct ural Steel	12.00	HR	B-PAINTSS	1.00	565	0	0	0	0	565	47.10
TOTAL Rehab Gate	1.00	EA			1,516	0	0	0	3,564	5,079	5079.23
11 02 02 4 05 3. Install/Test Rehabbed Gate											
MIL PM Steam/Pipefitter s Foreman	20.00	HR	B-STM/PIPE	1.00	781	0	0	0	0	781	39.03
MIL PM Steam/Pipefitter s	16.00	HR	B-STM/PIPE	1.00	608	0	0	0	0	608	38.03
MIL PM Laborers, (Semi- Skilled)	16.00	HR	B-LABORER	1.00	593	0	0	0	0	593	37.06
MIL PM Equip. Operators , Crane/Shovel	8.00	HR	B-EQOPRCRN	1.00	349	0	0	0	0	349	43.57
MAP PM CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16
MIL PM Outside Truck Dr ivers, Heavy	4.00	HR	X-TRKDVRHV	1.00	152	0	0	0	0	152	37.92
MAP PM FLATBED, 8'x 16. 0', W/SIDE RACKS (ADD TRUCK)	4.00	HR	T40KF016	1.00	0	3	0	0	0	3	0.84
EP PM TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	4.00	HR	T50FO006	1.00	0	57	0	0	0	57	14.36
TOTAL Install/Test Reh	1.00	EA			2,482	366	0	0	0	2,848	2848.28
TOTAL Gates					5,716	671	0	0	3,564	9,951	
TOTAL GW-9, 24" Drain					50,725	27,834	13,480	0	4,664	96,701	

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
11 02 02 5. GW-10, 42" Drain (East Fork)												
11 02 02 5 01. Mob, Demob & Preparatory Work Use the following crew for to mobilize equipment to the jobsite. Assume the same time for demobilzation. Use 2hrs operating time for each way. (Mob.& Demob.) Crew - -------- Truck w/Lowboy Truck Driver Mechanics Truck Operator Laborer												
11 02 02 5 01 1. Mobilization and Demobilization Asume 8hrs to mobilize equipment. Use 1hr operating time for loading and 1hr operating time for unloading equipment. Assume the same for demobilization.												
	UPB	PM	AIR COMPR, 1,600 CFM, 100 PSI REF. EP 1110-1-8 1600 CFM QUIET, 100 PSI (ADD HOSE)	4.00	HR	A15XX017	1.00	0	183	0	0	0	183	45.70
	UPB	PM	GENERATOR, 5.5 KW, 120/240V,PORT REF. EP 1110-1-8 5.5 KW	4.00	HR	G10HO004	0.00	0	7	0	0	0	7	1.64
	MIL	PM	PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRASH	4.00	HR	P50HO005	1.00	0	12	0	0	0	12	2.94
	MAP	PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	4.00	HR	C75GV002	1.00	0	153	0	0	0	153	38.16
	MIL	PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	4.00	HR	L50CS003	0.00	0	68	0	0	0	68	17.00
	UPB	PM	WELDER, 300 AMP, SKID,ELEC DRIVE	4.00	HR	W35XX009	0.00	0	6	0	0	0	6	1.59
L	UPB	PM	TRK,HWY, 46,000 GVW, 6X4, 3 AXLE	16.00	HR	T50FO018	1.00	0	558	0	0	0	558	34.90
L	MIL	PM	TRLR,LOWBOY, 60T, 3 AXLE (ADD TOWING TRUCK)	16.00	HR	T45XX017	1.00	0	134	0	0	0	134	8.38
L	MIL	PM	TRK,HWY,10,000GVW,4X2, 1T-PICKUP	16.00	HR	T50FO005	1.00	0	126	0	0	0	126	7.88
	MIL	PM	Outside Truck Drivers, Heavy *	16.00	HR	X-TRKDVRHV	1.00	607	0	0	0	0	607	37.92
	MIL	PM	Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57

	11 02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL	Mobilization and					1,897	1,247	0	0	0	3,143	
TOTAL	Mob, Demob & Pre					1,897	1,247	0	0	0	3,143	

11 02 02 5 02. Care and Diversion of Water

Care of water consists of the installation of temporary bulkheads. Assume small trash pump and operator for any required pumping. Operator is assumed to be on-site for 10 working days for the purpose of dewatering.

11 02 02 5 02 1. Fabricate Bulkheads

B MIL PM	Fabricate Bulkheads	1.00	LS		0.00	0	0	2,500	0	0	2,500	2500.00
TOTAL	Fabricate Bulkhe					0	0	2,500	0	0	2,500	

11 02 02 5 02 2. Install Temporary Bulkheads

MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	16.00	HR	L50CS003	0.00	0	272	0	0	0	272	17.00
MIL PM	Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57
MIL PM	Outside Laborers, (Semi-Skilled)	32.00	HR	X-LABORER	1.00	1,186	0	0	0	0	1,186	37.06
TOTAL	Install Temporar	2.00	DAY			1,883	272	0	0	0	2,155	1077.53

11 02 02 5 02 3. Remove Temporary Bulkheads

MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS003	0.00	0	136	0	0	0	136	17.00
MIL PM	Outside Equip. Operators, Heavy *	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL	Remove Temporary	1.00	DAY			942	136	0	0	0	1,078	1077.53

11 02 02 5 02 4. Unwatering Pumps

MIL PM	Outside Equip. Operators, Heavy	80.00	HR	X-EQOPRHVY	1.00	3,485	0	0	0	0	3,485	43.57

		11 02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
MIL	PM	PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRA SH	80.00	HR	P50HO005	1.00	0	235	0	0	0	235	2.94
UPB	PM	TRK,HWY, 8,800GVW,4X4, 3/4T-PKUP REF. EP 1110-1-8 4X4 3/4-TON PICK-UP, 8800 GVW	80.00	HR	T50FO004	1.00	0	613	0	0	0	613	7.66
TOTAL		Unwatering Pumps					3,485	848	0	0	0	4,333	
TOTAL		Care and Diversi					6,310	1,256	2,500	0	0	10,066	
		11 02 02 5 03. Sitework											
		11 02 02 5 03 1. Site Preparation											
EP	PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS005	1.00	0	134	0	0	0	134	16.71
MIL	PM	Outside Equip. Operators, Heavy	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL	PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL		Site Preparation					942	134	0	0	0	1,075	
		11 02 02 5 03 2. Line Existing Pipe w/ HDPE Pipe There are 2-pipes to be lined at this location (quantities are multiplied by two)											
USR	PM	HDPE Liner	250.00	LF		0.00	0	0	0	0	25,000	25,000	100.00
B CIV	PM	Grouting, pressure, place grout between pipes	500.00	CF	XXQEB47B	17.50	5,323	1,403	1,500	0	0	8,226	16.45
TOTAL		Line Existing Pi					5,323	1,403	1,500	0	25,000	33,226	
		11 02 02 5 03 3. Site Restoration											
EP	PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS005	1.00	0	134	0	0	0	134	16.71
MIL	PM	Outside Equip. Operators, Heavy	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL	PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
USR	PM	Seeding	1.00	ACR		0.00	0	0	0	0	1,000	1,000	1000.00
TOTAL		Site Restoration					942	134	0	0	1,000	2,075	

	11 02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL	Sitework					7,206	1,671	1,500	0	26,000	36,377	
	11 02 02 5 04. Drainage Structure											
	11 02 02 5 04 1. Replace Handrail											
B CIV PM	Remove Existing Handrail handrail	70.00	LF	SIWSSSWK2	8.00	811	0	0	0	0	811	11.58
CIV PM	Castings fibergl ass, 2" dia rails pickets 5' OC, 42" high, handrail	70.00	LF	SIWSSSWK2	4.00	1,622	0	2,954	0	0	4,576	65.37
TOTAL	Replace Handrail					2,433	0	2,954	0	0	5,387	
	11 02 02 5 04 2. Replace Grating											
B CIV PM	Remove Grating	20.00	SF	SIWSSSWK2	40.00	46	0	0	0	0	46	2.32
CIV PM	Grating fbgls, m olded, 2" T, 2" sq mesh, grn (mod crsv env)	20.00	SF	SIWSSSWK2	40.00	46	0	410	0	0	457	22.84
TOTAL	Replace Grating					93	0	410	0	0	503	
	11 02 02 5 04 3. Replace Ladders											
B MIL PM	Remove Ladders	10.00	VLF	SIWSE4	12.50	149	4	0	0	0	153	15.31
MIL PM	Ladder, 20" wide , bolted to conc, w/safety equip	10.00	VLF	SIWSE4	6.25	298	8	532	0	0	838	83.81
TOTAL	Replace Ladders					447	12	532	0	0	991	
TOTAL	Drainage Structu					2,973	12	3,896	0	0	6,881	
	11 02 02 5 05. Gates											
	11 02 02 5 05 1. Remove Existing Gate											
MIL PM	Steam/Pipefitter s Foreman	16.00	HR	B-STM/PIPE	1.00	624	0	0	0	0	624	39.03
MIL PM	Steam/Pipefitter s	16.00	HR	B-STM/PIPE	1.00	608	0	0	0	0	608	38.03
MIL PM	Laborers, (Semi- Skilled)	16.00	HR	B-LABORER	1.00	593	0	0	0	0	593	37.06
MIL PM	Equip. Operators , Crane/Shovel	12.00	HR	B-EQOPRCRN	1.00	523	0	0	0	0	523	43.57
MAP PM	CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	12.00	HR	C75GV002	1.00	0	458	0	0	0	458	38.16

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL	Remove Existing	1.00	EA			2,349	458	0	0	0	2,807	2806.63
	11 02 02 5 05 2. Rehab Gate											
	Manufacturers Rep/Erection Engineer is considered for field assistance.											
USR ME	Rehab 42" Gate w / New Manual Operator	1.00	EA		0.00	0	0	0	0	4,276	4,276	4276.43
USR ME	Erection Enginee r	1.00	LS		0.00	950	0	0	0	0	950	950.32
MIL ME	Painters, Struct ural Steel	20.00	HR	B-PAINTSS	1.00	942	0	0	0	0	942	47.10
TOTAL	Rehab Gate	1.00	EA			1,892	0	0	0	4,276	6,169	6168.78
	11 02 02 5 05 3. Install/Test Rehabbed Gate											
MIL PM	Steam/Pipefitter s Foreman	24.00	HR	B-STM/PIPE	1.00	937	0	0	0	0	937	39.03
MIL PM	Steam/Pipefitter s	20.00	HR	B-STM/PIPE	1.00	761	0	0	0	0	761	38.03
MIL PM	Laborers, (Semi- Skilled)	20.00	HR	B-LABORER	1.00	741	0	0	0	0	741	37.06
MIL PM	Equip. Operators , Crane/Shovel	16.00	HR	B-EQOPRCRN	1.00	697	0	0	0	0	697	43.57
MAP PM	CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	16.00	HR	C75GV002	1.00	0	611	0	0	0	611	38.16
MIL PM	Outside Truck Dr ivers, Heavy	4.00	HR	X-TRKDVRHV	1.00	152	0	0	0	0	152	37.92
MAP PM	FLATBED, 8'x 16. 0', W/SIDE RACKS (ADD TRUCK)	4.00	HR	T40KF016	1.00	0	3	0	0	0	3	0.84
EP PM	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	4.00	HR	T50FO006	1.00	0	57	0	0	0	57	14.36
TOTAL	Install/Test Reh	1.00	EA			3,287	671	0	0	0	3,959	3958.59
TOTAL	Gates					7,528	1,129	0	0	4,276	12,934	
TOTAL	GW-10, 42" Drain					25,913	5,315	7,896	0	30,276	69,401	

11 02. Gravity Drainage St			QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
11 02 02 6. GW-11, 36" Drain (East Fork)													
11 02 02 6 01. Mob, Demob & Preparatory Work Use the following crew for to mobilize equipment to the jobsite. Assume the same time for demobilzation. Use 2hrs operating time for each way. (Mob.& Demob.) Crew - -------- Truck w/Lowboy Truck Driver Mechanics Truck Operator Laborer													
11 02 02 6 01 1. Mobilization and Demobilization Asume 8hrs to mobilize equipment. Use 1hr operating time for loading and 1hr operating time for unloading equipment. Assume the same for demobilization.													
	UPB	PM	AIR COMPR, 1,600 CFM, 100 PSI REF. EP 1110-1-8 1600 CFM QUIET, 100 PSI (ADD HOSE)	4.00	HR	A15XX017	1.00	0	183	0	0	0	183	45.70
	UPB	PM	GENERATOR, 5.5 KW, 120/240V,PORT REF. EP 1110-1-8 5.5 KW	4.00	HR	G10HO004	0.00	0	7	0	0	0	7	1.64
	MIL	PM	PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRASH	4.00	HR	P50HO005	1.00	0	12	0	0	0	12	2.94
	MAP	PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	4.00	HR	C75GV002	1.00	0	153	0	0	0	153	38.16
	MIL	PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	4.00	HR	L50CS003	0.00	0	68	0	0	0	68	17.00
	UPB	PM	WELDER, 300 AMP, SKID,ELEC DRIVE	4.00	HR	W35XX009	0.00	0	6	0	0	0	6	1.59
L	UPB	PM	TRK,HWY, 46,000 GVW, 6X4, 3 AXLE	16.00	HR	T50FO018	1.00	0	558	0	0	0	558	34.90
L	MIL	PM	TRLR,LOWBOY, 60T, 3 AXLE (ADD TOWING TRUCK)	16.00	HR	T45XX017	1.00	0	134	0	0	0	134	8.38
L	MIL	PM	TRK,HWY,10,000GVW,4X2, 1T-PICKUP	16.00	HR	T50FO005	1.00	0	126	0	0	0	126	7.88
	MIL	PM	Outside Truck Drivers, Heavy *	16.00	HR	X-TRKDVRHV	1.00	607	0	0	0	0	607	37.92
	MIL	PM	Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL	Mobilization and					1,897	1,247	0	0	0	3,143	
TOTAL	Mob, Demob & Pre					1,897	1,247	0	0	0	3,143	

11 02 02 6 02. Care and Diversion of Water

Care of water consists of the installation of temporary bulkheads. Assume small trash pump and operator for any required pumping. Operator is assumed to be on-site for 10 working days for the purpose of dewatering.

11 02 02 6 02 1. Fabricate Bulkheads

B MIL PM	Fabricate Bulkheads	1.00	LS		0.00	0	0	2,500	0	0	2,500	2500.00
TOTAL	Fabricate Bulkhe					0	0	2,500	0	0	2,500	

11 02 02 6 02 2. Install Temporary Bulkheads

MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	16.00	HR	L50CS003	0.00	0	272	0	0	0	272	17.00
MIL PM	Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57
MIL PM	Outside Laborers, (Semi-Skilled)	32.00	HR	X-LABORER	1.00	1,186	0	0	0	0	1,186	37.06
TOTAL	Install Temporar	2.00	DAY			1,883	272	0	0	0	2,155	1077.53

11 02 02 6 02 3. Remove Temporary Bulkheads

MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS003	0.00	0	136	0	0	0	136	17.00
MIL PM	Outside Equip. Operators, Heavy *	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL	Remove Temporary	1.00	DAY			942	136	0	0	0	1,078	1077.53

11 02 02 6 02 4. Unwatering Pumps

MIL PM	Outside Equip. Operators, Heavy	80.00	HR	X-EQOPRHVY	1.00	3,485	0	0	0	0	3,485	43.57

11 02. Gravity Drainage St			QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
MIL	PM	PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRA SH	80.00	HR	P50HO005	1.00	0	235	0	0	0	235	2.94
UPB	PM	TRK,HWY, 8,800GVW,4X4, 3/4T-PKUP REF. EP 1110-1-8 4X4 3/4-TON PICK-UP, 8800 GVW	80.00	HR	T50FO004	1.00	0	613	0	0	0	613	7.66
TOTAL		Unwatering Pumps					3,485	848	0	0	0	4,333	
TOTAL		Care and Diversi					6,310	1,256	2,500	0	0	10,066	
		11 02 02 6 03. Sitework											
		11 02 02 6 03 1. Site Preparation											
EP	PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS005	1.00	0	134	0	0	0	134	16.71
MIL	PM	Outside Equip. Operators, Heavy	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL	PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL		Site Preparation					942	134	0	0	0	1,075	
		11 02 02 6 03 2. Line Existing Pipe w/ HDPE Pipe There are 2-pipes to be lined at this location (quantities are multiplied by two)											
USR	PM	HDPE Liner	250.00	LF		0.00	0	0	0	0	25,000	25,000	100.00
B CIV	PM	Grouting, pressure, place grout between pipes	500.00	CF	XXQEB47B	17.50	5,323	1,403	1,500	0	0	8,226	16.45
TOTAL		Line Existing Pi					5,323	1,403	1,500	0	25,000	33,226	
		11 02 02 6 03 3. Site Restoration											
EP	PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS005	1.00	0	134	0	0	0	134	16.71
MIL	PM	Outside Equip. Operators, Heavy	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL	PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
USR	PM	Seeding	1.00	ACR		0.00	0	0	0	0	1,000	1,000	1000.00
TOTAL		Site Restoration					942	134	0	0	1,000	2,075	

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL	Sitework					7,206	1,671	1,500	0	26,000	36,377	
	11 02 02 6 04. Drainage Structure											
	11 02 02 6 04 1. Replace Handrail											
B CIV PM	Remove Existing Handrail handrail	70.00	LF	SIWSSSWK2	8.00	811	0	0	0	0	811	11.58
CIV PM	Castings fibergl ass, 2" dia rails pickets 5' OC, 42" high, handrail	70.00	LF	SIWSSSWK2	4.00	1,622	0	2,954	0	0	4,576	65.37
TOTAL	Replace Handrail					2,433	0	2,954	0	0	5,387	
	11 02 02 6 04 2. Replace Grating											
B CIV PM	Remove Grating	20.00	SF	SIWSSSWK2	40.00	46	0	0	0	0	46	2.32
CIV PM	Grating fbgls, m olded, 2" T, 2" sq mesh, grn (mod crsv env)	20.00	SF	SIWSSSWK2	40.00	46	0	410	0	0	457	22.84
TOTAL	Replace Grating					93	0	410	0	0	503	
	11 02 02 6 04 3. Replace Ladders											
B MIL PM	Remove Ladders	10.00	VLF	SIWSE4	12.50	149	4	0	0	0	153	15.31
MIL PM	Ladder, 20" wide , bolted to conc, w/safety equip	10.00	VLF	SIWSE4	6.25	298	8	532	0	0	838	83.81
TOTAL	Replace Ladders					447	12	532	0	0	991	
TOTAL	Drainage Structu					2,973	12	3,896	0	0	6,881	
	11 02 02 6 05. Gates											
	11 02 02 6 05 1. Remove Existing Gate											
MIL PM	Steam/Pipefitter s Foreman	12.00	HR	B-STM/PIPE	1.00	468	0	0	0	0	468	39.03
MIL PM	Steam/Pipefitter s	12.00	HR	B-STM/PIPE	1.00	456	0	0	0	0	456	38.03
MIL PM	Laborers, (Semi- Skilled)	12.00	HR	B-LABORER	1.00	445	0	0	0	0	445	37.06
MIL PM	Equip. Operators , Crane/Shovel	8.00	HR	B-EQOPRCRN	1.00	349	0	0	0	0	349	43.57
MAP PM	CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL	Remove Existing	1.00	EA			1,718	305	0	0	0	2,023	2023.24
	11 02 02 6 05 2. Rehab Gate											
	Manufacturers Rep/Erection Engineer is considered for field assistance.											
USR ME	Rehab 36" Gate w / New Manual Operator	1.00	EA		0.00	0	0	0	0	4,039	4,039	4038.85
USR ME	Erection Enginee r	1.00	LS		0.00	950	0	0	0	0	950	950.32
MIL ME	Painters, Struct ural Steel	16.00	HR	B-PAINTSS	1.00	754	0	0	0	0	754	47.10
TOTAL	Rehab Gate	1.00	EA			1,704	0	0	0	4,039	5,743	5742.79
	11 02 02 6 05 3. Install/Test Rehabbed Gate											
MIL PM	Steam/Pipefitter s Foreman	20.00	HR	B-STM/PIPE	1.00	781	0	0	0	0	781	39.03
MIL PM	Steam/Pipefitter s	16.00	HR	B-STM/PIPE	1.00	608	0	0	0	0	608	38.03
MIL PM	Laborers, (Semi- Skilled)	16.00	HR	B-LABORER	1.00	593	0	0	0	0	593	37.06
MIL PM	Equip. Operators , Crane/Shovel	12.00	HR	B-EQOPRCRN	1.00	523	0	0	0	0	523	43.57
MAP PM	CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	12.00	HR	C75GV002	1.00	0	458	0	0	0	458	38.16
MIL PM	Outside Truck Dr ivers, Heavy	4.00	HR	X-TRKDVRHV	1.00	152	0	0	0	0	152	37.92
MAP PM	FLATBED, 8'x 16. 0', W/SIDE RACKS (ADD TRUCK)	4.00	HR	T40KF016	1.00	0	3	0	0	0	3	0.84
EP PM	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	4.00	HR	T50FO006	1.00	0	57	0	0	0	57	14.36
TOTAL	Install/Test Reh	1.00	EA			2,656	519	0	0	0	3,175	3175.20
TOTAL	Gates					6,078	824	0	0	4,039	10,941	
TOTAL	GW-11, 36" Drain					24,464	5,009	7,896	0	30,039	67,408	

11 02. Gravity Drainage St			QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
11 02 02 7. GW-12, 36" Drain (West Fork)													
11 02 02 7 01. Mob, Demob & Preparatory Work Use the following crew for to mobilize equipment to the jobsite. Assume the same time for demobilzation. Use 2hrs operating time for each way. (Mob.& Demob.) Crew - -------- Truck w/Lowboy Truck Driver Mechanics Truck Operator Laborer													
11 02 02 7 01 1. Mobilization and Demobilization Asume 8hrs to mobilize equipment. Use 1hr operating time for loading and 1hr operating time for unloading equipment. Assume the same for demobilization.													
	UPB	PM	AIR COMPR, 1,600 CFM, 100 PSI REF. EP 1110-1-8 1600 CFM QUIET, 100 PSI (ADD HOSE)	4.00	HR	A15XX017	1.00	0	183	0	0	0	183	45.70
	UPB	PM	GENERATOR, 5.5 KW, 120/240V,PORT REF. EP 1110-1-8 5.5 KW	4.00	HR	G10HO004	0.00	0	7	0	0	0	7	1.64
	MIL	PM	PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRASH	4.00	HR	P50HO005	1.00	0	12	0	0	0	12	2.94
	MAP	PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	4.00	HR	C75GV002	1.00	0	153	0	0	0	153	38.16
	MIL	PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	4.00	HR	L50CS003	0.00	0	68	0	0	0	68	17.00
	UPB	PM	WELDER, 300 AMP, SKID,ELEC DRIVE	4.00	HR	W35XX009	0.00	0	6	0	0	0	6	1.59
L	UPB	PM	TRK,HWY, 46,000 GVW, 6X4, 3 AXLE	16.00	HR	T50FO018	1.00	0	558	0	0	0	558	34.90
L	MIL	PM	TRLR,LOWBOY, 60T, 3 AXLE (ADD TOWING TRUCK)	16.00	HR	T45XX017	1.00	0	134	0	0	0	134	8.38
L	MIL	PM	TRK,HWY,10,000GVW,4X2, 1T-PICKUP	16.00	HR	T50FO005	1.00	0	126	0	0	0	126	7.88
	MIL	PM	Outside Truck Drivers, Heavy *	16.00	HR	X-TRKDVRHV	1.00	607	0	0	0	0	607	37.92
	MIL	PM	Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57

	11 02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL	Mobilization and					1,897	1,247	0	0	0	3,143	
TOTAL	Mob, Demob & Pre					1,897	1,247	0	0	0	3,143	

11 02 02 7 02. Care and Diversion of Water

Care of water consists of the installation of temporary bulkheads. Assume small trash pump and operator for any required pumping. Operator is assumed to be on-site for 10 working days for the purpose of dewatering.

11 02 02 7 02 1. Fabricate Bulkheads

B MIL PM	Fabricate Bulkheads	1.00	LS		0.00	0	0	2,500	0	0	2,500	2500.00
TOTAL	Fabricate Bulkhe					0	0	2,500	0	0	2,500	

11 02 02 7 02 2. Install Temporary Bulkheads

MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	16.00	HR	L50CS003	0.00	0	272	0	0	0	272	17.00
MIL PM	Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57
MIL PM	Outside Laborers, (Semi-Skilled)	32.00	HR	X-LABORER	1.00	1,186	0	0	0	0	1,186	37.06
TOTAL	Install Temporar	2.00	DAY			1,883	272	0	0	0	2,155	1077.53

11 02 02 7 02 3. Remove Temporary Bulkheads

MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS003	0.00	0	136	0	0	0	136	17.00
MIL PM	Outside Equip. Operators, Heavy *	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL	Remove Temporary	1.00	DAY			942	136	0	0	0	1,078	1077.53

11 02 02 7 02 4. Unwatering Pumps

MIL PM	Outside Equip. Operators, Heavy	80.00	HR	X-EQOPRHVY	1.00	3,485	0	0	0	0	3,485	43.57

11 02. Gravity Drainage St			QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
MIL	PM	PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRA SH	80.00	HR	P50HO005	1.00	0	235	0	0	0	235	2.94
UPB	PM	TRK,HWY, 8,800GVW,4X4, 3/4T-PKUP REF. EP 1110-1-8 4X4 3/4-TON PICK-UP, 8800 GVW	80.00	HR	T50FO004	1.00	0	613	0	0	0	613	7.66
TOTAL		Unwatering Pumps					3,485	848	0	0	0	4,333	
TOTAL		Care and Diversi					6,310	1,256	2,500	0	0	10,066	
		11 02 02 7 03. Sitework											
		11 02 02 7 03 1. Site Preparation											
EP	PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS005	1.00	0	134	0	0	0	134	16.71
MIL	PM	Outside Equip. Operators, Heavy	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL	PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL		Site Preparation					942	134	0	0	0	1,075	
		11 02 02 7 03 2. Line Existing Pipe w/ HDPE Pipe There are 2-pipes to be lined at this location (quantities are multiplied by two)											
USR	PM	HDPE Liner	250.00	LF		0.00	0	0	0	0	25,000	25,000	100.00
B CIV	PM	Grouting, pressure, place grout between pipes	500.00	CF	XXQEB47B	17.50	5,323	1,403	1,500	0	0	8,226	16.45
TOTAL		Line Existing Pi					5,323	1,403	1,500	0	25,000	33,226	
		11 02 02 7 03 3. Site Restoration											
EP	PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS005	1.00	0	134	0	0	0	134	16.71
MIL	PM	Outside Equip. Operators, Heavy	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL	PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
USR	PM	Seeding	1.00	ACR		0.00	0	0	0	0	1,000	1,000	1000.00
TOTAL		Site Restoration					942	134	0	0	1,000	2,075	

	11 02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL	Sitework					7,206	1,671	1,500	0	26,000	36,377	
	11 02 02 7 04. Drainage Structure											
	11 02 02 7 04 1. Replace Handrail											
B CIV PM	Remove Existing Handrail handrail	70.00	LF	SIWSSSWK2	8.00	811	0	0	0	0	811	11.58
CIV PM	Castings fibergl ass, 2" dia rails pickets 5' OC, 42" high, handrail	70.00	LF	SIWSSSWK2	4.00	1,622	0	2,954	0	0	4,576	65.37
TOTAL	Replace Handrail					2,433	0	2,954	0	0	5,387	
	11 02 02 7 04 2. Replace Grating											
B CIV PM	Remove Grating	20.00	SF	SIWSSSWK2	40.00	46	0	0	0	0	46	2.32
CIV PM	Grating fbgls, m olded, 2" T, 2" sq mesh, grn (mod crsv env)	20.00	SF	SIWSSSWK2	40.00	46	0	410	0	0	457	22.84
TOTAL	Replace Grating					93	0	410	0	0	503	
	11 02 02 7 04 3. Replace Ladders											
B MIL PM	Remove Ladders	10.00	VLF	SIWSE4	12.50	149	4	0	0	0	153	15.31
MIL PM	Ladder, 20" wide , bolted to conc, w/safety equip	10.00	VLF	SIWSE4	6.25	298	8	532	0	0	838	83.81
TOTAL	Replace Ladders					447	12	532	0	0	991	
TOTAL	Drainage Structu					2,973	12	3,896	0	0	6,881	
	11 02 02 7 05. Gates											
	11 02 02 7 05 1. Remove Existing Gate											
MIL PM	Steam/Pipefitter s Foreman	12.00	HR	B-STM/PIPE	1.00	468	0	0	0	0	468	39.03
MIL PM	Steam/Pipefitter s	12.00	HR	B-STM/PIPE	1.00	456	0	0	0	0	456	38.03
MIL PM	Laborers, (Semi- Skilled)	12.00	HR	B-LABORER	1.00	445	0	0	0	0	445	37.06
MIL PM	Equip. Operators , Crane/Shovel	8.00	HR	B-EQOPRCRN	1.00	349	0	0	0	0	349	43.57
MAP PM	CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL	Remove Existing	1.00	EA			1,718	305	0	0	0	2,023	2023.24
	11 02 02 7 05 2. Rehab Gate											
	Manufacturers Rep/Erection Engineer is considered for field assistance.											
USR ME	Rehab 36" Gate w / New Manual Operator	1.00	EA		0.00	0	0	0	0	4,039	4,039	4038.85
USR ME	Erection Enginee r	1.00	LS		0.00	950	0	0	0	0	950	950.32
MIL ME	Painters, Struct ural Steel	16.00	HR	B-PAINTSS	1.00	754	0	0	0	0	754	47.10
TOTAL	Rehab Gate	1.00	EA			1,704	0	0	0	4,039	5,743	5742.79
	11 02 02 7 05 3. Install/Test Rehabbed Gate											
MIL PM	Steam/Pipefitter s Foreman	20.00	HR	B-STM/PIPE	1.00	781	0	0	0	0	781	39.03
MIL PM	Steam/Pipefitter s	16.00	HR	B-STM/PIPE	1.00	608	0	0	0	0	608	38.03
MIL PM	Laborers, (Semi- Skilled)	16.00	HR	B-LABORER	1.00	593	0	0	0	0	593	37.06
MIL PM	Equip. Operators , Crane/Shovel	12.00	HR	B-EQOPRCRN	1.00	523	0	0	0	0	523	43.57
MAP PM	CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	12.00	HR	C75GV002	1.00	0	458	0	0	0	458	38.16
MIL PM	Outside Truck Dr ivers, Heavy	4.00	HR	X-TRKDVRHV	1.00	152	0	0	0	0	152	37.92
MAP PM	FLATBED, 8'x 16. 0', W/SIDE RACKS (ADD TRUCK)	4.00	HR	T40KF016	1.00	0	3	0	0	0	3	0.84
EP PM	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	4.00	HR	T50FO006	1.00	0	57	0	0	0	57	14.36
TOTAL	Install/Test Reh	1.00	EA			2,656	519	0	0	0	3,175	3175.20
TOTAL	Gates					6,078	824	0	0	4,039	10,941	
	11 02 02 7 06. Olin Property Security											
	11 02 02 7 06 1. Security Personel											
MIL	Field personnel, security officer	3.00	WK	UFLDSECO1	0.03	1,704	0	0	0	0	1,704	567.90
TOTAL	Security Persone					1,704	0	0	0	0	1,704	

11 02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL Olin Property Se					1,704	0	0	0	0	1,704	
TOTAL GW-12, 36" Drain					26,167	5,009	7,896	0	30,039	69,112	

11 02 02 8. GW-13, 12" Drain (West Fork)

11 02 02 8 01. Mob, Demob & Preparatory Work

Use the following crew for to mobilize equipment to the jobsite. Assume the same time for demobilzation. Use 2hrs operating time for each way. (Mob.& Demob.)

Crew -

Truck w/Lowboy	Truck Driver
Mechanics Truck	Operator
Laborer	

11 02 02 8 01 1. Mobilization and Demobilization

Asume 8hrs to mobilize equipment. Use 1hr operating time for loading and 1hr operating time for unloading equipment. Assume the same for demobilization.

UPB PM	AIR COMPR, 1,600 CFM, 100 PSI REF. EP 1110-1-8 1600 CFM QUIET, 100 PSI (ADD HOSE)	4.00	HR	A15XX017	1.00	0	183	0	0	0	183	45.70
UPB PM	GENERATOR, 5.5 KW, 120/240V,PORT REF. EP 1110-1-8 5.5 KW	4.00	HR	G10HO004	0.00	0	7	0	0	0	7	1.64
MIL PM	PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRASH	4.00	HR	P50HO005	1.00	0	12	0	0	0	12	2.94
MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	4.00	HR	C75GV002	1.00	0	153	0	0	0	153	38.16
MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	4.00	HR	L50CS003	0.00	0	68	0	0	0	68	17.00
UPB PM	WELDER, 300 AMP, SKID,ELEC DRIVE	4.00	HR	W35XX009	0.00	0	6	0	0	0	6	1.59
L UPB PM	TRK,HWY, 46,000 GVW, 6X4, 3 AXLE	16.00	HR	T50FO018	1.00	0	558	0	0	0	558	34.90
L MIL PM	TRLR,LOWBOY, 60T, 3 AXLE (ADD TOWING TRUCK)	16.00	HR	T45XX017	1.00	0	134	0	0	0	134	8.38
L MIL PM	TRK,HWY,10,000GVW,4X2, 1T-PICKUP	16.00	HR	T50FO005	1.00	0	126	0	0	0	126	7.88

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
MIL PM	Outside Truck Drivers, Heavy *	16.00	HR	X-TRKDVRHV	1.00	607	0	0	0	0	607	37.92
MIL PM	Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57
MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL	Mobilization and					1,897	1,247	0	0	0	3,143	
TOTAL	Mob, Demob & Pre					1,897	1,247	0	0	0	3,143	

11 02 02 8 02. Care and Diversion of Water

Care of water consists of the installation of temporary bulkheads. Assume small trash pump and operator for any required pumping. Operator is assumed to be on-site for 10 working days for the purpose of dewatering.

11 02 02 8 02 1. Fabricate Bulkheads

B MIL PM	Fabricate Bulkheads	1.00	LS		0.00	0	0	2,500	0	0	2,500	2500.00
TOTAL	Fabricate Bulkhe					0	0	2,500	0	0	2,500	

11 02 02 8 02 2. Install Temporary Bulkheads

MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	16.00	HR	L50CS003	0.00	0	272	0	0	0	272	17.00
MIL PM	Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57
MIL PM	Outside Laborers, (Semi-Skilled)	32.00	HR	X-LABORER	1.00	1,186	0	0	0	0	1,186	37.06
TOTAL	Install Temporar	2.00	DAY			1,883	272	0	0	0	2,155	1077.53

11 02 02 8 02 3. Remove Temporary Bulkheads

MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS003	0.00	0	136	0	0	0	136	17.00
MIL PM	Outside Equip. Operators, Heavy *	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL	Remove Temporary	1.00	DAY			942	136	0	0	0	1,078	1077.53

11 02. Gravity Drainage St			QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
		11 02 02 8 02 4. Unwatering Pumps											
MIL	PM	Outside Equip. Operators, Heavy	80.00	HR	X-EQOPRHVY	1.00	3,485	0	0	0	0	3,485	43.57
MIL	PM	PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRA SH	80.00	HR	P50HO005	1.00	0	235	0	0	0	235	2.94
UPB	PM	TRK,HWY, 8,800GVW,4X4, 3/4T-PKUP REF. EP 1110-1-8 4X4 3/4-TON PICK-UP, 8800 GVW	80.00	HR	T50FO004	1.00	0	613	0	0	0	613	7.66
TOTAL		Unwatering Pumps					3,485	848	0	0	0	4,333	
TOTAL		Care and Diversi					6,310	1,256	2,500	0	0	10,066	
		11 02 02 8 03. Sitework											
		11 02 02 8 03 1. Clearing, Grubbing and Stripping											
AF	PM	Felling trees & piling, chipping, medium brush	1.20	ACR	CODFB7	0.22	1,223	504	0	0	0	1,727	1438.84
TOTAL		Clearing, Grubbi	1.20	ACR			1,223	504	0	0	0	1,727	1438.84
		11 02 02 8 03 2. Pavement Removal											
L MIL	PM	Site dml, bituminous, pavement removal, roads, 3" thick	110.00	SY	CLADB38	50.00	408	184	0	0	0	592	5.38
MIL	PM	Excavate & load, hydr excavator, 2 CY, medium matl	9.20	CY	CODEB12C	130.00	6	4	0	0	0	10	1.08
TOTAL		Pavement Removal	110.00	SY			413	188	0	0	0	602	5.47
		11 02 02 8 03 3. Remove Crushed Stone											
USR	PM	Remove Crushed Stone and Stockpile	80.00	TON	CODFB10P	36.00	123	157	0	0	0	279	3.49
TOTAL		Remove Crushed S	80.00	TON			123	157	0	0	0	279	3.49

	11 02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
	11 02 02 8 03 4. Excavation											
L MIL PM	Excavate & load, hydr excavator, 2 CY, medium matl	6540.00	CY	CODEB12C	150.00	3,471	2,659	0	0	0	6,130	0.94
L MIL PM	Hauling, hwy haulers, 12 CY, 1 mi round trip @ 20 MPH (4.2 cyc/hr)	6540.00	CY	COEIB34B	50.40	4,920	5,037	0	0	0	9,957	1.52
TOTAL	Excavation	6540.00	CY			8,391	7,696	0	0	0	16,087	2.46
	11 02 02 8 03 5. Cofferdam											
L MIL PM	Excavate & load, hydr excavator, 2 CY, medium matl	1700.00	CY	CODEB12C	150.00	902	691	0	0	0	1,593	0.94
L MIL PM	Hauling, hwy haulers, 12 CY, 1 mi round trip @ 20 MPH (4.2 cyc/hr)	1700.00	CY	COEIB34B	50.40	1,279	1,309	0	0	0	2,588	1.52
MIL PM	Spread & compact, 8" lift, embankment, 300 HP tractor	1700.00	CY	CODTB10C	312.50	300	367	0	0	0	667	0.39
TOTAL	Cofferdam	1700.00	CY			2,481	2,367	0	0	0	4,848	2.85
	11 02 02 8 03 6. Remove Existing Pipe											
CIV PM	Site dml, pipe removal, 18" dia,conc, water/sewer, no excavation	250.00	LF	CODLB6	18.75	1,474	170	0	0	0	1,644	6.58
TOTAL	Remove Existing	250.00	LF			1,474	170	0	0	0	1,644	6.58
	11 02 02 8 03 7. Install New RCP											
MIL PM	Backfill, sand bedding trenches, front-end loader, 1.5 CY	30.00	CY	CODFB10N	47.50	35	20	642	0	0	697	23.24
MIL PM	Piping, drainage & sewage, 12" dia, RCP, class 3, no gaskets	250.00	LF	CLABB14	26.25	2,122	121	2,025	0	0	4,268	17.07
M CIV PM	Piping, drainage & sewage, RCP, precast end section, 12" dia	1.00	EA	CLABB14	3.13	71	4	175	0	0	250	250.24
USR PM	Concrete Cradle for Pipe	2.00	CY		0.00	0	0	0	0	600	600	300.00
USR PM	Connect Pipe to Existing Structure	1.00	EA		0.00	0	0	0	0	500	500	500.00

11 02. Gravity Drainage St			QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL		Install New RCP	250.00	LF			2,228	146	2,842	0	1,100	6,315	25.26
		11 02 02 8 03 8. Place and Compact Backfill											
L	MIL PM	Excavate & load, hydr excavator, 2 CY, medium matl	7800.00	CY	CODEB12C	150.00	4,139	3,171	0	0	0	7,311	0.94
L	MIL PM	Hauling, hwy haulers, 12 CY, 1 mi round trip @ 20 MPH (4.2 cyc/hr)	7800.00	CY	COEIB34B	50.40	5,868	6,008	0	0	0	11,876	1.52
L	AF PM	Fill, spread bor row w/dozer	7800.00	CY	CODTB10B	150.00	2,869	2,825	0	0	0	5,694	0.73
	AF PM	Compaction, ridi ng, 8" lifts, 2 passes, sheepsfoot/wobbly wheel roller	7800.00	CY	COFCB32F	600.00	1,451	998	0	0	0	2,448	0.31
TOTAL		Place and Compac	7800.00	CY			14,327	13,002	0	0	0	27,329	3.50
		11 02 02 8 03 9. Crushed Stone Surfacing											
B	MIL PM	Base course, 3/4 " maximum size, 3" deep, crushed stone, large areas	50.00	CY	COFGB36B	75.00	198	136	488	0	0	821	16.42
TOTAL		Crushed Stone Su	80.00	TON			198	136	488	0	0	821	10.26
		11 02 02 8 03 10. Bitumineous Road Repair											
	MIL PM	Surface treatmen t, prime coat, bituminous, 0.28 gal/SY	9.90	CSF	COKBB45	300.00	2	2	32	0	0	36	3.66
	MIL PM	Asphaltic conc p avement, highway, wearing course, 3" thick	14.00	TON	COKCB25B	100.00	62	23	406	0	0	491	35.07
TOTAL		Bitumineous Road	110.00	SY			65	24	438	0	0	527	4.79
		11 02 02 8 03 11. Establishment of Turf											
	MIL PM	Seeding, athleti c field mix, mechanical seeding, 450#/acre	1.20	ACR	COELB66	0.24	186	80	659	0	0	925	771.05
	AF PM	Seeding, apply f ertilizer, 1# nitrogen/MSF, spray from truck	1.20	MSF	COFWB59	35.00	1	2	6	0	0	9	7.46

	11 02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL	Establishment of	1.20	ACR			187	81	666	0	0	934	778.50
TOTAL	Sitework					31,109	24,471	4,433	0	1,100	61,113	
	11 02 02 8 04. Drainage Structure											
	11 02 02 8 04 1. Replace Handrail											
B CIV PM	Remove Existing Handrail handrail	70.00	LF	SIWSSSWK2	8.00	811	0	0	0	0	811	11.58
CIV PM	Castings fibergl ass, 2" dia rails pickets 5' OC, 42" high, handrail	70.00	LF	SIWSSSWK2	4.00	1,622	0	2,954	0	0	4,576	65.37
TOTAL	Replace Handrail					2,433	0	2,954	0	0	5,387	
	11 02 02 8 04 2. Replace Grating											
B CIV PM	Remove Grating	20.00	SF	SIWSSSWK2	40.00	46	0	0	0	0	46	2.32
CIV PM	Grating fbgls, m olded, 2" T, 2" sq mesh, grn (mod crsv env)	20.00	SF	SIWSSSWK2	40.00	46	0	410	0	0	457	22.84
TOTAL	Replace Grating					93	0	410	0	0	503	
	11 02 02 8 04 3. Replace Ladders											
B MIL PM	Remove Ladders	10.00	VLF	SIWSE4	12.50	149	4	0	0	0	153	15.31
MIL PM	Ladder, 20" wide , bolted to conc, w/safety equip	10.00	VLF	SIWSE4	6.25	298	8	532	0	0	838	83.81
TOTAL	Replace Ladders					447	12	532	0	0	991	
TOTAL	Drainage Structu					2,973	12	3,896	0	0	6,881	
	11 02 02 8 05. Gates											
	11 02 02 8 05 1. Remove Existing Gate											
MIL PM	Steam/Pipefitter s Foreman	8.00	HR	B-STM/PIPE	1.00	312	0	0	0	0	312	39.03
MIL PM	Steam/Pipefitter s	8.00	HR	B-STM/PIPE	1.00	304	0	0	0	0	304	38.03
MIL PM	Laborers, (Semi- Skilled)	8.00	HR	B-LABORER	1.00	296	0	0	0	0	296	37.06
MIL PM	Equip. Operators , Crane/Shovel	8.00	HR	B-EQOPRCRN	1.00	349	0	0	0	0	349	43.57

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
MAP	PM	CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16
TOTAL		Remove Existing	1.00	EA			1,261	305	0	0	0	1,567	1566.77
		11 02 02 8 05 2. Rehab Gate											
		Manufacturers Rep/Erection Engineer is considered for field assistance.											
USR	ME	Rehab 12" Gate w / New Manual Operator	1.00	EA		0.00	0	0	0	0	2,613	2,613	2613.37
USR	ME	Erection Enginee r	1.00	LS		0.00	950	0	0	0	0	950	950.32
MIL	ME	Painters, Struct ural Steel	8.00	HR	B-PAINTSS	1.00	377	0	0	0	0	377	47.10
TOTAL		Rehab Gate	1.00	EA			1,327	0	0	0	2,613	3,941	3940.50
		11 02 02 8 05 3. Install/Test Rehabbed Gate											
MIL	PM	Steam/Pipefitter s Foreman	20.00	HR	B-STM/PIPE	1.00	781	0	0	0	0	781	39.03
MIL	PM	Steam/Pipefitter s	16.00	HR	B-STM/PIPE	1.00	608	0	0	0	0	608	38.03
MIL	PM	Laborers, (Semi- Skilled)	16.00	HR	B-LABORER	1.00	593	0	0	0	0	593	37.06
MIL	PM	Equip. Operators , Crane/Shovel	8.00	HR	B-EQOPRCRN	1.00	349	0	0	0	0	349	43.57
MAP	PM	CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16
MIL	PM	Outside Truck Dr ivers, Heavy	4.00	HR	X-TRKDVRHV	1.00	152	0	0	0	0	152	37.92
MAP	PM	FLATBED, 8'x 16. 0', W/SIDE RACKS (ADD TRUCK)	4.00	HR	T40KF016	1.00	0	3	0	0	0	3	0.84
EP	PM	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	4.00	HR	T50FO006	1.00	0	57	0	0	0	57	14.36
TOTAL		Install/Test Reh	1.00	EA			2,482	366	0	0	0	2,848	2848.28
TOTAL		Gates					5,071	671	0	0	2,613	8,356	
		11 02 02 8 06. Olin Property Security											
		11 02 02 8 06 1. Security Personel											
MIL		Field personnel, security officer	3.00	WK	UFLDSECO1	0.03	1,704	0	0	0	0	1,704	567.90

11 02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL Security Persone					1,704	0	0	0	0	1,704	
TOTAL Olin Property Se					1,704	0	0	0	0	1,704	
TOTAL GW-13, 12" Drain					49,063	27,657	10,830	0	3,713	91,263	
TOTAL East and West Fo					277,434	108,981	77,271	0	164,542	628,227	

11 02 03. Lower Wood River Levee (LWRL)

11 02 03 1. GW-14, 48" Drain (Flank)

11 02 03 1 01. Mob, Demob & Preparatory Work

Use the following crew for to mobilize equipment to the jobsite. Assume the same time for demobilzation. Use 2hrs operating time for each way. (Mob.& Demob.)

Crew -

Truck w/Lowboy	Truck Driver
Mechanics Truck	Operator
Laborer	

11 02 03 1 01 1. Mobilization and Demobilization

Asume 8hrs to mobilize equipment. Use 1hr operating time for loading and 1hr operating time for unloading equipment. Assume the same for demobilization.

UPB PM	AIR COMPR, 1,600 CFM, 100 PSI REF. EP 1110-1-8 1600 CFM QUIET, 100 PSI (ADD HOSE)	4.00	HR	A15XX017	1.00	0	183	0	0	0	183	45.70
UPB PM	GENERATOR, 5.5 KW, 120/240V,PORT REF. EP 1110-1-8 5.5 KW	4.00	HR	G10HO004	0.00	0	7	0	0	0	7	1.64
MIL PM	PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRASH	4.00	HR	P50HO005	1.00	0	12	0	0	0	12	2.94
MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	4.00	HR	C75GV002	1.00	0	153	0	0	0	153	38.16
MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	4.00	HR	L50CS003	0.00	0	68	0	0	0	68	17.00
UPB PM	WELDER, 300 AMP, SKID,ELEC DRIVE	4.00	HR	W35XX009	0.00	0	6	0	0	0	6	1.59

11 02. Gravity Drainage St			QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
L	UPB	PM	TRK,HWY, 46,000 GVW, 6X4, 3 AXLE	16.00	HR	T50FO018	1.00	0	558	0	0	0	558	34.90
L	MIL	PM	TRLR,LOWBOY, 60T , 3 AXLE (ADD TOWING TRUCK)	16.00	HR	T45XX017	1.00	0	134	0	0	0	134	8.38
L	MIL	PM	TRK,HWY,10,000GVW,4X2, 1T-PICKUP	16.00	HR	T50FO005	1.00	0	126	0	0	0	126	7.88
	MIL	PM	Outside Truck Drivers, Heavy *	16.00	HR	X-TRKDVRHV	1.00	607	0	0	0	0	607	37.92
	MIL	PM	Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57
	MIL	PM	Outside Laborers , (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
	TOTAL		Mobilization and					1,897	1,247	0	0	0	3,143	
	TOTAL		Mob, Demob & Pre					1,897	1,247	0	0	0	3,143	

11 02 03 1 02. Care and Diversion of Water

Care of water consists of the installation of temporary bulkheads. Assume small trash pump and operator for any required pumping. Operator is assumed to be on-site for 10 working days for the purpose of dewatering.

11 02 03 1 02 1. Fabricate Bulkheads

B	MIL	PM	Fabricate Bulkheads	1.00	LS		0.00	0	0	2,500	0	0	2,500	2500.00
	TOTAL		Fabricate Bulkhe					0	0	2,500	0	0	2,500	

11 02 03 1 02 2. Install Temporary Bulkheads

	MIL	PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	16.00	HR	L50CS003	0.00	0	272	0	0	0	272	17.00
	MIL	PM	Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57
	MIL	PM	Outside Laborers , (Semi-Skilled)	32.00	HR	X-LABORER	1.00	1,186	0	0	0	0	1,186	37.06
	TOTAL		Install Temporar	2.00	DAY			1,883	272	0	0	0	2,155	1077.53

11 02 03 1 02 3. Remove Temporary Bulkheads

	MIL	PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS003	0.00	0	136	0	0	0	136	17.00
	MIL	PM	Outside Equip. Operators, Heavy *	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57

11 02. Gravity Drainage St			QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
MIL	PM	Outside Laborers , (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL		Remove Temporary	1.00	DAY			942	136	0	0	0	1,078	1077.53
		11 02 03 1 02 4. Unwatering Pumps											
MIL	PM	Outside Equip. Operators, Heavy	80.00	HR	X-EQOPRHVY	1.00	3,485	0	0	0	0	3,485	43.57
MIL	PM	PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRASH	80.00	HR	P50HO005	1.00	0	235	0	0	0	235	2.94
UPB	PM	TRK,HWY, 8,800GVW,4X4, 3/4T-PKUP REF. EP 1110-1-8 4X4 3/4-TON PICK-UP, 8800 GVW	80.00	HR	T50FO004	1.00	0	613	0	0	0	613	7.66
TOTAL		Unwatering Pumps					3,485	848	0	0	0	4,333	
TOTAL		Care and Diversi					6,310	1,256	2,500	0	0	10,066	
		11 02 03 1 03. Sitework											
		11 02 03 1 03 1. Site Preparation											
EP	PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS005	1.00	0	134	0	0	0	134	16.71
MIL	PM	Outside Equip. Operators, Heavy	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL	PM	Outside Laborers , (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL		Site Preparation					942	134	0	0	0	1,075	
		11 02 03 1 03 2. Line Existing Pipe w/ HDPE Pipe There are 2-pipes to be lined at this location (quantities are multiplied by two)											
USR	PM	HDPE Liner	250.00	LF		0.00	0	0	0	0	25,000	25,000	100.00
B CIV	PM	Grouting, pressure, place grout between pipes	500.00	CF	XXQEB47B	17.50	5,323	1,403	1,500	0	0	8,226	16.45
TOTAL		Line Existing Pi					5,323	1,403	1,500	0	25,000	33,226	

11 02. Gravity Drainage St			QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
		11 02 03 1 03 3. Site Restoration											
EP	PM	LDR,BH,WH, 1.00C Y FE BKT, 24"DIP	8.00	HR	L50CS005	1.00	0	134	0	0	0	134	16.71
MIL	PM	Outside Equip. Operators, Heavy	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL	PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
USR	PM	Seeding	1.00	ACR		0.00	0	0	0	0	1,000	1,000	1000.00
TOTAL		Site Restoration					942	134	0	0	1,000	2,075	
TOTAL		Sitework					7,206	1,671	1,500	0	26,000	36,377	
		11 02 03 1 04. Drainage Structure											
		11 02 03 1 04 1. Replace Handrail											
B CIV	PM	Remove Existing Handrail handrail	70.00	LF	SIWSSSWK2	8.00	811	0	0	0	0	811	11.58
CIV	PM	Castings fiberglass, 2" dia rails pickets 5' OC, 42" high, handrail	70.00	LF	SIWSSSWK2	4.00	1,622	0	2,954	0	0	4,576	65.37
TOTAL		Replace Handrail					2,433	0	2,954	0	0	5,387	
		11 02 03 1 04 2. Replace Grating											
B CIV	PM	Remove Grating	20.00	SF	SIWSSSWK2	40.00	46	0	0	0	0	46	2.32
CIV	PM	Grating fbgls, molded, 2" T, 2" sq mesh, grn (mod crsv env)	20.00	SF	SIWSSSWK2	40.00	46	0	410	0	0	457	22.84
TOTAL		Replace Grating					93	0	410	0	0	503	
		11 02 03 1 04 3. Replace Ladders											
B MIL	PM	Remove Ladders	10.00	VLF	SIWSE4	12.50	149	4	0	0	0	153	15.31
MIL	PM	Ladder, 20" wide, bolted to conc, w/safety equip	10.00	VLF	SIWSE4	6.25	298	8	532	0	0	838	83.81
TOTAL		Replace Ladders					447	12	532	0	0	991	
TOTAL		Drainage Structu					2,973	12	3,896	0	0	6,881	

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
11 02 03 1 05. Gates												
11 02 03 1 05 1. Remove Existing Gate												
MIL PM	Steam/Pipefitters Foreman	16.00	HR	B-STM/PIPE	1.00	624	0	0	0	0	624	39.03
MIL PM	Steam/Pipefitters	16.00	HR	B-STM/PIPE	1.00	608	0	0	0	0	608	38.03
MIL PM	Laborers, (Semi-Skilled)	16.00	HR	B-LABORER	1.00	593	0	0	0	0	593	37.06
MIL PM	Equip. Operators, Crane/Shovel	12.00	HR	B-EQOPRCRN	1.00	523	0	0	0	0	523	43.57
MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	12.00	HR	C75GV002	1.00	0	458	0	0	0	458	38.16
TOTAL	Remove Existing	1.00	EA			2,349	458	0	0	0	2,807	2806.63
11 02 03 1 05 2. Rehab Gate												
Manufacturers Rep/Erection Engineer is considered for field assistance.												
USR ME	Rehab 48" Gate w / New Manual Operator	1.00	EA		0.00	0	0	0	0	5,108	5,108	5107.96
USR ME	Erection Engineer	1.00	LS		0.00	950	0	0	0	0	950	950.32
MIL ME	Painters, Structural Steel	20.00	HR	B-PAINTSS	1.00	942	0	0	0	0	942	47.10
TOTAL	Rehab Gate	1.00	EA			1,892	0	0	0	5,108	7,000	7000.31
11 02 03 1 05 3. Install/Test Rehabbed Gate												
MIL PM	Steam/Pipefitters Foreman	24.00	HR	B-STM/PIPE	1.00	937	0	0	0	0	937	39.03
MIL PM	Steam/Pipefitters	20.00	HR	B-STM/PIPE	1.00	761	0	0	0	0	761	38.03
MIL PM	Laborers, (Semi-Skilled)	20.00	HR	B-LABORER	1.00	741	0	0	0	0	741	37.06
MIL PM	Equip. Operators, Crane/Shovel	16.00	HR	B-EQOPRCRN	1.00	697	0	0	0	0	697	43.57
MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	16.00	HR	C75GV002	1.00	0	611	0	0	0	611	38.16
MIL PM	Outside Truck Drivers, Heavy	4.00	HR	X-TRKDVRHV	1.00	152	0	0	0	0	152	37.92
MAP PM	FLATBED, 8'x 16.0', W/SIDE RACKS (ADD TRUCK)	4.00	HR	T40KF016	1.00	0	3	0	0	0	3	0.84
EP PM	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	4.00	HR	T50FO006	1.00	0	57	0	0	0	57	14.36
TOTAL	Install/Test Reh	1.00	EA			3,287	671	0	0	0	3,959	3958.59

		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
11 02. Gravity Drainage St												
TOTAL Gates						7,528	1,129	0	0	5,108	13,766	
TOTAL GW-14, 48" Drain						25,913	5,315	7,896	0	31,108	70,232	

11 02 03 2. GW-15, 30" Drain (Flank)

11 02 03 2 01. Mob, Demob & Preparatory Work

Use the following crew for to mobilize equipment to the jobsite. Assume the same time for demobilzation. Use 2hrs operating time for each way. (Mob.& Demob.)

Crew -

Truck w/Lowboy — Truck Driver
Mechanics Truck — Operator
Laborer

11 02 03 2 01 1. Mobilization and Demobilization

Asume 8hrs to mobilize equipment. Use 1hr operating time for loading and 1hr operating time for unloading equipment. Assume the same for demobilization.

UPB PM	AIR COMPR, 1,600 CFM, 100 PSI REF. EP 1110-1-8 1600 CFM QUIET, 100 PSI (ADD HOSE)	4.00	HR	A15XX017	1.00	0	183	0	0	0	183	45.70
UPB PM	GENERATOR, 5.5 KW, 120/240V,PORT REF. EP 1110-1-8 5.5 KW	4.00	HR	G10HO004	0.00	0	7	0	0	0	7	1.64
MIL PM	PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRASH	4.00	HR	P50HO005	1.00	0	12	0	0	0	12	2.94
MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	4.00	HR	C75GV002	1.00	0	153	0	0	0	153	38.16
MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	4.00	HR	L50CS003	0.00	0	68	0	0	0	68	17.00
UPB PM	WELDER, 300 AMP, SKID,ELEC DRIVE	4.00	HR	W35XX009	0.00	0	6	0	0	0	6	1.59
L UPB PM	TRK,HWY, 46,000 GVW, 6X4, 3 AXLE	16.00	HR	T50FO018	1.00	0	558	0	0	0	558	34.90
L MIL PM	TRLR,LOWBOY, 60T, 3 AXLE (ADD TOWING TRUCK)	16.00	HR	T45XX017	1.00	0	134	0	0	0	134	8.38
L MIL PM	TRK,HWY,10,000GVW,4X2, 1T-PICKUP	16.00	HR	T50FO005	1.00	0	126	0	0	0	126	7.88

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
MIL PM	Outside Truck Drivers, Heavy *	16.00	HR	X-TRKDVRHV	1.00	607	0	0	0	0	607	37.92
MIL PM	Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57
MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL	Mobilization and					1,897	1,247	0	0	0	3,143	
TOTAL	Mob, Demob & Pre					1,897	1,247	0	0	0	3,143	

11 02 03 2 02. Care and Diversion of Water

Care of water consists of the installation of temporary bulkheads. Assume small trash pump and operator for any required pumping. Operator is assumed to be on-site for 10 working days for the purpose of dewatering.

11 02 03 2 02 1. Fabricate Bulkheads

B MIL PM	Fabricate Bulkheads	1.00	LS		0.00	0	0	2,500	0	0	2,500	2500.00
TOTAL	Fabricate Bulkhe					0	0	2,500	0	0	2,500	

11 02 03 2 02 2. Install Temporary Bulkheads

MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	16.00	HR	L50CS003	0.00	0	272	0	0	0	272	17.00
MIL PM	Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57
MIL PM	Outside Laborers, (Semi-Skilled)	32.00	HR	X-LABORER	1.00	1,186	0	0	0	0	1,186	37.06
TOTAL	Install Temporar	2.00	DAY			1,883	272	0	0	0	2,155	1077.53

11 02 03 2 02 3. Remove Temporary Bulkheads

MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS003	0.00	0	136	0	0	0	136	17.00
MIL PM	Outside Equip. Operators, Heavy *	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL	Remove Temporary	1.00	DAY			942	136	0	0	0	1,078	1077.53

		11 02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
		11 02 03 2 02 4. Unwatering Pumps											
MIL	PM	Outside Equip. Operators, Heavy	80.00	HR	X-EQOPRHVY	1.00	3,485	0	0	0	0	3,485	43.57
MIL	PM	PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRASH	80.00	HR	P50HO005	1.00	0	235	0	0	0	235	2.94
UPB	PM	TRK,HWY, 8,800GVW,4X4, 3/4T-PKUP REF. EP 1110-1-8 4X4 3/4-TON PICK-UP, 8800 GVW	80.00	HR	T50FO004	1.00	0	613	0	0	0	613	7.66
TOTAL		Unwatering Pumps					3,485	848	0	0	0	4,333	
TOTAL		Care and Diversi					6,310	1,256	2,500	0	0	10,066	
		11 02 03 2 03. Sitework											
		11 02 03 2 03 1. Site Preparation											
EP	PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS005	1.00	0	134	0	0	0	134	16.71
MIL	PM	Outside Equip. Operators, Heavy	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL	PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL		Site Preparation					942	134	0	0	0	1,075	
		11 02 03 2 03 2. Line Existing Pipe w/ HDPE Pipe There are 2-pipes to be lined at this location (quantities are multiplied by two)											
USR	PM	HDPE Liner	250.00	LF		0.00	0	0	0	0	25,000	25,000	100.00
B CIV	PM	Grouting, pressure, place grout between pipes	500.00	CF	XXQEB47B	17.50	5,323	1,403	1,500	0	0	8,226	16.45
TOTAL		Line Existing Pi					5,323	1,403	1,500	0	25,000	33,226	
		11 02 03 2 03 3. Site Restoration											
EP	PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS005	1.00	0	134	0	0	0	134	16.71
MIL	PM	Outside Equip. Operators, Heavy	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL	PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
USR	PM	Seeding	1.00	ACR		0.00	0	0	0	0	1,000	1,000	1000.00

11 02. Gravity Drainage St			QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL	Site Restoration						942	134	0	0	1,000	2,075	
TOTAL	Sitework						7,206	1,671	1,500	0	26,000	36,377	
	11 02 03 2 04. Drainage Structure												
	11 02 03 2 04 1. Replace Handrail												
B CIV PM	Remove Existing Handrail handrail		70.00	LF	SIWSSSWK2	8.00	811	0	0	0	0	811	11.58
CIV PM	Castings fibergl ass, 2" dia rails pickets 5' OC, 42" high, handrail		70.00	LF	SIWSSSWK2	4.00	1,622	0	2,954	0	0	4,576	65.37
TOTAL	Replace Handrail						2,433	0	2,954	0	0	5,387	
	11 02 03 2 04 2. Replace Grating												
B CIV PM	Remove Grating		20.00	SF	SIWSSSWK2	40.00	46	0	0	0	0	46	2.32
CIV PM	Grating fbgls, m olded, 2" T, 2" sq mesh, grn (mod crsv env)		20.00	SF	SIWSSSWK2	40.00	46	0	410	0	0	457	22.84
TOTAL	Replace Grating						93	0	410	0	0	503	
	11 02 03 2 04 3. Replace Ladders												
B MIL PM	Remove Ladders		10.00	VLF	SIWSE4	12.50	149	4	0	0	0	153	15.31
MIL PM	Ladder, 20" wide , bolted to conc, w/safety equip		10.00	VLF	SIWSE4	6.25	298	8	532	0	0	838	83.81
TOTAL	Replace Ladders						447	12	532	0	0	991	
TOTAL	Drainage Structu						2,973	12	3,896	0	0	6,881	
	11 02 03 2 05. Gates												
	11 02 03 2 05 1. Remove Existing Gate												
MIL PM	Steam/Pipefitter s Foreman		12.00	HR	B-STM/PIPE	1.00	468	0	0	0	0	468	39.03
MIL PM	Steam/Pipefitter s		12.00	HR	B-STM/PIPE	1.00	456	0	0	0	0	456	38.03
MIL PM	Laborers, (Semi- Skilled)		12.00	HR	B-LABORER	1.00	445	0	0	0	0	445	37.06
MIL PM	Equip. Operators , Crane/Shovel		8.00	HR	B-EQOPRCRN	1.00	349	0	0	0	0	349	43.57

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
MAP	PM	CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16
TOTAL		Remove Existing	1.00	EA			1,718	305	0	0	0	2,023	2023.24
		11 02 03 2 05 2. Rehab Gate											
		Manufacturers Rep/Erection Engineer is considered for field assistance.											
USR	ME	Rehab 30" Gate w / New Manual Operator	1.00	EA		0.00	0	0	0	0	3,801	3,801	3801.27
USR	ME	Erection Enginee r	1.00	LS		0.00	950	0	0	0	0	950	950.32
MIL	ME	Painters, Struct ural Steel	12.00	HR	B-PAINTSS	1.00	565	0	0	0	0	565	47.10
TOTAL		Rehab Gate	1.00	EA			1,516	0	0	0	3,801	5,317	5316.81
		11 02 03 2 05 3. Install/Test Rehabbed Gate											
MIL	PM	Steam/Pipefitter s Foreman	20.00	HR	B-STM/PIPE	1.00	781	0	0	0	0	781	39.03
MIL	PM	Steam/Pipefitter s	16.00	HR	B-STM/PIPE	1.00	608	0	0	0	0	608	38.03
MIL	PM	Laborers, (Semi- Skilled)	16.00	HR	B-LABORER	1.00	593	0	0	0	0	593	37.06
MIL	PM	Equip. Operators , Crane/Shovel	12.00	HR	B-EQOPRCRN	1.00	523	0	0	0	0	523	43.57
MAP	PM	CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	12.00	HR	C75GV002	1.00	0	458	0	0	0	458	38.16
MIL	PM	Outside Truck Dr ivers, Heavy	4.00	HR	X-TRKDVRHV	1.00	152	0	0	0	0	152	37.92
MAP	PM	FLATBED, 8'x 16. 0', W/SIDE RACKS (ADD TRUCK)	4.00	HR	T40KF016	1.00	0	3	0	0	0	3	0.84
EP	PM	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	4.00	HR	T50FO006	1.00	0	57	0	0	0	57	14.36
TOTAL		Install/Test Reh	1.00	EA			2,656	519	0	0	0	3,175	3175.20
TOTAL		Gates					5,890	824	0	0	3,801	10,515	
		11 02 03 2 06. Olin Property Security											
		11 02 03 2 06 1. Security Personel											
MIL		Field personnel, security officer	3.00	WK	UFLDSECO1	0.03	1,704	0	0	0	0	1,704	567.90

11 02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL Security Persone					1,704	0	0	0	0	1,704	
TOTAL Olin Property Se					1,704	0	0	0	0	1,704	
TOTAL GW-15, 30" Drain					25,979	5,009	7,896	0	29,801	68,686	

11 02 03 3. GW-16, 42" Drain (Flank)

11 02 03 3 01. Mob, Demob & Preparatory Work

Use the following crew for to mobilize equipment to the jobsite. Assume the same time for demobilzation. Use 2hrs operating time for each way. (Mob.& Demob.)

Crew -

Truck w/Lowboy	Truck Driver
Mechanics Truck	Operator
Laborer	

11 02 03 3 01 1. Mobilization and Demobilization

Asume 8hrs to mobilize equipment. Use 1hr operating time for loading and 1hr operating time for unloading equipment. Assume the same for demobilization.

UPB PM	AIR COMPR, 1,600 CFM, 100 PSI REF. EP 1110-1-8 1600 CFM QUIET, 100 PSI (ADD HOSE)	4.00	HR	A15XX017	1.00	0	183	0	0	0	183	45.70
UPB PM	GENERATOR, 5.5 KW, 120/240V,PORT REF. EP 1110-1-8 5.5 KW	4.00	HR	G10HO004	0.00	0	7	0	0	0	7	1.64
MIL PM	PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRASH	4.00	HR	P50HO005	1.00	0	12	0	0	0	12	2.94
MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	4.00	HR	C75GV002	1.00	0	153	0	0	0	153	38.16
MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	4.00	HR	L50CS003	0.00	0	68	0	0	0	68	17.00
UPB PM	WELDER, 300 AMP, SKID,ELEC DRIVE	4.00	HR	W35XX009	0.00	0	6	0	0	0	6	1.59
L UPB PM	TRK,HWY, 46,000 GVW, 6X4, 3 AXLE	16.00	HR	T50FO018	1.00	0	558	0	0	0	558	34.90
L MIL PM	TRLR,LOWBOY, 60T, 3 AXLE (ADD TOWING TRUCK)	16.00	HR	T45XX017	1.00	0	134	0	0	0	134	8.38

11	02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
L	MIL PM TRK,HWY,10,000GVW,4X2, 1T-PICKUP	16.00	HR	T50FO005	1.00	0	126	0	0	0	126	7.88
	MIL PM Outside Truck Drivers, Heavy *	16.00	HR	X-TRKDVRHV	1.00	607	0	0	0	0	607	37.92
	MIL PM Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57
	MIL PM Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
	TOTAL Mobilization and					1,897	1,247	0	0	0	3,143	
	TOTAL Mob, Demob & Pre					1,897	1,247	0	0	0	3,143	

11 02 03 3 02. Care and Diversion of Water

Care of water consists of the installation of temporary bulkheads. Assume small trash pump and operator for any required pumping. Operator is assumed to be on-site for 10 working days for the purpose of dewatering.

11 02 03 3 02 1. Fabricate Bulkheads

B	MIL PM Fabricate Bulkheads	1.00	LS		0.00	0	0	2,500	0	0	2,500	2500.00
	TOTAL Fabricate Bulkhe					0	0	2,500	0	0	2,500	

11 02 03 3 02 2. Install Temporary Bulkheads

	MIL PM LDR,BH,WH, 1.00CY FE BKT, 24"DIP	16.00	HR	L50CS003	0.00	0	272	0	0	0	272	17.00
	MIL PM Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57
	MIL PM Outside Laborers, (Semi-Skilled)	32.00	HR	X-LABORER	1.00	1,186	0	0	0	0	1,186	37.06
	TOTAL Install Temporar	2.00	DAY			1,883	272	0	0	0	2,155	1077.53

11 02 03 3 02 3. Remove Temporary Bulkheads

	MIL PM LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS003	0.00	0	136	0	0	0	136	17.00
	MIL PM Outside Equip. Operators, Heavy *	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
	MIL PM Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
	TOTAL Remove Temporary	1.00	DAY			942	136	0	0	0	1,078	1077.53

11 02. Gravity Drainage St			QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
		11 02 03 3 02 4. Unwatering Pumps											
MIL	PM	Outside Equip. Operators, Heavy	80.00	HR	X-EQOPRHVY	1.00	3,485	0	0	0	0	3,485	43.57
MIL	PM	PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRASH	80.00	HR	P50HO005	1.00	0	235	0	0	0	235	2.94
UPB	PM	TRK,HWY, 8,800GVW,4X4, 3/4T-PKUP REF. EP 1110-1-8 4X4 3/4-TON PICK-UP, 8800 GVW	80.00	HR	T50FO004	1.00	0	613	0	0	0	613	7.66
TOTAL		Unwatering Pumps					3,485	848	0	0	0	4,333	
TOTAL		Care and Diversi					6,310	1,256	2,500	0	0	10,066	
		11 02 03 3 03. Sitework											
		11 02 03 3 03 1. Site Preparation											
EP	PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS005	1.00	0	134	0	0	0	134	16.71
MIL	PM	Outside Equip. Operators, Heavy	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL	PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL		Site Preparation					942	134	0	0	0	1,075	
		11 02 03 3 03 2. Line Existing Pipe w/ HDPE Pipe There are 2-pipes to be lined at this location (quantities are multiplied by two)											
USR	PM	HDPE Liner	250.00	LF		0.00	0	0	0	0	25,000	25,000	100.00
B CIV	PM	Grouting, pressure, place grout between pipes	500.00	CF	XXQEB47B	17.50	5,323	1,403	1,500	0	0	8,226	16.45
TOTAL		Line Existing Pi					5,323	1,403	1,500	0	25,000	33,226	
		11 02 03 3 03 3. Site Restoration											
EP	PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS005	1.00	0	134	0	0	0	134	16.71
MIL	PM	Outside Equip. Operators, Heavy	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL	PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
USR	PM	Seeding	1.00	ACR		0.00	0	0	0	0	1,000	1,000	1000.00

11 02. Gravity Drainage St			QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
	TOTAL	Site Restoration					942	134	0	0	1,000	2,075	
	TOTAL	Sitework					7,206	1,671	1,500	0	26,000	36,377	
		11 02 03 3 04. Drainage Structure											
		11 02 03 3 04 1. Replace Handrail											
B	CIV PM	Remove Existing Handrail handrail	70.00	LF	SIWSSSWK2	8.00	811	0	0	0	0	811	11.58
	CIV PM	Castings fibergl ass, 2" dia rails pickets 5' OC, 42" high, handrail	70.00	LF	SIWSSSWK2	4.00	1,622	0	2,954	0	0	4,576	65.37
	TOTAL	Replace Handrail					2,433	0	2,954	0	0	5,387	
		11 02 03 3 04 2. Replace Grating											
B	CIV PM	Remove Grating	20.00	SF	SIWSSSWK2	40.00	46	0	0	0	0	46	2.32
	CIV PM	Grating fbgls, m olded, 2" T, 2" sq mesh, grn (mod crsv env)	20.00	SF	SIWSSSWK2	40.00	46	0	410	0	0	457	22.84
	TOTAL	Replace Grating					93	0	410	0	0	503	
		11 02 03 3 04 3. Replace Ladders											
B	MIL PM	Remove Ladders	10.00	VLF	SIWSE4	12.50	149	4	0	0	0	153	15.31
	MIL PM	Ladder, 20" wide , bolted to conc, w/safety equip	10.00	VLF	SIWSE4	6.25	298	8	532	0	0	838	83.81
	TOTAL	Replace Ladders					447	12	532	0	0	991	
	TOTAL	Drainage Structu					2,973	12	3,896	0	0	6,881	
		11 02 03 3 05. Gates											
		11 02 03 3 05 1. Remove Existing Gate											
	MIL PM	Steam/Pipefitter s Foreman	16.00	HR	B-STM/PIPE	1.00	624	0	0	0	0	624	39.03
	MIL PM	Steam/Pipefitter s	16.00	HR	B-STM/PIPE	1.00	608	0	0	0	0	608	38.03
	MIL PM	Laborers, (Semi- Skilled)	16.00	HR	B-LABORER	1.00	593	0	0	0	0	593	37.06
	MIL PM	Equip. Operators , Crane/Shovel	12.00	HR	B-EQOPRCRN	1.00	523	0	0	0	0	523	43.57

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
MAP	PM	CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	12.00	HR	C75GV002	1.00	0	458	0	0	0	458	38.16
TOTAL		Remove Existing	1.00	EA			2,349	458	0	0	0	2,807	2806.63
		11 02 03 3 05 2. Rehab Gate											
		Manufacturers Rep/Erection Engineer is considered for field assistance.											
USR	ME	Rehab 42" Gate w / New Manual Operator	1.00	EA		0.00	0	0	0	0	4,276	4,276	4276.43
USR	ME	Erection Enginee r	1.00	LS		0.00	950	0	0	0	0	950	950.32
MIL	ME	Painters, Struct ural Steel	20.00	HR	B-PAINTSS	1.00	942	0	0	0	0	942	47.10
TOTAL		Rehab Gate	1.00	EA			1,892	0	0	0	4,276	6,169	6168.78
		11 02 03 3 05 3. Install/Test Rehabbed Gate											
MIL	PM	Steam/Pipefitter s Foreman	24.00	HR	B-STM/PIPE	1.00	937	0	0	0	0	937	39.03
MIL	PM	Steam/Pipefitter s	20.00	HR	B-STM/PIPE	1.00	761	0	0	0	0	761	38.03
MIL	PM	Laborers, (Semi- Skilled)	20.00	HR	B-LABORER	1.00	741	0	0	0	0	741	37.06
MIL	PM	Equip. Operators , Crane/Shovel	16.00	HR	B-EQOPRCRN	1.00	697	0	0	0	0	697	43.57
MAP	PM	CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	16.00	HR	C75GV002	1.00	0	611	0	0	0	611	38.16
MIL	PM	Outside Truck Dr ivers, Heavy	4.00	HR	X-TRKDVRHV	1.00	152	0	0	0	0	152	37.92
MAP	PM	FLATBED, 8'x 16. 0', W/SIDE RACKS (ADD TRUCK)	4.00	HR	T40KF016	1.00	0	3	0	0	0	3	0.84
EP	PM	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	4.00	HR	T50FO006	1.00	0	57	0	0	0	57	14.36
TOTAL		Install/Test Reh	1.00	EA			3,287	671	0	0	0	3,959	3958.59
TOTAL		Gates					7,528	1,129	0	0	4,276	12,934	
		11 02 03 3 06. Olin Property Security											
		11 02 03 3 06 1. Security Personel											
MIL		Field personnel, security officer	3.00	WK	UFLDSECO1	0.03	1,704	0	0	0	0	1,704	567.90

		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
11 02. Gravity Drainage St												
TOTAL Security Persone						1,704	0	0	0	0	1,704	
TOTAL Olin Property Se						1,704	0	0	0	0	1,704	
TOTAL GW-16, 42" Drain						27,617	5,315	7,896	0	30,276	71,105	

11 02 03 4. GW-17, 42" Drain (Flank)

11 02 03 4 01. Mob, Demob & Preparatory Work

Use the following crew for to mobilize equipment to the jobsite. Assume the same time for demobilzation. Use 2hrs operating time for each way. (Mob.& Demob.)

Crew -

Truck w/Lowboy	Truck Driver
Mechanics Truck	Operator
Laborer	

11 02 03 4 01 1. Mobilization and Demobilization

Asume 8hrs to mobilize equipment. Use 1hr operating time for loading and 1hr operating time for unloading equipment. Assume the same for demobilization.

UPB PM	AIR COMPR, 1,600 CFM, 100 PSI REF. EP 1110-1-8 1600 CFM QUIET, 100 PSI (ADD HOSE)	4.00	HR	A15XX017	1.00	0	183	0	0	0	183	45.70
UPB PM	GENERATOR, 5.5 KW, 120/240V,PORT REF. EP 1110-1-8 5.5 KW	4.00	HR	G10HO004	0.00	0	7	0	0	0	7	1.64
MIL PM	PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRASH	4.00	HR	P50HO005	1.00	0	12	0	0	0	12	2.94
MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	4.00	HR	C75GV002	1.00	0	153	0	0	0	153	38.16
MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	4.00	HR	L50CS003	0.00	0	68	0	0	0	68	17.00
UPB PM	WELDER, 300 AMP, SKID,ELEC DRIVE	4.00	HR	W35XX009	0.00	0	6	0	0	0	6	1.59
L UPB PM	TRK,HWY, 46,000 GVW, 6X4, 3 AXLE	16.00	HR	T50FO018	1.00	0	558	0	0	0	558	34.90
L MIL PM	TRLR,LOWBOY, 60T, 3 AXLE (ADD TOWING TRUCK)	16.00	HR	T45XX017	1.00	0	134	0	0	0	134	8.38

	11 02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
L	MIL PM TRK,HWY,10,000GVW,4X2, 1T-PICKUP	16.00	HR	T50FO005	1.00	0	126	0	0	0	126	7.88
	MIL PM Outside Truck Drivers, Heavy *	16.00	HR	X-TRKDVRHV	1.00	607	0	0	0	0	607	37.92
	MIL PM Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57
	MIL PM Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
	TOTAL Mobilization and					1,897	1,247	0	0	0	3,143	
	TOTAL Mob, Demob & Pre					1,897	1,247	0	0	0	3,143	

11 02 03 4 02. Care and Diversion of Water

Care of water consists of the installation of temporary bulkheads. Assume small trash pump and operator for any required pumping. Operator is assumed to be on-site for 10 working days for the purpose of dewatering.

11 02 03 4 02 1. Fabricate Bulkheads

B	MIL PM Fabricate Bulkheads	1.00	LS		0.00	0	0	2,500	0	0	2,500	2500.00
	TOTAL Fabricate Bulkhe					0	0	2,500	0	0	2,500	

11 02 03 4 02 2. Install Temporary Bulkheads

	MIL PM LDR,BH,WH, 1.00CY FE BKT, 24"DIP	16.00	HR	L50CS003	0.00	0	272	0	0	0	272	17.00
	MIL PM Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57
	MIL PM Outside Laborers, (Semi-Skilled)	32.00	HR	X-LABORER	1.00	1,186	0	0	0	0	1,186	37.06
	TOTAL Install Temporar	2.00	DAY			1,883	272	0	0	0	2,155	1077.53

11 02 03 4 02 3. Remove Temporary Bulkheads

	MIL PM LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS003	0.00	0	136	0	0	0	136	17.00
	MIL PM Outside Equip. Operators, Heavy *	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
	MIL PM Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
	TOTAL Remove Temporary	1.00	DAY			942	136	0	0	0	1,078	1077.53

11 02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
11 02 03 4 02 4. Unwatering Pumps											
MIL PM Outside Equip. Operators, Heavy	80.00	HR	X-EQOPRHVY	1.00	3,485	0	0	0	0	3,485	43.57
MIL PM PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRASH	80.00	HR	P50HO005	1.00	0	235	0	0	0	235	2.94
UPB PM TRK,HWY, 8,800GVW,4X4, 3/4T-PKUP REF. EP 1110-1-8 4X4 3/4-TON PICK-UP, 8800 GVW	80.00	HR	T50FO004	1.00	0	613	0	0	0	613	7.66
TOTAL Unwatering Pumps					3,485	848	0	0	0	4,333	
TOTAL Care and Diversi					6,310	1,256	2,500	0	0	10,066	
11 02 03 4 03. Sitework											
11 02 03 4 03 1. Site Preparation											
EP PM LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS005	1.00	0	134	0	0	0	134	16.71
MIL PM Outside Equip. Operators, Heavy	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL PM Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL Site Preparation					942	134	0	0	0	1,075	
11 02 03 4 03 2. Line Existing Pipe w/ HDPE Pipe There are 2-pipes to be lined at this location (quantities are multiplied by two)											
USR PM HDPE Liner	250.00	LF		0.00	0	0	0	0	25,000	25,000	100.00
B CIV PM Grouting, pressure, place grout between pipes	500.00	CF	XXQEB47B	17.50	5,323	1,403	1,500	0	0	8,226	16.45
TOTAL Line Existing Pi					5,323	1,403	1,500	0	25,000	33,226	
11 02 03 4 03 3. Site Restoration											
EP PM LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS005	1.00	0	134	0	0	0	134	16.71
MIL PM Outside Equip. Operators, Heavy	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL PM Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
USR PM Seeding	1.00	ACR		0.00	0	0	0	0	1,000	1,000	1000.00

11 02. Gravity Drainage St			QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL	Site Restoration						942	134	0	0	1,000	2,075	
TOTAL	Sitework						7,206	1,671	1,500	0	26,000	36,377	
	11 02 03 4 04. Drainage Structure												
	11 02 03 4 04 1. Replace Handrail												
B CIV PM	Remove Existing Handrail handrail		70.00	LF	SIWSSSWK2	8.00	811	0	0	0	0	811	11.58
CIV PM	Castings fibergl ass, 2" dia rails pickets 5' OC, 42" high, handrail		70.00	LF	SIWSSSWK2	4.00	1,622	0	2,954	0	0	4,576	65.37
TOTAL	Replace Handrail						2,433	0	2,954	0	0	5,387	
	11 02 03 4 04 2. Replace Grating												
B CIV PM	Remove Grating		20.00	SF	SIWSSSWK2	40.00	46	0	0	0	0	46	2.32
CIV PM	Grating fbgls, m olded, 2" T, 2" sq mesh, grn (mod crsv env)		20.00	SF	SIWSSSWK2	40.00	46	0	410	0	0	457	22.84
TOTAL	Replace Grating						93	0	410	0	0	503	
	11 02 03 4 04 3. Replace Ladders												
B MIL PM	Remove Ladders		10.00	VLF	SIWSE4	12.50	149	4	0	0	0	153	15.31
MIL PM	Ladder, 20" wide , bolted to conc, w/safety equip		10.00	VLF	SIWSE4	6.25	298	8	532	0	0	838	83.81
TOTAL	Replace Ladders						447	12	532	0	0	991	
TOTAL	Drainage Structu						2,973	12	3,896	0	0	6,881	
	11 02 03 4 05. Gates												
	11 02 03 4 05 1. Remove Existing Gate												
MIL PM	Steam/Pipefitter s Foreman		16.00	HR	B-STM/PIPE	1.00	624	0	0	0	0	624	39.03
MIL PM	Steam/Pipefitter s		16.00	HR	B-STM/PIPE	1.00	608	0	0	0	0	608	38.03
MIL PM	Laborers, (Semi- Skilled)		16.00	HR	B-LABORER	1.00	593	0	0	0	0	593	37.06
MIL PM	Equip. Operators , Crane/Shovel		12.00	HR	B-EQOPRCRN	1.00	523	0	0	0	0	523	43.57

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
MAP	PM	CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	12.00	HR	C75GV002	1.00	0	458	0	0	0	458	38.16
TOTAL		Remove Existing	1.00	EA			2,349	458	0	0	0	2,807	2806.63
		11 02 03 4 05 2. Replace Gate											
		Manufacturers Rep/Erection Engineer is considered for field assistance.											
USR	ME	Replace 42" Gate w/ New Manual Operator	1.00	EA		0.00	0	0	0	0	7,127	7,127	7127.38
USR	ME	Replace 42" Flap Gate	1.00	EA		0.00	0	0	0	0	6,058	6,058	6058.27
USR	ME	Erection Enginee r	1.00	LS		0.00	1,188	0	0	0	0	1,188	1187.90
TOTAL		Replace Gate	1.00	EA			1,188	0	0	0	13,186	14,374	14374
		11 02 03 4 05 3. Install/Test New Gate											
MIL	PM	Steam/Pipefitter s Foreman	24.00	HR	B-STM/PIPE	1.00	937	0	0	0	0	937	39.03
MIL	PM	Steam/Pipefitter s	20.00	HR	B-STM/PIPE	1.00	761	0	0	0	0	761	38.03
MIL	PM	Laborers, (Semi- Skilled)	20.00	HR	B-LABORER	1.00	741	0	0	0	0	741	37.06
MIL	PM	Equip. Operators , Crane/Shovel	16.00	HR	B-EQOPRCRN	1.00	697	0	0	0	0	697	43.57
MAP	PM	CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	16.00	HR	C75GV002	1.00	0	611	0	0	0	611	38.16
MIL	PM	Outside Truck Dr ivers, Heavy	4.00	HR	X-TRKDVRHV	1.00	152	0	0	0	0	152	37.92
MAP	PM	FLATBED, 8'x 16. 0', W/SIDE RACKS (ADD TRUCK)	4.00	HR	T40KF016	1.00	0	3	0	0	0	3	0.84
EP	PM	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	4.00	HR	T50FO006	1.00	0	57	0	0	0	57	14.36
TOTAL		Install/Test New	1.00	EA			3,287	671	0	0	0	3,959	3958.59
TOTAL		Gates					6,824	1,129	0	0	13,186	21,139	
		11 02 03 4 06. Olin Property Security											
		11 02 03 4 06 1. Security Personel											
MIL		Field personnel, security officer	3.00	WK	UFLDSECO1	0.03	1,704	0	0	0	0	1,704	567.90

	11 02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
	TOTAL Security Persone					1,704	0	0	0	0	1,704	
	TOTAL Olin Property Se					1,704	0	0	0	0	1,704	
	TOTAL GW-17, 42" Drain					26,913	5,315	7,896	0	39,186	79,309	

11 02 03 5. GW-18, 42" Drain (Flank)

11 02 03 5 01. Mob, Demob & Preparatory Work

Use the following crew for to mobilize equipment to the jobsite. Assume the same time for demobilzation. Use 2hrs operating time for each way. (Mob.& Demob.)

Crew -

Truck w/Lowboy	Truck Driver
Mechanics Truck	Operator
Laborer	

11 02 03 5 01 1. Mobilization and Demobilization

Asume 8hrs to mobilize equipment. Use 1hr operating time for loading and 1hr operating time for unloading equipment. Assume the same for demobilization.

UPB	PM	AIR COMPR, 1,600 CFM, 100 PSI REF. EP 1110-1-8 1600 CFM QUIET, 100 PSI (ADD HOSE)	4.00	HR	A15XX017	1.00	0	183	0	0	0	183	45.70
UPB	PM	GENERATOR, 5.5 KW, 120/240V,PORT REF. EP 1110-1-8 5.5 KW	4.00	HR	G10HO004	0.00	0	7	0	0	0	7	1.64
MIL	PM	PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRASH	4.00	HR	P50HO005	1.00	0	12	0	0	0	12	2.94
MAP	PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	4.00	HR	C75GV002	1.00	0	153	0	0	0	153	38.16
MIL	PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	4.00	HR	L50CS003	0.00	0	68	0	0	0	68	17.00
UPB	PM	WELDER, 300 AMP, SKID,ELEC DRIVE	4.00	HR	W35XX009	0.00	0	6	0	0	0	6	1.59
L UPB	PM	TRK,HWY, 46,000 GVW, 6X4, 3 AXLE	16.00	HR	T50FO018	1.00	0	558	0	0	0	558	34.90
L MIL	PM	TRLR,LOWBOY, 60T, 3 AXLE (ADD TOWING TRUCK)	16.00	HR	T45XX017	1.00	0	134	0	0	0	134	8.38

		11 02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
L	MIL PM	TRK,HWY,10,000GVW,4X2, 1T-PICKUP	16.00	HR	T50FO005	1.00	0	126	0	0	0	126	7.88
	MIL PM	Outside Truck Drivers, Heavy *	16.00	HR	X-TRKDVRHV	1.00	607	0	0	0	0	607	37.92
	MIL PM	Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57
	MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
	TOTAL	Mobilization and					1,897	1,247	0	0	0	3,143	
	TOTAL	Mob, Demob & Pre					1,897	1,247	0	0	0	3,143	

11 02 03 5 02. Care and Diversion of Water

Care of water consists of the installation of temporary bulkheads. Assume small trash pump and operator for any required pumping. Operator is assumed to be on-site for 10 working days for the purpose of dewatering.

11 02 03 5 02 1. Fabricate Bulkheads

B	MIL PM	Fabricate Bulkheads	1.00	LS		0.00	0	0	2,500	0	0	2,500	2500.00
	TOTAL	Fabricate Bulkhe					0	0	2,500	0	0	2,500	

11 02 03 5 02 2. Install Temporary Bulkheads

	MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	16.00	HR	L50CS003	0.00	0	272	0	0	0	272	17.00
	MIL PM	Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57
	MIL PM	Outside Laborers, (Semi-Skilled)	32.00	HR	X-LABORER	1.00	1,186	0	0	0	0	1,186	37.06
	TOTAL	Install Temporar	2.00	DAY			1,883	272	0	0	0	2,155	1077.53

11 02 03 5 02 3. Remove Temporary Bulkheads

	MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS003	0.00	0	136	0	0	0	136	17.00
	MIL PM	Outside Equip. Operators, Heavy *	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
	MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
	TOTAL	Remove Temporary	1.00	DAY			942	136	0	0	0	1,078	1077.53

11 02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
11 02 03 5 02 4. Unwatering Pumps											
MIL PM Outside Equip. Operators, Heavy	80.00	HR	X-EQOPRHVY	1.00	3,485	0	0	0	0	3,485	43.57
MIL PM PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRASH	80.00	HR	P50HO005	1.00	0	235	0	0	0	235	2.94
UPB PM TRK,HWY, 8,800GVW,4X4, 3/4T-PKUP REF. EP 1110-1-8 4X4 3/4-TON PICK-UP, 8800 GVW	80.00	HR	T50FO004	1.00	0	613	0	0	0	613	7.66
TOTAL Unwatering Pumps					3,485	848	0	0	0	4,333	
TOTAL Care and Diversi					6,310	1,256	2,500	0	0	10,066	
11 02 03 5 03. Sitework											
11 02 03 5 03 1. Site Preparation											
EP PM LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS005	1.00	0	134	0	0	0	134	16.71
MIL PM Outside Equip. Operators, Heavy	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL PM Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL Site Preparation					942	134	0	0	0	1,075	
11 02 03 5 03 2. Line Existing Pipe w/ HDPE Pipe There are 2-pipes to be lined at this location (quantities are multiplied by two)											
USR PM HDPE Liner	250.00	LF		0.00	0	0	0	0	25,000	25,000	100.00
B CIV PM Grouting, pressure, place grout between pipes	500.00	CF	XXQEB47B	17.50	5,323	1,403	1,500	0	0	8,226	16.45
TOTAL Line Existing Pi					5,323	1,403	1,500	0	25,000	33,226	
11 02 03 5 03 3. Site Restoration											
EP PM LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS005	1.00	0	134	0	0	0	134	16.71
MIL PM Outside Equip. Operators, Heavy	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL PM Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
USR PM Seeding	1.00	ACR		0.00	0	0	0	0	1,000	1,000	1000.00

	11 02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL	Site Restoration					942	134	0	0	1,000	2,075	
TOTAL	Sitework					7,206	1,671	1,500	0	26,000	36,377	
	11 02 03 5 04. Drainage Structure											
	11 02 03 5 04 1. Replace Handrail											
B CIV PM	Remove Existing Handrail handrail	70.00	LF	SIWSSSWK2	8.00	811	0	0	0	0	811	11.58
CIV PM	Castings fibergl ass, 2" dia rails pickets 5' OC, 42" high, handrail	70.00	LF	SIWSSSWK2	4.00	1,622	0	2,954	0	0	4,576	65.37
TOTAL	Replace Handrail					2,433	0	2,954	0	0	5,387	
	11 02 03 5 04 2. Replace Grating											
B CIV PM	Remove Grating	20.00	SF	SIWSSSWK2	40.00	46	0	0	0	0	46	2.32
CIV PM	Grating fbgls, m olded, 2" T, 2" sq mesh, grn (mod crsv env)	20.00	SF	SIWSSSWK2	40.00	46	0	410	0	0	457	22.84
TOTAL	Replace Grating					93	0	410	0	0	503	
	11 02 03 5 04 3. Replace Ladders											
B MIL PM	Remove Ladders	10.00	VLF	SIWSE4	12.50	149	4	0	0	0	153	15.31
MIL PM	Ladder, 20" wide , bolted to conc, w/safety equip	10.00	VLF	SIWSE4	6.25	298	8	532	0	0	838	83.81
TOTAL	Replace Ladders					447	12	532	0	0	991	
TOTAL	Drainage Structu					2,973	12	3,896	0	0	6,881	
	11 02 03 5 05. Gates											
	11 02 03 5 05 1. Remove Existing Gate											
MIL PM	Steam/Pipefitter s Foreman	16.00	HR	B-STM/PIPE	1.00	624	0	0	0	0	624	39.03
MIL PM	Steam/Pipefitter s	16.00	HR	B-STM/PIPE	1.00	608	0	0	0	0	608	38.03
MIL PM	Laborers, (Semi- Skilled)	16.00	HR	B-LABORER	1.00	593	0	0	0	0	593	37.06
MIL PM	Equip. Operators , Crane/Shovel	12.00	HR	B-EQOPRCRN	1.00	523	0	0	0	0	523	43.57

11 02. Gravity Drainage St			QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
MAP	PM	CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	12.00	HR	C75GV002	1.00	0	458	0	0	0	458	38.16
TOTAL		Remove Existing	1.00	EA			2,349	458	0	0	0	2,807	2806.63
		11 02 03 5 05 2. Rehab Gate											
		Manufacturers Rep/Erection Engineer is considered for field assistance.											
USR	ME	Rehab 42" Gate w / New Manual Operator	1.00	EA		0.00	0	0	0	0	4,276	4,276	4276.43
USR	ME	Erection Enginee r	1.00	LS		0.00	950	0	0	0	0	950	950.32
MIL	ME	Painters, Struct ural Steel	20.00	HR	B-PAINTSS	1.00	942	0	0	0	0	942	47.10
TOTAL		Rehab Gate	1.00	EA			1,892	0	0	0	4,276	6,169	6168.78
		11 02 03 5 05 3. Install/Test Rehabbed Gate											
MIL	PM	Steam/Pipefitter s Foreman	24.00	HR	B-STM/PIPE	1.00	937	0	0	0	0	937	39.03
MIL	PM	Steam/Pipefitter s	20.00	HR	B-STM/PIPE	1.00	761	0	0	0	0	761	38.03
MIL	PM	Laborers, (Semi- Skilled)	20.00	HR	B-LABORER	1.00	741	0	0	0	0	741	37.06
MIL	PM	Equip. Operators , Crane/Shovel	16.00	HR	B-EQOPRCRN	1.00	697	0	0	0	0	697	43.57
MAP	PM	CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	16.00	HR	C75GV002	1.00	0	611	0	0	0	611	38.16
MIL	PM	Outside Truck Dr ivers, Heavy	4.00	HR	X-TRKDVRHV	1.00	152	0	0	0	0	152	37.92
MAP	PM	FLATBED, 8'x 16. 0', W/SIDE RACKS (ADD TRUCK)	4.00	HR	T40KF016	1.00	0	3	0	0	0	3	0.84
EP	PM	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	4.00	HR	T50FO006	1.00	0	57	0	0	0	57	14.36
TOTAL		Install/Test Reh	1.00	EA			3,287	671	0	0	0	3,959	3958.59
TOTAL		Gates					7,528	1,129	0	0	4,276	12,934	
TOTAL		GW-18, 42" Drain					25,913	5,315	7,896	0	30,276	69,401	

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
11 02 03 6. GW-19, 36" Drain (Flank)												
11 02 03 6 01. Mob, Demob & Preparatory Work Use the following crew for to mobilize equipment to the jobsite. Assume the same time for demobilzation. Use 2hrs operating time for each way. (Mob.& Demob.) Crew - -------- Truck w/Lowboy Truck Driver Mechanics Truck Operator Laborer												
11 02 03 6 01 1. Mobilization and Demobilization Asume 8hrs to mobilize equipment. Use 1hr operating time for loading and 1hr operating time for unloading equipment. Assume the same for demobilization.												
	UPB	PM	AIR COMPR, 1,600 CFM, 100 PSI REF. EP 1110-1-8 1600 CFM QUIET, 100 PSI (ADD HOSE)	4.00	HR	A15XX017	1.00	0	183	0	0	0	183	45.70
	UPB	PM	GENERATOR, 5.5 KW, 120/240V,PORT REF. EP 1110-1-8 5.5 KW	4.00	HR	G10HO004	0.00	0	7	0	0	0	7	1.64
	MIL	PM	PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRASH	4.00	HR	P50HO005	1.00	0	12	0	0	0	12	2.94
	MAP	PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	4.00	HR	C75GV002	1.00	0	153	0	0	0	153	38.16
	MIL	PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	4.00	HR	L50CS003	0.00	0	68	0	0	0	68	17.00
	UPB	PM	WELDER, 300 AMP, SKID,ELEC DRIVE	4.00	HR	W35XX009	0.00	0	6	0	0	0	6	1.59
L	UPB	PM	TRK,HWY, 46,000 GVW, 6X4, 3 AXLE	16.00	HR	T50FO018	1.00	0	558	0	0	0	558	34.90
L	MIL	PM	TRLR,LOWBOY, 60T, 3 AXLE (ADD TOWING TRUCK)	16.00	HR	T45XX017	1.00	0	134	0	0	0	134	8.38
L	MIL	PM	TRK,HWY,10,000GVW,4X2, 1T-PICKUP	16.00	HR	T50FO005	1.00	0	126	0	0	0	126	7.88
	MIL	PM	Outside Truck Drivers, Heavy *	16.00	HR	X-TRKDVRHV	1.00	607	0	0	0	0	607	37.92
	MIL	PM	Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL	Mobilization and					1,897	1,247	0	0	0	3,143	
TOTAL	Mob, Demob & Pre					1,897	1,247	0	0	0	3,143	
	11 02 03 6 02. Care and Diversion of Water											
	Care of water consists of the installation of temporary bulkheads. Assume small trash pump and operator for any required pumping. Operator is assumed to be on-site for 10 working days for the purpose of dewatering.											
	11 02 03 6 02 1. Fabricate Bulkheads											
B MIL PM	Fabricate Bulkheads	1.00	LS		0.00	0	0	2,500	0	0	2,500	2500.00
TOTAL	Fabricate Bulkhe					0	0	2,500	0	0	2,500	
	11 02 03 6 02 2. Install Temporary Bulkheads											
MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	16.00	HR	L50CS003	0.00	0	272	0	0	0	272	17.00
MIL PM	Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57
MIL PM	Outside Laborers, (Semi-Skilled)	32.00	HR	X-LABORER	1.00	1,186	0	0	0	0	1,186	37.06
TOTAL	Install Temporar	2.00	DAY			1,883	272	0	0	0	2,155	1077.53
	11 02 03 6 02 3. Remove Temporary Bulkheads											
MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS003	0.00	0	136	0	0	0	136	17.00
MIL PM	Outside Equip. Operators, Heavy *	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL	Remove Temporary	1.00	DAY			942	136	0	0	0	1,078	1077.53
	11 02 03 6 02 4. Unwatering Pumps											
MIL PM	Outside Equip. Operators, Heavy	80.00	HR	X-EQOPRHVY	1.00	3,485	0	0	0	0	3,485	43.57

11 02. Gravity Drainage St			QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
MIL	PM	PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRA SH	80.00	HR	P50HO005	1.00	0	235	0	0	0	235	2.94
UPB	PM	TRK,HWY, 8,800GVW,4X4, 3/4T-PKUP REF. EP 1110-1-8 4X4 3/4-TON PICK-UP, 8800 GVW	80.00	HR	T50FO004	1.00	0	613	0	0	0	613	7.66
TOTAL		Unwatering Pumps					3,485	848	0	0	0	4,333	
TOTAL		Care and Diversi					6,310	1,256	2,500	0	0	10,066	
		11 02 03 6 03. Sitework											
		11 02 03 6 03 1. Site Preparation											
EP	PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS005	1.00	0	134	0	0	0	134	16.71
MIL	PM	Outside Equip. Operators, Heavy	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL	PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL		Site Preparation					942	134	0	0	0	1,075	
		11 02 03 6 03 2. Line Existing Pipe w/ HDPE Pipe There are 2-pipes to be lined at this location (quantities are multiplied by two)											
USR	PM	HDPE Liner	250.00	LF		0.00	0	0	0	0	25,000	25,000	100.00
B CIV	PM	Grouting, pressure, place grout between pipes	500.00	CF	XXQEB47B	17.50	5,323	1,403	1,500	0	0	8,226	16.45
TOTAL		Line Existing Pi					5,323	1,403	1,500	0	25,000	33,226	
		11 02 03 6 03 3. Site Restoration											
EP	PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS005	1.00	0	134	0	0	0	134	16.71
MIL	PM	Outside Equip. Operators, Heavy	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL	PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
USR	PM	Seeding	1.00	ACR		0.00	0	0	0	0	1,000	1,000	1000.00
TOTAL		Site Restoration					942	134	0	0	1,000	2,075	

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL	Sitework					7,206	1,671	1,500	0	26,000	36,377	
	11 02 03 6 04. Drainage Structure											
	11 02 03 6 04 1. Replace Handrail											
B CIV PM	Remove Existing Handrail handrail	70.00	LF	SIWSSSWK2	8.00	811	0	0	0	0	811	11.58
CIV PM	Castings fibergl ass, 2" dia rails pickets 5' OC, 42" high, handrail	70.00	LF	SIWSSSWK2	4.00	1,622	0	2,954	0	0	4,576	65.37
TOTAL	Replace Handrail					2,433	0	2,954	0	0	5,387	
	11 02 03 6 04 2. Replace Grating											
B CIV PM	Remove Grating	20.00	SF	SIWSSSWK2	40.00	46	0	0	0	0	46	2.32
CIV PM	Grating fbgls, m olded, 2" T, 2" sq mesh, grn (mod crsv env)	20.00	SF	SIWSSSWK2	40.00	46	0	410	0	0	457	22.84
TOTAL	Replace Grating					93	0	410	0	0	503	
	11 02 03 6 04 3. Replace Ladders											
B MIL PM	Remove Ladders	10.00	VLF	SIWSE4	12.50	149	4	0	0	0	153	15.31
MIL PM	Ladder, 20" wide , bolted to conc, w/safety equip	10.00	VLF	SIWSE4	6.25	298	8	532	0	0	838	83.81
TOTAL	Replace Ladders					447	12	532	0	0	991	
TOTAL	Drainage Structu					2,973	12	3,896	0	0	6,881	
	11 02 03 6 05. Gates											
	11 02 03 6 05 1. Remove Existing Gate											
MIL PM	Steam/Pipefitter s Foreman	12.00	HR	B-STM/PIPE	1.00	468	0	0	0	0	468	39.03
MIL PM	Steam/Pipefitter s	12.00	HR	B-STM/PIPE	1.00	456	0	0	0	0	456	38.03
MIL PM	Laborers, (Semi- Skilled)	12.00	HR	B-LABORER	1.00	445	0	0	0	0	445	37.06
MIL PM	Equip. Operators , Crane/Shovel	8.00	HR	B-EQOPRCRN	1.00	349	0	0	0	0	349	43.57
MAP PM	CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL	Remove Existing	1.00	EA			1,718	305	0	0	0	2,023	2023.24
	11 02 03 6 05 2. Rehab Gate											
	Manufacturers Rep/Erection Engineer is considered for field assistance.											
USR ME	Rehab 36" Gate w / New Manual Operator	1.00	EA		0.00	0	0	0	0	4,039	4,039	4038.85
USR ME	Erection Enginee r	1.00	LS		0.00	950	0	0	0	0	950	950.32
MIL ME	Painters, Struct ural Steel	16.00	HR	B-PAINTSS	1.00	754	0	0	0	0	754	47.10
TOTAL	Rehab Gate	1.00	EA			1,704	0	0	0	4,039	5,743	5742.79
	11 02 03 6 05 3. Install/Test Rehabbed Gate											
MIL PM	Steam/Pipefitter s Foreman	20.00	HR	B-STM/PIPE	1.00	781	0	0	0	0	781	39.03
MIL PM	Steam/Pipefitter s	16.00	HR	B-STM/PIPE	1.00	608	0	0	0	0	608	38.03
MIL PM	Laborers, (Semi- Skilled)	16.00	HR	B-LABORER	1.00	593	0	0	0	0	593	37.06
MIL PM	Equip. Operators , Crane/Shovel	12.00	HR	B-EQOPRCRN	1.00	523	0	0	0	0	523	43.57
MAP PM	CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	12.00	HR	C75GV002	1.00	0	458	0	0	0	458	38.16
MIL PM	Outside Truck Dr ivers, Heavy	4.00	HR	X-TRKDVRHV	1.00	152	0	0	0	0	152	37.92
MAP PM	FLATBED, 8'x 16. 0', W/SIDE RACKS (ADD TRUCK)	4.00	HR	T40KF016	1.00	0	3	0	0	0	3	0.84
EP PM	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	4.00	HR	T50FO006	1.00	0	57	0	0	0	57	14.36
TOTAL	Install/Test Reh	1.00	EA			2,656	519	0	0	0	3,175	3175.20
TOTAL	Gates					6,078	824	0	0	4,039	10,941	
TOTAL	GW-19, 36" Drain					24,464	5,009	7,896	0	30,039	67,408	

11 02. Gravity Drainage St

11 02 03 7. GW-20, 24" Drain (Flank)

11 02 03 7 01. Mob, Demob & Preparatory Work

Use the following crew for to mobilize equipment to the jobsite. Assume the same time for demobilzation. Use 2hrs operating time for each way. (Mob.& Demob.)

Crew -

Truck w/Lowboy	Truck Driver
Mechanics Truck	Operator
Laborer	

11 02 03 7 01 1. Mobilization and Demobilization

Asume 8hrs to mobilize equipment. Use 1hr operating time for loading and 1hr operating time for unloading equipment. Assume the same for demobilization.

		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
UPB PM	AIR COMPR, 1,600 CFM, 100 PSI REF. EP 1110-1-8 1600 CFM QUIET, 100 PSI (ADD HOSE)	4.00	HR	A15XX017	1.00	0	183	0	0	0	183	45.70
UPB PM	GENERATOR, 5.5 KW, 120/240V,PORT REF. EP 1110-1-8 5.5 KW	4.00	HR	G10HO004	0.00	0	7	0	0	0	7	1.64
MIL PM	PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRASH	4.00	HR	P50HO005	1.00	0	12	0	0	0	12	2.94
MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	4.00	HR	C75GV002	1.00	0	153	0	0	0	153	38.16
MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	4.00	HR	L50CS003	0.00	0	68	0	0	0	68	17.00
UPB PM	WELDER, 300 AMP, SKID,ELEC DRIVE	4.00	HR	W35XX009	0.00	0	6	0	0	0	6	1.59
L UPB PM	TRK,HWY, 46,000 GVW, 6X4, 3 AXLE	16.00	HR	T50FO018	1.00	0	558	0	0	0	558	34.90
L MIL PM	TRLR,LOWBOY, 60T, 3 AXLE (ADD TOWING TRUCK)	16.00	HR	T45XX017	1.00	0	134	0	0	0	134	8.38
L MIL PM	TRK,HWY,10,000GVW,4X2, 1T-PICKUP	16.00	HR	T50FO005	1.00	0	126	0	0	0	126	7.88
MIL PM	Outside Truck Drivers, Heavy *	16.00	HR	X-TRKDVRHV	1.00	607	0	0	0	0	607	37.92
MIL PM	Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL	Mobilization and					1,897	1,247	0	0	0	3,143	
TOTAL	Mob, Demob & Pre					1,897	1,247	0	0	0	3,143	
	11 02 03 7 02. Care and Diversion of Water Care of water consists of the installation of temporary bulkheads. Assume small trash pump and operator for any required pumping. Operator is assumed to be on-site for 10 working days for the purpose of dewatering.											
	11 02 03 7 02 1. Fabricate Bulkheads											
B MIL PM	Fabricate Bulkheads	1.00	LS		0.00	0	0	2,500	0	0	2,500	2500.00
TOTAL	Fabricate Bulkhe					0	0	2,500	0	0	2,500	
	11 02 03 7 02 2. Install Temporary Bulkheads											
MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	16.00	HR	L50CS003	0.00	0	272	0	0	0	272	17.00
MIL PM	Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57
MIL PM	Outside Laborers, (Semi-Skilled)	32.00	HR	X-LABORER	1.00	1,186	0	0	0	0	1,186	37.06
TOTAL	Install Temporar	2.00	DAY			1,883	272	0	0	0	2,155	1077.53
	11 02 03 7 02 3. Remove Temporary Bulkheads											
MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS003	0.00	0	136	0	0	0	136	17.00
MIL PM	Outside Equip. Operators, Heavy *	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL	Remove Temporary	1.00	DAY			942	136	0	0	0	1,078	1077.53
	11 02 03 7 02 4. Unwatering Pumps											
MIL PM	Outside Equip. Operators, Heavy	80.00	HR	X-EQOPRHVY	1.00	3,485	0	0	0	0	3,485	43.57

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
MIL PM	PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRA SH	80.00	HR	P50HO005	1.00	0	235	0	0	0	235	2.94
UPB PM	TRK,HWY, 8,800GVW,4X4, 3/4T-PKUP REF. EP 1110-1-8 4X4 3/4-TON PICK-UP, 8800 GVW	80.00	HR	T50FO004	1.00	0	613	0	0	0	613	7.66
TOTAL	Unwatering Pumps					3,485	848	0	0	0	4,333	
TOTAL	Care and Diversi					6,310	1,256	2,500	0	0	10,066	
	11 02 03 7 03. Sitework											
	11 02 03 7 03 1. Clearing, Grubbing and Stripping											
AF PM	Felling trees & piling, chipping, medium brush	1.20	ACR	CODFB7	0.22	1,223	504	0	0	0	1,727	1438.84
TOTAL	Clearing, Grubbi	1.20	ACR			1,223	504	0	0	0	1,727	1438.84
	11 02 03 7 03 2. Pavement Removal											
L MIL PM	Site dml, bituminous, pavement removal, roads, 3" thick	110.00	SY	CLADB38	50.00	408	184	0	0	0	592	5.38
MIL PM	Excavate & load, hydr excavator, 2 CY, medium matl	9.20	CY	CODEB12C	130.00	6	4	0	0	0	10	1.08
TOTAL	Pavement Removal	110.00	SY			413	188	0	0	0	602	5.47
	11 02 03 7 03 3. Remove Crushed Stone											
USR PM	Remove Crushed Stone and Stockpile	80.00	TON	CODFB10P	36.00	123	157	0	0	0	279	3.49
TOTAL	Remove Crushed S	80.00	TON			123	157	0	0	0	279	3.49
	11 02 03 7 03 4. Excavation											
L MIL PM	Excavate & load, hydr excavator, 2 CY, medium matl	6540.00	CY	CODEB12C	150.00	3,471	2,659	0	0	0	6,130	0.94

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
L	MIL PM	Hauling, hwy haulers, 12 CY, 1 mi round trip @ 20 MPH (4.2 cyc/hr)	6540.00	CY	COEIB34B	50.40	4,920	5,037	0	0	0	9,957	1.52
	TOTAL	Excavation	6540.00	CY			8,391	7,696	0	0	0	16,087	2.46
		11 02 03 7 03 5. Cofferdam											
L	MIL PM	Excavate & load, hydr excavator, 2 CY, medium matl	1700.00	CY	CODEB12C	150.00	902	691	0	0	0	1,593	0.94
L	MIL PM	Hauling, hwy haulers, 12 CY, 1 mi round trip @ 20 MPH (4.2 cyc/hr)	1700.00	CY	COEIB34B	50.40	1,279	1,309	0	0	0	2,588	1.52
	MIL PM	Spread & compact, 8" lift, embankment, 300 HP tractor	1700.00	CY	CODTB10C	312.50	300	367	0	0	0	667	0.39
	TOTAL	Cofferdam	1700.00	CY			2,481	2,367	0	0	0	4,848	2.85
		11 02 03 7 03 6. Remove Existing Pipe											
	CIV PM	Site dml, pipe removal, 24" dia, conc, water/sewer, no excavation	250.00	LF	CODLB6	15.00	1,843	212	0	0	0	2,055	8.22
	TOTAL	Remove Existing	250.00	LF			1,843	212	0	0	0	2,055	8.22
		11 02 03 7 03 7. Install New RCP											
	MIL PM	Backfill, sand bedding trenches, front-end loader, 1.5 CY	30.00	CY	CODFB10N	47.50	35	20	642	0	0	697	23.24
	MIL PM	Piping, drainage & sewage, 24" dia, RCP, class 3, no gaskets	250.00	LF	CLABB14	12.50	4,455	254	4,583	0	0	9,292	37.17
	CIV PM	Piping, drainage & sewage, RCP, precast end section, 24" dia	1.00	EA	CLABB14	2.50	89	5	268	0	0	362	361.70
	USR PM	Concrete Cradle for Pipe	2.00	CY		0.00	0	0	0	0	600	600	300.00
	USR PM	Connect Pipe to Existing Structure	1.00	EA		0.00	0	0	0	0	500	500	500.00
	TOTAL	Install New RCP	250.00	LF			4,579	280	5,492	0	1,100	11,451	45.81

11 02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
11 02 03 7 03 8. Place and Compact Backfill											
L MIL PM Excavate & load, hydr excavator, 2 CY, medium matl	7800.00	CY	CODEB12C	150.00	4,139	3,171	0	0	0	7,311	0.94
L MIL PM Hauling, hwy haulers, 12 CY, 1 mi round trip @ 20 MPH (4.2 cyc/hr)	7800.00	CY	COEIB34B	50.40	5,868	6,008	0	0	0	11,876	1.52
L AF PM Fill, spread borrow w/dozer	7800.00	CY	CODTB10B	150.00	2,869	2,825	0	0	0	5,694	0.73
AF PM Compaction, ridi ng, 8" lifts, 2 passes, sheepsfoot/wobbly wheel roller	7800.00	CY	COFCB32F	600.00	1,451	998	0	0	0	2,448	0.31
TOTAL Place and Compac	7800.00	CY			14,327	13,002	0	0	0	27,329	3.50
11 02 03 7 03 9. Crushed Stone Surfacing											
B MIL PM Base course, 3/4 " maximum size, 3" deep, crushed stone, large areas	50.00	CY	COFGB36B	75.00	198	136	488	0	0	821	16.42
TOTAL Crushed Stone Su	80.00	TON			198	136	488	0	0	821	10.26
11 02 03 7 03 10. Bituminous Road Repair											
MIL PM Surface treatmen t, prime coat, bituminous, 0.28 gal/SY	9.90	CSF	COKBB45	300.00	2	2	32	0	0	36	3.66
MIL PM Asphaltic conc p avement, highway, wearing course, 3" thick	14.00	TON	COKCB25B	100.00	62	23	406	0	0	491	35.07
TOTAL Bitumineous Road	110.00	SY			65	24	438	0	0	527	4.79
11 02 03 7 03 11. Establishment of Turf											
MIL PM Seeding, athleti c field mix, mechanical seeding, 450#/acre	1.20	ACR	COELB66	0.24	186	80	659	0	0	925	771.05
AF PM Seeding, apply f ertilizer, 1# nitrogen/MSF, spray from truck	1.20	MSF	COFWB59	35.00	1	2	6	0	0	9	7.46
TOTAL Establishment of	1.20	ACR			187	81	666	0	0	934	778.50

11	02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
	TOTAL Sitework					33,830	24,648	7,083	0	1,100	66,660	
	11 02 03 7 04. Drainage Structure											
	11 02 03 7 04 1. Replace Handrail											
B	CIV PM Remove Existing Handrail handrail	70.00	LF	SIWSSSWK2	8.00	811	0	0	0	0	811	11.58
	CIV PM Castings fibergl ass, 2" dia rails pickets 5' OC, 42" high, handrail	70.00	LF	SIWSSSWK2	4.00	1,622	0	2,954	0	0	4,576	65.37
	TOTAL Replace Handrail					2,433	0	2,954	0	0	5,387	
	11 02 03 7 04 2. Replace Grating											
B	CIV PM Remove Grating	20.00	SF	SIWSSSWK2	40.00	46	0	0	0	0	46	2.32
	CIV PM Grating fbgls, m olded, 2" T, 2" sq mesh, grn (mod crsv env)	20.00	SF	SIWSSSWK2	40.00	46	0	410	0	0	457	22.84
	TOTAL Replace Grating					93	0	410	0	0	503	
	11 02 03 7 04 3. Replace Ladders											
B	MIL PM Remove Ladders	10.00	VLF	SIWSE4	12.50	149	4	0	0	0	153	15.31
	MIL PM Ladder, 20" wide , bolted to conc, w/safety equip	10.00	VLF	SIWSE4	6.25	298	8	532	0	0	838	83.81
	TOTAL Replace Ladders					447	12	532	0	0	991	
	TOTAL Drainage Structu					2,973	12	3,896	0	0	6,881	
	11 02 03 7 05. Gates											
	11 02 03 7 05 1. Remove Existing Gate											
	MIL PM Steam/Pipefitter s Foreman	12.00	HR	B-STM/PIPE	1.00	468	0	0	0	0	468	39.03
	MIL PM Steam/Pipefitter s	12.00	HR	B-STM/PIPE	1.00	456	0	0	0	0	456	38.03
	MIL PM Laborers, (Semi- Skilled)	12.00	HR	B-LABORER	1.00	445	0	0	0	0	445	37.06
	MIL PM Equip. Operators , Crane/Shovel	8.00	HR	B-EQOPRCRN	1.00	349	0	0	0	0	349	43.57
	MAP PM CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16

11 02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL Remove Existing	1.00	EA			1,718	305	0	0	0	2,023	2023.24
11 02 03 7 05 2. Rehab Gate											
Manufacturers Rep/Erection Engineer is considered for field assistance.											
USR ME Rehab 24" Gate w / New Manual Operator	1.00	EA		0.00	0	0	0	0	3,564	3,564	3563.69
USR ME Erection Enginee r	1.00	LS		0.00	950	0	0	0	0	950	950.32
MIL ME Painters, Struct ural Steel	12.00	HR	B-PAINTSS	1.00	565	0	0	0	0	565	47.10
TOTAL Rehab Gate	1.00	EA			1,516	0	0	0	3,564	5,079	5079.23
11 02 03 7 05 3. Install/Test Rehabbed Gate											
MIL PM Steam/Pipefitter s Foreman	20.00	HR	B-STM/PIPE	1.00	781	0	0	0	0	781	39.03
MIL PM Steam/Pipefitter s	16.00	HR	B-STM/PIPE	1.00	608	0	0	0	0	608	38.03
MIL PM Laborers, (Semi- Skilled)	16.00	HR	B-LABORER	1.00	593	0	0	0	0	593	37.06
MIL PM Equip. Operators , Crane/Shovel	8.00	HR	B-EQOPRCRN	1.00	349	0	0	0	0	349	43.57
MAP PM CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16
MIL PM Outside Truck Dr ivers, Heavy	4.00	HR	X-TRKDVRHV	1.00	152	0	0	0	0	152	37.92
MAP PM FLATBED, 8'x 16. 0', W/SIDE RACKS (ADD TRUCK)	4.00	HR	T40KF016	1.00	0	3	0	0	0	3	0.84
EP PM TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	4.00	HR	T50FO006	1.00	0	57	0	0	0	57	14.36
TOTAL Install/Test Reh	1.00	EA			2,482	366	0	0	0	2,848	2848.28
TOTAL Gates					5,716	671	0	0	3,564	9,951	
TOTAL GW-20, 24" Drain					50,725	27,834	13,480	0	4,664	96,701	

11 02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
11 02 03 8. GW-21, 24" Drain (Flank)											
11 02 03 8 01. Mob, Demob & Preparatory Work Use the following crew for to mobilize equipment to the jobsite. Assume the same time for demobilzation. Use 2hrs operating time for each way. (Mob.& Demob.) Crew - -------- Truck w/Lowboy — Truck Driver Mechanics Truck — Operator Laborer											
11 02 03 8 01 1. Mobilization and Demobilization Asume 8hrs to mobilize equipment. Use 1hr operating time for loading and 1hr operating time for unloading equipment. Assume the same for demobilization.											
UPB PM AIR COMPR, 1,600 CFM, 100 PSI REF. EP 1110-1-8 1600 CFM QUIET, 100 PSI (ADD HOSE)	4.00	HR	A15XX017	1.00	0	183	0	0	0	183	45.70
UPB PM GENERATOR, 5.5 KW, 120/240V,PORT REF. EP 1110-1-8 5.5 KW	4.00	HR	G10HO004	0.00	0	7	0	0	0	7	1.64
MIL PM PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRASH	4.00	HR	P50HO005	1.00	0	12	0	0	0	12	2.94
MAP PM CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	4.00	HR	C75GV002	1.00	0	153	0	0	0	153	38.16
MIL PM LDR,BH,WH, 1.00CY FE BKT, 24"DIP	4.00	HR	L50CS003	0.00	0	68	0	0	0	68	17.00
UPB PM WELDER, 300 AMP, SKID,ELEC DRIVE	4.00	HR	W35XX009	0.00	0	6	0	0	0	6	1.59
L UPB PM TRK,HWY, 46,000 GVW, 6X4, 3 AXLE	16.00	HR	T50FO018	1.00	0	558	0	0	0	558	34.90
L MIL PM TRLR,LOWBOY, 60T, 3 AXLE (ADD TOWING TRUCK)	16.00	HR	T45XX017	1.00	0	134	0	0	0	134	8.38
L MIL PM TRK,HWY,10,000GVW,4X2, 1T-PICKUP	16.00	HR	T50FO005	1.00	0	126	0	0	0	126	7.88
MIL PM Outside Truck Drivers, Heavy *	16.00	HR	X-TRKDVRHV	1.00	607	0	0	0	0	607	37.92
MIL PM Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL	Mobilization and					1,897	1,247	0	0	0	3,143	
TOTAL	Mob, Demob & Pre					1,897	1,247	0	0	0	3,143	
	11 02 03 8 02. Care and Diversion of Water											
	Care of water consists of the installation of temporary bulkheads. Assume small trash pump and operator for any required pumping. Operator is assumed to be on-site for 10 working days for the purpose of dewatering.											
	11 02 03 8 02 1. Fabricate Bulkheads											
B MIL PM	Fabricate Bulkheads	1.00	LS		0.00	0	0	2,500	0	0	2,500	2500.00
TOTAL	Fabricate Bulkhe					0	0	2,500	0	0	2,500	
	11 02 03 8 02 2. Install Temporary Bulkheads											
MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	16.00	HR	L50CS003	0.00	0	272	0	0	0	272	17.00
MIL PM	Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57
MIL PM	Outside Laborers, (Semi-Skilled)	32.00	HR	X-LABORER	1.00	1,186	0	0	0	0	1,186	37.06
TOTAL	Install Temporar	2.00	DAY			1,883	272	0	0	0	2,155	1077.53
	11 02 03 8 02 3. Remove Temporary Bulkheads											
MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS003	0.00	0	136	0	0	0	136	17.00
MIL PM	Outside Equip. Operators, Heavy *	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL	Remove Temporary	1.00	DAY			942	136	0	0	0	1,078	1077.53
	11 02 03 8 02 4. Unwatering Pumps											
MIL PM	Outside Equip. Operators, Heavy	80.00	HR	X-EQOPRHVY	1.00	3,485	0	0	0	0	3,485	43.57

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
MIL PM	PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRA SH	80.00	HR	P50HO005	1.00	0	235	0	0	0	235	2.94
UPB PM	TRK,HWY, 8,800GVW,4X4, 3/4T-PKUP REF. EP 1110-1-8 4X4 3/4-TON PICK-UP, 8800 GVW	80.00	HR	T50FO004	1.00	0	613	0	0	0	613	7.66
TOTAL	Unwatering Pumps					3,485	848	0	0	0	4,333	
TOTAL	Care and Diversi					6,310	1,256	2,500	0	0	10,066	
	11 02 03 8 03. Sitework											
	11 02 03 8 03 1. Clearing, Grubbing and Stripping											
AF PM	Felling trees & piling, chipping, medium brush	1.20	ACR	CODFB7	0.22	1,223	504	0	0	0	1,727	1438.84
TOTAL	Clearing, Grubbi	1.20	ACR			1,223	504	0	0	0	1,727	1438.84
	11 02 03 8 03 2. Pavement Removal											
L MIL PM	Site dml, bituminous, pavement removal, roads, 3" thick	110.00	SY	CLADB38	50.00	408	184	0	0	0	592	5.38
MIL PM	Excavate & load, hydr excavator, 2 CY, medium matl	9.20	CY	CODEB12C	130.00	6	4	0	0	0	10	1.08
TOTAL	Pavement Removal	110.00	SY			413	188	0	0	0	602	5.47
	11 02 03 8 03 3. Remove Crushed Stone											
USR PM	Remove Crushed Stone and Stockpile	80.00	TON	CODFB10P	36.00	123	157	0	0	0	279	3.49
TOTAL	Remove Crushed S	80.00	TON			123	157	0	0	0	279	3.49
	11 02 03 8 03 4. Excavation											
L MIL PM	Excavate & load, hydr excavator, 2 CY, medium matl	6540.00	CY	CODEB12C	150.00	3,471	2,659	0	0	0	6,130	0.94

11	02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
L	MIL PM Hauling, hwy hau lers, 12 CY, 1 mi round trip @ 20 MPH (4.2 cyc/hr)	6540.00	CY	COEIB34B	50.40	4,920	5,037	0	0	0	9,957	1.52
	TOTAL Excavation	6540.00	CY			8,391	7,696	0	0	0	16,087	2.46
	11 02 03 8 03 5. Cofferdam											
L	MIL PM Excavate & load, hydr excavator, 2 CY, medium matl	1700.00	CY	CODEB12C	150.00	902	691	0	0	0	1,593	0.94
L	MIL PM Hauling, hwy hau lers, 12 CY, 1 mi round trip @ 20 MPH (4.2 cyc/hr)	1700.00	CY	COEIB34B	50.40	1,279	1,309	0	0	0	2,588	1.52
	MIL PM Spread & compact , 8" lift, embankment, 300 HP tractor	1700.00	CY	CODTB10C	312.50	300	367	0	0	0	667	0.39
	TOTAL Cofferdam	1700.00	CY			2,481	2,367	0	0	0	4,848	2.85
	11 02 03 8 03 6. Remove Existing Pipe											
	CIV PM Site dml, pipe r emoval, 24" dia, conc, water/sewer, no excavation	250.00	LF	CODLB6	15.00	1,843	212	0	0	0	2,055	8.22
	TOTAL Remove Existing	250.00	LF			1,843	212	0	0	0	2,055	8.22
	11 02 03 8 03 7. Install New RCP											
	MIL PM Backfill, sand b edding trenches, front-end loader, 1.5 CY	30.00	CY	CODFB10N	47.50	35	20	642	0	0	697	23.24
	MIL PM Piping, drainage & sewage, 24" dia, RCP, class 3, no gaskets	250.00	LF	CLABB14	12.50	4,455	254	4,583	0	0	9,292	37.17
	CIV PM Piping, drainage & sewage, RCP, precast end section, 24" dia	1.00	EA	CLABB14	2.50	89	5	268	0	0	362	361.70
	USR PM Concrete Cradle for Pipe	2.00	CY		0.00	0	0	0	0	600	600	300.00
	USR PM Connect Pipe to Existing Structure	1.00	EA		0.00	0	0	0	0	500	500	500.00
	TOTAL Install New RCP	250.00	LF			4,579	280	5,492	0	1,100	11,451	45.81

11 02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
11 02 03 8 03 8. Place and Compact Backfill											
L MIL PM Excavate & load, hydr excavator, 2 CY, medium matl	7800.00	CY	CODEB12C	150.00	4,139	3,171	0	0	0	7,311	0.94
L MIL PM Hauling, hwy haulers, 12 CY, 1 mi round trip @ 20 MPH (4.2 cyc/hr)	7800.00	CY	COEIB34B	50.40	5,868	6,008	0	0	0	11,876	1.52
L AF PM Fill, spread borrow w/dozer	7800.00	CY	CODTB10B	150.00	2,869	2,825	0	0	0	5,694	0.73
AF PM Compaction, ridi ng, 8" lifts, 2 passes, sheepsfoot/wobbly wheel roller	7800.00	CY	COFCB32F	600.00	1,451	998	0	0	0	2,448	0.31
TOTAL Place and Compac	7800.00	CY			14,327	13,002	0	0	0	27,329	3.50
11 02 03 8 03 9. Crushed Stone Surfacing											
B MIL PM Base course, 3/4 " maximum size, 3" deep, crushed stone, large areas	50.00	CY	COFGB36B	75.00	198	136	488	0	0	821	16.42
TOTAL Crushed Stone Su	80.00	TON			198	136	488	0	0	821	10.26
11 02 03 8 03 10. Bituminous Road Repair											
MIL PM Surface treatmen t, prime coat, bituminous, 0.28 gal/SY	9.90	CSF	COKBB45	300.00	2	2	32	0	0	36	3.66
MIL PM Asphaltic conc p avement, highway, wearing course, 3" thick	14.00	TON	COKCB25B	100.00	62	23	406	0	0	491	35.07
TOTAL Bitumineous Road	110.00	SY			65	24	438	0	0	527	4.79
11 02 03 8 03 11. Establishment of Turf											
MIL PM Seeding, athleti c field mix, mechanical seeding, 450#/acre	1.20	ACR	COELB66	0.24	186	80	659	0	0	925	771.05
AF PM Seeding, apply f ertilizer, 1# nitrogen/MSF, spray from truck	1.20	MSF	COFWB59	35.00	1	2	6	0	0	9	7.46
TOTAL Establishment of	1.20	ACR			187	81	666	0	0	934	778.50

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL	Sitework					33,830	24,648	7,083	0	1,100	66,660	
	11 02 03 8 04. Drainage Structure											
	11 02 03 8 04 1. Replace Handrail											
B CIV PM	Remove Existing Handrail handrail	70.00	LF	SIWSSSWK2	8.00	811	0	0	0	0	811	11.58
CIV PM	Castings fibergl ass, 2" dia rails pickets 5' OC, 42" high, handrail	70.00	LF	SIWSSSWK2	4.00	1,622	0	2,954	0	0	4,576	65.37
TOTAL	Replace Handrail					2,433	0	2,954	0	0	5,387	
	11 02 03 8 04 2. Replace Grating											
B CIV PM	Remove Grating	20.00	SF	SIWSSSWK2	40.00	46	0	0	0	0	46	2.32
CIV PM	Grating fbgls, m olded, 2" T, 2" sq mesh, grn (mod crsv env)	20.00	SF	SIWSSSWK2	40.00	46	0	410	0	0	457	22.84
TOTAL	Replace Grating					93	0	410	0	0	503	
	11 02 03 8 04 3. Replace Ladders											
B MIL PM	Remove Ladders	10.00	VLF	SIWSE4	12.50	149	4	0	0	0	153	15.31
MIL PM	Ladder, 20" wide , bolted to conc, w/safety equip	10.00	VLF	SIWSE4	6.25	298	8	532	0	0	838	83.81
TOTAL	Replace Ladders					447	12	532	0	0	991	
TOTAL	Drainage Structu					2,973	12	3,896	0	0	6,881	
	11 02 03 8 05. Gates											
	11 02 03 8 05 1. Remove Existing Gate											
MIL PM	Steam/Pipefitter s Foreman	12.00	HR	B-STM/PIPE	1.00	468	0	0	0	0	468	39.03
MIL PM	Steam/Pipefitter s	12.00	HR	B-STM/PIPE	1.00	456	0	0	0	0	456	38.03
MIL PM	Laborers, (Semi- Skilled)	12.00	HR	B-LABORER	1.00	445	0	0	0	0	445	37.06
MIL PM	Equip. Operators , Crane/Shovel	8.00	HR	B-EQOPRCRN	1.00	349	0	0	0	0	349	43.57
MAP PM	CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL	Remove Existing	1.00	EA			1,718	305	0	0	0	2,023	2023.24
	11 02 03 8 05 2. Rehab Gate											
	Manufacturers Rep/Erection Engineer is considered for field assistance.											
USR ME	Rehab 24" Gate w / New Manual Operator	1.00	EA		0.00	0	0	0	0	3,564	3,564	3563.69
USR ME	Erection Enginee r	1.00	LS		0.00	950	0	0	0	0	950	950.32
MIL ME	Painters, Struct ural Steel	12.00	HR	B-PAINTSS	1.00	565	0	0	0	0	565	47.10
TOTAL	Rehab Gate	1.00	EA			1,516	0	0	0	3,564	5,079	5079.23
	11 02 03 8 05 3. Install/Test Rehabbed Gate											
MIL PM	Steam/Pipefitter s Foreman	20.00	HR	B-STM/PIPE	1.00	781	0	0	0	0	781	39.03
MIL PM	Steam/Pipefitter s	16.00	HR	B-STM/PIPE	1.00	608	0	0	0	0	608	38.03
MIL PM	Laborers, (Semi- Skilled)	16.00	HR	B-LABORER	1.00	593	0	0	0	0	593	37.06
MIL PM	Equip. Operators , Crane/Shovel	8.00	HR	B-EQOPRCRN	1.00	349	0	0	0	0	349	43.57
MAP PM	CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16
MIL PM	Outside Truck Dr ivers, Heavy	4.00	HR	X-TRKDVRHV	1.00	152	0	0	0	0	152	37.92
MAP PM	FLATBED, 8'x 16. 0', W/SIDE RACKS (ADD TRUCK)	4.00	HR	T40KF016	1.00	0	3	0	0	0	3	0.84
EP PM	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	4.00	HR	T50FO006	1.00	0	57	0	0	0	57	14.36
TOTAL	Install/Test Reh	1.00	EA			2,482	366	0	0	0	2,848	2848.28
TOTAL	Gates					5,716	671	0	0	3,564	9,951	
TOTAL	GW-21, 24" Drain					50,725	27,834	13,480	0	4,664	96,701	

11 02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
11 02 03 10. GW-23, 30" Drain (Flank)											
11 02 03 10 01. Mob, Demob & Preparatory Work Use the following crew for to mobilize equipment to the jobsite. Assume the same time for demobilzation. Use 2hrs operating time for each way. (Mob.& Demob.) Crew - -------- Truck w/Lowboy Truck Driver Mechanics Truck Operator Laborer											
11 02 03 10 01 1. Mobilization and Demobilization Asume 8hrs to mobilize equipment. Use 1hr operating time for loading and 1hr operating time for unloading equipment. Assume the same for demobilization.											
UPB PM AIR COMPR, 1,600 CFM, 100 PSI REF. EP 1110-1-8 1600 CFM QUIET, 100 PSI (ADD HOSE)	4.00	HR	A15XX017	1.00	0	183	0	0	0	183	45.70
UPB PM GENERATOR, 5.5 KW, 120/240V,PORT REF. EP 1110-1-8 5.5 KW	4.00	HR	G10HO004	0.00	0	7	0	0	0	7	1.64
MIL PM PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRASH	4.00	HR	P50HO005	1.00	0	12	0	0	0	12	2.94
MAP PM CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	4.00	HR	C75GV002	1.00	0	153	0	0	0	153	38.16
MIL PM LDR,BH,WH, 1.00CY FE BKT, 24"DIP	4.00	HR	L50CS003	0.00	0	68	0	0	0	68	17.00
UPB PM WELDER, 300 AMP, SKID,ELEC DRIVE	4.00	HR	W35XX009	0.00	0	6	0	0	0	6	1.59
L UPB PM TRK,HWY, 46,000 GVW, 6X4, 3 AXLE	16.00	HR	T50FO018	1.00	0	558	0	0	0	558	34.90
L MIL PM TRLR,LOWBOY, 60T, 3 AXLE (ADD TOWING TRUCK)	16.00	HR	T45XX017	1.00	0	134	0	0	0	134	8.38
L MIL PM TRK,HWY,10,000GVW,4X2, 1T-PICKUP	16.00	HR	T50FO005	1.00	0	126	0	0	0	126	7.88
MIL PM Outside Truck Drivers, Heavy *	16.00	HR	X-TRKDVRHV	1.00	607	0	0	0	0	607	37.92
MIL PM Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL	Mobilization and					1,897	1,247	0	0	0	3,143	
TOTAL	Mob, Demob & Pre					1,897	1,247	0	0	0	3,143	
	11 02 03 10 02. Care and Diversion of Water											
	Care of water consists of the installation of temporary bulkheads. Assume small trash pump and operator for any required pumping. Operator is assumed to be on-site for 10 working days for the purpose of dewatering.											
	11 02 03 10 02 1. Fabricate Bulkheads											
B MIL PM	Fabricate Bulkheads	1.00	LS		0.00	0	0	2,500	0	0	2,500	2500.00
TOTAL	Fabricate Bulkhe					0	0	2,500	0	0	2,500	
	11 02 03 10 02 2. Install Temporary Bulkheads											
MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	16.00	HR	L50CS003	0.00	0	272	0	0	0	272	17.00
MIL PM	Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57
MIL PM	Outside Laborers, (Semi-Skilled)	32.00	HR	X-LABORER	1.00	1,186	0	0	0	0	1,186	37.06
TOTAL	Install Temporar	2.00	DAY			1,883	272	0	0	0	2,155	1077.53
	11 02 03 10 02 3. Remove Temporary Bulkheads											
MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS003	0.00	0	136	0	0	0	136	17.00
MIL PM	Outside Equip. Operators, Heavy *	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL	Remove Temporary	1.00	DAY			942	136	0	0	0	1,078	1077.53
	11 02 03 10 02 4. Unwatering Pumps											
MIL PM	Outside Equip. Operators, Heavy	80.00	HR	X-EQOPRHVY	1.00	3,485	0	0	0	0	3,485	43.57

		11 02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
MIL	PM	PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRA SH	80.00	HR	P50HO005	1.00	0	235	0	0	0	235	2.94
UPB	PM	TRK,HWY, 8,800GVW,4X4, 3/4T-PKUP REF. EP 1110-1-8 4X4 3/4-TON PICK-UP, 8800 GVW	80.00	HR	T50FO004	1.00	0	613	0	0	0	613	7.66
TOTAL		Unwatering Pumps					3,485	848	0	0	0	4,333	
TOTAL		Care and Diversi					6,310	1,256	2,500	0	0	10,066	
		11 02 03 10 03. Sitework											
		11 02 03 10 03 1. Site Preparation											
EP	PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS005	1.00	0	134	0	0	0	134	16.71
MIL	PM	Outside Equip. Operators, Heavy	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL	PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL		Site Preparation					942	134	0	0	0	1,075	
		11 02 03 10 03 2. Line Existing Pipe w/ HDPE Pipe There are 2-pipes to be lined at this location (quantities are multiplied by two)											
USR	PM	HDPE Liner	250.00	LF		0.00	0	0	0	0	25,000	25,000	100.00
B CIV	PM	Grouting, pressure, place grout between pipes	500.00	CF	XXQEB47B	17.50	5,323	1,403	1,500	0	0	8,226	16.45
TOTAL		Line Existing Pi					5,323	1,403	1,500	0	25,000	33,226	
		11 02 03 10 03 3. Site Restoration											
EP	PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS005	1.00	0	134	0	0	0	134	16.71
MIL	PM	Outside Equip. Operators, Heavy	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL	PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
USR	PM	Seeding	1.00	ACR		0.00	0	0	0	0	1,000	1,000	1000.00
TOTAL		Site Restoration					942	134	0	0	1,000	2,075	

		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
11 02. Gravity Drainage St												
TOTAL	Sitework					7,206	1,671	1,500	0	26,000	36,377	
	11 02 03 10 04. Drainage Structure											
	11 02 03 10 04 1. Replace Handrail											
B CIV PM	Remove Existing Handrail handrail	70.00	LF	SIWSSSWK2	8.00	811	0	0	0	0	811	11.58
CIV PM	Castings fibergl ass, 2" dia rails pickets 5' OC, 42" high, handrail	70.00	LF	SIWSSSWK2	4.00	1,622	0	2,954	0	0	4,576	65.37
TOTAL	Replace Handrail					2,433	0	2,954	0	0	5,387	
	11 02 03 10 04 2. Replace Grating											
B CIV PM	Remove Grating	20.00	SF	SIWSSSWK2	40.00	46	0	0	0	0	46	2.32
CIV PM	Grating fbgls, m olded, 2" T, 2" sq mesh, grn (mod crsv env)	20.00	SF	SIWSSSWK2	40.00	46	0	410	0	0	457	22.84
TOTAL	Replace Grating					93	0	410	0	0	503	
	11 02 03 10 04 3. Replace Ladders											
B MIL PM	Remove Ladders	10.00	VLF	SIWSE4	12.50	149	4	0	0	0	153	15.31
MIL PM	Ladder, 20" wide , bolted to conc, w/safety equip	10.00	VLF	SIWSE4	6.25	298	8	532	0	0	838	83.81
TOTAL	Replace Ladders					447	12	532	0	0	991	
TOTAL	Drainage Structu					2,973	12	3,896	0	0	6,881	
	11 02 03 10 05. Gates											
	11 02 03 10 05 1. Remove Existing Gate											
MIL PM	Steam/Pipefitter s Foreman	12.00	HR	B-STM/PIPE	1.00	468	0	0	0	0	468	39.03
MIL PM	Steam/Pipefitter s	12.00	HR	B-STM/PIPE	1.00	456	0	0	0	0	456	38.03
MIL PM	Laborers, (Semi- Skilled)	12.00	HR	B-LABORER	1.00	445	0	0	0	0	445	37.06
MIL PM	Equip. Operators , Crane/Shovel	8.00	HR	B-EQOPRCRN	1.00	349	0	0	0	0	349	43.57
MAP PM	CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL	Remove Existing	1.00	EA			1,718	305	0	0	0	2,023	2023.24
	11 02 03 10 05 2. Rehab Gate											
	Manufacturers Rep/Erection Engineer is considered for field assistance.											
USR ME	Rehab 30" Gate w / New Manual Operator	1.00	EA		0.00	0	0	0	0	3,801	3,801	3801.27
USR ME	Erection Enginee r	1.00	LS		0.00	950	0	0	0	0	950	950.32
MIL ME	Painters, Struct ural Steel	12.00	HR	B-PAINTSS	1.00	565	0	0	0	0	565	47.10
TOTAL	Rehab Gate	1.00	EA			1,516	0	0	0	3,801	5,317	5316.81
	11 02 03 10 05 3. Install/Test Rehabbed Gate											
MIL PM	Steam/Pipefitter s Foreman	20.00	HR	B-STM/PIPE	1.00	781	0	0	0	0	781	39.03
MIL PM	Steam/Pipefitter s	16.00	HR	B-STM/PIPE	1.00	608	0	0	0	0	608	38.03
MIL PM	Laborers, (Semi- Skilled)	16.00	HR	B-LABORER	1.00	593	0	0	0	0	593	37.06
MIL PM	Equip. Operators , Crane/Shovel	12.00	HR	B-EQOPRCRN	1.00	523	0	0	0	0	523	43.57
MAP PM	CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	12.00	HR	C75GV002	1.00	0	458	0	0	0	458	38.16
MIL PM	Outside Truck Dr ivers, Heavy	4.00	HR	X-TRKDVRHV	1.00	152	0	0	0	0	152	37.92
MAP PM	FLATBED, 8'x 16. 0', W/SIDE RACKS (ADD TRUCK)	4.00	HR	T40KF016	1.00	0	3	0	0	0	3	0.84
EP PM	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	4.00	HR	T50FO006	1.00	0	57	0	0	0	57	14.36
TOTAL	Install/Test Reh	1.00	EA			2,656	519	0	0	0	3,175	3175.20
TOTAL	Gates					5,890	824	0	0	3,801	10,515	
TOTAL	GW-23, 30" Drain					24,275	5,009	7,896	0	29,801	66,982	

11 02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
11 02 03 11. GW-24, 48" Drain (Riverfront)											
11 02 03 11 01. Mob, Demob & Preparatory Work Use the following crew for to mobilize equipment to the jobsite. Assume the same time for demobilzation. Use 2hrs operating time for each way. (Mob.& Demob.) Crew - -------- Truck w/Lowboy Truck Driver Mechanics Truck Operator Laborer											
11 02 03 11 01 1. Mobilization and Demobilization Asume 8hrs to mobilize equipment. Use 1hr operating time for loading and 1hr operating time for unloading equipment. Assume the same for demobilization.											
UPB PM AIR COMPR, 1,600 CFM, 100 PSI REF. EP 1110-1-8 1600 CFM QUIET, 100 PSI (ADD HOSE)	4.00	HR	A15XX017	1.00	0	183	0	0	0	183	45.70
UPB PM GENERATOR, 5.5 KW, 120/240V,PORT REF. EP 1110-1-8 5.5 KW	4.00	HR	G10HO004	0.00	0	7	0	0	0	7	1.64
MIL PM PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRASH	4.00	HR	P50HO005	1.00	0	12	0	0	0	12	2.94
MAP PM CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	4.00	HR	C75GV002	1.00	0	153	0	0	0	153	38.16
MIL PM LDR,BH,WH, 1.00CY FE BKT, 24"DIP	4.00	HR	L50CS003	0.00	0	68	0	0	0	68	17.00
UPB PM WELDER, 300 AMP, SKID,ELEC DRIVE	4.00	HR	W35XX009	0.00	0	6	0	0	0	6	1.59
L UPB PM TRK,HWY, 46,000 GVW, 6X4, 3 AXLE	16.00	HR	T50FO018	1.00	0	558	0	0	0	558	34.90
L MIL PM TRLR,LOWBOY, 60T, 3 AXLE (ADD TOWING TRUCK)	16.00	HR	T45XX017	1.00	0	134	0	0	0	134	8.38
L MIL PM TRK,HWY,10,000GVW,4X2, 1T-PICKUP	16.00	HR	T50FO005	1.00	0	126	0	0	0	126	7.88
MIL PM Outside Truck Drivers, Heavy *	16.00	HR	X-TRKDVRHV	1.00	607	0	0	0	0	607	37.92
MIL PM Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL	Mobilization and					1,897	1,247	0	0	0	3,143	
TOTAL	Mob, Demob & Pre					1,897	1,247	0	0	0	3,143	
	11 02 03 11 02. Care and Diversion of Water											
	Care of water consists of the installation of temporary bulkheads. Assume small trash pump and operator for any required pumping. Operator is assumed to be on-site for 10 working days for the purpose of dewatering.											
	11 02 03 11 02 1. Fabricate Bulkheads											
B MIL PM	Fabricate Bulkheads	1.00	LS		0.00	0	0	2,500	0	0	2,500	2500.00
TOTAL	Fabricate Bulkhe					0	0	2,500	0	0	2,500	
	11 02 03 11 02 2. Install Temporary Bulkheads											
MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	16.00	HR	L50CS003	0.00	0	272	0	0	0	272	17.00
MIL PM	Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57
MIL PM	Outside Laborers, (Semi-Skilled)	32.00	HR	X-LABORER	1.00	1,186	0	0	0	0	1,186	37.06
TOTAL	Install Temporar	2.00	DAY			1,883	272	0	0	0	2,155	1077.53
	11 02 03 11 02 3. Remove Temporary Bulkheads											
MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS003	0.00	0	136	0	0	0	136	17.00
MIL PM	Outside Equip. Operators, Heavy *	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL	Remove Temporary	1.00	DAY			942	136	0	0	0	1,078	1077.53
	11 02 03 11 02 4. Unwatering Pumps											
MIL PM	Outside Equip. Operators, Heavy	80.00	HR	X-EQOPRHVY	1.00	3,485	0	0	0	0	3,485	43.57

11 02. Gravity Drainage St			QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
MIL	PM	PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRA SH	80.00	HR	P50HO005	1.00	0	235	0	0	0	235	2.94
UPB	PM	TRK,HWY, 8,800GVW,4X4, 3/4T-PKUP REF. EP 1110-1-8 4X4 3/4-TON PICK-UP, 8800 GVW	80.00	HR	T50FO004	1.00	0	613	0	0	0	613	7.66
TOTAL		Unwatering Pumps					3,485	848	0	0	0	4,333	
TOTAL		Care and Diversi					6,310	1,256	2,500	0	0	10,066	
		11 02 03 11 03. Sitework											
		11 02 03 11 03 1. Site Preparation											
EP	PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS005	1.00	0	134	0	0	0	134	16.71
MIL	PM	Outside Equip. Operators, Heavy	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL	PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL		Site Preparation					942	134	0	0	0	1,075	
		11 02 03 11 03 2. Line Existing Pipe w/ HDPE Pipe There are 2-pipes to be lined at this location (quantities are multiplied by two)											
USR	PM	HDPE Liner	250.00	LF		0.00	0	0	0	0	25,000	25,000	100.00
B CIV	PM	Grouting, pressure, place grout between pipes	500.00	CF	XXQEB47B	17.50	5,323	1,403	1,500	0	0	8,226	16.45
TOTAL		Line Existing Pi					5,323	1,403	1,500	0	25,000	33,226	
		11 02 03 11 03 3. Site Restoration											
EP	PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS005	1.00	0	134	0	0	0	134	16.71
MIL	PM	Outside Equip. Operators, Heavy	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL	PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
USR	PM	Seeding	1.00	ACR		0.00	0	0	0	0	1,000	1,000	1000.00
TOTAL		Site Restoration					942	134	0	0	1,000	2,075	

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL	Sitework					7,206	1,671	1,500	0	26,000	36,377	
	11 02 03 11 04. Drainage Structure											
	11 02 03 11 04 1. Replace Handrail											
B CIV PM	Remove Existing Handrail handrail	70.00	LF	SIWSSSWK2	8.00	811	0	0	0	0	811	11.58
CIV PM	Castings fibergl ass, 2" dia rails pickets 5' OC, 42" high, handrail	70.00	LF	SIWSSSWK2	4.00	1,622	0	2,954	0	0	4,576	65.37
TOTAL	Replace Handrail					2,433	0	2,954	0	0	5,387	
	11 02 03 11 04 2. Replace Grating											
B CIV PM	Remove Grating	20.00	SF	SIWSSSWK2	40.00	46	0	0	0	0	46	2.32
CIV PM	Grating fbgls, m olded, 2" T, 2" sq mesh, grn (mod crsv env)	20.00	SF	SIWSSSWK2	40.00	46	0	410	0	0	457	22.84
TOTAL	Replace Grating					93	0	410	0	0	503	
	11 02 03 11 04 3. Replace Ladders											
B MIL PM	Remove Ladders	10.00	VLF	SIWSE4	12.50	149	4	0	0	0	153	15.31
MIL PM	Ladder, 20" wide , bolted to conc, w/safety equip	10.00	VLF	SIWSE4	6.25	298	8	532	0	0	838	83.81
TOTAL	Replace Ladders					447	12	532	0	0	991	
TOTAL	Drainage Structu					2,973	12	3,896	0	0	6,881	
	11 02 03 11 05. Gates											
	11 02 03 11 05 1. Remove Existing Gate											
MIL PM	Steam/Pipefitter s Foreman	16.00	HR	B-STM/PIPE	1.00	624	0	0	0	0	624	39.03
MIL PM	Steam/Pipefitter s	16.00	HR	B-STM/PIPE	1.00	608	0	0	0	0	608	38.03
MIL PM	Laborers, (Semi- Skilled)	16.00	HR	B-LABORER	1.00	593	0	0	0	0	593	37.06
MIL PM	Equip. Operators , Crane/Shovel	12.00	HR	B-EQOPRCRN	1.00	523	0	0	0	0	523	43.57
MAP PM	CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	12.00	HR	C75GV002	1.00	0	458	0	0	0	458	38.16

11 02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL Remove Existing	1.00	EA			2,349	458	0	0	0	2,807	2806.63
11 02 03 11 05 2. Replace Gate											
Manufacturers Rep/Erection Engineer is considered for field assistance.											
USR ME Replace 48" Gate w/ New Manual Operator	1.00	EA		0.00	0	0	0	0	8,315	8,315	8315.28
USR ME Replace 48" Flap Gate	1.00	EA		0.00	0	0	0	0	7,721	7,721	7721.33
USR ME Erection Engineer	1.00	LS		0.00	1,188	0	0	0	0	1,188	1187.90
TOTAL Replace Gate	1.00	EA			1,188	0	0	0	16,037	17,225	17225
11 02 03 11 05 3. Install/Test New Gate											
MIL PM Steam/Pipefitters Foreman	24.00	HR	B-STM/PIPE	1.00	937	0	0	0	0	937	39.03
MIL PM Steam/Pipefitters	20.00	HR	B-STM/PIPE	1.00	761	0	0	0	0	761	38.03
MIL PM Laborers, (Semi-Skilled)	20.00	HR	B-LABORER	1.00	741	0	0	0	0	741	37.06
MIL PM Equip. Operators, Crane/Shovel	16.00	HR	B-EQOPRCRN	1.00	697	0	0	0	0	697	43.57
MAP PM CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	16.00	HR	C75GV002	1.00	0	611	0	0	0	611	38.16
MIL PM Outside Truck Drivers, Heavy	4.00	HR	X-TRKDVRHV	1.00	152	0	0	0	0	152	37.92
MAP PM FLATBED, 8'x 16.0', W/SIDE RACKS (ADD TRUCK)	4.00	HR	T40KF016	1.00	0	3	0	0	0	3	0.84
EP PM TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	4.00	HR	T50FO006	1.00	0	57	0	0	0	57	14.36
TOTAL Install/Test New	1.00	EA			3,287	671	0	0	0	3,959	3958.59
TOTAL Gates					6,824	1,129	0	0	16,037	23,990	
TOTAL GW-24, 48" Drain					25,209	5,315	7,896	0	42,037	80,457	

11 02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
11 02 03 14. GW-27, 24" Drain (Riverfront)											
11 02 03 14 01. Mob, Demob & Preparatory Work Use the following crew for to mobilize equipment to the jobsite. Assume the same time for demobilzation. Use 2hrs operating time for each way. (Mob.& Demob.) Crew - -------- Truck w/Lowboy — Truck Driver Mechanics Truck — Operator Laborer											
11 02 03 14 01 1. Mobilization and Demobilization Asume 8hrs to mobilize equipment. Use 1hr operating time for loading and 1hr operating time for unloading equipment. Assume the same for demobilization.											
UPB PM AIR COMPR, 1,600 CFM, 100 PSI REF. EP 1110-1-8 1600 CFM QUIET, 100 PSI (ADD HOSE)	4.00	HR	A15XX017	1.00	0	183	0	0	0	183	45.70
UPB PM GENERATOR, 5.5 KW, 120/240V,PORT REF. EP 1110-1-8 5.5 KW	4.00	HR	G10HO004	0.00	0	7	0	0	0	7	1.64
MIL PM PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRASH	4.00	HR	P50HO005	1.00	0	12	0	0	0	12	2.94
MAP PM CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	4.00	HR	C75GV002	1.00	0	153	0	0	0	153	38.16
MIL PM LDR,BH,WH, 1.00CY FE BKT, 24"DIP	4.00	HR	L50CS003	0.00	0	68	0	0	0	68	17.00
UPB PM WELDER, 300 AMP, SKID,ELEC DRIVE	4.00	HR	W35XX009	0.00	0	6	0	0	0	6	1.59
L UPB PM TRK,HWY, 46,000 GVW, 6X4, 3 AXLE	16.00	HR	T50FO018	1.00	0	558	0	0	0	558	34.90
L MIL PM TRLR,LOWBOY, 60T, 3 AXLE (ADD TOWING TRUCK)	16.00	HR	T45XX017	1.00	0	134	0	0	0	134	8.38
L MIL PM TRK,HWY,10,000GVW,4X2, 1T-PICKUP	16.00	HR	T50FO005	1.00	0	126	0	0	0	126	7.88
MIL PM Outside Truck Drivers, Heavy *	16.00	HR	X-TRKDVRHV	1.00	607	0	0	0	0	607	37.92
MIL PM Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL	Mobilization and					1,897	1,247	0	0	0	3,143	
TOTAL	Mob, Demob & Pre					1,897	1,247	0	0	0	3,143	

11 02 03 14 02. Care and Diversion of Water

Care of water consists of the installation of temporary bulkheads. Assume small trash pump and operator for any required pumping. Operator is assumed to be on-site for 10 working days for the purpose of dewatering.

11 02 03 14 02 1. Fabricate Bulkheads

B MIL PM	Fabricate Bulkheads	1.00	LS		0.00	0	0	2,500	0	0	2,500	2500.00
TOTAL	Fabricate Bulkhe					0	0	2,500	0	0	2,500	

11 02 03 14 02 2. Install Temporary Bulkheads

MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	16.00	HR	L50CS003	0.00	0	272	0	0	0	272	17.00
MIL PM	Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57
MIL PM	Outside Laborers, (Semi-Skilled)	32.00	HR	X-LABORER	1.00	1,186	0	0	0	0	1,186	37.06
TOTAL	Install Temporar	2.00	DAY			1,883	272	0	0	0	2,155	1077.53

11 02 03 14 02 3. Remove Temporary Bulkheads

MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS003	0.00	0	136	0	0	0	136	17.00
MIL PM	Outside Equip. Operators, Heavy *	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL	Remove Temporary	1.00	DAY			942	136	0	0	0	1,078	1077.53

11 02 03 14 02 4. Unwatering Pumps

MIL PM	Outside Equip. Operators, Heavy	80.00	HR	X-EQOPRHVY	1.00	3,485	0	0	0	0	3,485	43.57

11 02. Gravity Drainage St			QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
MIL	PM	PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRA SH	80.00	HR	P50HO005	1.00	0	235	0	0	0	235	2.94
UPB	PM	TRK,HWY, 8,800GVW,4X4, 3/4T-PKUP REF. EP 1110-1-8 4X4 3/4-TON PICK-UP, 8800 GVW	80.00	HR	T50FO004	1.00	0	613	0	0	0	613	7.66
TOTAL		Unwatering Pumps					3,485	848	0	0	0	4,333	
TOTAL		Care and Diversi					6,310	1,256	2,500	0	0	10,066	
		11 02 03 14 03. Sitework											
		11 02 03 14 03 1. Clearing, Grubbing and Stripping											
AF	PM	Felling trees & piling, chipping, medium brush	1.20	ACR	CODFB7	0.22	1,223	504	0	0	0	1,727	1438.84
TOTAL		Clearing, Grubbi	1.20	ACR			1,223	504	0	0	0	1,727	1438.84
		11 02 03 14 03 2. Pavement Removal											
L MIL	PM	Site dml, bituminous, pavement removal, roads, 3" thick	110.00	SY	CLADB38	50.00	408	184	0	0	0	592	5.38
MIL	PM	Excavate & load, hydr excavator, 2 CY, medium matl	9.20	CY	CODEB12C	130.00	6	4	0	0	0	10	1.08
TOTAL		Pavement Removal	110.00	SY			413	188	0	0	0	602	5.47
		11 02 03 14 03 3. Remove Crushed Stone											
USR	PM	Remove Crushed Stone and Stockpile	80.00	TON	CODFB10P	36.00	123	157	0	0	0	279	3.49
TOTAL		Remove Crushed S	80.00	TON			123	157	0	0	0	279	3.49
		11 02 03 14 03 4. Excavation											
L MIL	PM	Excavate & load, hydr excavator, 2 CY, medium matl	6540.00	CY	CODEB12C	150.00	3,471	2,659	0	0	0	6,130	0.94

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
L	MIL PM	Hauling, hwy hau lers, 12 CY, 1 mi round trip @ 20 MPH (4.2 cyc/hr)	6540.00	CY	COEIB34B	50.40	4,920	5,037	0	0	0	9,957	1.52
	TOTAL	Excavation	6540.00	CY			8,391	7,696	0	0	0	16,087	2.46
		11 02 03 14 03 5. Cofferdam											
L	MIL PM	Excavate & load, hydr excavator, 2 CY, medium matl	1700.00	CY	CODEB12C	150.00	902	691	0	0	0	1,593	0.94
L	MIL PM	Hauling, hwy hau lers, 12 CY, 1 mi round trip @ 20 MPH (4.2 cyc/hr)	1700.00	CY	COEIB34B	50.40	1,279	1,309	0	0	0	2,588	1.52
	MIL PM	Spread & compact , 8" lift, embankment, 300 HP tractor	1700.00	CY	CODTB10C	312.50	300	367	0	0	0	667	0.39
	TOTAL	Cofferdam	1700.00	CY			2,481	2,367	0	0	0	4,848	2.85
		11 02 03 14 03 6. Remove Existing Pipe											
	CIV PM	Site dml, pipe r emoval, 24" dia, conc, water/sewer, no excavation	250.00	LF	CODLB6	15.00	1,843	212	0	0	0	2,055	8.22
	TOTAL	Remove Existing	250.00	LF			1,843	212	0	0	0	2,055	8.22
		11 02 03 14 03 7. Install New RCP											
	MIL PM	Backfill, sand b edding trenches, front-end loader, 1.5 CY	30.00	CY	CODFB10N	47.50	35	20	642	0	0	697	23.24
	MIL PM	Piping, drainage & sewage, 24" dia, RCP, class 3, no gaskets	250.00	LF	CLABB14	12.50	4,455	254	4,583	0	0	9,292	37.17
	CIV PM	Piping, drainage & sewage, RCP, precast end section, 24" dia	1.00	EA	CLABB14	2.50	89	5	268	0	0	362	361.70
	USR PM	Concrete Cradle for Pipe	2.00	CY		0.00	0	0	0	0	600	600	300.00
	USR PM	Connect Pipe to Existing Structure	1.00	EA		0.00	0	0	0	0	500	500	500.00
	TOTAL	Install New RCP	250.00	LF			4,579	280	5,492	0	1,100	11,451	45.81

11 02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
11 02 03 14 03 8. Place and Compact Backfill											
L MIL PM Excavate & load, hydr excavator, 2 CY, medium matl	7800.00	CY	CODEB12C	150.00	4,139	3,171	0	0	0	7,311	0.94
L MIL PM Hauling, hwy haulers, 12 CY, 1 mi round trip @ 20 MPH (4.2 cyc/hr)	7800.00	CY	COEIB34B	50.40	5,868	6,008	0	0	0	11,876	1.52
L AF PM Fill, spread borrow w/dozer	7800.00	CY	CODTB10B	150.00	2,869	2,825	0	0	0	5,694	0.73
AF PM Compaction, ridging, 8" lifts, 2 passes, sheepsfoot/wobbly wheel roller	7800.00	CY	COFCB32F	600.00	1,451	998	0	0	0	2,448	0.31
TOTAL Place and Compac	7800.00	CY			14,327	13,002	0	0	0	27,329	3.50
11 02 03 14 03 9. Crushed Stone Surfacing											
B MIL PM Base course, 3/4 " maximum size, 3" deep, crushed stone, large areas	50.00	CY	COFGB36B	75.00	198	136	488	0	0	821	16.42
TOTAL Crushed Stone Su	80.00	TON			198	136	488	0	0	821	10.26
11 02 03 14 03 10. Bituminous Road Repair											
MIL PM Surface treatment, prime coat, bituminous, 0.28 gal/SY	9.90	CSF	COKBB45	300.00	2	2	32	0	0	36	3.66
MIL PM Asphaltic conc pavement, highway, wearing course, 3" thick	14.00	TON	COKCB25B	100.00	62	23	406	0	0	491	35.07
TOTAL Bitumineous Road	110.00	SY			65	24	438	0	0	527	4.79
11 02 03 14 03 11. Establishment of Turf											
MIL PM Seeding, athletic field mix, mechanical seeding, 450#/acre	1.20	ACR	COELB66	0.24	186	80	659	0	0	925	771.05
AF PM Seeding, apply fertilizer, 1# nitrogen/MSF, spray from truck	1.20	MSF	COFWB59	35.00	1	2	6	0	0	9	7.46
TOTAL Establishment of	1.20	ACR			187	81	666	0	0	934	778.50

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL	Sitework					33,830	24,648	7,083	0	1,100	66,660	
	11 02 03 14 04. Drainage Structure											
	11 02 03 14 04 1. Replace Handrail											
B CIV PM	Remove Existing Handrail handrail	70.00	LF	SIWSSSWK2	8.00	811	0	0	0	0	811	11.58
CIV PM	Castings fibergl ass, 2" dia rails pickets 5' OC, 42" high, handrail	70.00	LF	SIWSSSWK2	4.00	1,622	0	2,954	0	0	4,576	65.37
TOTAL	Replace Handrail					2,433	0	2,954	0	0	5,387	
	11 02 03 14 04 2. Replace Grating											
B CIV PM	Remove Grating	20.00	SF	SIWSSSWK2	40.00	46	0	0	0	0	46	2.32
CIV PM	Grating fbgls, m olded, 2" T, 2" sq mesh, grn (mod crsv env)	20.00	SF	SIWSSSWK2	40.00	46	0	410	0	0	457	22.84
TOTAL	Replace Grating					93	0	410	0	0	503	
	11 02 03 14 04 3. Replace Ladders											
B MIL PM	Remove Ladders	10.00	VLF	SIWSE4	12.50	149	4	0	0	0	153	15.31
MIL PM	Ladder, 20" wide , bolted to conc, w/safety equip	10.00	VLF	SIWSE4	6.25	298	8	532	0	0	838	83.81
TOTAL	Replace Ladders					447	12	532	0	0	991	
TOTAL	Drainage Structu					2,973	12	3,896	0	0	6,881	
	11 02 03 14 05. Gates											
	11 02 03 14 05 1. Remove Existing Gate											
MIL PM	Steam/Pipefitter s Foreman	12.00	HR	B-STM/PIPE	1.00	468	0	0	0	0	468	39.03
MIL PM	Steam/Pipefitter s	12.00	HR	B-STM/PIPE	1.00	456	0	0	0	0	456	38.03
MIL PM	Laborers, (Semi- Skilled)	12.00	HR	B-LABORER	1.00	445	0	0	0	0	445	37.06
MIL PM	Equip. Operators , Crane/Shovel	8.00	HR	B-EQOPRCRN	1.00	349	0	0	0	0	349	43.57
MAP PM	CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT	
TOTAL	Remove Existing	1.00	EA			1,718	305	0	0	0	2,023	2023.24	
	11 02 03 14 05 2. Rehab Gate												
	Manufacturers Rep/Erection Engineer is considered for field assistance.												
USR ME	Rehab 24" Gate w / New Manual Operator	1.00	EA		0.00	0	0	0	0	3,564	3,564	3563.69	
USR ME	Erection Enginee r	1.00	LS		0.00	950	0	0	0	0	950	950.32	
MIL ME	Painters, Struct ural Steel	12.00	HR	B-PAINTSS	1.00	565	0	0	0	0	565	47.10	
TOTAL	Rehab Gate	1.00	EA			1,516	0	0	0	3,564	5,079	5079.23	
	11 02 03 14 05 3. Install/Test Rehabbed Gate												
MIL PM	Steam/Pipefitter s Foreman	20.00	HR	B-STM/PIPE	1.00	781	0	0	0	0	781	39.03	
MIL PM	Steam/Pipefitter s	16.00	HR	B-STM/PIPE	1.00	608	0	0	0	0	608	38.03	
MIL PM	Laborers, (Semi- Skilled)	16.00	HR	B-LABORER	1.00	593	0	0	0	0	593	37.06	
MIL PM	Equip. Operators , Crane/Shovel	8.00	HR	B-EQOPRCRN	1.00	349	0	0	0	0	349	43.57	
MAP PM	CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16	
MIL PM	Outside Truck Dr ivers, Heavy	4.00	HR	X-TRKDVRHV	1.00	152	0	0	0	0	152	37.92	
MAP PM	FLATBED, 8'x 16. 0', W/SIDE RACKS (ADD TRUCK)	4.00	HR	T40KF016	1.00	0	3	0	0	0	3	0.84	
EP PM	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	4.00	HR	T50FO006	1.00	0	57	0	0	0	57	14.36	
TOTAL	Install/Test Reh	1.00	EA			2,482	366	0	0	0	2,848	2848.28	
TOTAL	Gates					5,716	671	0	0	3,564	9,951		
TOTAL	GW-27, 24" Drain					50,725	27,834	13,480	0	4,664	96,701		

11 02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
11 02 03 16. GW-29, 18" Drain (Riverfront)											
11 02 03 16 01. Mob, Demob & Preparatory Work Use the following crew for to mobilize equipment to the jobsite. Assume the same time for demobilzation. Use 2hrs operating time for each way. (Mob.& Demob.) Crew - -------- Truck w/Lowboy Truck Driver Mechanics Truck Operator Laborer											
11 02 03 16 01 1. Mobilization and Demobilization Asume 8hrs to mobilize equipment. Use 1hr operating time for loading and 1hr operating time for unloading equipment. Assume the same for demobilization.											
UPB PM AIR COMPR, 1,600 CFM, 100 PSI REF. EP 1110-1-8 1600 CFM QUIET, 100 PSI (ADD HOSE)	4.00	HR	A15XX017	1.00	0	183	0	0	0	183	45.70
UPB PM GENERATOR, 5.5 KW, 120/240V,PORT REF. EP 1110-1-8 5.5 KW	4.00	HR	G10HO004	0.00	0	7	0	0	0	7	1.64
MIL PM PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRASH	4.00	HR	P50HO005	1.00	0	12	0	0	0	12	2.94
MAP PM CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	4.00	HR	C75GV002	1.00	0	153	0	0	0	153	38.16
MIL PM LDR,BH,WH, 1.00CY FE BKT, 24"DIP	4.00	HR	L50CS003	0.00	0	68	0	0	0	68	17.00
UPB PM WELDER, 300 AMP, SKID,ELEC DRIVE	4.00	HR	W35XX009	0.00	0	6	0	0	0	6	1.59
L UPB PM TRK,HWY, 46,000 GVW, 6X4, 3 AXLE	16.00	HR	T50FO018	1.00	0	558	0	0	0	558	34.90
L MIL PM TRLR,LOWBOY, 60T, 3 AXLE (ADD TOWING TRUCK)	16.00	HR	T45XX017	1.00	0	134	0	0	0	134	8.38
L MIL PM TRK,HWY,10,000GVW,4X2, 1T-PICKUP	16.00	HR	T50FO005	1.00	0	126	0	0	0	126	7.88
MIL PM Outside Truck Drivers, Heavy *	16.00	HR	X-TRKDVRHV	1.00	607	0	0	0	0	607	37.92
MIL PM Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL	Mobilization and					1,897	1,247	0	0	0	3,143	
TOTAL	Mob, Demob & Pre					1,897	1,247	0	0	0	3,143	

11 02 03 16 02. Care and Diversion of Water

Care of water consists of the installation of temporary bulkheads. Assume small trash pump and operator for any required pumping. Operator is assumed to be on-site for 10 working days for the purpose of dewatering.

11 02 03 16 02 1. Fabricate Bulkheads

B MIL PM	Fabricate Bulkheads	1.00	LS		0.00	0	0	2,500	0	0	2,500	2500.00
TOTAL	Fabricate Bulkhe					0	0	2,500	0	0	2,500	

11 02 03 16 02 2. Install Temporary Bulkheads

MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	16.00	HR	L50CS003	0.00	0	272	0	0	0	272	17.00
MIL PM	Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57
MIL PM	Outside Laborers, (Semi-Skilled)	32.00	HR	X-LABORER	1.00	1,186	0	0	0	0	1,186	37.06
TOTAL	Install Temporar	2.00	DAY			1,883	272	0	0	0	2,155	1077.53

11 02 03 16 02 3. Remove Temporary Bulkheads

MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS003	0.00	0	136	0	0	0	136	17.00
MIL PM	Outside Equip. Operators, Heavy *	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL	Remove Temporary	1.00	DAY			942	136	0	0	0	1,078	1077.53

11 02 03 16 02 4. Unwatering Pumps

MIL PM	Outside Equip. Operators, Heavy	80.00	HR	X-EQOPRHVY	1.00	3,485	0	0	0	0	3,485	43.57

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
MIL PM	PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRA SH	80.00	HR	P50HO005	1.00	0	235	0	0	0	235	2.94
UPB PM	TRK,HWY, 8,800GVW,4X4, 3/4T-PKUP REF. EP 1110-1-8 4X4 3/4-TON PICK-UP, 8800 GVW	80.00	HR	T50FO004	1.00	0	613	0	0	0	613	7.66
TOTAL	Unwatering Pumps					3,485	848	0	0	0	4,333	
TOTAL	Care and Diversi					6,310	1,256	2,500	0	0	10,066	
	11 02 03 16 03. Sitework											
	11 02 03 16 03 1. Clearing, Grubbing and Stripping											
AF PM	Felling trees & piling, chipping, medium brush	1.20	ACR	CODFB7	0.22	1,223	504	0	0	0	1,727	1438.84
TOTAL	Clearing, Grubbi	1.20	ACR			1,223	504	0	0	0	1,727	1438.84
	11 02 03 16 03 2. Pavement Removal											
L MIL PM	Site dml, bituminous, pavement removal, roads, 3" thick	110.00	SY	CLADB38	50.00	408	184	0	0	0	592	5.38
MIL PM	Excavate & load, hydr excavator, 2 CY, medium matl	9.20	CY	CODEB12C	130.00	6	4	0	0	0	10	1.08
TOTAL	Pavement Removal	110.00	SY			413	188	0	0	0	602	5.47
	11 02 03 16 03 3. Remove Crushed Stone											
USR PM	Remove Crushed Stone and Stockpile	80.00	TON	CODFB10P	36.00	123	157	0	0	0	279	3.49
TOTAL	Remove Crushed S	80.00	TON			123	157	0	0	0	279	3.49
	11 02 03 16 03 4. Excavation											
L MIL PM	Excavate & load, hydr excavator, 2 CY, medium matl	6540.00	CY	CODEB12C	150.00	3,471	2,659	0	0	0	6,130	0.94

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
L	MIL PM	Hauling, hwy haulers, 12 CY, 1 mi round trip @ 20 MPH (4.2 cyc/hr)	6540.00	CY	COEIB34B	50.40	4,920	5,037	0	0	0	9,957	1.52
	TOTAL	Excavation	6540.00	CY			8,391	7,696	0	0	0	16,087	2.46
		11 02 03 16 03 5. Cofferdam											
L	MIL PM	Excavate & load, hydr excavator, 2 CY, medium matl	1700.00	CY	CODEB12C	150.00	902	691	0	0	0	1,593	0.94
L	MIL PM	Hauling, hwy haulers, 12 CY, 1 mi round trip @ 20 MPH (4.2 cyc/hr)	1700.00	CY	COEIB34B	50.40	1,279	1,309	0	0	0	2,588	1.52
	MIL PM	Spread & compact, 8" lift, embankment, 300 HP tractor	1700.00	CY	CODTB10C	312.50	300	367	0	0	0	667	0.39
	TOTAL	Cofferdam	1700.00	CY			2,481	2,367	0	0	0	4,848	2.85
		11 02 03 16 03 6. Remove Existing Pipe											
	CIV PM	Site dml, pipe removal, 18" dia,conc, water/sewer, no	250.00	LF	CODLB6	18.75	1,474	170	0	0	0	1,644	6.58
	TOTAL	Remove Existing	250.00	LF			1,474	170	0	0	0	1,644	6.58
		11 02 03 16 03 7. Install New RCP											
	MIL PM	Backfill, sand bedding trenches, front-end loader, 1.5 CY	30.00	CY	CODFB10N	47.50	35	20	642	0	0	697	23.24
	MIL PM	Piping, drainage & sewage, 18" dia, RCP, class 3, no gaskets	250.00	LF	CLABB14	16.25	3,427	196	2,893	0	0	6,515	26.06
	CIV PM	Piping, drainage & sewage, RCP, precast end section, 18" dia	1.00	EA	CLABB14	3.13	71	4	210	0	0	285	285.24
	USR PM	Concrete Cradle for Pipe	2.00	CY		0.00	0	0	0	0	600	600	300.00
	USR PM	Connect Pipe to Existing Structure	1.00	EA		0.00	0	0	0	0	500	500	500.00
	TOTAL	Install New RCP	250.00	LF			3,533	220	3,745	0	1,100	8,598	34.39

11 02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
11 02 03 16 03 8. Place and Compact Backfill											
L MIL PM Excavate & load, hydr excavator, 2 CY, medium matl	7800.00	CY	CODEB12C	150.00	4,139	3,171	0	0	0	7,311	0.94
L MIL PM Hauling, hwy haulers, 12 CY, 1 mi round trip @ 20 MPH (4.2 cyc/hr)	7800.00	CY	COEIB34B	50.40	5,868	6,008	0	0	0	11,876	1.52
L AF PM Fill, spread borrow w/dozer	7800.00	CY	CODTB10B	150.00	2,869	2,825	0	0	0	5,694	0.73
AF PM Compaction, ridi ng, 8" lifts, 2 passes, sheepsfoot/wobbly wheel roller	7800.00	CY	COFCB32F	600.00	1,451	998	0	0	0	2,448	0.31
TOTAL Place and Compac	7800.00	CY			14,327	13,002	0	0	0	27,329	3.50
11 02 03 16 03 9. Crushed Stone Surfacing											
B MIL PM Base course, 3/4 " maximum size, 3" deep, crushed stone, large areas	50.00	CY	COFGB36B	75.00	198	136	488	0	0	821	16.42
TOTAL Crushed Stone Su	80.00	TON			198	136	488	0	0	821	10.26
11 02 03 16 03 10. Bituminous Road Repair											
MIL PM Surface treatmen t, prime coat, bituminous, 0.28 gal/SY	9.90	CSF	COKBB45	300.00	2	2	32	0	0	36	3.66
MIL PM Asphaltic conc p avement, highway, wearing course, 3" thick	14.00	TON	COKCB25B	100.00	62	23	406	0	0	491	35.07
TOTAL Bituminous Road	110.00	SY			65	24	438	0	0	527	4.79
11 02 03 16 03 11. Establishment of Turf											
MIL PM Seeding, athleti c field mix, mechanical seeding, 450#/acre	1.20	ACR	COELB66	0.24	186	80	659	0	0	925	771.05
AF PM Seeding, apply f ertilizer, 1# nitrogen/MSF, spray from truck	1.20	MSF	COFWB59	35.00	1	2	6	0	0	9	7.46
TOTAL Establishment of	1.20	ACR			187	81	666	0	0	934	778.50

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL	Sitework					32,415	24,545	5,336	0	1,100	63,396	
	11 02 03 16 04. Drainage Structure											
	11 02 03 16 04 1. Replace Handrail											
B CIV PM	Remove Existing Handrail handrail	70.00	LF	SIWSSSWK2	8.00	811	0	0	0	0	811	11.58
CIV PM	Castings fibergl ass, 2" dia rails pickets 5' OC, 42" high, handrail	70.00	LF	SIWSSSWK2	4.00	1,622	0	2,954	0	0	4,576	65.37
TOTAL	Replace Handrail					2,433	0	2,954	0	0	5,387	
	11 02 03 16 04 2. Replace Grating											
B CIV PM	Remove Grating	20.00	SF	SIWSSSWK2	40.00	46	0	0	0	0	46	2.32
CIV PM	Grating fbgls, m olded, 2" T, 2" sq mesh, grn (mod crsv env)	20.00	SF	SIWSSSWK2	40.00	46	0	410	0	0	457	22.84
TOTAL	Replace Grating					93	0	410	0	0	503	
	11 02 03 16 04 3. Replace Ladders											
B MIL PM	Remove Ladders	10.00	VLF	SIWSE4	12.50	149	4	0	0	0	153	15.31
MIL PM	Ladder, 20" wide , bolted to conc, w/safety equip	10.00	VLF	SIWSE4	6.25	298	8	532	0	0	838	83.81
TOTAL	Replace Ladders					447	12	532	0	0	991	
TOTAL	Drainage Structu					2,973	12	3,896	0	0	6,881	
	11 02 03 16 05. Gates											
	11 02 03 16 05 1. Remove Existing Gate											
MIL PM	Steam/Pipefitter s Foreman	8.00	HR	B-STM/PIPE	1.00	312	0	0	0	0	312	39.03
MIL PM	Steam/Pipefitter s	8.00	HR	B-STM/PIPE	1.00	304	0	0	0	0	304	38.03
MIL PM	Laborers, (Semi- Skilled)	8.00	HR	B-LABORER	1.00	296	0	0	0	0	296	37.06
MIL PM	Equip. Operators , Crane/Shovel	8.00	HR	B-EQOPRCRN	1.00	349	0	0	0	0	349	43.57
MAP PM	CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL	Remove Existing	1.00	EA			1,261	305	0	0	0	1,567	1566.77
	11 02 03 16 05 2. Rehab Gate											
	Manufacturers Rep/Erection Engineer is considered for field assistance.											
USR ME	Rehab 18" Gate w / New Manual Operator	1.00	EA		0.00	0	0	0	0	3,089	3,089	3088.53
USR ME	Erection Enginee r	1.00	LS		0.00	950	0	0	0	0	950	950.32
MIL ME	Painters, Struct ural Steel	12.00	HR	B-PAINTSS	1.00	565	0	0	0	0	565	47.10
TOTAL	Rehab Gate	1.00	EA			1,516	0	0	0	3,089	4,604	4604.07
	11 02 03 16 05 3. Install/Test Rehabbed Gate											
MIL PM	Steam/Pipefitter s Foreman	20.00	HR	B-STM/PIPE	1.00	781	0	0	0	0	781	39.03
MIL PM	Steam/Pipefitter s	16.00	HR	B-STM/PIPE	1.00	608	0	0	0	0	608	38.03
MIL PM	Laborers, (Semi- Skilled)	16.00	HR	B-LABORER	1.00	593	0	0	0	0	593	37.06
MIL PM	Equip. Operators , Crane/Shovel	8.00	HR	B-EQOPRCRN	1.00	349	0	0	0	0	349	43.57
MAP PM	CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16
MIL PM	Outside Truck Dr ivers, Heavy	4.00	HR	X-TRKDVRHV	1.00	152	0	0	0	0	152	37.92
MAP PM	FLATBED, 8'x 16. 0', W/SIDE RACKS (ADD TRUCK)	4.00	HR	T40KF016	1.00	0	3	0	0	0	3	0.84
EP PM	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	4.00	HR	T50FO006	1.00	0	57	0	0	0	57	14.36
TOTAL	Install/Test Reh	1.00	EA			2,482	366	0	0	0	2,848	2848.28
TOTAL	Gates					5,259	671	0	0	3,089	9,019	
TOTAL	GW-29, 18" Drain					48,853	27,731	11,732	0	4,189	92,505	

11 02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
11 02 03 18. GW-31, 24" Drain (Riverfront)											
11 02 03 18 01. Mob, Demob & Preparatory Work Use the following crew for to mobilize equipment to the jobsite. Assume the same time for demobilzation. Use 2hrs operating time for each way. (Mob.& Demob.) Crew - -------- Truck w/Lowboy — Truck Driver Mechanics Truck — Operator Laborer											
11 02 03 18 01 1. Mobilization and Demobilization Asume 8hrs to mobilize equipment. Use 1hr operating time for loading and 1hr operating time for unloading equipment. Assume the same for demobilization.											
UPB PM AIR COMPR, 1,600 CFM, 100 PSI REF. EP 1110-1-8 1600 CFM QUIET, 100 PSI (ADD HOSE)	4.00	HR	A15XX017	1.00	0	183	0	0	0	183	45.70
UPB PM GENERATOR, 5.5 KW, 120/240V,PORT REF. EP 1110-1-8 5.5 KW	4.00	HR	G10HO004	0.00	0	7	0	0	0	7	1.64
MIL PM PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRASH	4.00	HR	P50HO005	1.00	0	12	0	0	0	12	2.94
MAP PM CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	4.00	HR	C75GV002	1.00	0	153	0	0	0	153	38.16
MIL PM LDR,BH,WH, 1.00CY FE BKT, 24"DIP	4.00	HR	L50CS003	0.00	0	68	0	0	0	68	17.00
UPB PM WELDER, 300 AMP, SKID,ELEC DRIVE	4.00	HR	W35XX009	0.00	0	6	0	0	0	6	1.59
L UPB PM TRK,HWY, 46,000 GVW, 6X4, 3 AXLE	16.00	HR	T50FO018	1.00	0	558	0	0	0	558	34.90
L MIL PM TRLR,LOWBOY, 60T, 3 AXLE (ADD TOWING TRUCK)	16.00	HR	T45XX017	1.00	0	134	0	0	0	134	8.38
L MIL PM TRK,HWY,10,000GVW,4X2, 1T-PICKUP	16.00	HR	T50FO005	1.00	0	126	0	0	0	126	7.88
MIL PM Outside Truck Drivers, Heavy *	16.00	HR	X-TRKDVRHV	1.00	607	0	0	0	0	607	37.92
MIL PM Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL	Mobilization and					1,897	1,247	0	0	0	3,143	
TOTAL	Mob, Demob & Pre					1,897	1,247	0	0	0	3,143	

11 02 03 18 02. Care and Diversion of Water

Care of water consists of the installation of temporary bulkheads. Assume small trash pump and operator for any required pumping. Operator is assumed to be on-site for 10 working days for the purpose of dewatering.

11 02 03 18 02 1. Fabricate Bulkheads

B MIL PM	Fabricate Bulkheads	1.00	LS		0.00	0	0	2,500	0	0	2,500	2500.00
TOTAL	Fabricate Bulkhe					0	0	2,500	0	0	2,500	

11 02 03 18 02 2. Install Temporary Bulkheads

MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	16.00	HR	L50CS003	0.00	0	272	0	0	0	272	17.00
MIL PM	Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57
MIL PM	Outside Laborers, (Semi-Skilled)	32.00	HR	X-LABORER	1.00	1,186	0	0	0	0	1,186	37.06
TOTAL	Install Temporar	2.00	DAY			1,883	272	0	0	0	2,155	1077.53

11 02 03 18 02 3. Remove Temporary Bulkheads

MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS003	0.00	0	136	0	0	0	136	17.00
MIL PM	Outside Equip. Operators, Heavy *	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL	Remove Temporary	1.00	DAY			942	136	0	0	0	1,078	1077.53

11 02 03 18 02 4. Unwatering Pumps

MIL PM	Outside Equip. Operators, Heavy	80.00	HR	X-EQOPRHVY	1.00	3,485	0	0	0	0	3,485	43.57

11	02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT	
MIL	PM PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRA SH	80.00	HR	P50HO005	1.00	0	235	0	0	0	235	2.94	
UPB	PM TRK,HWY, 8,800GVW,4X4, 3/4T-PKUP REF. EP 1110-1-8 4X4 3/4-TON PICK-UP, 8800 GVW	80.00	HR	T50FO004	1.00	0	613	0	0	0	613	7.66	
TOTAL	Unwatering Pumps					3,485	848	0	0	0	4,333		
TOTAL	Care and Diversi					6,310	1,256	2,500	0	0	10,066		
	11 02 03 18 03. Sitework												
	11 02 03 18 03 1. Clearing, Grubbing and Stripping												
AF	PM Felling trees & piling, chipping, medium brush	1.20	ACR	CODFB7	0.22	1,223	504	0	0	0	1,727	1438.84	
TOTAL	Clearing, Grubbi	1.20	ACR			1,223	504	0	0	0	1,727	1438.84	
	11 02 03 18 03 2. Pavement Removal												
L MIL	PM Site dml, bituminous, pavement removal, roads, 3" thick	110.00	SY	CLADB38	50.00	408	184	0	0	0	592	5.38	
MIL	PM Excavate & load, hydr excavator, 2 CY, medium matl	9.20	CY	CODEB12C	130.00	6	4	0	0	0	10	1.08	
TOTAL	Pavement Removal	110.00	SY			413	188	0	0	0	602	5.47	
	11 02 03 18 03 3. Remove Crushed Stone												
USR	PM Remove Crushed Stone and Stockpile	80.00	TON	CODFB10P	36.00	123	157	0	0	0	279	3.49	
TOTAL	Remove Crushed S	80.00	TON			123	157	0	0	0	279	3.49	
	11 02 03 18 03 4. Excavation												
L MIL	PM Excavate & load, hydr excavator, 2 CY, medium matl	6540.00	CY	CODEB12C	150.00	3,471	2,659	0	0	0	6,130	0.94	

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
L	MIL PM	Hauling, hwy hau lers, 12 CY, 1 mi round trip @ 20 MPH (4.2 cyc/hr)	6540.00	CY	COEIB34B	50.40	4,920	5,037	0	0	0	9,957	1.52
	TOTAL	Excavation	6540.00	CY			8,391	7,696	0	0	0	16,087	2.46
		11 02 03 18 03 5. Cofferdam											
L	MIL PM	Excavate & load, hydr excavator, 2 CY, medium matl	1700.00	CY	CODEB12C	150.00	902	691	0	0	0	1,593	0.94
L	MIL PM	Hauling, hwy hau lers, 12 CY, 1 mi round trip @ 20 MPH (4.2 cyc/hr)	1700.00	CY	COEIB34B	50.40	1,279	1,309	0	0	0	2,588	1.52
	MIL PM	Spread & compact , 8" lift, embankment, 300 HP tractor	1700.00	CY	CODTB10C	312.50	300	367	0	0	0	667	0.39
	TOTAL	Cofferdam	1700.00	CY			2,481	2,367	0	0	0	4,848	2.85
		11 02 03 18 03 6. Remove Existing Pipe											
	CIV PM	Site dml, pipe r emoval, 24" dia, conc, water/sewer, no excavation	250.00	LF	CODLB6	15.00	1,843	212	0	0	0	2,055	8.22
	TOTAL	Remove Existing	250.00	LF			1,843	212	0	0	0	2,055	8.22
		11 02 03 18 03 7. Install New RCP											
	MIL PM	Backfill, sand b edding trenches, front-end loader, 1.5 CY	30.00	CY	CODFB10N	47.50	35	20	642	0	0	697	23.24
	MIL PM	Piping, drainage & sewage, 24" dia, RCP, class 3, no gaskets	250.00	LF	CLABB14	12.50	4,455	254	4,583	0	0	9,292	37.17
	CIV PM	Piping, drainage & sewage, RCP, precast end section, 24" dia	1.00	EA	CLABB14	2.50	89	5	268	0	0	362	361.70
	USR PM	Concrete Cradle for Pipe	2.00	CY		0.00	0	0	0	0	600	600	300.00
	USR PM	Connect Pipe to Existing Structure	1.00	EA		0.00	0	0	0	0	500	500	500.00
	TOTAL	Install New RCP	250.00	LF			4,579	280	5,492	0	1,100	11,451	45.81

11 02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
11 02 03 18 03 8. Place and Compact Backfill											
L MIL PM Excavate & load, hydr excavator, 2 CY, medium matl	7800.00	CY	CODEB12C	150.00	4,139	3,171	0	0	0	7,311	0.94
L MIL PM Hauling, hwy haulers, 12 CY, 1 mi round trip @ 20 MPH (4.2 cyc/hr)	7800.00	CY	COEIB34B	50.40	5,868	6,008	0	0	0	11,876	1.52
L AF PM Fill, spread bor row w/dozer	7800.00	CY	CODTB10B	150.00	2,869	2,825	0	0	0	5,694	0.73
AF PM Compaction, ridi ng, 8" lifts, 2 passes, sheepsfoot/wobbly wheel roller	7800.00	CY	COFCB32F	600.00	1,451	998	0	0	0	2,448	0.31
TOTAL Place and Compac	7800.00	CY			14,327	13,002	0	0	0	27,329	3.50
11 02 03 18 03 9. Crushed Stone Surfacing											
B MIL PM Base course, 3/4 " maximum size, 3" deep, crushed stone, large areas	50.00	CY	COFGB36B	75.00	198	136	488	0	0	821	16.42
TOTAL Crushed Stone Su	80.00	TON			198	136	488	0	0	821	10.26
11 02 03 18 03 10. Bituminous Road Repair											
MIL PM Surface treatmen t, prime coat, bituminous, 0.28 gal/SY	9.90	CSF	COKBB45	300.00	2	2	32	0	0	36	3.66
MIL PM Asphaltic conc p avement, highway, wearing course, 3" thick	14.00	TON	COKCB25B	100.00	62	23	406	0	0	491	35.07
TOTAL Bituminous Road	110.00	SY			65	24	438	0	0	527	4.79
11 02 03 18 03 11. Establishment of Turf											
MIL PM Seeding, athleti c field mix, mechanical seeding, 450#/acre	1.20	ACR	COELB66	0.24	186	80	659	0	0	925	771.05
AF PM Seeding, apply f ertilizer, 1# nitrogen/MSF, spray from truck	1.20	MSF	COFWB59	35.00	1	2	6	0	0	9	7.46
TOTAL Establishment of	1.20	ACR			187	81	666	0	0	934	778.50

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL	Sitework					33,830	24,648	7,083	0	1,100	66,660	
	11 02 03 18 04. Drainage Structure											
	11 02 03 18 04 1. Replace Handrail											
B CIV PM	Remove Existing Handrail handrail	70.00	LF	SIWSSSWK2	8.00	811	0	0	0	0	811	11.58
CIV PM	Castings fibergl ass, 2" dia rails pickets 5' OC, 42" high, handrail	70.00	LF	SIWSSSWK2	4.00	1,622	0	2,954	0	0	4,576	65.37
TOTAL	Replace Handrail					2,433	0	2,954	0	0	5,387	
	11 02 03 18 04 2. Replace Grating											
B CIV PM	Remove Grating	20.00	SF	SIWSSSWK2	40.00	46	0	0	0	0	46	2.32
CIV PM	Grating fbgls, m olded, 2" T, 2" sq mesh, grn (mod crsv env)	20.00	SF	SIWSSSWK2	40.00	46	0	410	0	0	457	22.84
TOTAL	Replace Grating					93	0	410	0	0	503	
	11 02 03 18 04 3. Replace Ladders											
B MIL PM	Remove Ladders	10.00	VLF	SIWSE4	12.50	149	4	0	0	0	153	15.31
MIL PM	Ladder, 20" wide , bolted to conc, w/safety equip	10.00	VLF	SIWSE4	6.25	298	8	532	0	0	838	83.81
TOTAL	Replace Ladders					447	12	532	0	0	991	
TOTAL	Drainage Structu					2,973	12	3,896	0	0	6,881	
	11 02 03 18 05. Gates											
	11 02 03 18 05 1. Remove Existing Gate											
MIL PM	Steam/Pipefitter s Foreman	12.00	HR	B-STM/PIPE	1.00	468	0	0	0	0	468	39.03
MIL PM	Steam/Pipefitter s	12.00	HR	B-STM/PIPE	1.00	456	0	0	0	0	456	38.03
MIL PM	Laborers, (Semi- Skilled)	12.00	HR	B-LABORER	1.00	445	0	0	0	0	445	37.06
MIL PM	Equip. Operators , Crane/Shovel	8.00	HR	B-EQOPRCRN	1.00	349	0	0	0	0	349	43.57
MAP PM	CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT	
TOTAL	Remove Existing	1.00	EA			1,718	305	0	0	0	2,023	2023.24	
	11 02 03 18 05 2. Rehab Gate												
	Manufacturers Rep/Erection Engineer is considered for field assistance.												
USR ME	Rehab 24" Gate w / New Manual Operator	1.00	EA		0.00	0	0	0	0	3,564	3,564	3563.69	
USR ME	Erection Enginee r	1.00	LS		0.00	950	0	0	0	0	950	950.32	
MIL ME	Painters, Struct ural Steel	12.00	HR	B-PAINTSS	1.00	565	0	0	0	0	565	47.10	
TOTAL	Rehab Gate	1.00	EA			1,516	0	0	0	3,564	5,079	5079.23	
	11 02 03 18 05 3. Install/Test Rehabbed Gate												
MIL PM	Steam/Pipefitter s Foreman	20.00	HR	B-STM/PIPE	1.00	781	0	0	0	0	781	39.03	
MIL PM	Steam/Pipefitter s	16.00	HR	B-STM/PIPE	1.00	608	0	0	0	0	608	38.03	
MIL PM	Laborers, (Semi- Skilled)	16.00	HR	B-LABORER	1.00	593	0	0	0	0	593	37.06	
MIL PM	Equip. Operators , Crane/Shovel	8.00	HR	B-EQOPRCRN	1.00	349	0	0	0	0	349	43.57	
MAP PM	CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16	
MIL PM	Outside Truck Dr ivers, Heavy	4.00	HR	X-TRKDVRHV	1.00	152	0	0	0	0	152	37.92	
MAP PM	FLATBED, 8'x 16. 0', W/SIDE RACKS (ADD TRUCK)	4.00	HR	T40KF016	1.00	0	3	0	0	0	3	0.84	
EP PM	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	4.00	HR	T50FO006	1.00	0	57	0	0	0	57	14.36	
TOTAL	Install/Test Reh	1.00	EA			2,482	366	0	0	0	2,848	2848.28	
TOTAL	Gates					5,716	671	0	0	3,564	9,951		
TOTAL	GW-31, 24" Drain					50,725	27,834	13,480	0	4,664	96,701		

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
11 02 03 19. GW-32, 24" Drain (Riverfront)												
11 02 03 19 01. Mob, Demob & Preparatory Work Use the following crew for to mobilize equipment to the jobsite. Assume the same time for demobilzation. Use 2hrs operating time for each way. (Mob.& Demob.) Crew - -------- Truck w/Lowboy — Truck Driver Mechanics Truck — Operator Laborer												
11 02 03 19 01 1. Mobilization and Demobilization Asume 8hrs to mobilize equipment. Use 1hr operating time for loading and 1hr operating time for unloading equipment. Assume the same for demobilization.												
	UPB	PM	AIR COMPR, 1,600 CFM, 100 PSI REF. EP 1110-1-8 1600 CFM QUIET, 100 PSI (ADD HOSE)	4.00	HR	A15XX017	1.00	0	183	0	0	0	183	45.70
	UPB	PM	GENERATOR, 5.5 KW, 120/240V,PORT REF. EP 1110-1-8 5.5 KW	4.00	HR	G10HO004	0.00	0	7	0	0	0	7	1.64
	MIL	PM	PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRASH	4.00	HR	P50HO005	1.00	0	12	0	0	0	12	2.94
	MAP	PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	4.00	HR	C75GV002	1.00	0	153	0	0	0	153	38.16
	MIL	PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	4.00	HR	L50CS003	0.00	0	68	0	0	0	68	17.00
	UPB	PM	WELDER, 300 AMP, SKID,ELEC DRIVE	4.00	HR	W35XX009	0.00	0	6	0	0	0	6	1.59
L	UPB	PM	TRK,HWY, 46,000 GVW, 6X4, 3 AXLE	16.00	HR	T50FO018	1.00	0	558	0	0	0	558	34.90
L	MIL	PM	TRLR,LOWBOY, 60T, 3 AXLE (ADD TOWING TRUCK)	16.00	HR	T45XX017	1.00	0	134	0	0	0	134	8.38
L	MIL	PM	TRK,HWY,10,000GVW,4X2, 1T-PICKUP	16.00	HR	T50FO005	1.00	0	126	0	0	0	126	7.88
	MIL	PM	Outside Truck Drivers, Heavy *	16.00	HR	X-TRKDVRHV	1.00	607	0	0	0	0	607	37.92
	MIL	PM	Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL	Mobilization and					1,897	1,247	0	0	0	3,143	
TOTAL	Mob, Demob & Pre					1,897	1,247	0	0	0	3,143	

11 02 03 19 02. Care and Diversion of Water

Care of water consists of the installation of temporary bulkheads. Assume small trash pump and operator for any required pumping. Operator is assumed to be on-site for 10 working days for the purpose of dewatering.

11 02 03 19 02 1. Fabricate Bulkheads

B MIL PM	Fabricate Bulkheads	1.00	LS		0.00	0	0	2,500	0	0	2,500	2500.00
TOTAL	Fabricate Bulkhe					0	0	2,500	0	0	2,500	

11 02 03 19 02 2. Install Temporary Bulkheads

MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	16.00	HR	L50CS003	0.00	0	272	0	0	0	272	17.00
MIL PM	Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57
MIL PM	Outside Laborers, (Semi-Skilled)	32.00	HR	X-LABORER	1.00	1,186	0	0	0	0	1,186	37.06
TOTAL	Install Temporar	2.00	DAY			1,883	272	0	0	0	2,155	1077.53

11 02 03 19 02 3. Remove Temporary Bulkheads

MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS003	0.00	0	136	0	0	0	136	17.00
MIL PM	Outside Equip. Operators, Heavy *	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL	Remove Temporary	1.00	DAY			942	136	0	0	0	1,078	1077.53

11 02 03 19 02 4. Unwatering Pumps

MIL PM	Outside Equip. Operators, Heavy	80.00	HR	X-EQOPRHVY	1.00	3,485	0	0	0	0	3,485	43.57

11 02. Gravity Drainage St			QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
MIL PM	PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRA SH		80.00	HR	P50HO005	1.00	0	235	0	0	0	235	2.94
UPB PM	TRK,HWY, 8,800GVW,4X4, 3/4T-PKUP REF. EP 1110-1-8 4X4 3/4-TON PICK-UP, 8800 GVW		80.00	HR	T50FO004	1.00	0	613	0	0	0	613	7.66
TOTAL	Unwatering Pumps						3,485	848	0	0	0	4,333	
TOTAL	Care and Diversi						6,310	1,256	2,500	0	0	10,066	
	11 02 03 19 03. Sitework												
	11 02 03 19 03 1. Clearing, Grubbing and Stripping												
AF PM	Felling trees & piling, chipping, medium brush		1.20	ACR	CODFB7	0.22	1,223	504	0	0	0	1,727	1438.84
TOTAL	Clearing, Grubbi		1.20	ACR			1,223	504	0	0	0	1,727	1438.84
	11 02 03 19 03 2. Pavement Removal												
L MIL PM	Site dml, bituminous, pavement removal, roads, 3" thick		110.00	SY	CLADB38	50.00	408	184	0	0	0	592	5.38
MIL PM	Excavate & load, hydr excavator, 2 CY, medium matl		9.20	CY	CODEB12C	130.00	6	4	0	0	0	10	1.08
TOTAL	Pavement Removal		110.00	SY			413	188	0	0	0	602	5.47
	11 02 03 19 03 3. Remove Crushed Stone												
USR PM	Remove Crushed Stone and Stockpile		80.00	TON	CODFB10P	36.00	123	157	0	0	0	279	3.49
TOTAL	Remove Crushed S		80.00	TON			123	157	0	0	0	279	3.49
	11 02 03 19 03 4. Excavation												
L MIL PM	Excavate & load, hydr excavator, 2 CY, medium matl		6540.00	CY	CODEB12C	150.00	3,471	2,659	0	0	0	6,130	0.94

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
L	MIL PM	Hauling, hwy haulers, 12 CY, 1 mi round trip @ 20 MPH (4.2 cyc/hr)	6540.00	CY	COEIB34B	50.40	4,920	5,037	0	0	0	9,957	1.52
	TOTAL	Excavation	6540.00	CY			8,391	7,696	0	0	0	16,087	2.46
		11 02 03 19 03 5. Cofferdam											
L	MIL PM	Excavate & load, hydr excavator, 2 CY, medium matl	1700.00	CY	CODEB12C	150.00	902	691	0	0	0	1,593	0.94
L	MIL PM	Hauling, hwy haulers, 12 CY, 1 mi round trip @ 20 MPH (4.2 cyc/hr)	1700.00	CY	COEIB34B	50.40	1,279	1,309	0	0	0	2,588	1.52
	MIL PM	Spread & compact, 8" lift, embankment, 300 HP tractor	1700.00	CY	CODTB10C	312.50	300	367	0	0	0	667	0.39
	TOTAL	Cofferdam	1700.00	CY			2,481	2,367	0	0	0	4,848	2.85
		11 02 03 19 03 6. Remove Existing Pipe											
	CIV PM	Site dml, pipe removal, 24" dia, conc, water/sewer, no excavation	250.00	LF	CODLB6	15.00	1,843	212	0	0	0	2,055	8.22
	TOTAL	Remove Existing	250.00	LF			1,843	212	0	0	0	2,055	8.22
		11 02 03 19 03 7. Install New RCP											
	MIL PM	Backfill, sand bedding trenches, front-end loader, 1.5 CY	30.00	CY	CODFB10N	47.50	35	20	642	0	0	697	23.24
	MIL PM	Piping, drainage & sewage, 24" dia, RCP, class 3, no gaskets	250.00	LF	CLABB14	12.50	4,455	254	4,583	0	0	9,292	37.17
	CIV PM	Piping, drainage & sewage, RCP, precast end section, 24" dia	1.00	EA	CLABB14	2.50	89	5	268	0	0	362	361.70
	USR PM	Concrete Cradle for Pipe	2.00	CY		0.00	0	0	0	0	600	600	300.00
	USR PM	Connect Pipe to Existing Structure	1.00	EA		0.00	0	0	0	0	500	500	500.00
	TOTAL	Install New RCP	250.00	LF			4,579	280	5,492	0	1,100	11,451	45.81

11 02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
11 02 03 19 03 8. Place and Compact Backfill											
L MIL PM Excavate & load, hydr excavator, 2 CY, medium matl	7800.00	CY	CODEB12C	150.00	4,139	3,171	0	0	0	7,311	0.94
L MIL PM Hauling, hwy haulers, 12 CY, 1 mi round trip @ 20 MPH (4.2 cyc/hr)	7800.00	CY	COEIB34B	50.40	5,868	6,008	0	0	0	11,876	1.52
L AF PM Fill, spread borrow w/dozer	7800.00	CY	CODTB10B	150.00	2,869	2,825	0	0	0	5,694	0.73
AF PM Compaction, ridging, 8" lifts, 2 passes, sheepsfoot/wobbly wheel roller	7800.00	CY	COFCB32F	600.00	1,451	998	0	0	0	2,448	0.31
TOTAL Place and Compac	7800.00	CY			14,327	13,002	0	0	0	27,329	3.50
11 02 03 19 03 9. Crushed Stone Surfacing											
B MIL PM Base course, 3/4 " maximum size, 3" deep, crushed stone, large areas	50.00	CY	COFGB36B	75.00	198	136	488	0	0	821	16.42
TOTAL Crushed Stone Su	80.00	TON			198	136	488	0	0	821	10.26
11 02 03 19 03 10. Bituminous Road Repair											
MIL PM Surface treatment, prime coat, bituminous, 0.28 gal/SY	9.90	CSF	COKBB45	300.00	2	2	32	0	0	36	3.66
MIL PM Asphaltic conc pavement, highway, wearing course, 3" thick	14.00	TON	COKCB25B	100.00	62	23	406	0	0	491	35.07
TOTAL Bitumineous Road	110.00	SY			65	24	438	0	0	527	4.79
11 02 03 19 03 11. Establishment of Turf											
MIL PM Seeding, athletic field mix, mechanical seeding, 450#/acre	1.20	ACR	COELB66	0.24	186	80	659	0	0	925	771.05
AF PM Seeding, apply fertilizer, 1# nitrogen/MSF, spray from truck	1.20	MSF	COFWB59	35.00	1	2	6	0	0	9	7.46
TOTAL Establishment of	1.20	ACR			187	81	666	0	0	934	778.50

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL	Sitework					33,830	24,648	7,083	0	1,100	66,660	
	11 02 03 19 04. Drainage Structure											
	11 02 03 19 04 1. Replace Handrail											
B CIV PM	Remove Existing Handrail handrail	70.00	LF	SIWSSSWK2	8.00	811	0	0	0	0	811	11.58
CIV PM	Castings fibergl ass, 2" dia rails pickets 5' OC, 42" high, handrail	70.00	LF	SIWSSSWK2	4.00	1,622	0	2,954	0	0	4,576	65.37
TOTAL	Replace Handrail					2,433	0	2,954	0	0	5,387	
	11 02 03 19 04 2. Replace Grating											
B CIV PM	Remove Grating	20.00	SF	SIWSSSWK2	40.00	46	0	0	0	0	46	2.32
CIV PM	Grating fbgls, m olded, 2" T, 2" sq mesh, grn (mod crsv env)	20.00	SF	SIWSSSWK2	40.00	46	0	410	0	0	457	22.84
TOTAL	Replace Grating					93	0	410	0	0	503	
	11 02 03 19 04 3. Replace Ladders											
B MIL PM	Remove Ladders	10.00	VLF	SIWSE4	12.50	149	4	0	0	0	153	15.31
MIL PM	Ladder, 20" wide , bolted to conc, w/safety equip	10.00	VLF	SIWSE4	6.25	298	8	532	0	0	838	83.81
TOTAL	Replace Ladders					447	12	532	0	0	991	
TOTAL	Drainage Structu					2,973	12	3,896	0	0	6,881	
	11 02 03 19 05. Gates											
	11 02 03 19 05 1. Remove Existing Gate											
MIL PM	Steam/Pipefitter s Foreman	12.00	HR	B-STM/PIPE	1.00	468	0	0	0	0	468	39.03
MIL PM	Steam/Pipefitter s	12.00	HR	B-STM/PIPE	1.00	456	0	0	0	0	456	38.03
MIL PM	Laborers, (Semi- Skilled)	12.00	HR	B-LABORER	1.00	445	0	0	0	0	445	37.06
MIL PM	Equip. Operators , Crane/Shovel	8.00	HR	B-EQOPRCRN	1.00	349	0	0	0	0	349	43.57
MAP PM	CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL	Remove Existing	1.00	EA			1,718	305	0	0	0	2,023	2023.24
	11 02 03 19 05 2. Rehab Gate											
	Manufacturers Rep/Erection Engineer is considered for field assistance.											
USR ME	Rehab 24" Gate w / New Manual Operator	1.00	EA		0.00	0	0	0	0	3,564	3,564	3563.69
USR ME	Erection Enginee r	1.00	LS		0.00	950	0	0	0	0	950	950.32
MIL ME	Painters, Struct ural Steel	12.00	HR	B-PAINTSS	1.00	565	0	0	0	0	565	47.10
TOTAL	Rehab Gate	1.00	EA			1,516	0	0	0	3,564	5,079	5079.23
	11 02 03 19 05 3. Install/Test Rehabbed Gate											
MIL PM	Steam/Pipefitter s Foreman	20.00	HR	B-STM/PIPE	1.00	781	0	0	0	0	781	39.03
MIL PM	Steam/Pipefitter s	16.00	HR	B-STM/PIPE	1.00	608	0	0	0	0	608	38.03
MIL PM	Laborers, (Semi- Skilled)	16.00	HR	B-LABORER	1.00	593	0	0	0	0	593	37.06
MIL PM	Equip. Operators , Crane/Shovel	8.00	HR	B-EQOPRCRN	1.00	349	0	0	0	0	349	43.57
MAP PM	CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16
MIL PM	Outside Truck Dr ivers, Heavy	4.00	HR	X-TRKDVRHV	1.00	152	0	0	0	0	152	37.92
MAP PM	FLATBED, 8'x 16. 0', W/SIDE RACKS (ADD TRUCK)	4.00	HR	T40KF016	1.00	0	3	0	0	0	3	0.84
EP PM	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	4.00	HR	T50FO006	1.00	0	57	0	0	0	57	14.36
TOTAL	Install/Test Reh	1.00	EA			2,482	366	0	0	0	2,848	2848.28
TOTAL	Gates					5,716	671	0	0	3,564	9,951	
TOTAL	GW-32, 24" Drain					50,725	27,834	13,480	0	4,664	96,701	

11 02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
11 02 03 20. GW-33, 24" Drain (Riverfront)											
11 02 03 20 01. Mob, Demob & Preparatory Work Use the following crew for to mobilize equipment to the jobsite. Assume the same time for demobilzation. Use 2hrs operating time for each way. (Mob.& Demob.) Crew - -------- Truck w/Lowboy — Truck Driver Mechanics Truck — Operator Laborer											
11 02 03 20 01 1. Mobilization and Demobilization Asume 8hrs to mobilize equipment. Use 1hr operating time for loading and 1hr operating time for unloading equipment. Assume the same for demobilization.											
UPB PM AIR COMPR, 1,600 CFM, 100 PSI REF. EP 1110-1-8 1600 CFM QUIET, 100 PSI (ADD HOSE)	4.00	HR	A15XX017	1.00	0	183	0	0	0	183	45.70
UPB PM GENERATOR, 5.5 KW, 120/240V,PORT REF. EP 1110-1-8 5.5 KW	4.00	HR	G10HO004	0.00	0	7	0	0	0	7	1.64
MIL PM PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRASH	4.00	HR	P50HO005	1.00	0	12	0	0	0	12	2.94
MAP PM CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	4.00	HR	C75GV002	1.00	0	153	0	0	0	153	38.16
MIL PM LDR,BH,WH, 1.00CY FE BKT, 24"DIP	4.00	HR	L50CS003	0.00	0	68	0	0	0	68	17.00
UPB PM WELDER, 300 AMP, SKID,ELEC DRIVE	4.00	HR	W35XX009	0.00	0	6	0	0	0	6	1.59
L UPB PM TRK,HWY, 46,000 GVW, 6X4, 3 AXLE	16.00	HR	T50FO018	1.00	0	558	0	0	0	558	34.90
L MIL PM TRLR,LOWBOY, 60T, 3 AXLE (ADD TOWING TRUCK)	16.00	HR	T45XX017	1.00	0	134	0	0	0	134	8.38
L MIL PM TRK,HWY,10,000GVW,4X2, 1T-PICKUP	16.00	HR	T50FO005	1.00	0	126	0	0	0	126	7.88
MIL PM Outside Truck Drivers, Heavy *	16.00	HR	X-TRKDVRHV	1.00	607	0	0	0	0	607	37.92
MIL PM Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL	Mobilization and					1,897	1,247	0	0	0	3,143	
TOTAL	Mob, Demob & Pre					1,897	1,247	0	0	0	3,143	

11 02 03 20 02. Care and Diversion of Water

Care of water consists of the installation of temporary bulkheads. Assume small trash pump and operator for any required pumping. Operator is assumed to be on-site for 10 working days for the purpose of dewatering.

11 02 03 20 02 1. Fabricate Bulkheads

B MIL PM	Fabricate Bulkheads	1.00	LS		0.00	0	0	2,500	0	0	2,500	2500.00
TOTAL	Fabricate Bulkhe					0	0	2,500	0	0	2,500	

11 02 03 20 02 2. Install Temporary Bulkheads

MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	16.00	HR	L50CS003	0.00	0	272	0	0	0	272	17.00
MIL PM	Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57
MIL PM	Outside Laborers, (Semi-Skilled)	32.00	HR	X-LABORER	1.00	1,186	0	0	0	0	1,186	37.06
TOTAL	Install Temporar	2.00	DAY			1,883	272	0	0	0	2,155	1077.53

11 02 03 20 02 3. Remove Temporary Bulkheads

MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS003	0.00	0	136	0	0	0	136	17.00
MIL PM	Outside Equip. Operators, Heavy *	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL	Remove Temporary	1.00	DAY			942	136	0	0	0	1,078	1077.53

11 02 03 20 02 4. Unwatering Pumps

MIL PM	Outside Equip. Operators, Heavy	80.00	HR	X-EQOPRHVY	1.00	3,485	0	0	0	0	3,485	43.57

11 02. Gravity Drainage St			QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
MIL	PM	PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRA SH	80.00	HR	P50HO005	1.00	0	235	0	0	0	235	2.94
UPB	PM	TRK,HWY, 8,800GVW,4X4, 3/4T-PKUP REF. EP 1110-1-8 4X4 3/4-TON PICK-UP, 8800 GVW	80.00	HR	T50FO004	1.00	0	613	0	0	0	613	7.66
TOTAL		Unwatering Pumps					3,485	848	0	0	0	4,333	
TOTAL		Care and Diversi					6,310	1,256	2,500	0	0	10,066	
		11 02 03 20 03. Sitework											
		11 02 03 20 03 1. Clearing, Grubbing and Stripping											
AF	PM	Felling trees & piling, chipping, medium brush	1.20	ACR	CODFB7	0.22	1,223	504	0	0	0	1,727	1438.84
TOTAL		Clearing, Grubbi	1.20	ACR			1,223	504	0	0	0	1,727	1438.84
		11 02 03 20 03 2. Pavement Removal											
L MIL	PM	Site dml, bituminous, pavement removal, roads, 3" thick	110.00	SY	CLADB38	50.00	408	184	0	0	0	592	5.38
MIL	PM	Excavate & load, hydr excavator, 2 CY, medium matl	9.20	CY	CODEB12C	130.00	6	4	0	0	0	10	1.08
TOTAL		Pavement Removal	110.00	SY			413	188	0	0	0	602	5.47
		11 02 03 20 03 3. Remove Crushed Stone											
USR	PM	Remove Crushed Stone and Stockpile	80.00	TON	CODFB10P	36.00	123	157	0	0	0	279	3.49
TOTAL		Remove Crushed S	80.00	TON			123	157	0	0	0	279	3.49
		11 02 03 20 03 4. Excavation											
L MIL	PM	Excavate & load, hydr excavator, 2 CY, medium matl	6540.00	CY	CODEB12C	150.00	3,471	2,659	0	0	0	6,130	0.94

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
L	MIL PM	Hauling, hwy haulers, 12 CY, 1 mi round trip @ 20 MPH (4.2 cyc/hr)	6540.00	CY	COEIB34B	50.40	4,920	5,037	0	0	0	9,957	1.52
	TOTAL	Excavation	6540.00	CY			8,391	7,696	0	0	0	16,087	2.46
		11 02 03 20 03 5. Cofferdam											
L	MIL PM	Excavate & load, hydr excavator, 2 CY, medium matl	1700.00	CY	CODEB12C	150.00	902	691	0	0	0	1,593	0.94
L	MIL PM	Hauling, hwy haulers, 12 CY, 1 mi round trip @ 20 MPH (4.2 cyc/hr)	1700.00	CY	COEIB34B	50.40	1,279	1,309	0	0	0	2,588	1.52
	MIL PM	Spread & compact, 8" lift, embankment, 300 HP tractor	1700.00	CY	CODTB10C	312.50	300	367	0	0	0	667	0.39
	TOTAL	Cofferdam	1700.00	CY			2,481	2,367	0	0	0	4,848	2.85
		11 02 03 20 03 6. Remove Existing Pipe											
	CIV PM	Site dml, pipe removal, 24" dia, conc, water/sewer, no excavation	250.00	LF	CODLB6	15.00	1,843	212	0	0	0	2,055	8.22
	TOTAL	Remove Existing	250.00	LF			1,843	212	0	0	0	2,055	8.22
		11 02 03 20 03 7. Install New RCP											
	MIL PM	Backfill, sand bedding trenches, front-end loader, 1.5 CY	30.00	CY	CODFB10N	47.50	35	20	642	0	0	697	23.24
	MIL PM	Piping, drainage & sewage, 24" dia, RCP, class 3, no gaskets	250.00	LF	CLABB14	12.50	4,455	254	4,583	0	0	9,292	37.17
	CIV PM	Piping, drainage & sewage, RCP, precast end section, 24" dia	1.00	EA	CLABB14	2.50	89	5	268	0	0	362	361.70
	USR PM	Concrete Cradle for Pipe	2.00	CY		0.00	0	0	0	0	600	600	300.00
	USR PM	Connect Pipe to Existing Structure	1.00	EA		0.00	0	0	0	0	500	500	500.00
	TOTAL	Install New RCP	250.00	LF			4,579	280	5,492	0	1,100	11,451	45.81

11 02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
11 02 03 20 03 8. Place and Compact Backfill											
L MIL PM Excavate & load, hydr excavator, 2 CY, medium matl	7800.00	CY	CODEB12C	150.00	4,139	3,171	0	0	0	7,311	0.94
L MIL PM Hauling, hwy haulers, 12 CY, 1 mi round trip @ 20 MPH (4.2 cyc/hr)	7800.00	CY	COEIB34B	50.40	5,868	6,008	0	0	0	11,876	1.52
L AF PM Fill, spread borrow w/dozer	7800.00	CY	CODTB10B	150.00	2,869	2,825	0	0	0	5,694	0.73
AF PM Compaction, ridi ng, 8" lifts, 2 passes, sheepsfoot/wobbly wheel roller	7800.00	CY	COFCB32F	600.00	1,451	998	0	0	0	2,448	0.31
TOTAL Place and Compac	7800.00	CY			14,327	13,002	0	0	0	27,329	3.50
11 02 03 20 03 9. Crushed Stone Surfacing											
B MIL PM Base course, 3/4 " maximum size, 3" deep, crushed stone, large areas	50.00	CY	COFGB36B	75.00	198	136	488	0	0	821	16.42
TOTAL Crushed Stone Su	80.00	TON			198	136	488	0	0	821	10.26
11 02 03 20 03 10. Bituminous Road Repair											
MIL PM Surface treatmen t, prime coat, bituminous, 0.28 gal/SY	9.90	CSF	COKBB45	300.00	2	2	32	0	0	36	3.66
MIL PM Asphaltic conc p avement, highway, wearing course, 3" thick	14.00	TON	COKCB25B	100.00	62	23	406	0	0	491	35.07
TOTAL Bituminous Road	110.00	SY			65	24	438	0	0	527	4.79
11 02 03 20 03 11. Establishment of Turf											
MIL PM Seeding, athleti c field mix, mechanical seeding, 450#/acre	1.20	ACR	COELB66	0.24	186	80	659	0	0	925	771.05
AF PM Seeding, apply f ertilizer, 1# nitrogen/MSF, spray from truck	1.20	MSF	COFWB59	35.00	1	2	6	0	0	9	7.46
TOTAL Establishment of	1.20	ACR			187	81	666	0	0	934	778.50

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL	Sitework					33,830	24,648	7,083	0	1,100	66,660	
	11 02 03 20 04. Drainage Structure											
	11 02 03 20 04 1. Replace Handrail											
B CIV PM	Remove Existing Handrail handrail	70.00	LF	SIWSSSWK2	8.00	811	0	0	0	0	811	11.58
CIV PM	Castings fibergl ass, 2" dia rails pickets 5' OC, 42" high, handrail	70.00	LF	SIWSSSWK2	4.00	1,622	0	2,954	0	0	4,576	65.37
TOTAL	Replace Handrail					2,433	0	2,954	0	0	5,387	
	11 02 03 20 04 2. Replace Grating											
B CIV PM	Remove Grating	20.00	SF	SIWSSSWK2	40.00	46	0	0	0	0	46	2.32
CIV PM	Grating fbgls, m olded, 2" T, 2" sq mesh, grn (mod crsv env)	20.00	SF	SIWSSSWK2	40.00	46	0	410	0	0	457	22.84
TOTAL	Replace Grating					93	0	410	0	0	503	
	11 02 03 20 04 3. Replace Ladders											
B MIL PM	Remove Ladders	10.00	VLF	SIWSE4	12.50	149	4	0	0	0	153	15.31
MIL PM	Ladder, 20" wide , bolted to conc, w/safety equip	10.00	VLF	SIWSE4	6.25	298	8	532	0	0	838	83.81
TOTAL	Replace Ladders					447	12	532	0	0	991	
TOTAL	Drainage Structu					2,973	12	3,896	0	0	6,881	
	11 02 03 20 05. Gates											
	11 02 03 20 05 1. Remove Existing Gate											
MIL PM	Steam/Pipefitter s Foreman	12.00	HR	B-STM/PIPE	1.00	468	0	0	0	0	468	39.03
MIL PM	Steam/Pipefitter s	12.00	HR	B-STM/PIPE	1.00	456	0	0	0	0	456	38.03
MIL PM	Laborers, (Semi- Skilled)	12.00	HR	B-LABORER	1.00	445	0	0	0	0	445	37.06
MIL PM	Equip. Operators , Crane/Shovel	8.00	HR	B-EQOPRCRN	1.00	349	0	0	0	0	349	43.57
MAP PM	CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16

11 02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL Remove Existing	1.00	EA			1,718	305	0	0	0	2,023	2023.24
11 02 03 20 05 2. Replace Gate											
Manufacturers Rep/Erection Engineer is considered for field assistance.											
USR ME Replace 24" Gate w/ New Manual Operator	1.00	EA		0.00	0	0	0	0	4,989	4,989	4989.17
USR ME Replace 24" Flap Gate	1.00	EA		0.00	0	0	0	0	3,920	3,920	3920.06
USR ME Erection Enginee r	1.00	LS		0.00	1,188	0	0	0	0	1,188	1187.90
TOTAL Replace Gate	1.00	EA			1,188	0	0	0	8,909	10,097	10097
11 02 03 20 05 3. Install/Test New Gate											
MIL PM Steam/Pipefitter s Foreman	20.00	HR	B-STM/PIPE	1.00	781	0	0	0	0	781	39.03
MIL PM Steam/Pipefitter s	16.00	HR	B-STM/PIPE	1.00	608	0	0	0	0	608	38.03
MIL PM Laborers, (Semi- Skilled)	16.00	HR	B-LABORER	1.00	593	0	0	0	0	593	37.06
MIL PM Equip. Operators , Crane/Shovel	8.00	HR	B-EQOPRCRN	1.00	349	0	0	0	0	349	43.57
MAP PM CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16
MIL PM Outside Truck Dr ivers, Heavy	4.00	HR	X-TRKDVRHV	1.00	152	0	0	0	0	152	37.92
MAP PM FLATBED, 8'x 16. 0', W/SIDE RACKS (ADD TRUCK)	4.00	HR	T40KF016	1.00	0	3	0	0	0	3	0.84
EP PM TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	4.00	HR	T50FO006	1.00	0	57	0	0	0	57	14.36
TOTAL Install/Test New	1.00	EA			2,482	366	0	0	0	2,848	2848.28
TOTAL Gates					5,388	671	0	0	8,909	14,969	
TOTAL GW-33, 24" Drain					50,397	27,834	13,480	0	10,009	101,719	

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
11 02 03 21. GW-34, 48" Drain (Cahokia Creek)												
11 02 03 21 01. Mob, Demob & Preparatory Work Use the following crew for to mobilize equipment to the jobsite. Assume the same time for demobilzation. Use 2hrs operating time for each way. (Mob.& Demob.) Crew - -------- Truck w/Lowboy Truck Driver Mechanics Truck Operator Laborer												
11 02 03 21 01 1. Mobilization and Demobilization Asume 8hrs to mobilize equipment. Use 1hr operating time for loading and 1hr operating time for unloading equipment. Assume the same for demobilization.												
	UPB	PM	AIR COMPR, 1,600 CFM, 100 PSI REF. EP 1110-1-8 1600 CFM QUIET, 100 PSI (ADD HOSE)	4.00	HR	A15XX017	1.00	0	183	0	0	0	183	45.70
	UPB	PM	GENERATOR, 5.5 KW, 120/240V,PORT REF. EP 1110-1-8 5.5 KW	4.00	HR	G10HO004	0.00	0	7	0	0	0	7	1.64
	MIL	PM	PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRASH	4.00	HR	P50HO005	1.00	0	12	0	0	0	12	2.94
	MAP	PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	4.00	HR	C75GV002	1.00	0	153	0	0	0	153	38.16
	MIL	PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	4.00	HR	L50CS003	0.00	0	68	0	0	0	68	17.00
	UPB	PM	WELDER, 300 AMP, SKID,ELEC DRIVE	4.00	HR	W35XX009	0.00	0	6	0	0	0	6	1.59
L	UPB	PM	TRK,HWY, 46,000 GVW, 6X4, 3 AXLE	16.00	HR	T50FO018	1.00	0	558	0	0	0	558	34.90
L	MIL	PM	TRLR,LOWBOY, 60T, 3 AXLE (ADD TOWING TRUCK)	16.00	HR	T45XX017	1.00	0	134	0	0	0	134	8.38
L	MIL	PM	TRK,HWY,10,000GVW,4X2, 1T-PICKUP	16.00	HR	T50FO005	1.00	0	126	0	0	0	126	7.88
	MIL	PM	Outside Truck Drivers, Heavy *	16.00	HR	X-TRKDVRHV	1.00	607	0	0	0	0	607	37.92
	MIL	PM	Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL	Mobilization and					1,897	1,247	0	0	0	3,143	
TOTAL	Mob, Demob & Pre					1,897	1,247	0	0	0	3,143	

11 02 03 21 02. Care and Diversion of Water

Care of water consists of the installation of temporary bulkheads. Assume small trash pump and operator for any required pumping. Operator is assumed to be on-site for 10 working days for the purpose of dewatering.

11 02 03 21 02 1. Fabricate Bulkheads

B MIL PM	Fabricate Bulkheads	1.00	LS		0.00	0	0	2,500	0	0	2,500	2500.00
TOTAL	Fabricate Bulkhe					0	0	2,500	0	0	2,500	

11 02 03 21 02 2. Install Temporary Bulkheads

MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	16.00	HR	L50CS003	0.00	0	272	0	0	0	272	17.00
MIL PM	Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57
MIL PM	Outside Laborers, (Semi-Skilled)	32.00	HR	X-LABORER	1.00	1,186	0	0	0	0	1,186	37.06
TOTAL	Install Temporar	2.00	DAY			1,883	272	0	0	0	2,155	1077.53

11 02 03 21 02 3. Remove Temporary Bulkheads

MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS003	0.00	0	136	0	0	0	136	17.00
MIL PM	Outside Equip. Operators, Heavy *	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL	Remove Temporary	1.00	DAY			942	136	0	0	0	1,078	1077.53

11 02 03 21 02 4. Unwatering Pumps

MIL PM	Outside Equip. Operators, Heavy	80.00	HR	X-EQOPRHVY	1.00	3,485	0	0	0	0	3,485	43.57

		11 02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
MIL	PM	PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRA SH	80.00	HR	P50HO005	1.00	0	235	0	0	0	235	2.94
UPB	PM	TRK,HWY, 8,800GVW,4X4, 3/4T-PKUP REF. EP 1110-1-8 4X4 3/4-TON PICK-UP, 8800 GVW	80.00	HR	T50FO004	1.00	0	613	0	0	0	613	7.66
TOTAL		Unwatering Pumps					3,485	848	0	0	0	4,333	
TOTAL		Care and Diversi					6,310	1,256	2,500	0	0	10,066	
		11 02 03 21 03. Sitework											
		11 02 03 21 03 1. Site Preparation											
EP	PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS005	1.00	0	134	0	0	0	134	16.71
MIL	PM	Outside Equip. Operators, Heavy	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL	PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL		Site Preparation					942	134	0	0	0	1,075	
		11 02 03 21 03 2. Line Existing Pipe w/ HDPE Pipe There are 2-pipes to be lined at this location (quantities are multiplied by two)											
USR	PM	HDPE Liner	250.00	LF		0.00	0	0	0	0	25,000	25,000	100.00
B CIV	PM	Grouting, pressure, place grout between pipes	500.00	CF	XXQEB47B	17.50	5,323	1,403	1,500	0	0	8,226	16.45
TOTAL		Line Existing Pi					5,323	1,403	1,500	0	25,000	33,226	
		11 02 03 21 03 3. Site Restoration											
EP	PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS005	1.00	0	134	0	0	0	134	16.71
MIL	PM	Outside Equip. Operators, Heavy	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL	PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
USR	PM	Seeding	1.00	ACR		0.00	0	0	0	0	1,000	1,000	1000.00
TOTAL		Site Restoration					942	134	0	0	1,000	2,075	

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL	Sitework					7,206	1,671	1,500	0	26,000	36,377	
	11 02 03 21 04. Drainage Structure											
	11 02 03 21 04 1. Replace Handrail											
B CIV PM	Remove Existing Handrail handrail	70.00	LF	SIWSSSWK2	8.00	811	0	0	0	0	811	11.58
CIV PM	Castings fibergl ass, 2" dia rails pickets 5' OC, 42" high, handrail	70.00	LF	SIWSSSWK2	4.00	1,622	0	2,954	0	0	4,576	65.37
TOTAL	Replace Handrail					2,433	0	2,954	0	0	5,387	
	11 02 03 21 04 2. Replace Grating											
B CIV PM	Remove Grating	20.00	SF	SIWSSSWK2	40.00	46	0	0	0	0	46	2.32
CIV PM	Grating fbgls, m olded, 2" T, 2" sq mesh, grn (mod crsv env)	20.00	SF	SIWSSSWK2	40.00	46	0	410	0	0	457	22.84
TOTAL	Replace Grating					93	0	410	0	0	503	
	11 02 03 21 04 3. Replace Ladders											
B MIL PM	Remove Ladders	10.00	VLF	SIWSE4	12.50	149	4	0	0	0	153	15.31
MIL PM	Ladder, 20" wide , bolted to conc, w/safety equip	10.00	VLF	SIWSE4	6.25	298	8	532	0	0	838	83.81
TOTAL	Replace Ladders					447	12	532	0	0	991	
TOTAL	Drainage Structu					2,973	12	3,896	0	0	6,881	
	11 02 03 21 05. Gates											
	11 02 03 21 05 1. Remove Existing Gate											
MIL PM	Steam/Pipefitter s Foreman	16.00	HR	B-STM/PIPE	1.00	624	0	0	0	0	624	39.03
MIL PM	Steam/Pipefitter s	16.00	HR	B-STM/PIPE	1.00	608	0	0	0	0	608	38.03
MIL PM	Laborers, (Semi- Skilled)	16.00	HR	B-LABORER	1.00	593	0	0	0	0	593	37.06
MIL PM	Equip. Operators , Crane/Shovel	12.00	HR	B-EQOPRCRN	1.00	523	0	0	0	0	523	43.57
MAP PM	CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	12.00	HR	C75GV002	1.00	0	458	0	0	0	458	38.16

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL	Remove Existing	1.00	EA			2,349	458	0	0	0	2,807	2806.63
	11 02 03 21 05 2. Rehab Gate											
	Manufacturers Rep/Erection Engineer is considered for field assistance.											
USR ME	Rehab 48" Gate w / New Manual Operator	1.00	EA		0.00	0	0	0	0	5,108	5,108	5107.96
USR ME	Erection Enginee r	1.00	LS		0.00	950	0	0	0	0	950	950.32
MIL ME	Painters, Struct ural Steel	20.00	HR	B-PAINTSS	1.00	942	0	0	0	0	942	47.10
TOTAL	Rehab Gate	1.00	EA			1,892	0	0	0	5,108	7,000	7000.31
	11 02 03 21 05 3. Install/Test Rehabbed Gate											
MIL PM	Steam/Pipefitter s Foreman	24.00	HR	B-STM/PIPE	1.00	937	0	0	0	0	937	39.03
MIL PM	Steam/Pipefitter s	20.00	HR	B-STM/PIPE	1.00	761	0	0	0	0	761	38.03
MIL PM	Laborers, (Semi- Skilled)	20.00	HR	B-LABORER	1.00	741	0	0	0	0	741	37.06
MIL PM	Equip. Operators , Crane/Shovel	16.00	HR	B-EQOPRCRN	1.00	697	0	0	0	0	697	43.57
MAP PM	CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	16.00	HR	C75GV002	1.00	0	611	0	0	0	611	38.16
MIL PM	Outside Truck Dr ivers, Heavy	4.00	HR	X-TRKDVRHV	1.00	152	0	0	0	0	152	37.92
MAP PM	FLATBED, 8'x 16. 0', W/SIDE RACKS (ADD TRUCK)	4.00	HR	T40KF016	1.00	0	3	0	0	0	3	0.84
EP PM	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	4.00	HR	T50FO006	1.00	0	57	0	0	0	57	14.36
TOTAL	Install/Test Reh	1.00	EA			3,287	671	0	0	0	3,959	3958.59
TOTAL	Gates					7,528	1,129	0	0	5,108	13,766	
TOTAL	GW-34, 48" Drain					25,913	5,315	7,896	0	31,108	70,232	

11 02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
11 02 03 22. GW-35, 48" Drain (Cahokia Creek)											
11 02 03 22 01. Mob, Demob & Preparatory Work Use the following crew for to mobilize equipment to the jobsite. Assume the same time for demobilzation. Use 2hrs operating time for each way. (Mob.& Demob.) Crew - -------- Truck w/Lowboy — Truck Driver Mechanics Truck — Operator Laborer											
11 02 03 22 01 1. Mobilization and Demobilization Asume 8hrs to mobilize equipment. Use 1hr operating time for loading and 1hr operating time for unloading equipment. Assume the same for demobilization.											
UPB PM AIR COMPR, 1,600 CFM, 100 PSI REF. EP 1110-1-8 1600 CFM QUIET, 100 PSI (ADD HOSE)	4.00	HR	A15XX017	1.00	0	183	0	0	0	183	45.70
UPB PM GENERATOR, 5.5 KW, 120/240V,PORT REF. EP 1110-1-8 5.5 KW	4.00	HR	G10HO004	0.00	0	7	0	0	0	7	1.64
MIL PM PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRASH	4.00	HR	P50HO005	1.00	0	12	0	0	0	12	2.94
MAP PM CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	4.00	HR	C75GV002	1.00	0	153	0	0	0	153	38.16
MIL PM LDR,BH,WH, 1.00CY FE BKT, 24"DIP	4.00	HR	L50CS003	0.00	0	68	0	0	0	68	17.00
UPB PM WELDER, 300 AMP, SKID,ELEC DRIVE	4.00	HR	W35XX009	0.00	0	6	0	0	0	6	1.59
L UPB PM TRK,HWY, 46,000 GVW, 6X4, 3 AXLE	16.00	HR	T50FO018	1.00	0	558	0	0	0	558	34.90
L MIL PM TRLR,LOWBOY, 60T, 3 AXLE (ADD TOWING TRUCK)	16.00	HR	T45XX017	1.00	0	134	0	0	0	134	8.38
L MIL PM TRK,HWY,10,000GVW,4X2, 1T-PICKUP	16.00	HR	T50FO005	1.00	0	126	0	0	0	126	7.88
MIL PM Outside Truck Drivers, Heavy *	16.00	HR	X-TRKDVRHV	1.00	607	0	0	0	0	607	37.92
MIL PM Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL	Mobilization and					1,897	1,247	0	0	0	3,143	
TOTAL	Mob, Demob & Pre					1,897	1,247	0	0	0	3,143	
	11 02 03 22 02. Care and Diversion of Water											
	Care of water consists of the installation of temporary bulkheads. Assume small trash pump and operator for any required pumping. Operator is assumed to be on-site for 10 working days for the purpose of dewatering.											
	11 02 03 22 02 1. Fabricate Bulkheads											
B MIL PM	Fabricate Bulkheads	1.00	LS		0.00	0	0	2,500	0	0	2,500	2500.00
TOTAL	Fabricate Bulkhe					0	0	2,500	0	0	2,500	
	11 02 03 22 02 2. Install Temporary Bulkheads											
MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	16.00	HR	L50CS003	0.00	0	272	0	0	0	272	17.00
MIL PM	Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57
MIL PM	Outside Laborers, (Semi-Skilled)	32.00	HR	X-LABORER	1.00	1,186	0	0	0	0	1,186	37.06
TOTAL	Install Temporar	2.00	DAY			1,883	272	0	0	0	2,155	1077.53
	11 02 03 22 02 3. Remove Temporary Bulkheads											
MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS003	0.00	0	136	0	0	0	136	17.00
MIL PM	Outside Equip. Operators, Heavy *	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL	Remove Temporary	1.00	DAY			942	136	0	0	0	1,078	1077.53
	11 02 03 22 02 4. Unwatering Pumps											
MIL PM	Outside Equip. Operators, Heavy	80.00	HR	X-EQOPRHVY	1.00	3,485	0	0	0	0	3,485	43.57

		11 02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
MIL	PM	PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRA SH	80.00	HR	P50HO005	1.00	0	235	0	0	0	235	2.94
UPB	PM	TRK,HWY, 8,800GVW,4X4, 3/4T-PKUP REF. EP 1110-1-8 4X4 3/4-TON PICK-UP, 8800 GVW	80.00	HR	T50FO004	1.00	0	613	0	0	0	613	7.66
TOTAL		Unwatering Pumps					3,485	848	0	0	0	4,333	
TOTAL		Care and Diversi					6,310	1,256	2,500	0	0	10,066	
		11 02 03 22 03. Sitework											
		11 02 03 22 03 1. Site Preparation											
EP	PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS005	1.00	0	134	0	0	0	134	16.71
MIL	PM	Outside Equip. Operators, Heavy	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL	PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL		Site Preparation					942	134	0	0	0	1,075	
		11 02 03 22 03 2. Line Existing Pipe w/ HDPE Pipe There are 2-pipes to be lined at this location (quantities are multiplied by two)											
USR	PM	HDPE Liner	250.00	LF		0.00	0	0	0	0	25,000	25,000	100.00
B CIV	PM	Grouting, pressure, place grout between pipes	500.00	CF	XXQEB47B	17.50	5,323	1,403	1,500	0	0	8,226	16.45
TOTAL		Line Existing Pi					5,323	1,403	1,500	0	25,000	33,226	
		11 02 03 22 03 3. Site Restoration											
EP	PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS005	1.00	0	134	0	0	0	134	16.71
MIL	PM	Outside Equip. Operators, Heavy	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL	PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
USR	PM	Seeding	1.00	ACR		0.00	0	0	0	0	1,000	1,000	1000.00
TOTAL		Site Restoration					942	134	0	0	1,000	2,075	

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL	Sitework					7,206	1,671	1,500	0	26,000	36,377	
	11 02 03 22 04. Drainage Structure											
	11 02 03 22 04 1. Replace Handrail											
B CIV PM	Remove Existing Handrail handrail	70.00	LF	SIWSSSWK2	8.00	811	0	0	0	0	811	11.58
CIV PM	Castings fibergl ass, 2" dia rails pickets 5' OC, 42" high, handrail	70.00	LF	SIWSSSWK2	4.00	1,622	0	2,954	0	0	4,576	65.37
TOTAL	Replace Handrail					2,433	0	2,954	0	0	5,387	
	11 02 03 22 04 2. Replace Grating											
B CIV PM	Remove Grating	20.00	SF	SIWSSSWK2	40.00	46	0	0	0	0	46	2.32
CIV PM	Grating fbgls, m olded, 2" T, 2" sq mesh, grn (mod crsv env)	20.00	SF	SIWSSSWK2	40.00	46	0	410	0	0	457	22.84
TOTAL	Replace Grating					93	0	410	0	0	503	
	11 02 03 22 04 3. Replace Ladders											
B MIL PM	Remove Ladders	10.00	VLF	SIWSE4	12.50	149	4	0	0	0	153	15.31
MIL PM	Ladder, 20" wide , bolted to conc, w/safety equip	10.00	VLF	SIWSE4	6.25	298	8	532	0	0	838	83.81
TOTAL	Replace Ladders					447	12	532	0	0	991	
TOTAL	Drainage Structu					2,973	12	3,896	0	0	6,881	
	11 02 03 22 05. Gates											
	11 02 03 22 05 1. Remove Existing Gate											
MIL PM	Steam/Pipefitter s Foreman	16.00	HR	B-STM/PIPE	1.00	624	0	0	0	0	624	39.03
MIL PM	Steam/Pipefitter s	16.00	HR	B-STM/PIPE	1.00	608	0	0	0	0	608	38.03
MIL PM	Laborers, (Semi- Skilled)	16.00	HR	B-LABORER	1.00	593	0	0	0	0	593	37.06
MIL PM	Equip. Operators , Crane/Shovel	12.00	HR	B-EQOPRCRN	1.00	523	0	0	0	0	523	43.57
MAP PM	CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	12.00	HR	C75GV002	1.00	0	458	0	0	0	458	38.16

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT	
TOTAL	Remove Existing	1.00	EA			2,349	458	0	0	0	2,807	2806.63	
	11 02 03 22 05 2. Rehab Gate												
	Manufacturers Rep/Erection Engineer is considered for field assistance.												
USR ME	Rehab 48" Gate w / New Manual Operator	1.00	EA		0.00	0	0	0	0	5,108	5,108	5107.96	
USR ME	Erection Enginee r	1.00	LS		0.00	950	0	0	0	0	950	950.32	
MIL ME	Painters, Struct ural Steel	20.00	HR	B-PAINTSS	1.00	942	0	0	0	0	942	47.10	
TOTAL	Rehab Gate	1.00	EA			1,892	0	0	0	5,108	7,000	7000.31	
	11 02 03 22 05 3. Install/Test Rehabbed Gate												
MIL PM	Steam/Pipefitter s Foreman	24.00	HR	B-STM/PIPE	1.00	937	0	0	0	0	937	39.03	
MIL PM	Steam/Pipefitter s	20.00	HR	B-STM/PIPE	1.00	761	0	0	0	0	761	38.03	
MIL PM	Laborers, (Semi- Skilled)	20.00	HR	B-LABORER	1.00	741	0	0	0	0	741	37.06	
MIL PM	Equip. Operators , Crane/Shovel	16.00	HR	B-EQOPRCRN	1.00	697	0	0	0	0	697	43.57	
MAP PM	CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	16.00	HR	C75GV002	1.00	0	611	0	0	0	611	38.16	
MIL PM	Outside Truck Dr ivers, Heavy	4.00	HR	X-TRKDVRHV	1.00	152	0	0	0	0	152	37.92	
MAP PM	FLATBED, 8'x 16. 0', W/SIDE RACKS (ADD TRUCK)	4.00	HR	T40KF016	1.00	0	3	0	0	0	3	0.84	
EP PM	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	4.00	HR	T50FO006	1.00	0	57	0	0	0	57	14.36	
TOTAL	Install/Test Reh	1.00	EA			3,287	671	0	0	0	3,959	3958.59	
TOTAL	Gates					7,528	1,129	0	0	5,108	13,766		
TOTAL	GW-35, 48" Drain					25,913	5,315	7,896	0	31,108	70,232		

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
11 02 03 23. GW-36, 48" Drain (Cahokia Creek)												
11 02 03 23 01. Mob, Demob & Preparatory Work Use the following crew for to mobilize equipment to the jobsite. Assume the same time for demobilzation. Use 2hrs operating time for each way. (Mob.& Demob.) Crew - -------- Truck w/Lowboy — Truck Driver Mechanics Truck — Operator Laborer												
11 02 03 23 01 1. Mobilization and Demobilization Asume 8hrs to mobilize equipment. Use 1hr operating time for loading and 1hr operating time for unloading equipment. Assume the same for demobilization.												
	UPB PM	AIR COMPR, 1,600 CFM, 100 PSI REF. EP 1110-1-8 1600 CFM QUIET, 100 PSI (ADD HOSE)	4.00	HR	A15XX017	1.00	0	183	0	0	0	183	45.70
	UPB PM	GENERATOR, 5.5 KW, 120/240V,PORT REF. EP 1110-1-8 5.5 KW	4.00	HR	G10HO004	0.00	0	7	0	0	0	7	1.64
	MIL PM	PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRASH	4.00	HR	P50HO005	1.00	0	12	0	0	0	12	2.94
	MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	4.00	HR	C75GV002	1.00	0	153	0	0	0	153	38.16
	MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	4.00	HR	L50CS003	0.00	0	68	0	0	0	68	17.00
	UPB PM	WELDER, 300 AMP, SKID,ELEC DRIVE	4.00	HR	W35XX009	0.00	0	6	0	0	0	6	1.59
L	UPB PM	TRK,HWY, 46,000 GVW, 6X4, 3 AXLE	16.00	HR	T50FO018	1.00	0	558	0	0	0	558	34.90
L	MIL PM	TRLR,LOWBOY, 60T, 3 AXLE (ADD TOWING TRUCK)	16.00	HR	T45XX017	1.00	0	134	0	0	0	134	8.38
L	MIL PM	TRK,HWY,10,000GVW,4X2, 1T-PICKUP	16.00	HR	T50FO005	1.00	0	126	0	0	0	126	7.88
	MIL PM	Outside Truck Drivers, Heavy *	16.00	HR	X-TRKDVRHV	1.00	607	0	0	0	0	607	37.92
	MIL PM	Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL	Mobilization and					1,897	1,247	0	0	0	3,143	
TOTAL	Mob, Demob & Pre					1,897	1,247	0	0	0	3,143	

11 02 03 23 02. Care and Diversion of Water

Care of water consists of the installation of temporary bulkheads. Assume small trash pump and operator for any required pumping. Operator is assumed to be on-site for 10 working days for the purpose of dewatering.

11 02 03 23 02 1. Fabricate Bulkheads

B MIL PM	Fabricate Bulkheads	1.00	LS		0.00	0	0	2,500	0	0	2,500	2500.00
TOTAL	Fabricate Bulkhe					0	0	2,500	0	0	2,500	

11 02 03 23 02 2. Install Temporary Bulkheads

MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	16.00	HR	L50CS003	0.00	0	272	0	0	0	272	17.00
MIL PM	Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57
MIL PM	Outside Laborers, (Semi-Skilled)	32.00	HR	X-LABORER	1.00	1,186	0	0	0	0	1,186	37.06
TOTAL	Install Temporar	2.00	DAY			1,883	272	0	0	0	2,155	1077.53

11 02 03 23 02 3. Remove Temporary Bulkheads

MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS003	0.00	0	136	0	0	0	136	17.00
MIL PM	Outside Equip. Operators, Heavy *	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL	Remove Temporary	1.00	DAY			942	136	0	0	0	1,078	1077.53

11 02 03 23 02 4. Unwatering Pumps

MIL PM	Outside Equip. Operators, Heavy	80.00	HR	X-EQOPRHVY	1.00	3,485	0	0	0	0	3,485	43.57

		11 02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
MIL	PM	PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRA SH	80.00	HR	P50HO005	1.00	0	235	0	0	0	235	2.94
UPB	PM	TRK,HWY, 8,800GVW,4X4, 3/4T-PKUP REF. EP 1110-1-8 4X4 3/4-TON PICK-UP, 8800 GVW	80.00	HR	T50FO004	1.00	0	613	0	0	0	613	7.66
TOTAL		Unwatering Pumps					3,485	848	0	0	0	4,333	
TOTAL		Care and Diversi					6,310	1,256	2,500	0	0	10,066	
		11 02 03 23 03. Sitework											
		11 02 03 23 03 1. Site Preparation											
EP	PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS005	1.00	0	134	0	0	0	134	16.71
MIL	PM	Outside Equip. Operators, Heavy	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL	PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL		Site Preparation					942	134	0	0	0	1,075	
		11 02 03 23 03 2. Line Existing Pipe w/ HDPE Pipe There are 2-pipes to be lined at this location (quantities are multiplied by two)											
USR	PM	HDPE Liner	250.00	LF		0.00	0	0	0	0	25,000	25,000	100.00
B CIV	PM	Grouting, pressure, place grout between pipes	500.00	CF	XXQEB47B	17.50	5,323	1,403	1,500	0	0	8,226	16.45
TOTAL		Line Existing Pi					5,323	1,403	1,500	0	25,000	33,226	
		11 02 03 23 03 3. Site Restoration											
EP	PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS005	1.00	0	134	0	0	0	134	16.71
MIL	PM	Outside Equip. Operators, Heavy	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL	PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
USR	PM	Seeding	1.00	ACR		0.00	0	0	0	0	1,000	1,000	1000.00
TOTAL		Site Restoration					942	134	0	0	1,000	2,075	

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL	Sitework					7,206	1,671	1,500	0	26,000	36,377	
	11 02 03 23 04. Drainage Structure											
	11 02 03 23 04 1. Replace Handrail											
B CIV PM	Remove Existing Handrail handrail	70.00	LF	SIWSSSWK2	8.00	811	0	0	0	0	811	11.58
CIV PM	Castings fibergl ass, 2" dia rails pickets 5' OC, 42" high, handrail	70.00	LF	SIWSSSWK2	4.00	1,622	0	2,954	0	0	4,576	65.37
TOTAL	Replace Handrail					2,433	0	2,954	0	0	5,387	
	11 02 03 23 04 2. Replace Grating											
B CIV PM	Remove Grating	20.00	SF	SIWSSSWK2	40.00	46	0	0	0	0	46	2.32
CIV PM	Grating fbgls, m olded, 2" T, 2" sq mesh, grn (mod crsv env)	20.00	SF	SIWSSSWK2	40.00	46	0	410	0	0	457	22.84
TOTAL	Replace Grating					93	0	410	0	0	503	
	11 02 03 23 04 3. Replace Ladders											
B MIL PM	Remove Ladders	10.00	VLF	SIWSE4	12.50	149	4	0	0	0	153	15.31
MIL PM	Ladder, 20" wide , bolted to conc, w/safety equip	10.00	VLF	SIWSE4	6.25	298	8	532	0	0	838	83.81
TOTAL	Replace Ladders					447	12	532	0	0	991	
TOTAL	Drainage Structu					2,973	12	3,896	0	0	6,881	
	11 02 03 23 05. Gates											
	11 02 03 23 05 1. Remove Existing Gate											
MIL PM	Steam/Pipefitter s Foreman	16.00	HR	B-STM/PIPE	1.00	624	0	0	0	0	624	39.03
MIL PM	Steam/Pipefitter s	16.00	HR	B-STM/PIPE	1.00	608	0	0	0	0	608	38.03
MIL PM	Laborers, (Semi- Skilled)	16.00	HR	B-LABORER	1.00	593	0	0	0	0	593	37.06
MIL PM	Equip. Operators , Crane/Shovel	12.00	HR	B-EQOPRCRN	1.00	523	0	0	0	0	523	43.57
MAP PM	CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	12.00	HR	C75GV002	1.00	0	458	0	0	0	458	38.16

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL	Remove Existing	1.00	EA			2,349	458	0	0	0	2,807	2806.63
	11 02 03 23 05 2. Rehab Gate											
	Manufacturers Rep/Erection Engineer is considered for field assistance.											
USR ME	Rehab 48" Gate w / New Manual Operator	1.00	EA		0.00	0	0	0	0	5,108	5,108	5107.96
USR ME	Erection Enginee r	1.00	LS		0.00	950	0	0	0	0	950	950.32
MIL ME	Painters, Struct ural Steel	20.00	HR	B-PAINTSS	1.00	942	0	0	0	0	942	47.10
TOTAL	Rehab Gate	1.00	EA			1,892	0	0	0	5,108	7,000	7000.31
	11 02 03 23 05 3. Install/Test Rehabbed Gate											
MIL PM	Steam/Pipefitter s Foreman	24.00	HR	B-STM/PIPE	1.00	937	0	0	0	0	937	39.03
MIL PM	Steam/Pipefitter s	20.00	HR	B-STM/PIPE	1.00	761	0	0	0	0	761	38.03
MIL PM	Laborers, (Semi- Skilled)	20.00	HR	B-LABORER	1.00	741	0	0	0	0	741	37.06
MIL PM	Equip. Operators , Crane/Shovel	16.00	HR	B-EQOPRCRN	1.00	697	0	0	0	0	697	43.57
MAP PM	CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	16.00	HR	C75GV002	1.00	0	611	0	0	0	611	38.16
MIL PM	Outside Truck Dr ivers, Heavy	4.00	HR	X-TRKDVRHV	1.00	152	0	0	0	0	152	37.92
MAP PM	FLATBED, 8'x 16. 0', W/SIDE RACKS (ADD TRUCK)	4.00	HR	T40KF016	1.00	0	3	0	0	0	3	0.84
EP PM	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	4.00	HR	T50FO006	1.00	0	57	0	0	0	57	14.36
TOTAL	Install/Test Reh	1.00	EA			3,287	671	0	0	0	3,959	3958.59
TOTAL	Gates					7,528	1,129	0	0	5,108	13,766	
TOTAL	GW-36, 48" Drain					25,913	5,315	7,896	0	31,108	70,232	

11 02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
11 02 03 24. GW-37, 72" Drain (Cahokia Creek)											
11 02 03 24 01. Mob, Demob & Preparatory Work Use the following crew for to mobilize equipment to the jobsite. Assume the same time for demobilzation. Use 2hrs operating time for each way. (Mob.& Demob.) Crew - -------- Truck w/Lowboy — Truck Driver Mechanics Truck — Operator Laborer											
11 02 03 24 01 1. Mobilization and Demobilization Asume 8hrs to mobilize equipment. Use 1hr operating time for loading and 1hr operating time for unloading equipment. Assume the same for demobilization.											
UPB PM AIR COMPR, 1,600 CFM, 100 PSI REF. EP 1110-1-8 1600 CFM QUIET, 100 PSI (ADD HOSE)	4.00	HR	A15XX017	1.00	0	183	0	0	0	183	45.70
UPB PM GENERATOR, 5.5 KW, 120/240V,PORT REF. EP 1110-1-8 5.5 KW	4.00	HR	G10HO004	0.00	0	7	0	0	0	7	1.64
MIL PM PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRASH	4.00	HR	P50HO005	1.00	0	12	0	0	0	12	2.94
MAP PM CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	4.00	HR	C75GV002	1.00	0	153	0	0	0	153	38.16
MIL PM LDR,BH,WH, 1.00CY FE BKT, 24"DIP	4.00	HR	L50CS003	0.00	0	68	0	0	0	68	17.00
UPB PM WELDER, 300 AMP, SKID,ELEC DRIVE	4.00	HR	W35XX009	0.00	0	6	0	0	0	6	1.59
L UPB PM TRK,HWY, 46,000 GVW, 6X4, 3 AXLE	16.00	HR	T50FO018	1.00	0	558	0	0	0	558	34.90
L MIL PM TRLR,LOWBOY, 60T, 3 AXLE (ADD TOWING TRUCK)	16.00	HR	T45XX017	1.00	0	134	0	0	0	134	8.38
L MIL PM TRK,HWY,10,000GVW,4X2, 1T-PICKUP	16.00	HR	T50FO005	1.00	0	126	0	0	0	126	7.88
MIL PM Outside Truck Drivers, Heavy *	16.00	HR	X-TRKDVRHV	1.00	607	0	0	0	0	607	37.92
MIL PM Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL	Mobilization and					1,897	1,247	0	0	0	3,143	
TOTAL	Mob, Demob & Pre					1,897	1,247	0	0	0	3,143	

11 02 03 24 02. Care and Diversion of Water

Care of water consists of the installation of temporary bulkheads. Assume small trash pump and operator for any required pumping. Operator is assumed to be on-site for 10 working days for the purpose of dewatering.

11 02 03 24 02 1. Fabricate Bulkheads

B MIL PM	Fabricate Bulkheads	1.00	LS		0.00	0	0	2,500	0	0	2,500	2500.00
TOTAL	Fabricate Bulkhe					0	0	2,500	0	0	2,500	

11 02 03 24 02 2. Install Temporary Bulkheads

MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	16.00	HR	L50CS003	0.00	0	272	0	0	0	272	17.00
MIL PM	Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57
MIL PM	Outside Laborers, (Semi-Skilled)	32.00	HR	X-LABORER	1.00	1,186	0	0	0	0	1,186	37.06
TOTAL	Install Temporar	2.00	DAY			1,883	272	0	0	0	2,155	1077.53

11 02 03 24 02 3. Remove Temporary Bulkheads

MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS003	0.00	0	136	0	0	0	136	17.00
MIL PM	Outside Equip. Operators, Heavy *	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL	Remove Temporary	1.00	DAY			942	136	0	0	0	1,078	1077.53

11 02 03 24 02 4. Unwatering Pumps

MIL PM	Outside Equip. Operators, Heavy	80.00	HR	X-EQOPRHVY	1.00	3,485	0	0	0	0	3,485	43.57

11 02. Gravity Drainage St			QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
MIL	PM	PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRA SH	80.00	HR	P50HO005	1.00	0	235	0	0	0	235	2.94
UPB	PM	TRK,HWY, 8,800GVW,4X4, 3/4T-PKUP REF. EP 1110-1-8 4X4 3/4-TON PICK-UP, 8800 GVW	80.00	HR	T50FO004	1.00	0	613	0	0	0	613	7.66
TOTAL		Unwatering Pumps					3,485	848	0	0	0	4,333	
TOTAL		Care and Diversi					6,310	1,256	2,500	0	0	10,066	
		11 02 03 24 03. Sitework											
		11 02 03 24 03 1. Site Preparation											
EP	PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS005	1.00	0	134	0	0	0	134	16.71
MIL	PM	Outside Equip. Operators, Heavy	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL	PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL		Site Preparation					942	134	0	0	0	1,075	
		11 02 03 24 03 2. Line Existing Pipe w/ HDPE Pipe There are 2-pipes to be lined at this location (quantities are multiplied by two)											
USR	PM	HDPE Liner	250.00	LF		0.00	0	0	0	0	62,500	62,500	250.00
B CIV	PM	Grouting, pressure, place grout between pipes	800.00	CF	XXQEB47B	17.50	8,517	2,245	2,400	0	0	13,162	16.45
TOTAL		Line Existing Pi					8,517	2,245	2,400	0	62,500	75,662	
		11 02 03 24 03 3. Site Restoration											
EP	PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS005	1.00	0	134	0	0	0	134	16.71
MIL	PM	Outside Equip. Operators, Heavy	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL	PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
USR	PM	Seeding	1.00	ACR		0.00	0	0	0	0	1,000	1,000	1000.00
TOTAL		Site Restoration					942	134	0	0	1,000	2,075	

		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
11 02. Gravity Drainage St												
TOTAL	Sitework					10,400	2,513	2,400	0	63,500	78,813	
	11 02 03 24 04. Drainage Structure											
	11 02 03 24 04 1. Replace Handrail											
B CIV PM	Remove Existing Handrail handrail	120.00	LF	SIWSSSWK2	8.00	1,390	0	0	0	0	1,390	11.58
CIV PM	Castings fibergl ass, 2" dia rails pickets 5' OC, 42" high, handrail	120.00	LF	SIWSSSWK2	4.00	2,780	0	5,064	0	0	7,844	65.37
TOTAL	Replace Handrail					4,170	0	5,064	0	0	9,234	
	11 02 03 24 04 2. Replace Grating											
B CIV PM	Remove Grating	60.00	SF	SIWSSSWK2	40.00	139	0	0	0	0	139	2.32
CIV PM	Grating fbgls, m olded, 2" T, 2" sq mesh, grn (mod crsv env)	60.00	SF	SIWSSSWK2	40.00	139	0	1,231	0	0	1,370	22.84
TOTAL	Replace Grating					278	0	1,231	0	0	1,509	
	11 02 03 24 04 3. Replace Ladders											
B MIL PM	Remove Ladders	55.00	VLF	SIWSE4	12.50	820	22	0	0	0	842	15.31
MIL PM	Ladder, 20" wide , bolted to conc, w/safety equip	55.00	VLF	SIWSE4	6.25	1,640	44	2,926	0	0	4,610	83.81
TOTAL	Replace Ladders					2,460	66	2,926	0	0	5,452	
TOTAL	Drainage Structu					6,908	66	9,221	0	0	16,195	
	11 02 03 24 05. Gates											
	11 02 03 24 05 1. Remove Existing Gate											
MIL PM	Steam/Pipefitter s Foreman	16.00	HR	B-STM/PIPE	1.00	624	0	0	0	0	624	39.03
MIL PM	Steam/Pipefitter s	32.00	HR	B-STM/PIPE	1.00	1,217	0	0	0	0	1,217	38.03
MIL PM	Laborers, (Semi- Skilled)	16.00	HR	B-LABORER	1.00	593	0	0	0	0	593	37.06
MIL PM	Equip. Operators , Crane/Shovel	12.00	HR	B-EQOPRCRN	1.00	523	0	0	0	0	523	43.57
MAP PM	CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	12.00	HR	C75GV002	1.00	0	458	0	0	0	458	38.16

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL	Remove Existing	1.00	EA			2,957	458	0	0	0	3,415	3415.07
	11 02 03 24 05 2. Replace Gate											
	Manufacturers Rep/Erection Engineer is considered for field assistance.											
USR ME	Replace 72" Gate w/ New Manual Operator	1.00	EA		0.00	0	0	0	0	18,412	18,412	18412
USR ME	Erection Enginee r	1.00	LS		0.00	1,188	0	0	0	0	1,188	1187.90
TOTAL	Replace Gate	1.00	EA			1,188	0	0	0	18,412	19,600	19600
	11 02 03 24 05 3. Install/Test New Gate											
MIL PM	Steam/Pipefitter s Foreman	24.00	HR	B-STM/PIPE	1.00	937	0	0	0	0	937	39.03
MIL PM	Steam/Pipefitter s	40.00	HR	B-STM/PIPE	1.00	1,521	0	0	0	0	1,521	38.03
MIL PM	Laborers, (Semi- Skilled)	20.00	HR	B-LABORER	1.00	741	0	0	0	0	741	37.06
MIL PM	Equip. Operators , Crane/Shovel	16.00	HR	B-EQOPRCRN	1.00	697	0	0	0	0	697	43.57
MAP PM	CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	16.00	HR	C75GV002	1.00	0	611	0	0	0	611	38.16
MIL PM	Outside Truck Dr ivers, Heavy	4.00	HR	X-TRKDVRHV	1.00	152	0	0	0	0	152	37.92
MAP PM	FLATBED, 8'x 16. 0', W/SIDE RACKS (ADD TRUCK)	4.00	HR	T40KF016	1.00	0	3	0	0	0	3	0.84
EP PM	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	4.00	HR	T50FO006	1.00	0	57	0	0	0	57	14.36
TOTAL	Install/Test New	1.00	EA			4,048	671	0	0	0	4,719	4719.14
TOTAL	Gates					8,193	1,129	0	0	18,412	27,734	
TOTAL	GW-37, 72" Drain					33,707	6,210	14,121	0	81,912	135,951	

11 02 03 25. GW-38, 42" Drain (Cahokia Creek)

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
11 02 03 25 01. Mob, Demob & Preparatory Work Use the following crew for to mobilize equipment to the jobsite. Assume the same time for demobilzation. Use 2hrs operating time for each way. (Mob.& Demob.) Crew - -------- Truck w/Lowboy Truck Driver Mechanics Truck Operator Laborer												
11 02 03 25 01 1. Mobilization and Demobilization Asume 8hrs to mobilize equipment. Use 1hr operating time for loading and 1hr operating time for unloading equipment. Assume the same for demobilization.												
	UPB PM	AIR COMPR, 1,600 CFM, 100 PSI REF. EP 1110-1-8 1600 CFM QUIET, 100 PSI (ADD HOSE)	4.00	HR	A15XX017	1.00	0	183	0	0	0	183	45.70
	UPB PM	GENERATOR, 5.5 KW, 120/240V,PORT REF. EP 1110-1-8 5.5 KW	4.00	HR	G10HO004	0.00	0	7	0	0	0	7	1.64
	MIL PM	PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRASH	4.00	HR	P50HO005	1.00	0	12	0	0	0	12	2.94
	MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	4.00	HR	C75GV002	1.00	0	153	0	0	0	153	38.16
	MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	4.00	HR	L50CS003	0.00	0	68	0	0	0	68	17.00
	UPB PM	WELDER, 300 AMP, SKID,ELEC DRIVE	4.00	HR	W35XX009	0.00	0	6	0	0	0	6	1.59
L	UPB PM	TRK,HWY, 46,000 GVW, 6X4, 3 AXLE	16.00	HR	T50FO018	1.00	0	558	0	0	0	558	34.90
L	MIL PM	TRLR,LOWBOY, 60T, 3 AXLE (ADD TOWING TRUCK)	16.00	HR	T45XX017	1.00	0	134	0	0	0	134	8.38
L	MIL PM	TRK,HWY,10,000GVW,4X2, 1T-PICKUP	16.00	HR	T50FO005	1.00	0	126	0	0	0	126	7.88
	MIL PM	Outside Truck Drivers, Heavy *	16.00	HR	X-TRKDVRHV	1.00	607	0	0	0	0	607	37.92
	MIL PM	Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57
	MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06

	11 02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
	TOTAL Mobilization and					1,897	1,247	0	0	0	3,143	
	TOTAL Mob, Demob & Pre					1,897	1,247	0	0	0	3,143	
	11 02 03 25 02. Care and Diversion of Water Care of water consists of the installation of temporary bulkheads. Assume small trash pump and operator for any required pumping. Operator is assumed to be on-site for 10 working days for the purpose of dewatering.											
	11 02 03 25 02 1. Fabricate Bulkheads											
B MIL PM	Fabricate Bulkheads	1.00	LS		0.00	0	0	2,500	0	0	2,500	2500.00
	TOTAL Fabricate Bulkhe					0	0	2,500	0	0	2,500	
	11 02 03 25 02 2. Install Temporary Bulkheads											
MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	16.00	HR	L50CS003	0.00	0	272	0	0	0	272	17.00
MIL PM	Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57
MIL PM	Outside Laborers, (Semi-Skilled)	32.00	HR	X-LABORER	1.00	1,186	0	0	0	0	1,186	37.06
	TOTAL Install Temporar	2.00	DAY			1,883	272	0	0	0	2,155	1077.53
	11 02 03 25 02 3. Remove Temporary Bulkheads											
MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS003	0.00	0	136	0	0	0	136	17.00
MIL PM	Outside Equip. Operators, Heavy *	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
	TOTAL Remove Temporary	1.00	DAY			942	136	0	0	0	1,078	1077.53
	11 02 03 25 02 4. Unwatering Pumps											
MIL PM	Outside Equip. Operators, Heavy	80.00	HR	X-EQOPRHVY	1.00	3,485	0	0	0	0	3,485	43.57
MIL PM	PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRASH	80.00	HR	P50HO005	1.00	0	235	0	0	0	235	2.94

11 02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
UPB PM TRK,HWY, 8,800GVW,4X4, 3/4T-PKUP REF. EP 1110-1-8 4X4 3/4-TON PICK-UP, 8800 GVW	80.00	HR	T50FO004	1.00	0	613	0	0	0	613	7.66
TOTAL Unwatering Pumps					3,485	848	0	0	0	4,333	
TOTAL Care and Diversi					6,310	1,256	2,500	0	0	10,066	
11 02 03 25 03. Sitework											
11 02 03 25 03 1. Site Preparation											
EP PM LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS005	1.00	0	134	0	0	0	134	16.71
MIL PM Outside Equip. Operators, Heavy	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL PM Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL Site Preparation					942	134	0	0	0	1,075	
11 02 03 25 03 2. Line Existing Pipe w/ HDPE Pipe There are 2-pipes to be lined at this location (quantities are multiplied by two)											
USR PM HDPE Liner	250.00	LF		0.00	0	0	0	0	25,000	25,000	100.00
B CIV PM Grouting, pressure, place grout between pipes	500.00	CF	XXQEB47B	17.50	5,323	1,403	1,500	0	0	8,226	16.45
TOTAL Line Existing Pi					5,323	1,403	1,500	0	25,000	33,226	
11 02 03 25 03 3. Site Restoration											
EP PM LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS005	1.00	0	134	0	0	0	134	16.71
MIL PM Outside Equip. Operators, Heavy	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL PM Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
USR PM Seeding	1.00	ACR		0.00	0	0	0	0	1,000	1,000	1000.00
TOTAL Site Restoration					942	134	0	0	1,000	2,075	
TOTAL Sitework					7,206	1,671	1,500	0	26,000	36,377	

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
11 02 03 25 04. Drainage Structure												
11 02 03 25 04 1. Replace Handrail												
B CIV PM	Remove Existing Handrail handrail	70.00	LF	SIWSSSWK2	8.00	811	0	0	0	0	811	11.58
CIV PM	Castings fibergl ass, 2" dia rails pickets 5' OC, 42" high, handrail	70.00	LF	SIWSSSWK2	4.00	1,622	0	2,954	0	0	4,576	65.37
TOTAL	Replace Handrail					2,433	0	2,954	0	0	5,387	
11 02 03 25 04 2. Replace Grating												
B CIV PM	Remove Grating	20.00	SF	SIWSSSWK2	40.00	46	0	0	0	0	46	2.32
CIV PM	Grating fbgls, m olded, 2" T, 2" sq mesh, grn (mod crsv env)	20.00	SF	SIWSSSWK2	40.00	46	0	410	0	0	457	22.84
TOTAL	Replace Grating					93	0	410	0	0	503	
11 02 03 25 04 3. Replace Ladders												
B MIL PM	Remove Ladders	10.00	VLF	SIWSE4	12.50	149	4	0	0	0	153	15.31
MIL PM	Ladder, 20" wide , bolted to conc, w/safety equip	10.00	VLF	SIWSE4	6.25	298	8	532	0	0	838	83.81
TOTAL	Replace Ladders					447	12	532	0	0	991	
TOTAL	Drainage Structu					2,973	12	3,896	0	0	6,881	
11 02 03 25 05. Gates												
11 02 03 25 05 1. Remove Existing Gate												
MIL PM	Steam/Pipefitter s Foreman	16.00	HR	B-STM/PIPE	1.00	624	0	0	0	0	624	39.03
MIL PM	Steam/Pipefitter s	16.00	HR	B-STM/PIPE	1.00	608	0	0	0	0	608	38.03
MIL PM	Laborers, (Semi- Skilled)	16.00	HR	B-LABORER	1.00	593	0	0	0	0	593	37.06
MIL PM	Equip. Operators , Crane/Shovel	12.00	HR	B-EQOPRCRN	1.00	523	0	0	0	0	523	43.57
MAP PM	CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	12.00	HR	C75GV002	1.00	0	458	0	0	0	458	38.16
TOTAL	Remove Existing	1.00	EA			2,349	458	0	0	0	2,807	2806.63

11 02. Gravity Drainage St			QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
		11 02 03 25 05 2. Replace Gate											
		Manufacturers Rep/Erection Engineer is considered for field assistance.											
USR	ME	Replace 42" Gate w/ New Manual Operator	1.00	EA		0.00	0	0	0	0	7,127	7,127	7127.38
USR	ME	Replace 42" Flap Gate	1.00	EA		0.00	0	0	0	0	6,058	6,058	6058.27
USR	ME	Erection Enginee r	1.00	LS		0.00	1,188	0	0	0	0	1,188	1187.90
TOTAL		Replace Gate	1.00	EA			1,188	0	0	0	13,186	14,374	14374
		11 02 03 25 05 3. Install/Test New Gate											
MIL	PM	Steam/Pipefitter s Foreman	24.00	HR	B-STM/PIPE	1.00	937	0	0	0	0	937	39.03
MIL	PM	Steam/Pipefitter s	20.00	HR	B-STM/PIPE	1.00	761	0	0	0	0	761	38.03
MIL	PM	Laborers, (Semi- Skilled)	20.00	HR	B-LABORER	1.00	741	0	0	0	0	741	37.06
MIL	PM	Equip. Operators , Crane/Shovel	16.00	HR	B-EQOPRCRN	1.00	697	0	0	0	0	697	43.57
MAP	PM	CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	16.00	HR	C75GV002	1.00	0	611	0	0	0	611	38.16
MIL	PM	Outside Truck Dr ivers, Heavy	4.00	HR	X-TRKDVRHV	1.00	152	0	0	0	0	152	37.92
MAP	PM	FLATBED, 8'x 16. 0', W/SIDE RACKS (ADD TRUCK)	4.00	HR	T40KF016	1.00	0	3	0	0	0	3	0.84
EP	PM	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	4.00	HR	T50FO006	1.00	0	57	0	0	0	57	14.36
TOTAL		Install/Test New	1.00	EA			3,287	671	0	0	0	3,959	3958.59
TOTAL		Gates					6,824	1,129	0	0	13,186	21,139	
TOTAL		GW-38, 42" Drain					25,209	5,315	7,896	0	39,186	77,606	

11 02 03 26. GW-39, 72" Drain (Cahokia Creek)
Sluice gates for this structure will not be rehabbed or replaced

11 02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
11 02 03 26 01. Mob, Demob & Preparatory Work Use the following crew for to mobilize equipment to the jobsite. Assume the same time for demobilzation. Use 2hrs operating time for each way. (Mob.& Demob.) Crew - -------- Truck w/Lowboy Truck Driver Mechanics Truck Operator Laborer											
11 02 03 26 01 1. Mobilization and Demobilization Asume 8hrs to mobilize equipment. Use 1hr operating time for loading and 1hr operating time for unloading equipment. Assume the same for demobilization.											
UPB PM AIR COMPR, 1,600 CFM, 100 PSI REF. EP 1110-1-8 1600 CFM QUIET, 100 PSI (ADD HOSE)	4.00	HR	A15XX017	1.00	0	183	0	0	0	183	45.70
UPB PM GENERATOR, 5.5 KW, 120/240V,PORT REF. EP 1110-1-8 5.5 KW	4.00	HR	G10HO004	0.00	0	7	0	0	0	7	1.64
MIL PM PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRASH	4.00	HR	P50HO005	1.00	0	12	0	0	0	12	2.94
MAP PM CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	4.00	HR	C75GV002	1.00	0	153	0	0	0	153	38.16
MIL PM LDR,BH,WH, 1.00CY FE BKT, 24"DIP	4.00	HR	L50CS003	0.00	0	68	0	0	0	68	17.00
UPB PM WELDER, 300 AMP, SKID,ELEC DRIVE	4.00	HR	W35XX009	0.00	0	6	0	0	0	6	1.59
L UPB PM TRK,HWY, 46,000 GVW, 6X4, 3 AXLE	16.00	HR	T50FO018	1.00	0	558	0	0	0	558	34.90
L MIL PM TRLR,LOWBOY, 60T, 3 AXLE (ADD TOWING TRUCK)	16.00	HR	T45XX017	1.00	0	134	0	0	0	134	8.38
L MIL PM TRK,HWY,10,000GVW,4X2, 1T-PICKUP	16.00	HR	T50FO005	1.00	0	126	0	0	0	126	7.88
MIL PM Outside Truck Drivers, Heavy *	16.00	HR	X-TRKDVRHV	1.00	607	0	0	0	0	607	37.92
MIL PM Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57
MIL PM Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06

11 02. Gravity Drainage St			QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL Mobilization and							1,897	1,247	0	0	0	3,143	
TOTAL Mob, Demob & Pre							1,897	1,247	0	0	0	3,143	
11 02 03 26 03. Sitework													
11 02 03 26 03 1. Site Preparation													
EP	PM	LDR,BH,WH, 1.00C Y FE BKT, 24"DIP	8.00	HR	L50CS005	1.00	0	134	0	0	0	134	16.71
MIL	PM	Outside Equip. Operators, Heavy	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL	PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL Site Preparation							942	134	0	0	0	1,075	
11 02 03 26 03 2. Line Existing Pipe w/ HDPE Pipe There are 2-pipes to be lined at this location (quantities are multiplied by two)													
USR	PM	HDPE Liner	250.00	LF		0.00	0	0	0	0	62,500	62,500	250.00
B CIV	PM	Grouting, pressure, place grout between pipes	800.00	CF	XXQEB47B	17.50	8,517	2,245	2,400	0	0	13,162	16.45
TOTAL Line Existing Pi							8,517	2,245	2,400	0	62,500	75,662	
11 02 03 26 03 3. Site Restoration													
EP	PM	LDR,BH,WH, 1.00C Y FE BKT, 24"DIP	8.00	HR	L50CS005	1.00	0	134	0	0	0	134	16.71
MIL	PM	Outside Equip. Operators, Heavy	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL	PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
USR	PM	Seeding	1.00	ACR		0.00	0	0	0	0	1,000	1,000	1000.00
TOTAL Site Restoration							942	134	0	0	1,000	2,075	
TOTAL Sitework							10,400	2,513	2,400	0	63,500	78,813	

			QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
11 02. Gravity Drainage St													
11 02 03 26 04. Drainage Structure													
11 02 03 26 04 1. Replace Handrail													
B	CIV	PM	Remove Existing Handrail handrail	70.00	LF	SIWSSSWK2	8.00	811	0	0	0	0	811	11.58
	CIV	PM	Castings fibergl ass, 2" dia rails pickets 5' OC, 42" high, handrail	70.00	LF	SIWSSSWK2	4.00	1,622	0	2,954	0	0	4,576	65.37
	TOTAL		Replace Handrail					2,433	0	2,954	0	0	5,387	
11 02 03 26 04 2. Replace Grating													
B	CIV	PM	Remove Grating	20.00	SF	SIWSSSWK2	40.00	46	0	0	0	0	46	2.32
	CIV	PM	Grating fbgls, m olded, 2" T, 2" sq mesh, grn (mod crsv env)	20.00	SF	SIWSSSWK2	40.00	46	0	410	0	0	457	22.84
	TOTAL		Replace Grating					93	0	410	0	0	503	
11 02 03 26 04 3. Replace Ladders													
B	MIL	PM	Remove Ladders	10.00	VLF	SIWSE4	12.50	149	4	0	0	0	153	15.31
	MIL	PM	Ladder, 20" wide , bolted to conc, w/safety equip	10.00	VLF	SIWSE4	6.25	298	8	532	0	0	838	83.81
	TOTAL		Replace Ladders					447	12	532	0	0	991	
	TOTAL		Drainage Structu					2,973	12	3,896	0	0	6,881	
	TOTAL		GW-39, 72" Drain					15,269	3,771	6,296	0	63,500	88,837	

11 02 03 27. GW-40, 30" Drain (Indian Creek)

11 02 03 27 01. Mob, Demob & Preparatory Work

Use the following crew for to mobilize equipment to the jobsite. Assume the same time for demobilzation. Use 2hrs operating time for each way. (Mob.& Demob.)

Crew -

Truck w/Lowboy	Truck Driver
Mechanics Truck	Operator
Laborer	

		11 02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
		11 02 03 27 01 1. Mobilization and Demobilization Asume 8hrs to mobilize equipment. Use 1hr operating time for loading and 1hr operating time for unloading equipment. Assume the same for demobilization.											
	UPB PM	AIR COMPR, 1,600 CFM, 100 PSI REF. EP 1110-1-8 1600 CFM QUIET, 100 PSI (ADD HOSE)	4.00	HR	A15XX017	1.00	0	183	0	0	0	183	45.70
	UPB PM	GENERATOR, 5.5 KW, 120/240V,PORT REF. EP 1110-1-8 5.5 KW	4.00	HR	G10HO004	0.00	0	7	0	0	0	7	1.64
	MIL PM	PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRASH	4.00	HR	P50HO005	1.00	0	12	0	0	0	12	2.94
	MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	4.00	HR	C75GV002	1.00	0	153	0	0	0	153	38.16
	MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	4.00	HR	L50CS003	0.00	0	68	0	0	0	68	17.00
	UPB PM	WELDER, 300 AMP, SKID,ELEC DRIVE	4.00	HR	W35XX009	0.00	0	6	0	0	0	6	1.59
L	UPB PM	TRK,HWY, 46,000 GVW, 6X4, 3 AXLE	16.00	HR	T50FO018	1.00	0	558	0	0	0	558	34.90
L	MIL PM	TRLR,LOWBOY, 60T, 3 AXLE (ADD TOWING TRUCK)	16.00	HR	T45XX017	1.00	0	134	0	0	0	134	8.38
L	MIL PM	TRK,HWY,10,000GVW,4X2, 1T-PICKUP	16.00	HR	T50FO005	1.00	0	126	0	0	0	126	7.88
	MIL PM	Outside Truck Drivers, Heavy *	16.00	HR	X-TRKDVRHV	1.00	607	0	0	0	0	607	37.92
	MIL PM	Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57
	MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
	TOTAL	Mobilization and					1,897	1,247	0	0	0	3,143	
	TOTAL	Mob, Demob & Pre					1,897	1,247	0	0	0	3,143	

11	02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
	11 02 03 27 02. Care and Diversion of Water Care of water consists of the installation of temporary bulkheads. Assume small trash pump and operator for any required pumping. Operator is assumed to be on-site for 10 working days for the purpose of dewatering.											
	11 02 03 27 02 1. Fabricate Bulkheads											
B MIL PM	Fabricate Bulkheads	1.00	LS		0.00	0	0	2,500	0	0	2,500	2500.00
TOTAL	Fabricate Bulkhe					0	0	2,500	0	0	2,500	
	11 02 03 27 02 2. Install Temporary Bulkheads											
MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	16.00	HR	L50CS003	0.00	0	272	0	0	0	272	17.00
MIL PM	Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57
MIL PM	Outside Laborers, (Semi-Skilled)	32.00	HR	X-LABORER	1.00	1,186	0	0	0	0	1,186	37.06
TOTAL	Install Temporar	2.00	DAY			1,883	272	0	0	0	2,155	1077.53
	11 02 03 27 02 3. Remove Temporary Bulkheads											
MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS003	0.00	0	136	0	0	0	136	17.00
MIL PM	Outside Equip. Operators, Heavy *	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL	Remove Temporary	1.00	DAY			942	136	0	0	0	1,078	1077.53
	11 02 03 27 02 4. Unwatering Pumps											
MIL PM	Outside Equip. Operators, Heavy	80.00	HR	X-EQOPRHVY	1.00	3,485	0	0	0	0	3,485	43.57
MIL PM	PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRASH	80.00	HR	P50HO005	1.00	0	235	0	0	0	235	2.94
UPB PM	TRK,HWY, 8,800GVW,4X4, 3/4T-PKUP REF. EP 1110-1-8 4X4 3/4-TON PICK-UP, 8800 GVW	80.00	HR	T50FO004	1.00	0	613	0	0	0	613	7.66
TOTAL	Unwatering Pumps					3,485	848	0	0	0	4,333	

			QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
11 02. Gravity Drainage St													
TOTAL		Care and Diversi					6,310	1,256	2,500	0	0	10,066	
11 02 03 27 03. Sitework													
11 02 03 27 03 1. Site Preparation													
EP	PM	LDR,BH,WH, 1.00C Y FE BKT, 24"DIP	8.00	HR	L50CS005	1.00	0	134	0	0	0	134	16.71
MIL	PM	Outside Equip. Operators, Heavy	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL	PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL		Site Preparation					942	134	0	0	0	1,075	
11 02 03 27 03 2. Line Existing Pipe w/ HDPE Pipe There are 2-pipes to be lined at this location (quantities are multiplied by two)													
USR	PM	HDPE Liner	250.00	LF		0.00	0	0	0	0	25,000	25,000	100.00
B CIV	PM	Grouting, pressure, place grout between pipes	500.00	CF	XXQEB47B	17.50	5,323	1,403	1,500	0	0	8,226	16.45
TOTAL		Line Existing Pi					5,323	1,403	1,500	0	25,000	33,226	
11 02 03 27 03 3. Site Restoration													
EP	PM	LDR,BH,WH, 1.00C Y FE BKT, 24"DIP	8.00	HR	L50CS005	1.00	0	134	0	0	0	134	16.71
MIL	PM	Outside Equip. Operators, Heavy	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL	PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
USR	PM	Seeding	1.00	ACR		0.00	0	0	0	0	1,000	1,000	1000.00
TOTAL		Site Restoration					942	134	0	0	1,000	2,075	
TOTAL		Sitework					7,206	1,671	1,500	0	26,000	36,377	
11 02 03 27 04. Drainage Structure													
11 02 03 27 04 1. Replace Handrail													
B CIV	PM	Remove Existing Handrail handrail	70.00	LF	SIWSSSWK2	8.00	811	0	0	0	0	811	11.58

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
CIV PM	Castings fibergl ass, 2" dia rails pickets 5' OC, 42" high, handrail	70.00	LF	SIWSSSWK2	4.00	1,622	0	2,954	0	0	4,576	65.37
TOTAL	Replace Handrail					2,433	0	2,954	0	0	5,387	
	11 02 03 27 04 2. Replace Grating											
B CIV PM	Remove Grating	20.00	SF	SIWSSSWK2	40.00	46	0	0	0	0	46	2.32
CIV PM	Grating fbgls, m olded, 2" T, 2" sq mesh, grn (mod crsv env)	20.00	SF	SIWSSSWK2	40.00	46	0	410	0	0	457	22.84
TOTAL	Replace Grating					93	0	410	0	0	503	
	11 02 03 27 04 3. Replace Ladders											
B MIL PM	Remove Ladders	10.00	VLF	SIWSE4	12.50	149	4	0	0	0	153	15.31
MIL PM	Ladder, 20" wide , bolted to conc, w/safety equip	10.00	VLF	SIWSE4	6.25	298	8	532	0	0	838	83.81
TOTAL	Replace Ladders					447	12	532	0	0	991	
TOTAL	Drainage Structu					2,973	12	3,896	0	0	6,881	
	11 02 03 27 05. Gates											
	11 02 03 27 05 1. Remove Existing Gate											
MIL PM	Steam/Pipefitter s Foreman	12.00	HR	B-STM/PIPE	1.00	468	0	0	0	0	468	39.03
MIL PM	Steam/Pipefitter s	12.00	HR	B-STM/PIPE	1.00	456	0	0	0	0	456	38.03
MIL PM	Laborers, (Semi- Skilled)	12.00	HR	B-LABORER	1.00	445	0	0	0	0	445	37.06
MIL PM	Equip. Operators , Crane/Shovel	8.00	HR	B-EQOPRCRN	1.00	349	0	0	0	0	349	43.57
MAP PM	CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16
TOTAL	Remove Existing	1.00	EA			1,718	305	0	0	0	2,023	2023.24
	11 02 03 27 05 2. Rehab Gate											
	Manufacturers Rep/Erection Engineer is considered for field assistance.											
USR ME	Rehab 30" Gate w / New Manual Operator	1.00	EA		0.00	0	0	0	0	3,801	3,801	3801.27

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
USR ME	Erection Enginee r	1.00	LS		0.00	950	0	0	0	0	950	950.32
MIL ME	Painters, Struct ural Steel	12.00	HR	B-PAINTSS	1.00	565	0	0	0	0	565	47.10
TOTAL	Rehab Gate	1.00	EA			1,516	0	0	0	3,801	5,317	5316.81
	11 02 03 27 05 3. Install/Test Rehabbed Gate											
MIL PM	Steam/Pipefitter s Foreman	20.00	HR	B-STM/PIPE	1.00	781	0	0	0	0	781	39.03
MIL PM	Steam/Pipefitter s	16.00	HR	B-STM/PIPE	1.00	608	0	0	0	0	608	38.03
MIL PM	Laborers, (Semi- Skilled)	16.00	HR	B-LABORER	1.00	593	0	0	0	0	593	37.06
MIL PM	Equip. Operators , Crane/Shovel	12.00	HR	B-EQOPRCRN	1.00	523	0	0	0	0	523	43.57
MAP PM	CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	12.00	HR	C75GV002	1.00	0	458	0	0	0	458	38.16
MIL PM	Outside Truck Dr ivers, Heavy	4.00	HR	X-TRKDVRHV	1.00	152	0	0	0	0	152	37.92
MAP PM	FLATBED, 8'x 16. 0', W/SIDE RACKS (ADD TRUCK)	4.00	HR	T40KF016	1.00	0	3	0	0	0	3	0.84
EP PM	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	4.00	HR	T50FO006	1.00	0	57	0	0	0	57	14.36
TOTAL	Install/Test Reh	1.00	EA			2,656	519	0	0	0	3,175	3175.20
TOTAL	Gates					5,890	824	0	0	3,801	10,515	
TOTAL	GW-40, 30" Drain					24,275	5,009	7,896	0	29,801	66,982	

11 02 03 28. GW-41, 72" Drain (Indian Creek)

11 02 03 28 01. Mob, Demob & Preparatory Work

Use the following crew for to mobilize equipment to the jobsite. Assume the same time for demobilzation. Use 2hrs operating time for each way. (Mob.& Demob.)

Crew -

Truck w/Lowboy Truck Driver
Mechanics Truck Operator
Laborer

		11 02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
		11 02 03 28 01 1. Mobilization and Demobilization Asume 8hrs to mobilize equipment. Use 1hr operating time for loading and 1hr operating time for unloading equipment. Assume the same for demobilization.											
	UPB PM	AIR COMPR, 1,600 CFM, 100 PSI REF. EP 1110-1-8 1600 CFM QUIET, 100 PSI (ADD HOSE)	4.00	HR	A15XX017	1.00	0	183	0	0	0	183	45.70
	UPB PM	GENERATOR, 5.5 KW, 120/240V,PORT REF. EP 1110-1-8 5.5 KW	4.00	HR	G10HO004	0.00	0	7	0	0	0	7	1.64
	MIL PM	PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRASH	4.00	HR	P50HO005	1.00	0	12	0	0	0	12	2.94
	MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	4.00	HR	C75GV002	1.00	0	153	0	0	0	153	38.16
	MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	4.00	HR	L50CS003	0.00	0	68	0	0	0	68	17.00
	UPB PM	WELDER, 300 AMP, SKID,ELEC DRIVE	4.00	HR	W35XX009	0.00	0	6	0	0	0	6	1.59
L	UPB PM	TRK,HWY, 46,000 GVW, 6X4, 3 AXLE	16.00	HR	T50FO018	1.00	0	558	0	0	0	558	34.90
L	MIL PM	TRLR,LOWBOY, 60T, 3 AXLE (ADD TOWING TRUCK)	16.00	HR	T45XX017	1.00	0	134	0	0	0	134	8.38
L	MIL PM	TRK,HWY,10,000GVW,4X2, 1T-PICKUP	16.00	HR	T50FO005	1.00	0	126	0	0	0	126	7.88
	MIL PM	Outside Truck Drivers, Heavy *	16.00	HR	X-TRKDVRHV	1.00	607	0	0	0	0	607	37.92
	MIL PM	Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57
	MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
	TOTAL	Mobilization and					1,897	1,247	0	0	0	3,143	
	TOTAL	Mob, Demob & Pre					1,897	1,247	0	0	0	3,143	

	11 02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
	11 02 03 28 02. Care and Diversion of Water Care of water consists of the installation of temporary bulkheads. Assume small trash pump and operator for any required pumping. Operator is assumed to be on-site for 10 working days for the purpose of dewatering.											
	11 02 03 28 02 1. Fabricate Bulkheads											
B MIL PM	Fabricate Bulkheads	1.00	LS		0.00	0	0	2,500	0	0	2,500	2500.00
TOTAL	Fabricate Bulkhe					0	0	2,500	0	0	2,500	
	11 02 03 28 02 2. Install Temporary Bulkheads											
MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	16.00	HR	L50CS003	0.00	0	272	0	0	0	272	17.00
MIL PM	Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57
MIL PM	Outside Laborers, (Semi-Skilled)	32.00	HR	X-LABORER	1.00	1,186	0	0	0	0	1,186	37.06
TOTAL	Install Temporar	2.00	DAY			1,883	272	0	0	0	2,155	1077.53
	11 02 03 28 02 3. Remove Temporary Bulkheads											
MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS003	0.00	0	136	0	0	0	136	17.00
MIL PM	Outside Equip. Operators, Heavy *	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL	Remove Temporary	1.00	DAY			942	136	0	0	0	1,078	1077.53
	11 02 03 28 02 4. Unwatering Pumps											
MIL PM	Outside Equip. Operators, Heavy	80.00	HR	X-EQOPRHVY	1.00	3,485	0	0	0	0	3,485	43.57
MIL PM	PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRASH	80.00	HR	P50HO005	1.00	0	235	0	0	0	235	2.94
UPB PM	TRK,HWY, 8,800GVW,4X4, 3/4T-PKUP REF. EP 1110-1-8 4X4 3/4-TON PICK-UP, 8800 GVW	80.00	HR	T50FO004	1.00	0	613	0	0	0	613	7.66
TOTAL	Unwatering Pumps					3,485	848	0	0	0	4,333	

11 02. Gravity Drainage St			QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL Care and Diversi							6,310	1,256	2,500	0	0	10,066	
11 02 03 28 03. Sitework													
11 02 03 28 03 1. Site Preparation													
EP	PM	LDR,BH,WH, 1.00C Y FE BKT, 24"DIP	8.00	HR	L50CS005	1.00	0	134	0	0	0	134	16.71
MIL	PM	Outside Equip. Operators, Heavy	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL	PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL Site Preparation							942	134	0	0	0	1,075	
11 02 03 28 03 2. Line Existing Pipe w/ HDPE Pipe There are 2-pipes to be lined at this location (quantities are multiplied by two)													
USR	PM	HDPE Liner	250.00	LF		0.00	0	0	0	0	62,500	62,500	250.00
B CIV	PM	Grouting, pressure, place grout between pipes	800.00	CF	XXQEB47B	17.50	8,517	2,245	2,400	0	0	13,162	16.45
TOTAL Line Existing Pi							8,517	2,245	2,400	0	62,500	75,662	
11 02 03 28 03 3. Site Restoration													
EP	PM	LDR,BH,WH, 1.00C Y FE BKT, 24"DIP	8.00	HR	L50CS005	1.00	0	134	0	0	0	134	16.71
MIL	PM	Outside Equip. Operators, Heavy	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL	PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
USR	PM	Seeding	1.00	ACR		0.00	0	0	0	0	1,000	1,000	1000.00
TOTAL Site Restoration							942	134	0	0	1,000	2,075	
TOTAL Sitework							10,400	2,513	2,400	0	63,500	78,813	
11 02 03 28 04. Drainage Structure													
11 02 03 28 04 1. Replace Handrail													
B CIV	PM	Remove Existing Handrail handrail	120.00	LF	SIWSSSWK2	8.00	1,390	0	0	0	0	1,390	11.58

11	02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
	CIV PM Castings fibergl ass, 2" dia rails pickets 5' OC, 42" high, handrail	120.00	LF	SIWSSSWK2	4.00	2,780	0	5,064	0	0	7,844	65.37
	TOTAL Replace Handrail					4,170	0	5,064	0	0	9,234	
	11 02 03 28 04 2. Replace Grating											
B	CIV PM Remove Grating	60.00	SF	SIWSSSWK2	40.00	139	0	0	0	0	139	2.32
	CIV PM Grating fbgls, m olded, 2" T, 2" sq mesh, grn (mod crsv env)	60.00	SF	SIWSSSWK2	40.00	139	0	1,231	0	0	1,370	22.84
	TOTAL Replace Grating					278	0	1,231	0	0	1,509	
	11 02 03 28 04 3. Replace Ladders											
B	MIL PM Remove Ladders	55.00	VLF	SIWSE4	12.50	820	22	0	0	0	842	15.31
	MIL PM Ladder, 20" wide , bolted to conc, w/safety equip	55.00	VLF	SIWSE4	6.25	1,640	44	2,926	0	0	4,610	83.81
	TOTAL Replace Ladders					2,460	66	2,926	0	0	5,452	
	TOTAL Drainage Structu					6,908	66	9,221	0	0	16,195	
	11 02 03 28 05. Gates											
	11 02 03 28 05 1. Remove Existing Gate											
	MIL PM Steam/Pipefitter s Foreman	16.00	HR	B-STM/PIPE	1.00	624	0	0	0	0	624	39.03
	MIL PM Steam/Pipefitter s	32.00	HR	B-STM/PIPE	1.00	1,217	0	0	0	0	1,217	38.03
	MIL PM Laborers, (Semi- Skilled)	16.00	HR	B-LABORER	1.00	593	0	0	0	0	593	37.06
	MIL PM Equip. Operators , Crane/Shovel	12.00	HR	B-EQOPRCRN	1.00	523	0	0	0	0	523	43.57
	MAP PM CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	12.00	HR	C75GV002	1.00	0	458	0	0	0	458	38.16
	TOTAL Remove Existing	1.00	EA			2,957	458	0	0	0	3,415	3415.07
	11 02 03 28 05 2. Rehab Gate											
	Manufacturers Rep/Erection Engineer is considered for field assistance.											
	USR ME Rehab 72" Gate w / New Manual Operator	1.00	EA		0.00	0	0	0	0	9,503	9,503	9503.17

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
USR ME	Erection Enginee r	1.00	LS		0.00	950	0	0	0	0	950	950.32
MIL ME	Painters, Struct ural Steel	40.00	HR	B-PAINTSS	1.00	1,884	0	0	0	0	1,884	47.10
TOTAL	Rehab Gate	1.00	EA			2,834	0	0	0	9,503	12,338	12338
	11 02 03 28 05 3. Install/Test Rehabbed Gate											
MIL PM	Steam/Pipefitter s Foreman	28.00	HR	B-STM/PIPE	1.00	1,093	0	0	0	0	1,093	39.03
MIL PM	Steam/Pipefitter s	48.00	HR	B-STM/PIPE	1.00	1,825	0	0	0	0	1,825	38.03
MIL PM	Laborers, (Semi- Skilled)	24.00	HR	B-LABORER	1.00	889	0	0	0	0	889	37.06
MIL PM	Equip. Operators , Crane/Shovel	20.00	HR	B-EQOPRCRN	1.00	871	0	0	0	0	871	43.57
MAP PM	CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	20.00	HR	C75GV002	1.00	0	763	0	0	0	763	38.16
MIL PM	Outside Truck Dr ivers, Heavy	4.00	HR	X-TRKDVRHV	1.00	152	0	0	0	0	152	37.92
MAP PM	FLATBED, 8'x 16. 0', W/SIDE RACKS (ADD TRUCK)	4.00	HR	T40KF016	1.00	0	3	0	0	0	3	0.84
EP PM	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	4.00	HR	T50FO006	1.00	0	57	0	0	0	57	14.36
TOTAL	Install/Test Reh	1.00	EA			4,831	824	0	0	0	5,655	5654.64
TOTAL	Gates					10,622	1,282	0	0	9,503	21,407	
TOTAL	GW-41, 72" Drain					36,137	6,363	14,121	0	73,003	129,624	

11 02 03 29. GW-42, 36" Drain (Indian Creek)

11 02 03 29 01. Mob, Demob & Preparatory Work

Use the following crew for to mobilize equipment to the jobsite. Assume the same time for demobilzation. Use 2hrs operating time for each way. (Mob.& Demob.)

Crew -

Truck w/Lowboy Truck Driver
Mechanics Truck Operator
Laborer

		11 02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
		11 02 03 29 01 1. Mobilization and Demobilization Asume 8hrs to mobilize equipment. Use 1hr operating time for loading and 1hr operating time for unloading equipment. Assume the same for demobilization.											
	UPB PM	AIR COMPR, 1,600 CFM, 100 PSI REF. EP 1110-1-8 1600 CFM QUIET, 100 PSI (ADD HOSE)	4.00	HR	A15XX017	1.00	0	183	0	0	0	183	45.70
	UPB PM	GENERATOR, 5.5 KW, 120/240V,PORT REF. EP 1110-1-8 5.5 KW	4.00	HR	G10HO004	0.00	0	7	0	0	0	7	1.64
	MIL PM	PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRASH	4.00	HR	P50HO005	1.00	0	12	0	0	0	12	2.94
	MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	4.00	HR	C75GV002	1.00	0	153	0	0	0	153	38.16
	MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	4.00	HR	L50CS003	0.00	0	68	0	0	0	68	17.00
	UPB PM	WELDER, 300 AMP, SKID,ELEC DRIVE	4.00	HR	W35XX009	0.00	0	6	0	0	0	6	1.59
L	UPB PM	TRK,HWY, 46,000 GVW, 6X4, 3 AXLE	16.00	HR	T50FO018	1.00	0	558	0	0	0	558	34.90
L	MIL PM	TRLR,LOWBOY, 60T, 3 AXLE (ADD TOWING TRUCK)	16.00	HR	T45XX017	1.00	0	134	0	0	0	134	8.38
L	MIL PM	TRK,HWY,10,000GVW,4X2, 1T-PICKUP	16.00	HR	T50FO005	1.00	0	126	0	0	0	126	7.88
	MIL PM	Outside Truck Drivers, Heavy *	16.00	HR	X-TRKDVRHV	1.00	607	0	0	0	0	607	37.92
	MIL PM	Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57
	MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
	TOTAL	Mobilization and					1,897	1,247	0	0	0	3,143	
	TOTAL	Mob, Demob & Pre					1,897	1,247	0	0	0	3,143	

	11 02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
	11 02 03 29 02. Care and Diversion of Water Care of water consists of the installation of temporary bulkheads. Assume small trash pump and operator for any required pumping. Operator is assumed to be on-site for 10 working days for the purpose of dewatering.											
	11 02 03 29 02 1. Fabricate Bulkheads											
B MIL PM	Fabricate Bulkheads	1.00	LS		0.00	0	0	2,500	0	0	2,500	2500.00
TOTAL	Fabricate Bulkhe					0	0	2,500	0	0	2,500	
	11 02 03 29 02 2. Install Temporary Bulkheads											
MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	16.00	HR	L50CS003	0.00	0	272	0	0	0	272	17.00
MIL PM	Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57
MIL PM	Outside Laborers, (Semi-Skilled)	32.00	HR	X-LABORER	1.00	1,186	0	0	0	0	1,186	37.06
TOTAL	Install Temporar	2.00	DAY			1,883	272	0	0	0	2,155	1077.53
	11 02 03 29 02 3. Remove Temporary Bulkheads											
MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS003	0.00	0	136	0	0	0	136	17.00
MIL PM	Outside Equip. Operators, Heavy *	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL	Remove Temporary	1.00	DAY			942	136	0	0	0	1,078	1077.53
	11 02 03 29 02 4. Unwatering Pumps											
MIL PM	Outside Equip. Operators, Heavy	80.00	HR	X-EQOPRHVY	1.00	3,485	0	0	0	0	3,485	43.57
MIL PM	PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRASH	80.00	HR	P50HO005	1.00	0	235	0	0	0	235	2.94
UPB PM	TRK,HWY, 8,800GVW,4X4, 3/4T-PKUP REF. EP 1110-1-8 4X4 3/4-TON PICK-UP, 8800 GVW	80.00	HR	T50FO004	1.00	0	613	0	0	0	613	7.66
TOTAL	Unwatering Pumps					3,485	848	0	0	0	4,333	

11 02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL Care and Diversi					6,310	1,256	2,500	0	0	10,066	
11 02 03 29 03. Sitework											
11 02 03 29 03 1. Site Preparation											
EP PM LDR,BH,WH, 1.00C Y FE BKT, 24"DIP	8.00	HR	L50CS005	1.00	0	134	0	0	0	134	16.71
MIL PM Outside Equip. Operators, Heavy	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL PM Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL Site Preparation					942	134	0	0	0	1,075	
11 02 03 29 03 2. Line Existing Pipe w/ HDPE Pipe There are 2-pipes to be lined at this location (quantities are multiplied by two)											
USR PM HDPE Liner	250.00	LF		0.00	0	0	0	0	25,000	25,000	100.00
B CIV PM Grouting, pressure, place grout between pipes	500.00	CF	XXQEB47B	17.50	5,323	1,403	1,500	0	0	8,226	16.45
TOTAL Line Existing Pi					5,323	1,403	1,500	0	25,000	33,226	
11 02 03 29 03 3. Site Restoration											
EP PM LDR,BH,WH, 1.00C Y FE BKT, 24"DIP	8.00	HR	L50CS005	1.00	0	134	0	0	0	134	16.71
MIL PM Outside Equip. Operators, Heavy	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL PM Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
USR PM Seeding	1.00	ACR		0.00	0	0	0	0	1,000	1,000	1000.00
TOTAL Site Restoration					942	134	0	0	1,000	2,075	
TOTAL Sitework					7,206	1,671	1,500	0	26,000	36,377	
11 02 03 29 04. Drainage Structure											
11 02 03 29 04 1. Replace Handrail											
B CIV PM Remove Existing Handrail handrail	70.00	LF	SIWSSSWK2	8.00	811	0	0	0	0	811	11.58

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
CIV PM	Castings fibergl ass, 2" dia rails pickets 5' OC, 42" high, handrail	70.00	LF	SIWSSSWK2	4.00	1,622	0	2,954	0	0	4,576	65.37
TOTAL	Replace Handrail					2,433	0	2,954	0	0	5,387	
	11 02 03 29 04 2. Replace Grating											
B CIV PM	Remove Grating	20.00	SF	SIWSSSWK2	40.00	46	0	0	0	0	46	2.32
CIV PM	Grating fbgls, m olded, 2" T, 2" sq mesh, grn (mod crsv env)	20.00	SF	SIWSSSWK2	40.00	46	0	410	0	0	457	22.84
TOTAL	Replace Grating					93	0	410	0	0	503	
	11 02 03 29 04 3. Replace Ladders											
B MIL PM	Remove Ladders	10.00	VLF	SIWSE4	12.50	149	4	0	0	0	153	15.31
MIL PM	Ladder, 20" wide , bolted to conc, w/safety equip	10.00	VLF	SIWSE4	6.25	298	8	532	0	0	838	83.81
TOTAL	Replace Ladders					447	12	532	0	0	991	
TOTAL	Drainage Structu					2,973	12	3,896	0	0	6,881	
	11 02 03 29 05. Gates											
	11 02 03 29 05 1. Remove Existing Gate											
MIL PM	Steam/Pipefitter s Foreman	12.00	HR	B-STM/PIPE	1.00	468	0	0	0	0	468	39.03
MIL PM	Steam/Pipefitter s	12.00	HR	B-STM/PIPE	1.00	456	0	0	0	0	456	38.03
MIL PM	Laborers, (Semi- Skilled)	12.00	HR	B-LABORER	1.00	445	0	0	0	0	445	37.06
MIL PM	Equip. Operators , Crane/Shovel	8.00	HR	B-EQOPRCRN	1.00	349	0	0	0	0	349	43.57
MAP PM	CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16
TOTAL	Remove Existing	1.00	EA			1,718	305	0	0	0	2,023	2023.24
	11 02 03 29 05 2. Rehab Gate											
	Manufacturers Rep/Erection Engineer is considered for field assistance.											
USR ME	Rehab 36" Gate w / New Manual Operator	1.00	EA		0.00	0	0	0	0	4,039	4,039	4038.85

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
USR ME	Erection Enginee r	1.00	LS		0.00	950	0	0	0	0	950	950.32
MIL ME	Painters, Struct ural Steel	16.00	HR	B-PAINTSS	1.00	754	0	0	0	0	754	47.10
TOTAL	Rehab Gate	1.00	EA			1,704	0	0	0	4,039	5,743	5742.79
	11 02 03 29 05 3. Install/Test Rehabbed Gate											
MIL PM	Steam/Pipefitter s Foreman	20.00	HR	B-STM/PIPE	1.00	781	0	0	0	0	781	39.03
MIL PM	Steam/Pipefitter s	16.00	HR	B-STM/PIPE	1.00	608	0	0	0	0	608	38.03
MIL PM	Laborers, (Semi- Skilled)	16.00	HR	B-LABORER	1.00	593	0	0	0	0	593	37.06
MIL PM	Equip. Operators , Crane/Shovel	12.00	HR	B-EQOPRCRN	1.00	523	0	0	0	0	523	43.57
MAP PM	CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	12.00	HR	C75GV002	1.00	0	458	0	0	0	458	38.16
MIL PM	Outside Truck Dr ivers, Heavy	4.00	HR	X-TRKDVRHV	1.00	152	0	0	0	0	152	37.92
MAP PM	FLATBED, 8'x 16. 0', W/SIDE RACKS (ADD TRUCK)	4.00	HR	T40KF016	1.00	0	3	0	0	0	3	0.84
EP PM	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	4.00	HR	T50FO006	1.00	0	57	0	0	0	57	14.36
TOTAL	Install/Test Reh	1.00	EA			2,656	519	0	0	0	3,175	3175.20
TOTAL	Gates					6,078	824	0	0	4,039	10,941	
TOTAL	GW-42, 36" Drain					24,464	5,009	7,896	0	30,039	67,408	

11 02 03 30. GW-43, 30" Drain (Indian Creek)

11 02 03 30 01. Mob, Demob & Preparatory Work

Use the following crew for to mobilize equipment to the jobsite. Assume the same time for demobilzation. Use 2hrs operating time for each way. (Mob.& Demob.)

Crew -

Truck w/Lowboy	Truck Driver
Mechanics Truck	Operator
Laborer	

		11 02. Gravity Drainage St	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
		11 02 03 30 01 1. Mobilization and Demobilization Asume 8hrs to mobilize equipment. Use 1hr operating time for loading and 1hr operating time for unloading equipment. Assume the same for demobilization.											
	UPB PM	AIR COMPR, 1,600 CFM, 100 PSI REF. EP 1110-1-8 1600 CFM QUIET, 100 PSI (ADD HOSE)	4.00	HR	A15XX017	1.00	0	183	0	0	0	183	45.70
	UPB PM	GENERATOR, 5.5 KW, 120/240V,PORT REF. EP 1110-1-8 5.5 KW	4.00	HR	G10HO004	0.00	0	7	0	0	0	7	1.64
	MIL PM	PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRASH	4.00	HR	P50HO005	1.00	0	12	0	0	0	12	2.94
	MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	4.00	HR	C75GV002	1.00	0	153	0	0	0	153	38.16
	MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	4.00	HR	L50CS003	0.00	0	68	0	0	0	68	17.00
	UPB PM	WELDER, 300 AMP, SKID,ELEC DRIVE	4.00	HR	W35XX009	0.00	0	6	0	0	0	6	1.59
L	UPB PM	TRK,HWY, 46,000 GVW, 6X4, 3 AXLE	16.00	HR	T50FO018	1.00	0	558	0	0	0	558	34.90
L	MIL PM	TRLR,LOWBOY, 60T, 3 AXLE (ADD TOWING TRUCK)	16.00	HR	T45XX017	1.00	0	134	0	0	0	134	8.38
L	MIL PM	TRK,HWY,10,000GVW,4X2, 1T-PICKUP	16.00	HR	T50FO005	1.00	0	126	0	0	0	126	7.88
	MIL PM	Outside Truck Drivers, Heavy *	16.00	HR	X-TRKDVRHV	1.00	607	0	0	0	0	607	37.92
	MIL PM	Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57
	MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
	TOTAL	Mobilization and					1,897	1,247	0	0	0	3,143	
	TOTAL	Mob, Demob & Pre					1,897	1,247	0	0	0	3,143	

11 02. Gravity Drainage St			QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
		11 02 03 30 03. Sitework											
		11 02 03 30 03 1. Site Preparation											
EP	PM	LDR,BH,WH, 1.00C Y FE BKT, 24"DIP	8.00	HR	L50CS005	1.00	0	134	0	0	0	134	16.71
MIL	PM	Outside Equip. Operators, Heavy	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL	PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL		Site Preparation					942	134	0	0	0	1,075	
		11 02 03 30 03 2. Line Existing Pipe w/ HDPE Pipe There are 2-pipes to be lined at this location (quantities are multiplied by two)											
USR	PM	HDPE Liner	250.00	LF		0.00	0	0	0	0	25,000	25,000	100.00
B CIV	PM	Grouting, pressure, place grout between pipes	500.00	CF	XXQEB47B	17.50	5,323	1,403	1,500	0	0	8,226	16.45
TOTAL		Line Existing Pi					5,323	1,403	1,500	0	25,000	33,226	
		11 02 03 30 03 3. Site Restoration											
EP	PM	LDR,BH,WH, 1.00C Y FE BKT, 24"DIP	8.00	HR	L50CS005	1.00	0	134	0	0	0	134	16.71
MIL	PM	Outside Equip. Operators, Heavy	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL	PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
USR	PM	Seeding	1.00	ACR		0.00	0	0	0	0	1,000	1,000	1000.00
TOTAL		Site Restoration					942	134	0	0	1,000	2,075	
TOTAL		Sitework					7,206	1,671	1,500	0	26,000	36,377	
		11 02 03 30 04. Drainage Structure											
		11 02 03 30 04 1. Replace Handrail											
B CIV	PM	Remove Existing Handrail handrail	70.00	LF	SIWSSSWK2	8.00	811	0	0	0	0	811	11.58
CIV	PM	Castings fiberglass, 2" dia rails pickets 5' OC, 42" high, handrail	70.00	LF	SIWSSSWK2	4.00	1,622	0	2,954	0	0	4,576	65.37
TOTAL		Replace Handrail					2,433	0	2,954	0	0	5,387	

11 02. Gravity Drainage St		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
	11 02 03 30 04 2. Replace Grating											
B CIV PM	Remove Grating	20.00	SF	SIWSSSWK2	40.00	46	0	0	0	0	46	2.32
CIV PM	Grating fbgls, m olded, 2" T, 2" sq mesh, grn (mod crsv env)	20.00	SF	SIWSSSWK2	40.00	46	0	410	0	0	457	22.84
TOTAL	Replace Grating					93	0	410	0	0	503	
	11 02 03 30 04 3. Replace Ladders											
B MIL PM	Remove Ladders	10.00	VLF	SIWSE4	12.50	149	4	0	0	0	153	15.31
MIL PM	Ladder, 20" wide , bolted to conc, w/safety equip	10.00	VLF	SIWSE4	6.25	298	8	532	0	0	838	83.81
TOTAL	Replace Ladders					447	12	532	0	0	991	
TOTAL	Drainage Structu					2,973	12	3,896	0	0	6,881	
TOTAL	GW-43, 30" Drain					12,075	2,929	5,396	0	26,000	46,401	

11 02 03 31. GW-44, 30" Drain (Indian Creek)

11 02 03 31 01. Mob, Demob & Preparatory Work

Use the following crew for to mobilize equipment to the jobsite. Assume the same time for demobilzation. Use 2hrs operating time for each way. (Mob.& Demob.)

Crew -

Truck w/Lowboy	Truck Driver
Mechanics Truck	Operator
Laborer	

	11 02 03 31 01 1. Mobilization and Demobilization Asume 8hrs to mobilize equipment. Use 1hr operating time for loading and 1hr operating time for unloading equipment. Assume the same for demobilization.											
UPB PM	AIR COMPR, 1,600 CFM, 100 PSI REF. EP 1110-1-8 1600 CFM QUIET, 100 PSI (ADD HOS E)	4.00	HR	A15XX017	1.00	0	183	0	0	0	183	45.70
UPB PM	GENERATOR, 5.5 K W, 120/240V,PORT REF. EP 1110-1-8 5.5 KW	4.00	HR	G10HO004	0.00	0	7	0	0	0	7	1.64

11 02. Gravity Drainage St			QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
	MIL	PM	PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRA SH	4.00	HR P50HO005	1.00	0	12	0	0	0	12	2.94
	MAP	PM	CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	4.00	HR C75GV002	1.00	0	153	0	0	0	153	38.16
	MIL	PM	LDR,BH,WH, 1.00C Y FE BKT, 24"DIP	4.00	HR L50CS003	0.00	0	68	0	0	0	68	17.00
	UPB	PM	WELDER, 300 AMP, SKID,ELEC DRIVE	4.00	HR W35XX009	0.00	0	6	0	0	0	6	1.59
L	UPB	PM	TRK,HWY, 46,000 GVW, 6X4, 3 AXLE	16.00	HR T50FO018	1.00	0	558	0	0	0	558	34.90
L	MIL	PM	TRLR,LOWBOY, 60T , 3 AXLE (ADD TOWING TRUCK)	16.00	HR T45XX017	1.00	0	134	0	0	0	134	8.38
L	MIL	PM	TRK,HWY,10,000GV W,4X2, 1T-PICKUP	16.00	HR T50FO005	1.00	0	126	0	0	0	126	7.88
	MIL	PM	Outside Truck Dr ivers, Heavy *	16.00	HR X-TRKDVRHV	1.00	607	0	0	0	0	607	37.92
	MIL	PM	Outside Equip. O perators, Heavy *	16.00	HR X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57
	MIL	PM	Outside Laborers , (Semi-Skilled)	16.00	HR X-LABORER	1.00	593	0	0	0	0	593	37.06
	TOTAL		Mobilization and				1,897	1,247	0	0	0	3,143	
	TOTAL		Mob, Demob & Pre				1,897	1,247	0	0	0	3,143	
			11 02 03 31 03. Sitework										
			11 02 03 31 03 1. Site Preparation										
	EP	PM	LDR,BH,WH, 1.00C Y FE BKT, 24"DIP	8.00	HR L50CS005	1.00	0	134	0	0	0	134	16.71
	MIL	PM	Outside Equip. O perators, Heavy	8.00	HR X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
	MIL	PM	Outside Laborers , (Semi-Skilled)	16.00	HR X-LABORER	1.00	593	0	0	0	0	593	37.06
	TOTAL		Site Preparation				942	134	0	0	0	1,075	

11 02. Gravity Drainage St			QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
		11 02 03 31 03 2. Line Existing Pipe w/ HDPE Pipe There are 2-pipes to be lined at this location (quantities are multiplied by two)											
	USR PM	HDPE Liner	250.00	LF		0.00	0	0	0	0	25,000	25,000	100.00
B	CIV PM	Grouting, pressure, place grout between pipes	500.00	CF	XXQEB47B	17.50	5,323	1,403	1,500	0	0	8,226	16.45
	TOTAL	Line Existing Pi					5,323	1,403	1,500	0	25,000	33,226	
		11 02 03 31 03 3. Site Restoration											
	EP PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS005	1.00	0	134	0	0	0	134	16.71
	MIL PM	Outside Equip. Operators, Heavy	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
	MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
	USR PM	Seeding	1.00	ACR		0.00	0	0	0	0	1,000	1,000	1000.00
	TOTAL	Site Restoration					942	134	0	0	1,000	2,075	
	TOTAL	Sitework					7,206	1,671	1,500	0	26,000	36,377	
		11 02 03 31 04. Drainage Structure											
		11 02 03 31 04 1. Replace Handrail											
B	CIV PM	Remove Existing Handrail handrail	70.00	LF	SIWSSSWK2	8.00	811	0	0	0	0	811	11.58
	CIV PM	Castings fiberglass, 2" dia rails pickets 5' OC, 42" high, handrail	70.00	LF	SIWSSSWK2	4.00	1,622	0	2,954	0	0	4,576	65.37
	TOTAL	Replace Handrail					2,433	0	2,954	0	0	5,387	
		11 02 03 31 04 2. Replace Grating											
B	CIV PM	Remove Grating	20.00	SF	SIWSSSWK2	40.00	46	0	0	0	0	46	2.32
	CIV PM	Grating fbgls, molded, 2" T, 2" sq mesh, grn (mod crsv env)	20.00	SF	SIWSSSWK2	40.00	46	0	410	0	0	457	22.84
	TOTAL	Replace Grating					93	0	410	0	0	503	

11 02. Gravity Drainage St			QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
		11 02 03 31 04 3. Replace Ladders											
B	MIL PM	Remove Ladders	10.00	VLF	SIWSE4	12.50	149	4	0	0	0	153	15.31
	MIL PM	Ladder, 20" wide , bolted to conc, w/safety equip	10.00	VLF	SIWSE4	6.25	298	8	532	0	0	838	83.81
	TOTAL	Replace Ladders					447	12	532	0	0	991	
	TOTAL	Drainage Structu					2,973	12	3,896	0	0	6,881	
	TOTAL	GW-44, 30" Drain					12,075	2,929	5,396	0	26,000	46,401	
	TOTAL	Lower Wood River					820,109	289,813	248,491	0	762,806	2,121,219	
	TOTAL	Gravity Drainage					1,276,304	488,297	369,754	0	1,012,916	3,147,271	
11 03. Closure Structures													
11 03 01. Upper Wood River Levee (UWRL)													
11 03 01 1. CS-1, Rail Closure (Riverfront)													
11 03 01 1 01. Replace Concrete Joint Sealant													
		11 03 01 1 01 1. Remove Exist Joint Sealant											
B	MIL PM	Remove old caulk ing & sealant	80.00	LF	AMABBRIC1	10.00	269	0	0	0	0	269	3.36
	TOTAL	Remove Exist Joi	80.00	LF			269	0	0	0	0	269	3.36
		11 03 01 1 01 2. New Joint Sealant											
L	MIL PM	Caulking & seala nts, backer rod, polyethylene, 1/2" dia	80.00	LF	AMABBRIC1	43.00	62	0	2	0	0	65	0.81
L	MIL PM	Caulking & seala nts, butyl rubber filler, 1/2" x 3/4"	80.00	LF	AMABBRIC1	20.00	134	0	48	0	0	182	2.28
	TOTAL	New Joint Sealan	80.00	LF			197	0	50	0	0	247	3.09
	TOTAL	Replace Concrete					465	0	50	0	0	516	

		11 03. Closure Structures	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
		11 03 01 1 02. Rehab Closure Structure Gate Rehab of the existing closure structure gates is assumed to be done on-site. The gates will be removed from the closure structure and placed in a nearby staging area for rehab.											
		11 03 01 1 02 1. Remove Exist Gate											
	MIL PM	Outside Steel Workers-Foreman	8.00	HR	X-STRSTEEL	1.00	341	0	0	0	0	341	42.61
	MIL PM	Outside Steel Workers	16.00	HR	X-STRSTEEL	1.00	666	0	0	0	0	666	41.61
	MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
	MIL PM	Outside Equip. Operators, Medium	8.00	HR	X-EQOPRMED	1.00	293	0	0	0	0	293	36.64
	MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16
	TOTAL	Remove Exist Gat					1,893	305	0	0	0	2,198	
		11 03 01 1 02 2. Rehab Gate											
L	MIL PM	Misc. Structural Steel	2600.00	LB	SIWSE17	300.00	812	0	1,794	0	0	2,606	1.00
	CIV PM	Coml blast, 6.7 PSF, exist coat badly pitted/nodules, (SSPC-6)	600.00	SF	APTRPORD2	96.25	461	0	270	0	0	731	1.22
	CIV PM	Struct steel projects, metal prep, brush-off blast	600.00	SF	APTRPORD2	475.00	93	0	42	0	0	135	0.23
	CIV PM	Ctg & paints, V-106D, light red oxide, vinyl paint (2-coats)	1200.00	SF	N/A	0.00	0	0	156	0	0	156	0.13
	CIV PM	Ctg & paints, V-766E, w/ added abrsv, gray, vinyl paint (3-coat	1800.00	SF	N/A	0.00	0	0	216	0	0	216	0.12
	CIV PM	Structural steel, 1 coat, paint, spray, heavy size, appl only	3000.00	SF	APTSPSST1	162.50	732	0	0	0	0	732	0.24
B	MIL PM	Install New J-Seals	50.00	LF	SIWSE17	10.00	468	0	1,400	0	0	1,868	37.37
	TOTAL	Rehab Gate					2,567	0	3,878	0	0	6,445	
		11 03 01 1 02 3. Install/Test Rehabbed Gate											
	MIL PM	Outside Steel Workers-Foreman	16.00	HR	X-STRSTEEL	1.00	682	0	0	0	0	682	42.61
	MIL PM	Outside Steel Workers	32.00	HR	X-STRSTEEL	1.00	1,332	0	0	0	0	1,332	41.61
	MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06

	11 03. Closure Structures	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
MIL PM	Outside Equip. Operators, Medium	8.00	HR	X-EQOPRMED	1.00	293	0	0	0	0	293	36.64
MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16
FOP PM	Engineers, Project	8.00	HR	FC-ENGPE	1.00	240	0	0	0	0	240	30.06
TOTAL	Install/Test Reh					3,140	305	0	0	0	3,445	
TOTAL	Rehab Closure St					7,600	611	3,878	0	0	12,088	
TOTAL	CS-1, Rail Closu					8,065	611	3,928	0	0	12,604	

11 03 01 2. CS-2, Rail Closure (Riverfront)

11 03 01 2 01. Replace Concrete Joint Sealant

11 03 01 2 01 1. Remove Exist Joint Sealant

B MIL PM	Remove old caulking & sealant	80.00	LF	AMABBRIC1	10.00	269	0	0	0	0	269	3.36
TOTAL	Remove Exist Joi	80.00	LF			269	0	0	0	0	269	3.36

11 03 01 2 01 2. New Joint Sealant

L MIL PM	Caulking & sealants, backer rod, polyethylene, 1/2" dia	80.00	LF	AMABBRIC1	43.00	62	0	2	0	0	65	0.81
L MIL PM	Caulking & sealants, butyl rubber filler, 1/2" x 3/4"	80.00	LF	AMABBRIC1	20.00	134	0	48	0	0	182	2.28
TOTAL	New Joint Sealan	80.00	LF			197	0	50	0	0	247	3.09
TOTAL	Replace Concrete					465	0	50	0	0	516	

11 03 01 2 02. Rehab Closure Structure Gate

Rehab of the existing closure structure gates is assumed to be done on-site. The gates will be removed from the closure structure and placed in a nearby staging area for rehab.

11 03 01 2 02 1. Remove Exist Gate

MIL PM	Outside Steel Workers-Foreman	8.00	HR	X-STRSTEEL	1.00	341	0	0	0	0	341	42.61
MIL PM	Outside Steel Workers	16.00	HR	X-STRSTEEL	1.00	666	0	0	0	0	666	41.61
MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06

		11 03. Closure Structures	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
	MIL PM	Outside Equip. Operators, Medium	8.00	HR	X-EQOPRMED	1.00	293	0	0	0	0	293	36.64
	MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16
	TOTAL	Remove Exist Gat					1,893	305	0	0	0	2,198	
		11 03 01 2 02 2. Rehab Gate											
L	MIL PM	Misc. Structural Steel	2600.00	LB	SIWSE17	300.00	812	0	1,794	0	0	2,606	1.00
	CIV PM	Coml blast, 6.7 PSF, exist coat badly pitted/nodules, (SSPC-6)	600.00	SF	APTRPORD2	96.25	461	0	270	0	0	731	1.22
	CIV PM	Struct steel projects, metal prep, brush-off blast	600.00	SF	APTRPORD2	475.00	93	0	42	0	0	135	0.23
	CIV PM	Ctg & paints, V-106D, light red oxide, vinyl paint (2-coats)	1200.00	SF	N/A	0.00	0	0	156	0	0	156	0.13
	CIV PM	Ctg & paints, V-766E, w/ added abrsv, gray, vinyl paint (3-coat	1800.00	SF	N/A	0.00	0	0	216	0	0	216	0.12
	CIV PM	Structural steel, 1 coat, paint, spray, heavy size, appl only	3000.00	SF	APTSPSST1	162.50	732	0	0	0	0	732	0.24
B	MIL PM	Install New J-Seals	50.00	LF	SIWSE17	10.00	468	0	1,400	0	0	1,868	37.37
	TOTAL	Rehab Gate					2,567	0	3,878	0	0	6,445	
		11 03 01 2 02 3. Install/Test Rehabbed Gate											
	MIL PM	Outside Steel Workers-Foreman	16.00	HR	X-STRSTEEL	1.00	682	0	0	0	0	682	42.61
	MIL PM	Outside Steel Workers	32.00	HR	X-STRSTEEL	1.00	1,332	0	0	0	0	1,332	41.61
	MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
	MIL PM	Outside Equip. Operators, Medium	8.00	HR	X-EQOPRMED	1.00	293	0	0	0	0	293	36.64
	MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16
	FOP PM	Engineers, Project	8.00	HR	FC-ENGPE	1.00	240	0	0	0	0	240	30.06
	TOTAL	Install/Test Reh					3,140	305	0	0	0	3,445	
	TOTAL	Rehab Closure St					7,600	611	3,878	0	0	12,088	

11 03. Closure Structures		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL	CS-2, Rail Closu					8,065	611	3,928	0	0	12,604	

11 03 01 3. CS-3, Rail Closure (Riverfront)

11 03 01 3 01. Replace Concrete Joint Sealant

11 03 01 3 01 1. Remove Exist Joint Sealant

B MIL PM	Remove old caulking & sealant	80.00	LF	AMABBRIC1	10.00	269	0	0	0	0	269	3.36
TOTAL	Remove Exist Joi	80.00	LF			269	0	0	0	0	269	3.36

11 03 01 3 01 2. New Joint Sealant

L MIL PM	Caulking & sealants, backer rod, polyethylene, 1/2" dia	80.00	LF	AMABBRIC1	43.00	62	0	2	0	0	65	0.81
L MIL PM	Caulking & sealants, butyl rubber filler, 1/2" x 3/4"	80.00	LF	AMABBRIC1	20.00	134	0	48	0	0	182	2.28
TOTAL	New Joint Sealan	80.00	LF			197	0	50	0	0	247	3.09
TOTAL	Replace Concrete					465	0	50	0	0	516	

11 03 01 3 02. Rehab Closure Structure Gate

Rehab of the existing closure structure gates is assumed to be done on-site. The gates will be removed from the closure structure and placed in a nearby staging area for rehab.

11 03 01 3 02 1. Remove Exist Gate

MIL PM	Outside Steel Workers-Foreman	8.00	HR	X-STRSTEEL	1.00	341	0	0	0	0	341	42.61
MIL PM	Outside Steel Workers	16.00	HR	X-STRSTEEL	1.00	666	0	0	0	0	666	41.61
MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
MIL PM	Outside Equip. Operators, Medium	8.00	HR	X-EQOPRMED	1.00	293	0	0	0	0	293	36.64
MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16
TOTAL	Remove Exist Gat					1,893	305	0	0	0	2,198	

		11 03. Closure Structures	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
		11 03 01 3 02 2. Rehab Gate											
L	MIL PM	Misc. Structural Steel	2600.00	LB	SIWSE17	300.00	812	0	1,794	0	0	2,606	1.00
	CIV PM	Coml blast, 6.7 PSF, exist coat badly pitted/nodules, (SSPC-6)	600.00	SF	APTRPORD2	96.25	461	0	270	0	0	731	1.22
	CIV PM	Struct steel projects, metal prep, brush-off blast	600.00	SF	APTRPORD2	475.00	93	0	42	0	0	135	0.23
	CIV PM	Ctg & paints, V-106D, light red oxide, vinyl paint (2-coats)	1200.00	SF	N/A	0.00	0	0	156	0	0	156	0.13
	CIV PM	Ctg & paints, V-766E, w/ added abrsv, gray, vinyl paint (3-coat	1800.00	SF	N/A	0.00	0	0	216	0	0	216	0.12
	CIV PM	Structural steel, 1 coat, paint, spray, heavy size, appl only	3000.00	SF	APTSPSST1	162.50	732	0	0	0	0	732	0.24
B	MIL PM	Install New J-Seals	50.00	LF	SIWSE17	10.00	468	0	1,400	0	0	1,868	37.37
	TOTAL	Rehab Gate					2,567	0	3,878	0	0	6,445	
		11 03 01 3 02 3. Install/Test Rehabbed Gate											
	MIL PM	Outside Steel Workers-Foreman	16.00	HR	X-STRSTEEL	1.00	682	0	0	0	0	682	42.61
	MIL PM	Outside Steel Workers	32.00	HR	X-STRSTEEL	1.00	1,332	0	0	0	0	1,332	41.61
	MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
	MIL PM	Outside Equip. Operators, Medium	8.00	HR	X-EQOPRMED	1.00	293	0	0	0	0	293	36.64
	MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16
	FOP PM	Engineers, Project	8.00	HR	FC-ENGPE	1.00	240	0	0	0	0	240	30.06
	TOTAL	Install/Test Reh					3,140	305	0	0	0	3,445	
	TOTAL	Rehab Closure St					7,600	611	3,878	0	0	12,088	
	TOTAL	CS-3, Rail Closu					8,065	611	3,928	0	0	12,604	

	11 03. Closure Structures	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
	11 03 01 4. CS-4, Rail Closure (Riverfront)											
	11 03 01 4 01. Replace Concrete Joint Sealant											
	11 03 01 4 01 1. Remove Exist Joint Sealant											
B MIL PM	Remove old caulking & sealant	160.00	LF	AMABBRIC1	10.00	537	0	0	0	0	537	3.36
TOTAL	Remove Exist Joi	160.00	LF			537	0	0	0	0	537	3.36
	11 03 01 4 01 2. New Joint Sealant											
L MIL PM	Caulking & sealants, backer rod, polyethylene, 1/2" dia	160.00	LF	AMABBRIC1	43.00	125	0	5	0	0	130	0.81
L MIL PM	Caulking & sealants, butyl rubber filler, 1/2" x 3/4"	160.00	LF	AMABBRIC1	20.00	269	0	96	0	0	365	2.28
TOTAL	New Joint Sealan	160.00	LF			393	0	101	0	0	494	3.09
TOTAL	Replace Concrete					931	0	101	0	0	1,031	
	11 03 01 4 02. Rehab Closure Structure Gate Rehab of the existing closure structure gates is assumed to be done on-site. The gates will be removed from the closure structure and placed in a nearby staging area for rehab.											
	11 03 01 4 02 1. Remove Exist Gate											
MIL PM	Outside Steel Workers-Foreman	8.00	HR	X-STRSTEEL	1.00	341	0	0	0	0	341	42.61
MIL PM	Outside Steel Workers	16.00	HR	X-STRSTEEL	1.00	666	0	0	0	0	666	41.61
MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
MIL PM	Outside Equip. Operators, Medium	8.00	HR	X-EQOPRMED	1.00	293	0	0	0	0	293	36.64
MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16
TOTAL	Remove Exist Gat					1,893	305	0	0	0	2,198	
	11 03 01 4 02 2. Rehab Gate											
L MIL PM	Misc. Structural Steel	2600.00	LB	SIWSE17	300.00	812	0	1,794	0	0	2,606	1.00
CIV PM	Coml blast, 6.7 PSF, exist coat badly pitted/nodules, (SSPC-6)	600.00	SF	APTRPORD2	96.25	461	0	270	0	0	731	1.22

		11 03. Closure Structures	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
CIV	PM	Struct steel projects, metal prep, brush-off blast	600.00	SF	APTRPORD2	475.00	93	0	42	0	0	135	0.23
CIV	PM	Ctg & paints, V-106D, light red oxide, vinyl paint (2-coats)	1200.00	SF	N/A	0.00	0	0	156	0	0	156	0.13
CIV	PM	Ctg & paints, V-766E, w/ added abrsv, gray, vinyl paint (3-coat	1800.00	SF	N/A	0.00	0	0	216	0	0	216	0.12
CIV	PM	Structural steel, 1 coat, paint, spray, heavy size, appl only	3000.00	SF	APTSPSST1	162.50	732	0	0	0	0	732	0.24
B MIL	PM	Install New J-Seals	50.00	LF	SIWSE17	10.00	468	0	1,400	0	0	1,868	37.37
TOTAL		Rehab Gate					2,567	0	3,878	0	0	6,445	
		11 03 01 4 02 3. Install/Test Rehabbed Gate											
MIL	PM	Outside Steel Workers-Foreman	16.00	HR	X-STRSTEEL	1.00	682	0	0	0	0	682	42.61
MIL	PM	Outside Steel Workers	32.00	HR	X-STRSTEEL	1.00	1,332	0	0	0	0	1,332	41.61
MIL	PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
MIL	PM	Outside Equip. Operators, Medium	8.00	HR	X-EQOPRMED	1.00	293	0	0	0	0	293	36.64
MAP	PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16
FOP	PM	Engineers, Project	8.00	HR	FC-ENGPE	1.00	240	0	0	0	0	240	30.06
TOTAL		Install/Test Reh					3,140	305	0	0	0	3,445	
TOTAL		Rehab Closure St					7,600	611	3,878	0	0	12,088	
		11 03 01 4 03. Demo of Exist Gate Monolith											
		11 03 01 4 03 1 . Remove & Dispose of Exist Conc.											
MIL	PM	Site dml, conc, 7" to 24" thick, reinf, w/backhoe	60.00	CY	CODLB6	1.05	6,319	727	0	0	0	7,046	117.43
MIL	PM	Excavate & load, hydr excavator, 2 CY	60.00	CY	CODEB12C	53.75	89	68	0	0	0	157	2.62
AF	PM	Hauling, hwy haulers, 12 CY, 12 mile round trip @ base wide rate	60.00	CY	COEIB34B	20.00	114	116	0	0	0	230	3.84
USR	PM	Landfill Disposal Fee	60.00	CY		0.00	0	0	0	0	1,800	1,800	30.00

11 03. Closure Structures	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL Remove & Dispose					6,521	912	0	0	1,800	9,233	
TOTAL Demo of Exist Ga					6,521	912	0	0	1,800	9,233	
11 03 01 4 04. New Gate Monolith											
11 03 01 4 04 1. Mobilization and Demobilization											
USR PM Mobilization and Demobilzation	1.00	LS		0.00	0	0	0	0	3,000	3,000	3000.00
TOTAL Mobilization and					0	0	0	0	3,000	3,000	
11 03 01 4 04 2. Structural Excavation & Backfill											
USR PM Excavation and Backfill	1.00	LS		0.00	0	0	0	0	2,500	2,500	2500.00
TOTAL Structural Excav					0	0	0	0	2,500	2,500	
11 03 01 4 04 3. Concrete											
Cost for this work is based on previous Railroad Closure Structures											
Reference Ste. Genevieve Closure Structures;											
Middle - DACW43-99-B-0211											
North - DACW43-97-B-0229											
USR PM Concrete, includes placement, finishing and curing	60.00	CY		0.00	0	0	0	0	15,000	15,000	250.00
TOTAL Concrete	60.00	CY			0	0	0	0	15,000	15,000	250.00
11 03 01 4 04 4. Reinforcing Steel											
MIL PM Reinforcing in place, walls, #3 to #7	5700.00	LB	SIWRRODM4	750.00	1,340	0	1,457	0	0	2,798	0.49
TOTAL Reinforcing Stee	5700.00	LB			1,340	0	1,457	0	0	2,798	0.49
11 03 01 4 04 5. Dowels											
L CIV PM Reinforcing in place, dowels, epoxy coated, 2' long, #7	16.00	EA	SIWRRODM2	6.00	235	0	22	0	0	257	16.09
TOTAL Dowels	16.00	EA			235	0	22	0	0	257	16.09

11 03. Closure Structures	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
11 03 01 4 04 6. Misc. Appurtenances											
RSM PM Waterstop, rubber, center bulb, 1/4" thick, 6" wide	35.00	LF	ACARCARP1	18.13	66	0	125	0	0	191	5.46
MIL PM Expansion joint, premolded, bituminous fiber, 1/2" x 6"	35.00	LF	ACARCARP1	46.88	26	0	13	0	0	39	1.10
MIL PM Caulking & sealants, butyl rubber filler, 1/2" x 3/4"	35.00	LF	AMABBRIC1	26.25	45	0	21	0	0	66	1.88
M AF PM Concrete Bonding Agent	1.00	GAL	N/A	0.00	0	0	13	0	0	13	13.30
TOTAL Misc. Appurtenan					136	0	172	0	0	309	
11 03 01 4 04 7. Railroad Traffic Control											
MIL PM Outside Laborer (RR Flagman)	120.00	HR	X-LABORER	1.00	4,447	0	0	0	0	4,447	37.06
TOTAL Railroad Traffic					4,447	0	0	0	0	4,447	
11 03 01 4 04 8. Railroad Insurance Requirements Reference Ste. Genevieve Closure Structures; Middle - DACW43-99-B-0211 North - DACW43-97-B-0229											
USR PM Special RR Insurance	1.00	LS		0.00	0	0	0	0	7,500	7,500	7500.00
TOTAL Railroad Insuran					0	0	0	0	7,500	7,500	
11 03 01 4 04 9. Site Restoration											
USR PM Seeding and Site Restoration	1.00	LS		0.00	0	0	0	0	1,250	1,250	1250.00
TOTAL Site Restoration					0	0	0	0	1,250	1,250	
TOTAL New Gate Monolit					6,159	0	1,652	0	29,250	37,061	
TOTAL CS-4, Rail Closu					21,211	1,522	5,631	0	31,050	59,414	

11 03. Closure Structures		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
11 03 01 5. CS-5, Road Closure (Riverfront)												
11 03 01 5 01. Replace Concrete Joint Sealant												
11 03 01 5 01 1. Remove Exist Joint Sealant												
B MIL PM	Remove old caulking & sealant	80.00	LF	AMABBRIC1	10.00	269	0	0	0	0	269	3.36
TOTAL	Remove Exist Joi	80.00	LF			269	0	0	0	0	269	3.36
11 03 01 5 01 2. New Joint Sealant												
L MIL PM	Caulking & sealants, backer rod, polyethylene, 1/2" dia	80.00	LF	AMABBRIC1	43.00	62	0	2	0	0	65	0.81
L MIL PM	Caulking & sealants, butyl rubber filler, 1/2" x 3/4"	80.00	LF	AMABBRIC1	20.00	134	0	48	0	0	182	2.28
TOTAL	New Joint Sealan	80.00	LF			197	0	50	0	0	247	3.09
TOTAL	Replace Concrete					465	0	50	0	0	516	
11 03 01 5 02. Rehab Closure Structure Gate Rehab of the existing closure structure gates is assumed to be done on-site. The gates will be removed from the closure structure and placed in a nearby staging area for rehab.												
11 03 01 5 02 1. Remove Exist Gate												
MIL PM	Outside Steel Workers-Foreman	8.00	HR	X-STRSTEEL	1.00	341	0	0	0	0	341	42.61
MIL PM	Outside Steel Workers	16.00	HR	X-STRSTEEL	1.00	666	0	0	0	0	666	41.61
MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
MIL PM	Outside Equip. Operators, Medium	8.00	HR	X-EQOPRMED	1.00	293	0	0	0	0	293	36.64
MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16
TOTAL	Remove Exist Gat					1,893	305	0	0	0	2,198	
11 03 01 5 02 2. Rehab Gate												
L MIL PM	Misc. Structural Steel	2600.00	LB	SIWSE17	300.00	812	0	1,794	0	0	2,606	1.00
CIV PM	Coml blast, 6.7 PSF, exist coat badly pitted/nodules, (SSPC-6)	600.00	SF	APTRPORD2	96.25	461	0	270	0	0	731	1.22

		03. Closure Structures	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
CIV	PM	Struct steel projects, metal prep, brush-off blast	600.00	SF	APTRPORD2	475.00	93	0	42	0	0	135	0.23
CIV	PM	Ctg & paints, V-106D, light red oxide, vinyl paint (2-coats)	1200.00	SF	N/A	0.00	0	0	156	0	0	156	0.13
CIV	PM	Ctg & paints, V-766E, w/ added abrsv, gray, vinyl paint (3-coat	1800.00	SF	N/A	0.00	0	0	216	0	0	216	0.12
CIV	PM	Structural steel, 1 coat, paint, spray, heavy size, appl only	3000.00	SF	APTSPSST1	162.50	732	0	0	0	0	732	0.24
B MIL	PM	Install New J-Seals	50.00	LF	SIWSE17	10.00	468	0	1,400	0	0	1,868	37.37
TOTAL		Rehab Gate					2,567	0	3,878	0	0	6,445	
		11 03 01 5 02 3. Install/Test Rehabbed Gate											
MIL	PM	Outside Steel Workers-Foreman	16.00	HR	X-STRSTEEL	1.00	682	0	0	0	0	682	42.61
MIL	PM	Outside Steel Workers	32.00	HR	X-STRSTEEL	1.00	1,332	0	0	0	0	1,332	41.61
MIL	PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
MIL	PM	Outside Equip. Operators, Medium	8.00	HR	X-EQOPRMED	1.00	293	0	0	0	0	293	36.64
MAP	PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16
FOP	PM	Engineers, Project	8.00	HR	FC-ENGPE	1.00	240	0	0	0	0	240	30.06
TOTAL		Install/Test Reh					3,140	305	0	0	0	3,445	
TOTAL		Rehab Closure St					7,600	611	3,878	0	0	12,088	
		11 03 01 5 03. Demo of Exist Aproach Slab											
		11 03 01 5 03 1 . Remove & Dispose of Exist Conc.											
MIL	PM	Site dml, conc, 7" to 24" thick, reinf, w/backhoe	61.00	CY	CODLB6	1.05	6,424	739	0	0	0	7,163	117.43
MIL	PM	Excavate & load, hydr excavator, 2 CY	61.00	CY	CODEB12C	53.75	90	69	0	0	0	160	2.62
AF	PM	Hauling, hwy haulers, 12 CY, 12 mile round trip @ base wide rate	61.00	CY	COEIB34B	20.00	116	118	0	0	0	234	3.84
USR	PM	Landfill Disposal Fee	61.00	CY		0.00	0	0	0	0	1,830	1,830	30.00

11 03. Closure Structures	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL Remove & Dispose					6,630	927	0	0	1,830	9,387	
TOTAL Demo of Exist Ap					6,630	927	0	0	1,830	9,387	
11 03 01 5 04. New Aproach Slab											
11 03 01 5 04 1. Mobilization and Demobilization											
USR PM Mobilization and Demobilzation	1.00	LS		0.00	0	0	0	0	500	500	500.00
TOTAL Mobilization and					0	0	0	0	500	500	
11 03 01 5 04 2. Structural Excavation & Backfill											
USR PM Excavation and Backfill	1.00	LS		0.00	0	0	0	0	500	500	500.00
TOTAL Structural Excav					0	0	0	0	500	500	
11 03 01 5 04 3. Concrete											
USR PM Concrete, includes placement, finishing and curing	61.00	CY		0.00	0	0	0	0	9,150	9,150	150.00
TOTAL Concrete	61.00	CY			0	0	0	0	9,150	9,150	150.00
11 03 01 5 04 4. Reinforcing Steel											
MIL PM Reinforcing in place, walls, #3 to #7	6100.00	LB	SIWRRODM4	750.00	1,434	0	1,560	0	0	2,994	0.49
TOTAL Reinforcing Stee	6100.00	LB			1,434	0	1,560	0	0	2,994	0.49
11 03 01 5 04 7. Traffic Control											
MIL PM Outside Laborer (Flagman)	24.00	HR	X-LABORER	1.00	889	0	0	0	0	889	37.06
TOTAL Traffic Control					889	0	0	0	0	889	
11 03 01 5 04 9. Site Restoration											
USR PM Seeding and Site Restoration	1.00	LS		0.00	0	0	0	0	500	500	500.00
TOTAL Site Restoration					0	0	0	0	500	500	

11 03. Closure Structures		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL	New Aproach Slab					2,324	0	1,560	0	10,650	14,533	
TOTAL	CS-5, Road Closu					17,019	1,537	5,488	0	12,480	36,524	
	11 03 01 7. CS-7, Rail Closure (Flank)											
	11 03 01 7 01. Replace Concrete Joint Sealant											
	11 03 01 7 01 1. Remove Exist Joint Sealant											
B MIL PM	Remove old caulking & sealant	30.00	LF	AMABBRIC1	10.00	101	0	0	0	0	101	3.36
TOTAL	Remove Exist Joi	30.00	LF			101	0	0	0	0	101	3.36
	11 03 01 7 01 2. New Joint Sealant											
L MIL PM	Caulking & sealants, backer rod, polyethylene, 1/2" dia	30.00	LF	AMABBRIC1	43.00	23	0	1	0	0	24	0.81
L MIL PM	Caulking & sealants, butyl rubber filler, 1/2" x 3/4"	30.00	LF	AMABBRIC1	20.00	50	0	18	0	0	68	2.28
TOTAL	New Joint Sealan	30.00	LF			74	0	19	0	0	93	3.09
TOTAL	Replace Concrete					174	0	19	0	0	193	
	11 03 01 7 02. Demo of Exist Sill Monolith											
	11 03 01 7 02 1 . Remove & Dispose of Exist Conc.											
MIL PM	Site dml, conc, 7" to 24" thick, reinf, w/backhoe	4.00	CY	CODLB6	1.05	421	48	0	0	0	470	117.43
MIL PM	Excavate & load, hydr excavator, 2 CY	4.00	CY	CODEB12C	53.75	6	5	0	0	0	10	2.62
AF PM	Hauling, hwy haulers, 12 CY, 12 mile round trip @ base wide rate	4.00	CY	COEIB34B	20.00	8	8	0	0	0	15	3.84
USR PM	Landfill Disposal Fee	4.00	CY		0.00	0	0	0	0	120	120	30.00
TOTAL	Remove & Dispose					435	61	0	0	120	616	
TOTAL	Demo of Exist Si					435	61	0	0	120	616	

	11 03. Closure Structures	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
	11 03 01 7 03. New Sill Monolith											
	11 03 01 7 03 1. Mobilization and Demobilization											
USR PM	Mobilization and Demobilzation	1.00	LS		0.00	0	0	0	0	500	500	500.00
TOTAL	Mobilization and					0	0	0	0	500	500	
	11 03 01 7 03 2. Structural Excavation & Backfill											
USR PM	Excavation and Backfill	1.00	LS		0.00	0	0	0	0	500	500	500.00
TOTAL	Structural Excav					0	0	0	0	500	500	
	11 03 01 7 03 3. Concrete											
USR PM	Concrete, includes placement, finishing and curing	4.00	CY		0.00	0	0	0	0	600	600	150.00
TOTAL	Concrete	4.00	CY			0	0	0	0	600	600	150.00
	11 03 01 7 03 4. Reinforcing Steel											
MIL PM	Reinforcing in place, walls, #3 to #7	40.00	LB	SIWRRODM4	750.00	9	0	10	0	0	20	0.49
TOTAL	Reinforcing Stee	40.00	LB			9	0	10	0	0	20	0.49
	11 03 01 7 03 5. Dowels											
L CIV PM	Reinforcing in place, dowels, epoxy coated, 2' long, #7	10.00	EA	SIWRRODM2	6.00	147	0	14	0	0	161	16.09
TOTAL	Dowels	10.00	EA			147	0	14	0	0	161	16.09
	11 03 01 7 03 6. Misc. Appurtenances											
M AF PM	Concrete Bonding Agent	1.00	GAL	N/A	0.00	0	0	13	0	0	13	13.30
USR PM	Corner Protection	20.00	LF	N/A	0.00	0	0	0	0	200	200	10.00
TOTAL	Misc. Appurtenan					0	0	13	0	200	213	

	11 03. Closure Structures	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
	11 03 01 7 03 7. Traffic Control											
MIL PM	Outside Laborer (Flagman)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL	Traffic Control					593	0	0	0	0	593	
	11 03 01 7 03 9. Site Restoration											
USR PM	Seeding and Site Restoration	1.00	LS		0.00	0	0	0	0	500	500	500.00
TOTAL	Site Restoration					0	0	0	0	500	500	
TOTAL	New Sill Monolit					749	0	37	0	2,300	3,087	
TOTAL	CS-7, Rail Closu					1,359	61	56	0	2,420	3,896	
	11 03 01 8. CS-8, Rail Closure (Flank)											
	11 03 01 8 01. Replace Concrete Joint Sealant											
	11 03 01 8 01 1. Remove Exist Joint Sealant											
B MIL PM	Remove old caulking & sealant	70.00	LF	AMABBRIC1	10.00	235	0	0	0	0	235	3.36
TOTAL	Remove Exist Joi	70.00	LF			235	0	0	0	0	235	3.36
	11 03 01 8 01 2. New Joint Sealant											
L MIL PM	Caulking & sealants, backer rod, polyethylene, 1/2" dia	70.00	LF	AMABBRIC1	43.00	55	0	2	0	0	57	0.81
L MIL PM	Caulking & sealants, butyl rubber filler, 1/2" x 3/4"	70.00	LF	AMABBRIC1	20.00	117	0	42	0	0	159	2.28
TOTAL	New Joint Sealan	70.00	LF			172	0	44	0	0	216	3.09
TOTAL	Replace Concrete					407	0	44	0	0	451	

		11 03. Closure Structures	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
		11 03 01 8 02. Rehab Closure Structure Gate											
		Rehab of the existing closure structure gates is assumed to be done on-site. The gates will be removed from the closure structure and placed in a nearby staging area for rehab.											
		11 03 01 8 02 1. Remove Exist Gate											
	MIL PM	Outside Steel Workers-Foreman	8.00	HR	X-STRSTEEL	1.00	341	0	0	0	0	341	42.61
	MIL PM	Outside Steel Workers	16.00	HR	X-STRSTEEL	1.00	666	0	0	0	0	666	41.61
	MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
	MIL PM	Outside Equip. Operators, Medium	8.00	HR	X-EQOPRMED	1.00	293	0	0	0	0	293	36.64
	MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16
	TOTAL	Remove Exist Gat					1,893	305	0	0	0	2,198	
		11 03 01 8 02 2. Rehab Gate											
L	MIL PM	Misc. Structural Steel	1350.00	LB	SIWSE17	300.00	422	0	931	0	0	1,353	1.00
	CIV PM	Coml blast, 6.7 PSF, exist coat badly pitted/nodules, (SSPC-6)	300.00	SF	APTRPORD2	96.25	231	0	135	0	0	366	1.22
	CIV PM	Struct steel projects, metal prep, brush-off blast	300.00	SF	APTRPORD2	475.00	47	0	21	0	0	68	0.23
	CIV PM	Ctg & paints, V-106D, light red oxide, vinyl paint (2-coats)	600.00	SF	N/A	0.00	0	0	78	0	0	78	0.13
	CIV PM	Ctg & paints, V-766E, w/ added abrsv, gray, vinyl paint (3-coat	900.00	SF	N/A	0.00	0	0	108	0	0	108	0.12
	CIV PM	Structural steel, 1 coat, paint, spray, heavy size, appl only	1500.00	SF	APTSPSST1	162.50	366	0	0	0	0	366	0.24
B	MIL PM	Install New J-Seals	40.00	LF	SIWSE17	10.00	375	0	1,120	0	0	1,495	37.37
	TOTAL	Rehab Gate					1,440	0	2,394	0	0	3,833	
		11 03 01 8 02 3. Install/Test Rehabbed Gate											
	MIL PM	Outside Steel Workers-Foreman	12.00	HR	X-STRSTEEL	1.00	511	0	0	0	0	511	42.61
	MIL PM	Outside Steel Workers	24.00	HR	X-STRSTEEL	1.00	999	0	0	0	0	999	41.61
	MIL PM	Outside Laborers, (Semi-Skilled)	12.00	HR	X-LABORER	1.00	445	0	0	0	0	445	37.06

	11 03. Closure Structures	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
MIL PM	Outside Equip. Operators, Medium	8.00	HR	X-EQOPRMED	1.00	293	0	0	0	0	293	36.64
MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16
FOP PM	Engineers, Project	8.00	HR	FC-ENGPE	1.00	240	0	0	0	0	240	30.06
TOTAL	Install/Test Reh					2,488	305	0	0	0	2,794	
TOTAL	Rehab Closure St					5,821	611	2,394	0	0	8,825	
	11 03 01 8 03. Demo of Exist Sill Monolith											
	11 03 01 8 03 1 . Remove & Dispose of Exist Conc.											
MIL PM	Site dml, conc, 7" to 24" thick, reinf, w/backhoe	4.00	CY	CODLB6	1.05	421	48	0	0	0	470	117.43
MIL PM	Excavate & load, hydr excavator, 2 CY	4.00	CY	CODEB12C	53.75	6	5	0	0	0	10	2.62
AF PM	Hauling, hwy haulers, 12 CY, 12 mile round trip @ base wide rate	4.00	CY	COEIB34B	20.00	8	8	0	0	0	15	3.84
USR PM	Landfill Disposal Fee	4.00	CY		0.00	0	0	0	0	120	120	30.00
TOTAL	Remove & Dispose					435	61	0	0	120	616	
TOTAL	Demo of Exist Si					435	61	0	0	120	616	
	11 03 01 8 04. New Sill Monolith											
	11 03 01 8 04 1. Mobilization and Demobilization											
USR PM	Mobilization and Demobilzation	1.00	LS		0.00	0	0	0	0	500	500	500.00
TOTAL	Mobilization and					0	0	0	0	500	500	
	11 03 01 8 04 2. Structural Excavation & Backfill											
USR PM	Excavation and Backfill	1.00	LS		0.00	0	0	0	0	500	500	500.00
TOTAL	Structural Excav					0	0	0	0	500	500	

	11 03. Closure Structures	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
	11 03 01 8 04 3. Concrete											
USR PM	Concrete, includes placement, finishing and curing	4.00	CY		0.00	0	0	0	0	600	600	150.00
TOTAL	Concrete	4.00	CY			0	0	0	0	600	600	150.00
	11 03 01 8 04 4. Reinforcing Steel											
MIL PM	Reinforcing in place, walls, #3 to #7	40.00	LB	SIWRRODM4	750.00	9	0	10	0	0	20	0.49
TOTAL	Reinforcing Stee	40.00	LB			9	0	10	0	0	20	0.49
	11 03 01 8 04 5. Dowels											
L CIV PM	Reinforcing in place, dowels, epoxy coated, 2' long, #7	10.00	EA	SIWRRODM2	6.00	147	0	14	0	0	161	16.09
TOTAL	Dowels	10.00	EA			147	0	14	0	0	161	16.09
	11 03 01 8 04 6. Misc. Appurtenances											
M AF PM	Concrete Bonding Agent	1.00	GAL	N/A	0.00	0	0	13	0	0	13	13.30
USR PM	Corner Protection	20.00	LF	N/A	0.00	0	0	0	0	200	200	10.00
TOTAL	Misc. Appurtenan					0	0	13	0	200	213	
	11 03 01 8 04 7. Traffic Control											
MIL PM	Outside Laborer (Flagman)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL	Traffic Control					593	0	0	0	0	593	
	11 03 01 8 04 9. Site Restoration											
USR PM	Seeding and Site Restoration	1.00	LS		0.00	0	0	0	0	500	500	500.00
TOTAL	Site Restoration					0	0	0	0	500	500	
TOTAL	New Sill Monolit					749	0	37	0	2,300	3,087	
TOTAL	CS-8, Rail Closu					7,412	671	2,475	0	2,420	12,978	

11 03. Closure Structures	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
11 03 01 9. CS-9, Rail Closure (Flank)											
11 03 01 9 01. Remove Closure Structure Gate											
11 03 01 9 01 1. Remove & Dispose of Exist Gate											
MIL PM Outside Steel Workers-Foreman	8.00	HR	X-STRSTEEL	1.00	341	0	0	0	0	341	42.61
MIL PM Outside Steel Workers	16.00	HR	X-STRSTEEL	1.00	666	0	0	0	0	666	41.61
MIL PM Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
MIL PM Outside Equip. Operators, Medium	8.00	HR	X-EQOPRMED	1.00	293	0	0	0	0	293	36.64
MAP PM CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16
MIL PM Outside Truck Drivers, Heavy	8.00	HR	X-TRKDVRHV	1.00	303	0	0	0	0	303	37.92
MAP PM FLATBED, 8'x 16.0', W/SIDE RACKS (ADD TRUCK)	8.00	HR	T40KF016	1.00	0	7	0	0	0	7	0.84
EP PM TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	8.00	HR	T50FO006	1.00	0	115	0	0	0	115	14.36
USR PM Salvage Value	2.50	TON		0.00	0	0	-125	0	0	-125	-50.00
TOTAL Remove & Dispose					2,196	427	-125	0	0	2,498	
TOTAL Remove Closure S					2,196	427	-125	0	0	2,498	
11 03 01 9 02. Remove RR Ballast Etc....											
11 03 01 9 02 1. Excavation and Removal											
MIL PM Site dml, ties & track, ballast, RR removal	550.00	CY	CLABB14	62.50	1,960	112	0	0	0	2,072	3.77
AF PM Hauling, hwy haulers, 12 CY, 6 mi round trip @ base wide rate	550.00	CY	COEIB34B	26.88	776	794	0	0	0	1,570	2.86
USR PM Disposal	550.00	CY		0.00	0	0	0	0	2,750	2,750	5.00
TOTAL Excavation and R	550.00	CY			2,736	906	0	0	2,750	6,393	11.62
TOTAL Remove RR Ballas					2,736	906	0	0	2,750	6,393	

	11 03. Closure Structures	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
	11 03 01 9 03. Abandon Structure/Close Opening											
	11 03 01 9 03 1. Place and Compact Embankment											
RSM PM	Fill, borrow, for embankments, load, 1 mile haul, spread w/dozer	1300.00	CY	CODTB15	150.00	1,135	1,144	4,719	0	0	6,998	5.38
AF PM	Compaction, riding, 8" lifts, 2 passes, sheepsfoot/wobbly wheel roller	1300.00	CY	COFCB32F	600.00	242	166	0	0	0	408	0.31
TOTAL	Place and Compac	1300.00	CY			1,377	1,310	4,719	0	0	7,406	5.70
TOTAL	Abandon Structur					1,377	1,310	4,719	0	0	7,406	
TOTAL	CS-9, Rail Closu					6,309	2,643	4,594	0	2,750	16,297	
TOTAL	Upper Wood River					77,505	8,267	30,029	0	51,120	166,921	
	11 03 02. East and West Fork Levee											
	11 03 02 1. CS-10, Rail Closure (East Fork)											
	11 03 02 1 01. Demolition of Existing Structure											
	11 03 02 1 01 1. Remove & Dispose of Exist Gate											
MIL PM	Outside Steel Workers-Foreman	8.00	HR	X-STRSTEEL	1.00	341	0	0	0	0	341	42.61
MIL PM	Outside Steel Workers	16.00	HR	X-STRSTEEL	1.00	666	0	0	0	0	666	41.61
MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
MIL PM	Outside Equip. Operators, Medium	8.00	HR	X-EQOPRMED	1.00	293	0	0	0	0	293	36.64
MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16
MIL PM	Outside Truck Drivers, Heavy	8.00	HR	X-TRKDVRHV	1.00	303	0	0	0	0	303	37.92
MAP PM	FLATBED, 8'x 16.0', W/SIDE RACKS (ADD TRUCK)	8.00	HR	T40KF016	1.00	0	7	0	0	0	7	0.84
EP PM	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	8.00	HR	T50FO006	1.00	0	115	0	0	0	115	14.36
USR PM	Salvage Value	2.50	TON		0.00	0	0	-125	0	0	-125	-50.00
TOTAL	Remove & Dispose					2,196	427	-125	0	0	2,498	

	11 03. Closure Structures	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
	11 03 02 1 01 2. Remove & Dispose of Exist Conc.											
MIL PM	Site dml, conc, 7" to 24" thick, reinf, w/backhoe	400.00	CY	CODLB6	1.05	42,126	4,847	0	0	0	46,972	117.43
MIL PM	Excavate & load, hydr excavator, 2 CY	400.00	CY	CODEB12C	53.75	592	454	0	0	0	1,046	2.62
AF PM	Hauling, hwy haulers, 12 CY, 12 mile round trip @ base wide rate	400.00	CY	COEIB34B	20.00	758	776	0	0	0	1,535	3.84
USR PM	Landfill Disposal Fee	400.00	CY		0.00	0	0	0	0	12,000	12,000	30.00
TOTAL	Remove & Dispose					43,476	6,077	0	0	12,000	61,553	
	11 03 02 1 01 3. Remove Ballast & RR Bedding											
	This material is assumed to be stockpiled on-site for reuse.											
MIL PM	Site dml, ties & track, ballast, RR removal	600.00	CY	CLABB14	62.50	2,139	122	0	0	0	2,261	3.77
MIL PM	Excavate & fill, dozer, move 150', stockpile, 200 HP	600.00	CY	CODTB11R	64.38	514	506	0	0	0	1,021	1.70
TOTAL	Remove Ballast &					2,653	629	0	0	0	3,281	
TOTAL	Demolition of Ex					48,325	7,132	-125	0	12,000	67,333	
	11 03 02 1 02. New Closure Structure											
	11 03 02 1 02 1. Mobilization and Demobilization											
USR PM	Mobilization and Demobilzation	1.00	LS		0.00	0	0	0	0	19,700	19,700	19700
TOTAL	Mobilization and					0	0	0	0	19,700	19,700	
	11 03 02 1 02 2. Structural Excavation & Backfill											
USR PM	Excavation and Backfill	1.00	LS		0.00	0	0	0	0	5,000	5,000	5000.00
TOTAL	Structural Excav					0	0	0	0	5,000	5,000	

	11 03. Closure Structures	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
	11 03 02 1 02 3. Concrete											
	Cost for this work is based on previous Railroad Closure Structures											
	Reference Ste. Genevieve Closure Structures;											
	Middle - DACW43-99-B-0211											
	North - DACW43-97-B-0229											
USR PM	Concrete, includ es placement, finishing and curing	400.00	CY		0.00	0	0	0	0	100,000	100,000	250.00
TOTAL	Concrete	400.00	CY			0	0	0	0	100,000	100,000	250.00
	11 03 02 1 02 4. Reinforcing Steel											
MIL PM	Reinforcing in p lace, walls, #3 to #7	40300	LB	SIWRRODM4	750.00	9,475	0	10,305	0	0	19,779	0.49
TOTAL	Reinforcing Stee	40300	LB			9,475	0	10,305	0	0	19,779	0.49
	11 03 02 1 02 5. Steel Sheetpile											
L RSM PM	Sheet piling, st l,15' exc,22 PSF,left in place, no wales	72.34	TON	CPIDB40	0.75	29,519	12,777	57,559	0	0	99,854	1380.34
TOTAL	Steel Sheetpile	6582.00	SF			29,519	12,777	57,559	0	0	99,854	15.17
	11 03 02 1 02 6. Misc. Appurtenances											
RSM PM	Waterstop, rubbe r, center bulb, 1/4" thick, 6" wide	200.00	LF	ACARCARP1	18.13	378	0	714	0	0	1,092	5.46
MIL PM	Expansion joint, premolded, bituminous fiber, 1/2" x 6"	50.00	LF	ACARCARP1	46.88	37	0	19	0	0	55	1.10
MIL PM	Caulking & seala nts, butyl rubber filler, 1/2" x 3/4"	50.00	LF	AMABBRIC1	26.25	64	0	30	0	0	94	1.88
TOTAL	Misc. Appurtenan					478	0	763	0	0	1,241	
	11 03 02 1 02 7. Railroad Work											
	Cost for this work is based on previous Railroad Closure Structures and											
	considers multiple installations and removals of RR falsework for											
	construction as well as any work the railroad would do with its own labor.											
	Reference Valley Park IV-A, DACW43-00-B-0228											
USR PM	RR Work, Falsewo rk, Ballast Track, Etc	1.00	LS		0.00	0	0	0	0	50,000	50,000	50000

	11 03. Closure Structures	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
	TOTAL Railroad Work					0	0	0	0	50,000	50,000	
	11 03 02 1 02 8. Railroad Insurance Requirements Reference Ste. Genevieve Closure Structures; Middle - DACW43-99-B-0211 North - DACW43-97-B-0229											
USR PM	Special RR Insurance	1.00	LS		0.00	0	0	0	0	15,000	15,000	15000
	TOTAL Railroad Insuran					0	0	0	0	15,000	15,000	
	11 03 02 1 02 9. Fabricate New Gate											
B MIL PM	Fabricate New Gate (2-Leafs)	5000.00	LB		0.00	0	0	0	0	12,500	12,500	2.50
USR PM	Misc. Structural Steel (weather shield)	1350.00	LB		0.00	0	0	0	0	3,375	3,375	2.50
CIV PM	Struct steel projects, metal prep, brush-off blast	300.00	SF	APTRPORD2	475.00	47	0	21	0	0	68	0.23
CIV PM	Ctg & paints, V-106D, light red oxide, vinyl paint (2-coats)	600.00	SF	N/A	0.00	0	0	78	0	0	78	0.13
CIV PM	Ctg & paints, V-766E, w/ added abrsv, gray, vinyl paint (3-coat	900.00	SF	N/A	0.00	0	0	108	0	0	108	0.12
CIV PM	Structural steel, 1 coat, paint, spray, heavy size, appl only	1500.00	SF	APTSPSST1	162.50	366	0	0	0	0	366	0.24
B MIL PM	J-Seals	40.00	LF	SIWSE17	10.00	375	0	1,120	0	0	1,495	37.37
	TOTAL Fabricate New Ga					787	0	1,327	0	15,875	17,989	
	11 03 02 1 02 10. Install/Test New Gate											
MIL PM	Outside Steel Workers-Foreman	16.00	HR	X-STRSTEEL	1.00	682	0	0	0	0	682	42.61
MIL PM	Outside Steel Workers	32.00	HR	X-STRSTEEL	1.00	1,332	0	0	0	0	1,332	41.61
MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
MIL PM	Outside Equip. Operators, Medium	8.00	HR	X-EQOPRMED	1.00	293	0	0	0	0	293	36.64
MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16
FOP PM	Engineers, Project	8.00	HR	FC-ENGPE	1.00	240	0	0	0	0	240	30.06

11 03. Closure Structures	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL Install/Test New					3,140	305	0	0	0	3,445	
11 03 02 1 02 11. Site Restoration											
USR PM Seeding and Site Restoration	1.00	LS		0.00	0	0	0	0	2,500	2,500	2500.00
TOTAL Site Restoration					0	0	0	0	2,500	2,500	
TOTAL New Closure Stru					43,399	13,082	69,953	0	208,075	334,509	
TOTAL CS-10, Rail Clos					91,724	20,214	69,828	0	220,075	401,841	
TOTAL East and West Fo					91,724	20,214	69,828	0	220,075	401,841	
11 03 03. Lower Wood River Levee (LWRL)											
11 03 03 1. CS-11, Rail Closure (Flank)											
11 03 03 1 01. Demolition of Existing Structure											
11 03 03 1 01 1. Remove & Dispose of Exist Gate											
MIL PM Outside Steel Workers-Foreman	8.00	HR	X-STRSTEEL	1.00	341	0	0	0	0	341	42.61
MIL PM Outside Steel Workers	16.00	HR	X-STRSTEEL	1.00	666	0	0	0	0	666	41.61
MIL PM Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
MIL PM Outside Equip. Operators, Medium	8.00	HR	X-EQOPRMED	1.00	293	0	0	0	0	293	36.64
MAP PM CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16
MIL PM Outside Truck Drivers, Heavy	8.00	HR	X-TRKDVRHV	1.00	303	0	0	0	0	303	37.92
MAP PM FLATBED, 8'x 16.0', W/SIDE RACKS (ADD TRUCK)	8.00	HR	T40KF016	1.00	0	7	0	0	0	7	0.84
EP PM TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	8.00	HR	T50FO006	1.00	0	115	0	0	0	115	14.36
USR PM Salvage Value	5.25	TON		0.00	0	0	-263	0	0	-263	-50.00
TOTAL Remove & Dispose					2,196	427	-263	0	0	2,360	

	11 03. Closure Structures	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
	11 03 03 1 01 2. Remove & Dispose of Exist Conc.											
MIL PM	Site dml, conc, 7" to 24" thick, reinf, w/backhoe	355.00	CY	CODLB6	1.05	37,387	4,301	0	0	0	41,688	117.43
MIL PM	Excavate & load, hydr excavator, 2 CY	355.00	CY	CODEB12C	53.75	526	403	0	0	0	929	2.62
AF PM	Hauling, hwy haulers, 12 CY, 12 mile round trip @ base wide rate	355.00	CY	COEIB34B	20.00	673	689	0	0	0	1,362	3.84
USR PM	Landfill Disposal Fee	355.00	CY		0.00	0	0	0	0	10,650	10,650	30.00
TOTAL	Remove & Dispose					38,585	5,393	0	0	10,650	54,629	
	11 03 03 1 01 3. Remove Ballast & RR Bedding											
	This material is assumed to be stockpiled on-site for reuse.											
MIL PM	Site dml, ties & track, ballast, RR removal	600.00	CY	CLABB14	62.50	2,139	122	0	0	0	2,261	3.77
MIL PM	Excavate & fill, dozer, move 150', stockpile, 200 HP	600.00	CY	CODTB11R	64.38	514	506	0	0	0	1,021	1.70
TOTAL	Remove Ballast &					2,653	629	0	0	0	3,281	
TOTAL	Demolition of Ex					43,434	6,449	-263	0	10,650	60,270	
	11 03 03 1 02. New Closure Structure											
	11 03 03 1 02 1. Mobilization and Demobilization											
USR PM	Mobilization and Demobilzation	1.00	LS		0.00	0	0	0	0	19,100	19,100	19100
TOTAL	Mobilization and					0	0	0	0	19,100	19,100	
	11 03 03 1 02 2. Structural Excavation & Backfill											
USR PM	Excavation and Backfill	1.00	LS		0.00	0	0	0	0	5,000	5,000	5000.00
TOTAL	Structural Excav					0	0	0	0	5,000	5,000	

	11 03. Closure Structures	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
	11 03 03 1 02 3. Concrete											
	Cost for this work is based on previous Railroad Closure Structures											
	Reference Ste. Genevieve Closure Structures;											
	Middle - DACW43-99-B-0211											
	North - DACW43-97-B-0229											
USR PM	Concrete, includes placement, finishing and curing	355.00	CY		0.00	0	0	0	0	88,750	88,750	250.00
TOTAL	Concrete	355.00	CY			0	0	0	0	88,750	88,750	250.00
	11 03 03 1 02 4. Reinforcing Steel											
MIL PM	Reinforcing in place, walls, #3 to #7	35500	LB	SIWRRODM4	750.00	8,346	0	9,077	0	0	17,423	0.49
TOTAL	Reinforcing Stee	35500	LB			8,346	0	9,077	0	0	17,423	0.49
	11 03 03 1 02 5. Steel Sheetpile											
L RSM PM	Sheet piling, stl,15' exc,22 PSF,left in place, no wales	72.34	TON	CPIDB40	0.75	29,519	12,777	57,559	0	0	99,854	1380.34
TOTAL	Steel Sheetpile	6582.00	SF			29,519	12,777	57,559	0	0	99,854	15.17
	11 03 03 1 02 6. Misc. Appurtenances											
RSM PM	Waterstop, rubber, center bulb, 1/4" thick, 6" wide	100.00	LF	ACARCARP1	18.13	189	0	357	0	0	546	5.46
MIL PM	Expansion joint, premolded, bituminous fiber, 1/2" x 6"	30.00	LF	ACARCARP1	46.88	22	0	11	0	0	33	1.10
MIL PM	Caulking & sealants, butyl rubber filler, 1/2" x 3/4"	30.00	LF	AMABBRIC1	26.25	38	0	18	0	0	56	1.88
TOTAL	Misc. Appurtenan					249	0	386	0	0	635	
	11 03 03 1 02 7. Railroad Work											
	Cost for this work is based on previous Railroad Closure Structures and considers multiple installations and removals of RR falsework for construction as well as any work the railroad would do with its own labor.											
	Reference Valley Park IV-A, DACW43-00-B-0228											
USR PM	RR Work, Falsework, Ballast Track, Etc	1.00	LS		0.00	0	0	0	0	50,000	50,000	50000

		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
11 03. Closure Structures												
TOTAL	Railroad Work					0	0	0	0	50,000	50,000	
11 03 03 1 02 8. Railroad Insurance Requirements Reference Ste. Genevieve Closure Structures; Middle - DACW43-99-B-0211 North - DACW43-97-B-0229												
USR PM	Special RR Insurance	1.00	LS		0.00	0	0	0	0	15,000	15,000	15000
TOTAL	Railroad Insuran					0	0	0	0	15,000	15,000	
11 03 03 1 02 9. Fabricate New Gate												
B MIL PM	Fabricate New Gate (2-Leafs)	10500	LB		0.00	0	0	0	0	26,250	26,250	2.50
USR PM	Misc. Structural Steel (weather shield)	2000.00	LB		0.00	0	0	0	0	5,000	5,000	2.50
CIV PM	Struct steel projects, metal prep, brush-off blast	660.00	SF	APTRPORD2	475.00	103	0	46	0	0	149	0.23
CIV PM	Ctg & paints, V-106D, light red oxide, vinyl paint (2-coats)	1320.00	SF	N/A	0.00	0	0	172	0	0	172	0.13
CIV PM	Ctg & paints, V-766E, w/ added abrsv, gray, vinyl paint (3-coat	1980.00	SF	N/A	0.00	0	0	238	0	0	238	0.12
CIV PM	Structural steel, 1 coat, paint, spray, heavy size, appl only	3300.00	SF	APTSPSST1	162.50	805	0	0	0	0	805	0.24
B MIL PM	J-Seals	50.00	LF	SIWSE17	10.00	468	0	1,400	0	0	1,868	37.37
TOTAL	Fabricate New Ga					1,376	0	1,855	0	31,250	34,482	
11 03 03 1 02 10. Install/Test New Gate												
MIL PM	Outside Steel Workers-Foreman	16.00	HR	X-STRSTEEL	1.00	682	0	0	0	0	682	42.61
MIL PM	Outside Steel Workers	32.00	HR	X-STRSTEEL	1.00	1,332	0	0	0	0	1,332	41.61
MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
MIL PM	Outside Equip. Operators, Medium	8.00	HR	X-EQOPRMED	1.00	293	0	0	0	0	293	36.64
MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16
FOP PM	Engineers, Project	8.00	HR	FC-ENGPE	1.00	240	0	0	0	0	240	30.06

	11 03. Closure Structures	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL	Install/Test New					3,140	305	0	0	0	3,445	
	11 03 03 1 02 11. Site Restoration											
USR PM	Seeding and Site Restoration	1.00	LS		0.00	0	0	0	0	2,500	2,500	2500.00
TOTAL	Site Restoration					0	0	0	0	2,500	2,500	
TOTAL	New Closure Stru					42,630	13,082	68,878	0	211,600	336,190	
TOTAL	CS-11, Rail Clos					86,064	19,531	68,615	0	222,250	396,460	
	11 03 03 2. CS-12, Road Closure (Flank)											
	11 03 03 2 01. Demolition of Existing Structure											
	11 03 03 2 01 1. Remove & Dispose of Exist Gate											
MIL PM	Outside Steel Workers-Foreman	8.00	HR	X-STRSTEEL	1.00	341	0	0	0	0	341	42.61
MIL PM	Outside Steel Workers	16.00	HR	X-STRSTEEL	1.00	666	0	0	0	0	666	41.61
MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
MIL PM	Outside Equip. Operators, Medium	8.00	HR	X-EQOPRMED	1.00	293	0	0	0	0	293	36.64
MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16
MIL PM	Outside Truck Drivers, Heavy	8.00	HR	X-TRKDVRHV	1.00	303	0	0	0	0	303	37.92
MAP PM	FLATBED, 8'x 16.0', W/SIDE RACKS (ADD TRUCK)	8.00	HR	T40KF016	1.00	0	7	0	0	0	7	0.84
EP PM	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	8.00	HR	T50FO006	1.00	0	115	0	0	0	115	14.36
USR PM	Salvage Value	5.25	TON		0.00	0	0	-263	0	0	-263	-50.00
TOTAL	Remove & Dispose					2,196	427	-263	0	0	2,360	
	11 03 03 2 01 2. Remove & Dispose of Exist Conc.											
MIL PM	Site dml, conc, 7" to 24" thick, reinf, w/backhoe	1140.00	CY	CODLB6	1.05	120,058	13,813	0	0	0	133,872	117.43
MIL PM	Excavate & load, hydr excavator, 2 CY	1140.00	CY	CODEB12C	53.75	1,688	1,294	0	0	0	2,982	2.62
AF PM	Hauling, hwy haulers, 12 CY, 12 mile round trip @ base wide rate	1140.00	CY	COEIB34B	20.00	2,161	2,213	0	0	0	4,374	3.84

	11 03. Closure Structures	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
USR PM	Landfill Disposal Fee	1140.00	CY		0.00	0	0	0	0	34,200	34,200	30.00
TOTAL	Remove & Dispose					123,908	17,320	0	0	34,200	175,427	
	11 03 03 2 01 3. Remove Ballast & RR Bedding											
	This material is assumed to be stockpiled on-site for reuse.											
MIL PM	Site dml, ties & track, ballast, RR removal	600.00	CY	CLABB14	62.50	2,139	122	0	0	0	2,261	3.77
MIL PM	Excavate & fill, dozer, move 150', stockpile, 200 HP	600.00	CY	CODTB11R	64.38	514	506	0	0	0	1,021	1.70
TOTAL	Remove Ballast &					2,653	629	0	0	0	3,281	
TOTAL	Demolition of Ex					128,757	18,375	-263	0	34,200	181,069	
	11 03 03 2 02. New Closure Structure											
	11 03 03 2 02 1. Mobilization and Demobilization											
USR PM	Mobilization and Demobilzation	1.00	LS		0.00	0	0	0	0	38,900	38,900	38900
TOTAL	Mobilization and					0	0	0	0	38,900	38,900	
	11 03 03 2 02 2. Structural Excavation & Backfill											
USR PM	Excavation and Backfill	1.00	LS		0.00	0	0	0	0	10,000	10,000	10000
TOTAL	Structural Excav					0	0	0	0	10,000	10,000	
	11 03 03 2 02 3. Concrete											
	Cost for this work is based on previous Railroad Closure Structures											
	Reference Ste. Genevieve Closure Structures;											
	Middle - DACW43-99-B-0211											
	North - DACW43-97-B-0229											
USR PM	Concrete, includes placement, finishing and curing	1140.00	CY		0.00	0	0	0	0	285,000	285,000	250.00
TOTAL	Concrete	1140.00	CY			0	0	0	0	285,000	285,000	250.00

		11 03. Closure Structures	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
		11 03 03 2 02 4. Reinforcing Steel											
	MIL PM	Reinforcing in place, walls, #3 to #7	113800	LB	SIWRRODM4	750.00	26,754	0	29,099	0	0	55,853	0.49
	TOTAL	Reinforcing Stee	113800	LB			26,754	0	29,099	0	0	55,853	0.49
		11 03 03 2 02 5. Steel Sheetpile											
L	RSM PM	Sheet piling, stl,15' exc,22 PSF,left in place, no wales	229.11	TON	CPIDB40	0.75	93,490	40,465	182,296	0	0	316,251	1380.34
	TOTAL	Steel Sheetpile	20845	SF			93,490	40,465	182,296	0	0	316,251	15.17
		11 03 03 2 02 6. Misc. Appurtenances											
	RSM PM	Waterstop, rubber, center bulb, 1/4" thick, 6" wide	425.00	LF	ACARCARP1	18.13	803	0	1,517	0	0	2,320	5.46
	MIL PM	Expansion joint, premolded, bituminous fiber, 1/2" x 6"	425.00	LF	ACARCARP1	46.88	311	0	157	0	0	468	1.10
	MIL PM	Caulking & sealants, butyl rubber filler, 1/2" x 3/4"	130.00	LF	AMABBRIC1	26.25	166	0	78	0	0	244	1.88
	MIL PM	Guide/guard rail, steel posts @ 12'- 6" OC, w/ corr steel galv rail	300.00	LF	CLABB80	92.00	485	49	1,749	0	0	2,283	7.61
	MIL PM	Guide/guard rail, wrap-around, end section, corr steel, guard rail	4.00	EA	CLABB80A	9.75	46	6	92	0	0	143	35.87
	TOTAL	Misc. Appurtenan					1,810	55	3,593	0	0	5,459	
		11 03 03 2 02 7. Traffic Control											
	MIL PM	Outside Laborer (Flagman)	160.00	HR	X-LABORER	1.00	5,930	0	0	0	0	5,930	37.06
	TOTAL	Traffic Control					5,930	0	0	0	0	5,930	
		11 03 03 2 02 9. Fabricate New Gate											
B	MIL PM	Fabricate New Gate (2-Leafs)	10500	LB		0.00	0	0	0	0	26,250	26,250	2.50
	USR PM	Misc. Structural Steel (weather shield)	2000.00	LB		0.00	0	0	0	0	5,000	5,000	2.50

11 03. Closure Structures	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
CIV PM Struct steel projects, metal prep, brush-off blast	660.00	SF	APTRPORD2	475.00	103	0	46	0	0	149	0.23
CIV PM Ctg & paints, V-106D, light red oxide, vinyl paint (2-coats)	1320.00	SF	N/A	0.00	0	0	172	0	0	172	0.13
CIV PM Ctg & paints, V-766E, w/ added abrsv, gray, vinyl paint (3-coat	1980.00	SF	N/A	0.00	0	0	238	0	0	238	0.12
CIV PM Structural steel, 1 coat, paint, spray, heavy size, appl only	3300.00	SF	APTSPSST1	162.50	805	0	0	0	0	805	0.24
B MIL PM J-Seals	50.00	LF	SIWSE17	10.00	468	0	1,400	0	0	1,868	37.37
TOTAL Fabricate New Ga					1,376	0	1,855	0	31,250	34,482	
11 03 03 2 02 10. Install/Test New Gate											
MIL PM Outside Steel Workers-Foreman	16.00	HR	X-STRSTEEL	1.00	682	0	0	0	0	682	42.61
MIL PM Outside Steel Workers	32.00	HR	X-STRSTEEL	1.00	1,332	0	0	0	0	1,332	41.61
MIL PM Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
MIL PM Outside Equip. Operators, Medium	8.00	HR	X-EQOPRMED	1.00	293	0	0	0	0	293	36.64
MAP PM CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16
FOP PM Engineers, Project	8.00	HR	FC-ENGPE	1.00	240	0	0	0	0	240	30.06
TOTAL Install/Test New					3,140	305	0	0	0	3,445	
11 03 03 2 02 11. Site Restoration											
USR PM Seeding and Site Restoration	1.00	LS		0.00	0	0	0	0	2,500	2,500	2500.00
TOTAL Site Restoration					0	0	0	0	2,500	2,500	
TOTAL New Closure Stru					132,500	40,826	216,843	0	367,650	757,819	
TOTAL CS-12, Road Clos					261,257	59,201	216,581	0	401,850	938,888	

11 03. Closure Structures	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
11 03 03 3. CS-13, Rail Closure (Flank)											
11 03 03 3 01. Remove Closure Structure Gate											
11 03 03 3 01 1. Remove & Dispose of Exist Gate											
MIL PM Outside Steel Workers-Foreman	8.00	HR	X-STRSTEEL	1.00	341	0	0	0	0	341	42.61
MIL PM Outside Steel Workers	16.00	HR	X-STRSTEEL	1.00	666	0	0	0	0	666	41.61
MIL PM Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
MIL PM Outside Equip. Operators, Medium	8.00	HR	X-EQOPRMED	1.00	293	0	0	0	0	293	36.64
MAP PM CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16
MIL PM Outside Truck Drivers, Heavy	8.00	HR	X-TRKDVRHV	1.00	303	0	0	0	0	303	37.92
MAP PM FLATBED, 8'x 16.0', W/SIDE RACKS (ADD TRUCK)	8.00	HR	T40KF016	1.00	0	7	0	0	0	7	0.84
EP PM TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	8.00	HR	T50FO006	1.00	0	115	0	0	0	115	14.36
USR PM Salvage Value	2.50	TON		0.00	0	0	-125	0	0	-125	-50.00
TOTAL Remove & Dispose					2,196	427	-125	0	0	2,498	
TOTAL Remove Closure S					2,196	427	-125	0	0	2,498	
11 03 03 3 02. Remove RR Ballast Etc....											
11 03 03 3 02 1. Excavation and Removal											
MIL PM Site dml, ties & track, ballast, RR removal	400.00	CY	CLABB14	62.50	1,426	81	0	0	0	1,507	3.77
AF PM Hauling, hwy haulers, 12 CY, 6 mi round trip @ base wide rate	400.00	CY	COEIB34B	26.88	564	578	0	0	0	1,142	2.86
USR PM Disposal	400.00	CY		0.00	0	0	0	0	2,000	2,000	5.00
TOTAL Excavation and R	400.00	CY			1,990	659	0	0	2,000	4,649	11.62
TOTAL Remove RR Ballas					1,990	659	0	0	2,000	4,649	

11 03. Closure Structures			QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
		11 03 03 3 03. Abandon Structure/Close Opening											
		11 03 03 3 03 1. Place and Compact Embankment											
RSM	PM	Fill, borrow, for embankments, load, 1 mile haul, spread w/dozer	800.00	CY	CODTB15	150.00	699	704	2,904	0	0	4,306	5.38
AF	PM	Compaction, riding, 8" lifts, 2 passes, sheepsfoot/wobbly wheel roller	800.00	CY	COFCB32F	600.00	149	102	0	0	0	251	0.31
TOTAL		Place and Compac	800.00	CY			847	806	2,904	0	0	4,558	5.70
TOTAL		Abandon Structur					847	806	2,904	0	0	4,558	
TOTAL		CS-13, Rail Clos					5,033	1,892	2,779	0	2,000	11,705	
		11 03 03 4. CS-14, Rail Closure (Flank)											
		11 03 03 4 01. Remove Closure Structure Gate											
		11 03 03 4 01 1. Remove & Dispose of Exist Gate											
MIL	PM	Outside Steel Workers-Foreman	8.00	HR	X-STRSTEEL	1.00	341	0	0	0	0	341	42.61
MIL	PM	Outside Steel Workers	16.00	HR	X-STRSTEEL	1.00	666	0	0	0	0	666	41.61
MIL	PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
MIL	PM	Outside Equip. Operators, Medium	8.00	HR	X-EQOPRMED	1.00	293	0	0	0	0	293	36.64
MAP	PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16
MIL	PM	Outside Truck Drivers, Heavy	8.00	HR	X-TRKDVRHV	1.00	303	0	0	0	0	303	37.92
MAP	PM	FLATBED, 8'x 16.0', W/SIDE RACKS (ADD TRUCK)	8.00	HR	T40KF016	1.00	0	7	0	0	0	7	0.84
EP	PM	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	8.00	HR	T50FO006	1.00	0	115	0	0	0	115	14.36
USR	PM	Salvage Value	2.50	TON		0.00	0	0	-125	0	0	-125	-50.00
TOTAL		Remove & Dispose					2,196	427	-125	0	0	2,498	
TOTAL		Remove Closure S					2,196	427	-125	0	0	2,498	

	11 03. Closure Structures	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
	11 03 03 4 02. Remove RR Ballast Etc....											
	11 03 03 4 02 1. Excavation and Removal											
MIL PM	Site dml, ties & track, ballast, RR removal	550.00	CY	CLABB14	62.50	1,960	112	0	0	0	2,072	3.77
AF PM	Hauling, hwy haulers, 12 CY, 6 mi round trip @ base wide rate	550.00	CY	COEIB34B	26.88	776	794	0	0	0	1,570	2.86
USR PM	Disposal	550.00	CY		0.00	0	0	0	0	2,750	2,750	5.00
TOTAL	Excavation and R	550.00	CY			2,736	906	0	0	2,750	6,393	11.62
TOTAL	Remove RR Ballas					2,736	906	0	0	2,750	6,393	
	11 03 03 4 03. Abandon Structure/Close Opening											
	11 03 03 4 03 1. Place and Compact Embankment											
RSM PM	Fill, borrow, for embankments, load, 1 mile haul, spread w/dozer	1300.00	CY	CODTB15	150.00	1,135	1,144	4,719	0	0	6,998	5.38
AF PM	Compaction, riding, 8" lifts, 2 passes, sheepsfoot/wobbly wheel roller	1300.00	CY	COFCB32F	600.00	242	166	0	0	0	408	0.31
TOTAL	Place and Compac	1300.00	CY			1,377	1,310	4,719	0	0	7,406	5.70
TOTAL	Abandon Structur					1,377	1,310	4,719	0	0	7,406	
TOTAL	CS-14, Rail Clos					6,309	2,643	4,594	0	2,750	16,297	
	11 03 03 5. CS-15, Road Closure (Flank)											
	11 03 03 5 01. Replace Concrete Joint Sealant											
	11 03 03 5 01 1. Remove Exist Joint Sealant											
B MIL PM	Remove old caulking & sealant	100.00	LF	AMABBRIC1	10.00	336	0	0	0	0	336	3.36
TOTAL	Remove Exist Joi	100.00	LF			336	0	0	0	0	336	3.36

		11 03. Closure Structures	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
		11 03 03 5 01 2. New Joint Sealant											
L	MIL PM	Caulking & sealants, backer rod, polyethylene, 1/2" dia	100.00	LF	AMABBRIC1	43.00	78	0	3	0	0	81	0.81
L	MIL PM	Caulking & sealants, butyl rubber filler, 1/2" x 3/4"	100.00	LF	AMABBRIC1	20.00	168	0	60	0	0	228	2.28
	TOTAL	New Joint Sealan	100.00	LF			246	0	63	0	0	309	3.09
	TOTAL	Replace Concrete					582	0	63	0	0	645	
		11 03 03 5 02. Closure Struct. Gate Cover Plate											
		11 03 03 5 02 1. Weather Shield											
	USR PM	Misc. Structural Steel (weather shield)	6500.00	LB		0.00	0	0	0	0	16,250	16,250	2.50
	CIV PM	Struct steel projects, metal prep, brush-off blast	700.00	SF	APTRPORD2	475.00	109	0	49	0	0	158	0.23
	CIV PM	Ctg & paints, V-106D, light red oxide, vinyl paint (2-coats)	1400.00	SF	N/A	0.00	0	0	182	0	0	182	0.13
	CIV PM	Ctg & paints, V-766E, w/ added abrsv, gray, vinyl paint (3-coat	2100.00	SF	N/A	0.00	0	0	252	0	0	252	0.12
	CIV PM	Structural steel, 1 coat, paint, spray, heavy size, appl only	3500.00	SF	APTSPSST1	162.50	854	0	0	0	0	854	0.24
	TOTAL	Weather Shield					963	0	483	0	16,250	17,696	
	TOTAL	Closure Struct.					963	0	483	0	16,250	17,696	
		11 03 03 5 03. Demo of Exist Gate Monolith											
		11 03 03 5 03 1 . Remove & Dispose of Exist Conc.											
	MIL PM	Site dml, conc, 7" to 24" thick, reinf, w/backhoe	22.00	CY	CODLB6	1.05	2,317	267	0	0	0	2,583	117.43
	MIL PM	Excavate & load, hydr excavator, 2 CY	22.00	CY	CODEB12C	53.75	33	25	0	0	0	58	2.62
	AF PM	Hauling, hwy haulers, 12 CY, 12 mile round trip @ base wide rate	22.00	CY	COEIB34B	20.00	42	43	0	0	0	84	3.84
	USR PM	Landfill Disposal Fee	22.00	CY		0.00	0	0	0	0	660	660	30.00

11 03. Closure Structures	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL Remove & Dispose					2,391	334	0	0	660	3,385	
TOTAL Demo of Exist Ga					2,391	334	0	0	660	3,385	
11 03 03 5 04. New Gate Monolith											
11 03 03 5 04 1. Mobilization and Demobilization											
USR PM Mobilization and Demobilzation	1.00	LS		0.00	0	0	0	0	2,000	2,000	2000.00
TOTAL Mobilization and					0	0	0	0	2,000	2,000	
11 03 03 5 04 2. Structural Excavation & Backfill											
USR PM Excavation and Backfill	1.00	LS		0.00	0	0	0	0	1,500	1,500	1500.00
TOTAL Structural Excav					0	0	0	0	1,500	1,500	
11 03 03 5 04 3. Concrete											
Cost for this work is based on previous Railroad Closure Structures											
Reference Ste. Genevieve Closure Structures;											
Middle - DACW43-99-B-0211											
North - DACW43-97-B-0229											
USR PM Concrete, includes placement, finishing and curing	22.00	CY		0.00	0	0	0	0	5,500	5,500	250.00
TOTAL Concrete	22.00	CY			0	0	0	0	5,500	5,500	250.00
11 03 03 5 04 4. Reinforcing Steel											
MIL PM Reinforcing in place, walls, #3 to #7	2200.00	LB	SIWRRODM4	750.00	517	0	563	0	0	1,080	0.49
TOTAL Reinforcing Stee	2200.00	LB			517	0	563	0	0	1,080	0.49
11 03 03 5 04 5. Dowels											
L CIV PM Reinforcing in place, dowels, epoxy coated, 2' long, #7	16.00	EA	SIWRRODM2	6.00	235	0	22	0	0	257	16.09
TOTAL Dowels	16.00	EA			235	0	22	0	0	257	16.09

		11 03. Closure Structures	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
		11 03 03 5 04 6. Misc. Appurtenances											
	RSM PM	Waterstop, rubber, center bulb, 1/4" thick, 6" wide	21.00	LF	ACARCARP1	18.13	40	0	75	0	0	115	5.46
	MIL PM	Expansion joint, premolded, bituminous fiber, 1/2" x 6"	21.00	LF	ACARCARP1	46.88	15	0	8	0	0	23	1.10
	MIL PM	Caulking & sealants, butyl rubber filler, 1/2" x 3/4"	21.00	LF	AMABBRIC1	26.25	27	0	13	0	0	39	1.88
M	AF PM	Concrete Bonding Agent	1.00	GAL	N/A	0.00	0	0	13	0	0	13	13.30
	TOTAL	Misc. Appurtenan					82	0	109	0	0	191	
		11 03 03 5 04 7. Traffic Control											
	MIL PM	Outside Laborer (Flagman)	60.00	HR	X-LABORER	1.00	2,224	0	0	0	0	2,224	37.06
	TOTAL	Traffic Control					2,224	0	0	0	0	2,224	
		11 03 03 5 04 9. Site Restoration											
	USR PM	Seeding and Site Restoration	1.00	LS		0.00	0	0	0	0	1,250	1,250	1250.00
	TOTAL	Site Restoration					0	0	0	0	1,250	1,250	
	TOTAL	New Gate Monolit					3,058	0	693	0	10,250	14,001	
	TOTAL	CS-15, Road Clos					6,994	334	1,239	0	27,160	35,727	
		11 03 03 6. CS-16, Road Closure (Flank)											
		11 03 03 6 01. Replace Concrete Joint Sealant											
		11 03 03 6 01 1. Remove Exist Joint Sealant											
B	MIL PM	Remove old caulking & sealant	100.00	LF	AMABBRIC1	10.00	336	0	0	0	0	336	3.36
	TOTAL	Remove Exist Joi	100.00	LF			336	0	0	0	0	336	3.36
		11 03 03 6 01 2. New Joint Sealant											
L	MIL PM	Caulking & sealants, backer rod, polyethylene, 1/2" dia	100.00	LF	AMABBRIC1	43.00	78	0	3	0	0	81	0.81
L	MIL PM	Caulking & sealants, butyl rubber filler, 1/2" x 3/4"	100.00	LF	AMABBRIC1	20.00	168	0	60	0	0	228	2.28

11 03. Closure Structures	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL New Joint Sealan	100.00	LF			246	0	63	0	0	309	3.09
TOTAL Replace Concrete					582	0	63	0	0	645	
11 03 03 6 02. Closure Struct. Gate Cover Plate											
11 03 03 6 02 1. Weather Shield											
USR PM Misc. Structural Steel (weather shield)	6500.00	LB		0.00	0	0	0	0	16,250	16,250	2.50
CIV PM Struct steel projects, metal prep, brush-off blast	700.00	SF	APTRPORD2	475.00	109	0	49	0	0	158	0.23
CIV PM Ctg & paints, V-106D, light red oxide, vinyl paint (2-coats)	1400.00	SF	N/A	0.00	0	0	182	0	0	182	0.13
CIV PM Ctg & paints, V-766E, w/ added abrsv, gray, vinyl paint (3-coat	2100.00	SF	N/A	0.00	0	0	252	0	0	252	0.12
CIV PM Structural steel, 1 coat, paint, spray, heavy size, appl only	3500.00	SF	APTSPSST1	162.50	854	0	0	0	0	854	0.24
TOTAL Weather Shield					963	0	483	0	16,250	17,696	
TOTAL Closure Struct.					963	0	483	0	16,250	17,696	
11 03 03 6 03. Demo of Exist Gate Monolith											
11 03 03 6 03 1 . Remove & Dispose of Exist Conc.											
MIL PM Site dml, conc, 7" to 24" thick, reinf, w/backhoe	22.00	CY	CODLB6	1.05	2,317	267	0	0	0	2,583	117.43
MIL PM Excavate & load, hydr excavator, 2 CY	22.00	CY	CODEB12C	53.75	33	25	0	0	0	58	2.62
AF PM Hauling, hwy haulers, 12 CY, 12 mile round trip @ base wide rate	22.00	CY	COEIB34B	20.00	42	43	0	0	0	84	3.84
USR PM Landfill Disposal Fee	22.00	CY		0.00	0	0	0	0	660	660	30.00
TOTAL Remove & Dispose					2,391	334	0	0	660	3,385	
TOTAL Demo of Exist Ga					2,391	334	0	0	660	3,385	

	11 03. Closure Structures	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
	11 03 03 6 04. New Gate Monolith											
	11 03 03 6 04 1. Mobilization and Demobilization											
USR PM	Mobilization and Demobilzation	1.00	LS		0.00	0	0	0	0	2,000	2,000	2000.00
TOTAL	Mobilization and					0	0	0	0	2,000	2,000	
	11 03 03 6 04 2. Structural Excavation & Backfill											
USR PM	Excavation and Backfill	1.00	LS		0.00	0	0	0	0	1,500	1,500	1500.00
TOTAL	Structural Excav					0	0	0	0	1,500	1,500	
	11 03 03 6 04 3. Concrete											
	Cost for this work is based on previous Railroad Closure Structures Reference Ste. Genevieve Closure Structures; Middle - DACW43-99-B-0211 North - DACW43-97-B-0229											
USR PM	Concrete, includes placement, finishing and curing	22.00	CY		0.00	0	0	0	0	5,500	5,500	250.00
TOTAL	Concrete	22.00	CY			0	0	0	0	5,500	5,500	250.00
	11 03 03 6 04 4. Reinforcing Steel											
MIL PM	Reinforcing in place, walls, #3 to #7	2200.00	LB	SIWRRODM4	750.00	517	0	563	0	0	1,080	0.49
TOTAL	Reinforcing Stee	2200.00	LB			517	0	563	0	0	1,080	0.49
	11 03 03 6 04 5. Dowels											
L CIV PM	Reinforcing in place, dowels, epoxy coated, 2' long, #7	16.00	EA	SIWRRODM2	6.00	235	0	22	0	0	257	16.09
TOTAL	Dowels	16.00	EA			235	0	22	0	0	257	16.09
	11 03 03 6 04 6. Misc. Appurtenances											
RSM PM	Waterstop, rubber, center bulb, 1/4" thick, 6" wide	21.00	LF	ACARCARP1	18.13	40	0	75	0	0	115	5.46
MIL PM	Expansion joint, premolded, bituminous fiber, 1/2" x 6"	21.00	LF	ACARCARP1	46.88	15	0	8	0	0	23	1.10

		11 03. Closure Structures	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
	MIL PM	Caulking & sealants, butyl rubber filler, 1/2" x 3/4"	21.00	LF	AMABBRIC1	26.25	27	0	13	0	0	39	1.88
M	AF PM	Concrete Bonding Agent	1.00	GAL	N/A	0.00	0	0	13	0	0	13	13.30
	TOTAL	Misc. Appurtenan					82	0	109	0	0	191	
		11 03 03 6 04 7. Traffic Control											
	MIL PM	Outside Laborer (Flagman)	60.00	HR	X-LABORER	1.00	2,224	0	0	0	0	2,224	37.06
	TOTAL	Traffic Control					2,224	0	0	0	0	2,224	
		11 03 03 6 04 9. Site Restoration											
	USR PM	Seeding and Site Restoration	1.00	LS		0.00	0	0	0	0	1,250	1,250	1250.00
	TOTAL	Site Restoration					0	0	0	0	1,250	1,250	
	TOTAL	New Gate Monolit					3,058	0	693	0	10,250	14,001	
	TOTAL	CS-16, Road Clos					6,994	334	1,239	0	27,160	35,727	
		11 03 03 7. CS-17, Rail Closure (Flank)											
		11 03 03 7 01. Replace Concrete Joint Sealant											
		11 03 03 7 01 1. Remove Exist Joint Sealant											
B	MIL PM	Remove old caulking & sealant	40.00	LF	AMABBRIC1	10.00	134	0	0	0	0	134	3.36
	TOTAL	Remove Exist Joi	40.00	LF			134	0	0	0	0	134	3.36
		11 03 03 7 01 2. New Joint Sealant											
L	MIL PM	Caulking & sealants, backer rod, polyethylene, 1/2" dia	40.00	LF	AMABBRIC1	43.00	31	0	1	0	0	32	0.81
L	MIL PM	Caulking & sealants, butyl rubber filler, 1/2" x 3/4"	40.00	LF	AMABBRIC1	20.00	67	0	24	0	0	91	2.28
	TOTAL	New Joint Sealan	40.00	LF			98	0	25	0	0	124	3.09
	TOTAL	Replace Concrete					233	0	25	0	0	258	

		11 03. Closure Structures	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
		11 03 03 7 02. Rehab Closure Structure Gate											
		Rehab of the existing closure structure gates is assumed to be done on-site. The gates will be removed from the closure structure and placed in a nearby staging area for rehab.											
		11 03 03 7 02 1. Remove Exist Gate											
	MIL PM	Outside Steel Workers-Foreman	8.00	HR	X-STRSTEEL	1.00	341	0	0	0	0	341	42.61
	MIL PM	Outside Steel Workers	16.00	HR	X-STRSTEEL	1.00	666	0	0	0	0	666	41.61
	MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
	MIL PM	Outside Equip. Operators, Medium	8.00	HR	X-EQOPRMED	1.00	293	0	0	0	0	293	36.64
	MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16
	TOTAL	Remove Exist Gat					1,893	305	0	0	0	2,198	
		11 03 03 7 02 2. Rehab Gate											
L	MIL PM	Misc. Structural Steel	1350.00	LB	SIWSE17	300.00	422	0	931	0	0	1,353	1.00
	CIV PM	Coml blast, 6.7 PSF, exist coat badly pitted/nodules, (SSPC-6)	300.00	SF	APTRPORD2	96.25	231	0	135	0	0	366	1.22
	CIV PM	Struct steel projects, metal prep, brush-off blast	300.00	SF	APTRPORD2	475.00	47	0	21	0	0	68	0.23
	CIV PM	Ctg & paints, V-106D, light red oxide, vinyl paint (2-coats)	600.00	SF	N/A	0.00	0	0	78	0	0	78	0.13
	CIV PM	Ctg & paints, V-766E, w/ added abrsv, gray, vinyl paint (3-coat	900.00	SF	N/A	0.00	0	0	108	0	0	108	0.12
	CIV PM	Structural steel, 1 coat, paint, spray, heavy size, appl only	1500.00	SF	APTSPSST1	162.50	366	0	0	0	0	366	0.24
B	MIL PM	Install New J-Seals	40.00	LF	SIWSE17	10.00	375	0	1,120	0	0	1,495	37.37
	TOTAL	Rehab Gate					1,440	0	2,394	0	0	3,833	
		11 03 03 7 02 3. Install/Test Rehabbed Gate											
	MIL PM	Outside Steel Workers-Foreman	12.00	HR	X-STRSTEEL	1.00	511	0	0	0	0	511	42.61
	MIL PM	Outside Steel Workers	24.00	HR	X-STRSTEEL	1.00	999	0	0	0	0	999	41.61
	MIL PM	Outside Laborers, (Semi-Skilled)	12.00	HR	X-LABORER	1.00	445	0	0	0	0	445	37.06

11 03. Closure Structures	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT	
MIL PM Outside Equip. Operators, Medium	8.00	HR	X-EQOPRMED	1.00	293	0	0	0	0	293	36.64	
MAP PM CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16	
FOP PM Engineers, Project	8.00	HR	FC-ENGPE	1.00	240	0	0	0	0	240	30.06	
TOTAL Install/Test Reh					2,488	305	0	0	0	2,794		
TOTAL Rehab Closure St					5,821	611	2,394	0	0	8,825		
11 03 03 7 03. Demo of Exist Sill Monolith												
11 03 03 7 03 1 . Remove & Dispose of Exist Conc.												
MIL PM Site dml, conc, 7" to 24" thick, reinf, w/backhoe	4.00	CY	CODLB6	1.05	421	48	0	0	0	470	117.43	
MIL PM Excavate & load, hydr excavator, 2 CY	4.00	CY	CODEB12C	53.75	6	5	0	0	0	10	2.62	
AF PM Hauling, hwy haulers, 12 CY, 12 mile round trip @ base wide rate	4.00	CY	COEIB34B	20.00	8	8	0	0	0	15	3.84	
USR PM Landfill Disposal Fee	4.00	CY		0.00	0	0	0	0	120	120	30.00	
TOTAL Remove & Dispose					435	61	0	0	120	616		
TOTAL Demo of Exist Si					435	61	0	0	120	616		
11 03 03 7 04. New Sill Monolith												
11 03 03 7 04 1. Mobilization and Demobilization												
USR PM Mobilization and Demobilzation	1.00	LS		0.00	0	0	0	0	500	500	500.00	
TOTAL Mobilization and					0	0	0	0	500	500		
11 03 03 7 04 2. Structural Excavation & Backfill												
USR PM Excavation and Backfill	1.00	LS		0.00	0	0	0	0	500	500	500.00	
TOTAL Structural Excav					0	0	0	0	500	500		

11 03. Closure Structures	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
11 03 03 7 04 3. Concrete											
USR PM Concrete, includes placement, finishing and curing	4.00	CY		0.00	0	0	0	0	600	600	150.00
TOTAL Concrete	4.00	CY			0	0	0	0	600	600	150.00
11 03 03 7 04 4. Reinforcing Steel											
MIL PM Reinforcing in place, walls, #3 to #7	40.00	LB	SIWRRODM4	750.00	9	0	10	0	0	20	0.49
TOTAL Reinforcing Stee	40.00	LB			9	0	10	0	0	20	0.49
11 03 03 7 04 5. Dowels											
L CIV PM Reinforcing in place, dowels, epoxy coated, 2' long, #7	10.00	EA	SIWRRODM2	6.00	147	0	14	0	0	161	16.09
TOTAL Dowels	10.00	EA			147	0	14	0	0	161	16.09
11 03 03 7 04 6. Misc. Appurtenances											
M AF PM Concrete Bonding Agent	1.00	GAL	N/A	0.00	0	0	13	0	0	13	13.30
USR PM Corner Protection	20.00	LF	N/A	0.00	0	0	0	0	200	200	10.00
TOTAL Misc. Appurtenan					0	0	13	0	200	213	
11 03 03 7 04 7. Traffic Control											
MIL PM Outside Laborer (Flagman)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL Traffic Control					593	0	0	0	0	593	
11 03 03 7 04 9. Site Restoration											
USR PM Seeding and Site Restoration	1.00	LS		0.00	0	0	0	0	500	500	500.00
TOTAL Site Restoration					0	0	0	0	500	500	
TOTAL New Sill Monolit					749	0	37	0	2,300	3,087	
TOTAL CS-17, Rail Clos					7,238	671	2,456	0	2,420	12,785	

	11 03. Closure Structures	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
	11 03 03 8. CS-18, Rail Closure (Flank)											
	11 03 03 8 01. Replace Concrete Joint Sealant											
	11 03 03 8 01 1. Remove Exist Joint Sealant											
B MIL PM	Remove old caulking & sealant	25.00	LF	AMABBRIC1	10.00	84	0	0	0	0	84	3.36
TOTAL	Remove Exist Joi	25.00	LF			84	0	0	0	0	84	3.36
	11 03 03 8 01 2. New Joint Sealant											
L MIL PM	Caulking & sealants, backer rod, polyethylene, 1/2" dia	25.00	LF	AMABBRIC1	43.00	20	0	1	0	0	20	0.81
L MIL PM	Caulking & sealants, butyl rubber filler, 1/2" x 3/4"	25.00	LF	AMABBRIC1	20.00	42	0	15	0	0	57	2.28
TOTAL	New Joint Sealan	25.00	LF			61	0	16	0	0	77	3.09
TOTAL	Replace Concrete					145	0	16	0	0	161	
TOTAL	CS-18, Rail Clos					145	0	16	0	0	161	
	11 03 03 9. CS-19, Road Closure (Riverfront)											
	11 03 03 9 01. Replace Concrete Joint Sealant											
	11 03 03 9 01 1. Remove Exist Joint Sealant											
B MIL PM	Remove old caulking & sealant	110.00	LF	AMABBRIC1	10.00	369	0	0	0	0	369	3.36
TOTAL	Remove Exist Joi	110.00	LF			369	0	0	0	0	369	3.36
	11 03 03 9 01 2. New Joint Sealant											
L MIL PM	Caulking & sealants, backer rod, polyethylene, 1/2" dia	110.00	LF	AMABBRIC1	43.00	86	0	3	0	0	89	0.81
L MIL PM	Caulking & sealants, butyl rubber filler, 1/2" x 3/4"	110.00	LF	AMABBRIC1	20.00	185	0	66	0	0	251	2.28
TOTAL	New Joint Sealan	110.00	LF			271	0	69	0	0	340	3.09
TOTAL	Replace Concrete					640	0	69	0	0	709	

		11 03. Closure Structures	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
		11 03 03 9 02. Rehab Closure Structure Gate											
		Rehab of the existing closure structure gates is assumed to be done on-site. The gates will be removed from the closure structure and placed in a nearby staging area for rehab.											
		11 03 03 9 02 1. Remove Exist Gate											
	MIL PM	Outside Steel Workers-Foreman	8.00	HR	X-STRSTEEL	1.00	341	0	0	0	0	341	42.61
	MIL PM	Outside Steel Workers	16.00	HR	X-STRSTEEL	1.00	666	0	0	0	0	666	41.61
	MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
	MIL PM	Outside Equip. Operators, Medium	8.00	HR	X-EQOPRMED	1.00	293	0	0	0	0	293	36.64
	MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16
	TOTAL	Remove Exist Gat					1,893	305	0	0	0	2,198	
		11 03 03 9 02 2. Rehab Gate											
L	MIL PM	Misc. Structural Steel	2600.00	LB	SIWSE17	300.00	812	0	1,794	0	0	2,606	1.00
	CIV PM	Coml blast, 6.7 PSF, exist coat badly pitted/nodules, (SSPC-6)	600.00	SF	APTRPORD2	96.25	461	0	270	0	0	731	1.22
	CIV PM	Struct steel projects, metal prep, brush-off blast	600.00	SF	APTRPORD2	475.00	93	0	42	0	0	135	0.23
	CIV PM	Ctg & paints, V-106D, light red oxide, vinyl paint (2-coats)	1200.00	SF	N/A	0.00	0	0	156	0	0	156	0.13
	CIV PM	Ctg & paints, V-766E, w/ added abrsv, gray, vinyl paint (3-coat	1800.00	SF	N/A	0.00	0	0	216	0	0	216	0.12
	CIV PM	Structural steel, 1 coat, paint, spray, heavy size, appl only	3000.00	SF	APTSPSST1	162.50	732	0	0	0	0	732	0.24
B	MIL PM	Install New J-Seals	50.00	LF	SIWSE17	10.00	468	0	1,400	0	0	1,868	37.37
	TOTAL	Rehab Gate					2,567	0	3,878	0	0	6,445	
		11 03 03 9 02 3. Install/Test Rehabbed Gate											
	MIL PM	Outside Steel Workers-Foreman	16.00	HR	X-STRSTEEL	1.00	682	0	0	0	0	682	42.61
	MIL PM	Outside Steel Workers	32.00	HR	X-STRSTEEL	1.00	1,332	0	0	0	0	1,332	41.61
	MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06

	11 03. Closure Structures	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
MIL PM	Outside Equip. Operators, Medium	8.00	HR	X-EQOPRMED	1.00	293	0	0	0	0	293	36.64
MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16
FOP PM	Engineers, Project	8.00	HR	FC-ENGPE	1.00	240	0	0	0	0	240	30.06
TOTAL	Install/Test Reh					3,140	305	0	0	0	3,445	
TOTAL	Rehab Closure St					7,600	611	3,878	0	0	12,088	
TOTAL	CS-19, Road Clos					8,240	611	3,947	0	0	12,798	

11 03 03 10. CS-20, Road Closure (Riverfront)

11 03 03 10 01. Replace Concrete Joint Sealant

11 03 03 10 01 1. Remove Exist Joint Sealant

B MIL PM	Remove old caulking & sealant	60.00	LF	AMABBRIC1	10.00	201	0	0	0	0	201	3.36
TOTAL	Remove Exist Joi	60.00	LF			201	0	0	0	0	201	3.36

11 03 03 10 01 2. New Joint Sealant

L MIL PM	Caulking & sealants, backer rod, polyethylene, 1/2" dia	60.00	LF	AMABBRIC1	43.00	47	0	2	0	0	49	0.81
L MIL PM	Caulking & sealants, butyl rubber filler, 1/2" x 3/4"	60.00	LF	AMABBRIC1	20.00	101	0	36	0	0	137	2.28
TOTAL	New Joint Sealan	60.00	LF			148	0	38	0	0	185	3.09
TOTAL	Replace Concrete					349	0	38	0	0	387	

11 03 03 10 02. Replace Closure Structure Gate

11 03 03 10 02 1. Remove & Dispose of Exist Gate

MIL PM	Outside Steel Workers-Foreman	8.00	HR	X-STRSTEEL	1.00	341	0	0	0	0	341	42.61
MIL PM	Outside Steel Workers	16.00	HR	X-STRSTEEL	1.00	666	0	0	0	0	666	41.61
MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
MIL PM	Outside Equip. Operators, Medium	8.00	HR	X-EQOPRMED	1.00	293	0	0	0	0	293	36.64
MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16

		11 03. Closure Structures	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
MIL	PM	Outside Truck Drivers, Heavy	8.00	HR	X-TRKDVRHV	1.00	303	0	0	0	0	303	37.92
MAP	PM	FLATBED, 8'x 16.0', W/SIDE RACKS (ADD TRUCK)	8.00	HR	T40KF016	1.00	0	7	0	0	0	7	0.84
EP	PM	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	8.00	HR	T50FO006	1.00	0	115	0	0	0	115	14.36
USR	PM	Salvage Value	5.25	TON		0.00	0	0	-263	0	0	-263	-50.00
TOTAL		Remove & Dispose					2,196	427	-263	0	0	2,360	
		11 03 03 10 02 2. Fabricate New Gate											
B MIL	PM	Fabricate New Gate (2-Leafs)	10500	LB		0.00	0	0	0	0	26,250	26,250	2.50
USR	PM	Misc. Structural Steel (weather shield)	2000.00	LB		0.00	0	0	0	0	5,000	5,000	2.50
CIV	PM	Struct steel projects, metal prep, brush-off blast	660.00	SF	APTRPORD2	475.00	103	0	46	0	0	149	0.23
CIV	PM	Ctg & paints, V-106D, light red oxide, vinyl paint (2-coats)	1320.00	SF	N/A	0.00	0	0	172	0	0	172	0.13
CIV	PM	Ctg & paints, V-766E, w/ added abrsv, gray, vinyl paint (3-coat	1980.00	SF	N/A	0.00	0	0	238	0	0	238	0.12
CIV	PM	Structural steel, 1 coat, paint, spray, heavy size, appl only	3300.00	SF	APTSPSST1	162.50	805	0	0	0	0	805	0.24
B MIL	PM	J-Seals	50.00	LF	SIWSE17	10.00	468	0	1,400	0	0	1,868	37.37
TOTAL		Fabricate New Ga					1,376	0	1,855	0	31,250	34,482	
		11 03 03 10 02 3. Install/Test New Gate											
MIL	PM	Outside Steel Workers-Foreman	16.00	HR	X-STRSTEEL	1.00	682	0	0	0	0	682	42.61
MIL	PM	Outside Steel Workers	32.00	HR	X-STRSTEEL	1.00	1,332	0	0	0	0	1,332	41.61
MIL	PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
MIL	PM	Outside Equip. Operators, Medium	8.00	HR	X-EQOPRMED	1.00	293	0	0	0	0	293	36.64
MAP	PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16
FOP	PM	Engineers, Project	8.00	HR	FC-ENGPE	1.00	240	0	0	0	0	240	30.06
TOTAL		Install/Test New					3,140	305	0	0	0	3,445	

	11 03. Closure Structures	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL	Replace Closure					6,712	732	1,593	0	31,250	40,287	
	11 03 03 10 03. Demo of Exist Sill Monolith											
	11 03 03 10 03 1 . Remove & Dispose of Exist Conc.											
MIL PM	Site dml, conc, 7" to 24" thick, reinf, w/backhoe	3.00	CY	CODLB6	1.05	316	36	0	0	0	352	117.43
MIL PM	Excavate & load, hydr excavator, 2 CY	3.00	CY	CODEB12C	53.75	4	3	0	0	0	8	2.62
AF PM	Hauling, hwy haulers, 12 CY, 12 mile round trip @ base wide rate	3.00	CY	COEIB34B	20.00	6	6	0	0	0	12	3.84
USR PM	Landfill Disposal Fee	3.00	CY		0.00	0	0	0	0	90	90	30.00
TOTAL	Remove & Dispose					326	46	0	0	90	462	
TOTAL	Demo of Exist Si					326	46	0	0	90	462	
	11 03 03 10 04. New Sill Monolith											
	11 03 03 10 04 1. Mobilization and Demobilization											
USR PM	Mobilization and Demobilzation	1.00	LS		0.00	0	0	0	0	500	500	500.00
TOTAL	Mobilization and					0	0	0	0	500	500	
	11 03 03 10 04 2. Structural Excavation & Backfill											
USR PM	Excavation and Backfill	1.00	LS		0.00	0	0	0	0	500	500	500.00
TOTAL	Structural Excav					0	0	0	0	500	500	
	11 03 03 10 04 3. Concrete											
USR PM	Concrete, includes placement, finishing and curing	3.00	CY		0.00	0	0	0	0	450	450	150.00
TOTAL	Concrete	3.00	CY			0	0	0	0	450	450	150.00

	11 03. Closure Structures	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
	11 03 03 10 04 4. Reinforcing Steel											
MIL PM	Reinforcing in place, walls, #3 to #7	30.00	LB	SIWRRODM4	750.00	7	0	8	0	0	15	0.49
TOTAL	Reinforcing Stee	30.00	LB			7	0	8	0	0	15	0.49
	11 03 03 10 04 5. Dowels											
L CIV PM	Reinforcing in place, dowels, epoxy coated, 2' long, #7	13.00	EA	SIWRRODM2	6.00	191	0	18	0	0	209	16.09
TOTAL	Dowels	13.00	EA			191	0	18	0	0	209	16.09
	11 03 03 10 04 6. Misc. Appurtenances											
M AF PM	Concrete Bonding Agent	1.00	GAL	N/A	0.00	0	0	13	0	0	13	13.30
USR PM	Corner Protection	25.00	LF	N/A	0.00	0	0	0	0	250	250	10.00
TOTAL	Misc. Appurtenan					0	0	13	0	250	263	
	11 03 03 10 04 7. Traffic Control											
MIL PM	Outside Laborer (Flagman)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL	Traffic Control					593	0	0	0	0	593	
	11 03 03 10 04 9. Site Restoration											
USR PM	Seeding and Site Restoration	1.00	LS		0.00	0	0	0	0	500	500	500.00
TOTAL	Site Restoration					0	0	0	0	500	500	
TOTAL	New Sill Monolit					791	0	39	0	2,200	3,030	
TOTAL	CS-20, Road Clos					8,178	778	1,670	0	33,540	44,166	

11 03. Closure Structures		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
11 03 03 11. CS-21 Road Closure (Riverfront)												
11 03 03 11 01. Replace Concrete Joint Sealant												
11 03 03 11 01 1. Remove Exist Joint Sealant												
B MIL PM	Remove old caulking & sealant	45.00	LF	AMABBRIC1	10.00	151	0	0	0	0	151	3.36
TOTAL	Remove Exist Joi	45.00	LF			151	0	0	0	0	151	3.36
11 03 03 11 01 2. New Joint Sealant												
L MIL PM	Caulking & sealants, backer rod, polyethylene, 1/2" dia	45.00	LF	AMABBRIC1	43.00	35	0	1	0	0	36	0.81
L MIL PM	Caulking & sealants, butyl rubber filler, 1/2" x 3/4"	45.00	LF	AMABBRIC1	20.00	76	0	27	0	0	103	2.28
TOTAL	New Joint Sealan	45.00	LF			111	0	28	0	0	139	3.09
TOTAL	Replace Concrete					262	0	28	0	0	290	
11 03 03 11 02. Rehab Closure Structure Gate												
Rehab of the existing closure structure gates is assumed to be done on-site. The gates will be removed from the closure structure and placed in a nearby staging area for rehab.												
11 03 03 11 02 1. Remove Exist Gate												
MIL PM	Outside Steel Workers-Foreman	8.00	HR	X-STRSTEEL	1.00	341	0	0	0	0	341	42.61
MIL PM	Outside Steel Workers	16.00	HR	X-STRSTEEL	1.00	666	0	0	0	0	666	41.61
MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
MIL PM	Outside Equip. Operators, Medium	8.00	HR	X-EQOPRMED	1.00	293	0	0	0	0	293	36.64
MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16
TOTAL	Remove Exist Gat					1,893	305	0	0	0	2,198	
11 03 03 11 02 2. Rehab Gate												
L MIL PM	Misc. Structural Steel	1350.00	LB	SIWSE17	300.00	422	0	931	0	0	1,353	1.00
CIV PM	Coml blast, 6.7 PSF, exist coat badly pitted/nodules, (SSPC-6)	300.00	SF	APTRPORD2	96.25	231	0	135	0	0	366	1.22

		11 03. Closure Structures	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
	CIV PM	Struct steel projects, metal prep, brush-off blast	300.00	SF	APTRPORD2	475.00	47	0	21	0	0	68	0.23
	CIV PM	Ctg & paints, V-106D, light red oxide, vinyl paint (2-coats)	600.00	SF	N/A	0.00	0	0	78	0	0	78	0.13
	CIV PM	Ctg & paints, V-766E, w/ added abrsv, gray, vinyl paint (3-coat	900.00	SF	N/A	0.00	0	0	108	0	0	108	0.12
	CIV PM	Structural steel, 1 coat, paint, spray, heavy size, appl only	1500.00	SF	APTSPSST1	162.50	366	0	0	0	0	366	0.24
B	MIL PM	Install New J-Seals	40.00	LF	SIWSE17	10.00	375	0	1,120	0	0	1,495	37.37
	TOTAL	Rehab Gate					1,440	0	2,394	0	0	3,833	
		11 03 03 11 02 3. Install/Test Rehabbed Gate											
	MIL PM	Outside Steel Workers-Foreman	12.00	HR	X-STRSTEEL	1.00	511	0	0	0	0	511	42.61
	MIL PM	Outside Steel Workers	24.00	HR	X-STRSTEEL	1.00	999	0	0	0	0	999	41.61
	MIL PM	Outside Laborers, (Semi-Skilled)	12.00	HR	X-LABORER	1.00	445	0	0	0	0	445	37.06
	MIL PM	Outside Equip. Operators, Medium	8.00	HR	X-EQOPRMED	1.00	293	0	0	0	0	293	36.64
	MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16
	FOP PM	Engineers, Project	8.00	HR	FC-ENGPE	1.00	240	0	0	0	0	240	30.06
	TOTAL	Install/Test Reh					2,488	305	0	0	0	2,794	
	TOTAL	Rehab Closure St					5,821	611	2,394	0	0	8,825	
	TOTAL	CS-21 Road Closu					6,082	611	2,422	0	0	9,115	
		11 03 03 12. CS-22, Road Closure (Riverfront)											
		11 03 03 12 01. Replace Concrete Joint Sealant											
		11 03 03 12 01 1. Remove Exist Joint Sealant											
B	MIL PM	Remove old caulking & sealant	110.00	LF	AMABBRIC1	10.00	369	0	0	0	0	369	3.36
	TOTAL	Remove Exist Joi	110.00	LF			369	0	0	0	0	369	3.36

		11 03. Closure Structures	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
		11 03 03 12 01 2. New Joint Sealant											
L	MIL PM	Caulking & sealants, backer rod, polyethylene, 1/2" dia	110.00	LF	AMABBRIC1	43.00	86	0	3	0	0	89	0.81
L	MIL PM	Caulking & sealants, butyl rubber filler, 1/2" x 3/4"	110.00	LF	AMABBRIC1	20.00	185	0	66	0	0	251	2.28
	TOTAL	New Joint Sealan	110.00	LF			271	0	69	0	0	340	3.09
	TOTAL	Replace Concrete					640	0	69	0	0	709	
		11 03 03 12 02 2. Rehab Closure Structure Gate Rehab of the existing closure structure gates is assumed to be done on-site. The gates will be removed from the closure structure and placed in a nearby staging area for rehab.											
		11 03 03 12 02 1. Remove Exist Gate											
	MIL PM	Outside Steel Workers-Foreman	8.00	HR	X-STRSTEEL	1.00	341	0	0	0	0	341	42.61
	MIL PM	Outside Steel Workers	16.00	HR	X-STRSTEEL	1.00	666	0	0	0	0	666	41.61
	MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
	MIL PM	Outside Equip. Operators, Medium	8.00	HR	X-EQOPRMED	1.00	293	0	0	0	0	293	36.64
	MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16
	TOTAL	Remove Exist Gat					1,893	305	0	0	0	2,198	
		11 03 03 12 02 2. Rehab Gate											
L	MIL PM	Misc. Structural Steel	2600.00	LB	SIWSE17	300.00	812	0	1,794	0	0	2,606	1.00
	CIV PM	Coml blast, 6.7 PSF, exist coat badly pitted/nodules, (SSPC-6)	600.00	SF	APTRPORD2	96.25	461	0	270	0	0	731	1.22
	CIV PM	Struct steel projects, metal prep, brush-off blast	600.00	SF	APTRPORD2	475.00	93	0	42	0	0	135	0.23
	CIV PM	Ctg & paints, V-106D, light red oxide, vinyl paint (2-coats)	1200.00	SF	N/A	0.00	0	0	156	0	0	156	0.13
	CIV PM	Ctg & paints, V-766E, w/ added abrsv, gray, vinyl paint (3-coat	1800.00	SF	N/A	0.00	0	0	216	0	0	216	0.12
	CIV PM	Structural steel, 1 coat, paint, spray, heavy size, appl only	3000.00	SF	APTSPSST1	162.50	732	0	0	0	0	732	0.24

	11 03. Closure Structures	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
B MIL PM	Install New J-Seals	50.00	LF	SIWSE17	10.00	468	0	1,400	0	0	1,868	37.37
TOTAL	Rehab Gate					2,567	0	3,878	0	0	6,445	
	11 03 03 12 02 3. Install/Test Rehabbed Gate											
MIL PM	Outside Steel Workers-Foreman	16.00	HR	X-STRSTEEL	1.00	682	0	0	0	0	682	42.61
MIL PM	Outside Steel Workers	32.00	HR	X-STRSTEEL	1.00	1,332	0	0	0	0	1,332	41.61
MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
MIL PM	Outside Equip. Operators, Medium	8.00	HR	X-EQOPRMED	1.00	293	0	0	0	0	293	36.64
MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16
FOP PM	Engineers, Project	8.00	HR	FC-ENGPE	1.00	240	0	0	0	0	240	30.06
TOTAL	Install/Test Reh					3,140	305	0	0	0	3,445	
TOTAL	Rehab Closure St					7,600	611	3,878	0	0	12,088	
TOTAL	CS-22, Road Clos					8,240	611	3,947	0	0	12,798	
	11 03 03 13. CS-23, Road Closure(Cahokia Crk)											
	11 03 03 13 01. Replace Concrete Joint Sealant											
	11 03 03 13 01 1. Remove Exist Joint Sealant											
B MIL PM	Remove old caulking & sealant	110.00	LF	AMABBRIC1	10.00	369	0	0	0	0	369	3.36
TOTAL	Remove Exist Joi	110.00	LF			369	0	0	0	0	369	3.36
	11 03 03 13 01 2. New Joint Sealant											
L MIL PM	Caulking & sealants, backer rod, polyethylene, 1/2" dia	110.00	LF	AMABBRIC1	43.00	86	0	3	0	0	89	0.81
L MIL PM	Caulking & sealants, butyl rubber filler, 1/2" x 3/4"	110.00	LF	AMABBRIC1	20.00	185	0	66	0	0	251	2.28
TOTAL	New Joint Sealan	110.00	LF			271	0	69	0	0	340	3.09
TOTAL	Replace Concrete					640	0	69	0	0	709	

	11 03. Closure Structures	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL	CS-23, Road Clos					640	0	69	0	0	709	
	11 03 03 14. CS-24, Road Closure (Indian Crk)											
	11 03 03 14 01. Replace Concrete Joint Sealant											
	11 03 03 14 01 1. Remove Exist Joint Sealant											
B MIL PM	Remove old caulking & sealant	130.00	LF	AMABBRIC1	10.00	436	0	0	0	0	436	3.36
TOTAL	Remove Exist Joi	130.00	LF			436	0	0	0	0	436	3.36
	11 03 03 14 01 2. New Joint Sealant											
L MIL PM	Caulking & sealants, backer rod, polyethylene, 1/2" dia	130.00	LF	AMABBRIC1	43.00	101	0	4	0	0	105	0.81
L MIL PM	Caulking & sealants, butyl rubber filler, 1/2" x 3/4"	130.00	LF	AMABBRIC1	20.00	218	0	78	0	0	296	2.28
TOTAL	New Joint Sealan	130.00	LF			320	0	82	0	0	402	3.09
TOTAL	Replace Concrete					756	0	82	0	0	838	
	11 03 03 14 02. Rehab Closure Structure Gate											
	Rehab of the existing closure structure gates is assumed to be done on-site. The gates will be removed from the closure structure and placed in a nearby staging area for rehab.											
	11 03 03 14 02 1. Remove Exist Gate											
MIL PM	Outside Steel Workers-Foreman	8.00	HR	X-STRSTEEL	1.00	341	0	0	0	0	341	42.61
MIL PM	Outside Steel Workers	16.00	HR	X-STRSTEEL	1.00	666	0	0	0	0	666	41.61
MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
MIL PM	Outside Equip. Operators, Medium	8.00	HR	X-EQOPRMED	1.00	293	0	0	0	0	293	36.64
MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16
TOTAL	Remove Exist Gat					1,893	305	0	0	0	2,198	

		11 03. Closure Structures	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
		11 03 03 14 02 2. Rehab Gate											
L	MIL PM	Misc. Structural Steel	2600.00	LB	SIWSE17	300.00	812	0	1,794	0	0	2,606	1.00
	CIV PM	Coml blast, 6.7 PSF, exist coat badly pitted/nodules, (SSPC-6)	600.00	SF	APTRPORD2	96.25	461	0	270	0	0	731	1.22
	CIV PM	Struct steel projects, metal prep, brush-off blast	600.00	SF	APTRPORD2	475.00	93	0	42	0	0	135	0.23
	CIV PM	Ctg & paints, V-106D, light red oxide, vinyl paint (2-coats)	1200.00	SF	N/A	0.00	0	0	156	0	0	156	0.13
	CIV PM	Ctg & paints, V-766E, w/ added abrsv, gray, vinyl paint (3-coat	1800.00	SF	N/A	0.00	0	0	216	0	0	216	0.12
	CIV PM	Structural steel, 1 coat, paint, spray, heavy size, appl only	3000.00	SF	APTSPSST1	162.50	732	0	0	0	0	732	0.24
B	MIL PM	Install New J-Seals	50.00	LF	SIWSE17	10.00	468	0	1,400	0	0	1,868	37.37
	TOTAL	Rehab Gate					2,567	0	3,878	0	0	6,445	
		11 03 03 14 02 3. Install/Test Rehabbed Gate											
	MIL PM	Outside Steel Workers-Foreman	16.00	HR	X-STRSTEEL	1.00	682	0	0	0	0	682	42.61
	MIL PM	Outside Steel Workers	32.00	HR	X-STRSTEEL	1.00	1,332	0	0	0	0	1,332	41.61
	MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
	MIL PM	Outside Equip. Operators, Medium	8.00	HR	X-EQOPRMED	1.00	293	0	0	0	0	293	36.64
	MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16
	FOP PM	Engineers, Project	8.00	HR	FC-ENGPE	1.00	240	0	0	0	0	240	30.06
	TOTAL	Install/Test Reh					3,140	305	0	0	0	3,445	
	TOTAL	Rehab Closure St					7,600	611	3,878	0	0	12,088	
	TOTAL	CS-24, Road Clos					8,356	611	3,960	0	0	12,926	

	11 03. Closure Structures	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
	11 03 03 15. CS-25, Road Closure (Indian Crk)											
	11 03 03 15 01. Replace Concrete Joint Sealant											
	11 03 03 15 01 1. Remove Exist Joint Sealant											
B MIL PM	Remove old caulking & sealant	120.00	LF	AMABBRIC1	10.00	403	0	0	0	0	403	3.36
TOTAL	Remove Exist Joi	120.00	LF			403	0	0	0	0	403	3.36
	11 03 03 15 01 2. New Joint Sealant											
L MIL PM	Caulking & sealants, backer rod, polyethylene, 1/2" dia	120.00	LF	AMABBRIC1	43.00	94	0	4	0	0	97	0.81
L MIL PM	Caulking & sealants, butyl rubber filler, 1/2" x 3/4"	120.00	LF	AMABBRIC1	20.00	201	0	72	0	0	273	2.28
TOTAL	New Joint Sealan	120.00	LF			295	0	76	0	0	371	3.09
TOTAL	Replace Concrete					698	0	76	0	0	774	
TOTAL	CS-25, Road Clos					698	0	76	0	0	774	
	11 03 03 16. CS-26, Rail Closure (Indian Crk)											
	11 03 03 16 01. Replace Closure Structure Gate											
	11 03 03 16 01 1. Remove & Dispose of Exist Gate											
MIL PM	Outside Steel Workers-Foreman	8.00	HR	X-STRSTEEL	1.00	341	0	0	0	0	341	42.61
MIL PM	Outside Steel Workers	16.00	HR	X-STRSTEEL	1.00	666	0	0	0	0	666	41.61
MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
MIL PM	Outside Equip. Operators, Medium	8.00	HR	X-EQOPRMED	1.00	293	0	0	0	0	293	36.64
MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16
MIL PM	Outside Truck Drivers, Heavy	8.00	HR	X-TRKDVRHV	1.00	303	0	0	0	0	303	37.92
MAP PM	FLATBED, 8'x 16.0', W/SIDE RACKS (ADD TRUCK)	8.00	HR	T40KF016	1.00	0	7	0	0	0	7	0.84
EP PM	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	8.00	HR	T50FO006	1.00	0	115	0	0	0	115	14.36
USR PM	Salvage Value	2.50	TON		0.00	0	0	-125	0	0	-125	-50.00

11 03. Closure Structures	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT	
TOTAL Remove & Dispose					2,196	427	-125	0	0	2,498		
11 03 03 16 01 2. Fabricate New Gate												
B MIL PM Fabricate New Gate (2-Leafs)	5000.00	LB		0.00	0	0	0	0	12,500	12,500	2.50	
USR PM Misc. Structural Steel (weather shield)	1350.00	LB		0.00	0	0	0	0	3,375	3,375	2.50	
CIV PM Struct steel projects, metal prep, brush-off blast	300.00	SF	APTRPORD2	475.00	47	0	21	0	0	68	0.23	
CIV PM Ctg & paints, V-106D, light red oxide, vinyl paint (2-coats)	600.00	SF	N/A	0.00	0	0	78	0	0	78	0.13	
CIV PM Ctg & paints, V-766E, w/ added abrsv, gray, vinyl paint (3-coat	900.00	SF	N/A	0.00	0	0	108	0	0	108	0.12	
CIV PM Structural steel, 1 coat, paint, spray, heavy size, appl only	1500.00	SF	APTSPSST1	162.50	366	0	0	0	0	366	0.24	
B MIL PM J-Seals	40.00	LF	SIWSE17	10.00	375	0	1,120	0	0	1,495	37.37	
TOTAL Fabricate New Ga					787	0	1,327	0	15,875	17,989		
11 03 03 16 01 3. Install/Test New Gate												
MIL PM Outside Steel Workers-Foreman	16.00	HR	X-STRSTEEL	1.00	682	0	0	0	0	682	42.61	
MIL PM Outside Steel Workers	32.00	HR	X-STRSTEEL	1.00	1,332	0	0	0	0	1,332	41.61	
MIL PM Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06	
MIL PM Outside Equip. Operators, Medium	8.00	HR	X-EQOPRMED	1.00	293	0	0	0	0	293	36.64	
MAP PM CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16	
FOP PM Engineers, Project	8.00	HR	FC-ENGPE	1.00	240	0	0	0	0	240	30.06	
TOTAL Install/Test New					3,140	305	0	0	0	3,445		
TOTAL Replace Closure					6,123	732	1,202	0	15,875	23,933		
TOTAL CS-26, Rail Clos					6,123	732	1,202	0	15,875	23,933		
TOTAL Lower Wood River					426,592	88,560	314,813	0	735,005	1,564,969		

11 03. Closure Structures	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL Closure Structur					595,821	117,041	414,670	0	1,006,200	2,133,732	
TOTAL Levees and Flood					1,872,125	605,337	784,424	0	5,349,371	8,611,258	

13 01. East Alton No. 1	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT

13. Pumping Plant

13 01. East Alton No. 1

13 01 01. Mob, Demob & Preparatory Work

13 01 01 01. Mobilization and Demobilization

Use the following crew for to mobilize equipment to the jobsite.
Assume the same time for demobilzation. Use 2hrs operating time for each way. (Mob.& Demob.)

Crew -

Truck w/Lowboy	Truck Driver
Mechanics Truck	Operator
Laborer	

13 01 01 01 1. Mobilization and Demobilization

Asume 8hrs to mobilize equipment. Use 1hr operating time for loading and 1hr operating time for unloading equipment. Assume the same for demobilization.

	UPB PM	AIR COMPR, 1,600 CFM, 100 PSI REF. EP 1110-1-8 1600 CFM QUIET, 100 PSI (ADD HOSE)	4.00	HR	A15XX017	1.00	0	183	0	0	0	183	45.70
	UPB PM	GENERATOR, 5.5 KW, 120/240V,PORT REF. EP 1110-1-8 5.5 KW	4.00	HR	G10HO004	0.00	0	7	0	0	0	7	1.64
	MIL PM	PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRASH	4.00	HR	P50HO005	1.00	0	12	0	0	0	12	2.94
	MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	4.00	HR	C75GV002	1.00	0	153	0	0	0	153	38.16
	MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	4.00	HR	L50CS003	0.00	0	68	0	0	0	68	17.00
	UPB PM	WELDER, 300 AMP, SKID,ELEC DRIVE	4.00	HR	W35XX009	0.00	0	6	0	0	0	6	1.59
L	UPB PM	TRK,HWY, 46,000 GVW, 6X4, 3 AXLE	16.00	HR	T50FO018	1.00	0	558	0	0	0	558	34.90
L	MIL PM	TRLR,LOWBOY, 60T, 3 AXLE (ADD TOWING TRUCK)	16.00	HR	T45XX017	1.00	0	134	0	0	0	134	8.38
L	MIL PM	TRK,HWY,10,000GVW,4X2, 1T-PICKUP	16.00	HR	T50FO005	1.00	0	126	0	0	0	126	7.88
	MIL PM	Outside Truck Drivers, Heavy *	16.00	HR	X-TRKDVRHV	1.00	607	0	0	0	0	607	37.92

13. Pumping Plant

13 01. East Alton No. 1		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
MIL PM	Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57
MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL	Mobilization and					1,897	1,247	0	0	0	3,143	
TOTAL	Mobilization and					1,897	1,247	0	0	0	3,143	
TOTAL	Mob, Demob & Pre					1,897	1,247	0	0	0	3,143	

13 01 03. Care and Diversion of Water

Care of water consists of the installation of temporary bulkheads. Assume small trash pump and operator for any required pumping. Operator is assumed to be on-site for 10 working days for the purpose of dewatering.

13 01 03 02. Site Work

13 01 03 02 1. Fabricate Bulkheads

B MIL PM	Fabricate Bulkheads	1.00	LS		0.00	0	0	2,500	0	0	2,500	2500.00
TOTAL	Fabricate Bulkhe					0	0	2,500	0	0	2,500	

13 01 03 02 2. Install Temporary Bulkheads

MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	16.00	HR	L50CS003	0.00	0	272	0	0	0	272	17.00
MIL PM	Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57
MIL PM	Outside Laborers, (Semi-Skilled)	32.00	HR	X-LABORER	1.00	1,186	0	0	0	0	1,186	37.06
TOTAL	Install Temporar	2.00	DAY			1,883	272	0	0	0	2,155	1077.53

13 01 03 02 3. Remove Temporary Bulkheads

MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS003	0.00	0	136	0	0	0	136	17.00
MIL PM	Outside Equip. Operators, Heavy *	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL	Remove Temporary	1.00	DAY			942	136	0	0	0	1,078	1077.53

13. Pumping Plant

	13 01. East Alton No. 1	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL	Site Work					2,825	408	2,500	0	0	5,733	
	13 01 03 15. Mechanical											
	13 01 03 15 1. Unwatering Pumps											
MIL PM	Outside Equip. Operators, Heavy	80.00	HR	X-EQOPRHVY	1.00	3,485	0	0	0	0	3,485	43.57
MIL PM	PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRASH	80.00	HR	P50HO005	1.00	0	235	0	0	0	235	2.94
UPB PM	TRK,HWY, 8,800GVW,4X4, 3/4T-PKUP REF. EP 1110-1-8 4X4 3/4-TON PICK-UP, 8800 GVW	80.00	HR	T50FO004	1.00	0	613	0	0	0	613	7.66
TOTAL	Unwatering Pumps					3,485	848	0	0	0	4,333	
TOTAL	Mechanical					3,485	848	0	0	0	4,333	
TOTAL	Care and Diversi					6,310	1,256	2,500	0	0	10,066	
	13 01 78. Auxiliary Equipment											
	13 01 78 15. Mechanical											
	13 01 78 15 1. Remove Existing Trash Rakes											
MIL PM	Steam/Pipefitters Foreman	40.00	HR	B-STM/PIPE	1.00	1,561	0	0	0	0	1,561	39.03
MIL PM	Steam/Pipefitters	80.00	HR	B-STM/PIPE	1.00	3,042	0	0	0	0	3,042	38.03
MIL PM	Laborers, (Semi-Skilled)	80.00	HR	B-LABORER	1.00	2,965	0	0	0	0	2,965	37.06
MIL PM	Equip. Operators, Crane/Shovel	40.00	HR	B-EQOPRCRN	1.00	1,743	0	0	0	0	1,743	43.57
MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	40.00	HR	C75GV002	1.00	0	1,527	0	0	0	1,527	38.16
TOTAL	Remove Existing					9,311	1,527	0	0	0	10,837	
	13 01 78 15 2. New Trash Rakes Manufacturers Rep/Erection Engineer is considered for field assistance.											
USR PM	New Trash Rakes	3.00	EA		0.00	0	0	0	0	450,000	450,000	150000
USR PM	Erection Engineer	1.00	LS		0.00	4,000	0	0	0	0	4,000	4000.00

13 01. East Alton No. 1	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT	
TOTAL New Trash Rakes	3.00	EA			4,000	0	0	0	450,000	454,000	151333	
13 01 78 15 3. Install and Test New Trash Rakes												
MIL PM Steam/Pipefitters Foreman	32.00	HR	B-STM/PIPE	1.00	1,249	0	0	0	0	1,249	39.03	
MIL PM Steam/Pipefitters	48.00	HR	B-STM/PIPE	1.00	1,825	0	0	0	0	1,825	38.03	
MIL PM Laborers, (Semi-Skilled)	24.00	HR	B-LABORER	1.00	889	0	0	0	0	889	37.06	
MIL PM Equip. Operators, Crane/Shovel	16.00	HR	B-EQOPRCRN	1.00	697	0	0	0	0	697	43.57	
MAP PM CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	16.00	HR	C75GV002	1.00	0	611	0	0	0	611	38.16	
MIL PM Outside Truck Drivers, Heavy	16.00	HR	X-TRKDVRHV	1.00	607	0	0	0	0	607	37.92	
MAP PM FLATBED, 8'x 16.0', W/SIDE RACKS (ADD TRUCK)	16.00	HR	T40KF016	1.00	0	13	0	0	0	13	0.84	
EP PM TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	16.00	HR	T50FO006	1.00	0	230	0	0	0	230	14.36	
TOTAL Install and Test	3.00	EA			5,267	854	0	0	0	6,121	2040.41	
TOTAL Mechanical					18,578	2,380	0	0	450,000	470,959		
TOTAL Auxiliary Equipm					18,578	2,380	0	0	450,000	470,959		
TOTAL East Alton No. 1					26,785	4,883	2,500	0	450,000	484,168		

13 02. East Alton No. 2

13 02 01. Mob, Demob & Preparatory Work

13 02 01 01. Mobilization and Demobilization

Use the following crew for to mobilize equipment to the jobsite. Assume the same time for demobilzation. Use 2hrs operating time for each way. (Mob.& Demob.)

Crew -

Truck w/Lowboy	Truck Driver
Mechanics Truck	Operator
Laborer	

13 02. East Alton No. 2		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
	13 02 01 01	1. Mobilization and Demobilization Asume 8hrs to mobilize equipment. Use 1hr operating time for loading and 1hr operating time for unloading equipment. Assume the same for demobilization.										
UPB PM	AIR COMPR, 1,600 CFM, 100 PSI REF. EP 1110-1-8 1600 CFM QUIET, 100 PSI (ADD HOSE)	4.00	HR	A15XX017	1.00	0	183	0	0	0	183	45.70
UPB PM	GENERATOR, 5.5 KW, 120/240V,PORT REF. EP 1110-1-8 5.5 KW	4.00	HR	G10HO004	0.00	0	7	0	0	0	7	1.64
MIL PM	PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRASH	4.00	HR	P50HO005	1.00	0	12	0	0	0	12	2.94
MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	4.00	HR	C75GV002	1.00	0	153	0	0	0	153	38.16
MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	4.00	HR	L50CS003	0.00	0	68	0	0	0	68	17.00
UPB PM	WELDER, 300 AMP, SKID,ELEC DRIVE	4.00	HR	W35XX009	0.00	0	6	0	0	0	6	1.59
L UPB PM	TRK,HWY, 46,000 GVW, 6X4, 3 AXLE	16.00	HR	T50FO018	1.00	0	558	0	0	0	558	34.90
L MIL PM	TRLR,LOWBOY, 60T, 3 AXLE (ADD TOWING TRUCK)	16.00	HR	T45XX017	1.00	0	134	0	0	0	134	8.38
L MIL PM	TRK,HWY,10,000GVW,4X2, 1T-PICKUP	16.00	HR	T50FO005	1.00	0	126	0	0	0	126	7.88
MIL PM	Outside Truck Drivers, Heavy *	16.00	HR	X-TRKDVRHV	1.00	607	0	0	0	0	607	37.92
MIL PM	Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57
MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL	Mobilization and					1,897	1,247	0	0	0	3,143	
TOTAL	Mobilization and					1,897	1,247	0	0	0	3,143	
TOTAL	Mob, Demob & Pre					1,897	1,247	0	0	0	3,143	

13. Pumping Plant

13 02. East Alton No. 2			QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
13 02 02. Sitework													
13 02 02 5. Site Preparation													
EP	PM	LDR,BH,WH, 1.00C Y FE BKT, 24"DIP	8.00	HR	L50CS005	1.00	0	134	0	0	0	134	16.71
MIL	PM	Outside Equip. Operators, Heavy	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL	PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL		Site Preparation					942	134	0	0	0	1,075	
13 02 02 10. Line Existing Pipe w/ HDPE Pipe There are 2-pipes to be lined at this location (quantities are multiplied by two)													
USR	PM	HDPE Liner	500.00	LF		0.00	0	0	0	0	50,000	50,000	100.00
B CIV	PM	Grouting, pressure, place grout between pipes	1000.00	CF	XXQEB47B	17.50	10,646	2,807	3,000	0	0	16,453	16.45
TOTAL		Line Existing Pi	2.00	EA			10,646	2,807	3,000	0	50,000	66,453	33226
13 02 02 15. Site Restoration													
EP	PM	LDR,BH,WH, 1.00C Y FE BKT, 24"DIP	8.00	HR	L50CS005	1.00	0	134	0	0	0	134	16.71
MIL	PM	Outside Equip. Operators, Heavy	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL	PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
USR	PM	Seeding	1.00	ACR		0.00	0	0	0	0	1,000	1,000	1000.00
TOTAL		Site Restoration					942	134	0	0	1,000	2,075	
TOTAL		Sitework					12,529	3,074	3,000	0	51,000	69,603	
13 02 03. Care and Diversion of Water Care of water consists of the installation of temporary bulkheads. Assume small trash pump and operator for any required pumping. Operator is assumed to be on-site for 10 working days for the purpose of dewatering.													
13 02 03 02. Site Work													
13 02 03 02 1. Fabricate Bulkheads													
B MIL	PM	Fabricate Bulkheads	1.00	LS		0.00	0	0	2,500	0	0	2,500	2500.00
TOTAL		Fabricate Bulkhe					0	0	2,500	0	0	2,500	

13 02. East Alton No. 2	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
13 02 03 02 2. Install Temporary Bulkheads											
MIL PM LDR,BH,WH, 1.00CY FE BKT, 24"DIP	16.00	HR	L50CS003	0.00	0	272	0	0	0	272	17.00
MIL PM Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57
MIL PM Outside Laborers, (Semi-Skilled)	32.00	HR	X-LABORER	1.00	1,186	0	0	0	0	1,186	37.06
TOTAL Install Temporar	2.00	DAY			1,883	272	0	0	0	2,155	1077.53
13 02 03 02 3. Remove Temporary Bulkheads											
MIL PM LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS003	0.00	0	136	0	0	0	136	17.00
MIL PM Outside Equip. Operators, Heavy *	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL PM Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL Remove Temporary	1.00	DAY			942	136	0	0	0	1,078	1077.53
TOTAL Site Work					2,825	408	2,500	0	0	5,733	
13 02 03 15. Mechanical											
13 02 03 15 1. Unwatering Pumps											
MIL PM Outside Equip. Operators, Heavy	80.00	HR	X-EQOPRHVY	1.00	3,485	0	0	0	0	3,485	43.57
MIL PM PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRASH	80.00	HR	P50HO005	1.00	0	235	0	0	0	235	2.94
UPB PM TRK,HWY, 8,800GVW,4X4, 3/4T-PKUP REF. EP 1110-1-8 4X4 3/4-TON PICK-UP, 8800 GVW	80.00	HR	T50FO004	1.00	0	613	0	0	0	613	7.66
TOTAL Unwatering Pumps					3,485	848	0	0	0	4,333	
TOTAL Mechanical					3,485	848	0	0	0	4,333	
TOTAL Care and Diversi					6,310	1,256	2,500	0	0	10,066	

	13 02. East Alton No. 2	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
	13 02 75. Pumping Plant Superstructure											
	13 02 75 04. Masonry											
	13 02 75 04 01 . Masonry Restoration											
	13 02 75 04 01 1. Clean Brick											
MIL MA	Masonry cleaning, steam, masonry bldg, common brick face, w/scaf	4800.00	SF	ULABB9	125.00	8,605	394	0	0	0	8,999	1.87
TOTAL	Clean Brick					8,605	394	0	0	0	8,999	
	13 02 75 04 01 2. Tuckpointing											
MIL MA	Pointing masonry, running bond, cut & repoint brick, soft old mortar	4800.00	SF	AMABBRIC1	10.00	19,381	0	1,443	0	0	20,825	4.34
TOTAL	Tuckpointing					19,381	0	1,443	0	0	20,825	
TOTAL	Masonry Restorat					27,986	394	1,443	0	0	29,824	
TOTAL	Masonry					27,986	394	1,443	0	0	29,824	
	13 02 75 06. Wood and Plastic											
	13 02 75 06 01. Fiberglass Grating (PS)											
	13 02 75 06 01 1. Remove Existing Grating											
B CIV PM	Remove Grating	200.00	SF	SIWSSSWK2	40.00	463	0	0	0	0	463	2.32
TOTAL	Remove Existing	200.00	SF			463	0	0	0	0	463	2.32
	13 02 75 06 01 2. Install New Grating											
CIV PM	Grating fbgls, molded, 2" T, 2" sq mesh, grn (mod crsv env)	200.00	SF	SIWSSSWK2	40.00	463	0	4,104	0	0	4,567	22.84
TOTAL	Install New Grat	200.00	SF			463	0	4,104	0	0	4,567	22.84
TOTAL	Fiberglass Grati					927	0	4,104	0	0	5,031	

13 02. East Alton No. 2	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
13 02 75 06 02. Fiberglass Ladders - 5ea (PS)											
13 02 75 06 02 1. Remove Existing Ladders											
B MIL PM Remove Ladders	120.00	VLF	SIWSE4	12.50	1,789	48	0	0	0	1,837	15.31
TOTAL Remove Existing	120.00	LF			1,789	48	0	0	0	1,837	15.31
13 02 75 06 02 2. Install New Ladders											
MIL PM Ladder, 20" wide , bolted to conc, w/safety equip	120.00	VLF	SIWSE4	6.25	3,578	96	6,384	0	0	10,058	83.81
TOTAL Install New Ladd	120.00	LF			3,578	96	6,384	0	0	10,058	83.81
TOTAL Fiberglass Ladde					5,367	144	6,384	0	0	11,894	
13 02 75 06 03. Fiberglass Grating (GW)											
13 02 75 06 03 1. Remove Existing Grating											
B CIV PM Remove Grating	60.00	SF	SIWSSSWK2	40.00	139	0	0	0	0	139	2.32
TOTAL Remove Existing	60.00	SF			139	0	0	0	0	139	2.32
13 02 75 06 03 2. Install New Grating											
CIV PM Grating fbgls, m olded, 2" T, 2" sq mesh, grn (mod crsv env)	60.00	SF	SIWSSSWK2	40.00	139	0	1,231	0	0	1,370	22.84
TOTAL Install New Grat	60.00	SF			139	0	1,231	0	0	1,370	22.84
TOTAL Fiberglass Grati					278	0	1,231	0	0	1,509	
13 02 75 06 04. Fiberglass Ladders (GW)											
13 02 75 06 04 1. Remove Existing Ladders											
B MIL PM Remove Ladders	55.00	VLF	SIWSE4	12.50	820	22	0	0	0	842	15.31
TOTAL Remove Existing	55.00	LF			820	22	0	0	0	842	15.31
13 02 75 06 04 2. Install New Ladders											
MIL PM Ladder, 20" wide , bolted to conc, w/safety equip	55.00	VLF	SIWSE4	6.25	1,640	44	2,926	0	0	4,610	83.81
TOTAL Install New Ladd	55.00	LF			1,640	44	2,926	0	0	4,610	83.81

	13 02. East Alton No. 2	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL	Fiberglass Ladde					2,460	66	2,926	0	0	5,452	
	13 02 75 06 05. Fiberglass Railing (GW)											
	13 02 75 06 05 1. Remove Existing Railing											
B CIV PM	Remove Existing Handrail handrail	120.00	LF	SIWSSSWK2	8.00	1,390	0	0	0	0	1,390	11.58
TOTAL	Remove Existing	120.00	LF			1,390	0	0	0	0	1,390	11.58
	13 02 75 06 05 2. Install New Railing											
CIV PM	Castings fibergl ass, 2" dia rails pickets 5' OC, 42" high, handrail	120.00	LF	SIWSSSWK2	4.00	2,780	0	5,064	0	0	7,844	65.37
TOTAL	Install New Rail	120.00	LF			2,780	0	5,064	0	0	7,844	65.37
TOTAL	Fiberglass Raili					4,170	0	5,064	0	0	9,234	
TOTAL	Wood and Plastic					13,202	209	19,709	0	0	33,120	
	13 02 75 07. Thermal & Moisture Protection											
	13 02 75 07 01 . Roofing											
	13 02 75 07 01 1. Remove Existing Roof											
M MIL RF	Remove Existing BUR	8.00	CSF	ARFCG1	2.50	838	73	0	0	0	912	113.97
TOTAL	Remove Existing	8.00	CSF			838	73	0	0	0	912	113.97
	13 02 75 07 01 2. Install New Roof											
MIL RF	BUR, asph flood ct w/grvl surf, 4 plies #15 felt, mppd, base sheet	8.00	CSF	ARFCG1	2.50	838	73	468	0	0	1,380	172.48
TOTAL	Install New Roof	8.00	CSF			838	73	468	0	0	1,380	172.48
TOTAL	Roofing					1,677	147	468	0	0	2,292	
TOTAL	Thermal & Moistu					1,677	147	468	0	0	2,292	

13. Pumping Plant

13 02. East Alton No. 2	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
13 02 75 15. Mechanical											
13 02 75 15 01. HVAC											
13 02 75 15 01 1. Electric Unit Heaters											
MIL ME Laborers, (Semi-Skilled)	16.00	HR	B-LABORER	1.00	704	0	0	0	0	704	44.03
USR ME 10 KW Unit Heaters	3.00	EA		0.00	0	0	0	0	3,386	3,386	1128.50
TOTAL Electric Unit He	3.00	EA			704	0	0	0	3,386	4,090	1363.30
13 02 75 15 01 2. Ventilation System											
USR ME Ventalation System Mechanical	1.00	LS		0.00	0	0	0	0	5,939	5,939	5939.48
TOTAL Ventilation Syst					0	0	0	0	5,939	5,939	
TOTAL HVAC					704	0	0	0	9,325	10,029	
TOTAL Mechanical					704	0	0	0	9,325	10,029	
13 02 75 16. Electrical											
For details reference electrical estimate dated 13 Feb 2002 in backup file.											
13 02 75 16 01. HVAC											
13 02 75 16 01 1. Electric Unit Heaters											
USR EL Heater Electrical	1.00	LS		0.00	0	0	0	0	3,306	3,306	3306.33
TOTAL Electric Unit He					0	0	0	0	3,306	3,306	
13 02 75 16 01 2. Ventilation System											
USR EL Ventilation System Electrical	1.00	LS		0.00	0	0	0	0	877	877	877.31
TOTAL Ventilation Syst					0	0	0	0	877	877	
TOTAL HVAC					0	0	0	0	4,184	4,184	
13 02 75 16 02. Lighting and Power											
USR EL Lighting and Power	1.00	LS		0.00	0	0	0	0	8,331	8,331	8331.46
TOTAL Lighting and Pow					0	0	0	0	8,331	8,331	

13. Pumping Plant

13 02. East Alton No. 2	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL Electrical					0	0	0	0	12,515	12,515	
TOTAL Pumping Plant Su					43,569	751	21,621	0	21,840	87,781	
13 02 76. Pumping Machinery & Appurtenance											
13 02 76 15. Mechanical											
13 02 76 15 01. Rehab Stormwater Pumps No 1 & 2											
13 02 76 15 01 1. Remove Existing Pumps											
MIL PM Steam/Pipefitters Foreman	16.00	HR	B-STM/PIPE	1.00	624	0	0	0	0	624	39.03
MIL PM Steam/Pipefitters	32.00	HR	B-STM/PIPE	1.00	1,217	0	0	0	0	1,217	38.03
MIL PM Laborers, (Semi-Skilled)	16.00	HR	B-LABORER	1.00	593	0	0	0	0	593	37.06
MIL PM Equip. Operators, Crane/Shovel	16.00	HR	B-EQOPRCRN	1.00	697	0	0	0	0	697	43.57
MAP PM CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	16.00	HR	C75GV002	1.00	0	611	0	0	0	611	38.16
TOTAL Remove Existing	2.00	EA			3,131	611	0	0	0	3,742	1870.99
13 02 76 15 01 2. Rehab Pumps											
Manufacturers Rep/Erection Engineer is considered for field assistance.											
USR ME Rehab Stormwater Pumps	2.00	EA		0.00	0	0	0	0	137,796	137,796	68898
USR ME Erection Engineer	1.00	LS		0.00	2,970	0	0	0	0	2,970	2969.74
TOTAL Rehab Pumps	2.00	EA			2,970	0	0	0	137,796	140,766	70383
13 02 76 15 01 3. Install and Test Rehabbed Pumps											
MIL PM Steam/Pipefitters Foreman	32.00	HR	B-STM/PIPE	1.00	1,249	0	0	0	0	1,249	39.03
MIL PM Steam/Pipefitters	48.00	HR	B-STM/PIPE	1.00	1,825	0	0	0	0	1,825	38.03
MIL PM Laborers, (Semi-Skilled)	24.00	HR	B-LABORER	1.00	889	0	0	0	0	889	37.06
MIL PM Equip. Operators, Crane/Shovel	16.00	HR	B-EQOPRCRN	1.00	697	0	0	0	0	697	43.57
MAP PM CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	16.00	HR	C75GV002	1.00	0	611	0	0	0	611	38.16
MIL PM Outside Truck Drivers, Heavy	16.00	HR	X-TRKDVRHV	1.00	607	0	0	0	0	607	37.92
MAP PM FLATBED, 8'x 16.0', W/SIDE RACKS (ADD TRUCK)	16.00	HR	T40KF016	1.00	0	13	0	0	0	13	0.84

		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
13 02. East Alton No. 2												
EP PM	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	16.00	HR	T50FO006	1.00	0	230	0	0	0	230	14.36
TOTAL	Install and Test	2.00	EA			5,267	854	0	0	0	6,121	3060.61
TOTAL	Rehab Stormwater	2.00	EA			11,369	1,464	0	0	137,796	150,629	75314
TOTAL	Mechanical					11,369	1,464	0	0	137,796	150,629	

13 02 76 16. Electrical

For details reference electrical estimate dated 13 Feb 2002 in backup file. Estimate was updated to include the use of two, 200 Hp variable frequency drives.

13 02 76 16 01. Motor Rehabilitation

USR EL	Rehab Motors	1.00	LS		0.00	0	0	0	0	33,183	33,183	33183
TOTAL	Motor Rehabilita					0	0	0	0	33,183	33,183	

13 02 76 16 02. MCC Replacement

USR EL	Replace Motor Control Center	1.00	LS		0.00	0	0	0	0	85,463	85,463	85463
TOTAL	MCC Replacement					0	0	0	0	85,463	85,463	

13 02 76 16 03. Sluice Gate Operator

USR EL	Electrical for Sluice Gate Operator	1.00	LS		0.00	0	0	0	0	1,182	1,182	1181.68
TOTAL	Sluice Gate Oper					0	0	0	0	1,182	1,182	

13 02 76 16 04. Lubrication System

USR EL	Electrical for Lubrication System	1.00	LS		0.00	0	0	0	0	2,530	2,530	2530.47
TOTAL	Lubrication Syst					0	0	0	0	2,530	2,530	
TOTAL	Electrical					0	0	0	0	122,358	122,358	
TOTAL	Pumping Machiner					11,369	1,464	0	0	260,154	272,987	

13 02. East Alton No. 2		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
13 02 77. Gates and Valves												
13 02 77 15. Mechanical												
13 02 77 15 01. Rehab Forebay Sluice Gates Rehabilitate 2-60 inch sluice gates and install new electric motor gate hoists.												
13 02 77 15 01 1. Remove Existing Gates												
MIL PM	Steam/Pipefitters Foreman	40.00	HR	B-STM/PIPE	1.00	1,561	0	0	0	0	1,561	39.03
MIL PM	Steam/Pipefitters	80.00	HR	B-STM/PIPE	1.00	3,042	0	0	0	0	3,042	38.03
MIL PM	Laborers, (Semi-Skilled)	80.00	HR	B-LABORER	1.00	2,965	0	0	0	0	2,965	37.06
MIL PM	Equip. Operators, Crane/Shovel	40.00	HR	B-EQOPRCRN	1.00	1,743	0	0	0	0	1,743	43.57
MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	40.00	HR	C75GV002	1.00	0	1,527	0	0	0	1,527	38.16
TOTAL	Remove Existing	2.00	EA			9,311	1,527	0	0	0	10,837	5418.72
13 02 77 15 01 2. Rehab Gates Manufacturers Rep/Erection Engineer is considered for field assistance.												
USR ME	Rehab 60" Gate w/ New Electric Operator	2.00	EA		0.00	0	0	0	0	29,697	29,697	14849
USR ME	Erection Engineer	1.00	LS		0.00	2,138	0	0	0	0	2,138	2138.21
MIL ME	Painters, Structural Steel	32.00	HR	B-PAINTSS	1.00	1,507	0	0	0	0	1,507	47.10
TOTAL	Rehab Gates	2.00	EA			3,645	0	0	0	29,697	33,343	16671
13 02 77 15 01 3. Install/Test Rehabbed Gates												
MIL PM	Steam/Pipefitters Foreman	28.00	HR	B-STM/PIPE	1.00	1,093	0	0	0	0	1,093	39.03
MIL PM	Steam/Pipefitters	48.00	HR	B-STM/PIPE	1.00	1,825	0	0	0	0	1,825	38.03
MIL PM	Laborers, (Semi-Skilled)	24.00	HR	B-LABORER	1.00	889	0	0	0	0	889	37.06
MIL PM	Equip. Operators, Crane/Shovel	24.00	HR	B-EQOPRCRN	1.00	1,046	0	0	0	0	1,046	43.57
MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	24.00	HR	C75GV002	1.00	0	916	0	0	0	916	38.16
MIL PM	Outside Truck Drivers, Heavy	12.00	HR	X-TRKDVRHV	1.00	455	0	0	0	0	455	37.92
MAP PM	FLATBED, 8'x 16.0', W/SIDE RACKS (ADD TRUCK)	12.00	HR	T40KF016	1.00	0	10	0	0	0	10	0.84

13 02. East Alton No. 2			QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
EP	PM	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	12.00	HR	T50FO006	1.00	0	172	0	0	0	172	14.36
TOTAL		Install/Test Reh	2.00	EA			5,308	1,098	0	0	0	6,406	3203.24
TOTAL		Rehab Forebay Sl	2.00	EA			18,265	2,625	0	0	29,697	50,587	25293

13 02 77 15 02. Rehab Gravity Drain Sluice Gate
Rehabilitate 1-60 inch sluice gate and install new electric motor gate hoist.

13 02 77 15 02 1. Remove Existing Gates

MIL	PM	Steam/Pipefitters Foreman	12.00	HR	B-STM/PIPE	1.00	468	0	0	0	0	468	39.03
MIL	PM	Steam/Pipefitters	24.00	HR	B-STM/PIPE	1.00	913	0	0	0	0	913	38.03
MIL	PM	Laborers, (Semi-Skilled)	12.00	HR	B-LABORER	1.00	445	0	0	0	0	445	37.06
MIL	PM	Equip. Operators, Crane/Shovel	12.00	HR	B-EQOPRCRN	1.00	523	0	0	0	0	523	43.57
MAP	PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	12.00	HR	C75GV002	1.00	0	458	0	0	0	458	38.16
TOTAL		Remove Existing	2.00	EA			2,349	458	0	0	0	2,806	1403.25

13 02 77 15 02 2. Rehab Gates
Manufacturers Rep/Erection Engineer is considered for field assistance.

USR	ME	Rehab 60" Gate w / New Electric Operator	1.00	EA		0.00	0	0	0	0	14,849	14,849	14849
USR	ME	Erection Engineer	1.00	LS		0.00	1,782	0	0	0	0	1,782	1781.84
MIL	ME	Painters, Structural Steel	24.00	HR	B-PAINTSS	1.00	1,130	0	0	0	0	1,130	47.10
TOTAL		Rehab Gates	2.00	EA			2,912	0	0	0	14,849	17,761	8880.50

13 02 77 15 02 3. Install/Test Rehabbed Gates

MIL	PM	Steam/Pipefitters Foreman	24.00	HR	B-STM/PIPE	1.00	937	0	0	0	0	937	39.03
MIL	PM	Steam/Pipefitters	32.00	HR	B-STM/PIPE	1.00	1,217	0	0	0	0	1,217	38.03
MIL	PM	Laborers, (Semi-Skilled)	16.00	HR	B-LABORER	1.00	593	0	0	0	0	593	37.06
MIL	PM	Equip. Operators, Crane/Shovel	16.00	HR	B-EQOPRCRN	1.00	697	0	0	0	0	697	43.57
MAP	PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	16.00	HR	C75GV002	1.00	0	611	0	0	0	611	38.16

13. Pumping Plant

13 02. East Alton No. 2		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
MIL PM	Outside Truck Drivers, Heavy	8.00	HR	X-TRKDVRHV	1.00	303	0	0	0	0	303	37.92
MAP PM	FLATBED, 8'x 16.0', W/SIDE RACKS (ADD TRUCK)	8.00	HR	T40KF016	1.00	0	7	0	0	0	7	0.84
EP PM	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	8.00	HR	T50FO006	1.00	0	115	0	0	0	115	14.36
TOTAL	Install/Test Reh	2.00	EA			3,747	732	0	0	0	4,479	2239.57
TOTAL	Rehab Gravity Dr	1.00	EA			9,008	1,190	0	0	14,849	25,047	25047
TOTAL	Mechanical					27,272	3,815	0	0	44,546	75,633	
TOTAL	Gates and Valves					27,272	3,815	0	0	44,546	75,633	
	13 02 99. Associated General Items											
	13 02 99 01. Trashrack											
	13 02 99 01 1. Remove Existing Trashrack Steel											
USR PM	Remove Existing Trashrack	8.00	HR	SIWSE7A	1.00	2,869	643	0	0	0	3,512	439.00
TOTAL	Remove Existing					2,869	643	0	0	0	3,512	
	13 02 99 01 2. Install New Trashrack Steel											
USR PM	Fabricate Trashrack	4000.00	LB		0.00	0	0	0	0	12,000	12,000	3.00
USR PM	Install Trashrack	4000.00	LB	SIWSE7A	500.00	2,869	643	0	0	0	3,512	0.88
TOTAL	Install New Tras					2,869	643	0	0	12,000	15,512	
TOTAL	Trashrack					5,738	1,286	0	0	12,000	19,024	
TOTAL	Associated Gener					5,738	1,286	0	0	12,000	19,024	
TOTAL	East Alton No. 2					108,684	12,893	27,121	0	389,540	538,237	

13 03. Wood River	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
13 03. Wood River											
13 03 01. Mob, Demob & Preparatory Work											
13 03 01 01. Mobilization and Demobilization											
Use the following crew for to mobilize equipment to the jobsite. Assume the same time for demobilzation. Use 2hrs operating time for each way. (Mob.& Demob.)											
Crew -											
Truck w/Lowboy; Truck Driver; Mechanics Truck; Operator; Laborer											
13 03 01 01 1. Mobilization and Demobilization											
Asume 8hrs to mobilize equipment. Use 1hr operating time for loading and 1hr operating time for unloading equipment. Assume the same for demobilization.											
UPB PM AIR COMPR, 1,600 CFM, 100 PSI REF. EP 1110-1-8 1600 CFM QUIET, 100 PSI (ADD HOSE)	4.00	HR	A15XX017	1.00	0	183	0	0	0	183	45.70
UPB PM GENERATOR, 5.5 KW, 120/240V,PORT REF. EP 1110-1-8 5.5 KW	4.00	HR	G10HO004	0.00	0	7	0	0	0	7	1.64
MIL PM PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRASH	4.00	HR	P50HO005	1.00	0	12	0	0	0	12	2.94
MAP PM CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	4.00	HR	C75GV002	1.00	0	153	0	0	0	153	38.16
MIL PM LDR,BH,WH, 1.00CY FE BKT, 24"DIP	4.00	HR	L50CS003	0.00	0	68	0	0	0	68	17.00
UPB PM WELDER, 300 AMP, SKID,ELEC DRIVE	4.00	HR	W35XX009	0.00	0	6	0	0	0	6	1.59
L UPB PM TRK,HWY, 46,000 GVW, 6X4, 3 AXLE	16.00	HR	T50FO018	1.00	0	558	0	0	0	558	34.90
L MIL PM TRLR,LOWBOY, 60T, 3 AXLE (ADD TOWING TRUCK)	16.00	HR	T45XX017	1.00	0	134	0	0	0	134	8.38
L MIL PM TRK,HWY,10,000GVW,4X2, 1T-PICKUP	16.00	HR	T50FO005	1.00	0	126	0	0	0	126	7.88
MIL PM Outside Truck Drivers, Heavy *	16.00	HR	X-TRKDVRHV	1.00	607	0	0	0	0	607	37.92

	13 03. Wood River	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
MIL PM	Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57
MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL	Mobilization and					1,897	1,247	0	0	0	3,143	
TOTAL	Mobilization and					1,897	1,247	0	0	0	3,143	
TOTAL	Mob, Demob & Pre					1,897	1,247	0	0	0	3,143	

13 03 03. Care and Diversion of Water

Care of water consists of the installation of temporary bulkheads. Assume small trash pump and operator for any required pumping. Operator is assumed to be on-site for 10 working days for the purpose of dewatering.

13 03 03 02. Site Work

13 03 03 02 1. Fabricate Bulkheads

B MIL PM	Fabricate Bulkheads	1.00	LS		0.00	0	0	2,500	0	0	2,500	2500.00
TOTAL	Fabricate Bulkhe					0	0	2,500	0	0	2,500	

13 03 03 02 2. Install Temporary Bulkheads

MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	16.00	HR	L50CS003	0.00	0	272	0	0	0	272	17.00
MIL PM	Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57
MIL PM	Outside Laborers, (Semi-Skilled)	32.00	HR	X-LABORER	1.00	1,186	0	0	0	0	1,186	37.06
TOTAL	Install Temporar	2.00	DAY			1,883	272	0	0	0	2,155	1077.53

13 03 03 02 3. Remove Temporary Bulkheads

MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS003	0.00	0	136	0	0	0	136	17.00
MIL PM	Outside Equip. Operators, Heavy *	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL	Remove Temporary	1.00	DAY			942	136	0	0	0	1,078	1077.53

13 03. Wood River	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL Site Work					2,825	408	2,500	0	0	5,733	
13 03 03 15. Mechanical											
13 03 03 15 1. Unwatering Pumps											
MIL PM Outside Equip. Operators, Heavy	80.00	HR	X-EQOPRHVY	1.00	3,485	0	0	0	0	3,485	43.57
MIL PM PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRASH	80.00	HR	P50HO005	1.00	0	235	0	0	0	235	2.94
UPB PM TRK,HWY, 8,800GVW,4X4, 3/4T-PKUP REF. EP 1110-1-8 4X4 3/4-TON PICK-UP, 8800 GVW	80.00	HR	T50FO004	1.00	0	613	0	0	0	613	7.66
TOTAL Unwatering Pumps					3,485	848	0	0	0	4,333	
TOTAL Mechanical					3,485	848	0	0	0	4,333	
TOTAL Care and Diversi					6,310	1,256	2,500	0	0	10,066	
13 03 75. Pumping Plant Superstructure											
13 03 75 04. Masonry											
13 03 75 04 01 . Masonry Restoration											
13 03 75 04 01 1. Clean Brick											
MIL MA Masonry cleaning, steam, masonry bldg, common brick face, w/scaf	5250.00	SF	ULABB9	125.00	9,412	431	0	0	0	9,843	1.87
TOTAL Clean Brick					9,412	431	0	0	0	9,843	
13 03 75 04 01 2. Tuckpointing											
MIL MA Pointing masonry, running bond, cut & repoint brick, soft old mortar	5250.00	SF	AMABBRIC1	10.00	21,198	0	1,579	0	0	22,777	4.34
TOTAL Tuckpointing					21,198	0	1,579	0	0	22,777	
TOTAL Masonry Restorat					30,610	431	1,579	0	0	32,620	

13 03. Wood River	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL Masonry					30,610	431	1,579	0	0	32,620	

13 03 75 06. Wood and Plastic
Grating, ladders and railing considered for the gatewell structures are for two double units.

13 03 75 06 01. Fiberglass Grating (PS)

13 03 75 06 01 1. Remove Existing Grating

B CIV PM Remove Grating	315.00	SF	SIWSSSWK2	40.00	730	0	0	0	0	730	2.32
TOTAL Remove Existing	315.00	SF			730	0	0	0	0	730	2.32

13 03 75 06 01 2. Install New Grating

CIV PM Grating fbgls, molded, 2" T, 2" sq mesh, grn (mod crsv env)	315.00	SF	SIWSSSWK2	40.00	730	0	6,464	0	0	7,194	22.84
TOTAL Install New Grat	315.00	SF			730	0	6,464	0	0	7,194	22.84
TOTAL Fiberglass Grati					1,460	0	6,464	0	0	7,923	

13 03 75 06 02. Fiberglass Ladders - 14ea (PS)

13 03 75 06 02 1. Remove Existing Ladders

B MIL PM Remove Ladders	225.00	VLF	SIWSE4	12.50	3,354	90	0	0	0	3,444	15.31
TOTAL Remove Existing	225.00	LF			3,354	90	0	0	0	3,444	15.31

13 03 75 06 02 2. Install New Ladders

MIL PM Ladder, 20" wide, bolted to conc, w/safety equip	225.00	VLF	SIWSE4	6.25	6,709	180	11,970	0	0	18,858	83.81
TOTAL Install New Ladd	225.00	LF			6,709	180	11,970	0	0	18,858	83.81
TOTAL Fiberglass Ladde					10,063	269	11,970	0	0	22,302	

13 03 75 06 03. Fiberglass Grating (GW)

13 03 75 06 03 1. Remove Existing Grating

B CIV PM Remove Grating	120.00	SF	SIWSSSWK2	40.00	278	0	0	0	0	278	2.32
TOTAL Remove Existing	120.00	SF			278	0	0	0	0	278	2.32

13 03. Wood River	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
13 03 75 06 03 2. Install New Grating											
CIV PM Grating fbgls, molded, 2" T, 2" sq mesh, grn (mod crsv env)	120.00	SF	SIWSSSWK2	40.00	278	0	2,462	0	0	2,740	22.84
TOTAL Install New Grat	120.00	SF			278	0	2,462	0	0	2,740	22.84
TOTAL Fiberglass Grati					556	0	2,462	0	0	3,018	
13 03 75 06 04. Fiberglass Ladders (GW)											
13 03 75 06 04 1. Remove Existing Ladders											
B MIL PM Remove Ladders	110.00	VLF	SIWSE4	12.50	1,640	44	0	0	0	1,684	15.31
TOTAL Remove Existing	110.00	LF			1,640	44	0	0	0	1,684	15.31
13 03 75 06 04 2. Install New Ladders											
MIL PM Ladder, 20" wide, bolted to conc, w/safety equip	110.00	VLF	SIWSE4	6.25	3,280	88	5,852	0	0	9,220	83.81
TOTAL Install New Ladd	110.00	LF			3,280	88	5,852	0	0	9,220	83.81
TOTAL Fiberglass Ladde					4,920	132	5,852	0	0	10,903	
13 03 75 06 05. Fiberglass Railing (GW)											
13 03 75 06 05 1. Remove Existing Railing											
B CIV PM Remove Existing Handrail handrail	240.00	LF	SIWSSSWK2	8.00	2,780	0	0	0	0	2,780	11.58
TOTAL Remove Existing	240.00	LF			2,780	0	0	0	0	2,780	11.58
13 03 75 06 05 2. Install New Railing											
CIV PM Castings fiberglass, 2" dia rails pickets 5' OC, 42" high, handrail	240.00	LF	SIWSSSWK2	4.00	5,561	0	10,128	0	0	15,689	65.37
TOTAL Install New Rail	240.00	LF			5,561	0	10,128	0	0	15,689	65.37
TOTAL Fiberglass Raili					8,341	0	10,128	0	0	18,469	
TOTAL Wood and Plastic					25,339	401	36,876	0	0	62,616	

	13 03. Wood River	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
	13 03 75 07. Thermal & Moisture Protection											
	13 03 75 07 01 . Roofing											
	13 03 75 07 01 1. Remove Existing Roof											
M MIL RF	Remove Existing BUR	10.00	CSF	ARFCG1	2.50	1,048	92	0	0	0	1,140	113.97
TOTAL	Remove Existing	10.00	CSF			1,048	92	0	0	0	1,140	113.97
	13 03 75 07 01 2. Install New Roof											
MIL RF	BUR, asph flood ct w/grvl surf, 4 plies #15 felt, mppd, base sheet	10.00	CSF	ARFCG1	2.50	1,048	92	585	0	0	1,725	172.48
TOTAL	Install New Roof	10.00	CSF			1,048	92	585	0	0	1,725	172.48
TOTAL	Roofing					2,096	184	585	0	0	2,864	
TOTAL	Thermal & Moistu					2,096	184	585	0	0	2,864	
	13 03 75 15. Mechanical											
	13 03 75 15 01. HVAC											
	13 03 75 15 01 1. Electric Unit Heaters											
MIL ME	Laborers, (Semi-Skilled)	16.00	HR	B-LABORER	1.00	704	0	0	0	0	704	44.03
USR ME	12.5 KW Unit Heaters	3.00	EA		0.00	0	0	0	0	3,564	3,564	1187.90
TOTAL	Electric Unit He	3.00	EA			704	0	0	0	3,564	4,268	1422.70
	13 03 75 15 01 2. Ventilation System											
USR ME	Ventalation System Mechanical	1.00	LS		0.00	0	0	0	0	5,939	5,939	5939.48
TOTAL	Ventilation Syst					0	0	0	0	5,939	5,939	
TOTAL	HVAC					704	0	0	0	9,503	10,208	
TOTAL	Mechanical					704	0	0	0	9,503	10,208	

13 03. Wood River	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
13 03 75 16. Electrical											
For details reference electrical estimate dated 13 Feb 2002 in backup file.											
13 03 75 16 01. HVAC											
13 03 75 16 01 1. Electric Unit Heaters											
USR EL Heater Electrical	1.00	LS		0.00	0	0	0	0	3,581	3,581	3580.86
TOTAL Electric Unit He					0	0	0	0	3,581	3,581	
13 03 75 16 01 2. Ventilation System											
USR EL Ventilation System Electrical	1.00	LS		0.00	0	0	0	0	877	877	877.31
TOTAL Ventilation Syst					0	0	0	0	877	877	
TOTAL HVAC					0	0	0	0	4,458	4,458	
13 03 75 16 02. Lighting and Power											
USR EL Lighting and Power	1.00	LS		0.00	0	0	0	0	7,997	7,997	7997.25
TOTAL Lighting and Pow					0	0	0	0	7,997	7,997	
TOTAL Electrical					0	0	0	0	12,455	12,455	
TOTAL Pumping Plant Su					58,749	1,016	39,040	0	21,959	120,764	
13 03 76. Pumping Machinery & Appurtenance											
13 03 76 15. Mechanical											
13 03 76 15 01. Replace Baseflow Pump No. 1 w/submersible pump											
13 03 76 15 01 1. Remove Existing Pump											
MIL PM Steam/Pipefitters Foreman	12.00	HR	B-STM/PIPE	1.00	468	0	0	0	0	468	39.03
MIL PM Steam/Pipefitters	12.00	HR	B-STM/PIPE	1.00	456	0	0	0	0	456	38.03
MIL PM Laborers, (Semi-Skilled)	8.00	HR	B-LABORER	1.00	296	0	0	0	0	296	37.06
TOTAL Remove Existing	1.00	EA			1,221	0	0	0	0	1,221	1221.15

13 03. Wood River		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
	13 03 76 15 01 2. New Submersible Pump											
	Manufacturers Rep/Erection Engineer is considered for field assistance.											
USR ME	New Submersible Baseflow Pump	1.00	EA		0.00	0	0	0	0	15,443	15,443	15443
USR ME	Erection Enginee r	1.00	LS		0.00	594	0	0	0	0	594	593.95
TOTAL	New Submersible	1.00	EA			594	0	0	0	15,443	16,037	16037
	13 03 76 15 01 3. Install and Test New Pump											
MIL PM	Steam/Pipefitter s Foreman	20.00	HR	B-STM/PIPE	1.00	781	0	0	0	0	781	39.03
MIL PM	Steam/Pipefitter s	16.00	HR	B-STM/PIPE	1.00	608	0	0	0	0	608	38.03
MIL PM	Laborers, (Semi- Skilled)	8.00	HR	B-LABORER	1.00	296	0	0	0	0	296	37.06
MIL PM	Outside Truck Dr ivers, Heavy	8.00	HR	X-TRKDVRHV	1.00	303	0	0	0	0	303	37.92
MAP PM	FLATBED, 8'x 16. 0', W/SIDE RACKS (ADD TRUCK)	8.00	HR	T40KF016	1.00	0	7	0	0	0	7	0.84
EP PM	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	8.00	HR	T50FO006	1.00	0	115	0	0	0	115	14.36
TOTAL	Install and Test	1.00	EA			1,989	122	0	0	0	2,110	2110.41
TOTAL	Replace Baseflow	1.00	EA			3,804	122	0	0	15,443	19,368	19368
	13 03 76 15 02 . Rehab Stormwater Pumps No 2 & 3											
	13 03 76 15 02 1. Remove Existing Pumps											
MIL PM	Steam/Pipefitter s Foreman	16.00	HR	B-STM/PIPE	1.00	624	0	0	0	0	624	39.03
MIL PM	Steam/Pipefitter s	32.00	HR	B-STM/PIPE	1.00	1,217	0	0	0	0	1,217	38.03
MIL PM	Laborers, (Semi- Skilled)	16.00	HR	B-LABORER	1.00	593	0	0	0	0	593	37.06
MIL PM	Equip. Operators , Crane/Shovel	16.00	HR	B-EQOPRCRN	1.00	697	0	0	0	0	697	43.57
MAP PM	CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	16.00	HR	C75GV002	1.00	0	611	0	0	0	611	38.16
TOTAL	Remove Existing	2.00	EA			3,131	611	0	0	0	3,742	1870.99

13 03. Wood River		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
13 03 76 15 02 2. Rehab Pumps												
Manufacturers Rep/Erection Engineer is considered for field assistance.												
USR ME	Rehab Stormwater Pumps	2.00	EA		0.00	0	0	0	0	121,165	121,165	60583
USR ME	Erection Engineer	1.00	LS		0.00	2,970	0	0	0	0	2,970	2969.74
TOTAL	Rehab Pumps	2.00	EA			2,970	0	0	0	121,165	124,135	62068
13 03 76 15 02 3. Install and Test Rehabbed Pumps												
MIL PM	Steam/Pipefitters Foreman	32.00	HR	B-STM/PIPE	1.00	1,249	0	0	0	0	1,249	39.03
MIL PM	Steam/Pipefitters	48.00	HR	B-STM/PIPE	1.00	1,825	0	0	0	0	1,825	38.03
MIL PM	Laborers, (Semi-Skilled)	24.00	HR	B-LABORER	1.00	889	0	0	0	0	889	37.06
MIL PM	Equip. Operators, Crane/Shovel	16.00	HR	B-EQOPRCRN	1.00	697	0	0	0	0	697	43.57
MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	16.00	HR	C75GV002	1.00	0	611	0	0	0	611	38.16
MIL PM	Outside Truck Drivers, Heavy	16.00	HR	X-TRKDVRHV	1.00	607	0	0	0	0	607	37.92
MAP PM	FLATBED, 8'x 16.0', W/SIDE RACKS (ADD TRUCK)	16.00	HR	T40KF016	1.00	0	13	0	0	0	13	0.84
EP PM	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	16.00	HR	T50FO006	1.00	0	230	0	0	0	230	14.36
TOTAL	Install and Test	2.00	EA			5,267	854	0	0	0	6,121	3060.61
TOTAL	Rehab Stormwater	2.00	EA			11,369	1,464	0	0	121,165	133,998	66999
13 03 76 15 03 . Rehab Stormwater Pumps No 4,5&6												
13 03 76 15 03 1. Remove Existing Pumps												
MIL PM	Steam/Pipefitters Foreman	16.00	HR	B-STM/PIPE	1.00	624	0	0	0	0	624	39.03
MIL PM	Steam/Pipefitters	32.00	HR	B-STM/PIPE	1.00	1,217	0	0	0	0	1,217	38.03
MIL PM	Laborers, (Semi-Skilled)	16.00	HR	B-LABORER	1.00	593	0	0	0	0	593	37.06
MIL PM	Equip. Operators, Crane/Shovel	16.00	HR	B-EQOPRCRN	1.00	697	0	0	0	0	697	43.57
MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	16.00	HR	C75GV002	1.00	0	611	0	0	0	611	38.16
TOTAL	Remove Existing	3.00	EA			3,131	611	0	0	0	3,742	1247.33

13. Pumping Plant

13 03. Wood River	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
13 03 76 15 03 2. Rehab Pumps											
Manufacturers Rep/Erection Engineer is considered for field assistance.											
USR ME Rehab Stormwater Pumps	3.00	EA		0.00	0	0	0	0	206,694	206,694	68898
USR ME Erection Engineer	1.00	LS		0.00	2,970	0	0	0	0	2,970	2969.74
TOTAL Rehab Pumps	3.00	EA			2,970	0	0	0	206,694	209,664	69888
13 03 76 15 03 3. Install and Test Rehabbed Pumps											
MIL PM Steam/Pipefitters Foreman	40.00	HR	B-STM/PIPE	1.00	1,561	0	0	0	0	1,561	39.03
MIL PM Steam/Pipefitters	64.00	HR	B-STM/PIPE	1.00	2,434	0	0	0	0	2,434	38.03
MIL PM Laborers, (Semi-Skilled)	32.00	HR	B-LABORER	1.00	1,186	0	0	0	0	1,186	37.06
MIL PM Equip. Operators, Crane/Shovel	20.00	HR	B-EQOPRCRN	1.00	871	0	0	0	0	871	43.57
MAP PM CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	20.00	HR	C75GV002	1.00	0	763	0	0	0	763	38.16
MIL PM Outside Truck Drivers, Heavy	20.00	HR	X-TRKDVRHV	1.00	758	0	0	0	0	758	37.92
MAP PM FLATBED, 8'x 16.0', W/SIDE RACKS (ADD TRUCK)	20.00	HR	T40KF016	1.00	0	17	0	0	0	17	0.84
EP PM TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	20.00	HR	T50FO006	1.00	0	287	0	0	0	287	14.36
TOTAL Install and Test	3.00	EA			6,810	1,067	0	0	0	7,878	2625.92
TOTAL Rehab Stormwater	3.00	EA			12,912	1,678	0	0	206,694	221,283	73761
TOTAL Mechanical					28,084	3,264	0	0	343,302	374,650	
13 03 76 16. Electrical											
For details reference electrical estimate dated 13 Feb 2002 in backup file.											
13 03 76 16 01. Motor Rehabilitation											
USR EL Rehab Motors	1.00	LS		0.00	0	0	0	0	66,007	66,007	66007
TOTAL Motor Rehabilita					0	0	0	0	66,007	66,007	
13 03 76 16 02. MCC Replacement											
USR EL Replace Motor Control Center	1.00	LS		0.00	0	0	0	0	71,140	71,140	71140
TOTAL MCC Replacement					0	0	0	0	71,140	71,140	

13 03. Wood River	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
13 03 76 16 03. Sluice Gate Operator											
USR EL Electrical for Sluice Gate Operator	1.00	LS		0.00	0	0	0	0	3,127	3,127	3127.28
TOTAL Sluice Gate Oper					0	0	0	0	3,127	3,127	
13 03 76 16 04. Lubrication System											
USR EL Electrical for Lubrication System	1.00	LS		0.00	0	0	0	0	6,004	6,004	6003.91
TOTAL Lubrication Syst					0	0	0	0	6,004	6,004	
TOTAL Electrical					0	0	0	0	146,278	146,278	
TOTAL Pumping Machiner					28,084	3,264	0	0	489,580	520,928	
13 03 77. Gates and Valves											
13 03 77 15. Mechanical											
13 03 77 15 01. Rehab Forebay Sluice Gates Rehabilitate 3-60 inch sluice gates and install new electric motor gate hoists.											
13 03 77 15 01 1. Remove Existing Gates											
MIL PM Steam/Pipefitters Foreman	20.00	HR	B-STM/PIPE	1.00	781	0	0	0	0	781	39.03
MIL PM Steam/Pipefitters	40.00	HR	B-STM/PIPE	1.00	1,521	0	0	0	0	1,521	38.03
MIL PM Laborers, (Semi-Skilled)	20.00	HR	B-LABORER	1.00	741	0	0	0	0	741	37.06
MIL PM Equip. Operators, Crane/Shovel	20.00	HR	B-EQOPRCRN	1.00	871	0	0	0	0	871	43.57
MAP PM CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	20.00	HR	C75GV002	1.00	0	763	0	0	0	763	38.16
TOTAL Remove Existing	3.00	EA			3,914	763	0	0	0	4,677	1559.16
13 03 77 15 01 2. Rehab Gates Manufacturers Rep/Erection Engineer is considered for field assistance.											
USR ME Rehab 60" Gate w / New Electric Operator	3.00	EA		0.00	0	0	0	0	44,546	44,546	14849
USR ME Erection Engineer	1.00	LS		0.00	2,376	0	0	0	0	2,376	2375.79

13 03. Wood River		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
MIL ME	Painters, Structural Steel	48.00	HR	B-PAINTSS	1.00	2,261	0	0	0	0	2,261	47.10
TOTAL	Rehab Gates	3.00	EA			4,637	0	0	0	44,546	49,183	16394
	13 03 77 15 01 3. Install/Test Rehabbed Gates											
MIL PM	Steam/Pipefitters Foreman	36.00	HR	B-STM/PIPE	1.00	1,405	0	0	0	0	1,405	39.03
MIL PM	Steam/Pipefitters	56.00	HR	B-STM/PIPE	1.00	2,130	0	0	0	0	2,130	38.03
MIL PM	Laborers, (Semi-Skilled)	28.00	HR	B-LABORER	1.00	1,038	0	0	0	0	1,038	37.06
MIL PM	Equip. Operators, Crane/Shovel	28.00	HR	B-EQOPRCRN	1.00	1,220	0	0	0	0	1,220	43.57
MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	28.00	HR	C75GV002	1.00	0	1,069	0	0	0	1,069	38.16
MIL PM	Outside Truck Drivers, Heavy	16.00	HR	X-TRKDVRHV	1.00	607	0	0	0	0	607	37.92
MAP PM	FLATBED, 8'x 16.0', W/SIDE RACKS (ADD TRUCK)	16.00	HR	T40KF016	1.00	0	13	0	0	0	13	0.84
EP PM	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	16.00	HR	T50FO006	1.00	0	230	0	0	0	230	14.36
TOTAL	Install/Test Reh	3.00	EA			6,399	1,312	0	0	0	7,711	2570.18
TOTAL	Rehab Forebay Sl	3.00	EA			14,950	2,075	0	0	44,546	61,571	20524
	13 03 77 15 02. Rehab Forebay/Pond Sluice Gate											
	Rehabilitate 2-60 inch sluice gates and install new manual gate hoist.											
	13 03 77 15 02 1. Remove Existing Gates											
MIL PM	Steam/Pipefitters Foreman	12.00	HR	B-STM/PIPE	1.00	468	0	0	0	0	468	39.03
MIL PM	Steam/Pipefitters	24.00	HR	B-STM/PIPE	1.00	913	0	0	0	0	913	38.03
MIL PM	Laborers, (Semi-Skilled)	12.00	HR	B-LABORER	1.00	445	0	0	0	0	445	37.06
MIL PM	Equip. Operators, Crane/Shovel	12.00	HR	B-EQOPRCRN	1.00	523	0	0	0	0	523	43.57
MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	12.00	HR	C75GV002	1.00	0	458	0	0	0	458	38.16
TOTAL	Remove Existing	2.00	EA			2,349	458	0	0	0	2,806	1403.25

13 03. Wood River		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
	13 03 77 15 02 2. Rehab Gates											
	Manufacturers Rep/Erection Engineer is considered for field assistance.											
USR ME	Rehab 60" Gate w / New Manual Operator	2.00	EA		0.00	0	0	0	0	15,443	15,443	7721.33
USR ME	Erection Enginee r	1.00	LS		0.00	1,901	0	0	0	0	1,901	1900.63
MIL ME	Painters, Struct ural Steel	32.00	HR	B-PAINTSS	1.00	1,507	0	0	0	0	1,507	47.10
TOTAL	Rehab Gates	2.00	EA			3,408	0	0	0	15,443	18,851	9425.27
	13 03 77 15 02 3. Install/Test Rehabbed Gates											
MIL PM	Steam/Pipefitter s Foreman	24.00	HR	B-STM/PIPE	1.00	937	0	0	0	0	937	39.03
MIL PM	Steam/Pipefitter s	48.00	HR	B-STM/PIPE	1.00	1,825	0	0	0	0	1,825	38.03
MIL PM	Laborers, (Semi- Skilled)	24.00	HR	B-LABORER	1.00	889	0	0	0	0	889	37.06
MIL PM	Equip. Operators , Crane/Shovel	24.00	HR	B-EQOPRCRN	1.00	1,046	0	0	0	0	1,046	43.57
MAP PM	CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	24.00	HR	C75GV002	1.00	0	916	0	0	0	916	38.16
MIL PM	Outside Truck Dr ivers, Heavy	12.00	HR	X-TRKDVRHV	1.00	455	0	0	0	0	455	37.92
MAP PM	FLATBED, 8'x 16. 0', W/SIDE RACKS (ADD TRUCK)	12.00	HR	T40KF016	1.00	0	10	0	0	0	10	0.84
EP PM	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	12.00	HR	T50FO006	1.00	0	172	0	0	0	172	14.36
TOTAL	Install/Test Reh	2.00	EA			5,152	1,098	0	0	0	6,250	3125.19
TOTAL	Rehab Forebay/Po	2.00	EA			10,908	1,556	0	0	15,443	27,907	13954
	13 03 77 15 03. Rehab Dischg Chamber Sluice Gate											
	Rehabilitate 1-72 inch sluice gate and install new manual gate hoist.											
	13 03 77 15 03 1. Remove Existing Gate											
MIL PM	Steam/Pipefitter s Foreman	12.00	HR	B-STM/PIPE	1.00	468	0	0	0	0	468	39.03
MIL PM	Steam/Pipefitter s	24.00	HR	B-STM/PIPE	1.00	913	0	0	0	0	913	38.03
MIL PM	Laborers, (Semi- Skilled)	12.00	HR	B-LABORER	1.00	445	0	0	0	0	445	37.06
MIL PM	Equip. Operators , Crane/Shovel	12.00	HR	B-EQOPRCRN	1.00	523	0	0	0	0	523	43.57
MAP PM	CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	12.00	HR	C75GV002	1.00	0	458	0	0	0	458	38.16

13 03. Wood River	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL Remove Existing	1.00	EA			2,349	458	0	0	0	2,806	2806.49
13 03 77 15 03 2. Rehab Gate											
Manufacturers Rep/Erection Engineer is considered for field assistance.											
USR ME Rehab 72" Gate w / New Manual Operator	1.00	EA		0.00	0	0	0	0	9,622	9,622	9621.96
USR ME Erection Enginee r	1.00	LS		0.00	1,425	0	0	0	0	1,425	1425.48
MIL ME Painters, Struct ural Steel	24.00	HR	B-PAINTSS	1.00	1,130	0	0	0	0	1,130	47.10
TOTAL Rehab Gate	1.00	EA			2,556	0	0	0	9,622	12,178	12178
13 03 77 15 03 3. Install/Test Rehabbed Gate											
MIL PM Steam/Pipefitter s Foreman	20.00	HR	B-STM/PIPE	1.00	781	0	0	0	0	781	39.03
MIL PM Steam/Pipefitter s	32.00	HR	B-STM/PIPE	1.00	1,217	0	0	0	0	1,217	38.03
MIL PM Laborers, (Semi- Skilled)	16.00	HR	B-LABORER	1.00	593	0	0	0	0	593	37.06
MIL PM Equip. Operators , Crane/Shovel	16.00	HR	B-EQOPRCRN	1.00	697	0	0	0	0	697	43.57
MAP PM CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	16.00	HR	C75GV002	1.00	0	611	0	0	0	611	38.16
MIL PM Outside Truck Dr ivers, Heavy	8.00	HR	X-TRKDVRHV	1.00	303	0	0	0	0	303	37.92
MAP PM FLATBED, 8'x 16. 0', W/SIDE RACKS (ADD TRUCK)	8.00	HR	T40KF016	1.00	0	7	0	0	0	7	0.84
EP PM TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	8.00	HR	T50FO006	1.00	0	115	0	0	0	115	14.36
TOTAL Install/Test Reh	1.00	EA			3,591	732	0	0	0	4,323	4323.03
TOTAL Rehab Dischg Cha	1.00	EA			8,495	1,190	0	0	9,622	19,307	19307
13 03 77 15 04. Rehab Emerg. Closure Sluice Gate											
Rehabilitate 1-72 inch sluice gate and install new manual motor gate hoist.											
13 03 77 15 04 1. Remove Existing Gate											
MIL PM Steam/Pipefitter s Foreman	12.00	HR	B-STM/PIPE	1.00	468	0	0	0	0	468	39.03
MIL PM Steam/Pipefitter s	24.00	HR	B-STM/PIPE	1.00	913	0	0	0	0	913	38.03
MIL PM Laborers, (Semi- Skilled)	12.00	HR	B-LABORER	1.00	445	0	0	0	0	445	37.06

13 03. Wood River		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
MIL PM	Equip. Operators, Crane/Shovel	12.00	HR	B-EQOPRCRN	1.00	523	0	0	0	0	523	43.57
MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	12.00	HR	C75GV002	1.00	0	458	0	0	0	458	38.16
TOTAL	Remove Existing	1.00	EA			2,349	458	0	0	0	2,806	2806.49
	13 03 77 15 04 2. Rehab Gate											
	Manufacturers Rep/Erection Engineer is considered for field assistance.											
USR ME	Rehab 72" Gate w / New Manual Operator	1.00	EA		0.00	0	0	0	0	9,622	9,622	9621.96
USR ME	Erection Enginee r	1.00	LS		0.00	1,425	0	0	0	0	1,425	1425.48
MIL ME	Painters, Struct ural Steel	24.00	HR	B-PAINTSS	1.00	1,130	0	0	0	0	1,130	47.10
TOTAL	Rehab Gate	1.00	EA			2,556	0	0	0	9,622	12,178	12178
	13 03 77 15 04 3. Install/Test Rehabbed Gate											
MIL PM	Steam/Pipefitter s Foreman	20.00	HR	B-STM/PIPE	1.00	781	0	0	0	0	781	39.03
MIL PM	Steam/Pipefitter s	32.00	HR	B-STM/PIPE	1.00	1,217	0	0	0	0	1,217	38.03
MIL PM	Laborers, (Semi- Skilled)	16.00	HR	B-LABORER	1.00	593	0	0	0	0	593	37.06
MIL PM	Equip. Operators, Crane/Shovel	16.00	HR	B-EQOPRCRN	1.00	697	0	0	0	0	697	43.57
MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	16.00	HR	C75GV002	1.00	0	611	0	0	0	611	38.16
MIL PM	Outside Truck Dr ivers, Heavy	8.00	HR	X-TRKDVRHV	1.00	303	0	0	0	0	303	37.92
MAP PM	FLATBED, 8'x 16. 0', W/SIDE RACKS (ADD TRUCK)	8.00	HR	T40KF016	1.00	0	7	0	0	0	7	0.84
EP PM	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	8.00	HR	T50FO006	1.00	0	115	0	0	0	115	14.36
TOTAL	Install/Test Reh	1.00	EA			3,591	732	0	0	0	4,323	4323.03
TOTAL	Rehab Emerg. Clo	1.00	EA			8,495	1,190	0	0	9,622	19,307	19307

13 03. Wood River		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
13 03 77 15 05. Replace Dischg Chamber Sluice												
Replace 1-84 inch sluice gate and install new electric motor gate hoist.												
13 03 77 15 05 1. Remove Existing Gate												
MIL PM	Steam/Pipefitters Foreman	12.00	HR	B-STM/PIPE	1.00	468	0	0	0	0	468	39.03
MIL PM	Steam/Pipefitters	24.00	HR	B-STM/PIPE	1.00	913	0	0	0	0	913	38.03
MIL PM	Laborers, (Semi-Skilled)	12.00	HR	B-LABORER	1.00	445	0	0	0	0	445	37.06
MIL PM	Equip. Operators, Crane/Shovel	12.00	HR	B-EQOPRCRN	1.00	523	0	0	0	0	523	43.57
MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	12.00	HR	C75GV002	1.00	0	458	0	0	0	458	38.16
TOTAL	Remove Existing	1.00	EA			2,349	458	0	0	0	2,806	2806.49
13 03 77 15 05 2. New Gate												
Manufacturers Rep/Erection Engineer is considered for field assistance.												
USR ME	New 84" Gate w/ New Electric Operator	1.00	EA		0.00	0	0	0	0	35,637	35,637	35637
USR ME	Erection Engineer	1.00	LS		0.00	1,782	0	0	0	0	1,782	1781.84
TOTAL	New Gate	1.00	EA			1,782	0	0	0	35,637	37,419	37419
13 03 77 15 05 3. Install/Test New Gate												
MIL PM	Steam/Pipefitters Foreman	20.00	HR	B-STM/PIPE	1.00	781	0	0	0	0	781	39.03
MIL PM	Steam/Pipefitters	24.00	HR	B-STM/PIPE	1.00	913	0	0	0	0	913	38.03
MIL PM	Laborers, (Semi-Skilled)	12.00	HR	B-LABORER	1.00	445	0	0	0	0	445	37.06
MIL PM	Equip. Operators, Crane/Shovel	12.00	HR	B-EQOPRCRN	1.00	523	0	0	0	0	523	43.57
MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	12.00	HR	C75GV002	1.00	0	458	0	0	0	458	38.16
MIL PM	Outside Truck Drivers, Heavy	8.00	HR	X-TRKDVRHV	1.00	303	0	0	0	0	303	37.92
MAP PM	FLATBED, 8'x 16.0', W/SIDE RACKS (ADD TRUCK)	8.00	HR	T40KF016	1.00	0	7	0	0	0	7	0.84
EP PM	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	8.00	HR	T50FO006	1.00	0	115	0	0	0	115	14.36
TOTAL	Install/Test New	1.00	EA			2,964	580	0	0	0	3,544	3543.64

	13 03. Wood River	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL	Replace Dischg C	1.00	EA			7,094	1,038	0	0	35,637	43,769	43769

13 03 77 15 06. Rehab Emerg. Closure Sluice Gate
Rehabilitate 1-84 inch sluice gate and install new manual gate hoist.

13 03 77 15 06 1. Remove Existing Gate

MIL PM	Steam/Pipefitters Foreman	12.00	HR	B-STM/PIPE	1.00	468	0	0	0	0	468	39.03
MIL PM	Steam/Pipefitters	24.00	HR	B-STM/PIPE	1.00	913	0	0	0	0	913	38.03
MIL PM	Laborers, (Semi-Skilled)	12.00	HR	B-LABORER	1.00	445	0	0	0	0	445	37.06
MIL PM	Equip. Operators, Crane/Shovel	12.00	HR	B-EQOPRCRN	1.00	523	0	0	0	0	523	43.57
MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	12.00	HR	C75GV002	1.00	0	458	0	0	0	458	38.16
TOTAL	Remove Existing	1.00	EA			2,349	458	0	0	0	2,806	2806.49

13 03 77 15 06 2. Rehab Gate
Manufacturers Rep/Erection Engineer is considered for field assistance.

USR ME	Rehab 84" Gate w/ New Manual Operator	1.00	EA		0.00	0	0	0	0	12,473	12,473	12473
USR ME	Erection Engineer	1.00	LS		0.00	1,425	0	0	0	0	1,425	1425.48
MIL ME	Painters, Structural Steel	24.00	HR	B-PAINTSS	1.00	1,130	0	0	0	0	1,130	47.10
TOTAL	Rehab Gate	1.00	EA			2,556	0	0	0	12,473	15,029	15029

13 03 77 15 06 3. Install/Test Rehabbed Gate

MIL PM	Steam/Pipefitters Foreman	24.00	HR	B-STM/PIPE	1.00	937	0	0	0	0	937	39.03
MIL PM	Steam/Pipefitters	32.00	HR	B-STM/PIPE	1.00	1,217	0	0	0	0	1,217	38.03
MIL PM	Laborers, (Semi-Skilled)	16.00	HR	B-LABORER	1.00	593	0	0	0	0	593	37.06
MIL PM	Equip. Operators, Crane/Shovel	16.00	HR	B-EQOPRCRN	1.00	697	0	0	0	0	697	43.57
MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	16.00	HR	C75GV002	1.00	0	611	0	0	0	611	38.16
MIL PM	Outside Truck Drivers, Heavy	8.00	HR	X-TRKDVRHV	1.00	303	0	0	0	0	303	37.92
MAP PM	FLATBED, 8'x 16.0', W/SIDE RACKS (ADD TRUCK)	8.00	HR	T40KF016	1.00	0	7	0	0	0	7	0.84

			QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
13 03. Wood River													
EP	PM	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	8.00	HR	T50FO006	1.00	0	115	0	0	0	115	14.36
TOTAL		Install/Test Reh	1.00	EA			3,747	732	0	0	0	4,479	4479.14
TOTAL		Rehab Emerg. Clo	1.00	EA			8,651	1,190	0	0	12,473	22,314	22314
		13 03 77 15 07. Replace Pump Dischg Flap Gates											
		Replace 3-36", 2-24" and 1-12" flap gates.											
		13 03 77 15 07 1. Remove Existing Gates											
MIL	PM	Steam/Pipefitters Foreman	24.00	HR	B-STM/PIPE	1.00	937	0	0	0	0	937	39.03
MIL	PM	Steam/Pipefitters	48.00	HR	B-STM/PIPE	1.00	1,825	0	0	0	0	1,825	38.03
MIL	PM	Laborers, (Semi-Skilled)	24.00	HR	B-LABORER	1.00	889	0	0	0	0	889	37.06
MIL	PM	Equip. Operators, Crane/Shovel	24.00	HR	B-EQOPRCRN	1.00	1,046	0	0	0	0	1,046	43.57
MAP	PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	24.00	HR	C75GV002	1.00	0	916	0	0	0	916	38.16
TOTAL		Remove Existing	1.00	EA			4,697	916	0	0	0	5,613	5612.98
		13 03 77 15 07 2. New Gates											
		Manufacturers Rep/Erection Engineer is considered for field assistance.											
USR	ME	New 36" Cast Iron Flap Gates	3.00	EA		0.00	0	0	0	0	18,888	18,888	6295.85
USR	ME	New 24" Cast Iron Flap Gates	2.00	EA		0.00	0	0	0	0	8,553	8,553	4276.43
USR	ME	New 36" Cast Iron Flap Gates	1.00	EA		0.00	0	0	0	0	2,851	2,851	2850.95
TOTAL		New Gates	1.00	EA			0	0	0	0	30,291	30,291	30291
		13 03 77 15 07 3. Install/Test New Gates											
MIL	PM	Steam/Pipefitters Foreman	16.00	HR	B-STM/PIPE	1.00	624	0	0	0	0	624	39.03
MIL	PM	Steam/Pipefitters	32.00	HR	B-STM/PIPE	1.00	1,217	0	0	0	0	1,217	38.03
MIL	PM	Laborers, (Semi-Skilled)	16.00	HR	B-LABORER	1.00	593	0	0	0	0	593	37.06
MIL	PM	Equip. Operators, Crane/Shovel	16.00	HR	B-EQOPRCRN	1.00	697	0	0	0	0	697	43.57
MAP	PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	16.00	HR	C75GV002	1.00	0	611	0	0	0	611	38.16
MIL	PM	Outside Truck Drivers, Heavy	8.00	HR	X-TRKDVRHV	1.00	303	0	0	0	0	303	37.92

	13 03. Wood River	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
MAP PM	FLATBED, 8'x 16. 0', W/SIDE RACKS (ADD TRUCK)	8.00	HR	T40KF016	1.00	0	7	0	0	0	7	0.84
EP PM	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	8.00	HR	T50FO006	1.00	0	115	0	0	0	115	14.36
TOTAL	Install/Test New	1.00	EA			3,435	732	0	0	0	4,167	4166.92
TOTAL	Replace Pump Dis					8,132	1,648	0	0	30,291	40,071	
TOTAL	Mechanical					66,726	9,888	0	0	157,634	234,248	
TOTAL	Gates and Valves					66,726	9,888	0	0	157,634	234,248	
	13 03 99. Associated General Items											
	13 03 99 01. Chain Link Fence											
	13 03 99 01 1. Remove Existing Chainlink Fence											
RSM PM	Site dml, chain link, remove only, 8' to 10' high	300.00	LF	CODLB6	55.63	596	69	0	0	0	665	2.22
TOTAL	Remove Existing					596	69	0	0	0	665	
	13 03 99 01 2. Install New Chain Link Fence											
MIL PM	Fence, CL scty, galv,10'H, 2.5"line post@10',3"pull post@100',9ga,3barb	300.00	LF	CLABB80B	12.00	3,691	1,198	4,134	0	0	9,023	30.08
MIL PM	Fence,scty,3' x 10',transom for 10' fence,galv,sgl,gate,w/3 barb wire	2.00	EA	CLABB80A	1.00	222	30	398	0	0	650	324.98
TOTAL	Install New Chai					3,913	1,228	4,532	0	0	9,673	
TOTAL	Chain Link Fence					4,510	1,297	4,532	0	0	10,338	
TOTAL	Associated Gener					4,510	1,297	4,532	0	0	10,338	
TOTAL	Wood River					166,276	17,966	46,071	0	669,173	899,486	

13 04. Rand	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT

13 04. Rand

13 04 01. Mob, Demob & Preparatory Work

13 04 01 01. Mobilization and Demobilization

Use the following crew for to mobilize equipment to the jobsite. Assume the same time for demobilzation. Use 2hrs operating time for each way. (Mob.& Demob.)

Crew -

Truck w/Lowboy	Truck Driver
Mechanics Truck	Operator
Laborer	

13 04 01 01 1. Mobilization and Demobilization

Asume 8hrs to mobilize equipment. Use 1hr operating time for loading and 1hr operating time for unloading equipment. Assume the same for demobilization.

	UPB PM	AIR COMPR, 1,600 CFM, 100 PSI REF. EP 1110-1-8 1600 CFM QUIET, 100 PSI (ADD HOSE)	4.00 HR	A15XX017	1.00	0	183	0	0	0	183	45.70
	UPB PM	GENERATOR, 5.5 KW, 120/240V,PORT REF. EP 1110-1-8 5.5 KW	4.00 HR	G10HO004	0.00	0	7	0	0	0	7	1.64
	MIL PM	PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRASH	4.00 HR	P50HO005	1.00	0	12	0	0	0	12	2.94
	MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	4.00 HR	C75GV002	1.00	0	153	0	0	0	153	38.16
	MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	4.00 HR	L50CS003	0.00	0	68	0	0	0	68	17.00
	UPB PM	WELDER, 300 AMP, SKID,ELEC DRIVE	4.00 HR	W35XX009	0.00	0	6	0	0	0	6	1.59
L	UPB PM	TRK,HWY, 46,000 GVW, 6X4, 3 AXLE	16.00 HR	T50FO018	1.00	0	558	0	0	0	558	34.90
L	MIL PM	TRLR,LOWBOY, 60T, 3 AXLE (ADD TOWING TRUCK)	16.00 HR	T45XX017	1.00	0	134	0	0	0	134	8.38
L	MIL PM	TRK,HWY,10,000GVW,4X2, 1T-PICKUP	16.00 HR	T50FO005	1.00	0	126	0	0	0	126	7.88
	MIL PM	Outside Truck Drivers, Heavy *	16.00 HR	X-TRKDVRHV	1.00	607	0	0	0	0	607	37.92

13 04. Rand	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
MIL PM Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57
MIL PM Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL Mobilization and					1,897	1,247	0	0	0	3,143	
TOTAL Mobilization and					1,897	1,247	0	0	0	3,143	
TOTAL Mob, Demob & Pre					1,897	1,247	0	0	0	3,143	
13 04 02. Sitework											
13 04 02 5. Site Preparation											
EP PM LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS005	1.00	0	134	0	0	0	134	16.71
MIL PM Outside Equip. Operators, Heavy	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL PM Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL Site Preparation					942	134	0	0	0	1,075	
13 04 02 10. Line Existing Pipe w/Insituform											
An average cost for different wall thicknesses was used as a basis for cost per LF. Reference Insituform Technologies budget price estimates for cured-in-place pipe.											
The following assumptions were made in determining these prices: 1. Access to construction sites are suitable for equipment and installation crew. 2. A source of clean water is available within 1000 lf 3. Only light cleaning of the existing pipes will be necessary. 4. No by-passing of storm water flows will be necessary. 5. No access shafts will be required. 6. The existing culvert pipes are structurally sound with a cross-sectional ovality of no more than 5 percent.											
USR PM Line Existing 36" CIP w/Insituform	250.00	LF		0.00	0	0	0	0	78,750	78,750	315.00
TOTAL Line Existing Pi					0	0	0	0	78,750	78,750	

13. Pumping Plant

13 04. Rand			QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
		13 04 02 15. Site Restoration											
EP	PM	LDR,BH,WH, 1.00C Y FE BKT, 24"DIP	8.00	HR	L50CS005	1.00	0	134	0	0	0	134	16.71
MIL	PM	Outside Equip. Operators, Heavy	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL	PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
USR	PM	Seeding	1.00	ACR		0.00	0	0	0	0	1,000	1,000	1000.00
TOTAL		Site Restoration					942	134	0	0	1,000	2,075	
TOTAL		Sitework					1,883	267	0	0	79,750	81,900	
		13 04 03. Care and Diversion of Water Care of water consists of the installation of temporary bulkheads. Assume small trash pump and operator for any required pumping. Operator is assumed to be on-site for 10 working days for the purpose of dewatering.											
		13 04 03 02. Site Work											
		13 04 03 02 1. Fabricate Bulkheads											
B MIL	PM	Fabricate Bulkheads	1.00	LS		0.00	0	0	2,500	0	0	2,500	2500.00
TOTAL		Fabricate Bulkhe					0	0	2,500	0	0	2,500	
		13 04 03 02 2. Install Temporary Bulkheads											
MIL	PM	LDR,BH,WH, 1.00C Y FE BKT, 24"DIP	16.00	HR	L50CS003	0.00	0	272	0	0	0	272	17.00
MIL	PM	Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57
MIL	PM	Outside Laborers, (Semi-Skilled)	32.00	HR	X-LABORER	1.00	1,186	0	0	0	0	1,186	37.06
TOTAL		Install Temporar	2.00	DAY			1,883	272	0	0	0	2,155	1077.53
		13 04 03 02 3. Remove Temporary Bulkheads											
MIL	PM	LDR,BH,WH, 1.00C Y FE BKT, 24"DIP	8.00	HR	L50CS003	0.00	0	136	0	0	0	136	17.00
MIL	PM	Outside Equip. Operators, Heavy *	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL	PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL		Remove Temporary	1.00	DAY			942	136	0	0	0	1,078	1077.53

13. Pumping Plant

13 04. Rand	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL Site Work					2,825	408	2,500	0	0	5,733	
13 04 03 15. Mechanical											
13 04 03 15 1. Unwatering Pumps											
MIL PM Outside Equip. Operators, Heavy	80.00	HR	X-EQOPRHVY	1.00	3,485	0	0	0	0	3,485	43.57
MIL PM PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRASH	80.00	HR	P50HO005	1.00	0	235	0	0	0	235	2.94
UPB PM TRK,HWY, 8,800GVW,4X4, 3/4T-PKUP REF. EP 1110-1-8 4X4 3/4-TON PICK-UP, 8800 GVW	80.00	HR	T50FO004	1.00	0	613	0	0	0	613	7.66
TOTAL Unwatering Pumps					3,485	848	0	0	0	4,333	
TOTAL Mechanical					3,485	848	0	0	0	4,333	
TOTAL Care and Diversi					6,310	1,256	2,500	0	0	10,066	
13 04 75. Pumping Plant Superstructure											
13 04 75 04. Masonry											
13 04 75 04 01 . Masonry Restoration											
13 04 75 04 01 1. Clean Brick											
MIL MA Masonry cleaning, steam, masonry bldg, common brick face, w/scaf	2500.00	SF	ULABB9	125.00	4,482	205	0	0	0	4,687	1.87
TOTAL Clean Brick					4,482	205	0	0	0	4,687	
13 04 75 04 01 2. Tuckpointing											
MIL MA Pointing masonry, running bond, cut & repoint brick, soft old mortar	2500.00	SF	AMABBRIC1	10.00	10,094	0	752	0	0	10,846	4.34
TOTAL Tuckpointing					10,094	0	752	0	0	10,846	
TOTAL Masonry Restorat					14,576	205	752	0	0	15,533	

13 04. Rand	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL Masonry					14,576	205	752	0	0	15,533	
13 04 75 06. Wood and Plastic											
13 04 75 06 01. Fiberglass Grating (PS)											
13 04 75 06 01 1. Remove Existing Grating											
B CIV PM Remove Grating	260.00	SF	SIWSSSWK2	40.00	602	0	0	0	0	602	2.32
TOTAL Remove Existing	260.00	SF			602	0	0	0	0	602	2.32
13 04 75 06 01 2. Install New Grating											
CIV PM Grating fbgls, molded, 2" T, 2" sq mesh, grn (mod crsv env)	260.00	SF	SIWSSSWK2	40.00	602	0	5,335	0	0	5,938	22.84
TOTAL Install New Grat	260.00	SF			602	0	5,335	0	0	5,938	22.84
TOTAL Fiberglass Grati					1,205	0	5,335	0	0	6,540	
13 04 75 06 02. Fiberglass Ladders - 7ea (PS)											
13 04 75 06 02 1. Remove Existing Ladders											
B MIL PM Remove Ladders	110.00	VLF	SIWSE4	12.50	1,640	44	0	0	0	1,684	15.31
TOTAL Remove Existing	110.00	LF			1,640	44	0	0	0	1,684	15.31
13 04 75 06 02 2. Install New Ladders											
MIL PM Ladder, 20" wide, bolted to conc, w/safety equip	110.00	VLF	SIWSE4	6.25	3,280	88	5,852	0	0	9,220	83.81
TOTAL Install New Ladd	110.00	LF			3,280	88	5,852	0	0	9,220	83.81
TOTAL Fiberglass Ladde					4,920	132	5,852	0	0	10,903	
13 04 75 06 03. Fiberglass Grating (GW)											
13 04 75 06 03 1. Remove Existing Grating											
B CIV PM Remove Grating	60.00	SF	SIWSSSWK2	40.00	139	0	0	0	0	139	2.32
TOTAL Remove Existing	60.00	SF			139	0	0	0	0	139	2.32

13 04. Rand	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
13 04 75 06 03 2. Install New Grating											
CIV PM Grating fbgls, molded, 2" T, 2" sq mesh, grn (mod crsv env)	60.00	SF	SIWSSSWK2	40.00	139	0	1,231	0	0	1,370	22.84
TOTAL Install New Grat	60.00	SF			139	0	1,231	0	0	1,370	22.84
TOTAL Fiberglass Grati					278	0	1,231	0	0	1,509	
13 04 75 06 04. Fiberglass Ladders (GW)											
13 04 75 06 04 1. Remove Existing Ladders											
B MIL PM Remove Ladders	55.00	VLF	SIWSE4	12.50	820	22	0	0	0	842	15.31
TOTAL Remove Existing	55.00	LF			820	22	0	0	0	842	15.31
13 04 75 06 04 2. Install New Ladders											
MIL PM Ladder, 20" wide, bolted to conc, w/safety equip	55.00	VLF	SIWSE4	6.25	1,640	44	2,926	0	0	4,610	83.81
TOTAL Install New Ladd	55.00	LF			1,640	44	2,926	0	0	4,610	83.81
TOTAL Fiberglass Ladde					2,460	66	2,926	0	0	5,452	
13 04 75 06 05. Fiberglass Railing (GW)											
13 04 75 06 05 1. Remove Existing Railing											
B CIV PM Remove Existing Handrail handrail	120.00	LF	SIWSSSWK2	8.00	1,390	0	0	0	0	1,390	11.58
TOTAL Remove Existing	120.00	LF			1,390	0	0	0	0	1,390	11.58
13 04 75 06 05 2. Install New Railing											
CIV PM Castings fibergl ass, 2" dia rails pickets 5' OC, 42" high, handrail	120.00	LF	SIWSSSWK2	4.00	2,780	0	5,064	0	0	7,844	65.37
TOTAL Install New Rail	120.00	LF			2,780	0	5,064	0	0	7,844	65.37
TOTAL Fiberglass Raili					4,170	0	5,064	0	0	9,234	
TOTAL Wood and Plastic					13,033	197	20,408	0	0	33,639	

13 04. Rand		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
13 04 75 07. Thermal & Moisture Protection												
13 04 75 07 01 . Roofing												
13 04 75 07 01 1. Remove Existing Roof												
M MIL RF	Remove Existing BUR	3.00	CSF	ARFCG1	2.50	314	28	0	0	0	342	113.97
TOTAL	Remove Existing	3.00	CSF			314	28	0	0	0	342	113.97
13 04 75 07 01 2. Install New Roof												
MIL RF	BUR, asph flood ct w/grvl surf, 4 plies #15 felt, mppd, base sheet	3.00	CSF	ARFCG1	2.50	314	28	176	0	0	517	172.48
TOTAL	Install New Roof	3.00	CSF			314	28	176	0	0	517	172.48
TOTAL	Roofing					629	55	176	0	0	859	
TOTAL	Thermal & Moistu					629	55	176	0	0	859	
13 04 75 15. Mechanical												
13 04 75 15 01. HVAC												
13 04 75 15 01 1. Electric Unit Heaters												
MIL ME	Laborers, (Semi-Skilled)	16.00	HR	B-LABORER	1.00	704	0	0	0	0	704	44.03
USR ME	7.5 KW Unit Heaters	2.00	EA		0.00	0	0	0	0	2,138	2,138	1069.11
TOTAL	Electric Unit He	2.00	EA			704	0	0	0	2,138	2,843	1421.31
13 04 75 15 01 2. Ventilation System												
USR ME	Ventalation System Mechanical	1.00	LS		0.00	0	0	0	0	3,564	3,564	3563.69
TOTAL	Ventilation Syst					0	0	0	0	3,564	3,564	
TOTAL	HVAC					704	0	0	0	5,702	6,406	
TOTAL	Mechanical					704	0	0	0	5,702	6,406	

13. Pumping Plant

13 04. Rand	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
13 04 75 16. Electrical											
For details reference electrical estimate dated 13 Feb 2002 in backup file.											
13 04 75 16 01. HVAC											
13 04 75 16 01 1. Electric Unit Heaters											
USR EL Heater Electrical	1.00	LS		0.00	0	0	0	0	2,029	2,029	2029.15
TOTAL Electric Unit He					0	0	0	0	2,029	2,029	
13 04 75 16 01 2. Ventilation System											
USR EL Ventilation System Electrical	1.00	LS		0.00	0	0	0	0	549	549	549.06
TOTAL Ventilation Syst					0	0	0	0	549	549	
TOTAL HVAC					0	0	0	0	2,578	2,578	
13 04 75 16 02. Lighting and Power											
USR EL Lighting and Power	1.00	LS		0.00	0	0	0	0	6,804	6,804	6803.63
TOTAL Lighting and Pow					0	0	0	0	6,804	6,804	
TOTAL Electrical					0	0	0	0	9,382	9,382	
TOTAL Pumping Plant Su					28,942	458	21,336	0	15,084	65,819	
13 04 76. Pumping Machinery & Appurtenance											
13 04 76 15. Mechanical											
13 04 76 15 01. Replace Baseflow Pump No. 1 w/submersible pump											
13 04 76 15 01 1. Remove Existing Pump											
MIL PM Steam/Pipefitters Foreman	12.00	HR	B-STM/PIPE	1.00	468	0	0	0	0	468	39.03
MIL PM Steam/Pipefitters	12.00	HR	B-STM/PIPE	1.00	456	0	0	0	0	456	38.03
MIL PM Laborers, (Semi-Skilled)	8.00	HR	B-LABORER	1.00	296	0	0	0	0	296	37.06
TOTAL Remove Existing	1.00	EA			1,221	0	0	0	0	1,221	1221.15

13 04. Rand		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
13 04 76 15 01 2. New Submersible Pump												
Manufacturers Rep/Erection Engineer is considered for field assistance.												
USR ME	New Submersible Baseflow Pump	1.00	EA		0.00	0	0	0	0	15,443	15,443	15443
USR ME	Erection Engineer	1.00	LS		0.00	594	0	0	0	0	594	593.95
TOTAL	New Submersible	1.00	EA			594	0	0	0	15,443	16,037	16037
13 04 76 15 01 3. Install and Test New Pump												
MIL PM	Steam/Pipefitters Foreman	20.00	HR	B-STM/PIPE	1.00	781	0	0	0	0	781	39.03
MIL PM	Steam/Pipefitters	16.00	HR	B-STM/PIPE	1.00	608	0	0	0	0	608	38.03
MIL PM	Laborers, (Semi-Skilled)	8.00	HR	B-LABORER	1.00	296	0	0	0	0	296	37.06
MIL PM	Outside Truck Drivers, Heavy	8.00	HR	X-TRKDVRHV	1.00	303	0	0	0	0	303	37.92
MAP PM	FLATBED, 8'x 16.0', W/SIDE RACKS (ADD TRUCK)	8.00	HR	T40KF016	1.00	0	7	0	0	0	7	0.84
EP PM	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	8.00	HR	T50FO006	1.00	0	115	0	0	0	115	14.36
TOTAL	Install and Test	1.00	EA			1,989	122	0	0	0	2,110	2110.41
TOTAL	Replace Baseflow	1.00	EA			3,804	122	0	0	15,443	19,368	19368
13 04 76 15 02 . Rehab Stormwater Pumps No 2 & 3												
13 04 76 15 02 1. Remove Existing Pumps												
MIL PM	Steam/Pipefitters Foreman	16.00	HR	B-STM/PIPE	1.00	624	0	0	0	0	624	39.03
MIL PM	Steam/Pipefitters	32.00	HR	B-STM/PIPE	1.00	1,217	0	0	0	0	1,217	38.03
MIL PM	Laborers, (Semi-Skilled)	16.00	HR	B-LABORER	1.00	593	0	0	0	0	593	37.06
MIL PM	Equip. Operators, Crane/Shovel	16.00	HR	B-EQOPRCRN	1.00	697	0	0	0	0	697	43.57
MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	16.00	HR	C75GV002	1.00	0	611	0	0	0	611	38.16
TOTAL	Remove Existing	2.00	EA			3,131	611	0	0	0	3,742	1870.99

13 04. Rand	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
13 04 76 15 02 2. Rehab Pumps											
Manufacturers Rep/Erection Engineer is considered for field assistance.											
USR PM Rehab Stormwater Pumps	2.00	EA		0.00	0	0	0	0	102,000	102,000	51000
USR PM Erection Enginee r	1.00	LS		0.00	2,500	0	0	0	0	2,500	2500.00
TOTAL Rehab Pumps	2.00	EA			2,500	0	0	0	102,000	104,500	52250
13 04 76 15 02 3. Install and Test Rehabbed Pumps											
MIL PM Steam/Pipefitter s Foreman	32.00	HR	B-STM/PIPE	1.00	1,249	0	0	0	0	1,249	39.03
MIL PM Steam/Pipefitter s	48.00	HR	B-STM/PIPE	1.00	1,825	0	0	0	0	1,825	38.03
MIL PM Laborers, (Semi- Skilled)	24.00	HR	B-LABORER	1.00	889	0	0	0	0	889	37.06
MIL PM Equip. Operators , Crane/Shovel	16.00	HR	B-EQOPRCRN	1.00	697	0	0	0	0	697	43.57
MAP PM CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	16.00	HR	C75GV002	1.00	0	611	0	0	0	611	38.16
MIL PM Outside Truck Dr ivers, Heavy	16.00	HR	X-TRKDVRHV	1.00	607	0	0	0	0	607	37.92
MAP PM FLATBED, 8'x 16. 0', W/SIDE RACKS (ADD TRUCK)	16.00	HR	T40KF016	1.00	0	13	0	0	0	13	0.84
EP PM TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	16.00	HR	T50FO006	1.00	0	230	0	0	0	230	14.36
TOTAL Install and Test	2.00	EA			5,267	854	0	0	0	6,121	3060.61
TOTAL Rehab Stormwater	2.00	EA			10,899	1,464	0	0	102,000	114,363	57182
13 04 76 15 03 . Rehab Stormwater Pumps No 4,5&6											
13 04 76 15 03 1. Remove Existing Pumps											
MIL PM Steam/Pipefitter s Foreman	16.00	HR	B-STM/PIPE	1.00	624	0	0	0	0	624	39.03
MIL PM Steam/Pipefitter s	32.00	HR	B-STM/PIPE	1.00	1,217	0	0	0	0	1,217	38.03
MIL PM Laborers, (Semi- Skilled)	16.00	HR	B-LABORER	1.00	593	0	0	0	0	593	37.06
MIL PM Equip. Operators , Crane/Shovel	16.00	HR	B-EQOPRCRN	1.00	697	0	0	0	0	697	43.57
MAP PM CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	16.00	HR	C75GV002	1.00	0	611	0	0	0	611	38.16
TOTAL Remove Existing	3.00	EA			3,131	611	0	0	0	3,742	1247.33

13. Pumping Plant

13 04. Rand	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
13 04 76 15 03 2. Rehab Pumps											
Manufacturers Rep/Erection Engineer is considered for field assistance.											
USR ME Rehab Stormwater Pumps	3.00	EA		0.00	0	0	0	0	206,694	206,694	68898
USR ME Erection Engineer	1.00	LS		0.00	2,970	0	0	0	0	2,970	2969.74
TOTAL Rehab Pumps	3.00	EA			2,970	0	0	0	206,694	209,664	69888
13 04 76 15 03 3. Install and Test Rehabbed Pumps											
MIL PM Steam/Pipefitters Foreman	40.00	HR	B-STM/PIPE	1.00	1,561	0	0	0	0	1,561	39.03
MIL PM Steam/Pipefitters	64.00	HR	B-STM/PIPE	1.00	2,434	0	0	0	0	2,434	38.03
MIL PM Laborers, (Semi-Skilled)	32.00	HR	B-LABORER	1.00	1,186	0	0	0	0	1,186	37.06
MIL PM Equip. Operators, Crane/Shovel	20.00	HR	B-EQOPRCRN	1.00	871	0	0	0	0	871	43.57
MAP PM CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	20.00	HR	C75GV002	1.00	0	763	0	0	0	763	38.16
MIL PM Outside Truck Drivers, Heavy	20.00	HR	X-TRKDVRHV	1.00	758	0	0	0	0	758	37.92
MAP PM FLATBED, 8'x 16.0', W/SIDE RACKS (ADD TRUCK)	20.00	HR	T40KF016	1.00	0	17	0	0	0	17	0.84
EP PM TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	20.00	HR	T50FO006	1.00	0	287	0	0	0	287	14.36
TOTAL Install and Test	3.00	EA			6,810	1,067	0	0	0	7,878	2625.92
TOTAL Rehab Stormwater	3.00	EA			12,912	1,678	0	0	206,694	221,283	73761
TOTAL Mechanical					27,614	3,264	0	0	324,137	355,015	
13 04 76 16. Electrical											
For details reference electrical estimate dated 13 Feb 2002 in backup file.											
13 04 76 16 02. MCC Replacement											
USR EL Replace Motor Control Center	1.00	LS		0.00	0	0	0	0	39,151	39,151	39151
TOTAL MCC Replacement					0	0	0	0	39,151	39,151	

13 04. Rand		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
13 04 76 16 03. Sluice Gate Operator												
USR EL	Electrical for Sluice Gate Operator	1.00	LS		0.00	0	0	0	0	1,313	1,313	1312.98
TOTAL	Sluice Gate Oper					0	0	0	0	1,313	1,313	
TOTAL	Electrical					0	0	0	0	40,464	40,464	
TOTAL	Pumping Machiner					27,614	3,264	0	0	364,600	395,479	

13 04 77. Gates and Valves

13 04 77 15. Mechanical

13 04 77 15 01. Rehab Forebay Sluice Gate

Rehabilitate 1-24 inch sluice gate and install new manual gate hoist.

13 04 77 15 01 1. Remove Existing Gate

MIL PM	Steam/Pipefitters Foreman	4.00	HR	B-STM/PIPE	1.00	156	0	0	0	0	156	39.03
MIL PM	Steam/Pipefitters	4.00	HR	B-STM/PIPE	1.00	152	0	0	0	0	152	38.03
MIL PM	Laborers, (Semi-Skilled)	4.00	HR	B-LABORER	1.00	148	0	0	0	0	148	37.06
MIL PM	Equip. Operators, Crane/Shovel	4.00	HR	B-EQOPRCRN	1.00	174	0	0	0	0	174	43.57
MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	4.00	HR	C75GV002	1.00	0	153	0	0	0	153	38.16
TOTAL	Remove Existing	1.00	EA			631	153	0	0	0	783	783.39

13 04 77 15 01 2. Rehab Gate

Manufacturers Rep/Erection Engineer is considered for field assistance.

USR ME	Rehab 24" Gate w/ New Manual Operator	1.00	EA		0.00	0	0	0	0	3,801	3,801	3801.27
USR ME	Erection Engineer	1.00	LS		0.00	1,188	0	0	0	0	1,188	1187.90
MIL ME	Painters, Structural Steel	8.00	HR	B-PAINTSS	1.00	377	0	0	0	0	377	47.10
TOTAL	Rehab Gate	1.00	EA			1,565	0	0	0	3,801	5,366	5365.98

13 04. Rand		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
	13 04 77 15 01 3. Install/Test Rehabbed Gate											
MIL PM	Steam/Pipefitters Foreman	16.00	HR	B-STM/PIPE	1.00	624	0	0	0	0	624	39.03
MIL PM	Steam/Pipefitters	12.00	HR	B-STM/PIPE	1.00	456	0	0	0	0	456	38.03
MIL PM	Laborers, (Semi-Skilled)	12.00	HR	B-LABORER	1.00	445	0	0	0	0	445	37.06
MIL PM	Equip. Operators, Crane/Shovel	12.00	HR	B-EQOPRCRN	1.00	523	0	0	0	0	523	43.57
MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	12.00	HR	C75GV002	1.00	0	458	0	0	0	458	38.16
MIL PM	Outside Truck Drivers, Heavy	4.00	HR	X-TRKDVRHV	1.00	152	0	0	0	0	152	37.92
MAP PM	FLATBED, 8'x 16.0', W/SIDE RACKS (ADD TRUCK)	4.00	HR	T40KF016	1.00	0	3	0	0	0	3	0.84
EP PM	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	4.00	HR	T50FO006	1.00	0	57	0	0	0	57	14.36
TOTAL	Install/Test Reh	1.00	EA			2,200	519	0	0	0	2,719	2718.73
TOTAL	Rehab Forebay Sl	1.00	EA			4,395	671	0	0	3,801	8,868	8868.10
	13 04 77 15 02. Rehab Dischg Chamber Sluice Gate Rehabilitate 1-24 inch sluice gate and install new electric motor gate hoist.											
	13 04 77 15 02 1. Remove Existing Gate											
MIL PM	Steam/Pipefitters Foreman	8.00	HR	B-STM/PIPE	1.00	312	0	0	0	0	312	39.03
MIL PM	Steam/Pipefitters	8.00	HR	B-STM/PIPE	1.00	304	0	0	0	0	304	38.03
MIL PM	Laborers, (Semi-Skilled)	8.00	HR	B-LABORER	1.00	296	0	0	0	0	296	37.06
MIL PM	Equip. Operators, Crane/Shovel	8.00	HR	B-EQOPRCRN	1.00	349	0	0	0	0	349	43.57
MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16
TOTAL	Remove Existing	1.00	EA			1,261	305	0	0	0	1,567	1566.77
	13 04 77 15 02 2. Rehab Gate Manufacturers Rep/Erection Engineer is considered for field assistance.											
USR ME	Rehab 24" Gate w/ New Electric Operator	1.00	EA		0.00	0	0	0	0	6,890	6,890	6889.80
USR ME	Erection Engineer	1.00	LS		0.00	1,425	0	0	0	0	1,425	1425.48

13 04. Rand		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
MIL ME	Painters, Structural Steel	8.00	HR	B-PAINTSS	1.00	377	0	0	0	0	377	47.10
TOTAL	Rehab Gate	1.00	EA			1,802	0	0	0	6,890	8,692	8692.09
	13 04 77 15 02 3. Install/Test Rehabbed Gate											
MIL PM	Steam/Pipefitters Foreman	24.00	HR	B-STM/PIPE	1.00	937	0	0	0	0	937	39.03
MIL PM	Steam/Pipefitters	16.00	HR	B-STM/PIPE	1.00	608	0	0	0	0	608	38.03
MIL PM	Laborers, (Semi-Skilled)	16.00	HR	B-LABORER	1.00	593	0	0	0	0	593	37.06
MIL PM	Equip. Operators, Crane/Shovel	16.00	HR	B-EQOPRCRN	1.00	697	0	0	0	0	697	43.57
MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	16.00	HR	C75GV002	1.00	0	611	0	0	0	611	38.16
MIL PM	Outside Truck Drivers, Heavy	4.00	HR	X-TRKDVRHV	1.00	152	0	0	0	0	152	37.92
MAP PM	FLATBED, 8'x 16.0', W/SIDE RACKS (ADD TRUCK)	4.00	HR	T40KF016	1.00	0	3	0	0	0	3	0.84
EP PM	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	4.00	HR	T50FO006	1.00	0	57	0	0	0	57	14.36
TOTAL	Install/Test Reh	1.00	EA			2,987	671	0	0	0	3,658	3658.23
TOTAL	Rehab Dischg Cha	1.00	EA			6,051	977	0	0	6,890	13,917	13917
	13 04 77 15 03. Rehab Emerg. Closure Sluice Gate											
	Rehabilitate 1-24 inch sluice gate and install new manual gate hoist.											
	13 04 77 15 03 1. Remove Existing Gate											
MIL PM	Steam/Pipefitters Foreman	8.00	HR	B-STM/PIPE	1.00	312	0	0	0	0	312	39.03
MIL PM	Steam/Pipefitters	8.00	HR	B-STM/PIPE	1.00	304	0	0	0	0	304	38.03
MIL PM	Laborers, (Semi-Skilled)	8.00	HR	B-LABORER	1.00	296	0	0	0	0	296	37.06
MIL PM	Equip. Operators, Crane/Shovel	8.00	HR	B-EQOPRCRN	1.00	349	0	0	0	0	349	43.57
MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16
TOTAL	Remove Existing	1.00	EA			1,261	305	0	0	0	1,567	1566.77

13 04. Rand		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
13 04 77 15 03 2. Rehab Gate												
Manufacturers Rep/Erection Engineer is considered for field assistance.												
USR ME	Rehab 24" Gate w / New Manual Operator	1.00	EA		0.00	0	0	0	0	3,801	3,801	3801.27
USR ME	Erection Enginee r	1.00	LS		0.00	1,188	0	0	0	0	1,188	1187.90
MIL ME	Painters, Struct ural Steel	8.00	HR	B-PAINTSS	1.00	377	0	0	0	0	377	47.10
TOTAL	Rehab Gate	1.00	EA			1,565	0	0	0	3,801	5,366	5365.98
13 04 77 15 03 3. Install/Test Rehabbed Gate												
MIL PM	Steam/Pipefitter s Foreman	24.00	HR	B-STM/PIPE	1.00	937	0	0	0	0	937	39.03
MIL PM	Steam/Pipefitter s	16.00	HR	B-STM/PIPE	1.00	608	0	0	0	0	608	38.03
MIL PM	Laborers, (Semi- Skilled)	16.00	HR	B-LABORER	1.00	593	0	0	0	0	593	37.06
MIL PM	Equip. Operators , Crane/Shovel	16.00	HR	B-EQOPRCRN	1.00	697	0	0	0	0	697	43.57
MAP PM	CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	16.00	HR	C75GV002	1.00	0	611	0	0	0	611	38.16
MIL PM	Outside Truck Dr ivers, Heavy	4.00	HR	X-TRKDVRHV	1.00	152	0	0	0	0	152	37.92
MAP PM	FLATBED, 8'x 16. 0', W/SIDE RACKS (ADD TRUCK)	4.00	HR	T40KF016	1.00	0	3	0	0	0	3	0.84
EP PM	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	4.00	HR	T50FO006	1.00	0	57	0	0	0	57	14.36
TOTAL	Install/Test Reh	1.00	EA			2,987	671	0	0	0	3,658	3658.23
TOTAL	Rehab Emerg. Clo	1.00	EA			5,813	977	0	0	3,801	10,591	10591
13 04 77 15 04. Rehab Forebay Sluice Gate												
Rehabilitate 1-36 inch sluice gate and install new manual gate hoist.												
13 04 77 15 04 1. Remove Existing Gate												
MIL PM	Steam/Pipefitter s Foreman	4.00	HR	B-STM/PIPE	1.00	156	0	0	0	0	156	39.03
MIL PM	Steam/Pipefitter s	4.00	HR	B-STM/PIPE	1.00	152	0	0	0	0	152	38.03
MIL PM	Laborers, (Semi- Skilled)	4.00	HR	B-LABORER	1.00	148	0	0	0	0	148	37.06
MIL PM	Equip. Operators , Crane/Shovel	4.00	HR	B-EQOPRCRN	1.00	174	0	0	0	0	174	43.57
MAP PM	CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	4.00	HR	C75GV002	1.00	0	153	0	0	0	153	38.16

13 04. Rand		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL	Remove Existing	1.00	EA			631	153	0	0	0	783	783.39
	13 04 77 15 04 2. Rehab Gate											
	Manufacturers Rep/Erection Engineer is considered for field assistance.											
USR ME	Rehab 36" Gate w / New Electric Operator	1.00	EA		0.00	0	0	0	0	7,246	7,246	7246.17
USR ME	Erection Enginee r	1.00	LS		0.00	1,663	0	0	0	0	1,663	1663.06
MIL ME	Painters, Struct ural Steel	16.00	HR	B-PAINTSS	1.00	754	0	0	0	0	754	47.10
TOTAL	Rehab Gate	1.00	EA			2,417	0	0	0	7,246	9,663	9662.85
	13 04 77 15 04 3. Install/Test Rehabbed Gate											
MIL PM	Steam/Pipefitter s Foreman	20.00	HR	B-STM/PIPE	1.00	781	0	0	0	0	781	39.03
MIL PM	Steam/Pipefitter s	12.00	HR	B-STM/PIPE	1.00	456	0	0	0	0	456	38.03
MIL PM	Laborers, (Semi- Skilled)	12.00	HR	B-LABORER	1.00	445	0	0	0	0	445	37.06
MIL PM	Equip. Operators , Crane/Shovel	12.00	HR	B-EQOPRCRN	1.00	523	0	0	0	0	523	43.57
MAP PM	CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	12.00	HR	C75GV002	1.00	0	458	0	0	0	458	38.16
MIL PM	Outside Truck Dr ivers, Heavy	4.00	HR	X-TRKDVRHV	1.00	152	0	0	0	0	152	37.92
MAP PM	FLATBED, 8'x 16. 0', W/SIDE RACKS (ADD TRUCK)	4.00	HR	T40KF016	1.00	0	3	0	0	0	3	0.84
EP PM	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	4.00	HR	T50FO006	1.00	0	57	0	0	0	57	14.36
TOTAL	Install/Test Reh	1.00	EA			2,356	519	0	0	0	2,875	2874.84
TOTAL	Rehab Forebay Sl	1.00	EA			5,403	671	0	0	7,246	13,321	13321
	13 04 77 15 05. Rehab Dischg Chamber Sluice Gate											
	Rehabilitate 1-36 inch sluice gate and install new electric motor gate hoist.											
	13 04 77 15 05 1. Remove Existing Gate											
MIL PM	Steam/Pipefitter s Foreman	8.00	HR	B-STM/PIPE	1.00	312	0	0	0	0	312	39.03
MIL PM	Steam/Pipefitter s	8.00	HR	B-STM/PIPE	1.00	304	0	0	0	0	304	38.03

13 04. Rand		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
MIL PM	Laborers, (Semi-Skilled)	8.00	HR	B-LABORER	1.00	296	0	0	0	0	296	37.06
MIL PM	Equip. Operators, Crane/Shovel	8.00	HR	B-EQOPRCRN	1.00	349	0	0	0	0	349	43.57
MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16
TOTAL	Remove Existing	1.00	EA			1,261	305	0	0	0	1,567	1566.77
	13 04 77 15 05 2. Rehab Gate											
	Manufacturers Rep/Erection Engineer is considered for field assistance.											
USR ME	Rehab 36" Gate w / New Electric Operator	1.00	EA		0.00	0	0	0	0	7,246	7,246	7246.17
USR ME	Erection Engineer	1.00	LS		0.00	1,663	0	0	0	0	1,663	1663.06
MIL ME	Painters, Structural Steel	16.00	HR	B-PAINTSS	1.00	754	0	0	0	0	754	47.10
TOTAL	Rehab Gate	1.00	EA			2,417	0	0	0	7,246	9,663	9662.85
	13 04 77 15 05 3. Install/Test Rehabbed Gate											
MIL PM	Steam/Pipefitters Foreman	24.00	HR	B-STM/PIPE	1.00	937	0	0	0	0	937	39.03
MIL PM	Steam/Pipefitters	16.00	HR	B-STM/PIPE	1.00	608	0	0	0	0	608	38.03
MIL PM	Laborers, (Semi-Skilled)	16.00	HR	B-LABORER	1.00	593	0	0	0	0	593	37.06
MIL PM	Equip. Operators, Crane/Shovel	16.00	HR	B-EQOPRCRN	1.00	697	0	0	0	0	697	43.57
MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	16.00	HR	C75GV002	1.00	0	611	0	0	0	611	38.16
MIL PM	Outside Truck Drivers, Heavy	4.00	HR	X-TRKDVRHV	1.00	152	0	0	0	0	152	37.92
MAP PM	FLATBED, 8'x 16.0', W/SIDE RACKS (ADD TRUCK)	4.00	HR	T40KF016	1.00	0	3	0	0	0	3	0.84
EP PM	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	4.00	HR	T50FO006	1.00	0	57	0	0	0	57	14.36
TOTAL	Install/Test Reh	1.00	EA			2,987	671	0	0	0	3,658	3658.23
TOTAL	Rehab Dischg Cha	1.00	EA			6,665	977	0	0	7,246	14,888	14888

13 04. Rand		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
13 04 77 15 06. Rehab Emerg. Closure Sluice Gate												
Rehabilitate 1-36 inch sluice gate and install new manual gate hoist.												
13 04 77 15 06 1. Remove Existing Gate												
MIL PM	Steam/Pipefitters Foreman	8.00	HR	B-STM/PIPE	1.00	312	0	0	0	0	312	39.03
MIL PM	Steam/Pipefitters	8.00	HR	B-STM/PIPE	1.00	304	0	0	0	0	304	38.03
MIL PM	Laborers, (Semi-Skilled)	8.00	HR	B-LABORER	1.00	296	0	0	0	0	296	37.06
MIL PM	Equip. Operators, Crane/Shovel	8.00	HR	B-EQOPRCRN	1.00	349	0	0	0	0	349	43.57
MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16
TOTAL	Remove Existing	1.00	EA			1,261	305	0	0	0	1,567	1566.77
13 04 77 15 06 2. Rehab Gate												
Manufacturers Rep/Erection Engineer is considered for field assistance.												
USR ME	Rehab 36" Gate w / New Manual Operator	1.00	EA		0.00	0	0	0	0	4,039	4,039	4038.85
USR ME	Erection Engineer	1.00	LS		0.00	1,188	0	0	0	0	1,188	1187.90
MIL ME	Painters, Structural Steel	16.00	HR	B-PAINTSS	1.00	754	0	0	0	0	754	47.10
TOTAL	Rehab Gate	1.00	EA			1,942	0	0	0	4,039	5,980	5980.37
13 04 77 15 06 3. Install/Test Rehabbed Gate												
MIL PM	Steam/Pipefitters Foreman	20.00	HR	B-STM/PIPE	1.00	781	0	0	0	0	781	39.03
MIL PM	Steam/Pipefitters	16.00	HR	B-STM/PIPE	1.00	608	0	0	0	0	608	38.03
MIL PM	Laborers, (Semi-Skilled)	16.00	HR	B-LABORER	1.00	593	0	0	0	0	593	37.06
MIL PM	Equip. Operators, Crane/Shovel	16.00	HR	B-EQOPRCRN	1.00	697	0	0	0	0	697	43.57
MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	16.00	HR	C75GV002	1.00	0	611	0	0	0	611	38.16
MIL PM	Outside Truck Drivers, Heavy	4.00	HR	X-TRKDVRHV	1.00	152	0	0	0	0	152	37.92
MAP PM	FLATBED, 8'x 16.0', W/SIDE RACKS (ADD TRUCK)	4.00	HR	T40KF016	1.00	0	3	0	0	0	3	0.84
EP PM	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	4.00	HR	T50FO006	1.00	0	57	0	0	0	57	14.36

13 04. Rand	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL Install/Test Reh	1.00	EA			2,831	671	0	0	0	3,502	3502.12
TOTAL Rehab Emerg. Clo	1.00	EA			6,034	977	0	0	4,039	11,049	11049
TOTAL Mechanical					34,361	5,250	0	0	33,024	72,634	
TOTAL Gates and Valves					34,361	5,250	0	0	33,024	72,634	
13 04 99. Associated General Items											
13 04 99 01. Chain Link Fence											
13 04 99 01 1. Remove Existing Chainlink Fence											
RSM PM Site dml, chain link, remove only, 8' to 10' high	200.00	LF	CODLB6	55.63	398	46	0	0	0	443	2.22
TOTAL Remove Existing					398	46	0	0	0	443	
13 04 99 01 2. Install New Chain Link Fence											
MIL PM Fence, CL scty, galv,10'H, 2.5"line post@10',3"pull post@100',9ga,3barb	200.00	LF	CLABB80B	12.00	2,461	799	2,756	0	0	6,015	30.08
MIL PM Fence,scty,3' x 10',transom for 10' fence,galv,sgl,gate,w/3 barb wire	2.00	EA	CLABB80A	1.00	222	30	398	0	0	650	324.98
TOTAL Install New Chai					2,683	829	3,154	0	0	6,665	
TOTAL Chain Link Fence					3,081	874	3,154	0	0	7,109	
TOTAL Associated Gener					3,081	874	3,154	0	0	7,109	
TOTAL Rand					104,088	12,616	26,989	0	492,458	636,150	

13 05. Hawthorne	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT

13 05. Hawthorne

13 05 01. Mob, Demob & Preparatory Work

13 05 01 01. Mobilization and Demobilization

Use the following crew for to mobilize equipment to the jobsite. Assume the same time for demobilzation. Use 2hrs operating time for each way. (Mob.& Demob.)

Crew -

Truck w/Lowboy	Truck Driver
Mechanics Truck	Operator
Laborer	

13 05 01 01 1. Mobilization and Demobilization

Asume 8hrs to mobilize equipment. Use 1hr operating time for loading and 1hr operating time for unloading equipment. Assume the same for demobilization.

	UPB PM	AIR COMPR, 1,600 CFM, 100 PSI REF. EP 1110-1-8 1600 CFM QUIET, 100 PSI (ADD HOSE)	4.00 HR	A15XX017	1.00	0	183	0	0	0	183	45.70
	UPB PM	GENERATOR, 5.5 KW, 120/240V,PORT REF. EP 1110-1-8 5.5 KW	4.00 HR	G10HO004	0.00	0	7	0	0	0	7	1.64
	MIL PM	PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRASH	4.00 HR	P50HO005	1.00	0	12	0	0	0	12	2.94
	MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	4.00 HR	C75GV002	1.00	0	153	0	0	0	153	38.16
	MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	4.00 HR	L50CS003	0.00	0	68	0	0	0	68	17.00
	UPB PM	WELDER, 300 AMP, SKID,ELEC DRIVE	4.00 HR	W35XX009	0.00	0	6	0	0	0	6	1.59
L	UPB PM	TRK,HWY, 46,000 GVW, 6X4, 3 AXLE	16.00 HR	T50FO018	1.00	0	558	0	0	0	558	34.90
L	MIL PM	TRLR,LOWBOY, 60T, 3 AXLE (ADD TOWING TRUCK)	16.00 HR	T45XX017	1.00	0	134	0	0	0	134	8.38
L	MIL PM	TRK,HWY,10,000GVW,4X2, 1T-PICKUP	16.00 HR	T50FO005	1.00	0	126	0	0	0	126	7.88
	MIL PM	Outside Truck Drivers, Heavy *	16.00 HR	X-TRKDVRHV	1.00	607	0	0	0	0	607	37.92

	13 05. Hawthorne	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
MIL PM	Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57
MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL	Mobilization and					1,897	1,247	0	0	0	3,143	
TOTAL	Mobilization and					1,897	1,247	0	0	0	3,143	
TOTAL	Mob, Demob & Pre					1,897	1,247	0	0	0	3,143	

13 05 03. Care and Diversion of Water

Care of water consists of the installation of temporary bulkheads. Assume small trash pump and operator for any required pumping. Operator is assumed to be on-site for 10 working days for the purpose of dewatering.

13 05 03 02. Site Work

13 05 03 02 1. Fabricate Bulkheads

B MIL PM	Fabricate Bulkheads	1.00	LS		0.00	0	0	2,500	0	0	2,500	2500.00
TOTAL	Fabricate Bulkhe					0	0	2,500	0	0	2,500	

13 05 03 02 2. Install Temporary Bulkheads

MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	16.00	HR	L50CS003	0.00	0	272	0	0	0	272	17.00
MIL PM	Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57
MIL PM	Outside Laborers, (Semi-Skilled)	32.00	HR	X-LABORER	1.00	1,186	0	0	0	0	1,186	37.06
TOTAL	Install Temporar	2.00	DAY			1,883	272	0	0	0	2,155	1077.53

13 05 03 02 3. Remove Temporary Bulkheads

MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS003	0.00	0	136	0	0	0	136	17.00
MIL PM	Outside Equip. Operators, Heavy *	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL	Remove Temporary	1.00	DAY			942	136	0	0	0	1,078	1077.53

13 05. Hawthorne	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL Site Work					2,825	408	2,500	0	0	5,733	
13 05 03 15. Mechanical											
13 05 03 15 1. Unwatering Pumps											
MIL PM Outside Equip. Operators, Heavy	80.00	HR	X-EQOPRHVY	1.00	3,485	0	0	0	0	3,485	43.57
MIL PM PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRASH	80.00	HR	P50HO005	1.00	0	235	0	0	0	235	2.94
UPB PM TRK,HWY, 8,800GVW,4X4, 3/4T-PKUP REF. EP 1110-1-8 4X4 3/4-TON PICK-UP, 8800 GVW	80.00	HR	T50FO004	1.00	0	613	0	0	0	613	7.66
TOTAL Unwatering Pumps					3,485	848	0	0	0	4,333	
TOTAL Mechanical					3,485	848	0	0	0	4,333	
TOTAL Care and Diversi					6,310	1,256	2,500	0	0	10,066	
13 05 75. Pumping Plant Superstructure											
13 05 75 04. Masonry											
13 05 75 04 01 . Masonry Restoration											
13 05 75 04 01 1. Clean Brick											
MIL MA Masonry cleaning, steam, masonry bldg, common brick face, w/scaf	3500.00	SF	ULABB9	125.00	6,275	288	0	0	0	6,562	1.87
TOTAL Clean Brick					6,275	288	0	0	0	6,562	
13 05 75 04 01 2. Tuckpointing											
MIL MA Pointing masonry, running bond, cut & repoint brick, soft old mortar	3500.00	SF	AMABBRIC1	10.00	14,132	0	1,052	0	0	15,185	4.34
TOTAL Tuckpointing					14,132	0	1,052	0	0	15,185	
TOTAL Masonry Restorat					20,407	288	1,052	0	0	21,747	

13 05. Hawthorne	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL Masonry					20,407	288	1,052	0	0	21,747	
13 05 75 06. Wood and Plastic											
13 05 75 06 01. Fiberglass Grating (PS)											
13 05 75 06 01 1. Remove Existing Grating											
B CIV PM Remove Grating	205.00	SF	SIWSSSWK2	40.00	475	0	0	0	0	475	2.32
TOTAL Remove Existing	205.00	SF			475	0	0	0	0	475	2.32
13 05 75 06 01 2. Install New Grating											
CIV PM Grating fbgls, molded, 2" T, 2" sq mesh, grn (mod crsv env)	205.00	SF	SIWSSSWK2	40.00	475	0	4,207	0	0	4,682	22.84
TOTAL Install New Grat	205.00	SF			475	0	4,207	0	0	4,682	22.84
TOTAL Fiberglass Grati					950	0	4,207	0	0	5,157	
13 05 75 06 02. Fiberglass Ladders - 9ea (PS)											
13 05 75 06 02 1. Remove Existing Ladders											
B MIL PM Remove Ladders	110.00	VLF	SIWSE4	12.50	1,640	44	0	0	0	1,684	15.31
TOTAL Remove Existing	110.00	LF			1,640	44	0	0	0	1,684	15.31
13 05 75 06 02 2. Install New Ladders											
MIL PM Ladder, 20" wide, bolted to conc, w/safety equip	110.00	VLF	SIWSE4	6.25	3,280	88	5,852	0	0	9,220	83.81
TOTAL Install New Ladd	110.00	LF			3,280	88	5,852	0	0	9,220	83.81
TOTAL Fiberglass Ladde					4,920	132	5,852	0	0	10,903	
13 05 75 06 03. Fiberglass Grating (GW)											
13 05 75 06 03 1. Remove Existing Grating											
B CIV PM Remove Grating	20.00	SF	SIWSSSWK2	40.00	46	0	0	0	0	46	2.32
TOTAL Remove Existing	20.00	SF			46	0	0	0	0	46	2.32

13 05. Hawthorne	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
13 05 75 06 03 2. Install New Grating											
CIV PM Grating fbgls, molded, 2" T, 2" sq mesh, grn (mod crsv env)	20.00	SF	SIWSSSWK2	40.00	46	0	410	0	0	457	22.84
TOTAL Install New Grat	20.00	SF			46	0	410	0	0	457	22.84
TOTAL Fiberglass Grati					93	0	410	0	0	503	
13 05 75 06 04. Fiberglass Ladders (GW)											
13 05 75 06 04 1. Remove Existing Ladders											
B MIL PM Remove Ladders	10.00	VLF	SIWSE4	12.50	149	4	0	0	0	153	15.31
TOTAL Remove Existing	10.00	LF			149	4	0	0	0	153	15.31
13 05 75 06 04 2. Install New Ladders											
MIL PM Ladder, 20" wide, bolted to conc, w/safety equip	10.00	VLF	SIWSE4	6.25	298	8	532	0	0	838	83.81
TOTAL Install New Ladd	10.00	LF			298	8	532	0	0	838	83.81
TOTAL Fiberglass Ladde					447	12	532	0	0	991	
13 05 75 06 05. Fiberglass Railing (GW)											
13 05 75 06 05 1. Remove Existing Railing											
B CIV PM Remove Existing Handrail handrail	70.00	LF	SIWSSSWK2	8.00	811	0	0	0	0	811	11.58
TOTAL Remove Existing	70.00	LF			811	0	0	0	0	811	11.58
13 05 75 06 05 2. Install New Railing											
CIV PM Castings fiberglass, 2" dia rails pickets 5' OC, 42" high, handrail	70.00	LF	SIWSSSWK2	4.00	1,622	0	2,954	0	0	4,576	65.37
TOTAL Install New Rail	70.00	LF			1,622	0	2,954	0	0	4,576	65.37
TOTAL Fiberglass Raili					2,433	0	2,954	0	0	5,387	
TOTAL Wood and Plastic					8,842	144	13,955	0	0	22,941	

13. Pumping Plant

13 05. Hawthorne	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
13 05 75 07. Thermal & Moisture Protection											
13 05 75 07 01 . Roofing											
13 05 75 07 01 1. Remove Existing Roof											
M MIL RF Remove Existing BUR	4.50	CSF	ARFCG1	2.50	472	41	0	0	0	513	113.97
TOTAL Remove Existing	4.50	CSF			472	41	0	0	0	513	113.97
13 05 75 07 01 2. Install New Roof											
MIL RF BUR, asph flood ct w/grvl surf, 4 plies #15 felt, mppd, base sheet	4.50	CSF	ARFCG1	2.50	472	41	263	0	0	776	172.48
TOTAL Install New Roof	4.50	CSF			472	41	263	0	0	776	172.48
TOTAL Roofing					943	83	263	0	0	1,289	
TOTAL Thermal & Moistu					943	83	263	0	0	1,289	
13 05 75 15. Mechanical											
13 05 75 15 01. HVAC											
13 05 75 15 01 1. Electric Unit Heaters											
MIL ME Laborers, (Semi-Skilled)	16.00	HR	B-LABORER	1.00	704	0	0	0	0	704	44.03
USR ME 7.5 KW Unit Heaters	2.00	EA		0.00	0	0	0	0	2,138	2,138	1069.11
TOTAL Electric Unit He	2.00	EA			704	0	0	0	2,138	2,843	1421.31
13 05 75 15 01 2. Ventilation System											
USR ME Ventalation System Mechanical	1.00	LS		0.00	0	0	0	0	3,564	3,564	3563.69
TOTAL Ventilation Syst					0	0	0	0	3,564	3,564	
TOTAL HVAC					704	0	0	0	5,702	6,406	
TOTAL Mechanical					704	0	0	0	5,702	6,406	

13. Pumping Plant

13 05. Hawthorne	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
13 05 75 16. Electrical											
For details reference electrical estimate dated 13 Feb 2002 in backup file.											
13 05 75 16 01. HVAC											
13 05 75 16 01 1. Electric Unit Heaters											
USR EL Heater Electrical	1.00	LS		0.00	0	0	0	0	2,029	2,029	2029.15
TOTAL Electric Unit He					0	0	0	0	2,029	2,029	
13 05 75 16 01 2. Ventilation System											
USR EL Ventilation System Electrical	1.00	LS		0.00	0	0	0	0	549	549	549.06
TOTAL Ventilation Syst					0	0	0	0	549	549	
TOTAL HVAC					0	0	0	0	2,578	2,578	
13 05 75 16 02. Lighting and Power											
USR EL Lighting and Power	1.00	LS		0.00	0	0	0	0	7,162	7,162	7161.72
TOTAL Lighting and Pow					0	0	0	0	7,162	7,162	
TOTAL Electrical					0	0	0	0	9,740	9,740	
TOTAL Pumping Plant Su					30,897	514	15,271	0	15,442	62,123	
13 05 76. Pumping Machinery & Appurtenance											
13 05 76 15. Mechanical											
13 05 76 15 01. Replace Baseflow Pump w/submersible pump											
13 05 76 15 01 1. Remove Existing Pump											
MIL PM Steam/Pipefitters Foreman	8.00	HR	B-STM/PIPE	1.00	312	0	0	0	0	312	39.03
MIL PM Steam/Pipefitters	8.00	HR	B-STM/PIPE	1.00	304	0	0	0	0	304	38.03
MIL PM Laborers, (Semi-Skilled)	8.00	HR	B-LABORER	1.00	296	0	0	0	0	296	37.06
TOTAL Remove Existing	1.00	EA			913	0	0	0	0	913	912.93

13 05. Hawthorne		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
13 05 76 15 01 2. New Submersible Pump												
Manufacturers Rep/Erection Engineer is considered for field assistance.												
USR ME	New Submersible Baseflow Pump	1.00	EA		0.00	0	0	0	0	7,127	7,127	7127.38
USR ME	Erection Engineer	1.00	LS		0.00	594	0	0	0	0	594	593.95
TOTAL	New Submersible	1.00	EA			594	0	0	0	7,127	7,721	7721.33
13 05 76 15 01 3. Install and Test New Pump												
MIL PM	Steam/Pipefitters Foreman	20.00	HR	B-STM/PIPE	1.00	781	0	0	0	0	781	39.03
MIL PM	Steam/Pipefitters	16.00	HR	B-STM/PIPE	1.00	608	0	0	0	0	608	38.03
MIL PM	Laborers, (Semi-Skilled)	8.00	HR	B-LABORER	1.00	296	0	0	0	0	296	37.06
MIL PM	Outside Truck Drivers, Heavy	8.00	HR	X-TRKDVRHV	1.00	303	0	0	0	0	303	37.92
MAP PM	FLATBED, 8'x 16.0', W/SIDE RACKS (ADD TRUCK)	8.00	HR	T40KF016	1.00	0	7	0	0	0	7	0.84
EP PM	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	8.00	HR	T50FO006	1.00	0	115	0	0	0	115	14.36
TOTAL	Install and Test	1.00	EA			1,989	122	0	0	0	2,110	2110.41
TOTAL	Replace Baseflow	1.00	EA			3,496	122	0	0	7,127	10,745	10745
13 05 76 15 02 . Rehab Stormwater Pumps No 1 & 2												
13 05 76 15 02 1. Remove Existing Pumps												
MIL PM	Steam/Pipefitters Foreman	16.00	HR	B-STM/PIPE	1.00	624	0	0	0	0	624	39.03
MIL PM	Steam/Pipefitters	32.00	HR	B-STM/PIPE	1.00	1,217	0	0	0	0	1,217	38.03
MIL PM	Laborers, (Semi-Skilled)	16.00	HR	B-LABORER	1.00	593	0	0	0	0	593	37.06
MIL PM	Equip. Operators, Crane/Shovel	16.00	HR	B-EQOPRCRN	1.00	697	0	0	0	0	697	43.57
MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	16.00	HR	C75GV002	1.00	0	611	0	0	0	611	38.16
TOTAL	Remove Existing	2.00	EA			3,131	611	0	0	0	3,742	1870.99

13. Pumping Plant

13 05. Hawthorne	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
13 05 76 15 02 2. Rehab Pumps											
Manufacturers Rep/Erection Engineer is considered for field assistance.											
USR ME Rehab Stormwater Pumps	2.00	EA		0.00	0	0	0	0	125,917	125,917	62959
USR ME Erection Engineer	1.00	LS		0.00	2,970	0	0	0	0	2,970	2969.74
TOTAL Rehab Pumps	2.00	EA			2,970	0	0	0	125,917	128,887	64443
13 05 76 15 02 3. Install and Test Rehabbed Pumps											
MIL PM Steam/Pipefitters Foreman	32.00	HR	B-STM/PIPE	1.00	1,249	0	0	0	0	1,249	39.03
MIL PM Steam/Pipefitters	48.00	HR	B-STM/PIPE	1.00	1,825	0	0	0	0	1,825	38.03
MIL PM Laborers, (Semi-Skilled)	24.00	HR	B-LABORER	1.00	889	0	0	0	0	889	37.06
MIL PM Equip. Operators, Crane/Shovel	16.00	HR	B-EQOPRCRN	1.00	697	0	0	0	0	697	43.57
MAP PM CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	16.00	HR	C75GV002	1.00	0	611	0	0	0	611	38.16
MIL PM Outside Truck Drivers, Heavy	16.00	HR	X-TRKDVRHV	1.00	607	0	0	0	0	607	37.92
MAP PM FLATBED, 8'x 16.0', W/SIDE RACKS (ADD TRUCK)	16.00	HR	T40KF016	1.00	0	13	0	0	0	13	0.84
EP PM TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	16.00	HR	T50FO006	1.00	0	230	0	0	0	230	14.36
TOTAL Install and Test	2.00	EA			5,267	854	0	0	0	6,121	3060.61
TOTAL Rehab Stormwater	2.00	EA			11,369	1,464	0	0	125,917	138,750	69375
TOTAL Mechanical					14,864	1,586	0	0	133,044	149,495	
13 05 76 16. Electrical											
For details reference electrical estimate dated 13 Feb 2002 in backup file.											
13 05 76 16 01. Motor Rehabilitation											
USR EL Rehab Motors	1.00	LS		0.00	0	0	0	0	26,379	26,379	26379
TOTAL Motor Rehabilita					0	0	0	0	26,379	26,379	
13 05 76 16 02. MCC Replacement											
USR EL Replace Motor Control Center	1.00	LS		0.00	0	0	0	0	39,628	39,628	39628
TOTAL MCC Replacement					0	0	0	0	39,628	39,628	

13. Pumping Plant

13 05. Hawthorne	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
13 05 76 16 03. Sluice Gate Operator											
USR EL Electrical for Sluice Gate Operator	1.00	LS		0.00	0	0	0	0	561	561	561.00
TOTAL Sluice Gate Oper					0	0	0	0	561	561	
13 05 76 16 04. Lubrication System											
USR EL Electrical for Lubrication System	1.00	LS		0.00	0	0	0	0	2,184	2,184	2184.32
TOTAL Lubrication Syst					0	0	0	0	2,184	2,184	
TOTAL Electrical					0	0	0	0	68,752	68,752	
TOTAL Pumping Machiner					14,864	1,586	0	0	201,797	218,247	
13 05 77. Gates and Valves											
13 05 77 15. Mechanical											
13 05 77 15 01. Rehab Forebay Sluice Gates											
Rehabilitate 1-72 inch sluice gate and install new manual gate hoist.											
13 05 77 15 01 1. Remove Existing Gate											
MIL PM Steam/Pipefitters Foreman	8.00	HR	B-STM/PIPE	1.00	312	0	0	0	0	312	39.03
MIL PM Steam/Pipefitters	8.00	HR	B-STM/PIPE	1.00	304	0	0	0	0	304	38.03
MIL PM Laborers, (Semi-Skilled)	8.00	HR	B-LABORER	1.00	296	0	0	0	0	296	37.06
MIL PM Equip. Operators, Crane/Shovel	8.00	HR	B-EQOPRCRN	1.00	349	0	0	0	0	349	43.57
MAP PM CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16
TOTAL Remove Existing	1.00	EA			1,261	305	0	0	0	1,567	1566.77
13 05 77 15 01 2. Rehab Gate											
Manufacturers Rep/Erection Engineer is considered for field assistance.											
USR ME Rehab 72" Gate w / New Manual Operator	1.00	EA		0.00	0	0	0	0	9,503	9,503	9503.17
USR ME Erection Engineer	1.00	LS		0.00	1,188	0	0	0	0	1,188	1187.90
MIL ME Painters, Structural Steel	16.00	HR	B-PAINTSS	1.00	754	0	0	0	0	754	47.10

13 05. Hawthorne	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL Rehab Gate	1.00	EA			1,942	0	0	0	9,503	11,445	11445
13 05 77 15 01 3. Install/Test Rehabbed Gate											
MIL PM Steam/Pipefitters Foreman	16.00	HR	B-STM/PIPE	1.00	624	0	0	0	0	624	39.03
MIL PM Steam/Pipefitters	12.00	HR	B-STM/PIPE	1.00	456	0	0	0	0	456	38.03
MIL PM Laborers, (Semi-Skilled)	12.00	HR	B-LABORER	1.00	445	0	0	0	0	445	37.06
MIL PM Equip. Operators, Crane/Shovel	12.00	HR	B-EQOPRCRN	1.00	523	0	0	0	0	523	43.57
MAP PM CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	12.00	HR	C75GV002	1.00	0	458	0	0	0	458	38.16
MIL PM Outside Truck Drivers, Heavy	4.00	HR	X-TRKDVRHV	1.00	152	0	0	0	0	152	37.92
MAP PM FLATBED, 8'x 16.0', W/SIDE RACKS (ADD TRUCK)	4.00	HR	T40KF016	1.00	0	3	0	0	0	3	0.84
EP PM TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	4.00	HR	T50FO006	1.00	0	57	0	0	0	57	14.36
TOTAL Install/Test Reh	1.00	EA			2,200	519	0	0	0	2,719	2718.73
TOTAL Rehab Forebay Sl	3.00	EA			5,403	824	0	0	9,503	15,730	5243.40
13 05 77 15 02. Rehab Forebay/Pond Sluice Gate Rehabilitate 1-48 inch sluice gate and install new manual gate hoist.											
13 05 77 15 02 1. Remove Existing Gate											
MIL PM Steam/Pipefitters Foreman	8.00	HR	B-STM/PIPE	1.00	312	0	0	0	0	312	39.03
MIL PM Steam/Pipefitters	8.00	HR	B-STM/PIPE	1.00	304	0	0	0	0	304	38.03
MIL PM Laborers, (Semi-Skilled)	8.00	HR	B-LABORER	1.00	296	0	0	0	0	296	37.06
MIL PM Equip. Operators, Crane/Shovel	8.00	HR	B-EQOPRCRN	1.00	349	0	0	0	0	349	43.57
MAP PM CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16
TOTAL Remove Existing	1.00	EA			1,261	305	0	0	0	1,567	1566.77

13 05. Hawthorne	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
13 05 77 15 02 2. Rehab Gate											
Manufacturers Rep/Erection Engineer is considered for field assistance.											
USR ME Rehab 48" Gate w / New Manual Operator	1.00	EA		0.00	0	0	0	0	5,108	5,108	5107.96
USR ME Erection Enginee r	1.00	LS		0.00	1,188	0	0	0	0	1,188	1187.90
MIL ME Painters, Struct ural Steel	16.00	HR	B-PAINTSS	1.00	754	0	0	0	0	754	47.10
TOTAL Rehab Gate	1.00	EA			1,942	0	0	0	5,108	7,049	7049.48
13 05 77 15 02 3. Install/Test Rehabbed Gate											
MIL PM Steam/Pipefitter s Foreman	20.00	HR	B-STM/PIPE	1.00	781	0	0	0	0	781	39.03
MIL PM Steam/Pipefitter s	16.00	HR	B-STM/PIPE	1.00	608	0	0	0	0	608	38.03
MIL PM Laborers, (Semi- Skilled)	16.00	HR	B-LABORER	1.00	593	0	0	0	0	593	37.06
MIL PM Equip. Operators , Crane/Shovel	16.00	HR	B-EQOPRCRN	1.00	697	0	0	0	0	697	43.57
MAP PM CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	16.00	HR	C75GV002	1.00	0	611	0	0	0	611	38.16
MIL PM Outside Truck Dr ivers, Heavy	4.00	HR	X-TRKDVRHV	1.00	152	0	0	0	0	152	37.92
MAP PM FLATBED, 8'x 16. 0', W/SIDE RACKS (ADD TRUCK)	4.00	HR	T40KF016	1.00	0	3	0	0	0	3	0.84
EP PM TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	4.00	HR	T50FO006	1.00	0	57	0	0	0	57	14.36
TOTAL Install/Test Reh	1.00	EA			2,831	671	0	0	0	3,502	3502.12
TOTAL Rehab Forebay/Po	2.00	EA			6,034	977	0	0	5,108	12,118	6059.19
TOTAL Mechanical					11,437	1,801	0	0	14,611	27,849	
TOTAL Gates and Valves					11,437	1,801	0	0	14,611	27,849	
TOTAL Hawthorne					65,404	6,403	17,771	0	231,850	321,428	

13 06. Homegarden		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
13 06. Homegarden												
13 06 01. Mob, Demob & Preparatory Work												
13 06 01 01. Mobilization and Demobilization Use the following crew for to mobilize equipment to the jobsite. Assume the same time for demobilzation. Use 2hrs operating time for each way. (Mob.& Demob.) Crew - -------- Truck w/Lowboy Truck Driver Mechanics Truck Operator Laborer												
13 06 01 01 1. Mobilization and Demobilization Asume 8hrs to mobilize equipment. Use 1hr operating time for loading and 1hr operating time for unloading equipment. Assume the same for demobilization.												
UPB	PM	AIR COMPR, 1,600 CFM, 100 PSI REF. EP 1110-1-8 1600 CFM QUIET, 100 PSI (ADD HOSE)	4.00	HR	A15XX017	1.00	0	183	0	0	0	183	45.70
MIL	PM	PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRASH	4.00	HR	P50HO005	1.00	0	12	0	0	0	12	2.94
MAP	PM	CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	4.00	HR	C75GV002	1.00	0	153	0	0	0	153	38.16
L UPB	PM	TRK,HWY, 46,000 GVW, 6X4, 3 AXLE	16.00	HR	T50FO018	1.00	0	558	0	0	0	558	34.90
L MIL	PM	TRLR,LOWBOY, 60T , 3 AXLE (ADD TOWING TRUCK)	16.00	HR	T45XX017	1.00	0	134	0	0	0	134	8.38
L MIL	PM	TRK,HWY,10,000GVW,4X2, 1T-PICKUP	16.00	HR	T50FO005	1.00	0	126	0	0	0	126	7.88
MIL	PM	Outside Truck Drivers, Heavy *	16.00	HR	X-TRKDVRHV	1.00	607	0	0	0	0	607	37.92
MIL	PM	Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57
MIL	PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL		Mobilization and					1,897	1,166	0	0	0	3,062	

13 06. Homegarden			QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL Mobilization and							1,897	1,166	0	0	0	3,062	
TOTAL Mob, Demob & Pre							1,897	1,166	0	0	0	3,062	
13 06 02. Sitework													
13 06 02 5. Site Preparation													
EP	PM	LDR,BH,WH, 1.00C Y FE BKT, 24"DIP	8.00	HR	L50CS005	1.00	0	134	0	0	0	134	16.71
MIL	PM	Outside Equip. Operators, Heavy	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL	PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL Site Preparation							942	134	0	0	0	1,075	
13 06 02 10. Line Existing Pipe w/ HDPE Pipe There are 2-pipes to be lined at this location (quantities are multiplied by two)													
USR	PM	HDPE Liner	250.00	LF		0.00	0	0	0	0	25,000	25,000	100.00
B CIV	PM	Grouting, pressure, place grout between pipes	500.00	CF	XXQEB47B	17.50	5,323	1,403	1,500	0	0	8,226	16.45
TOTAL Line Existing Pi							5,323	1,403	1,500	0	25,000	33,226	
13 06 02 15. Site Restoration													
EP	PM	LDR,BH,WH, 1.00C Y FE BKT, 24"DIP	8.00	HR	L50CS005	1.00	0	134	0	0	0	134	16.71
MIL	PM	Outside Equip. Operators, Heavy	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL	PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
USR	PM	Seeding	1.00	ACR		0.00	0	0	0	0	1,000	1,000	1000.00
TOTAL Site Restoration							942	134	0	0	1,000	2,075	
TOTAL Sitework							7,206	1,671	1,500	0	26,000	36,377	

	13 06. Homegarden	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
	13 06 03. Care and Diversion of Water Care of water consists of the installation of temporary bulkheads. Assume small trash pump and operator for any required pumping. Operator is assumed to be on-site for 10 working days for the purpose of dewatering.											
	13 06 03 02. Site Work											
	13 06 03 02 1. Fabricate Bulkheads											
B MIL PM	Fabricate Bulkheads	1.00	LS		0.00	0	0	2,500	0	0	2,500	2500.00
TOTAL	Fabricate Bulkhe					0	0	2,500	0	0	2,500	
	13 06 03 02 2. Install Temporary Bulkheads											
MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	16.00	HR	L50CS003	0.00	0	272	0	0	0	272	17.00
MIL PM	Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57
MIL PM	Outside Laborers, (Semi-Skilled)	32.00	HR	X-LABORER	1.00	1,186	0	0	0	0	1,186	37.06
TOTAL	Install Temporar	2.00	DAY			1,883	272	0	0	0	2,155	1077.53
	13 06 03 02 3. Remove Temporary Bulkheads											
MIL PM	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	8.00	HR	L50CS003	0.00	0	136	0	0	0	136	17.00
MIL PM	Outside Equip. Operators, Heavy *	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL	Remove Temporary	1.00	DAY			942	136	0	0	0	1,078	1077.53
TOTAL	Site Work					2,825	408	2,500	0	0	5,733	
	13 06 03 15. Mechanical											
	13 06 03 15 1. Unwatering Pumps											
MIL PM	Outside Equip. Operators, Heavy	80.00	HR	X-EQOPRHVY	1.00	3,485	0	0	0	0	3,485	43.57
MIL PM	PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRASH	80.00	HR	P50HO005	1.00	0	235	0	0	0	235	2.94

13. Pumping Plant

13 06. Homegarden	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
UPB PM TRK,HWY, 8,800GV W,4X4, 3/4T-PKUP REF. EP 1110-1-8 4X4 3/4-TON PICK-UP, 8800 GVW	80.00	HR	T50FO004	1.00	0	613	0	0	0	613	7.66
TOTAL Unwatering Pumps					3,485	848	0	0	0	4,333	
TOTAL Mechanical					3,485	848	0	0	0	4,333	
TOTAL Care and Diversi					6,310	1,256	2,500	0	0	10,066	

13 06 75. Pumping Plant Superstructure

13 06 75 06. Wood and Plastic

13 06 75 06 01. Fiberglass Grating (PS)

13 06 75 06 01 1. Remove Existing Grating

B CIV PM Remove Grating	50.00	SF	SIWSSSWK2	40.00	116	0	0	0	0	116	2.32
TOTAL Remove Existing	50.00	SF			116	0	0	0	0	116	2.32

13 06 75 06 01 2. Install New Grating

CIV PM Grating fbgls, m olded, 2" T, 2" sq mesh, grn (mod crsv env)	50.00	SF	SIWSSSWK2	40.00	116	0	1,026	0	0	1,142	22.84
TOTAL Install New Grat	50.00	SF			116	0	1,026	0	0	1,142	22.84
TOTAL Fiberglass Grati					232	0	1,026	0	0	1,258	

13 06 75 06 02. Fiberglass Grating (GW)

13 06 75 06 02 1. Remove Existing Grating

B CIV PM Remove Grating	20.00	SF	SIWSSSWK2	40.00	46	0	0	0	0	46	2.32
TOTAL Remove Existing	20.00	SF			46	0	0	0	0	46	2.32

13 06 75 06 02 2. Install New Grating

CIV PM Grating fbgls, m olded, 2" T, 2" sq mesh, grn (mod crsv env)	20.00	SF	SIWSSSWK2	40.00	46	0	410	0	0	457	22.84
TOTAL Install New Grat	20.00	SF			46	0	410	0	0	457	22.84

13 06. Homegarden	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL Fiberglass Grati					93	0	410	0	0	503	
13 06 75 06 03. Fiberglass Ladders (GW)											
13 06 75 06 03 1. Remove Existing Ladders											
B MIL PM Remove Ladders	10.00	VLF	SIWSE4	12.50	149	4	0	0	0	153	15.31
TOTAL Remove Existing	10.00	LF			149	4	0	0	0	153	15.31
13 06 75 06 03 2. Install New Ladders											
MIL PM Ladder, 20" wide , bolted to conc, w/safety equip	10.00	VLF	SIWSE4	6.25	298	8	532	0	0	838	83.81
TOTAL Install New Ladd	10.00	LF			298	8	532	0	0	838	83.81
TOTAL Fiberglass Ladde					447	12	532	0	0	991	
13 06 75 06 04. Fiberglass Railing (GW)											
13 06 75 06 04 1. Remove Existing Railing											
B CIV PM Remove Existing Handrail handrail	70.00	LF	SIWSSSWK2	8.00	811	0	0	0	0	811	11.58
TOTAL Remove Existing	70.00	LF			811	0	0	0	0	811	11.58
13 06 75 06 04 2. Install New Railing											
CIV PM Castings fibergl ass, 2" dia rails pickets 5' OC, 42" high, handrail	70.00	LF	SIWSSSWK2	4.00	1,622	0	2,954	0	0	4,576	65.37
TOTAL Install New Rail	70.00	LF			1,622	0	2,954	0	0	4,576	65.37
TOTAL Fiberglass Raili					2,433	0	2,954	0	0	5,387	
TOTAL Wood and Plastic					3,204	12	4,922	0	0	8,139	

13 06. Homegarden	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
13 06 75 07. Thermal & Moisture Protection											
13 06 75 07 01 . Roofing											
13 06 75 07 01 1. Remove Existing Roof											
M RSM RF Steel roofing, on stl fr, corrugated or ribbed, galv, 30 ga	130.00	SF	ALABG3	137.50	170	0	0	0	0	170	1.31
TOTAL Remove Existing	130.00	SF			170	0	0	0	0	170	1.31
13 06 75 07 01 2. Install New Roof											
RSM RF Steel roofing, on stl fr, corrugated or ribbed, galv, 30 ga	130.00	SF	ALABG3	137.50	170	0	117	0	0	287	2.21
TOTAL Install New Roof	130.00	SF			170	0	117	0	0	287	2.21
TOTAL Roofing					340	0	117	0	0	457	
TOTAL Thermal & Moistu					340	0	117	0	0	457	
13 06 75 16. Electrical											
For details reference electrical estimate dated 13 Feb 2002 in backup file.											
13 06 75 16 02. Lighting and Power											
USR EL Lighting and Power	1.00	LS		0.00	0	0	0	0	4,357	4,357	4356.71
TOTAL Lighting and Pow					0	0	0	0	4,357	4,357	
TOTAL Electrical					0	0	0	0	4,357	4,357	
TOTAL Pumping Plant Su					3,544	12	5,040	0	4,357	12,952	

	13 06. Homegarden	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
	13 06 76. Pumping Machinery & Appurtenance											
	13 06 76 15. Mechanical											
	13 06 76 15 01. Rehab Stormwater Pumps No 1											
	13 06 76 15 01 1. Remove Existing Pump											
MIL PM	Steam/Pipefitters Foreman	8.00	HR	B-STM/PIPE	1.00	312	0	0	0	0	312	39.03
MIL PM	Steam/Pipefitters	8.00	HR	B-STM/PIPE	1.00	304	0	0	0	0	304	38.03
MIL PM	Laborers, (Semi-Skilled)	8.00	HR	B-LABORER	1.00	296	0	0	0	0	296	37.06
MIL PM	Equip. Operators, Crane/Shovel	8.00	HR	B-EQOPRCRN	1.00	349	0	0	0	0	349	43.57
MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16
TOTAL	Remove Existing	1.00	EA			1,261	305	0	0	0	1,567	1566.77
	13 06 76 15 01 2. Rehab Pump											
	Manufacturers Rep/Erection Engineer is considered for field assistance.											
USR ME	Rehab Stormwater Pump	1.00	EA		0.00	0	0	0	0	35,637	35,637	35637
USR ME	Erection Engineer	1.00	LS		0.00	1,425	0	0	0	0	1,425	1425.48
TOTAL	Rehab Pump	1.00	EA			1,425	0	0	0	35,637	37,062	37062
	13 06 76 15 01 3. Install and Test Rehabbed Pump											
MIL PM	Steam/Pipefitters Foreman	16.00	HR	B-STM/PIPE	1.00	624	0	0	0	0	624	39.03
MIL PM	Steam/Pipefitters	12.00	HR	B-STM/PIPE	1.00	456	0	0	0	0	456	38.03
MIL PM	Laborers, (Semi-Skilled)	8.00	HR	B-LABORER	1.00	296	0	0	0	0	296	37.06
MIL PM	Equip. Operators, Crane/Shovel	8.00	HR	B-EQOPRCRN	1.00	349	0	0	0	0	349	43.57
MAP PM	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16
MIL PM	Outside Truck Drivers, Heavy	8.00	HR	X-TRKDVRHV	1.00	303	0	0	0	0	303	37.92
MAP PM	FLATBED, 8'x 16.0', W/SIDE RACKS (ADD TRUCK)	8.00	HR	T40KF016	1.00	0	7	0	0	0	7	0.84
EP PM	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	8.00	HR	T50FO006	1.00	0	115	0	0	0	115	14.36

13 06. Homegarden	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL Install and Test	1.00	EA			2,029	427	0	0	0	2,456	2456.03
TOTAL Rehab Stormwater	1.00	EA			4,716	732	0	0	35,637	41,085	41085
TOTAL Mechanical					4,716	732	0	0	35,637	41,085	

13 06 76 16. Electrical

For details reference electrical estimate dated 13 Feb 2002 in backup file. Estimate was updated to include the use of two, 30 Hp variable frequency drive.

13 06 76 16 01. Motor Rehabilitation

USR EL Rehab Motors	1.00	LS		0.00	0	0	0	0	3,390	3,390	3389.88
TOTAL Motor Rehabilita					0	0	0	0	3,390	3,390	

13 06 76 16 02. Starter Replacement

USR EL Replace Starter w/variable frequency drive	1.00	LS		0.00	0	0	0	0	13,906	13,906	13906
TOTAL Starter Replacem					0	0	0	0	13,906	13,906	
TOTAL Electrical					0	0	0	0	17,296	17,296	
TOTAL Pumping Machiner					4,716	732	0	0	52,932	58,381	

13 06 77. Gates and Valves

13 06 77 15. Mechanical

13 06 77 15 01. Rehab Gate Well Sluice Gate

Rehabilitate 1-36 inch sluice gate and install new manual gate hoist.

13 06 77 15 01 1. Remove Existing Gate

MIL PM Steam/Pipefitters Foreman	12.00	HR	B-STM/PIPE	1.00	468	0	0	0	0	468	39.03
MIL PM Steam/Pipefitters	12.00	HR	B-STM/PIPE	1.00	456	0	0	0	0	456	38.03
MIL PM Laborers, (Semi-Skilled)	12.00	HR	B-LABORER	1.00	445	0	0	0	0	445	37.06
MIL PM Equip. Operators, Crane/Shovel	8.00	HR	B-EQOPRCRN	1.00	349	0	0	0	0	349	43.57
MAP PM CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16

13 06. Homegarden		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL	Remove Existing	1.00	EA			1,718	305	0	0	0	2,023	2023.24
	13 06 77 15 01 2. Rehab Gate											
	Manufacturers Rep/Erection Engineer is considered for field assistance.											
USR ME	Rehab 36" Gate w / New Manual Operator	1.00	EA		0.00	0	0	0	0	4,039	4,039	4038.85
USR ME	Erection Enginee r	1.00	LS		0.00	950	0	0	0	0	950	950.32
MIL ME	Painters, Struct ural Steel	16.00	HR	B-PAINTSS	1.00	754	0	0	0	0	754	47.10
TOTAL	Rehab Gate	1.00	EA			1,704	0	0	0	4,039	5,743	5742.79
	13 06 77 15 01 3. Install/Test Rehabbed Gate											
MIL PM	Steam/Pipefitter s Foreman	16.00	HR	B-STM/PIPE	1.00	624	0	0	0	0	624	39.03
MIL PM	Steam/Pipefitter s	12.00	HR	B-STM/PIPE	1.00	456	0	0	0	0	456	38.03
MIL PM	Laborers, (Semi- Skilled)	12.00	HR	B-LABORER	1.00	445	0	0	0	0	445	37.06
MIL PM	Equip. Operators , Crane/Shovel	12.00	HR	B-EQOPRCRN	1.00	523	0	0	0	0	523	43.57
MAP PM	CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	12.00	HR	C75GV002	1.00	0	458	0	0	0	458	38.16
MIL PM	Outside Truck Dr ivers, Heavy	4.00	HR	X-TRKDVRHV	1.00	152	0	0	0	0	152	37.92
MAP PM	FLATBED, 8'x 16. 0', W/SIDE RACKS (ADD TRUCK)	4.00	HR	T40KF016	1.00	0	3	0	0	0	3	0.84
EP PM	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	4.00	HR	T50FO006	1.00	0	57	0	0	0	57	14.36
TOTAL	Install/Test Reh	1.00	EA			2,200	519	0	0	0	2,719	2718.73
TOTAL	Rehab Gate Well	1.00	EA			5,622	824	0	0	4,039	10,485	10485
TOTAL	Mechanical					5,622	824	0	0	4,039	10,485	
TOTAL	Gates and Valves					5,622	824	0	0	4,039	10,485	
TOTAL	Homegarden					29,294	5,661	9,040	0	87,328	131,323	

13 07. Lakeside

13 07 01. Mob, Demob & Preparatory Work

13 07 01 01. Mobilization and Demobilization

Use the following crew for to mobilize equipment to the jobsite. Assume the same time for demobilzation. Use 2hrs operating time for each way. (Mob.& Demob.)

Crew -

Truck w/Lowboy	Truck Driver
Mechanics Truck	Operator
Laborer	

13 07 01 01 1. Mobilization and Demobilization

Asume 8hrs to mobilize equipment. Use 1hr operating time for loading and 1hr operating time for unloading equipment. Assume the same for demobilization.

	13 07. Lakeside	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
UPB PM	AIR COMPR, 1,600 CFM, 100 PSI REF. EP 1110-1-8 1600 CFM QUIET, 100 PSI (ADD HOSE)	4.00	HR	A15XX017	1.00	0	183	0	0	0	183	45.70
MIL PM	PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRASH	4.00	HR	P50HO005	1.00	0	12	0	0	0	12	2.94
MAP PM	CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	4.00	HR	C75GV002	1.00	0	153	0	0	0	153	38.16
L UPB PM	TRK,HWY, 46,000 GVW, 6X4, 3 AXLE	16.00	HR	T50FO018	1.00	0	558	0	0	0	558	34.90
L MIL PM	TRLR,LOWBOY, 60T , 3 AXLE (ADD TOWING TRUCK)	16.00	HR	T45XX017	1.00	0	134	0	0	0	134	8.38
L MIL PM	TRK,HWY,10,000GVW,4X2, 1T-PICKUP	16.00	HR	T50FO005	1.00	0	126	0	0	0	126	7.88
MIL PM	Outside Truck Drivers, Heavy *	16.00	HR	X-TRKDVRHV	1.00	607	0	0	0	0	607	37.92
MIL PM	Outside Equip. Operators, Heavy *	16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57
MIL PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL	Mobilization and					1,897	1,166	0	0	0	3,062	

			QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
13 07. Lakeside													
TOTAL		Mobilization and					1,897	1,166	0	0	0	3,062	
TOTAL		Mob, Demob & Pre					1,897	1,166	0	0	0	3,062	
		13 07 02. Sitework											
		13 07 02 5. Site Preparation											
EP	PM	LDR,BH,WH, 1.00C Y FE BKT, 24"DIP	8.00	HR	L50CS005	1.00	0	134	0	0	0	134	16.71
MIL	PM	Outside Equip. Operators, Heavy	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL	PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL		Site Preparation					942	134	0	0	0	1,075	
		13 07 02 10. Line Existing Pipe w/ HDPE Pipe There are 2-pipes to be lined at this location (quantities are multiplied by two)											
USR	PM	HDPE Liner	250.00	LF		0.00	0	0	0	0	25,000	25,000	100.00
B CIV	PM	Grouting, pressure, place grout between pipes	500.00	CF	XXQEB47B	17.50	5,323	1,403	1,500	0	0	8,226	16.45
TOTAL		Line Existing Pi					5,323	1,403	1,500	0	25,000	33,226	
		13 07 02 15. Site Restoration											
EP	PM	LDR,BH,WH, 1.00C Y FE BKT, 24"DIP	8.00	HR	L50CS005	1.00	0	134	0	0	0	134	16.71
MIL	PM	Outside Equip. Operators, Heavy	8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL	PM	Outside Laborers, (Semi-Skilled)	16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
USR	PM	Seeding	1.00	ACR		0.00	0	0	0	0	1,000	1,000	1000.00
TOTAL		Site Restoration					942	134	0	0	1,000	2,075	
TOTAL		Sitework					7,206	1,671	1,500	0	26,000	36,377	

13 07. Lakeside		QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
13 07 03. Care and Diversion of Water Care of water consists of the installation of temporary bulkheads. Assume small trash pump and operator for any required pumping. Operator is assumed to be on-site for 10 working days for the purpose of dewatering.												
13 07 03 02. Site Work												
13 07 03 02 1. Fabricate Bulkheads												
B MIL PM Fabricate Bulkheads		1.00	LS		0.00	0	0	2,500	0	0	2,500	2500.00
TOTAL Fabricate Bulkhe						0	0	2,500	0	0	2,500	
13 07 03 02 2. Install Temporary Bulkheads												
MIL PM LDR,BH,WH, 1.00CY FE BKT, 24"DIP		16.00	HR	L50CS003	0.00	0	272	0	0	0	272	17.00
MIL PM Outside Equip. Operators, Heavy *		16.00	HR	X-EQOPRHVY	1.00	697	0	0	0	0	697	43.57
MIL PM Outside Laborers, (Semi-Skilled)		32.00	HR	X-LABORER	1.00	1,186	0	0	0	0	1,186	37.06
TOTAL Install Temporar		2.00	DAY			1,883	272	0	0	0	2,155	1077.53
13 07 03 02 3. Remove Temporary Bulkheads												
MIL PM LDR,BH,WH, 1.00CY FE BKT, 24"DIP		8.00	HR	L50CS003	0.00	0	136	0	0	0	136	17.00
MIL PM Outside Equip. Operators, Heavy *		8.00	HR	X-EQOPRHVY	1.00	349	0	0	0	0	349	43.57
MIL PM Outside Laborers, (Semi-Skilled)		16.00	HR	X-LABORER	1.00	593	0	0	0	0	593	37.06
TOTAL Remove Temporary		1.00	DAY			942	136	0	0	0	1,078	1077.53
TOTAL Site Work						2,825	408	2,500	0	0	5,733	
13 07 03 15. Mechanical												
13 07 03 15 1. Unwatering Pumps												
MIL PM Outside Equip. Operators, Heavy		80.00	HR	X-EQOPRHVY	1.00	3,485	0	0	0	0	3,485	43.57
MIL PM PUMP,TRASH, 4"D, 39,720GPH/25'HD REF. EP 1110-1-8 4" - 39,720 GPH AT 25' HEAD, TRASH		80.00	HR	P50HO005	1.00	0	235	0	0	0	235	2.94

13. Pumping Plant

13 07. Lakeside	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
UPB PM TRK,HWY, 8,800GVW,4X4, 3/4T-PKUP REF. EP 1110-1-8 4X4 3/4-TON PICK-UP, 8800 GVW	80.00	HR	T50FO004	1.00	0	613	0	0	0	613	7.66
TOTAL Unwatering Pumps					3,485	848	0	0	0	4,333	
TOTAL Mechanical					3,485	848	0	0	0	4,333	
TOTAL Care and Diversi					6,310	1,256	2,500	0	0	10,066	

13 07 75. Pumping Plant Superstructure

13 07 75 06. Wood and Plastic

13 07 75 06 01. Fiberglass Grating

13 07 75 06 01 1. Remove Existing Grating

B CIV PM Remove Grating	50.00	SF	SIWSSSWK2	40.00	116	0	0	0	0	116	2.32
TOTAL Remove Existing	50.00	SF			116	0	0	0	0	116	2.32

13 07 75 06 01 2. Install New Grating

CIV PM Grating fbgls, molded, 2" T, 2" sq mesh, grn (mod crsv env)	50.00	SF	SIWSSSWK2	40.00	116	0	1,026	0	0	1,142	22.84
TOTAL Install New Grat	50.00	SF			116	0	1,026	0	0	1,142	22.84
TOTAL Fiberglass Grati					232	0	1,026	0	0	1,258	

13 07 75 06 02. Fiberglass Grating (GW)

13 07 75 06 02 1. Remove Existing Grating

B CIV PM Remove Grating	20.00	SF	SIWSSSWK2	40.00	46	0	0	0	0	46	2.32
TOTAL Remove Existing	20.00	SF			46	0	0	0	0	46	2.32

13 07 75 06 02 2. Install New Grating

CIV PM Grating fbgls, molded, 2" T, 2" sq mesh, grn (mod crsv env)	20.00	SF	SIWSSSWK2	40.00	46	0	410	0	0	457	22.84
TOTAL Install New Grat	20.00	SF			46	0	410	0	0	457	22.84

13 07. Lakeside	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL Fiberglass Grati					93	0	410	0	0	503	
13 07 75 06 03. Fiberglass Ladders (GW)											
13 07 75 06 03 1. Remove Existing Ladders											
B MIL PM Remove Ladders	10.00	VLF	SIWSE4	12.50	149	4	0	0	0	153	15.31
TOTAL Remove Existing	10.00	LF			149	4	0	0	0	153	15.31
13 07 75 06 03 2. Install New Ladders											
MIL PM Ladder, 20" wide , bolted to conc, w/safety equip	10.00	VLF	SIWSE4	6.25	298	8	532	0	0	838	83.81
TOTAL Install New Ladd	10.00	LF			298	8	532	0	0	838	83.81
TOTAL Fiberglass Ladde					447	12	532	0	0	991	
13 07 75 06 04. Fiberglass Railing (GW)											
13 07 75 06 04 1. Remove Existing Railing											
B CIV PM Remove Existing Handrail handrail	70.00	LF	SIWSSSWK2	8.00	811	0	0	0	0	811	11.58
TOTAL Remove Existing	70.00	LF			811	0	0	0	0	811	11.58
13 07 75 06 04 2. Install New Railing											
CIV PM Castings fibergl ass, 2" dia rails pickets 5' OC, 42" high, handrail	70.00	LF	SIWSSSWK2	4.00	1,622	0	2,954	0	0	4,576	65.37
TOTAL Install New Rail	70.00	LF			1,622	0	2,954	0	0	4,576	65.37
TOTAL Fiberglass Raili					2,433	0	2,954	0	0	5,387	
TOTAL Wood and Plastic					3,204	12	4,922	0	0	8,139	

	13 07. Lakeside	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
	13 07 75 07. Thermal & Moisture Protection											
	13 07 75 07 01 . Roofing											
	13 07 75 07 01 1. Remove Existing Roof											
M RSM RF	Steel roofing, on stl fr, corrugated or ribbed, galv, 30 ga	130.00	SF	ALABG3	137.50	170	0	0	0	0	170	1.31
TOTAL	Remove Existing	130.00	SF			170	0	0	0	0	170	1.31
	13 07 75 07 01 2. Install New Roof											
RSM RF	Steel roofing, on stl fr, corrugated or ribbed, galv, 30 ga	130.00	SF	ALABG3	137.50	170	0	117	0	0	287	2.21
TOTAL	Install New Roof	130.00	SF			170	0	117	0	0	287	2.21
TOTAL	Roofing					340	0	117	0	0	457	
TOTAL	Thermal & Moistu					340	0	117	0	0	457	
	13 07 75 16. Electrical											
	For details reference electrical estimate dated 13 Feb 2002 in backup file.											
	13 07 75 16 02. Lighting and Power											
USR EL	Lighting and Power	1.00	LS		0.00	0	0	0	0	4,309	4,309	4308.97
TOTAL	Lighting and Pow					0	0	0	0	4,309	4,309	
TOTAL	Electrical					0	0	0	0	4,309	4,309	
TOTAL	Pumping Plant Su					3,544	12	5,040	0	4,309	12,904	

13 07. Lakeside	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
13 07 76. Pumping Machinery & Appurtenance											
13 07 76 15. Mechanical											
13 07 76 15 01. Rehab Stormwater Pumps No 1											
13 07 76 15 01 1. Remove Existing Pump											
MIL PM Steam/Pipefitters Foreman	8.00	HR	B-STM/PIPE	1.00	312	0	0	0	0	312	39.03
MIL PM Steam/Pipefitters	8.00	HR	B-STM/PIPE	1.00	304	0	0	0	0	304	38.03
MIL PM Laborers, (Semi-Skilled)	8.00	HR	B-LABORER	1.00	296	0	0	0	0	296	37.06
MIL PM Equip. Operators, Crane/Shovel	8.00	HR	B-EQOPRCRN	1.00	349	0	0	0	0	349	43.57
MAP PM CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16
TOTAL Remove Existing	1.00	EA			1,261	305	0	0	0	1,567	1566.77
13 07 76 15 01 2. Rehab Pump											
Manufacturers Rep/Erection Engineer is considered for field assistance.											
USR ME Rehab Stormwater Pump	1.00	EA		0.00	0	0	0	0	36,825	36,825	36825
USR ME Erection Engineer	1.00	LS		0.00	1,782	0	0	0	0	1,782	1781.84
TOTAL Rehab Pump	1.00	EA			1,782	0	0	0	36,825	38,607	38607
13 07 76 15 01 3. Install and Test Rehabbed Pump											
MIL PM Steam/Pipefitters Foreman	16.00	HR	B-STM/PIPE	1.00	624	0	0	0	0	624	39.03
MIL PM Steam/Pipefitters	12.00	HR	B-STM/PIPE	1.00	456	0	0	0	0	456	38.03
MIL PM Laborers, (Semi-Skilled)	8.00	HR	B-LABORER	1.00	296	0	0	0	0	296	37.06
MIL PM Equip. Operators, Crane/Shovel	8.00	HR	B-EQOPRCRN	1.00	349	0	0	0	0	349	43.57
MAP PM CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	8.00	HR	C75GV002	1.00	0	305	0	0	0	305	38.16
MIL PM Outside Truck Drivers, Heavy	8.00	HR	X-TRKDVRHV	1.00	303	0	0	0	0	303	37.92
MAP PM FLATBED, 8'x 16.0', W/SIDE RACKS (ADD TRUCK)	8.00	HR	T40KF016	1.00	0	7	0	0	0	7	0.84
EP PM TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	8.00	HR	T50FO006	1.00	0	115	0	0	0	115	14.36

13. Pumping Plant

13 07. Lakeside	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
TOTAL Install and Test	1.00	EA			2,029	427	0	0	0	2,456	2456.03
TOTAL Rehab Stormwater	1.00	EA			5,072	732	0	0	36,825	42,629	42629
TOTAL Mechanical					5,072	732	0	0	36,825	42,629	

13 07 76 16. Electrical

For details reference electrical estimate dated 13 Feb 2002 in backup file.

13 07 76 16 01. Motor Rehabilitation

USR EL Rehab Motors	1.00	LS		0.00	0	0	0	0	4,225	4,225	4225.41
TOTAL Motor Rehabilita					0	0	0	0	4,225	4,225	

13 07 76 16 02. Starter Replacement

USR EL Replace Starter	1.00	LS		0.00	0	0	0	0	8,654	8,654	8653.74
TOTAL Starter Replacem					0	0	0	0	8,654	8,654	
TOTAL Electrical					0	0	0	0	12,879	12,879	
TOTAL Pumping Machiner					5,072	732	0	0	49,704	55,509	

13 07 77. Gates and Valves

13 07 77 15. Mechanical

13 07 77 15 01. Rehab Gate Well Sluice Gate

Rehabilitate 1-48 inch sluice gate and install new manual gate hoist.

13 07 77 15 01 1. Remove Existing Gate

MIL PM Steam/Pipefitters Foreman	16.00	HR	B-STM/PIPE	1.00	624	0	0	0	0	624	39.03
MIL PM Steam/Pipefitters	16.00	HR	B-STM/PIPE	1.00	608	0	0	0	0	608	38.03
MIL PM Laborers, (Semi-Skilled)	16.00	HR	B-LABORER	1.00	593	0	0	0	0	593	37.06
MIL PM Equip. Operators, Crane/Shovel	12.00	HR	B-EQOPRCRN	1.00	523	0	0	0	0	523	43.57
MAP PM CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	12.00	HR	C75GV002	1.00	0	458	0	0	0	458	38.16
TOTAL Remove Existing	1.00	EA			2,349	458	0	0	0	2,807	2806.63

13 07. Lakeside	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
13 07 77 15 01 2. Rehab Gate											
Manufacturers Rep/Erection Engineer is considered for field assistance.											
USR ME Rehab 48" Gate w / New Manual Operator	1.00	EA		0.00	0	0	0	0	5,108	5,108	5107.96
USR ME Erection Enginee r	1.00	LS		0.00	950	0	0	0	0	950	950.32
MIL ME Painters, Struct ural Steel	20.00	HR	B-PAINTSS	1.00	942	0	0	0	0	942	47.10
TOTAL Rehab Gate	1.00	EA			1,892	0	0	0	5,108	7,000	7000.31
13 07 77 15 01 3. Install/Test Rehabbed Gate											
MIL PM Steam/Pipefitter s Foreman	24.00	HR	B-STM/PIPE	1.00	937	0	0	0	0	937	39.03
MIL PM Steam/Pipefitter s	20.00	HR	B-STM/PIPE	1.00	761	0	0	0	0	761	38.03
MIL PM Laborers, (Semi- Skilled)	20.00	HR	B-LABORER	1.00	741	0	0	0	0	741	37.06
MIL PM Equip. Operators , Crane/Shovel	16.00	HR	B-EQOPRCRN	1.00	697	0	0	0	0	697	43.57
MAP PM CRANE,HYD,S/P,RT ,4WD,20T/70'BOOM	16.00	HR	C75GV002	1.00	0	611	0	0	0	611	38.16
MIL PM Outside Truck Dr ivers, Heavy	4.00	HR	X-TRKDVRHV	1.00	152	0	0	0	0	152	37.92
MAP PM FLATBED, 8'x 16. 0', W/SIDE RACKS (ADD TRUCK)	4.00	HR	T40KF016	1.00	0	3	0	0	0	3	0.84
EP PM TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	4.00	HR	T50FO006	1.00	0	57	0	0	0	57	14.36
TOTAL Install/Test Reh	1.00	EA			3,287	671	0	0	0	3,959	3958.59
TOTAL Rehab Gate Well	1.00	EA			7,528	1,129	0	0	5,108	13,766	13766
TOTAL Mechanical					7,528	1,129	0	0	5,108	13,766	
TOTAL Gates and Valves					7,528	1,129	0	0	5,108	13,766	
TOTAL Lakeside					31,557	5,966	9,040	0	85,121	131,684	
TOTAL Pumping Plant					532,088	66,388	138,531	0	2,405,469	3,142,476	

30 01. Planning, Engineeri	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
30. Planning, Engineering, & Design											
30 01. Planning, Engineering, & Design											
TOTAL Planning, Engine					0	0	0	0	2,441,000	2,441,000	
TOTAL Planning, Engine					0	0	0	0	2,441,000	2,441,000	
TOTAL Planning, Engine					0	0	0	0	2,441,000	2,441,000	

31 01. Construction Manage	QUANTY	UOM	CREW ID	OUTPUT	LABOR	EQUIPMNT	MATERIAL	SUPPLIES	UNIT PRC	TOTAL COST	UNIT
31. Construction Management											
31 01. Construction Management											
TOTAL Construction Man				0	0	0	0	0	1,436,000	1,436,000	
TOTAL Construction Man				0	0	0	0	0	1,436,000	1,436,000	
TOTAL Construction Man				0	0	0	0	0	1,436,000	1,436,000	
TOTAL WOOD RIVER				2,404,213	671,725	922,955		0	11731840	15,730,734	

** LABOR BACKUP **

SRC	LABOR ID	DESCRIPTION	BASE	OVERTM	TXS/INS	FRNG	TRVL	RATE	UOM	UPDATE	**** TOTAL **** DEFAULT	HOURS
MIL	B-BRKLAYR	Bricklayers	20.90	0.0%	34.5%	5.46	0.00	33.57	HR	01/01/99	33.57	1881
MIL	B-CARPNTER	Carpenters	20.46	0.0%	36.4%	6.34	0.00	34.25	HR	02/05/02	33.22	57
MIL	B-EQOPRCRN	Equip. Operators, Crane/Shovel	23.90	0.0%	28.1%	12.95	0.00	43.57	HR	02/05/02	34.98	4042
MIL	B-EQOPRLT	Equip. Operators, Light	18.35	0.0%	28.1%	12.95	0.00	36.46	HR	02/05/02	30.98	2614
MIL	B-EQOPRMED	Equip. Operators, Medium	18.49	0.0%	28.1%	12.95	0.00	36.64	HR	02/05/02	32.72	1151
MIL	B-EQOPROIL	Equip. Operators, Oilers	18.02	0.0%	28.1%	12.95	0.00	36.03	HR	02/05/02	27.66	1944
MIL	B-LABORER	Laborers, (Semi-Skilled)	19.95	0.0%	36.4%	9.85	0.00	37.06	HR	02/05/02	25.28	14348
MIL	B-PAINTORD	Painters, Ordinary	23.02	0.0%	32.1%	6.60	0.00	37.01	HR	02/05/02	29.28	159
MIL	B-PAINTSS	Painters, Structural Steel	25.02	0.0%	32.1%	6.60	0.00	39.65	HR	02/12/02	38.66	1142
MIL	B-PILEDRVR	Pile Drivers	20.46	0.0%	46.8%	6.34	0.00	36.38	HR	02/05/02	36.11	2492
MIL	B-RODMAN	Rodmen, (Reinforcing)	22.07	0.0%	49.1%	11.18	0.00	44.09	HR	02/05/02	39.15	1129
MIL	B-ROOFER	Roofers, Composition	18.13	0.0%	51.1%	4.92	0.00	32.31	HR	01/01/99	32.31	102
MIL	B-ROOFERH	Roofers, (Semi-Skilled)	15.24	0.0%	51.1%	4.59	0.00	27.62	HR	01/01/99	27.62	41
MIL	B-SHTMTLWK	Sheet Metal Workers	22.56	0.0%	29.3%	8.41	0.00	37.58	HR	01/01/99	37.58	8
MIL	B-STM/PIPE	Steam/Pipefitters	23.99	0.0%	25.5%	7.92	0.00	38.03	HR	01/01/99	38.03	5228
MIL	B-STRSTEEL	Structural Steel Workers	22.07	0.0%	59.3%	11.18	0.00	46.34	HR	02/05/02	42.08	4439
MIL	B-TRKDVRHV	Truck Drivers, Heavy	23.79	0.0%	32.1%	6.49	0.00	37.92	HR	02/05/02	26.04	4526
MIL	B-TRKDVRLT	Truck Drivers, Light	23.19	0.0%	32.1%	6.49	0.00	37.12	HR	02/05/02	24.87	3
MIL	B-WELDERS	Welders, Structural Steel	22.07	0.0%	59.3%	11.18	0.00	46.34	HR	02/05/02	42.08	16
FOP	FC-ENGPE	Engineers, Project	24.33	0.0%	19.9%	0.89	0.00	30.06	HR	01/01/99	30.06	128
FOP	FD-SECRT	Security Officers	10.32	0.0%	29.5%	0.89	0.00	14.25	HR	01/01/99	14.25	598
MIL	X-EQOPRHVY	Outside Equip. Operators, Heavy	23.90	0.0%	28.1%	12.95	0.00	43.57	HR	02/05/02	31.61	5552
MIL	X-EQOPRMED	Outside Equip. Operators, Medium	18.49	0.0%	28.1%	12.95	0.00	36.64	HR	02/05/02	30.38	280
MIL	X-LABORER	Outside Laborers, (Semi-Skilled)	19.95	0.0%	36.4%	9.85	0.00	37.06	HR	02/05/02	24.17	4700
MIL	X-STRSTEEL	Outside Steel Workers	22.07	0.0%	50.7%	8.36	0.00	41.61	HR	02/05/02	38.28	1188
MIL	X-TRKDVRHV	Outside Truck Drivers, Heavy	23.79	0.0%	32.1%	6.49	0.00	37.92	HR	02/05/02	24.55	1212

SRC	LABOR ID	DESCRIPTION	BASE	OVERTM	TXS/INS	FRNG	TRVL	RATE	UOM	UPDATE	**** TOTAL **** DEFAULT	HOURS
0	5	0. Overhead Items - PM										
0	5	5. Electrical Contractor										
0	5	10. Mechanical Contractor										
0	5	15. Roofing Contractor										
0	5	20. Masonry Contractor										
01	01	1. Lands and Damages										
11	01	01. Levees and Berms										
11	02	01. Upper Wood River Levee (UWRL)										
MIL	B-EQOPRCRN	Equip. Operators, Crane/Shovel	23.90	0.0%	28.1%	12.95	0.00	43.57	HR	02/05/02	34.98	401
MIL	B-EQOPRLT	Equip. Operators, Light	18.35	0.0%	28.1%	12.95	0.00	36.46	HR	02/05/02	30.98	109
MIL	B-EQOPRMED	Equip. Operators, Medium	18.49	0.0%	28.1%	12.95	0.00	36.64	HR	02/05/02	32.72	253
MIL	B-EQOPROIL	Equip. Operators, Oilers	18.02	0.0%	28.1%	12.95	0.00	36.03	HR	02/05/02	27.66	321
MIL	B-LABORER	Laborers, (Semi-Skilled)	19.95	0.0%	36.4%	9.85	0.00	37.06	HR	02/05/02	25.28	897
MIL	B-PAINTSS	Painters, Structural Steel	25.02	0.0%	32.1%	6.60	0.00	39.65	HR	02/12/02	38.66	76
MIL	B-STM/PIPE	Steam/Pipefitters	23.99	0.0%	25.5%	7.92	0.00	38.03	HR	01/01/99	38.03	280
MIL	B-STRSTEEL	Structural Steel Workers	22.07	0.0%	59.3%	11.18	0.00	46.34	HR	02/05/02	42.08	256
MIL	B-TRKDVRHV	Truck Drivers, Heavy	23.79	0.0%	32.1%	6.49	0.00	37.92	HR	02/05/02	26.04	996
MIL	X-EQOPRHVY	Outside Equip. Operators, Heavy	23.90	0.0%	28.1%	12.95	0.00	43.57	HR	02/05/02	31.61	496
MIL	X-LABORER	Outside Laborers, (Semi-Skilled)	19.95	0.0%	36.4%	9.85	0.00	37.06	HR	02/05/02	24.17	288
MIL	X-TRKDVRHV	Outside Truck Drivers, Heavy	23.79	0.0%	32.1%	6.49	0.00	37.92	HR	02/05/02	24.55	80
11	02	02. East and West Fork Levee										
MIL	B-EQOPRCRN	Equip. Operators, Crane/Shovel	23.90	0.0%	28.1%	12.95	0.00	43.57	HR	02/05/02	34.98	485
MIL	B-EQOPRLT	Equip. Operators, Light	18.35	0.0%	28.1%	12.95	0.00	36.46	HR	02/05/02	30.98	119
MIL	B-EQOPRMED	Equip. Operators, Medium	18.49	0.0%	28.1%	12.95	0.00	36.64	HR	02/05/02	32.72	253
MIL	B-EQOPROIL	Equip. Operators, Oilers	18.02	0.0%	28.1%	12.95	0.00	36.03	HR	02/05/02	27.66	321
MIL	B-LABORER	Laborers, (Semi-Skilled)	19.95	0.0%	36.4%	9.85	0.00	37.06	HR	02/05/02	25.28	1538
MIL	B-PAINTSS	Painters, Structural Steel	25.02	0.0%	32.1%	6.60	0.00	39.65	HR	02/12/02	38.66	120
MIL	B-STM/PIPE	Steam/Pipefitters	23.99	0.0%	25.5%	7.92	0.00	38.03	HR	01/01/99	38.03	504
MIL	B-STRSTEEL	Structural Steel Workers	22.07	0.0%	59.3%	11.18	0.00	46.34	HR	02/05/02	42.08	513
MIL	B-TRKDVRHV	Truck Drivers, Heavy	23.79	0.0%	32.1%	6.49	0.00	37.92	HR	02/05/02	26.04	996
FOP	FD-SECRT	Security Officers	10.32	0.0%	29.5%	0.89	0.00	14.25	HR	01/01/99	14.25	239
MIL	X-EQOPRHVY	Outside Equip. Operators, Heavy	23.90	0.0%	28.1%	12.95	0.00	43.57	HR	02/05/02	31.61	1040
MIL	X-LABORER	Outside Laborers, (Semi-Skilled)	19.95	0.0%	36.4%	9.85	0.00	37.06	HR	02/05/02	24.17	672
MIL	X-TRKDVRHV	Outside Truck Drivers, Heavy	23.79	0.0%	32.1%	6.49	0.00	37.92	HR	02/05/02	24.55	160
11	02	03. Lower Wood River Levee (LWRL)										
MIL	B-EQOPRCRN	Equip. Operators, Crane/Shovel	23.90	0.0%	28.1%	12.95	0.00	43.57	HR	02/05/02	34.98	1273
MIL	B-EQOPRLT	Equip. Operators, Light	18.35	0.0%	28.1%	12.95	0.00	36.46	HR	02/05/02	30.98	303
MIL	B-EQOPRMED	Equip. Operators, Medium	18.49	0.0%	28.1%	12.95	0.00	36.64	HR	02/05/02	32.72	590
MIL	B-EQOPROIL	Equip. Operators, Oilers	18.02	0.0%	28.1%	12.95	0.00	36.03	HR	02/05/02	27.66	749
MIL	B-LABORER	Laborers, (Semi-Skilled)	19.95	0.0%	36.4%	9.85	0.00	37.06	HR	02/05/02	25.28	5183
MIL	B-PAINTSS	Painters, Structural Steel	25.02	0.0%	32.1%	6.60	0.00	39.65	HR	02/12/02	38.66	300
MIL	B-STM/PIPE	Steam/Pipefitters	23.99	0.0%	25.5%	7.92	0.00	38.03	HR	01/01/99	38.03	1632
MIL	B-STRSTEEL	Structural Steel Workers	22.07	0.0%	59.3%	11.18	0.00	46.34	HR	02/05/02	42.08	1836
MIL	B-TRKDVRHV	Truck Drivers, Heavy	23.79	0.0%	32.1%	6.49	0.00	37.92	HR	02/05/02	26.04	2324
FOP	FD-SECRT	Security Officers	10.32	0.0%	29.5%	0.89	0.00	14.25	HR	01/01/99	14.25	359
MIL	X-EQOPRHVY	Outside Equip. Operators, Heavy	23.90	0.0%	28.1%	12.95	0.00	43.57	HR	02/05/02	31.61	3112
MIL	X-LABORER	Outside Laborers, (Semi-Skilled)	19.95	0.0%	36.4%	9.85	0.00	37.06	HR	02/05/02	24.17	2128
MIL	X-TRKDVRHV	Outside Truck Drivers, Heavy	23.79	0.0%	32.1%	6.49	0.00	37.92	HR	02/05/02	24.55	508

SRC	LABOR ID	DESCRIPTION	BASE	OVERTM	TXS/INS	FRNG	TRVL	RATE	UOM	UPDATE	**** TOTAL **** DEFAULT	HOURS
11 03 01. Upper Wood River Levee (UWRL)												
MIL	B-BRKLAYR	Bricklayers	20.90	0.0%	34.5%	5.46	0.00	33.57	HR	01/01/99	33.57	102
MIL	B-CARPNTER	Carpenters	20.46	0.0%	36.4%	6.34	0.00	34.25	HR	02/05/02	33.22	3
MIL	B-EQOPRCRN	Equip. Operators, Crane/Shovel	23.90	0.0%	28.1%	12.95	0.00	43.57	HR	02/05/02	34.98	2
MIL	B-EQOPRLT	Equip. Operators, Light	18.35	0.0%	28.1%	12.95	0.00	36.46	HR	02/05/02	30.98	132
MIL	B-EQOPRMED	Equip. Operators, Medium	18.49	0.0%	28.1%	12.95	0.00	36.64	HR	02/05/02	32.72	11
MIL	B-EQOPROIL	Equip. Operators, Oilers	18.02	0.0%	28.1%	12.95	0.00	36.03	HR	02/05/02	27.66	2
MIL	B-LABORER	Laborers, (Semi-Skilled)	19.95	0.0%	36.4%	9.85	0.00	37.06	HR	02/05/02	25.28	296
MIL	B-PAINTORD	Painters, Ordinary	23.02	0.0%	32.1%	6.60	0.00	37.01	HR	02/05/02	29.28	82
MIL	B-PAINTSS	Painters, Structural Steel	25.02	0.0%	32.1%	6.60	0.00	39.65	HR	02/12/02	38.66	102
MIL	B-RODMAN	Rodmen, (Reinforcing)	22.07	0.0%	49.1%	11.18	0.00	44.09	HR	02/05/02	39.15	75
MIL	B-STRSTEEL	Structural Steel Workers	22.07	0.0%	59.3%	11.18	0.00	46.34	HR	02/05/02	42.08	154
MIL	B-TRKDVRHV	Truck Drivers, Heavy	23.79	0.0%	32.1%	6.49	0.00	37.92	HR	02/05/02	26.04	46
FOP	FC-ENGPE	Engineers, Project	24.33	0.0%	19.9%	0.89	0.00	30.06	HR	01/01/99	30.06	48
MIL	X-EQOPRMED	Outside Equip. Operators, Medium	18.49	0.0%	28.1%	12.95	0.00	36.64	HR	02/05/02	30.38	104
MIL	X-LABORER	Outside Laborers, (Semi-Skilled)	19.95	0.0%	36.4%	9.85	0.00	37.06	HR	02/05/02	24.17	380
MIL	X-STRSTEEL	Outside Steel Workers	22.07	0.0%	50.7%	8.36	0.00	41.61	HR	02/05/02	38.28	444
MIL	X-TRKDVRHV	Outside Truck Drivers, Heavy	23.79	0.0%	32.1%	6.49	0.00	37.92	HR	02/05/02	24.55	8
11 03 02. East and West Fork Levee OR)												
MIL	B-BRKLAYR	Bricklayers	20.90	0.0%	34.5%	5.46	0.00	33.57	HR	01/01/99	33.57	2
MIL	B-CARPNTER	Carpenters	20.46	0.0%	36.4%	6.34	0.00	34.25	HR	02/05/02	33.22	12
MIL	B-EQOPRCRN	Equip. Operators, Crane/Shovel	23.90	0.0%	28.1%	12.95	0.00	43.57	HR	02/05/02	34.98	200
MIL	B-EQOPRLT	Equip. Operators, Light	18.35	0.0%	28.1%	12.95	0.00	36.46	HR	02/05/02	30.98	391
MIL	B-EQOPRMED	Equip. Operators, Medium	18.49	0.0%	28.1%	12.95	0.00	36.64	HR	02/05/02	32.72	9
MIL	B-EQOPROIL	Equip. Operators, Oilers	18.02	0.0%	28.1%	12.95	0.00	36.03	HR	02/05/02	27.66	104
MIL	B-LABORER	Laborers, (Semi-Skilled)	19.95	0.0%	36.4%	9.85	0.00	37.06	HR	02/05/02	25.28	815
MIL	B-PAINTORD	Painters, Ordinary	23.02	0.0%	32.1%	6.60	0.00	37.01	HR	02/05/02	29.28	1
MIL	B-PAINTSS	Painters, Structural Steel	25.02	0.0%	32.1%	6.60	0.00	39.65	HR	02/12/02	38.66	9
MIL	B-PILEDRVR	Pile Drivers	20.46	0.0%	46.8%	6.34	0.00	36.38	HR	02/05/02	36.11	482
MIL	B-RODMAN	Rodmen, (Reinforcing)	22.07	0.0%	49.1%	11.18	0.00	44.09	HR	02/05/02	39.15	215
MIL	B-STRSTEEL	Structural Steel Workers	22.07	0.0%	59.3%	11.18	0.00	46.34	HR	02/05/02	42.08	8
MIL	B-TRKDVRHV	Truck Drivers, Heavy	23.79	0.0%	32.1%	6.49	0.00	37.92	HR	02/05/02	26.04	20
FOP	FC-ENGPE	Engineers, Project	24.33	0.0%	19.9%	0.89	0.00	30.06	HR	01/01/99	30.06	8
MIL	X-EQOPRMED	Outside Equip. Operators, Medium	18.49	0.0%	28.1%	12.95	0.00	36.64	HR	02/05/02	30.38	16
MIL	X-LABORER	Outside Laborers, (Semi-Skilled)	19.95	0.0%	36.4%	9.85	0.00	37.06	HR	02/05/02	24.17	32
MIL	X-STRSTEEL	Outside Steel Workers	22.07	0.0%	50.7%	8.36	0.00	41.61	HR	02/05/02	38.28	72
MIL	X-TRKDVRHV	Outside Truck Drivers, Heavy	23.79	0.0%	32.1%	6.49	0.00	37.92	HR	02/05/02	24.55	8
11 03 03. Lower Wood River Levee (LWRL) RIES)												
MIL	B-BRKLAYR	Bricklayers	20.90	0.0%	34.5%	5.46	0.00	33.57	HR	01/01/99	33.57	172
MIL	B-CARPNTER	Carpenters	20.46	0.0%	36.4%	6.34	0.00	34.25	HR	02/05/02	33.22	42
MIL	B-EQOPRCRN	Equip. Operators, Crane/Shovel	23.90	0.0%	28.1%	12.95	0.00	43.57	HR	02/05/02	34.98	833
MIL	B-EQOPRLT	Equip. Operators, Light	18.35	0.0%	28.1%	12.95	0.00	36.46	HR	02/05/02	30.98	1510
MIL	B-EQOPRMED	Equip. Operators, Medium	18.49	0.0%	28.1%	12.95	0.00	36.64	HR	02/05/02	32.72	36
MIL	B-EQOPROIL	Equip. Operators, Oilers	18.02	0.0%	28.1%	12.95	0.00	36.03	HR	02/05/02	27.66	431
MIL	B-LABORER	Laborers, (Semi-Skilled)	19.95	0.0%	36.4%	9.85	0.00	37.06	HR	02/05/02	25.28	3144
MIL	B-PAINTORD	Painters, Ordinary	23.02	0.0%	32.1%	6.60	0.00	37.01	HR	02/05/02	29.28	75
MIL	B-PAINTSS	Painters, Structural Steel	25.02	0.0%	32.1%	6.60	0.00	39.65	HR	02/12/02	38.66	187
MIL	B-PILEDRVR	Pile Drivers	20.46	0.0%	46.8%	6.34	0.00	36.38	HR	02/05/02	36.11	2010
MIL	B-RODMAN	Rodmen, (Reinforcing)	22.07	0.0%	49.1%	11.18	0.00	44.09	HR	02/05/02	39.15	838

SRC	LABOR ID	DESCRIPTION	BASE	OVERTM	TXS/INS	FRNG	TRVL	RATE	UOM	UPDATE	**** TOTAL **** DEFAULT	HOURS
MIL	B-STRSTEEL	Structural Steel Workers	22.07	0.0%	59.3%	11.18	0.00	46.34	HR	02/05/02	42.08	154
MIL	B-TRKDVRHV	Truck Drivers, Heavy	23.79	0.0%	32.1%	6.49	0.00	37.92	HR	02/05/02	26.04	144
MIL	B-TRKDVRLT	Truck Drivers, Light	23.19	0.0%	32.1%	6.49	0.00	37.12	HR	02/05/02	24.87	3
FOP	FC-ENGPE	Engineers, Project	24.33	0.0%	19.9%	0.89	0.00	30.06	HR	01/01/99	30.06	72
MIL	X-EQOPRMED	Outside Equip. Operators, Medium	18.49	0.0%	28.1%	12.95	0.00	36.64	HR	02/05/02	30.38	160
MIL	X-LABORER	Outside Laborers, (Semi-Skilled)	19.95	0.0%	36.4%	9.85	0.00	37.06	HR	02/05/02	24.17	624
MIL	X-STRSTEEL	Outside Steel Workers	22.07	0.0%	50.7%	8.36	0.00	41.61	HR	02/05/02	38.28	672
MIL	X-TRKDVRHV	Outside Truck Drivers, Heavy	23.79	0.0%	32.1%	6.49	0.00	37.92	HR	02/05/02	24.55	48
		13 01 01. Mob, Demob & Preparatory Work L EQUI										
MIL	X-EQOPRHVY	Outside Equip. Operators, Heavy	23.90	0.0%	28.1%	12.95	0.00	43.57	HR	02/05/02	31.61	16
MIL	X-LABORER	Outside Laborers, (Semi-Skilled)	19.95	0.0%	36.4%	9.85	0.00	37.06	HR	02/05/02	24.17	16
MIL	X-TRKDVRHV	Outside Truck Drivers, Heavy	23.79	0.0%	32.1%	6.49	0.00	37.92	HR	02/05/02	24.55	16
		13 01 03. Care and Diversion of Water										
MIL	X-EQOPRHVY	Outside Equip. Operators, Heavy	23.90	0.0%	28.1%	12.95	0.00	43.57	HR	02/05/02	31.61	104
MIL	X-LABORER	Outside Laborers, (Semi-Skilled)	19.95	0.0%	36.4%	9.85	0.00	37.06	HR	02/05/02	24.17	48
		13 01 78. Auxiliary Equipment										
MIL	B-EQOPRCRN	Equip. Operators, Crane/Shovel	23.90	0.0%	28.1%	12.95	0.00	43.57	HR	02/05/02	34.98	56
MIL	B-LABORER	Laborers, (Semi-Skilled)	19.95	0.0%	36.4%	9.85	0.00	37.06	HR	02/05/02	25.28	104
MIL	B-STM/PIPE	Steam/Pipefitters	23.99	0.0%	25.5%	7.92	0.00	38.03	HR	01/01/99	38.03	200
MIL	X-TRKDVRHV	Outside Truck Drivers, Heavy	23.79	0.0%	32.1%	6.49	0.00	37.92	HR	02/05/02	24.55	16
		13 02 01. Mob, Demob & Preparatory Work										
MIL	X-EQOPRHVY	Outside Equip. Operators, Heavy	23.90	0.0%	28.1%	12.95	0.00	43.57	HR	02/05/02	31.61	16
MIL	X-LABORER	Outside Laborers, (Semi-Skilled)	19.95	0.0%	36.4%	9.85	0.00	37.06	HR	02/05/02	24.17	16
MIL	X-TRKDVRHV	Outside Truck Drivers, Heavy	23.79	0.0%	32.1%	6.49	0.00	37.92	HR	02/05/02	24.55	16
		13 02 02. Sitework										
MIL	B-LABORER	Laborers, (Semi-Skilled)	19.95	0.0%	36.4%	9.85	0.00	37.06	HR	02/05/02	25.28	286
MIL	X-EQOPRHVY	Outside Equip. Operators, Heavy	23.90	0.0%	28.1%	12.95	0.00	43.57	HR	02/05/02	31.61	16
MIL	X-LABORER	Outside Laborers, (Semi-Skilled)	19.95	0.0%	36.4%	9.85	0.00	37.06	HR	02/05/02	24.17	32
		13 02 03. Care and Diversion of Water										
MIL	X-EQOPRHVY	Outside Equip. Operators, Heavy	23.90	0.0%	28.1%	12.95	0.00	43.57	HR	02/05/02	31.61	104
MIL	X-LABORER	Outside Laborers, (Semi-Skilled)	19.95	0.0%	36.4%	9.85	0.00	37.06	HR	02/05/02	24.17	48
		13 02 75. Pumping Plant Superstructure										
MIL	B-BRKLAYR	Bricklayers	20.90	0.0%	34.5%	5.46	0.00	33.57	HR	01/01/99	33.57	480
MIL	B-LABORER	Laborers, (Semi-Skilled)	19.95	0.0%	36.4%	9.85	0.00	37.06	HR	02/05/02	25.28	208
MIL	B-ROOFER	Roofers, Composition	18.13	0.0%	51.1%	4.92	0.00	32.31	HR	01/01/99	32.31	32
MIL	B-ROOFERH	Roofers, (Semi-Skilled)	15.24	0.0%	51.1%	4.59	0.00	27.62	HR	01/01/99	27.62	13
MIL	B-STRSTEEL	Structural Steel Workers	22.07	0.0%	59.3%	11.18	0.00	46.34	HR	02/05/02	42.08	284
		13 02 76. Pumping Machinery & Appurtenance										
MIL	B-EQOPRCRN	Equip. Operators, Crane/Shovel	23.90	0.0%	28.1%	12.95	0.00	43.57	HR	02/05/02	34.98	32
MIL	B-LABORER	Laborers, (Semi-Skilled)	19.95	0.0%	36.4%	9.85	0.00	37.06	HR	02/05/02	25.28	40
MIL	B-STM/PIPE	Steam/Pipefitters	23.99	0.0%	25.5%	7.92	0.00	38.03	HR	01/01/99	38.03	128
MIL	X-TRKDVRHV	Outside Truck Drivers, Heavy	23.79	0.0%	32.1%	6.49	0.00	37.92	HR	02/05/02	24.55	16

SRC	LABOR ID	DESCRIPTION	BASE	OVERTM	TXS/INS	FRNG	TRVL	RATE	UOM	UPDATE	**** TOTAL **** DEFAULT	HOURS
		13 02 77. Gates and Valves										
MIL	B-EQOPRCRN	Equip. Operators, Crane/Shovel	23.90	0.0%	28.1%	12.95	0.00	43.57	HR	02/05/02	34.98	92
MIL	B-LABORER	Laborers, (Semi-Skilled)	19.95	0.0%	36.4%	9.85	0.00	37.06	HR	02/05/02	25.28	132
MIL	B-PAINTSS	Painters, Structural Steel	25.02	0.0%	32.1%	6.60	0.00	39.65	HR	02/12/02	38.66	56
MIL	B-STM/PIPE	Steam/Pipefitters	23.99	0.0%	25.5%	7.92	0.00	38.03	HR	01/01/99	38.03	288
MIL	X-TRKDVRHV	Outside Truck Drivers, Heavy	23.79	0.0%	32.1%	6.49	0.00	37.92	HR	02/05/02	24.55	20
		13 02 99. Associated General Items										
MIL	B-EQOPRCRN	Equip. Operators, Crane/Shovel	23.90	0.0%	28.1%	12.95	0.00	43.57	HR	02/05/02	34.98	16
MIL	B-EQOPROIL	Equip. Operators, Oilers	18.02	0.0%	28.1%	12.95	0.00	36.03	HR	02/05/02	27.66	16
MIL	B-STRSTEEL	Structural Steel Workers	22.07	0.0%	59.3%	11.18	0.00	46.34	HR	02/05/02	42.08	80
MIL	B-WELDERS	Welders, Structural Steel	22.07	0.0%	59.3%	11.18	0.00	46.34	HR	02/05/02	42.08	16
		13 03 01. Mob, Demob & Preparatory Work										
MIL	X-EQOPRHVY	Outside Equip. Operators, Heavy	23.90	0.0%	28.1%	12.95	0.00	43.57	HR	02/05/02	31.61	16
MIL	X-LABORER	Outside Laborers, (Semi-Skilled)	19.95	0.0%	36.4%	9.85	0.00	37.06	HR	02/05/02	24.17	16
MIL	X-TRKDVRHV	Outside Truck Drivers, Heavy	23.79	0.0%	32.1%	6.49	0.00	37.92	HR	02/05/02	24.55	16
		13 03 03. Care and Diversion of Water										
MIL	X-EQOPRHVY	Outside Equip. Operators, Heavy	23.90	0.0%	28.1%	12.95	0.00	43.57	HR	02/05/02	31.61	104
MIL	X-LABORER	Outside Laborers, (Semi-Skilled)	19.95	0.0%	36.4%	9.85	0.00	37.06	HR	02/05/02	24.17	48
		13 03 75. Pumping Plant Superstructure										
MIL	B-BRKLAYR	Bricklayers	20.90	0.0%	34.5%	5.46	0.00	33.57	HR	01/01/99	33.57	525
MIL	B-LABORER	Laborers, (Semi-Skilled)	19.95	0.0%	36.4%	9.85	0.00	37.06	HR	02/05/02	25.28	226
MIL	B-ROOFER	Roofers, Composition	18.13	0.0%	51.1%	4.92	0.00	32.31	HR	01/01/99	32.31	40
MIL	B-ROOFERH	Roofers, (Semi-Skilled)	15.24	0.0%	51.1%	4.59	0.00	27.62	HR	01/01/99	27.62	16
MIL	B-STRSTEEL	Structural Steel Workers	22.07	0.0%	59.3%	11.18	0.00	46.34	HR	02/05/02	42.08	545
		13 03 76. Pumping Machinery & Appurtenance										
MIL	B-EQOPRCRN	Equip. Operators, Crane/Shovel	23.90	0.0%	28.1%	12.95	0.00	43.57	HR	02/05/02	34.98	68
MIL	B-LABORER	Laborers, (Semi-Skilled)	19.95	0.0%	36.4%	9.85	0.00	37.06	HR	02/05/02	25.28	104
MIL	B-STM/PIPE	Steam/Pipefitters	23.99	0.0%	25.5%	7.92	0.00	38.03	HR	01/01/99	38.03	340
MIL	X-TRKDVRHV	Outside Truck Drivers, Heavy	23.79	0.0%	32.1%	6.49	0.00	37.92	HR	02/05/02	24.55	44
		13 03 77. Gates and Valves										
MIL	B-EQOPRCRN	Equip. Operators, Crane/Shovel	23.90	0.0%	28.1%	12.95	0.00	43.57	HR	02/05/02	34.98	232
MIL	B-LABORER	Laborers, (Semi-Skilled)	19.95	0.0%	36.4%	9.85	0.00	37.06	HR	02/05/02	25.28	232
MIL	B-PAINTSS	Painters, Structural Steel	25.02	0.0%	32.1%	6.60	0.00	39.65	HR	02/12/02	38.66	152
MIL	B-STM/PIPE	Steam/Pipefitters	23.99	0.0%	25.5%	7.92	0.00	38.03	HR	01/01/99	38.03	728
MIL	X-TRKDVRHV	Outside Truck Drivers, Heavy	23.79	0.0%	32.1%	6.49	0.00	37.92	HR	02/05/02	24.55	68
		13 03 99. Associated General Items										
MIL	B-EQOPRLT	Equip. Operators, Light	18.35	0.0%	28.1%	12.95	0.00	36.46	HR	02/05/02	30.98	30
MIL	B-LABORER	Laborers, (Semi-Skilled)	19.95	0.0%	36.4%	9.85	0.00	37.06	HR	02/05/02	25.28	92
		13 04 01. Mob, Demob & Preparatory Work RIES)										
MIL	X-EQOPRHVY	Outside Equip. Operators, Heavy	23.90	0.0%	28.1%	12.95	0.00	43.57	HR	02/05/02	31.61	16
MIL	X-LABORER	Outside Laborers, (Semi-Skilled)	19.95	0.0%	36.4%	9.85	0.00	37.06	HR	02/05/02	24.17	16
MIL	X-TRKDVRHV	Outside Truck Drivers, Heavy	23.79	0.0%	32.1%	6.49	0.00	37.92	HR	02/05/02	24.55	16

SRC	LABOR ID	DESCRIPTION	BASE	OVERTM	TXS/INS	FRNG	TRVL	RATE	UOM	UPDATE	**** TOTAL **** DEFAULT	HOURS
13 04 02. Sitework												
MIL	X-EQOPRHVY	Outside Equip. Operators, Heavy	23.90	0.0%	28.1%	12.95	0.00	43.57	HR	02/05/02	31.61	16
MIL	X-LABORER	Outside Laborers, (Semi-Skilled)	19.95	0.0%	36.4%	9.85	0.00	37.06	HR	02/05/02	24.17	32
13 04 03. Care and Diversion of Water												
MIL	X-EQOPRHVY	Outside Equip. Operators, Heavy	23.90	0.0%	28.1%	12.95	0.00	43.57	HR	02/05/02	31.61	104
MIL	X-LABORER	Outside Laborers, (Semi-Skilled)	19.95	0.0%	36.4%	9.85	0.00	37.06	HR	02/05/02	24.17	48
13 04 75. Pumping Plant Superstructure												
MIL	B-BRKLAYR	Bricklayers	20.90	0.0%	34.5%	5.46	0.00	33.57	HR	01/01/99	33.57	250
MIL	B-LABORER	Laborers, (Semi-Skilled)	19.95	0.0%	36.4%	9.85	0.00	37.06	HR	02/05/02	25.28	116
MIL	B-ROOFER	Roofers, Composition	18.13	0.0%	51.1%	4.92	0.00	32.31	HR	01/01/99	32.31	12
MIL	B-ROOFERH	Roofers, (Semi-Skilled)	15.24	0.0%	51.1%	4.59	0.00	27.62	HR	01/01/99	27.62	5
MIL	B-STRSTEEL	Structural Steel Workers	22.07	0.0%	59.3%	11.18	0.00	46.34	HR	02/05/02	42.08	280
13 04 76. Pumping Machinery & Appurtenance												
MIL	B-EQOPRCRN	Equip. Operators, Crane/Shovel	23.90	0.0%	28.1%	12.95	0.00	43.57	HR	02/05/02	34.98	68
MIL	B-LABORER	Laborers, (Semi-Skilled)	19.95	0.0%	36.4%	9.85	0.00	37.06	HR	02/05/02	25.28	104
MIL	B-STM/PIPE	Steam/Pipefitters	23.99	0.0%	25.5%	7.92	0.00	38.03	HR	01/01/99	38.03	340
MIL	X-TRKDVRHV	Outside Truck Drivers, Heavy	23.79	0.0%	32.1%	6.49	0.00	37.92	HR	02/05/02	24.55	44
13 04 77. Gates and Valves												
MIL	B-EQOPRCRN	Equip. Operators, Crane/Shovel	23.90	0.0%	28.1%	12.95	0.00	43.57	HR	02/05/02	34.98	128
MIL	B-LABORER	Laborers, (Semi-Skilled)	19.95	0.0%	36.4%	9.85	0.00	37.06	HR	02/05/02	25.28	128
MIL	B-PAINTSS	Painters, Structural Steel	25.02	0.0%	32.1%	6.60	0.00	39.65	HR	02/12/02	38.66	72
MIL	B-STM/PIPE	Steam/Pipefitters	23.99	0.0%	25.5%	7.92	0.00	38.03	HR	01/01/99	38.03	296
MIL	X-TRKDVRHV	Outside Truck Drivers, Heavy	23.79	0.0%	32.1%	6.49	0.00	37.92	HR	02/05/02	24.55	24
13 04 99. Associated General Items												
MIL	B-EQOPRLT	Equip. Operators, Light	18.35	0.0%	28.1%	12.95	0.00	36.46	HR	02/05/02	30.98	20
MIL	B-LABORER	Laborers, (Semi-Skilled)	19.95	0.0%	36.4%	9.85	0.00	37.06	HR	02/05/02	25.28	63
13 05 01. Mob, Demob & Preparatory Work RIES)												
MIL	X-EQOPRHVY	Outside Equip. Operators, Heavy	23.90	0.0%	28.1%	12.95	0.00	43.57	HR	02/05/02	31.61	16
MIL	X-LABORER	Outside Laborers, (Semi-Skilled)	19.95	0.0%	36.4%	9.85	0.00	37.06	HR	02/05/02	24.17	16
MIL	X-TRKDVRHV	Outside Truck Drivers, Heavy	23.79	0.0%	32.1%	6.49	0.00	37.92	HR	02/05/02	24.55	16
13 05 03. Care and Diversion of Water												
MIL	X-EQOPRHVY	Outside Equip. Operators, Heavy	23.90	0.0%	28.1%	12.95	0.00	43.57	HR	02/05/02	31.61	104
MIL	X-LABORER	Outside Laborers, (Semi-Skilled)	19.95	0.0%	36.4%	9.85	0.00	37.06	HR	02/05/02	24.17	48
13 05 75. Pumping Plant Superstructure												
MIL	B-BRKLAYR	Bricklayers	20.90	0.0%	34.5%	5.46	0.00	33.57	HR	01/01/99	33.57	350
MIL	B-LABORER	Laborers, (Semi-Skilled)	19.95	0.0%	36.4%	9.85	0.00	37.06	HR	02/05/02	25.28	156
MIL	B-ROOFER	Roofers, Composition	18.13	0.0%	51.1%	4.92	0.00	32.31	HR	01/01/99	32.31	18
MIL	B-ROOFERH	Roofers, (Semi-Skilled)	15.24	0.0%	51.1%	4.59	0.00	27.62	HR	01/01/99	27.62	7
MIL	B-STRSTEEL	Structural Steel Workers	22.07	0.0%	59.3%	11.18	0.00	46.34	HR	02/05/02	42.08	190
13 05 76. Pumping Machinery & Appurtenance												
MIL	B-EQOPRCRN	Equip. Operators, Crane/Shovel	23.90	0.0%	28.1%	12.95	0.00	43.57	HR	02/05/02	34.98	32
MIL	B-LABORER	Laborers, (Semi-Skilled)	19.95	0.0%	36.4%	9.85	0.00	37.06	HR	02/05/02	25.28	56

SRC	LABOR ID	DESCRIPTION	BASE	OVERTM	TXS/INS	FRNG	TRVL	RATE	UOM	UPDATE	**** TOTAL **** DEFAULT	HOURS
MIL	B-STM/PIPE	Steam/Pipefitters	23.99	0.0%	25.5%	7.92	0.00	38.03	HR	01/01/99	38.03	180
MIL	X-TRKDVRHV	Outside Truck Drivers, Heavy	23.79	0.0%	32.1%	6.49	0.00	37.92	HR	02/05/02	24.55	24
13 05 77. Gates and Valves												
MIL	B-EQOPRCRN	Equip. Operators, Crane/Shovel	23.90	0.0%	28.1%	12.95	0.00	43.57	HR	02/05/02	34.98	44
MIL	B-LABORER	Laborers, (Semi-Skilled)	19.95	0.0%	36.4%	9.85	0.00	37.06	HR	02/05/02	25.28	44
MIL	B-PAINTSS	Painters, Structural Steel	25.02	0.0%	32.1%	6.60	0.00	39.65	HR	02/12/02	38.66	32
MIL	B-STM/PIPE	Steam/Pipefitters	23.99	0.0%	25.5%	7.92	0.00	38.03	HR	01/01/99	38.03	96
MIL	X-TRKDVRHV	Outside Truck Drivers, Heavy	23.79	0.0%	32.1%	6.49	0.00	37.92	HR	02/05/02	24.55	8
13 06 01. Mob, Demob & Preparatory Work												
MIL	X-EQOPRHVY	Outside Equip. Operators, Heavy	23.90	0.0%	28.1%	12.95	0.00	43.57	HR	02/05/02	31.61	16
MIL	X-LABORER	Outside Laborers, (Semi-Skilled)	19.95	0.0%	36.4%	9.85	0.00	37.06	HR	02/05/02	24.17	16
MIL	X-TRKDVRHV	Outside Truck Drivers, Heavy	23.79	0.0%	32.1%	6.49	0.00	37.92	HR	02/05/02	24.55	16
13 06 02. Sitework												
MIL	B-LABORER	Laborers, (Semi-Skilled)	19.95	0.0%	36.4%	9.85	0.00	37.06	HR	02/05/02	25.28	143
MIL	X-EQOPRHVY	Outside Equip. Operators, Heavy	23.90	0.0%	28.1%	12.95	0.00	43.57	HR	02/05/02	31.61	16
MIL	X-LABORER	Outside Laborers, (Semi-Skilled)	19.95	0.0%	36.4%	9.85	0.00	37.06	HR	02/05/02	24.17	32
13 06 03. Care and Diversion of Water												
MIL	X-EQOPRHVY	Outside Equip. Operators, Heavy	23.90	0.0%	28.1%	12.95	0.00	43.57	HR	02/05/02	31.61	104
MIL	X-LABORER	Outside Laborers, (Semi-Skilled)	19.95	0.0%	36.4%	9.85	0.00	37.06	HR	02/05/02	24.17	48
13 06 75. Pumping Plant Superstructure												
MIL	B-LABORER	Laborers, (Semi-Skilled)	19.95	0.0%	36.4%	9.85	0.00	37.06	HR	02/05/02	25.28	4
MIL	B-SHTMTLWK	Sheet Metal Workers	22.56	0.0%	29.3%	8.41	0.00	37.58	HR	01/01/99	37.58	4
MIL	B-STRSTEEL	Structural Steel Workers	22.07	0.0%	59.3%	11.18	0.00	46.34	HR	02/05/02	42.08	69
13 06 76. Pumping Machinery & Appurtenance												
MIL	B-EQOPRCRN	Equip. Operators, Crane/Shovel	23.90	0.0%	28.1%	12.95	0.00	43.57	HR	02/05/02	34.98	16
MIL	B-LABORER	Laborers, (Semi-Skilled)	19.95	0.0%	36.4%	9.85	0.00	37.06	HR	02/05/02	25.28	16
MIL	B-STM/PIPE	Steam/Pipefitters	23.99	0.0%	25.5%	7.92	0.00	38.03	HR	01/01/99	38.03	44
MIL	X-TRKDVRHV	Outside Truck Drivers, Heavy	23.79	0.0%	32.1%	6.49	0.00	37.92	HR	02/05/02	24.55	8
13 06 77. Gates and Valves												
MIL	B-EQOPRCRN	Equip. Operators, Crane/Shovel	23.90	0.0%	28.1%	12.95	0.00	43.57	HR	02/05/02	34.98	20
MIL	B-LABORER	Laborers, (Semi-Skilled)	19.95	0.0%	36.4%	9.85	0.00	37.06	HR	02/05/02	25.28	24
MIL	B-PAINTSS	Painters, Structural Steel	25.02	0.0%	32.1%	6.60	0.00	39.65	HR	02/12/02	38.66	16
MIL	B-STM/PIPE	Steam/Pipefitters	23.99	0.0%	25.5%	7.92	0.00	38.03	HR	01/01/99	38.03	52
MIL	X-TRKDVRHV	Outside Truck Drivers, Heavy	23.79	0.0%	32.1%	6.49	0.00	37.92	HR	02/05/02	24.55	4
13 07 01. Mob, Demob & Preparatory Work												
MIL	X-EQOPRHVY	Outside Equip. Operators, Heavy	23.90	0.0%	28.1%	12.95	0.00	43.57	HR	02/05/02	31.61	16
MIL	X-LABORER	Outside Laborers, (Semi-Skilled)	19.95	0.0%	36.4%	9.85	0.00	37.06	HR	02/05/02	24.17	16
MIL	X-TRKDVRHV	Outside Truck Drivers, Heavy	23.79	0.0%	32.1%	6.49	0.00	37.92	HR	02/05/02	24.55	16
13 07 02. Sitework												
MIL	B-LABORER	Laborers, (Semi-Skilled)	19.95	0.0%	36.4%	9.85	0.00	37.06	HR	02/05/02	25.28	143
MIL	X-EQOPRHVY	Outside Equip. Operators, Heavy	23.90	0.0%	28.1%	12.95	0.00	43.57	HR	02/05/02	31.61	16
MIL	X-LABORER	Outside Laborers, (Semi-Skilled)	19.95	0.0%	36.4%	9.85	0.00	37.06	HR	02/05/02	24.17	32

SRC	LABOR ID	DESCRIPTION	BASE	OVERTM	TXS/INS	FRNG	TRVL	RATE	UOM	UPDATE	**** TOTAL **** DEFAULT	HOURS
13 07 03. Care and Diversion of Water												
MIL	X-EQOPRHVY	Outside Equip. Operators, Heavy	23.90	0.0%	28.1%	12.95	0.00	43.57	HR	02/05/02	31.61	104
MIL	X-LABORER	Outside Laborers, (Semi-Skilled)	19.95	0.0%	36.4%	9.85	0.00	37.06	HR	02/05/02	24.17	48
13 07 75. Pumping Plant Superstructure												
MIL	B-LABORER	Laborers, (Semi-Skilled)	19.95	0.0%	36.4%	9.85	0.00	37.06	HR	02/05/02	25.28	4
MIL	B-SHTMTLWK	Sheet Metal Workers	22.56	0.0%	29.3%	8.41	0.00	37.58	HR	01/01/99	37.58	4
MIL	B-STRSTEEL	Structural Steel Workers	22.07	0.0%	59.3%	11.18	0.00	46.34	HR	02/05/02	42.08	69
13 07 76. Pumping Machinery & Appurtenance												
MIL	B-EQOPRCRN	Equip. Operators, Crane/Shovel	23.90	0.0%	28.1%	12.95	0.00	43.57	HR	02/05/02	34.98	16
MIL	B-LABORER	Laborers, (Semi-Skilled)	19.95	0.0%	36.4%	9.85	0.00	37.06	HR	02/05/02	25.28	16
MIL	B-STM/PIPE	Steam/Pipefitters	23.99	0.0%	25.5%	7.92	0.00	38.03	HR	01/01/99	38.03	44
MIL	X-TRKDVRHV	Outside Truck Drivers, Heavy	23.79	0.0%	32.1%	6.49	0.00	37.92	HR	02/05/02	24.55	8
13 07 77. Gates and Valves												
MIL	B-EQOPRCRN	Equip. Operators, Crane/Shovel	23.90	0.0%	28.1%	12.95	0.00	43.57	HR	02/05/02	34.98	28
MIL	B-LABORER	Laborers, (Semi-Skilled)	19.95	0.0%	36.4%	9.85	0.00	37.06	HR	02/05/02	25.28	36
MIL	B-PAINTSS	Painters, Structural Steel	25.02	0.0%	32.1%	6.60	0.00	39.65	HR	02/12/02	38.66	20
MIL	B-STM/PIPE	Steam/Pipefitters	23.99	0.0%	25.5%	7.92	0.00	38.03	HR	01/01/99	38.03	76
MIL	X-TRKDVRHV	Outside Truck Drivers, Heavy	23.79	0.0%	32.1%	6.49	0.00	37.92	HR	02/05/02	24.55	4
30 01 1. Planning, Engineering, & Design												
31 01 1. Construction Management												

** EQUIPMENT BACKUP **

SRC	ID.NO.	EQUIPMENT DESCRIPTION	DEPR	FCCM	FUEL	FOG	TR WR	TR REP	EQ REP	TOTAL RATE	TOTAL HOURS
MAP	A15XX017	AIR COMPR, 1,600 CFM, 100 PSI	10.44	2.49	15.61	5.20	0.19	0.03	11.74	45.70 HR	180
GEN	A15Z0120	AIR COMPRESSOR, 100CFM, 100PSI	0.96	0.23	4.16	1.57	0.03	0.00	1.08	8.04 HR	128
GEN	A15Z0140	AIR COMPRESSOR, 250CFM, 100 PSI	2.29	0.54	2.87	0.96	0.03	0.00	2.57	9.26 HR	1794
GEN	A20Z0475	AIR HOSE,1.0"X 100'L (25MMX 31M)	0.11	0.01					0.20	0.32 HR	2691
GEN	A20Z0480	AIR HOSE,1.5"X 100'L (38MMX 31M)	0.17	0.01					0.32	0.50 HR	128
GEN	A25Z0580	ASPHALT DISTR, 3,000GAL (11355L)	5.52	0.97		1.80			7.05	15.34 HR	0
GEN	A30Z0640	ASPHALT PAVER, 10.0' (3.1M)W,SP	20.53	4.58	4.71	3.07	1.69	0.28	31.09	65.94 HR	2
GEN	B20Z0890	BRUSH CHIPPER, 12"(305MM)DIA LOG	2.05	0.37	9.74	3.68	0.06	0.01	2.72	18.63 HR	71
GEN	C05Z1210	CHAINSAW, 24" - 42" LONG BAR	0.12	0.01	0.57	0.21			0.42	1.34 HR	143
MAP	C75GV002	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	13.25	3.62	3.77	1.34	1.17	0.19	14.82	38.16 HR	2060
GEN	C80Z2240	CRANE, HYD, TRUCK MTD, 14T	18.22	4.92	6.07	2.56	0.76	0.13	15.25	47.91 HR	42
GEN	C80Z2280	CRANE, HYD, TRUCK MTD, 65T	28.15	8.57	10.63	3.30	0.92	0.15	27.47	79.18 HR	16
GEN	C85Z2395	DRAGLINE/CLAMSHELL,CRWLR, 2.0CY	27.16	7.22	3.22	1.29			32.13	71.02 HR	498
GEN	F10Z3040	FORK LIFT, R/T, 8,000LB (3629KG)	4.10	0.94	2.06	0.57	0.51	0.09	4.57	12.84 HR	897
GEN	G15Z3080	GRADER, MOTOR, 135 HP (101KW)	9.66	3.17	3.85	1.54	0.47	0.08	10.78	29.54 HR	9
GEN	H10Z3120	HYD HAMMER, 1000FT-LBS (1356N-M)	2.64	0.36		1.00			3.88	7.88 HR	29
GEN	H25Z3190	HYD EXCV, CRAWLER, 70,000LBS,	21.04	5.34	6.74	2.99			24.89	61.00 HR	1430
GEN	H25Z3680	BUCKET, PAVEMENT-REMOVAL, 36"	1.42	0.19					1.67	3.28 HR	29
GEN	L15Z4040	SPREADER, DRY CHEMICAL 85CF	1.38	0.13			0.03	0.00	1.34	2.88 HR	66
EP	L20AB012	LITE SET, 4L/1000W, 6KW-GEN,TRLR	1.47	0.29	0.49	0.13	0.05	0.01	3.46	5.90 HR	897
GEN	L30Z4160	CONVEYOR, 48'L x 16" W, (14.6M X	2.73	0.60	2.16	0.72	0.10	0.02	4.03	10.36 HR	20
GEN	L35Z4240	LOADER, F/E, CRWLR, 1.50CY	8.93	1.57	2.98	1.32			17.65	32.45 HR	17
GEN	L35Z4260	LOADER, F/E, CRWLR, 2.60CY	19.95	3.51	5.30	2.35			39.45	70.57 HR	100
GEN	L40Z4410	LOADER, F/E, WHEEL, 4.00CY	19.33	4.80	6.68	3.34	3.76	0.63	21.26	59.79 HR	29
EP	L50CS005	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	5.03	1.23	2.61	0.99	0.48	0.08	6.30	16.71 HR	464
GEN	L50Z4640	LOADER/BCK-HOE,WH, 0.80CY(0.6M3)	3.73	0.94	1.82	0.69	0.72	0.12	4.70	12.72 HR	2569
GEN	P30Z4920	PILE HAMMER,VIB, 80T (73MT)FORCE	16.02	2.91	9.87	3.72			28.93	61.45 HR	498
GEN	P45Z5035	PUMP,GROUT,20GPM(76LPM),3-HOPPER	1.47	0.24		0.15			2.03	3.88 HR	1794
EP	P50HO005	PUMP,TRASH, 4"D, 39,720GPH/25'HD	0.28	0.05	1.60	0.60			0.40	2.94 HR	3540
GEN	R30Z5645	ROLLER, STATIC, 9 TIRES, SP,14T	5.95	1.07	2.43	0.67	0.34	0.06	6.06	16.58 HR	176
GEN	R45Z5690	ROLLER, VIB, DD, SP 12.0T	12.42	2.18	4.23	1.60			19.78	40.22 HR	12
GEN	R50Z5760	ROLLER, VIB, SD, SP 3.0T	4.40	0.78	1.02	0.38	0.07	0.01	6.38	13.05 HR	71
GEN	R55Z5880	ROOF EQUIP, KETTLE, 400GAL	1.35	0.17	0.53	5.15	0.03	0.00	1.50	8.73 HR	20
GEN	T15Z6520	DOZER, CRAWLER, 181-250HP	15.42	5.72	7.95	2.65			22.59	54.33 HR	797
GEN	T15Z6570	DOZER, CRAWLER, 300-340HP	19.06	7.07	10.60	3.53			27.92	68.18 HR	9
MAP	T40KF016	FLATBED, 8'x 16.0', W/SIDE RACKS	0.41	0.07					0.36	0.84 HR	492
GEN	T40Z6860	REAR DUMP BODY, 16-23.5CY (12.2-	0.95	0.17					0.97	2.08 HR	4342
GEN	T40Z7000	TRK FLATBED, 8'X 20'(2.4MX 6.1M)	0.49	0.09					0.43	1.01 HR	8
EP	T45XX017	TRLR,LOWBOY, 60T, 3 AXLE	3.08	0.91		0.50	1.02	0.17	2.69	8.38 HR	720
GEN	T45Z7280	TRAILER, WATER TANKER, 5000GAL	2.93	0.81	1.91	0.53	0.45	0.07	3.00	9.71 HR	0
MAP	T50FO004	TRK,HWY, 8,800GVW,4X4, 3/4T-PKUP	1.93	0.35	2.28	0.76	0.34	0.06	1.96	7.66 HR	3360
EP	T50FO005	TRK,HWY,10,000GVW,4X2, 1T-PICKUP	1.96	0.36	2.28	0.76	0.46	0.08	2.00	7.88 HR	720
EP	T50FO006	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	2.22	0.45	6.80	2.41	0.34	0.06	2.09	14.36 HR	492
EP	T50FO018	TRK,HWY, 46,000 GVW, 6X4, 3 AXLE	10.95	2.01	7.91	2.63	1.49	0.25	9.65	34.90 HR	720
GEN	T50Z7400	TRUCK, HWY 25,000 (11,340KG)GVW	3.45	0.71	4.42	1.37	0.70	0.12	3.27	14.03 HR	8
GEN	T50Z7420	TRUCK, HWY 45,000 (20,412KG)GVW	10.79	1.95	10.04	3.34	0.97	0.16	9.48	36.73 HR	4342
GEN	T50Z7520	TRUCK, HWY 55,000 (24,948KG)GVW	10.07	1.82	10.04	3.34	0.97	0.16	8.85	35.27 HR	0
GEN	T50Z7580	TRUCK, HWY 45,000 (20,412KG)GVW	10.68	1.96	7.91	2.63	1.43	0.24	9.41	34.26 HR	0
GEN	T60Z7910	TRUCK, OFF-HWY, WATER, 5000GAL	10.15	2.74	5.31	2.01	1.82	0.30	10.66	32.98 HR	9
GEN	T60Z7920	TRUCK, OFF-HWY, WATER, 6000GAL	18.24	4.93	10.02	3.78	3.45	0.57	19.16	60.15 HR	175
GEN	W35Z8640	WELDER, 300AMP, TRAILER MTD	0.81	0.18	2.31	0.64	0.03	0.00	1.02	4.99 HR	308

** EQUIPMENT BACKUP **

SRC	ID.NO.	EQUIPMENT DESCRIPTION	DEPR	FCCM	FUEL	FOG	TR WR	TR REP	EQ REP	TOTAL RATE	** TOTAL ** HOURS
GEN	W35Z8680	WELDER, 300AMP, SKID MTD	0.33	0.05	0.38	0.18			0.26	1.20 HR	16
GEN	XMEZ9300	DRILL, AUGER, FENCE POST, TOWED	0.53	0.13	0.67	0.25		0.12	0.02	1.72 HR	3
NON	XMIXX020	SMALL TOOLS	0.50	0.22	0.16	0.07			0.63	1.57 HR	1794

SRC	ID.NO.	EQUIPMENT DESCRIPTION	DEPR	FCCM	FUEL	FOG	TR WR	TR REP	EQ REP	TOTAL RATE	TOTAL ** HOURS
0	5 0.	Overhead Items - PM									
0	5 5.	Electrical Contractor									
0	5 10.	Mechanical Contractor									
0	5 15.	Roofing Contractor									
0	5 20.	Masonry Contractor									
01	01 1.	Lands and Damages									
11	01 01.	Levees and Berms									
11	02 01.	Upper Wood River Levee (UWRL)									
MAP	A15XX017	AIR COMPR, 1,600 CFM, 100 PSI	10.44	2.49	15.61	5.20	0.19	0.03	11.74	45.70 HR	16
GEN	A15Z0140	AIR COMPRESSOR, 250CFM, 100 PSI	2.29	0.54	2.87	0.96	0.03	0.00	2.57	9.26 HR	91
GEN	A20Z0475	AIR HOSE,1.0"X 100'L (25MMX 31M)	0.11	0.01					0.20	0.32 HR	137
GEN	A25Z0580	ASPHALT DISTR, 3,000GAL (11355L)	5.52	0.97		1.80			7.05	15.34 HR	0
GEN	A30Z0640	ASPHALT PAVER, 10.0' (3.1M)W,SP	20.53	4.58	4.71	3.07	1.69	0.28	31.09	65.94 HR	0
GEN	B20Z0890	BRUSH CHIPPER, 12"(305MM)DIA LOG	2.05	0.37	9.74	3.68	0.06	0.01	2.72	18.63 HR	16
GEN	C05Z1210	CHAINSAW, 24" - 42" LONG BAR	0.12	0.01	0.57	0.21			0.42	1.34 HR	33
MAP	C75GV002	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	13.25	3.62	3.77	1.34	1.17	0.19	14.82	38.16 HR	96
GEN	F10Z3040	FORK LIFT, R/T, 8,000LB (3629KG)	4.10	0.94	2.06	0.57	0.51	0.09	4.57	12.84 HR	46
GEN	G15Z3080	GRADER, MOTOR, 135 HP (101KW)	9.66	3.17	3.85	1.54	0.47	0.08	10.78	29.54 HR	2
GEN	H10Z3120	HYD HAMMER, 1000FT-LBS (1356N-M)	2.64	0.36		1.00			3.88	7.88 HR	7
GEN	H25Z3190	HYD EXCV, CRAWLER, 70,000LBS,	21.04	5.34	6.74	2.99			24.89	61.00 HR	321
GEN	H25Z3680	BUCKET, PAVEMENT-REMOVAL, 36"	1.42	0.19					1.67	3.28 HR	7
GEN	L15Z4040	SPREADER, DRY CHEMICAL 85CF	1.38	0.13			0.03	0.00	1.34	2.88 HR	15
EP	L20AB012	LITE SET, 4L/1000W, 6KW-GEN,TRLR	1.47	0.29	0.49	0.13	0.05	0.01	3.46	5.90 HR	46
GEN	L35Z4240	LOADER, F/E, CRWLR, 1.50CY	8.93	1.57	2.98	1.32			17.65	32.45 HR	4
GEN	L35Z4260	LOADER, F/E, CRWLR, 2.60CY	19.95	3.51	5.30	2.35			39.45	70.57 HR	23
GEN	L40Z4410	LOADER, F/E, WHEEL, 4.00CY	19.33	4.80	6.68	3.34	3.76	0.63	21.26	59.79 HR	7
EP	L50CS005	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	5.03	1.23	2.61	0.99	0.48	0.08	6.30	16.71 HR	16
GEN	L50Z4640	LOADER/BCK-HOE,WH, 0.80CY(0.6M3)	3.73	0.94	1.82	0.69	0.72	0.12	4.70	12.72 HR	109
GEN	P45Z5035	PUMP,GROUT,20GPM(76LPM),3-HOPPER	1.47	0.24		0.15			2.03	3.88 HR	91
EP	P50HO005	PUMP,TRASH, 4"D, 39,720GPH/25'HD	0.28	0.05	1.60	0.60			0.40	2.94 HR	336
GEN	R30Z5645	ROLLER, STATIC, 9 TIRES, SP,14T	5.95	1.07	2.43	0.67	0.34	0.06	6.06	16.58 HR	39
GEN	R45Z5690	ROLLER, VIB, DD, SP 12.0T	12.42	2.18	4.23	1.60			19.78	40.22 HR	3
GEN	R50Z5760	ROLLER, VIB, SD, SP 3.0T	4.40	0.78	1.02	0.38	0.07	0.01	6.38	13.05 HR	16
GEN	T15Z6520	DOZER, CRAWLER, 181-250HP	15.42	5.72	7.95	2.65			22.59	54.33 HR	172
GEN	T15Z6570	DOZER, CRAWLER, 300-340HP	19.06	7.07	10.60	3.53			27.92	68.18 HR	2
MAP	T40KF016	FLATBED, 8'x 16.0', W/SIDE RACKS	0.41	0.07					0.36	0.84 HR	16
GEN	T40Z6860	REAR DUMP BODY, 16-23.5CY (12.2-	0.95	0.17					0.97	2.08 HR	955
EP	T45XX017	TRLR,LOWBOY, 60T, 3 AXLE	3.08	0.91		0.50	1.02	0.17	2.69	8.38 HR	64
GEN	T45Z7280	TRAILER, WATER TANKER, 5000GAL	2.93	0.81	1.91	0.53	0.45	0.07	3.00	9.71 HR	0
MAP	T50FO004	TRK,HWY, 8,800GVW,4X4, 3/4T-PKUP	1.93	0.35	2.28	0.76	0.34	0.06	1.96	7.66 HR	320
EP	T50FO005	TRK,HWY,10,000GVW,4X2, 1T-PICKUP	1.96	0.36	2.28	0.76	0.46	0.08	2.00	7.88 HR	64
EP	T50FO006	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	2.22	0.45	6.80	2.41	0.34	0.06	2.09	14.36 HR	16
EP	T50FO018	TRK,HWY, 46,000 GVW, 6X4, 3 AXLE	10.95	2.01	7.91	2.63	1.49	0.25	9.65	34.90 HR	64
GEN	T50Z7420	TRUCK, HWY 45,000 (20,412KG)GVW	10.79	1.95	10.04	3.34	0.97	0.16	9.48	36.73 HR	955
GEN	T50Z7520	TRUCK, HWY 55,000 (24,948KG)GVW	10.07	1.82	10.04	3.34	0.97	0.16	8.85	35.27 HR	0
GEN	T50Z7580	TRUCK, HWY 45,000 (20,412KG)GVW	10.68	1.96	7.91	2.63	1.43	0.24	9.41	34.26 HR	0
GEN	T60Z7910	TRUCK, OFF-HWY, WATER, 5000GAL	10.15	2.74	5.31	2.01	1.82	0.30	10.66	32.98 HR	2
GEN	T60Z7920	TRUCK, OFF-HWY, WATER, 6000GAL	18.24	4.93	10.02	3.78	3.45	0.57	19.16	60.15 HR	39
GEN	W35Z8640	WELDER, 300AMP, TRAILER MTD	0.81	0.18	2.31	0.64	0.03	0.00	1.02	4.99 HR	10
NON	XMIXX020	SMALL TOOLS	0.50	0.22	0.16	0.07			0.63	1.57 HR	91

SRC	ID.NO.	EQUIPMENT DESCRIPTION	DEPR	FCCM	FUEL	FOG	TR WR	TR REP	EQ REP	TOTAL RATE	TOTAL HOURS
11 02 02. East and West Fork Levee											
MAP	A15XX017	AIR COMPR, 1,600 CFM, 100 PSI	10.44	2.49	15.61	5.20	0.19	0.03	11.74	45.70 HR	32
GEN	A15Z0140	AIR COMPRESSOR, 250CFM, 100 PSI	2.29	0.54	2.87	0.96	0.03	0.00	2.57	9.26 HR	286
GEN	A20Z0475	AIR HOSE,1.0"X 100'L (25MMX 31M)	0.11	0.01					0.20	0.32 HR	429
GEN	A25Z0580	ASPHALT DISTR, 3,000GAL (11355L)	5.52	0.97		1.80			7.05	15.34 HR	0
GEN	A30Z0640	ASPHALT PAVER, 10.0' (3.1M)W,SP	20.53	4.58	4.71	3.07	1.69	0.28	31.09	65.94 HR	0
GEN	B20Z0890	BRUSH CHIPPER, 12"(305MM)DIA LOG	2.05	0.37	9.74	3.68	0.06	0.01	2.72	18.63 HR	16
GEN	C05Z1210	CHAINSAW, 24" - 42" LONG BAR	0.12	0.01	0.57	0.21			0.42	1.34 HR	33
MAP	C75GV002	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	13.25	3.62	3.77	1.34	1.17	0.19	14.82	38.16 HR	196
GEN	F10Z3040	FORK LIFT, R/T, 8,000LB (3629KG)	4.10	0.94	2.06	0.57	0.51	0.09	4.57	12.84 HR	143
GEN	G15Z3080	GRADER, MOTOR, 135 HP (101KW)	9.66	3.17	3.85	1.54	0.47	0.08	10.78	29.54 HR	2
GEN	H10Z3120	HYD HAMMER, 1000FT-LBS (1356N-M)	2.64	0.36		1.00			3.88	7.88 HR	7
GEN	H25Z3190	HYD EXCV, CRAWLER, 70,000LBS,	21.04	5.34	6.74	2.99			24.89	61.00 HR	321
GEN	H25Z3680	BUCKET, PAVEMENT-REMOVAL, 36"	1.42	0.19					1.67	3.28 HR	7
GEN	L15Z4040	SPREADER, DRY CHEMICAL 85CF	1.38	0.13			0.03	0.00	1.34	2.88 HR	15
EP	L20AB012	LITE SET, 4L/1000W, 6KW-GEN,TRLR	1.47	0.29	0.49	0.13	0.05	0.01	3.46	5.90 HR	143
GEN	L35Z4240	LOADER, F/E, CRWLR, 1.50CY	8.93	1.57	2.98	1.32			17.65	32.45 HR	4
GEN	L35Z4260	LOADER, F/E, CRWLR, 2.60CY	19.95	3.51	5.30	2.35			39.45	70.57 HR	23
GEN	L40Z4410	LOADER, F/E, WHEEL, 4.00CY	19.33	4.80	6.68	3.34	3.76	0.63	21.26	59.79 HR	7
EP	L50CS005	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	5.03	1.23	2.61	0.99	0.48	0.08	6.30	16.71 HR	80
GEN	L50Z4640	LOADER/BCK-HOE,WH, 0.80CY(0.6M3)	3.73	0.94	1.82	0.69	0.72	0.12	4.70	12.72 HR	119
GEN	P45Z5035	PUMP,GROUT,20GPM(76LPM),3-HOPPER	1.47	0.24		0.15			2.03	3.88 HR	286
EP	P50HO005	PUMP,TRASH, 4"D, 39,720GPH/25'HD	0.28	0.05	1.60	0.60			0.40	2.94 HR	672
GEN	R30Z5645	ROLLER, STATIC, 9 TIRES, SP,14T	5.95	1.07	2.43	0.67	0.34	0.06	6.06	16.58 HR	39
GEN	R45Z5690	ROLLER, VIB, DD, SP 12.0T	12.42	2.18	4.23	1.60			19.78	40.22 HR	3
GEN	R50Z5760	ROLLER, VIB, SD, SP 3.0T	4.40	0.78	1.02	0.38	0.07	0.01	6.38	13.05 HR	16
GEN	T15Z6520	DOZER, CRAWLER, 181-250HP	15.42	5.72	7.95	2.65			22.59	54.33 HR	172
GEN	T15Z6570	DOZER, CRAWLER, 300-340HP	19.06	7.07	10.60	3.53			27.92	68.18 HR	2
MAP	T40KF016	FLATBED, 8'x 16.0', W/SIDE RACKS	0.41	0.07					0.36	0.84 HR	32
GEN	T40Z6860	REAR DUMP BODY, 16-23.5CY (12.2-	0.95	0.17					0.97	2.08 HR	955
EP	T45XX017	TRLR,LOWBOY, 60T, 3 AXLE	3.08	0.91		0.50	1.02	0.17	2.69	8.38 HR	128
GEN	T45Z7280	TRAILER, WATER TANKER, 5000GAL	2.93	0.81	1.91	0.53	0.45	0.07	3.00	9.71 HR	0
MAP	T50FO004	TRK,HWY, 8,800GVW,4X4, 3/4T-PKUP	1.93	0.35	2.28	0.76	0.34	0.06	1.96	7.66 HR	640
EP	T50FO005	TRK,HWY,10,000GVW,4X2, 1T-PICKUP	1.96	0.36	2.28	0.76	0.46	0.08	2.00	7.88 HR	128
EP	T50FO006	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	2.22	0.45	6.80	2.41	0.34	0.06	2.09	14.36 HR	32
EP	T50FO018	TRK,HWY, 46,000 GVW, 6X4, 3 AXLE	10.95	2.01	7.91	2.63	1.49	0.25	9.65	34.90 HR	128
GEN	T50Z7420	TRUCK, HWY 45,000 (20,412KG)GVW	10.79	1.95	10.04	3.34	0.97	0.16	9.48	36.73 HR	955
GEN	T50Z7520	TRUCK, HWY 55,000 (24,948KG)GVW	10.07	1.82	10.04	3.34	0.97	0.16	8.85	35.27 HR	0
GEN	T50Z7580	TRUCK, HWY 45,000 (20,412KG)GVW	10.68	1.96	7.91	2.63	1.43	0.24	9.41	34.26 HR	0
GEN	T60Z7910	TRUCK, OFF-HWY, WATER, 5000GAL	10.15	2.74	5.31	2.01	1.82	0.30	10.66	32.98 HR	2
GEN	T60Z7920	TRUCK, OFF-HWY, WATER, 6000GAL	18.24	4.93	10.02	3.78	3.45	0.57	19.16	60.15 HR	39
GEN	W35Z8640	WELDER, 300AMP, TRAILER MTD	0.81	0.18	2.31	0.64	0.03	0.00	1.02	4.99 HR	19
NON	XMIXX020	SMALL TOOLS	0.50	0.22	0.16	0.07			0.63	1.57 HR	286
11 02 03. Lower Wood River Levee (LWRL)											
MAP	A15XX017	AIR COMPR, 1,600 CFM, 100 PSI	10.44	2.49	15.61	5.20	0.19	0.03	11.74	45.70 HR	104
GEN	A15Z0140	AIR COMPRESSOR, 250CFM, 100 PSI	2.29	0.54	2.87	0.96	0.03	0.00	2.57	9.26 HR	1189
GEN	A20Z0475	AIR HOSE,1.0"X 100'L (25MMX 31M)	0.11	0.01					0.20	0.32 HR	1783
GEN	A25Z0580	ASPHALT DISTR, 3,000GAL (11355L)	5.52	0.97		1.80			7.05	15.34 HR	0
GEN	A30Z0640	ASPHALT PAVER, 10.0' (3.1M)W,SP	20.53	4.58	4.71	3.07	1.69	0.28	31.09	65.94 HR	1
GEN	B20Z0890	BRUSH CHIPPER, 12"(305MM)DIA LOG	2.05	0.37	9.74	3.68	0.06	0.01	2.72	18.63 HR	38

** EQUIPMENT BACKUP - Level 3 **

SRC	ID.NO.	EQUIPMENT DESCRIPTION	DEPR	FCCM	FUEL	FOG	TR WR	TR REP	EQ REP	TOTAL RATE	** TOTAL ** HOURS
GEN	C05Z1210	CHAINSAW, 24" - 42" LONG BAR	0.12	0.01	0.57	0.21			0.42	1.34 HR	77
MAP	C75GV002	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	13.25	3.62	3.77	1.34	1.17	0.19	14.82	38.16 HR	628
GEN	F10Z3040	FORK LIFT, R/T, 8,000LB (3629KG)	4.10	0.94	2.06	0.57	0.51	0.09	4.57	12.84 HR	594
GEN	G15Z3080	GRADER, MOTOR, 135 HP (101KW)	9.66	3.17	3.85	1.54	0.47	0.08	10.78	29.54 HR	5
GEN	H10Z3120	HYD HAMMER, 1000FT-LBS (1356N-M)	2.64	0.36		1.00			3.88	7.88 HR	15
GEN	H25Z3190	HYD EXCV, CRAWLER, 70,000LBS,	21.04	5.34	6.74	2.99			24.89	61.00 HR	749
GEN	H25Z3680	BUCKET, PAVEMENT-REMOVAL, 36"	1.42	0.19					1.67	3.28 HR	15
GEN	L15Z4040	SPREADER, DRY CHEMICAL 85CF	1.38	0.13			0.03	0.00	1.34	2.88 HR	36
EP	L20AB012	LITE SET, 4L/1000W, 6KW-GEN,TRLR	1.47	0.29	0.49	0.13	0.05	0.01	3.46	5.90 HR	594
GEN	L35Z4240	LOADER, F/E, CRWLR, 1.50CY	8.93	1.57	2.98	1.32			17.65	32.45 HR	9
GEN	L35Z4260	LOADER, F/E, CRWLR, 2.60CY	19.95	3.51	5.30	2.35			39.45	70.57 HR	54
GEN	L40Z4410	LOADER, F/E, WHEEL, 4.00CY	19.33	4.80	6.68	3.34	3.76	0.63	21.26	59.79 HR	15
EP	L50CS005	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	5.03	1.23	2.61	0.99	0.48	0.08	6.30	16.71 HR	304
GEN	L50Z4640	LOADER/BCK-HOE,WH, 0.80CY(0.6M3)	3.73	0.94	1.82	0.69	0.72	0.12	4.70	12.72 HR	303
GEN	P45Z5035	PUMP,GROUT,20GPM(76LPM),3-HOPPER	1.47	0.24		0.15			2.03	3.88 HR	1189
EP	P50HO005	PUMP,TRASH, 4"D, 39,720GPH/25'HD	0.28	0.05	1.60	0.60			0.40	2.94 HR	1944
GEN	R30Z5645	ROLLER, STATIC, 9 TIRES, SP,14T	5.95	1.07	2.43	0.67	0.34	0.06	6.06	16.58 HR	92
GEN	R45Z5690	ROLLER, VIB, DD, SP 12.0T	12.42	2.18	4.23	1.60			19.78	40.22 HR	7
GEN	R50Z5760	ROLLER, VIB, SD, SP 3.0T	4.40	0.78	1.02	0.38	0.07	0.01	6.38	13.05 HR	38
GEN	T15Z6520	DOZER, CRAWLER, 181-250HP	15.42	5.72	7.95	2.65			22.59	54.33 HR	402
GEN	T15Z6570	DOZER, CRAWLER, 300-340HP	19.06	7.07	10.60	3.53			27.92	68.18 HR	5
MAP	T40KF016	FLATBED, 8'x 16.0', W/SIDE RACKS	0.41	0.07					0.36	0.84 HR	92
GEN	T40Z6860	REAR DUMP BODY, 16-23.5CY (12.2-	0.95	0.17					0.97	2.08 HR	2228
EP	T45XX017	TRLR,LOWBOY, 60T, 3 AXLE	3.08	0.91		0.50	1.02	0.17	2.69	8.38 HR	416
GEN	T45Z7280	TRAILER, WATER TANKER, 5000GAL	2.93	0.81	1.91	0.53	0.45	0.07	3.00	9.71 HR	0
MAP	T50FO004	TRK,HWY, 8,800GVW,4X4, 3/4T-PKUP	1.93	0.35	2.28	0.76	0.34	0.06	1.96	7.66 HR	1840
EP	T50FO005	TRK,HWY,10,000GVW,4X2, 1T-PICKUP	1.96	0.36	2.28	0.76	0.46	0.08	2.00	7.88 HR	416
EP	T50FO006	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	2.22	0.45	6.80	2.41	0.34	0.06	2.09	14.36 HR	92
EP	T50FO018	TRK,HWY, 46,000 GVW, 6X4, 3 AXLE	10.95	2.01	7.91	2.63	1.49	0.25	9.65	34.90 HR	416
GEN	T50Z7420	TRUCK, HWY 45,000 (20,412KG)GVW	10.79	1.95	10.04	3.34	0.97	0.16	9.48	36.73 HR	2228
GEN	T50Z7520	TRUCK, HWY 55,000 (24,948KG)GVW	10.07	1.82	10.04	3.34	0.97	0.16	8.85	35.27 HR	0
GEN	T50Z7580	TRUCK, HWY 45,000 (20,412KG)GVW	10.68	1.96	7.91	2.63	1.43	0.24	9.41	34.26 HR	0
GEN	T60Z7910	TRUCK, OFF-HWY, WATER, 5000GAL	10.15	2.74	5.31	2.01	1.82	0.30	10.66	32.98 HR	5
GEN	T60Z7920	TRUCK, OFF-HWY, WATER, 6000GAL	18.24	4.93	10.02	3.78	3.45	0.57	19.16	60.15 HR	91
GEN	W35Z8640	WELDER, 300AMP, TRAILER MTD	0.81	0.18	2.31	0.64	0.03	0.00	1.02	4.99 HR	84
NON	XMIXX020	SMALL TOOLS	0.50	0.22	0.16	0.07			0.63	1.57 HR	1189
11 03 01. Upper Wood River Levee (UWRL)											
MAP	C75GV002	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	13.25	3.62	3.77	1.34	1.17	0.19	14.82	38.16 HR	104
GEN	H25Z3190	HYD EXCV, CRAWLER, 70,000LBS,	21.04	5.34	6.74	2.99			24.89	61.00 HR	2
GEN	L50Z4640	LOADER/BCK-HOE,WH, 0.80CY(0.6M3)	3.73	0.94	1.82	0.69	0.72	0.12	4.70	12.72 HR	132
GEN	R30Z5645	ROLLER, STATIC, 9 TIRES, SP,14T	5.95	1.07	2.43	0.67	0.34	0.06	6.06	16.58 HR	2
GEN	T15Z6520	DOZER, CRAWLER, 181-250HP	15.42	5.72	7.95	2.65			22.59	54.33 HR	9
MAP	T40KF016	FLATBED, 8'x 16.0', W/SIDE RACKS	0.41	0.07					0.36	0.84 HR	8
GEN	T40Z6860	REAR DUMP BODY, 16-23.5CY (12.2-	0.95	0.17					0.97	2.08 HR	44
EP	T50FO006	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	2.22	0.45	6.80	2.41	0.34	0.06	2.09	14.36 HR	8
GEN	T50Z7420	TRUCK, HWY 45,000 (20,412KG)GVW	10.79	1.95	10.04	3.34	0.97	0.16	9.48	36.73 HR	44
GEN	T60Z7920	TRUCK, OFF-HWY, WATER, 6000GAL	18.24	4.93	10.02	3.78	3.45	0.57	19.16	60.15 HR	2
11 03 02. East and West Fork Levee											
MAP	C75GV002	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	13.25	3.62	3.77	1.34	1.17	0.19	14.82	38.16 HR	16

SRC	ID.NO.	EQUIPMENT DESCRIPTION	DEPR	FCCM	FUEL	FOG	TR WR	TR REP	EQ REP	TOTAL RATE	TOTAL HOURS
GEN	C85Z2395	DRAGLINE/CLAMSHELL,CRWLR, 2.0CY	27.16	7.22	3.22	1.29			32.13	71.02 HR	96
GEN	H25Z3190	HYD EXCV, CRAWLER, 70,000LBS,	21.04	5.34	6.74	2.99			24.89	61.00 HR	7
GEN	L50Z4640	LOADER/BCK-HOE,WH, 0.80CY(0.6M3)	3.73	0.94	1.82	0.69	0.72	0.12	4.70	12.72 HR	391
GEN	P30Z4920	PILE HAMMER,VIB, 80T (73MT)FORCE	16.02	2.91	9.87	3.72			28.93	61.45 HR	96
GEN	T15Z6520	DOZER, CRAWLER, 181-250HP	15.42	5.72	7.95	2.65			22.59	54.33 HR	9
MAP	T40KF016	FLATBED, 8'x 16.0', W/SIDE RACKS	0.41	0.07					0.36	0.84 HR	8
GEN	T40Z6860	REAR DUMP BODY, 16-23.5CY (12.2-	0.95	0.17					0.97	2.08 HR	20
EP	T50FO006	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	2.22	0.45	6.80	2.41	0.34	0.06	2.09	14.36 HR	8
GEN	T50Z7420	TRUCK, HWY 45,000 (20,412KG)GVW	10.79	1.95	10.04	3.34	0.97	0.16	9.48	36.73 HR	20
11 03 03. Lower Wood River Levee (LWRL)											
MAP	C75GV002	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	13.25	3.62	3.77	1.34	1.17	0.19	14.82	38.16 HR	160
GEN	C85Z2395	DRAGLINE/CLAMSHELL,CRWLR, 2.0CY	27.16	7.22	3.22	1.29			32.13	71.02 HR	402
GEN	H25Z3190	HYD EXCV, CRAWLER, 70,000LBS,	21.04	5.34	6.74	2.99			24.89	61.00 HR	29
GEN	L50Z4640	LOADER/BCK-HOE,WH, 0.80CY(0.6M3)	3.73	0.94	1.82	0.69	0.72	0.12	4.70	12.72 HR	1507
GEN	P30Z4920	PILE HAMMER,VIB, 80T (73MT)FORCE	16.02	2.91	9.87	3.72			28.93	61.45 HR	402
GEN	R30Z5645	ROLLER, STATIC, 9 TIRES, SP,14T	5.95	1.07	2.43	0.67	0.34	0.06	6.06	16.58 HR	4
GEN	T15Z6520	DOZER, CRAWLER, 181-250HP	15.42	5.72	7.95	2.65			22.59	54.33 HR	33
MAP	T40KF016	FLATBED, 8'x 16.0', W/SIDE RACKS	0.41	0.07					0.36	0.84 HR	48
GEN	T40Z6860	REAR DUMP BODY, 16-23.5CY (12.2-	0.95	0.17					0.97	2.08 HR	141
GEN	T40Z7000	TRK FLATBED, 8'X 20'(2.4MX 6.1M)	0.49	0.09					0.43	1.01 HR	4
EP	T50FO006	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	2.22	0.45	6.80	2.41	0.34	0.06	2.09	14.36 HR	48
GEN	T50Z7400	TRUCK, HWY 25,000 (11,340KG)GVW	3.45	0.71	4.42	1.37	0.70	0.12	3.27	14.03 HR	4
GEN	T50Z7420	TRUCK, HWY 45,000 (20,412KG)GVW	10.79	1.95	10.04	3.34	0.97	0.16	9.48	36.73 HR	141
GEN	T60Z7920	TRUCK, OFF-HWY, WATER, 6000GAL	18.24	4.93	10.02	3.78	3.45	0.57	19.16	60.15 HR	4
GEN	XMEZ9300	DRILL, AUGER, FENCE POST, TOWED	0.53	0.13	0.67	0.25		0.12	0.02	1.72 HR	3
13 01 01. Mob, Demob & Preparatory Work											
MAP	A15XX017	AIR COMPR, 1,600 CFM, 100 PSI	10.44	2.49	15.61	5.20	0.19	0.03	11.74	45.70 HR	4
MAP	C75GV002	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	13.25	3.62	3.77	1.34	1.17	0.19	14.82	38.16 HR	4
EP	P50HO005	PUMP,TRASH, 4"D, 39,720GPH/25'HD	0.28	0.05	1.60	0.60			0.40	2.94 HR	4
EP	T45XX017	TRLR,LOWBOY, 60T, 3 AXLE	3.08	0.91		0.50	1.02	0.17	2.69	8.38 HR	16
EP	T50FO005	TRK,HWY,10,000GVW,4X2, 1T-PICKUP	1.96	0.36	2.28	0.76	0.46	0.08	2.00	7.88 HR	16
EP	T50FO018	TRK,HWY, 46,000 GVW, 6X4, 3 AXLE	10.95	2.01	7.91	2.63	1.49	0.25	9.65	34.90 HR	16
13 01 03. Care and Diversion of Water											
EP	P50HO005	PUMP,TRASH, 4"D, 39,720GPH/25'HD	0.28	0.05	1.60	0.60			0.40	2.94 HR	80
MAP	T50FO004	TRK,HWY, 8,800GVW,4X4, 3/4T-PKUP	1.93	0.35	2.28	0.76	0.34	0.06	1.96	7.66 HR	80
13 01 78. Auxiliary Equipment											
MAP	C75GV002	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	13.25	3.62	3.77	1.34	1.17	0.19	14.82	38.16 HR	56
MAP	T40KF016	FLATBED, 8'x 16.0', W/SIDE RACKS	0.41	0.07					0.36	0.84 HR	16
EP	T50FO006	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	2.22	0.45	6.80	2.41	0.34	0.06	2.09	14.36 HR	16
13 02 01. Mob, Demob & Preparatory Work											
MAP	A15XX017	AIR COMPR, 1,600 CFM, 100 PSI	10.44	2.49	15.61	5.20	0.19	0.03	11.74	45.70 HR	4
MAP	C75GV002	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	13.25	3.62	3.77	1.34	1.17	0.19	14.82	38.16 HR	4
EP	P50HO005	PUMP,TRASH, 4"D, 39,720GPH/25'HD	0.28	0.05	1.60	0.60			0.40	2.94 HR	4
EP	T45XX017	TRLR,LOWBOY, 60T, 3 AXLE	3.08	0.91		0.50	1.02	0.17	2.69	8.38 HR	16
EP	T50FO005	TRK,HWY,10,000GVW,4X2, 1T-PICKUP	1.96	0.36	2.28	0.76	0.46	0.08	2.00	7.88 HR	16
EP	T50FO018	TRK,HWY, 46,000 GVW, 6X4, 3 AXLE	10.95	2.01	7.91	2.63	1.49	0.25	9.65	34.90 HR	16

SRC	ID.NO.	EQUIPMENT DESCRIPTION	DEPR	FCCM	FUEL	FOG	TR WR	TR REP	EQ REP	TOTAL RATE	TOTAL ** HOURS
13 02 02. Sitework											
GEN	A15Z0140	AIR COMPRESSOR, 250CFM, 100 PSI	2.29	0.54	2.87	0.96	0.03	0.00	2.57	9.26 HR	114
GEN	A20Z0475	AIR HOSE,1.0"X 100'L (25MMX 31M)	0.11	0.01					0.20	0.32 HR	171
GEN	F10Z3040	FORK LIFT, R/T, 8,000LB (3629KG)	4.10	0.94	2.06	0.57	0.51	0.09	4.57	12.84 HR	57
EP	L20AB012	LITE SET, 4L/1000W, 6KW-GEN,TRLR	1.47	0.29	0.49	0.13	0.05	0.01	3.46	5.90 HR	57
EP	L50CS005	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	5.03	1.23	2.61	0.99	0.48	0.08	6.30	16.71 HR	16
GEN	P45Z5035	PUMP,GROUT,20GPM(76LPM),3-HOPPER	1.47	0.24		0.15			2.03	3.88 HR	114
NON	XMIXX020	SMALL TOOLS	0.50	0.22	0.16	0.07			0.63	1.57 HR	114
13 02 03. Care and Diversion of Water											
EP	P50HO005	PUMP,TRASH, 4"D, 39,720GPH/25'HD	0.28	0.05	1.60	0.60			0.40	2.94 HR	80
MAP	T50FO004	TRK,HWY, 8,800GVW,4X4, 3/4T-PKUP	1.93	0.35	2.28	0.76	0.34	0.06	1.96	7.66 HR	80
13 02 75. Pumping Plant Superstructure											
GEN	A15Z0120	AIR COMPRESSOR, 100CFM, 100PSI	0.96	0.23	4.16	1.57	0.03	0.00	1.08	8.04 HR	38
GEN	A20Z0480	AIR HOSE,1.5"X 100'L (38MMX 31M)	0.17	0.01					0.32	0.50 HR	38
GEN	L30Z4160	CONVEYOR, 48'L x 16" W, (14.6M X	2.73	0.60	2.16	0.72	0.10	0.02	4.03	10.36 HR	6
GEN	R55Z5880	ROOF EQUIP, KETTLE, 400GAL	1.35	0.17	0.53	5.15	0.03	0.00	1.50	8.73 HR	6
GEN	W35Z8640	WELDER, 300AMP, TRAILER MTD	0.81	0.18	2.31	0.64	0.03	0.00	1.02	4.99 HR	42
13 02 76. Pumping Machinery & Appurtenance											
MAP	C75GV002	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	13.25	3.62	3.77	1.34	1.17	0.19	14.82	38.16 HR	32
MAP	T40KF016	FLATBED, 8'x 16.0', W/SIDE RACKS	0.41	0.07					0.36	0.84 HR	16
EP	T50FO006	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	2.22	0.45	6.80	2.41	0.34	0.06	2.09	14.36 HR	16
13 02 77. Gates and Valves											
MAP	C75GV002	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	13.25	3.62	3.77	1.34	1.17	0.19	14.82	38.16 HR	92
MAP	T40KF016	FLATBED, 8'x 16.0', W/SIDE RACKS	0.41	0.07					0.36	0.84 HR	20
EP	T50FO006	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	2.22	0.45	6.80	2.41	0.34	0.06	2.09	14.36 HR	20
13 02 99. Associated General Items											
GEN	C80Z2280	CRANE, HYD, TRUCK MTD, 65T	28.15	8.57	10.63	3.30	0.92	0.15	27.47	79.18 HR	16
GEN	W35Z8680	WELDER, 300AMP, SKID MTD	0.33	0.05	0.38	0.18			0.26	1.20 HR	16
13 03 01. Mob, Demob & Preparatory Work											
MAP	A15XX017	AIR COMPR, 1,600 CFM, 100 PSI	10.44	2.49	15.61	5.20	0.19	0.03	11.74	45.70 HR	4
MAP	C75GV002	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	13.25	3.62	3.77	1.34	1.17	0.19	14.82	38.16 HR	4
EP	P50HO005	PUMP,TRASH, 4"D, 39,720GPH/25'HD	0.28	0.05	1.60	0.60			0.40	2.94 HR	4
EP	T45XX017	TRLR,LOWBOY, 60T, 3 AXLE	3.08	0.91		0.50	1.02	0.17	2.69	8.38 HR	16
EP	T50FO005	TRK,HWY,10,000GVW,4X2, 1T-PICKUP	1.96	0.36	2.28	0.76	0.46	0.08	2.00	7.88 HR	16
EP	T50FO018	TRK,HWY, 46,000 GVW, 6X4, 3 AXLE	10.95	2.01	7.91	2.63	1.49	0.25	9.65	34.90 HR	16
13 03 03. Care and Diversion of Water											
EP	P50HO005	PUMP,TRASH, 4"D, 39,720GPH/25'HD	0.28	0.05	1.60	0.60			0.40	2.94 HR	80
MAP	T50FO004	TRK,HWY, 8,800GVW,4X4, 3/4T-PKUP	1.93	0.35	2.28	0.76	0.34	0.06	1.96	7.66 HR	80
13 03 75. Pumping Plant Superstructure											
GEN	A15Z0120	AIR COMPRESSOR, 100CFM, 100PSI	0.96	0.23	4.16	1.57	0.03	0.00	1.08	8.04 HR	42
GEN	A20Z0480	AIR HOSE,1.5"X 100'L (38MMX 31M)	0.17	0.01					0.32	0.50 HR	42
GEN	L30Z4160	CONVEYOR, 48'L x 16" W, (14.6M X	2.73	0.60	2.16	0.72	0.10	0.02	4.03	10.36 HR	8

SRC	ID.NO.	EQUIPMENT DESCRIPTION	DEPR	FCCM	FUEL	FOG	TR WR	TR REP	EQ REP	TOTAL RATE	** TOTAL ** HOURS
GEN	R55Z5880	ROOF EQUIP, KETTLE, 400GAL	1.35	0.17	0.53	5.15	0.03	0.00	1.50	8.73 HR	8
GEN	W35Z8640	WELDER, 300AMP, TRAILER MTD	0.81	0.18	2.31	0.64	0.03	0.00	1.02	4.99 HR	80
13 03 76. Pumping Machinery & Appurtenance											
MAP	C75GV002	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	13.25	3.62	3.77	1.34	1.17	0.19	14.82	38.16 HR	68
MAP	T40KF016	FLATBED, 8'x 16.0', W/SIDE RACKS	0.41	0.07					0.36	0.84 HR	44
EP	T50FO006	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	2.22	0.45	6.80	2.41	0.34	0.06	2.09	14.36 HR	44
13 03 77. Gates and Valves											
MAP	C75GV002	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	13.25	3.62	3.77	1.34	1.17	0.19	14.82	38.16 HR	232
MAP	T40KF016	FLATBED, 8'x 16.0', W/SIDE RACKS	0.41	0.07					0.36	0.84 HR	68
EP	T50FO006	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	2.22	0.45	6.80	2.41	0.34	0.06	2.09	14.36 HR	68
13 03 99. Associated General Items											
GEN	C80Z2240	CRANE, HYD, TRUCK MTD, 14T	18.22	4.92	6.07	2.56	0.76	0.13	15.25	47.91 HR	25
GEN	L50Z4640	LOADER/BCK-HOE,WH, 0.80CY(0.6M3)	3.73	0.94	1.82	0.69	0.72	0.12	4.70	12.72 HR	5
GEN	T40Z7000	TRK FLATBED, 8'X 20'(2.4MX 6.1M)	0.49	0.09					0.43	1.01 HR	2
GEN	T50Z7400	TRUCK, HWY 25,000 (11,340KG)GVW	3.45	0.71	4.42	1.37	0.70	0.12	3.27	14.03 HR	2
13 04 01. Mob, Demob & Preparatory Work											
MAP	A15XX017	AIR COMPR, 1,600 CFM, 100 PSI	10.44	2.49	15.61	5.20	0.19	0.03	11.74	45.70 HR	4
MAP	C75GV002	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	13.25	3.62	3.77	1.34	1.17	0.19	14.82	38.16 HR	4
EP	P50HO005	PUMP,TRASH, 4"D, 39,720GPH/25'HD	0.28	0.05	1.60	0.60			0.40	2.94 HR	4
EP	T45XX017	TRLR,LOWBOY, 60T, 3 AXLE	3.08	0.91		0.50	1.02	0.17	2.69	8.38 HR	16
EP	T50FO005	TRK,HWY,10,000GVW,4X2, 1T-PICKUP	1.96	0.36	2.28	0.76	0.46	0.08	2.00	7.88 HR	16
EP	T50FO018	TRK,HWY, 46,000 GVW, 6X4, 3 AXLE	10.95	2.01	7.91	2.63	1.49	0.25	9.65	34.90 HR	16
13 04 02. Sitework											
EP	L50CS005	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	5.03	1.23	2.61	0.99	0.48	0.08	6.30	16.71 HR	16
13 04 03. Care and Diversion of Water											
EP	P50HO005	PUMP,TRASH, 4"D, 39,720GPH/25'HD	0.28	0.05	1.60	0.60			0.40	2.94 HR	80
MAP	T50FO004	TRK,HWY, 8,800GVW,4X4, 3/4T-PKUP	1.93	0.35	2.28	0.76	0.34	0.06	1.96	7.66 HR	80
13 04 75. Pumping Plant Superstructure											
GEN	A15Z0120	AIR COMPRESSOR, 100CFM, 100PSI	0.96	0.23	4.16	1.57	0.03	0.00	1.08	8.04 HR	20
GEN	A20Z0480	AIR HOSE,1.5"X 100'L (38MMX 31M)	0.17	0.01					0.32	0.50 HR	20
GEN	L30Z4160	CONVEYOR, 48'L x 16" W, (14.6M X	2.73	0.60	2.16	0.72	0.10	0.02	4.03	10.36 HR	2
GEN	R55Z5880	ROOF EQUIP, KETTLE, 400GAL	1.35	0.17	0.53	5.15	0.03	0.00	1.50	8.73 HR	2
GEN	W35Z8640	WELDER, 300AMP, TRAILER MTD	0.81	0.18	2.31	0.64	0.03	0.00	1.02	4.99 HR	40
13 04 76. Pumping Machinery & Appurtenance											
MAP	C75GV002	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	13.25	3.62	3.77	1.34	1.17	0.19	14.82	38.16 HR	68
MAP	T40KF016	FLATBED, 8'x 16.0', W/SIDE RACKS	0.41	0.07					0.36	0.84 HR	44
EP	T50FO006	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	2.22	0.45	6.80	2.41	0.34	0.06	2.09	14.36 HR	44
13 04 77. Gates and Valves											
MAP	C75GV002	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	13.25	3.62	3.77	1.34	1.17	0.19	14.82	38.16 HR	128
MAP	T40KF016	FLATBED, 8'x 16.0', W/SIDE RACKS	0.41	0.07					0.36	0.84 HR	24
EP	T50FO006	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	2.22	0.45	6.80	2.41	0.34	0.06	2.09	14.36 HR	24

SRC	ID.NO.	EQUIPMENT DESCRIPTION	DEPR	FCCM	FUEL	FOG	TR WR	TR REP	EQ REP	TOTAL RATE	** TOTAL ** HOURS
13 04 99. Associated General Items											
GEN	C80Z2240	CRANE, HYD, TRUCK MTD, 14T	18.22	4.92	6.07	2.56	0.76	0.13	15.25	47.91 HR	17
GEN	L50Z4640	LOADER/BCK-HOE,WH, 0.80CY(0.6M3)	3.73	0.94	1.82	0.69	0.72	0.12	4.70	12.72 HR	4
GEN	T40Z7000	TRK FLATBED, 8'X 20'(2.4MX 6.1M)	0.49	0.09					0.43	1.01 HR	2
GEN	T50Z7400	TRUCK, HWY 25,000 (11,340KG)GVW	3.45	0.71	4.42	1.37	0.70	0.12	3.27	14.03 HR	2
13 05 01. Mob, Demob & Preparatory Work											
MAP	A15XX017	AIR COMPR, 1,600 CFM, 100 PSI	10.44	2.49	15.61	5.20	0.19	0.03	11.74	45.70 HR	4
MAP	C75GV002	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	13.25	3.62	3.77	1.34	1.17	0.19	14.82	38.16 HR	4
EP	P50HO005	PUMP,TRASH, 4"D, 39,720GPH/25'HD	0.28	0.05	1.60	0.60			0.40	2.94 HR	4
EP	T45XX017	TRLR,LOWBOY, 60T, 3 AXLE	3.08	0.91		0.50	1.02	0.17	2.69	8.38 HR	16
EP	T50FO005	TRK,HWY,10,000GVW,4X2, 1T-PICKUP	1.96	0.36	2.28	0.76	0.46	0.08	2.00	7.88 HR	16
EP	T50FO018	TRK,HWY, 46,000 GVW, 6X4, 3 AXLE	10.95	2.01	7.91	2.63	1.49	0.25	9.65	34.90 HR	16
13 05 03. Care and Diversion of Water											
EP	P50HO005	PUMP,TRASH, 4"D, 39,720GPH/25'HD	0.28	0.05	1.60	0.60			0.40	2.94 HR	80
MAP	T50FO004	TRK,HWY, 8,800GVW,4X4, 3/4T-PKUP	1.93	0.35	2.28	0.76	0.34	0.06	1.96	7.66 HR	80
13 05 75. Pumping Plant Superstructure											
GEN	A15Z0120	AIR COMPRESSOR, 100CFM, 100PSI	0.96	0.23	4.16	1.57	0.03	0.00	1.08	8.04 HR	28
GEN	A20Z0480	AIR HOSE,1.5"X 100'L (38MMX 31M)	0.17	0.01					0.32	0.50 HR	28
GEN	L30Z4160	CONVEYOR, 48'L x 16" W, (14.6M X	2.73	0.60	2.16	0.72	0.10	0.02	4.03	10.36 HR	4
GEN	R55Z5880	ROOF EQUIP, KETTLE, 400GAL	1.35	0.17	0.53	5.15	0.03	0.00	1.50	8.73 HR	4
GEN	W35Z8640	WELDER, 300AMP, TRAILER MTD	0.81	0.18	2.31	0.64	0.03	0.00	1.02	4.99 HR	29
13 05 76. Pumping Machinery & Appurtenance											
MAP	C75GV002	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	13.25	3.62	3.77	1.34	1.17	0.19	14.82	38.16 HR	32
MAP	T40KF016	FLATBED, 8'x 16.0', W/SIDE RACKS	0.41	0.07					0.36	0.84 HR	24
EP	T50FO006	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	2.22	0.45	6.80	2.41	0.34	0.06	2.09	14.36 HR	24
13 05 77. Gates and Valves											
MAP	C75GV002	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	13.25	3.62	3.77	1.34	1.17	0.19	14.82	38.16 HR	44
MAP	T40KF016	FLATBED, 8'x 16.0', W/SIDE RACKS	0.41	0.07					0.36	0.84 HR	8
EP	T50FO006	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	2.22	0.45	6.80	2.41	0.34	0.06	2.09	14.36 HR	8
13 06 01. Mob, Demob & Preparatory Work											
MAP	A15XX017	AIR COMPR, 1,600 CFM, 100 PSI	10.44	2.49	15.61	5.20	0.19	0.03	11.74	45.70 HR	4
MAP	C75GV002	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	13.25	3.62	3.77	1.34	1.17	0.19	14.82	38.16 HR	4
EP	P50HO005	PUMP,TRASH, 4"D, 39,720GPH/25'HD	0.28	0.05	1.60	0.60			0.40	2.94 HR	4
EP	T45XX017	TRLR,LOWBOY, 60T, 3 AXLE	3.08	0.91		0.50	1.02	0.17	2.69	8.38 HR	16
EP	T50FO005	TRK,HWY,10,000GVW,4X2, 1T-PICKUP	1.96	0.36	2.28	0.76	0.46	0.08	2.00	7.88 HR	16
EP	T50FO018	TRK,HWY, 46,000 GVW, 6X4, 3 AXLE	10.95	2.01	7.91	2.63	1.49	0.25	9.65	34.90 HR	16
13 06 02. Sitework											
GEN	A15Z0140	AIR COMPRESSOR, 250CFM, 100 PSI	2.29	0.54	2.87	0.96	0.03	0.00	2.57	9.26 HR	57
GEN	A20Z0475	AIR HOSE,1.0"X 100'L (25MMX 31M)	0.11	0.01					0.20	0.32 HR	86
GEN	F10Z3040	FORK LIFT, R/T, 8,000LB (3629KG)	4.10	0.94	2.06	0.57	0.51	0.09	4.57	12.84 HR	29
EP	L20AB012	LITE SET, 4L/1000W, 6KW-GEN,TRLR	1.47	0.29	0.49	0.13	0.05	0.01	3.46	5.90 HR	29
EP	L50CS005	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	5.03	1.23	2.61	0.99	0.48	0.08	6.30	16.71 HR	16
GEN	P45Z5035	PUMP,GROUT,20GPM(76LPM),3-HOPPER	1.47	0.24		0.15			2.03	3.88 HR	57
NON	XMIXX020	SMALL TOOLS	0.50	0.22	0.16	0.07			0.63	1.57 HR	57

SRC	ID.NO.	EQUIPMENT DESCRIPTION	DEPR	FCCM	FUEL	FOG	TR WR	TR REP	EQ REP	TOTAL RATE	** TOTAL ** HOURS
13 06 03. Care and Diversion of Water											
EP	P50HO005	PUMP,TRASH, 4"D, 39,720GPH/25'HD	0.28	0.05	1.60	0.60			0.40	2.94 HR	80
MAP	T50FO004	TRK,HWY, 8,800GVW,4X4, 3/4T-PKUP	1.93	0.35	2.28	0.76	0.34	0.06	1.96	7.66 HR	80
13 06 75. Pumping Plant Superstructure											
GEN	W35Z8640	WELDER, 300AMP, TRAILER MTD	0.81	0.18	2.31	0.64	0.03	0.00	1.02	4.99 HR	2
13 06 76. Pumping Machinery & Appurtenance											
MAP	C75GV002	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	13.25	3.62	3.77	1.34	1.17	0.19	14.82	38.16 HR	16
MAP	T40KF016	FLATBED, 8'x 16.0', W/SIDE RACKS	0.41	0.07					0.36	0.84 HR	8
EP	T50FO006	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	2.22	0.45	6.80	2.41	0.34	0.06	2.09	14.36 HR	8
13 06 77. Gates and Valves											
MAP	C75GV002	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	13.25	3.62	3.77	1.34	1.17	0.19	14.82	38.16 HR	20
MAP	T40KF016	FLATBED, 8'x 16.0', W/SIDE RACKS	0.41	0.07					0.36	0.84 HR	4
EP	T50FO006	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	2.22	0.45	6.80	2.41	0.34	0.06	2.09	14.36 HR	4
13 07 01. Mob, Demob & Preparatory Work											
MAP	A15XX017	AIR COMPR, 1,600 CFM, 100 PSI	10.44	2.49	15.61	5.20	0.19	0.03	11.74	45.70 HR	4
MAP	C75GV002	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	13.25	3.62	3.77	1.34	1.17	0.19	14.82	38.16 HR	4
EP	P50HO005	PUMP,TRASH, 4"D, 39,720GPH/25'HD	0.28	0.05	1.60	0.60			0.40	2.94 HR	4
EP	T45XX017	TRLR,LOWBOY, 60T, 3 AXLE	3.08	0.91		0.50	1.02	0.17	2.69	8.38 HR	16
EP	T50FO005	TRK,HWY,10,000GVW,4X2, 1T-PICKUP	1.96	0.36	2.28	0.76	0.46	0.08	2.00	7.88 HR	16
EP	T50FO018	TRK,HWY, 46,000 GVW, 6X4, 3 AXLE	10.95	2.01	7.91	2.63	1.49	0.25	9.65	34.90 HR	16
13 07 02. Sitework											
GEN	A15Z0140	AIR COMPRESSOR, 250CFM, 100 PSI	2.29	0.54	2.87	0.96	0.03	0.00	2.57	9.26 HR	57
GEN	A20Z0475	AIR HOSE,1.0"X 100'L (25MMX 31M)	0.11	0.01					0.20	0.32 HR	86
GEN	F10Z3040	FORK LIFT, R/T, 8,000LB (3629KG)	4.10	0.94	2.06	0.57	0.51	0.09	4.57	12.84 HR	29
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EP	L50CS005	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	5.03	1.23	2.61	0.99	0.48	0.08	6.30	16.71 HR	16
GEN	P45Z5035	PUMP,GROUT,20GPM(76LPM),3-HOPPER	1.47	0.24		0.15			2.03	3.88 HR	57
NON	XMIXX020	SMALL TOOLS	0.50	0.22	0.16	0.07			0.63	1.57 HR	57
13 07 03. Care and Diversion of Water											
EP	P50HO005	PUMP,TRASH, 4"D, 39,720GPH/25'HD	0.28	0.05	1.60	0.60			0.40	2.94 HR	80
MAP	T50FO004	TRK,HWY, 8,800GVW,4X4, 3/4T-PKUP	1.93	0.35	2.28	0.76	0.34	0.06	1.96	7.66 HR	80
13 07 75. Pumping Plant Superstructure											
GEN	W35Z8640	WELDER, 300AMP, TRAILER MTD	0.81	0.18	2.31	0.64	0.03	0.00	1.02	4.99 HR	2
13 07 76. Pumping Machinery & Appurtenance											
MAP	C75GV002	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	13.25	3.62	3.77	1.34	1.17	0.19	14.82	38.16 HR	16
MAP	T40KF016	FLATBED, 8'x 16.0', W/SIDE RACKS	0.41	0.07					0.36	0.84 HR	8
EP	T50FO006	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	2.22	0.45	6.80	2.41	0.34	0.06	2.09	14.36 HR	8
13 07 77. Gates and Valves											
MAP	C75GV002	CRANE,HYD,S/P,RT,4WD,20T/70'BOOM	13.25	3.62	3.77	1.34	1.17	0.19	14.82	38.16 HR	28
MAP	T40KF016	FLATBED, 8'x 16.0', W/SIDE RACKS	0.41	0.07					0.36	0.84 HR	4
EP	T50FO006	TRK,HWY, 21,000 GVW, 4X2, 2 AXLE	2.22	0.45	6.80	2.41	0.34	0.06	2.09	14.36 HR	4

SRC	ID.NO.	EQUIPMENT DESCRIPTION	DEPR	FCCM	FUEL	FOG	TR WR	TR REP	EQ REP	TOTAL RATE	** TOTAL ** HOURS

30 01 1. Planning, Engineering, & Design
31 01 1. Construction Management

APPENDIX - F

WOOD RIVER DRAINAGE & LEVEE DISTRICT
RE-EVALUATION REPORT
HYDROLOGIC AND HYDRAULIC APPENDIX

Hydrologic and Hydraulic Appendix

Authority

The original project was authorized by the Flood Control Act of 28 June 1938. The project provided for raising and enlarging the existing locally-built levee system as well as building new levees and apputenant works to protect the enlarged Wood River Drainage and Levee District from floods, primarily on the Mississippi River, as well as Cahokia Creek Diversion Channel, Wood River, East and West Forks of Wood River, and Indian Creek. Prior to 1938, the levees in the district were designed and built entirely as local units for protection against floods from the Wood River only, with the height and cross-section based on local experience and available funding.

Location of Project

The project is located in Madison County, near the City of Alton, Illinois on the left bank of the Mississippi River between river miles 195.0 and 202.7 above the mouth of the Ohio River.

Protected Areas

The area protected is approximately 13,700 acres and includes the bottomlands between the river and the bluffs and extends from the Cahokia Creek Diversion Channel on the south flank to the City of Alton on the north. A major portion of the 13,700 acres protected by the levee systems is devoted to industrial, commercial and urban uses.

Original Hydraulic Design Criteria

a. Riverfront levees. The design flood for the riverfront levee was the 1844 flood, which at the time the levee was built, was considered to be a flow of 1,300,000 cfs at St. Louis and equivalent to a 52-foot stage on the St. Louis gage. The height of protection was based upon an urban design flood profile having a water surface elevation of 443.4 feet NGVD at the upper end (river mile 202.7), elevation 442.7 feet NGVD at the mouth of Wood River, and elevation 441.4 feet NGVD at the lower end (Cahokia Creek Diversion Channel). The design net levee grade was 2 feet above the design water surface. The riverfront levee protection under current flood frequency criteria is considered to protect against a 700-year return period event.

b. Flank Levees. For the flank levees a net grade equal to the main stem design flood elevation plus 2 feet was projected back along the tributaries, parallel to the 100-year tributary design flood occurring coincidentally with the main stem design flood.

Hydraulic Data Used For This Re-evaluation Study

Riverside stage-frequency relationships were provided for each of the three study reaches, Upper Wood River, Lower Wood River, and East-West Forks of Wood River. Stage frequency values were determined at the midpoint along the riverfront for both the Upper and Lower Wood River reaches, at river miles 201 and 197, respectively. Stage

frequency values for the East-West Forks reach were taken from the Madison County Flood Insurance Report for the 10-,50-,100-,500-year profiles. A location along the East Fork Wood River, where flood elevations are controlled by headwater flooding, was chosen as the index point. A coincident frequency analysis was not deemed necessary for the small area protected in the east-West Fork reach. These values were then plotted on probability graph paper and a line drawn through those points to extrapolate additional frequency values. The stages for 8 frequency events (1-,5-,10-,50-,100-,200-,500-,and 700-year) were used to represent the entire range of frequency events. The assumption for this re-evaluation study is that if the levee fails, the exterior and interior stages are the same.

Estimate of Risk and Uncertainty

The uncertainty associated with the stage-frequency data was based on an equivalent record length of 100 years.

Pump Station Evaluation

Interior runoff volume to the Wood River Pump Stations was analyzed for 3 of the pump stations in order to determine damages that would result from interior rainfall events. The following tables represent the frequency storm events analyzed.

a. Pump Station: Lakeside
NRCS Curve Number: 85
Drainage Area (acres): 340

Return Period	10-Day Bulletin 70 Pt. Rainfall	Partial Duration to Annual Series	Areal Reduction	Adjusted Rainfall	Runoff (in.)	Volume (ac-ft.)	Elevation
2	5.54	0.88	1.00	4.88	3.80	108	435.7
5	6.80	0.96	1.00	6.53	4.80	136	436.1
10	7.80	0.99	1.00	7.72	5.90	167	436.5
25	9.20	1.00	1.00	9.20	7.35	208	437.1
50	10.44	1.00	1.00	10.44	8.60	244	437.6
100	11.81	1.00	1.00	11.81	9.90	280	438.1
200	14.50	1.00	1.00	14.50	12.60	357	439.2

b. Pump Station: Homegarden
NRCS Curve Number: 85
Drainage Area (acres): 128

Return Period	10-Day Bulletin 70 Pt. Rainfall	Partial Duration to Annual Series	Areal Reduction	Adjusted Rainfall	Runoff (in.)	Volume (ac-ft.)	Elevation
2	5.54	0.88	1.00	4.88	3.80	41	430.8
5	6.80	0.96	1.00	6.53	4.80	51	431.0
10	7.80	0.99	1.00	7.72	5.90	63	431.3
25	9.20	1.00	1.00	9.20	7.35	78	431.7
50	10.44	1.00	1.00	10.44	8.60	92	432.0
100	11.81	1.00	1.00	11.81	9.90	106	432.4
200	14.50	1.00	1.00	14.50	12.60	134	433.0

c. Pump Station: East Alton No. 1
NRCS Curve Number: 85
Drainage Area (acres): 454

Return Period	10-Day Bulletin 70 Pt. Rainfall	Partial Duration to Annual Series	Areal Reduction	Adjusted Rainfall	Runoff (in.)	Volume (ac-ft.)	Elevation
2	5.54	0.88	1.00	4.88	3.80	144	430.8
5	6.80	0.96	1.00	6.53	4.80	182	431.1
10	7.80	0.99	1.00	7.72	5.90	223	431.4
25	9.20	1.00	1.00	9.20	7.35	278	431.7
50	10.44	1.00	1.00	10.44	8.60	325	432.0
100	11.81	1.00	1.00	11.81	9.90	374	432.4
200	14.50	1.00	1.00	14.50	12.60	477	433.0

APPENDIX - G

WOOD RIVER DRAINAGE & LEVEE DISTRICT
RE-EVALUATION REPORT
INDEPENDENT TECHNICAL REVIEW

CERTIFICATION OF LEGAL REVIEW

The Draft Limited Reevaluation Report for the Wood River Levee, Illinois Project has been fully reviewed by the Office of Counsel, USAED, St. Louis.

Mark A. Wunsch
Assistant District Counsel

10 December 2004
Date

INDEPENDENT TECHNICAL REVIEW SHEET

23 Nov 04
Date

Structural

30 NOV 04
Date

Cost Estimating

29 Nov 04
Date

Geotechnical

23 Nov 04
Date

Mechanical

23 NOV 04
Date

Electrical

23 Nov. 2004
Date

Environmental

23 Nov 2004
Date

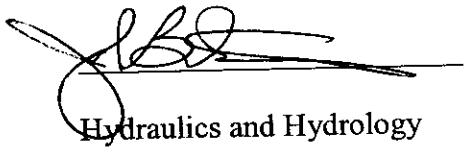
Real Estate

11/23/04
Date

Economics

Wood River Levee System Re-evaluation Draft Report – ITR Appendix G

INDEPENDENT TECHNICAL REVIEW SHEET



11/23/04

Hydraulics and Hydrology Date

Wood River Economic Appendix

Page B-6 Additional justification for use of New Orleans District data for commercial structures should be added.

Reply (Kelly): Comment is appreciated. The following additional justification is from Lisa Leonard and Brian Maestri (New Orleans District), who performed the economic work and prepared the Report for the April 2004 AFB.

"The depth-damage relationships developed by the New Orleans District for the commercial structures in the Wood River study area were determined to be appropriate after a field trip by New Orleans economics personnel. The type of commercial structures in the Wood River study area along with the building construction is similar to the Jefferson/Orleans study area. During the field inventory, photographs were taken of all non-residential structures along with the Marshal and Swift buildings data to value the structure and verify that the proper depth-damage curve was used for the different commercial structure classifications. The photographs were also used to show that both study areas contain Class A and B type buildings with steel frame walls for office buildings and hotels, Class C type buildings with masonry bearing walls for restaurants and strip malls, and the Class D and S buildings with wood frame or metal frame walls as used in fast-food restaurants and warehouses. The Marshal and Swift commercial estimator program was used to calculate site-specific building values."

"Since contents for commercial establishments such as fast food franchises, strip malls, medical offices, schools, and service garages throughout the United States are similar, it was deemed appropriate to use the New Orleans commercial survey data. However, for industrial buildings, an individual survey of the contents and their susceptibility to flooding was conducted."

Page B-8 and B-16 There appear to be different depth damage curves used in the levee analysis and the incremental analyses for pumps, gravity drains etc. If different curves were used the rational should be presented.

Reply (Kelly): Comment is appreciated and clarification will be made in Report. The depth-damage curves outlined under Depth-Damage Relationships on B-8 are used in the incremental analysis of alternative components. The sentence referencing St. Louis District curves under Structural Benefits on B-16 is incorrect and will be clarified. For Wastewater Benefits (which were not discussed under Depth-Damage Relationships on B-8) St. Louis District depth-damage curves are used.

Should consider conducting the analysis at the current discount rate of 5-3/8 percent.

Reply (Kelly): Comment is appreciated.

Need to check the price level used. Most references are for September 2004, but Table 6 shows October 2004.

Reply (Kelly): Comment is appreciated. Correction will be made to incorrect Oct. 2004 Table 6 heading to "Sept. 2004". Benefit figures in Tables 5 and 6 are equal (estimated using September 2004 price level).

Need to check the base year used. Base year of 2008 was found on page B-2, but looks like most of the Tables show 2006.

Reply (Kelly): Comment is greatly appreciated. Base year of 2008 as noted on B-2 is correct. All probability of unsatisfactory performance (PUP) estimates are 2008 estimates. All Tables will be corrected to properly reflect "Base Year of 2008".

It was not clear if costs for annual operation of items such as pumps were included in the incremental analyses.

Reply (Kelly): Comment is appreciated. OMRR&R costs are included in the incremental analyses. Label correction will be made in Table 8 to "Average Annual OMRR&R Costs".

Not possible to determine if interest during construction was included in determining gross investment for the levee system analysis.

Reply (Kelly): Comment is greatly appreciated. Tables 5 and 6 on B-15 and B-16, respectively, are corrected to reflect Interest During Construction (IDC) for levee system analysis.

Page B-18 A more detailed discussion of how the economic consequence benefits presented on Page B-18 were developed is needed.

Reply (Kelly): Comment is appreciated. A more detailed example has been added to the Report under Economic Consequence Benefits.

Tables presenting the different benefit categories for each of the analyses would be helpful.

Reply (Kelly): Comment is appreciated. Table 7 presenting different damage/benefit categories under inoperable pump station conditions has been added to the Report.

CEMVK-RE-EP 19 October 2004

MEMORANDUM FOR CEMVK-PP-PE; ATTN: Mr. Burke

SUBJECT: Technical Review, Wood River Drainage and Levee District, Re-evaluation Report, Draft Real Estate Plan

I have reviewed the above subject project in regard to the Draft Real Estate Plan and its related costs and content.

Comments and suggestions have been made in an effort to clarify portions of the report and minimize anticipated comments from Division reviewers. These comments are as follows:

The 20 points suggested for REP reports by Division have been covered, but are weak in format and content and probably will not pass Division review. Copies of recently approved REP's prepared by Vicksburg District can be furnished if that would be helpful.

Comment Noted. Division has already reviewed the Report.

Suggest that definitive comments like those in items 9 and 16 be expanded to include reasons why they are not anticipated.

Concur. Item information expanded.

Suggest that in Item 13, some discussion be incorporated to explain who will be responsible for condemnation, should it be required.

Concur. Information included.

Cost estimates appear to be reasonable based on location, highest and best uses, and estates to be acquired. It is assumed that estimated values were obtained from an approved Gross Appraisal.

Comment Noted.

Suggest that in Exhibit A, the verbiage in the temporary work easement that deals with borrow and fill be struck through, but left in the estate. (Recent comments from Division reviewer on nominal compensation for temporary work easement in Vicksburg REP.)

Concur. Verbiage modified.

I found the remaining portions of the draft REP to be satisfactory. Good luck.

Marion K. White

Chief, Appraisal and Planning Branch
Vicksburg District
Corps of Engineers

DrChecks / Select Project / Select Review / Select Report / View Report

Comment Report: All Comments
For the **Independent Technical Review** phase of project **Wood River Limited Re-evaluation Draft Report**
(sorted by Discipline , ID)
Displaying 86 comments.

Id	Discipline	DocType	Spec	Sheet	Detail
702788	Biology/Ecology	Planning Report	n/a	n/a	n/a
Draft Report - Table of Contents 4.4.7 should read 905(b) not 9056. Submitted By: Larry Marcy (601-631-5965). Submitted On: 19-Oct-04					
1-0	Evaluation **Concurred** Table of Contents will be corrected Submitted By: Deborah Roush (314-331-8033) Submitted On: 01-Nov-04				
	Backcheck not conducted				
	Current Comment Status: **Comment Open**				
702791	Biology/Ecology	Planning Report	n/a	n/a	n/a
Draft Report - Section 4.4.1., Paragraph beginning Upper Mississippi River Basin, last sentence should read... levees located on the South side... not locted. Submitted By: Larry Marcy (601-631-5965). Submitted On: 19-Oct-04					
1-0	Evaluation **Concurred** Spelling will be corrected Submitted By: Deborah Roush (314-331-8033) Submitted On: 01-Nov-04				
	Backcheck not conducted				
	Current Comment Status: **Comment Open**				
702792	Biology/Ecology	Planning Report	n/a	n/a	n/a
Draft Report - Section 5.1.2.2., Delete extra period (.) in front of...As these inspections show... Submitted By: Larry Marcy (601-631-5965). Submitted On: 19-Oct-04					
1-0	Evaluation **Concurred** Extra period will be deleted Submitted By: Deborah Roush (314-331-8033) Submitted On: 01-Nov-04				
	Backcheck not conducted				
	Current Comment Status: **Comment Open**				
702794	Biology/Ecology	Planning Report	n/a	n/a	n/a
Draft Report - Section 5.1.3.1., states there are 38 CMP gravity drains. In Table 5-2 there are 41 gravity drains listed and also the EA states there are 41 drains. Submitted By: Larry Marcy (601-631-5965). Submitted On: 19-Oct-04					

1-0	Evaluation **Concurred** As originally constructed the project had 41CMP drains. Sentence will be modified to clarify that of the originally constructed 41CMP drains 38 remain. The other 3 have been replaced or lined as a result of failures during flood events as depicted on Table 1, page A-11. Submitted By: Deborah Roush (314-331-8033) Submitted On: 01-Nov-04
	Backcheck not conducted
	Current Comment Status: **Comment Open**

702795	Biology/Ecology	Planning Report	n/a	n/a	n/a

Draft Report - Section 5.1.3.4., middle fo the page, "However, pumps of this type installed and operational for this period of time have been shown to require construction". Do you mean re-construction, repair, replacement, etc.?

Submitted By: Larry Marcy (601-631-5965).
Submitted On: 19-Oct-04

1-0	Evaluation **Concurred** Construction will be corrected to read re-construction Submitted By: Deborah Roush (314-331-8033) Submitted On: 01-Nov-04
	Backcheck not conducted
	Current Comment Status: **Comment Open**

702796	Biology/Ecology	Planning Report	n/a	n/a	n/a

Draft Report - Section 5.1.4.2., Climate and Weather, page 18, second paragraph, states that climatological data are summarized in Table 5-1. Sould read Table 5-3.

Submitted By: Larry Marcy (601-631-5965).
Submitted On: 19-Oct-04

1-0	Evaluation **Concurred** Reference will be corrected. Submitted By: Deborah Roush (314-331-8033) Submitted On: 01-Nov-04
	Backcheck not conducted
	Current Comment Status: **Comment Open**

702797	Biology/Ecology	Planning Report	n/a	n/a	n/a

Draft Report - Section 5.1.4.3, Economics, page 19, last sentence in the first paragraph, should read...The following three tables (Tables 5-4, 5-5, and 5-6)...

Submitted By: Larry Marcy (601-631-5965).
Submitted On: 19-Oct-04

1-0	Evaluation **Concurred** Sentence will be corrected. Submitted By: Deborah Roush (314-331-8033) Submitted On: 01-Nov-04
	Backcheck not conducted
	Current Comment Status: **Comment Open**

702798	Biology/Ecology	Planning Report	n/a	n/a	n/a

Draft Report - Section 5.1.4.3., Sentence following Table 5-4 should read Table 5-5, not 5-3. The second sentence following Table 5-5 should read Table 5-6, not Table 5-4. Submitted By: Larry Marcy (601-631-5965). Submitted On: 19-Oct-04	
1-0	Evaluation **Concurred** References will be corrected Submitted By: Deborah Roush (314-331-8033) Submitted On: 01-Nov-04
	Backcheck not conducted
	Current Comment Status: **Comment Open**

702799	Biology/Ecology	Planning Report	n/a	n/a	n/a

Draft Report - Section 5.1.4.4, Hydrology, is m.s.l. correct or is N.G.V.D. acceptable? I do not know, but I thought all elevations were reported as N.G.V.D. Submitted By: Larry Marcy (601-631-5965). Submitted On: 19-Oct-04	
1-0	Evaluation **Concurred** m.s.l will be changed to read N.G.V.D. Submitted By: Deborah Roush (314-331-8033) Submitted On: 01-Nov-04
	Backcheck not conducted
	Current Comment Status: **Comment Open**

702800	Biology/Ecology	Planning Report	n/a	n/a	n/a

Draft Report - Section 5.3.2.2, second paragraph, delete the extra period (.) before the last sentence. Submitted By: Larry Marcy (601-631-5965). Submitted On: 19-Oct-04	
1-0	Evaluation **Concurred** Correction will be made Submitted By: Deborah Roush (314-331-8033) Submitted On: 01-Nov-04
	Backcheck not conducted
	Current Comment Status: **Comment Open**

702803	Biology/Ecology	Planning Report	n/a	n/a	n/a

Draft Report - Section 5.3.4., Closure Structures, second sentence, spell out the number 3 at the beginning of the sentence. Same comment for Section 5.6.1.3.2, Gates and Stoplogs, spell out the number 2 at the beginning of the sentence. Submitted By: Larry Marcy (601-631-5965). Submitted On: 19-Oct-04	
1-0	Evaluation **Concurred** Correction will be made Submitted By: Deborah Roush (314-331-8033) Submitted On: 01-Nov-04
	Backcheck not conducted

	Current Comment Status: **Comment Open**				
702808	Biology/Ecology	Planning Report	n/a	n/a	n/a
Draft Report - Section 7, Environmental Consequences, in the sentence need to cite the environmental assessment as Appendix C. In most draft reports prepared at MVK, there is a brief explanation of environmental impacts of the alternatives and then for more detail refer the reader to the appendix. Submitted By: Larry Marcy (601-631-5965). Submitted On: 19-Oct-04					
1-0	Evaluation **Concurred** A reference to the Environmental Consequences Appendix will be added to the paragraph. Submitted By: Deborah Roush (314-331-8033) Submitted On: 01-Nov-04				
	Backcheck not conducted				
	Current Comment Status: **Comment Open**				
702809	Biology/Ecology	Planning Report	n/a	n/a	n/a
EA - Section I.A., Project Location, second sentence, recommend left descending bank instead of left bank. Submitted By: Larry Marcy (601-631-5965). Submitted On: 19-Oct-04					
1-0	Evaluation **Non-concurred** While technically correct for consistency purposes description will not be changed as it matches other existing project documents and project authorization documentation. Submitted By: Deborah Roush (314-331-8033) Submitted On: 05-Nov-04				
	Backcheck not conducted				
	Current Comment Status: **Comment Open**				
702811	Biology/Ecology	Planning Report	n/a	n/a	n/a
EA - Section II., Project Authorization, page C-3, recommending addind a brief explanation as to why the pump station was not built. Submitted By: Larry Marcy (601-631-5965). Submitted On: 19-Oct-04					
1-0	Evaluation **Concurred** Sentence will be expanded to explain lack of funds as the reason Submitted By: Deborah Roush (314-331-8033) Submitted On: 01-Nov-04				
	Backcheck not conducted				
	Current Comment Status: **Comment Open**				
702813	Biology/Ecology	Planning Report	n/a	n/a	n/a
EA- Section III.A., second paragraph, first sentence, should read 225 feet above the floodplain. Submitted By: Larry Marcy (601-631-5965). Submitted On: 19-Oct-04					
1-0	Evaluation **Concurred** Sentence will be corrected				

	Submitted By: Deborah Roush (314-331-8033) Submitted On: 01-Nov-04
	Backcheck not conducted
	Current Comment Status: **Comment Open**

702818	Biology/Ecology	Planning Report	n/a	n/a	n/a

EA- Section III.D., Prime Farmland, page C-4, NRCS 2000 is not shown in the literature cited. In the paragraph, suggest spelling out Natural Resources Conservation Service (NRCS) and then use NRCS in the remainder of the EA.

Submitted By: Larry Marcy (601-631-5965).
Submitted On: 19-Oct-04

1-0	Evaluation **Concurred** A review finds NRCS 2004 is the correct citation for both. This will be corrected. Submitted By: Deborah Roush (314-331-8033) Submitted On: 01-Nov-04
	Backcheck not conducted
	Current Comment Status: **Comment Open**

702823	Biology/Ecology	Planning Report	n/a	n/a	n/a

EA - Section III.F., Surface Water Resources, first sentence, show the abbreviation following Illinois Environmental Protection Agency (IEPA) and then use IEPA in the remainder of the EA.

Submitted By: Larry Marcy (601-631-5965).
Submitted On: 19-Oct-04

1-0	Evaluation **Concurred** Correction will be made Submitted By: Deborah Roush (314-331-8033) Submitted On: 01-Nov-04
	Backcheck not conducted
	Current Comment Status: **Comment Open**

702825	Biology/Ecology	Planning Report	n/a	n/a	n/a

EA - Section III.J., T&E species, F&WS offices in MVK area tell us to use interior least tern (Sterna antillarum athalassos) to avoid confusion with the other subspecies. Suggest using Interior Least Tern at the top of page C-7. Indiana Bat section, recommend adding scientific names of the trees to be consistent (scientific names were used for the T&E species).

Submitted By: Larry Marcy (601-631-5965).
Submitted On: 19-Oct-04

1-0	Evaluation **Concurred** The least tern will be identified as interior and scientific names of tree species will be added for consistency. Submitted By: Deborah Roush (314-331-8033) Submitted On: 05-Nov-04
	Backcheck not conducted
	Current Comment Status: **Comment Open**

702826	Biology/Ecology	Planning Report	n/a	n/a	n/a

EA - Section III.K., Recreation, are there any other recreation interests like fishing or boating in the

creeks?

Submitted By: Larry Marcy (601-631-5965).
Submitted On: 19-Oct-04

1-0	Evaluation **For Information Only** No other activities are occuring on project land. Recreation is not apart of the project purpose. Trails noted have been constructed at 100% non-Federal cost and PGM from Recon precluded this study looking at other project purposes. Submitted By: Deborah Roush (314-331-8033) Submitted On: 01-Nov-04
	Backcheck not conducted
	Current Comment Status: **Comment Open**

702827	Biology/Ecology	Planning Report	n/a	n/a	n/a

EA - Section III.M., Historic Properties, section title is duplicated three times.

Submitted By: Larry Marcy (601-631-5965).
Submitted On: 19-Oct-04

1-0	Evaluation **Concurred** Title will be corrected Submitted By: Deborah Roush (314-331-8033) Submitted On: 01-Nov-04
	Backcheck not conducted
	Current Comment Status: **Comment Open**

702828	Biology/Ecology	Planning Report	n/a	n/a	n/a

EA - pages C-3 and C-9, some confusion as Roman Numeral III is used on each page.

Submitted By: Larry Marcy (601-631-5965).
Submitted On: 19-Oct-04

1-0	Evaluation **Concurred** Numbering will be corrected Submitted By: Deborah Roush (314-331-8033) Submitted On: 01-Nov-04
	Backcheck not conducted
	Current Comment Status: **Comment Open**

702830	Biology/Ecology	Planning Report	n/a	n/a	n/a

EA - Section III. Future without Project (No Action), third paragraph, states that there would be "an environmental contamination scenario not experienced on any waterway system to date". However, Table EA-1, under the no action alternative, does not reflect this disaster scenario as minus signs. If the levee fails, there could be serious adverse impacts to natural resources, as well as economic and social impacts. Suggest showing the no action alternative as negative(s) where applicable.

Submitted By: Larry Marcy (601-631-5965).
Submitted On: 19-Oct-04

1-0	Evaluation **Non-concurred** Table EA-1 as descripted in the Appendix is designed to show probable impacts. For purposes of the EA it was not assumed that catastrophic levee failure was a certainty. Many categories in the without project column would need to be changed if failure was assumed to be a certainty. It was felt that without the project only three areas would have

	probable impacts because any flooding situation would effect these areas (flood damage reduction, safety and operation and maintenance) even during flood fight actions. Submitted By: Deborah Roush (314-331-8033) Submitted On: 05-Nov-04
	Backcheck not conducted
	Current Comment Status: **Comment Open**

702832	Biology/Ecology	Planning Report	n/a	n/a	n/a

EA - Section IV., Alternatives Considered and Recommended Plan, page C-9, second paragraph, Three action alternatives were formulated not two. Information provided in the paragraph explains three action alternatives and Table EA-1 shows three alternatives. Submitted By: Larry Marcy (601-631-5965). Submitted On: 19-Oct-04

1-0	Evaluation **Concurred** Paragraph will be corrected Submitted By: Deborah Roush (314-331-8033) Submitted On: 01-Nov-04
	Backcheck not conducted
	Current Comment Status: **Comment Open**

702833	Biology/Ecology	Planning Report	n/a	n/a	n/a

EA - Section VI., Environmental Effects of the Alternatives, page C-11, suggest deleting the words "Recommended Plan and the other two" and stating...Table EA-1 displays a summary of probable impacts to environmental, social, and economic resources in the project area for the three action alternatives and the no-action (future without project) alternative. Table EA-1, no action impacts should be shown as minuses where appropriate (see comment above under section III). Submitted By: Larry Marcy (601-631-5965). Submitted On: 19-Oct-04

1-0	Evaluation **Concurred** Wording will be changed as recommended Submitted By: Deborah Roush (314-331-8033) Submitted On: 01-Nov-04
	Backcheck not conducted
	Current Comment Status: **Comment Open**

702834	Biology/Ecology	Planning Report	n/a	n/a	n/a

EA - Section VI. D., page C-14, could use abbreviation NRCS since it was cited previously on page C-4. Submitted By: Larry Marcy (601-631-5965). Submitted On: 19-Oct-04

1-0	Evaluation **Concurred** Abbreviation will be substituted Submitted By: Deborah Roush (314-331-8033) Submitted On: 01-Nov-04
	Backcheck not conducted
	Current Comment Status: **Comment Open**

702851	Biology/Ecology	Planning Report	n/a	n/a	n/a
EA- Section VI.J., T&E species, page C-15, recommend using Interior Least Tern. Submitted By: Larry Marcy (601-631-5965). Submitted On: 19-Oct-04					
1-0	Evaluation **Concurred** Interior lest tern will be used. Submitted By: Deborah Roush (314-331-8033) Submitted On: 05-Nov-04				
	Backcheck not conducted				
	Current Comment Status: **Comment Open**				
702853	Biology/Ecology	Planning Report	n/a	n/a	n/a
EA - Literature Cited, NRCS 2002 is not cited in the text. This may have been NRCS 2000 as shown in the text on page C-4. Submitted By: Larry Marcy (601-631-5965). Submitted On: 19-Oct-04					
1-0	Evaluation **Concurred** A review finds that NRCS 2004 should be cited in both locations Submitted By: Deborah Roush (314-331-8033) Submitted On: 01-Nov-04				
	Backcheck not conducted				
	Current Comment Status: **Comment Open**				
702855	Biology/Ecology	Planning Report	n/a	n/a	n/a
EA - Section XI, Coordination, first paragraph, should read the St. Louis District has coordinated with... Submitted By: Larry Marcy (601-631-5965). Submitted On: 19-Oct-04					
1-0	Evaluation **Concurred** Correction to include the word "District" will be made Submitted By: Deborah Roush (314-331-8033) Submitted On: 01-Nov-04				
	Backcheck not conducted				
	Current Comment Status: **Comment Open**				
702856	Biology/Ecology	Planning Report	n/a	n/a	n/a
General comments on the draft report and EA, both documents are well written and clearly describe the need for the project, alternatives analyzed, rational for the selection of the recommended plan, as well as potential environmental impacts associated with the project. I agree that a FONSI is the correct determination. Submitted By: Larry Marcy (601-631-5965). Submitted On: 19-Oct-04					
1-0	Evaluation **For Information Only** Comment noted Submitted By: Deborah Roush (314-331-8033) Submitted On: 01-Nov-04				

	Backcheck not conducted
	Current Comment Status: **Comment Open**

707244	Civil	Design Memorandum or Report	n/a	n/a	n/a

Since there are no apparent problems with the levee itself, I have no comments.

Submitted By: Tim Graham (601-631-7193).
Submitted On: 26-Oct-04

1-0	Evaluation **For Information Only** Comment noted Submitted By: Deborah Roush (314-331-8033) Submitted On: 01-Nov-04
	Backcheck not conducted
	Current Comment Status: **Comment Open**

709876	Cost Engineering	Cost Estimate	n/a	n/a	n/a

There are no project notes to explain the bases of the estimate. Project notes explaining general scope of work, bases of the estimate, and any other information that will clarify the logic used in the estimate.

Submitted By: Danny McPhearson (601-631-5602).
Submitted On: 29-Oct-04

1-0	Evaluation **Concurred** Will add project notes explaining the general scope of work and basis of estimate. Submitted By: Gregory Dyn (314/331-8319) Submitted On: 03-Nov-04
1-1	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Danny McPhearson (601-631-5602) Submitted On: 19-Nov-04
1-2	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Danny McPhearson (601-631-5602) Submitted On: 19-Nov-04
1-3	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Gregory Dyn (314/331-8319) Submitted On: 30-Nov-04
	Current Comment Status: **Comment Closed**

709878	Cost Engineering	Cost Estimate	n/a	n/a	n/a

There appears to be no sales tax in estimate. Sales tax should be addressed.

Submitted By: Danny McPhearson (601-631-5602).
Submitted On: 29-Oct-04

1-0	Evaluation **Non-concurred** The state of Illinois does not require sales tax on federal projects. Submitted By: Gregory Dyn (314/331-8319)

	Submitted On: 03-Nov-04
1-1	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Danny McPhearson (601-631-5602) Submitted On: 19-Nov-04
1-2	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Gregory Dyn (314/331-8319) Submitted On: 30-Nov-04
	Current Comment Status: **Comment Closed**

709880	Cost Engineering	Cost Estimate	n/a	n/a	n/a

There is no escalation in the estimate. The excalation should be addressed.

Submitted By: Danny McPhearson (601-631-5602).
Submitted On: 29-Oct-04

1-0	Evaluation **Non-concurred** The price level for the estimate is Oct.04. Escalation is not considered to be necessary at the present time. Submitted By: Gregory Dyn (314/331-8319) Submitted On: 03-Nov-04
1-1	Backcheck Recommendation **Open Comment** Reference ER 1110-2-1150 paragraph C-19 and EI 01D010 paragraphs 2-9 and 13-4. The project schedule indicates completion in FY2008, thus it appears that escalation should be included in the Baseline Cost Estimate (BCE). Submitted By: Danny McPhearson (601-631-5602) Submitted On: 19-Nov-04
2-0	Evaluation **Concurred** Due to current funding restraints escalation will be added as part of the final report. Submitted By: Gregory Dyn (314/331-8319) Submitted On: 30-Nov-04
2-1	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Danny McPhearson (601-631-5602) Submitted On: 30-Nov-04
2-2	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Gregory Dyn (314/331-8319) Submitted On: 30-Nov-04
	Current Comment Status: **Comment Closed**

709883	Cost Engineering	Cost Estimate	n/a	n/a	n/a

Lands and Damages are not shown in the work breakdown structure. At a minimum, the lands and damages should be shown to the sub-feature level.

Submitted By: Danny McPhearson (601-631-5602).
Submitted On: 29-Oct-04

1-0	Evaluation **Non-concurred** The Real Estate baseline cost estimate is shown in Appendix D as Exhibit C. The details of the real estate estimate were not available to the cost estimator at the time the estimate was prepared. Submitted By: Gregory Dyn (314/331-8319) Submitted On: 03-Nov-04
1-1	Backcheck Recommendation **Open Comment** Reference ER 1110-2-1150 paragraph C-19, ER 1110-2-1302 paragraph 8.a, and EI 01D010 paragraph 13-3(1). Even if the Lands and Damages cost are detailed else where in the report, this does not exempt the information from being included in the estimate as required by the above references and being shown in the Baseline Cost Estimate documentation to the subfeature level. Escalation should be included. Submitted By: Danny McPhearson (601-631-5602) Submitted On: 19-Nov-04
1-2	Backcheck Recommendation **Close Comment** Concur. Due to current funding restraints the Real Estate estimate will be added as part of the final report Submitted By: Gregory Dyn (314/331-8319) Submitted On: 30-Nov-04
1-3	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Danny McPhearson (601-631-5602) Submitted On: 30-Nov-04
1-4	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Gregory Dyn (314/331-8319) Submitted On: 30-Nov-04
	Current Comment Status: **Comment Closed**

709888	Cost Engineering	Cost Estimate	n/a	n/a	n/a

There are no details are notes explaining the 30 feature or 31 feature. Cost in these feature are not adequately supported. The use of the civil work breakdown structure would help in determining the cost.

Submitted By: Danny McPhearson (601-631-5602).
Submitted On: 29-Oct-04

1-0	Evaluation **Non-concurred** Historic percentages that have proven to be reliable over time have been utilized and are considered more accurate at this stage of plan development. Submitted By: Deborah Roush (314-331-8033) Submitted On: 05-Nov-04
1-1	Backcheck Recommendation **Open Comment** A fully funded Baseline Cost Estimate(BCE)is required for a Limited Re-evaluation Report (Reference ER 1110-2-1150 paragraphs 8.1, 13.9, C-1, and C-19 and ER 1110-2-1302 paragraph 7.b.). Reference ER 1110-2-1302 paragraphs 13.9 and C-19, ER 1110-2-1302 and EI 01D010 for preparing and reporting the BCE. The BCE documentation must be in the MCACES format and include the summary sheets for direct costs, indirect costs, and owner costs to the subfeature level for all features and a total project cost summary that addresses escalation through project completion. Features 30 and 31 should be prepared according to ER 1110-2-1302 paragraphs 8.c. and d. and EI 01D010 paragraphs 13-3.a.(2)

	and (3). Submitted By: Danny McPhearson (601-631-5602) Submitted On: 19-Nov-04
1-2	Backcheck Recommendation **Close Comment** Concur. Due to current funding restraints details for the 30 and 31 account will be added as part of the final report Submitted By: Gregory Dyn (314/331-8319) Submitted On: 30-Nov-04
1-3	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Danny McPhearson (601-631-5602) Submitted On: 30-Nov-04
1-4	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Gregory Dyn (314/331-8319) Submitted On: 30-Nov-04
	Current Comment Status: **Comment Closed**

709981	Cost Engineering	Cost Estimate	n/a	n/a	n/a

	Under 11.01.01.01. "Rehab/Replace Exist Relief Wells" and 11.01.01.02. "New Relief Wells", the size and depth of the wells should be included in the notes in order to better evaluate cost. Submitted By: Danny McPhearson (601-631-5602). Submitted On: 29-Oct-04
1-0	Evaluation **Concurred** Will add a note to reflect the diameter and average depth of the wells. Submitted By: Gregory Dyn (314/331-8319) Submitted On: 03-Nov-04
1-1	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Danny McPhearson (601-631-5602) Submitted On: 19-Nov-04
1-2	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Gregory Dyn (314/331-8319) Submitted On: 30-Nov-04
	Current Comment Status: **Comment Closed**

710004	Cost Engineering	Cost Estimate	n/a	n/a	n/a

	Details such as "HDPE Liner", "Rehad 72" Gate w/New Manual", "New Trash Rakes", and etc. should be noted as inplace cost. The source of the cost should also be noted in the notes for the detail. Submitted By: Danny McPhearson (601-631-5602). Submitted On: 29-Oct-04
1-0	Evaluation **Concurred** Due to the limited funds available for this project and the number of notes that would have to be added to address this comment a general project note will be added at the highest

	level. (project notes) Submitted By: Gregory Dyn (314/331-8319) Submitted On: 03-Nov-04
1-1	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Danny McPhearson (601-631-5602) Submitted On: 19-Nov-04
1-2	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Gregory Dyn (314/331-8319) Submitted On: 30-Nov-04
	Current Comment Status: **Comment Closed**

710013	Cost Engineering	Cost Estimate	n/a	n/a	n/a

	The detail cost for asphaltic concrete pavement appears to be too low for the quantities required. The Mob and Demob for this work does not appear to be included any where, thus it is assumed that mob and demob cost is included in the detail. If so, the mob and demob would be a major cost and would increase the cost greatly for small quantities. Recomment that the detail cost for the asphaltic concrete pavement be re-checked. Submitted By: Danny McPhearson (601-631-5602). Submitted On: 29-Oct-04
1-0	Evaluation **Non-concurred** The detailed costs for asphaltic concrete are consistent with the market rate for the geographical area. Multiple sites will be completed at one time increasing the quantities. Mob and demob costs are not considered part of the detailed costs. A seperate item for mob, demob, and prep work is considered at a higher level. Submitted By: Gregory Dyn (314/331-8319) Submitted On: 03-Nov-04
1-1	Backcheck Recommendation **Open Comment** Could not find paving equipment in mob, demob, and prep work items of estimate. Submitted By: Danny McPhearson (601-631-5602) Submitted On: 19-Nov-04
1-2	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Gregory Dyn (314/331-8319) Submitted On: 30-Nov-04
1-3	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Danny McPhearson (601-631-5602) Submitted On: 30-Nov-04
1-4	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Gregory Dyn (314/331-8319) Submitted On: 30-Nov-04
	Current Comment Status: **Comment Closed**

710023	Cost Engineering	Cost Estimate	n/a	n/a	n/a

The equipment data file (NAT99A) appeared to have been adjusted from the original 1999 equipment book for region 5, but do not appeared had been adjusted for the high fuel cost that we are now experiencing now. Recomment that you consider making some adjustment to the fuel cost.

Submitted By: Danny McPhearson (601-631-5602).
Submitted On: 29-Oct-04

1-0	Evaluation **Non-concurred** To the best of my knowledge MCACES For Windows (MFW) will not allow you to adjust the area cost factors in the equipment database. Any additional cost due to increased fuel cost is considered to be covered under contingencies. Submitted By: Gregory Dyn (314/331-8319) Submitted On: 03-Nov-04
1-1	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Danny McPhearson (601-631-5602) Submitted On: 19-Nov-04
1-2	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Gregory Dyn (314/331-8319) Submitted On: 30-Nov-04
	Current Comment Status: **Comment Closed**

702439	Cultural Resources	Planning Report	n/a	n/a	n/a

Adequate coordination under 36 CFR Part 800 Subpart B and ER1105-2-100 of the Planning Guidance Notebook with the SHPO and affected tribes or other interested parties should be documented or addressed in the EA and summarized in the main report.

Submitted By: Jim Wojtala (601-634-5428).
Submitted On: 18-Oct-04

1-0	Evaluation **Non-concurred** As discussed in Section 9 of the main report public involvement of stakeholders has been on going and during the draft review period formal coordination will occur with the SHPO, affected tribes and other interested parties. Based on the nature and limited potential extent of effect this is considered adequate. Results will be included in the final report and in a Public Involvement Appendix if response warrants Submitted By: Deborah Roush (314-331-8033) Submitted On: 05-Nov-04
	Backcheck not conducted
	Current Comment Status: **Comment Open**

702442	Cultural Resources	Plans and Specs	n/a	n/a	n/a

Costs for incomplete cultural resources investigations including cultural resources survey, data recovery, and curation management services are not found in the MCACES or engineering cost appendix and are presumed to be included in the PED stage cost estimate. The consideration of these costs should be included as a summary statement in the main report.

Submitted By: Jim Wojtala (601-634-5428).
Submitted On: 18-Oct-04

1-0	Evaluation **Non-concurred** This information will be included in Section 7. A statement indicating minimal cultural

	resource investigation is anticipated based on the minimal effects of the project and this activity is scheduled to occur during the PED phase. Submitted By: Deborah Roush (314-331-8033) Submitted On: 05-Nov-04
	Backcheck not conducted
	Current Comment Status: **Comment Open**

708476	Electrical	Planning Report	n/a	n/a	n/a

[**This item is flagged as a critical issue.**]
Para. 5.1.3.4, 5.3.5 & 5.5.5.x (Pump Stations) should be expanded to adequately explain the importance of the electrical & mechanical systems (see 5.3.3 for example.) Specifically, levee systems which include pumping stations serve no other purpose than to enlarge areas of devastation if these systems are lost. The loss of pumping capability would likely cause catastrophic failure of the levee system during a major flood event. --- The unavailability of 1950-era electrical replacement parts combined with a failure (or multiple failures) due to electrical storms during a flood event would be a political disaster for the CoE. Currently, availability of replacement parts for large electrical equipment is a maximum of 30 years (approx.). The short repair times indicated in Para. 4.02 (3) (b) through (g) are *very* questionable, especially if motor starters & contactors are considered.

Submitted By: Hoyt McGrath (601.631.5568).
Submitted On: 28-Oct-04

Revised 28-Oct-04.

1-0	Evaluation **Non-concurred** While the pump stations are extremely important to the levee there would not be a catastophic failure of the of the levee system is a pump station became inoperable. There would be increased interior flooding to portions of the protected areas. However, since the age of the electrical equipment is beyond the reasonable life of the equipment and there is limited availability of replacement parts, the recommended plan is to replace all of the switchgear and MCC's. This is the only way to assure reliability of the pump stations in the future. Submitted By: Stephen Farkas (314-331-8264) Submitted On: 05-Nov-04
	Backcheck not conducted
	Current Comment Status: **Comment Open**

708537	Electrical	Planning Report	n/a	n/a	n/a

Para. 5.6.1.4.3 (Pumps and Motors), Reconstruction of Electric Motors - Careful evaluation should occur prior to making the decision to reconstruct these electric motors for the following reasons. Motors are typically constructed using standard frame sizes (horsepower ratings.) Rebuilding of motors causes a decrease in the efficiency and the horsepower rating of the motor. If the horsepower requirement fell close to a standard frame size, there is little-to-no excess capacity. A new pump motor may be necessary as a result. NOTE: Maximum loading of vertical shaft axial flow pumps typically occurs at high water level. See also para. 6.2.3.

Submitted By: Hoyt McGrath (601.631.5568).
Submitted On: 28-Oct-04

Revised 28-Oct-04.

1-0	Evaluation **Non-concurred** During the rehabilitation of the East St. Louis Flood Protection Project in the 1990's each electric motor under 1000 hp was rehabilitated. Winding insulation used was superior to that used when the motors were originally constructed in the 1950's. In addition new

	bearing were installed. Each motor was tested after the rehabilitation was complete and there was not loss of efficiency or horsepower. Submitted By: Stephen Farkas (314-331-8264) Submitted On: 05-Nov-04
	Backcheck not conducted
	Current Comment Status: **Comment Open**

708732	Equipment	Planning Report	n/a	n/a	n/a

Technical information regarding the electrical & mechanical equipment is sparse in this report. Electrical safety issues with respect to the operation of 50 year old equipment have not been addressed. This is in stark contrast with the information provided by other disciplines.

Submitted By: Hoyt McGrath (601.631.5568).
Submitted On: 28-Oct-04

Revised 28-Oct-04.

1-0	Evaluation **Concurred** Then mechanical equipment is covered in sufficient detail for this report. However, the existing condition of the electrical equipment will be expanded to include safety considerations. Submitted By: Stephen Farkas (314-331-8264) Submitted On: 05-Nov-04
	Backcheck not conducted
	Current Comment Status: **Comment Open**

708109	General	Planning Report	n/a	n/a	n/a

Provide a prioritized list of items for repair and/or reconstruction at each facility. Several items identified in this report should (arguably) be programmed for repair using O&M funds; e.g. roofing, chain link fencing, tuckpointing of brick and other architectural features. This report does not clearly indicate & prioritize the larger items requiring attention, yet provides a near comprehensive list of other items that may possibly fail, several of which would have little impact on the operation of the facility.

Submitted By: Hoyt McGrath (601.631.5568).
Submitted On: 27-Oct-04

Revised 28-Oct-04.

1-0	Evaluation **Non-concurred** It is felt by the Corps and the sponsor that the pump stations should be treated as a whole structure and therefore the rehabilitation of the stations should address all problems. There were not agreements between the sponsor and the Govt when the pump stations were built addressing future OMRR. Therefore it is thought that the only way to now require the sponsor to be responsible for all future OMRR is to bring the pump stations back to their original condition at the time of construction. Submitted By: Stephen Farkas (314-331-8264) Submitted On: 05-Nov-04
	Backcheck not conducted
	Current Comment Status: **Comment Open**

702928	Geotechnical	Engineering Appendix	n/a	n/a	n/a

Page A-65. In the first equation "FS=io/ic" should read "FS=ic/io"

Submitted By: Chuck Mendrop (601-631-5208).
Submitted On: 19-Oct-04

1-0	Evaluation **Concurred** Correction will be made Submitted By: Deborah Roush (314-331-8033) Submitted On: 01-Nov-04
	Backcheck not conducted
	Current Comment Status: **Comment Open**

702930	Geotechnical	Engineering Appendix	n/a	n/a	n/a

Page A-66, para 5.02a. In the third sentence delete one of the "result in".

Submitted By: Chuck Mendrop (601-631-5208).
Submitted On: 19-Oct-04

1-0	Evaluation **Concurred** Correction to sentence will be made Submitted By: Deborah Roush (314-331-8033) Submitted On: 01-Nov-04
	Backcheck not conducted
	Current Comment Status: **Comment Open**

702931	Geotechnical	Engineering Appendix	n/a	n/a	n/a

Page A-67. In the last sentence change "inconsistency if" to "inconsistency of".

Submitted By: Chuck Mendrop (601-631-5208).
Submitted On: 19-Oct-04

1-0	Evaluation **Concurred** Sentence will be corrected Submitted By: Deborah Roush (314-331-8033) Submitted On: 01-Nov-04
	Backcheck not conducted
	Current Comment Status: **Comment Open**

706046	Hydraulics	Planning Report	n/a	n/a	n/a

Para. 6.1.1 Additional Relief Wells. This paragraph states that 68 new wells are required for the recommended plan. Has the additional discharge from these wells into the interior areas been considered in the planning process?

Submitted By: John Smith (601-631-5734).
Submitted On: 25-Oct-04

1-0	Evaluation **For Information Only** Yes relief well dischage has been considered and adequate drainage is currently available to accomodate flows. Submitted By: Deborah Roush (314-331-8033) Submitted On: 17-Nov-04
	Backcheck not conducted
	Current Comment Status: **Comment Open**

706058	Hydraulics	Planning Report	n/a	n/a	n/a

Para. 6.2.1 Gravity Drainage Structures. This paragraph states that 13 CMP gravity drains will be replaced with RCP. It should be stated whether or not these pipes will be replaced with the same size as the existing pipes.

Submitted By: John Smith (601-631-5734).
Submitted On: 25-Oct-04

1-0	Evaluation **Concurred** Sentence will clarify that the replaced drains will be the same size. Submitted By: Deborah Roush (314-331-8033) Submitted On: 01-Nov-04
	Backcheck not conducted
	Current Comment Status: **Comment Open**

702300	Mechanical	Planning Report	n/a	n/a	n/a

Page 16 Paragraph 5.1.3.4 Pump Stations 7Th sentence "....this period of time have been shown to require construction" do you mean "reconstruction"?

Submitted By: Fred Lee (601-631-5576).
Submitted On: 18-Oct-04

1-0	Evaluation **Concurred** Word will be changed from construction to re-construction Submitted By: Deborah Roush (314-331-8033) Submitted On: 01-Nov-04
	Backcheck not conducted
	Current Comment Status: **Comment Open**

702317	Mechanical	Planning Report	n/a	n/a	n/a

Page 19 Table 5-4 Occupations column labeled "PERCENTAGE" the decimals should be removed.

Submitted By: Fred Lee (601-631-5576).
Submitted On: 18-Oct-04

1-0	Evaluation **Concurred** Decimals will be removed Submitted By: Deborah Roush (314-331-8033) Submitted On: 01-Nov-04
	Backcheck not conducted
	Current Comment Status: **Comment Open**

702356	Mechanical	Planning Report	n/a	n/a	n/a

Page A-45 paragraph f. (2) East Alton Pump Station No. 2 Suggest the old sanitary sewer pipe be permanently closed or explain why it should not . The cast iron gate will eventually fail.

Submitted By: Fred Lee (601-631-5576).
Submitted On: 18-Oct-04

1-0	Evaluation **Non-concurred** Right now the sanitary flows are handled by the treatment plant but incase of a failure of the plant flows could be sent to this pump. The flows would then be pumped by the sewage pumps in the station to the creek. If these pumps failed then the only alternative would be to allow gravity flow to the creek. We've discussed abandoning the 24-inch line with the levee district but it is their feeling that they want the line to remain in case it would be needed in the future.

	Submitted By: Stephen Farkas (314-331-8264) Submitted On: 05-Nov-04
	Backcheck not conducted
	Current Comment Status: **Comment Open**

702367	Mechanical	Planning Report	n/a	n/a	n/a

Page A-50 Paragraph 4.(e) Hathorne Street Pump Station 48" x 48" emergency closure sluice gate. If the check valve fails, the emergency closure sluice gate becomes very important.

Submitted By: Fred Lee (601-631-5576).
Submitted On: 18-Oct-04

1-0	Evaluation **Concurred** The emergency closure sluice gate is important but only if check valve fails and this valve was installed in the past 10 years. The importance of this emergency closure valve is why the recommended plan is to rehab this gate and install a new operator. Submitted By: Stephen Farkas (314-331-8264) Submitted On: 05-Nov-04
	Backcheck not conducted
	Current Comment Status: **Comment Open**

702376	Mechanical	Planning Report	n/a	n/a	n/a

Page A-55 Paragraph (4) Sluice Gates and Flap Gates. Recommend replacement of the stem nut on all screw stem hoists. The stem nut is the weakest link in screw stem hoists.

Submitted By: Fred Lee (601-631-5576).
Submitted On: 18-Oct-04

1-0	Evaluation **Concurred** The inspection of the stem nut only occurred on the Reconstruction alternative. The recommended plan is the Replacement alternative which includes a new stem nut. One reason for recommending the Replacement alternative was the importance of the stem nut. Submitted By: Stephen Farkas (314-331-8264) Submitted On: 05-Nov-04
	Backcheck not conducted
	Current Comment Status: **Comment Open**

702382	Mechanical	Planning Report	n/a	n/a	n/a

Page A-60 Paragraph d. Sluice Gates and Flap Gates It is not clear why the manual hoists are being replaced with electric operators. An unacceptable time to operate the gate? - a reason should be provided.

Submitted By: Fred Lee (601-631-5576).
Submitted On: 18-Oct-04

1-0	Evaluation **Concurred** The reason is user preference. The sluice gates which are to receive new electric operators are the one normally operated during periods of high water. The gates on structures such as the emergency closures are not normally operated and therefore will get new manual hoists. The levee district has reduced staff levels to the minimum due to limited budgets and therefore they desire to operate as many gates as possible in the shortest period of time. Submitted By: Stephen Farkas (314-331-8264) Submitted On: 05-Nov-04

	Backcheck not conducted
	Current Comment Status: **Comment Open**

709714	Structural	Engineering Appendix	n/a	A-4	n/a

(Document Reference: Para 2.01 a Pg A-4) Add "inches" to column heading for "Pipe Size".

Submitted By: John Burnworth (601 631-5553).
Submitted On: 29-Oct-04

Revised 29-Oct-04.

1-0	Evaluation **Concurred** Column heading will be corrected Submitted By: Deborah Roush (314-331-8033) Submitted On: 01-Nov-04
	Backcheck not conducted
	Current Comment Status: **Comment Open**

709719	Structural	Engineering Appendix	n/a	A-8	n/a

(Document Reference: Para 2.01 c (1) (a) Pg A-8) Typographical error in first sentence. Delete "a -" from sentence.

Submitted By: John Burnworth (601 631-5553).
Submitted On: 29-Oct-04

Revised 29-Oct-04.

1-0	Evaluation **Concurred** Correction will be made Submitted By: Deborah Roush (314-331-8033) Submitted On: 01-Nov-04
	Backcheck not conducted
	Current Comment Status: **Comment Open**

709729	Structural	Engineering Appendix	n/a	A-19	n/a

(Document Reference: Para 3.01 b (2) Pg A-19) Typographical error. Next to last line. Add period after "apparent", and capitalize the word "this".

Submitted By: John Burnworth (601 631-5553).
Submitted On: 29-Oct-04

Revised 29-Oct-04.

1-0	Evaluation **Concurred** Correction will be made Submitted By: Deborah Roush (314-331-8033) Submitted On: 01-Nov-04
	Backcheck not conducted
	Current Comment Status: **Comment Open**

709753	Structural	Engineering Appendix	n/a	A-21	n/a

(Document Reference: Para 3.02 a (1) Pg A-21 and A-22) Third sentence, second line. Add "be" between the words "will" and "a". Thirteenth line (next to last on page A-21). Add "and" after the

comma and before the word "with". Second line on page A-22. Add the word "attack" between the words "to rebar" near end of line.

Submitted By: John Burnworth (601 631-5553).
Submitted On: 29-Oct-04

Revised 29-Oct-04.

1-0	Evaluation **Concurred** Recommended corrections/changes will be made Submitted By: Deborah Roush (314-331-8033) Submitted On: 01-Nov-04
	Backcheck not conducted
	Current Comment Status: **Comment Open**

709767	Structural	Engineering Appendix	n/a	A-22	n/a

(Document Reference: Para 3.02 a (3) Pg A-22) Fourth sentence on third and fourth line. Delete the word "will" after the word "floodwall" since this opening already exists. Ninth line, seventh sentence. Change the word "may" to "can" between the words "concrete" and "occur" at the end of the sentence.

Submitted By: John Burnworth (601 631-5553).
Submitted On: 29-Oct-04

Revised 29-Oct-04.

1-0	Evaluation **Concurred** Sentences modified. Submitted By: Deborah Roush (314-331-8033) Submitted On: 05-Nov-04
	Backcheck not conducted
	Current Comment Status: **Comment Open**

709772	Structural	Engineering Appendix	n/a	A-22	n/a

(Document Reference: Para 3.02 a (4) Pg A-22) Fourth sentence on third and fourth line. Delete the word "will" after the word "floodwall" since this opening already exists. Ninth line, seventh sentence. Change the word "may" to "can" between the words "concrete" and "occur" at the end of the sentence. Sixteenth line, next to last sentence on this page. Add the word "attack" between the words "to rebar" near the end of the line.

Submitted By: John Burnworth (601 631-5553).
Submitted On: 29-Oct-04

Revised 29-Oct-04.

1-0	Evaluation **Concurred** Recommended changes incorporated. Submitted By: Deborah Roush (314-331-8033) Submitted On: 05-Nov-04
	Backcheck not conducted
	Current Comment Status: **Comment Open**

709952	Structural	Engineering Appendix	n/a	A-23	n/a

(Document Reference: Para 3.02 b (1) Pg A-23) Fourth sentence, third line. Replace "then" with

"than". Revise fourth sentence since it is grammatically incorrect.

Submitted By: John Burnworth (601 631-5553).
Submitted On: 29-Oct-04

Revised 29-Oct-04.

1-0	Evaluation **Concurred** Sentence corrected Submitted By: Deborah Roush (314-331-8033) Submitted On: 01-Nov-04
	Backcheck not conducted
	Current Comment Status: **Comment Open**

709953	Structural	Engineering Appendix	n/a	A-23	n/a

(Document Reference: Para 3.02 b (2) Pg A-23) Fourth sentence, third line. Replace "then" with "than". Revise fourth sentence since it is grammatically incorrect.

Submitted By: John Burnworth (601 631-5553).
Submitted On: 29-Oct-04

Revised 29-Oct-04.

1-0	Evaluation **Concurred** Sentence corrected Submitted By: Deborah Roush (314-331-8033) Submitted On: 01-Nov-04
	Backcheck not conducted
	Current Comment Status: **Comment Open**

709957	Structural	Engineering Appendix	n/a	A-23	n/a

(Document Reference: Para 3.02 b (3) Pg A-23) Revise fourth sentence since it is grammatically incorrect. Last sentence, next to last line. Change "could" to "will".

Submitted By: John Burnworth (601 631-5553).
Submitted On: 29-Oct-04

Revised 29-Oct-04.

1-0	Evaluation **Concurred** Sentence corrected per comment Submitted By: Deborah Roush (314-331-8033) Submitted On: 01-Nov-04
	Backcheck not conducted
	Current Comment Status: **Comment Open**

709959	Structural	Engineering Appendix	n/a	A-23	n/a

(Document Reference: Para 3.02 b (5) Pg A-23 and A-24) Fourth sentence, third line. Replace "then" with "than". Revise fourth sentence since it is grammatically incorrect. Last sentence of paragraph on pg A-24, next to last line. Change "could" to "will".

Submitted By: John Burnworth (601 631-5553).
Submitted On: 29-Oct-04

Revised 29-Oct-04.

1-0	Evaluation **Concurred** Corrected per comment Submitted By: Deborah Roush (314-331-8033) Submitted On: 01-Nov-04
	Backcheck not conducted
	Current Comment Status: **Comment Open**

709968	Structural	Engineering Appendix	n/a	A-24	n/a

(Document Reference: Para 3.02 c (1) (b) Pg A-24) Third sentence, fourth line. Change "repaired will allow" to read "repaired could allow".

Submitted By: John Burnworth (601 631-5553).
Submitted On: 29-Oct-04

Revised 29-Oct-04.

1-0	Evaluation **Concurred** Sentence changed per comment Submitted By: Deborah Roush (314-331-8033) Submitted On: 01-Nov-04
	Backcheck not conducted
	Current Comment Status: **Comment Open**

709971	Structural	Engineering Appendix	n/a	A-25	n/a

(Document Reference: Para 3.02 c (2) (b) Pg A-25) Third sentence, fourth line. Change "addressed will allow" to read "addressed could allow".

Submitted By: John Burnworth (601 631-5553).
Submitted On: 29-Oct-04

Revised 29-Oct-04.

1-0	Evaluation **Concurred** Sentence changed per comment Submitted By: Deborah Roush (314-331-8033) Submitted On: 01-Nov-04
	Backcheck not conducted
	Current Comment Status: **Comment Open**

709979	Structural	Engineering Appendix	n/a	A-27	n/a

(Document Reference: Para 3.02 c (3) (b) Pg A-27) Third sentence, fourth line. Change "addressed will allow" to read "addressed could allow".

Submitted By: John Burnworth (601 631-5553).
Submitted On: 29-Oct-04

Revised 29-Oct-04.

1-0	Evaluation **Concurred** Sentence changed per comment

	Submitted By: Deborah Roush (314-331-8033) Submitted On: 01-Nov-04
	Backcheck not conducted
	Current Comment Status: **Comment Open**

709982	Structural	Engineering Appendix	n/a	A-27	n/a

(Document Reference: Para 3.02 c (3) (c) Pg A-27) Fifth sentence, fifth line. Replace "seal and the sill be structurally sound." with "seal with the sill structurally sound."

Submitted By: John Burnworth (601 631-5553).
Submitted On: 29-Oct-04

Revised 29-Oct-04.

1-0	Evaluation **Concurred** Sentence changed per comment Submitted By: Deborah Roush (314-331-8033) Submitted On: 01-Nov-04
	Backcheck not conducted
	Current Comment Status: **Comment Open**

709984	Structural	Engineering Appendix	n/a	A-28	n/a

(Document Reference: Para 3.02 c (4) (b) Pg A-28) Third sentence, fourth line. Change "addressed will allow" to read "addressed could allow".

Submitted By: John Burnworth (601 631-5553).
Submitted On: 29-Oct-04

Revised 29-Oct-04.

1-0	Evaluation **Concurred** Sentence changed per comment Submitted By: Deborah Roush (314-331-8033) Submitted On: 01-Nov-04
	Backcheck not conducted
	Current Comment Status: **Comment Open**

709989	Structural	Engineering Appendix	n/a	A-30	n/a

(Document Reference: Para 3.02 d (1) (a) Pg A-30) Second sentence, fourth line. Change "effects pf icing" to read "effects of icing".

Submitted By: John Burnworth (601 631-5553).
Submitted On: 29-Oct-04

Revised 29-Oct-04.

1-0	Evaluation **Concurred** Sentence corrected per comment Submitted By: Deborah Roush (314-331-8033) Submitted On: 01-Nov-04
	Backcheck not conducted
	Current Comment Status: **Comment Open**

709994	Structural	Engineering Appendix	n/a	A-32	n/a

(Document Reference: Para 3.03 b (1) Pg A-32) Last sentence, next to last line. Change "effects pf icing" to read "effects of icing".

Submitted By: John Burnworth (601 631-5553).
Submitted On: 29-Oct-04

Revised 29-Oct-04.

1-0	Evaluation **Concurred** Sentence corrected per comment Submitted By: Deborah Roush (314-331-8033) Submitted On: 01-Nov-04
	Backcheck not conducted
	Current Comment Status: **Comment Open**

709997	Structural	Engineering Appendix	n/a	A-32	n/a

(Document Reference: Para 3.03 b (2) Pg A-32) Last sentence, next to last line. Change "effect pf icing" to read "effects of icing".

Submitted By: John Burnworth (601 631-5553).
Submitted On: 29-Oct-04

Revised 29-Oct-04.

1-0	Evaluation **Concurred** Sentence corrected per comment Submitted By: Deborah Roush (314-331-8033) Submitted On: 01-Nov-04
	Backcheck not conducted
	Current Comment Status: **Comment Open**

710160	Structural	Engineering Appendix	n/a	A-33	n/a

(Document Reference: Para 3.04 (1) (a) Pg A-33) First sentence, first line. Replace "determined" with "to determine". First sentence, second line. Replace "time was a" with "time is a".

Submitted By: John Burnworth (601 631-5553).
Submitted On: 29-Oct-04

Revised 29-Oct-04.

1-0	Evaluation **Concurred** Sentences corrected per comment Submitted By: Deborah Roush (314-331-8033) Submitted On: 01-Nov-04
	Backcheck not conducted
	Current Comment Status: **Comment Open**

710161	Structural	Engineering Appendix	n/a	A-35	n/a

(Document Reference: Para 3.04 (1) (c) Pg A-35) Paragraph beneath Table 2. If this paragraph is part of paragraph 3.04 (1) (c), it should not be indented.

Submitted By: John Burnworth (601 631-5553).

Submitted On: 29-Oct-04

Revised 29-Oct-04.

1-0	Evaluation **Concurred** Format corrected per comment Submitted By: Deborah Roush (314-331-8033) Submitted On: 01-Nov-04
	Backcheck not conducted
	Current Comment Status: **Comment Open**

710162	Structural	Engineering Appendix	n/a	A-35	n/a

(Document Reference: Para 3.04 (1) (d) Pg A-35) Paragraph (d) should be indented to be in line with paragraphs (b) and (c) above.

Submitted By: John Burnworth (601 631-5553).
Submitted On: 29-Oct-04

Revised 29-Oct-04.

1-0	Evaluation **Concurred** Format corrected per comment Submitted By: Deborah Roush (314-331-8033) Submitted On: 01-Nov-04
	Backcheck not conducted
	Current Comment Status: **Comment Open**

710163	Structural	Engineering Appendix	n/a	A-33	n/a

(Document Reference: Para 3.04 (1) Pg A-33) There is no paragraph 3.04 (2). Suggest revising to make 3.04(1) part of 3.04.

Submitted By: John Burnworth (601 631-5553).
Submitted On: 29-Oct-04

Revised 29-Oct-04.

1-0	Evaluation **Concurred** Paragraph numbering will be corrected Submitted By: Deborah Roush (314-331-8033) Submitted On: 01-Nov-04
	Backcheck not conducted
	Current Comment Status: **Comment Open**

710164	Structural	Engineering Appendix	n/a	A-36	n/a

(Document Reference: Para 4.01 a Pg A-36) Recommend moving the second sentence to be in front of the fourth sentence.

Submitted By: John Burnworth (601 631-5553).
Submitted On: 29-Oct-04

Revised 29-Oct-04.

1-0	Evaluation **Concurred** Change will be made

	Submitted By: Stephen Farkas (314-331-8264) Submitted On: 05-Nov-04
	Backcheck not conducted
	Current Comment Status: **Comment Open**

710165	Structural	Engineering Appendix	n/a	A-37	n/a

(Document Reference: Para 4.01 d (1) Pg A-37) Recommend adding a photograph of East Alton Pump Station No. 1 at the end of this paragraph to be consistent with paragraphs 4.01d (2) through 4.01d (7).

Submitted By: John Burnworth (601 631-5553).
Submitted On: 29-Oct-04

Revised 29-Oct-04.

1-0	Evaluation **Concurred** Photo will be added Submitted By: Stephen Farkas (314-331-8264) Submitted On: 05-Nov-04
	Backcheck not conducted
	Current Comment Status: **Comment Open**

710167	Structural	Engineering Appendix	n/a	A-42	n/a

(Document Reference: Para 4.01 e (3) (b) Pg A-42) Identify the two photographs at the end of this paragraph to be consistent with the labeling of other photographs.

Submitted By: John Burnworth (601 631-5553).
Submitted On: 29-Oct-04

Revised 29-Oct-04.

1-0	Evaluation **Concurred** Each of these pictures are of the 2 sizes of motors in the Wood River Pump Station - each picture will be labeled as such. Submitted By: Stephen Farkas (314-331-8264) Submitted On: 05-Nov-04
	Backcheck not conducted
	Current Comment Status: **Comment Open**

710169	Structural	Engineering Appendix	n/a	A-44	n/a

(Document Reference: Para 4.01 e (7) (b) Pg A-44) Recommend adding a photograph of the pump at Lakeside Pump Station to be consistent with paragraphs 4.01 e (2) through 4.01 e (6).

Submitted By: John Burnworth (601 631-5553).
Submitted On: 29-Oct-04

Revised 29-Oct-04.

1-0	Evaluation **Concurred** Photo will be added Submitted By: Stephen Farkas (314-331-8264) Submitted On: 05-Nov-04

	Backcheck not conducted
	Current Comment Status: **Comment Open**

710170	Structural	Engineering Appendix	n/a	A-41	n/a

(Document Reference: Para 4.01 e (1) (b) Pg A-41) Recommend adding a photograph of the pump at East Alton Pump Station No. 1 to be consistent with paragraphs 4.01 e (2) through 4.01 e (6).

Submitted By: John Burnworth (601 631-5553).
Submitted On: 29-Oct-04

Revised 29-Oct-04.

1-0	Evaluation **Concurred** Photo will be added Submitted By: Stephen Farkas (314-331-8264) Submitted On: 05-Nov-04
	Backcheck not conducted
	Current Comment Status: **Comment Open**

710172	Structural	Engineering Appendix	n/a	A-45	n/a

(Document Reference: Para 4.01 e (8) (b) Pg A-45) Recommend adding a photograph of the pump at Homegarden Pump Station to be consistent with paragraph 4.01 e (2) through 4.01 e (6).

Submitted By: John Burnworth (601 631-5553).
Submitted On: 29-Oct-04

Revised 29-Oct-04.

1-0	Evaluation **Concurred** Photo will be added Submitted By: Stephen Farkas (314-331-8264) Submitted On: 05-Nov-04
	Backcheck not conducted
	Current Comment Status: **Comment Open**

710173	Structural	Engineering Appendix	n/a	A-47	n/a

(Document Reference: Para 4.01 g Pg A-47) The paragraph as written is not true of the electrical equipment at East Alton Pump Station No. 1 where it is stated in paragraph 4.02 a (5) (a) that the switchgear and other electrical equipment is approximately 15 years old (furnished in the 1980's).

Submitted By: John Burnworth (601 631-5553).
Submitted On: 29-Oct-04

Revised 29-Oct-04.

1-0	Evaluation **Concurred** Paragraph will be modified to indicate East Alton Pump Station No. 1 is the exception. Submitted By: Deborah Roush (314-331-8033) Submitted On: 01-Nov-04
	Backcheck not conducted
	Current Comment Status: **Comment Open**

710175	Structural	Engineering Appendix	n/a	A-52	n/a

(Document Reference: Para 4.02 b (1) (c) Pg A-52) Second sentence, third and last line. Change "other are that" to read "other area that". Submitted By: John Burnworth (601 631-5553). Submitted On: 29-Oct-04 Revised 29-Oct-04.	
1-0	Evaluation **Concurred** Correction will be made Submitted By: Deborah Roush (314-331-8033) Submitted On: 01-Nov-04
	Backcheck not conducted
	Current Comment Status: **Comment Open**