

APPENDIX F
CERTIFIED COSTS, PLANNING COSTS, AND
ABBREVIATED COST RISK ANALYSIS

WALLA WALLA COST ENGINEERING MANDATORY CENTER OF EXPERTISE

COST AGENCY TECHNICAL REVIEW

CERTIFICATION STATEMENT

For Project No. 101394

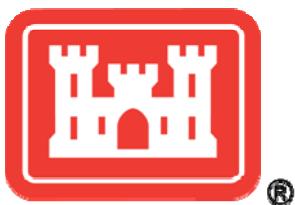
SWF San Marcos Section 206 Aquatic Ecosystem Restoration Project

The San Marcos Aquatic Ecosystem Restoration – Section 206 as presented by Fort Worth District, has undergone a successful Cost Agency Technical Review (Cost ATR), performed by the Walla Walla District Cost Engineering Mandatory Center of Expertise (Cost MCX) team. The Cost ATR included study of the project scope, report, cost estimates, schedules, escalation, and risk-based contingencies. This certification signifies the products meet the quality standards as prescribed in ER 1110-2-1150 Engineering and Design for Civil Works Projects and ER 1110-2-1302 Civil Works Cost Engineering.

As of January 8, 2014, the Cost MCX certifies the estimated total project cost:

FY 2014 Project First Cost:	\$3,576,000
Total Project Cost:	\$3,642,000
Estimated Federal Cost:	\$2,417,000

It remains the responsibility of the District to correctly reflect these cost values within the Final Report and to implement effective project management controls and implementation procedures including risk management throughout the life of the project.



**Kim C. Callan, PE, CCE, PM
Chief, Cost Engineering MCX
Walla Walla District**

***** TOTAL PROJECT COST SUMMARY *****

PROJECT: San Marcos Section 206
PROJECT NO: P2 No 101394
LOCATION: San Marcos, TX

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DISTRICT: SWE East Ward

[BICT] SWE East Watch

PREFACE.

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PUC. CHIEF, COST ENGINEERING, MILTON SCHMIT

AP Feasibility STUDY - San Marcos

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ESTIMATED COST

constant total project cost (in millions)

PROJECT: San Marcos Section 206
LOCATION: San Marcos, TX
This Estimate reflects the scope and schedule in report.

*** CONTRACT COST SUMMARY ***

DISTRICT: SWF Fort Worth PREPARED: 12/16/2013
POC: CHIEF COST ENGINEERING Milton Schmidt

CAP Feasibility STUDY - San Marcos His Estimate reflects the scope and schedule in report;

WBS Structure		ESTIMATED COST		PROJECT FIRST COST (Constant Dollar Basis)						TOTAL PROJECT COST (FULLY FUNDED)					
WBS NUMBER A	Civil Works Feature & Sub-Feature Description B	Estimate Prepared: Effective Price Level:		3/8/2013 10/1/2012						Program Year (Budget E): Effective Price Level Date:		2014 1 OCT 13			
		COST (\$K) C	CNTG (\$K) D	RISK BASED CNTG (\$K) E	TOTAL (\$K) F	ESC (\$K) G	COST (\$K) H	CNTG (\$K) I	TOTAL (\$K) J	Mid-Point Date P	INFLATED (\$K) L	COST (\$K) M	CNTG (\$K) N	FULL (\$K) O	
06	PHASE 1 or CONTRACT 1	\$52	\$11	21.8%	\$64	1.3%	\$53	\$12	\$64	2014Q4	1.7%	\$54	\$12	\$65	
06	EXOT1	\$440	\$78	17.8%	\$518	1.3%	\$445	\$79	\$525	2015Q4	3.4%	\$461	\$82	\$543	
06	RIP2	\$136	\$35	26.1%	\$171	1.3%	\$137	\$36	\$173	2015Q3	2.9%	\$141	\$37	\$178	
06	EXOA	\$447	\$108	24.3%	\$555	1.3%	\$452	\$110	\$562	2015Q4	3.4%	\$468	\$114	\$581	
06	SED	\$130	\$28	21.3%	\$158	1.3%	\$132	\$28	\$160	2015Q4	3.4%	\$136	\$29	\$165	
06	WET	\$115	\$26	22.7%	\$141	1.9%	\$117	\$27	\$144	2015Q1	1.9%	\$120	\$27	\$147	
CONSTRUCTION ESTIMATE TOTALS:		\$1,319	\$287	21.8%	\$1,607			\$1,337	\$291	\$1,628			\$1,379	\$300	\$1,680
01	LANDS AND DAMAGES	\$1,197	\$261	21.8%	\$1,458	1.3%	\$1,213	\$264	\$1,477	2014Q1			\$1,213	\$264	\$1,477
30	PLANNING, ENGINEERING & DESIGN	\$13	\$2	18.4%	\$15	1.8%	\$13	\$2	\$16	2014Q2	0.5%	\$13	\$2	\$16	
1.00%	Project Management	\$13	\$2	18.4%	\$15	1.8%	\$13	\$2	\$16	2014Q2	0.5%	\$13	\$2	\$16	
1.00%	Planning & Environmental Compliance	\$86	\$16	18.4%	\$102	1.8%	\$88	\$16	\$104	2014Q2	0.5%	\$88	\$16	\$104	
6.50%	Engineering & Design	\$13	\$2	18.4%	\$15	1.8%	\$13	\$2	\$16	2014Q2	0.5%	\$13	\$2	\$16	
1.00%	Engineering Tech Review ITR & VE	\$13	\$2	18.4%	\$15	1.8%	\$13	\$2	\$16	2014Q2	0.5%	\$13	\$2	\$16	
1.00%	Contracting & Reprographics	\$26	\$6	18.4%	\$31	1.8%	\$26	\$5	\$31	2016Q1	8.0%	\$29	\$5	\$34	
2.00%	Engineering During Construction	\$13	\$2	18.4%	\$15	1.8%	\$13	\$2	\$16	2016Q1	8.0%	\$14	\$3	\$17	
1.00%	Planning During Construction	\$13	\$2	18.4%	\$15	1.8%	\$13	\$2	\$16	2014Q2	0.5%	\$13	\$2	\$16	
1.00%	Project Operations														
31	CONSTRUCTION MANAGEMENT	\$132	\$33	24.9%	\$165	1.9%	\$135	\$33	\$168	2016Q1	3.8%	\$140	\$35	\$174	
10.00%	Construction Management	\$26	\$6	24.9%	\$32	1.9%	\$26	\$7	\$33	2016Q1	3.8%	\$28	\$7	\$34	
2.00%	Project Operation:	\$32	\$8	24.9%	\$40	1.9%	\$33	\$8	\$41	2016Q1	3.8%	\$34	\$8	\$42	
CONTRACT COST TOTALS:		\$2,897	\$631		\$3,527			\$2,937	\$639	\$3,576			\$2,990	\$651	\$3,642

Detailed Cost Estimate and Cost Analysis

Project Goals and Objectives

The primary goal of this study is to develop an aquatic ecosystem restoration plan that provides the greatest ecosystem benefits relative to implementation costs for the San Marcos 206 Project. The following objectives were developed to address specific problems and opportunities identified during the planning process.

- Increase habitat quality of the riparian corridor
- Improve the function of the riparian corridor as a buffer against sediment and pollutant inputs
- Increase aquatic habitat quality
- Reduce recreational impacts on habitat quality and on listed species
- Improve habitats for federally listed species

Opportunities for meeting the objectives of this study include availability of restoration methods that have been tested for feasibility and effectiveness, existence of ongoing and planned restoration efforts affecting the San Marcos River, and availability of a large portion of lands within the study area for implementation of restoration measures.

Expansion on Adjacent Restoration Efforts - Riparian and aquatic habitats associated with Spring Lake were recently restored through Section 206 funding and included measures, such as the removal of nonnative plants, that would have cumulative benefits on these habitats through restoration measures proposed for this study; other restoration efforts that have or would benefit the study area include the Edwards Aquifer Habitat Conservation Plan, community efforts to control elephant ear on private lands adjacent to the river, and others.

Availability of Restoration Methods and Materials - Efforts by USFWS, TPWD, and the TSU, River Systems Institute to conserve and restore the San Marcos River ecosystem provide the knowledge and experience necessary to develop feasibility and cost-effective restoration measures; furthermore, the current availability of plant stock propagated from local specimens increases the success probability of restoration efforts.

Availability of Lands for Restoration - A large portion of the floodplain corridor is publicly owned, primarily by the City of San Marcos, which provides the opportunity to reduce the impacts of urbanization by expanding the riparian corridor and improving discharge locations to restore the function of riparian forests.

Methodology

Through coordination with the USFWS and TPWD, nine restoration measures were developed to solve ecosystem problems and address the goals of the project: controlling discharge, increasing

the width of the riparian forest, improving wetlands in the watershed, controlling riparian exotic plants, controlling aquatic exotic plants, removing sediments from the channel, creating recreational access structures, controlling nuisance waterfowl, and educating the public. These measures were developed in sufficient detail to project their benefits across target years throughout the life of the project, to estimate costs, and to assess feasibility. These measures were developed in sufficient detail to project their benefits, estimate costs, and assess engineering feasibility. Incremental Cost Analysis (ICA) was used to determine the most cost-effective plan from all possible combinations of measures. The cost of each measure evaluated as average annual cost units (AACUs) was compared to the benefit of each measure evaluated as AAHUs. Through ICA, nine best-buy plans, including the No Action Plan, were identified, and seven of these best-buy plans were incrementally justified. Best-buy Plan 8, the most expensive and incrementally justified plan, includes six measures. Once the recommended plan was chosen, a detailed cost estimate was prepared in MII 4.2 as well as a detailed OMRR&R cost estimate, that was not included as part of the fully funded cost estimate. The Planning, Engineering and Design (PED) and Construction Management (CM) costs are reflected as 10 percent of the total cost for each alternative. PED and CM are assumed at the same percentage since it is a small project with minimal structural development. This is an ecosystem project with no items of work that are unusual or specialized with a design that has been used in the area previously.

Assumptions and Constraints

All work will be done within the current limits. The estimate is based on the assumption that this project will be awarded to a small business that will complete the majority of the work, with minimal specialty items being subbed out. It is assumed that there will be no need to capture sales tax since the project is located within Texas and contractors should fill out the proper request for tax exemption before beginning work. Material being excavated from the wetland restorations will be hauled to the San Marcos Animal Shelter for future use as needed. Plants and seeds being used for this project are assumed to be available from the same nurseries that were used for a previous project. The estimate is based on the assumption that the trees being chipped will be spread on site over the areas invasive species are being removed so no costs are associated with hauling that material off site or disposing of material.

Risks

Contingencies were developed and applied where areas of uncertainty exist. Risks for each alternative were based on available information and difficulty of the task. The computation of the contingency for each alternative was influenced by the known variables and their associated risk and was incorporated in the estimate.

Contingencies were based on an abbreviated cost risk analysis broken out for each of the features incorporated in the CE-ICA. The contingencies run from 17.82% to 24.88% with an overall

construction contingency of 21.79%. The risks were determined by a collaboration of the PDT members and possible issues that may arise before and during construction.

The costs associated with LLERDS include a 21.8% contingency.

Alternatives

Project measures were developed through coordination with the City of San Marcos, USFWS, and TPWD to address the stated problems within the constraints identified and represent stand alone actions that would improve the aquatic ecosystem. Guidelines provided in the following documents would be adhered to during design and implementation of proposed measures, where applicable. The following measures were considered:

CONTROL OF EXOTIC SHRUBS AND TREES (EXOT) - EXOT would improve the structure of the riparian forests by reducing the cover of exotic invasive shrubs and increasing the density of snags. These shrubs occupy the middle canopy of the riparian forest resulting in a dense cover of smaller stems. By removing these high frequency, small stems, EXOT would result in a reduction of basal area to optimum or near-optimum conditions in Type 1, Type 2, and Type 4 forests at TY1 (Appendix B, Table B-2). Because no exotics occur within Type 3 forest, this forest type would not benefit from EXOT.

RESTORE RIPARIAN CORRIDOR (RIP1 AND RIP2) - Two scales were considered for the development of the RIP (Appendix F, Table F-3). One scale, RIP1, would result in restoration of the riparian corridor by vegetative management within existing, low-quality forest types and improved lands to obtain increased habitat quality. A second scale, RIP2, would restore the riparian corridor by first removing impervious surfaces, such as parking lots and other hardpan or concrete structures, then planting native vegetation. Both scales would require relocation of trails. These trails are necessary for operation and maintenance of other recreational features within an existing, continuous trail system that connects the various public lands in the study area. Trails proposed for relocation travel near the river and allow easy access for recreationists at unauthorized locations. The cost of removing trails would be considered part of the initial construction cost and the cost to construct replacement trails would be considered operation and maintenance.

CONTROL OF EXOTIC AQUATIC VEGETATION-EMERGENT (EXOA) - It is assumed that the removal of elephant ear would result in restoration of native riverine habitats at TY1 and continue throughout the life of the project (Appendix B, Tables B-3 through B-5). These habitats are assumed to have the same suitability as existing adjacent riverine habitats. Removal of elephant ear would not only result in an increased area of suitable riverine habitats, but would increase suitability of native riverine habitats by improving foraging conditions for both smallmouth bass and belted kingfisher (Appendix B, Tables B-4 and B-5). This measure would also benefit listed species by restoring portions of the channel invaded by elephant ear to native habitats. There is evidence to suggest that fountain darters prefer native vegetation over some nonnative plant species, and that Texas wild-rice once occurred in portions of the channel now occupied by elephant ear.

RESTORE SHORELINE (SHORE1 AND SHORE2) - Two scales were considered for the development of the SHORE. SHORE1 would result in restoration of the shoreline by stabilizing areas of erosion. SHORE2 would include all of the restoration features of SHORE1 and would remove recreational headwalls at two locations and concrete debris from an area of the river channel near the shore.

CONTROL OF DISCHARGE (DISC) - Similar to SHORE and RIP, it is assumed that habitats providing the same benefits as Type 5 forests would be restored where DISC is implemented and that HUs would accrue at the same rate described for Type 5 forest under implementation of RIP (Appendix B, Table B-2). It is also assumed that DISC would reduce future input of suspended sediments to the San Marcos River (Appendix B, Tables B-3 and B-4). It is assumed that the DISC improvements proposed at locations throughout the study area would be sufficient to affect the relative composition of substrates (coarse vs. fine) within the channel. DISC would also reduce the magnitude of pollutant concentrations following storm events, which would benefit listed species similar to SHORE.

REMOVAL OF ACCUMULATED SEDIMENTS (SED) - It is assumed that SED would affect the relative composition of substrates (coarse vs. fine) throughout the entire study area over the life of the project (Appendix B, Tables B-3 and B-4), thus improving the quality of substrates for foraging conditions of the selected HSI model species. It was assumed that implementation of DISC and SED would have a cumulative effect on substrates, resulting in a greater improvement than implementation of either measure by itself. It is assumed that Texas wild-rice prefers the coarse substrates, which were historically predominant in the study area, for establishment; thus, SED would provide a substantial benefit to Texas wild-rice. It is assumed that there would be 10% sediment removal initially and 20% would be removed during the 3 year establishment period.

RESTORATION OF WETLANDS (WET) - It is assumed that construction, function, and habitat quality of wetlands restored under WET would be similar to the existing Sessoms Creek wetlands (Appendix B, Tables B-6 and B-7). It is assumed that habitat would be available at TY1 and would remain relatively constant through the life of the project. The removal of trees would be required for restoration of wetlands at the Sessoms Creek location; however, the surrounding forest at this location is an upland forest and the loss of these habitats is assumed to have no effect on the suitability of the surrounding forest.

EDUCATION (EDU) - There are no quantifiable benefits, as evaluated using selected models, that are assumed to occur as a result of education. However, it is assumed that EDU would result in reduced adverse impacts at a more localized scale and specifically to endemic species.

MANAGEMENT OF WATERFOWL (DUCK) - There are no quantifiable benefits, as evaluated using selected models, that are assumed to occur as a result of the management of waterfowl. While nonnative waterfowl likely have resulted in some level of degradation of shoreline habitats in the riparian zone, this effect would be difficult to quantify. However, it is assumed that DUCK would result in reduced adverse impacts at a more localized scale and specifically to endemic species.

Recommended Plan

The recommended plan was chosen to be the one that had the most benefit for the cost based on the Cost Estimated –Incremental Cost Analysis. The measures that were carried forward are: EXOT, RIP2, EXOA, DISC, SED, and WET.

The MII file was revised on 16 Dec 2013 to reflect additional notes and changes made based on Dr. Checks comments. The TPCS and ARA have also been adjusted to reflect updated cost information.

The TSP is based on the combined best buy measures determined by the implementation of the Cost Estimating-Incremental Cost Analysis (CE-ICA). The quantities and costs were developed by the AE and are based on best judgement and historical knowledge from previous projects in the area. The current estimate assumes all work is done by the Prime Contractor.

Estimate assumes a Small Business contractor will be the Prime Contractor

Hourly wages include a burden of 2.7, or a 100 percent markup for overhead and a 170 percent markup for benefits.

The Markups for the Prime Contractor are as follows:

For work completed by the Prime:

JOOH - 10%
HOOH - 10%
Profit - 10%
Bond - 1.5%

Work Completed by the Subcontractor:

JOOH - 8%
HOOH - 10%
Profit - 6%
Bond - 1.5%

Markups for the Subcontractor are as follows:

JOOH - 8%
HOOH - 5%
Profit - 10%

Estimated by	Michael Hodson
Designed by	Ninfa Taggart
Prepared by	
Preparation Date	3/8/2013
Effective Date of Pricing	10/1/2012
Estimated Construction Time	Days

PROJECT SUMMARY - Scope Page 1

Description	Quantity	UOM	ProjectCost
PROJECT SUMMARY - Scope			
1 TSP	1.00	LS	2,897,317
1.1 01 Lands and Damages	1.00	LS	1,197,162
1.1.1 Real Estate	1.00	LS	1,197,162
1.2 EXOT1 - CONTROL OF EXOTIC SHRUBS AND TREES (EXOT)	1.00	LS	66,255
1.2.2 Fish and Wildlife	1.00	LS	52,161
1.2.3 Planning, Engineering and Design	1.00	LS	7,047
1.2.4 Construction Management	1.00	LS	7,047
1.3 RIP2 - RESTORE RIPARIAN CORRIDOR (RIP1 AND RIP2)	1.00	LS	574,687
1.3.2 Fish and Wildlife	1.00	LS	439,791
1.3.3 Planning, Engineering and Design	1.00	LS	67,448
1.3.4 Construction Management	1.00	LS	67,448
1.4 EXOA1 - CONTROL OF EXOTIC AQUATIC VEGETATION-EMERGENT (EXOA)	1.00	LS	180,464
1.4.2 Fish and Wildlife	1.00	LS	135,653
1.4.3 Planning, Engineering and Design	1.00	LS	22,406
1.4.4 Construction Management	1.00	LS	22,406
1.5 DISC - CONTROL OF DISCHARGE	1.00	LS	146,210
1.5.2 Bank Stabilization	1.00	LS	115,109
1.5.3 Planning, Engineering and Design	1.00	LS	15,551
1.5.4 Construction Management	1.00	LS	15,551
1.6 SED - REMOVAL OF ACCUMULATED SEDIMENTS	1.00	LS	567,181
1.6.2 Fish and Wildlife	1.00	LS	446,531
1.6.3 Planning, Engineering and Design	1.00	LS	60,325
1.6.4 Construction Management	1.00	LS	60,325
1.7 WET - RESTORATION OF WETLANDS	1.00	LS	165,357
1.7.2 Fish and Wildlife	1.00	LS	130,183
1.7.3 Planning, Engineering and Design	1.00	LS	17,587
1.7.4 Construction Management	1.00	LS	17,587

Abbreviated Risk Analysis

Project (less than \$40M): San Marcos Section 206 Ecosystem Restoration

Project Development Stage: Feasibility (Recommended Plan)

Risk Category: Low Risk: Simple Project-No Life Safety

Total Construction Contract Cost = **\$ 1,319,428**

<u>CWWB\$</u>	<u>Feature of Work</u>	<u>Contract Cost</u>	<u>% Contingency</u>	<u>\$ Contingency</u>	<u>Total</u>
01 LANDS AND DAMAGES	Real Estate	\$ 1,197,162	21.80%	\$ 260,992	\$ 1,458,153.97
1 06 FISH AND WILDLIFE FACILITIES	RIP2	\$ 439,791	17.82%	\$ 78,384	\$ 518,175.66
2 06 FISH AND WILDLIFE FACILITIES	EXOT	\$ 52,161	21.78%	\$ 11,360	\$ 63,521.14
3 06 FISH AND WILDLIFE FACILITIES	EXOA	\$ 135,653	26.11%	\$ 35,423	\$ 171,076.26
4 06 FISH AND WILDLIFE FACILITIES	DISC	\$ 115,109	22.68%	\$ 26,102	\$ 141,210.48
5 06 FISH AND WILDLIFE FACILITIES	SED	\$ 446,531	24.29%	\$ 108,475	\$ 555,005.98
6 06 FISH AND WILDLIFE FACILITIES	WET	\$ 130,183	21.28%	\$ 27,699	\$ 157,882.02
12 Remaining Construction Items		\$ -	0.00%	\$ -	\$ -
13 30 PLANNING, ENGINEERING, AND DESIGN	Planning, Engineering, & Design	\$ 190,364	18.39%	\$ 35,001	\$ 225,365.22
14 31 CONSTRUCTION MANAGEMENT	Construction Management	\$ 190,364	24.88%	\$ 47,361	\$ 237,725.36
Totals					
Real Estate		\$ 1,197,162	21.80%	\$ 260,992	\$ 1,458,153.97
Total Construction Estimate		\$ 1,319,428	21.79%	\$ 287,443	\$ 1,606,872
Total Planning, Engineering & Design		\$ 190,364	18.39%	\$ 35,001	\$ 225,365
Total Construction Management		\$ 190,364	24.88%	\$ 47,361	\$ 237,725
Total		\$ 2,897,318		\$ 630,798	\$ 3,528,116

ALTERNATIVE COMPARISON COSTS

Table F-1. LERRDS Cost per acre (For Alternatives Comparison)

Property Type	Cost	Acres*	Cost Per Acre*
Property Outside of 100-year floodplain (Public)	\$ 852,800.00	17.055	\$ 50,002.93
Property Outside of 100-year floodplain (Private)	\$ 7,500.00	0.15	\$ 50,000.00
Property Within 100-year floodplain	\$ 1,040,900.00	34.695	\$ 30,001.44
Property within San Marcos River	\$ 7,100.00	2.35	\$ 3,021.28
		54.25	
Minerals	\$ 5,500.00	54.25	\$ 101.38
Damages/Severance @20%	\$ 382,800.00		\$ 7,056.22
Contingency @20%	\$ 382,800.00		\$ 7,056.22
TOTAL	\$ 2,679,400.00		\$ 14,213.82

*These costs are based on an initial real estate evaluation of lands within the study area, including all of those lands within the current distribution of proposed measures

** It was assumed that public lands would be acquired through easement at 60 percent of market value

LERRDS	Acres	\$/Acre	\$
City-owned	9.273		
< 100-year	8.492	\$ 44,215.27	\$ 375,461.11
> 100-year	0.781	\$ 64,216.76	\$ 50,157.99
State-owned (100% of value)	4.234		
< 100-year	4.234	\$ 44,215.27	\$ 187,194.98
> 100-year	0.000	\$ 64,216.76	\$ -
Private	0.000		
< 100-year	0.000	\$ 44,215.27	\$ -
> 100-year	0.000	\$ 64,213.82	\$ -
Total	13.506		\$ 612,814.08

Table F-1. LERRDS Cost per acre (For Alternatives Comparison) (continued)

RIP2			
LERRDS	Acres	\$/Acre	\$
City-owned	0.896		
< 100-year	0.866	\$ 44,215.27	\$ 38,276.71
> 100-year	0.030	\$ 64,216.76	\$ 1,933.49
State-owned (100% of value)	0.000		
< 100-year	0.000	\$ 44,215.27	\$ -
> 100-year	0.000	\$ 64,216.76	\$ -
Private	0.151		
< 100-year	0.151	\$ 44,215.27	\$ 6,687.02
> 100-year	0.000	\$ 64,213.82	\$ -
Total	1.047		\$ 46,897.21
EXOT			
LERRDS	Acres	\$/Acre	\$
City-owned	19.915		
< 100-year	18.044	\$ 44,215.27	\$ 797,816.19
> 100-year	1.871	\$ 64,216.76	\$ 120,149.76
State-owned	7.363		
< 100-year	7.363	\$ 44,215.27	\$ 325,563.93
> 100-year	0.000	\$ 64,216.76	\$ -
Total	27.278		\$ 1,243,529.89
EXOA			
LERRDS	Acres	\$/Acre	\$
Total	2.613	\$ 375,461.11	\$ 981,111.99

Table F-1. LERRDS Cost per acre (For Alternatives Comparison) (continued)

SHORE1			
LERRDS	Acres	\$/Acre	\$
City-owned	0.217		
< 100-year	0.174	\$ 44,215.27	\$ 7,673.64
> 100-year	0.044	\$ 64,216.76	\$ 2,811.38
State-owned	0.129		
< 100-year	0.129	\$ 44,215.27	\$ 5,693.72
> 100-year	0.000	\$ 64,216.76	\$ -
Total	0.346		\$ 16,178.74

SHORE2			
LERRDS	Acres	\$/Acre	\$
City-owned - Riparian	0.093		
< 100-year	0.090	\$ 44,215.27	\$ 3,993.59
> 100-year	0.003	\$ 64,216.76	\$ 180.49
Riverine	0.000	\$ 17,235.10	\$ -
Total	0.093		\$ 4,174.08

DISC			
LERRDS	Acres	\$/Acre	\$
City-owned	2.098		
< 100-year	1.204	\$ 44,215.27	\$ 53,253.59
> 100-year	0.894	\$ 64,216.76	\$ 57,378.75
State-owned	0.000		
< 100-year	0.000	\$ 44,215.27	\$ -
> 100-year	0.000	\$ 64,216.76	\$ -
Total	2.098		\$ 110,632.34

Table F-1. LERRDS Cost per acre (For Alternatives Comparison) (continued)

SED			
LERRDS	Acres	\$/Acre	\$
Riverine	25.419	\$ 17,235.10	\$ 438,099.93
WET			
LERRDS	Acres	\$/Acre	\$
City-owned	1.192		
< 100-year	0.084	\$ 44,215.27	\$ 3,692.65
> 100-year	1.109	\$ 44,215.27	\$ 49,031.85
Total	1.192	\$ 52,724.50	

*** All quantities are accounted using Excel, which calculates to a high precision. Some calculations may appear incorrect due to rounding errors. ***

Table F-2a. Initial Construction Costs for EXOT (For Alternatives Comparison) (TY0-TY1)

Table F-2b. 3-year Establishment Period Costs for EXOT (For Alternatives Comparison) (TY1-TY3)

Table E-2c. Operations and Maintenance Costs for EXOTI (For Alternatives Comparison) (TY3-50)

Table F-3a. Initial Construction Costs for RIPI (For Alternatives Comparison) (TY-0-TY1)

TASK DESCRIPTION	QUANTITY		LABOR			EQUIPMENT			MATERIAL		TOTAL	
	NO. OF UNITS	UNIT MEAS	TOTAL HRS	UNIT PRICE	COST	UNIT PRICE	COST	UNIT PRICE	COST			
1) Planting Zone 1 (20hr/acr) containerized tree (250/acr)	0.65	AC cell	13	60	781.27				6	976.58	781.27	
2) Planting Zone 2 (20hr/acr) containerized tree (250/acr)	163	AC	206	60	12,365.20				6	976.58	12,365.20	
3) Planting Zone 3 (30hr/acr) tractor with disc or box-blade (5hr/acr)	2,576	cell							6	15,456.50	15,456.50	
initial herbicide (2gal/acr)	2.28	AC	68	60	4,096.10				4	4,096.10		
initial herbicide (2gal/acr)	2.28	AC	11	80	910.25				50	568.90	1,479.15	
initial herbicide (2gal/acr)	5	GAL							150	682.68	682.68	
initial seed mix (20lb/acr)	46	lb							65	2,958.30	2,958.30	
fiber mat (100% area)	99.126	SF							0.50	49,562.86	49,562.86	
4) Irrigation Installation (20hr/acr) lines, sprinklers, etc.	13.23	AC	265	80	21,169.61					21,169.61		
water (2,000 gal/acr/yr)	13.23	AC							350	4,630.85	4,630.85	
5) Relocate Trail (10hr/acr)	26.462	GAL							0.1	2,646.20	2,646.20	
dozer or tractor with box-blade (10hr/acr)	0.28	AC	3	60	165.27						165.27	
48" tweed cloth	0.28	AC	3	80	220.36				50	13.77	13.77	
3/8" crushed rock, trail suitable mix (4" depth)	11.989	SF							0.15	1,759.78	1,759.78	
6) Best Management Practices (1hr/100LF) signs (1/300 fencing) post-and-cable (50% perimeter)	148	CY								15	2,221.95	2,221.95
7) Monitoring (data reporting)	13.453	LF	135	60	8,071.54						8,071.54	
	22	#							100	2,242.09	2,242.09	
	6,726	LF							1	6,726.28	6,726.28	
	2,018	LF							3	6,053.66	6,053.66	
	1	#							3,200.00		3,200.00	
TOTAL THIS SHEET			743		50,979.60				2,382.46	94,157.97	147,520.02	

Table F-3b. 3-year Establishment Period Costs for RIPI (For Alternatives Comparison) (TY1-TY3)

TASK DESCRIPTION	QUANTITY		LABOR			EQUIPMENT			MATERIAL		TOTAL
	NO. OF UNITS	UNIT MEAS	TOTAL HRS	UNIT PRICE	COST	UNIT PRICE	COST	UNIT PRICE	COST		
1) Surveys (8hr/acr) x 2	13.23	AC	212	60	12,701.77						12,701.77
2) Herbicide Application (5hr/acr) x 2	13.23	AC	132	60	7,938.60						7,938.60
follow-up herbicide (1gal/acr) x 2	26	GAL							150	3,969.30	3,969.30
3) Tree Replacement (5hr/acr) x 2	13.23	AC	132	60	7,938.60						7,938.60
containerized tree (20% installation) x 2	1,096	GAL							6	6,573.24	6,573.24
4) Irrigation and Fencing Maintenance (5hr/acr) x 2	13.23	AC	132	60	7,938.60						7,938.60
signs (10% installation) x 2	4	#							100	448.42	448.42
post-and-cable fencing (10% installation) x 2	1,345	LF							1	1,345.26	1,345.26
pipes, sprinklers, valves, etc (10% installation) x 2	2,65	AC							15	39.69	39.69
water (2,000 gal/acr/yr) x 2	52,924	GAL							0.1	5,292.40	5,292.40
5) Monitoring (data reporting) x 2	2	#							6,400.00		6,400.00
TOTAL THIS SHEET			689		42,917.57				17,668.31	60,585.88	

Table F-3c. Operation and Maintenance Costs for RIP1 (For Alternatives Comparison) (TY3-TY50)

TASK DESCRIPTION	QUANTITY		LABOR		EQUIPMENT		MATERIAL		TOTAL	
	NO. OF UNITS	UNIT MEAS	TOTAL HRS	UNIT PRICE	COST	UNIT PRICE	COST	UNIT PRICE	COST	TOTAL
1) Surveys (8hr/face) x 2	13.23	AC	212	60	12,701.77					12,701.77
2) Herbicide Application (5hr/face) x 2	13.23	AC	132	60	7,938.60					7,938.60
Follow-up herbicide (1gal/face) x 2	26	GAL								3,969.30
3) Trail Maintenance (5hr/face) x 2	0.28	AC								-
Bobcat or tractor with box-blade (10hr/face) x 2	0.28	AC	6	80	440.72	50	13.77	15	4,443.90	4,443.90
3/8" crushed rock, trail suitable mix (4" depth) x 2	296	CY								6,400.00
4) Monitoring (data reporting) x 2	2	#	80	80	6,400.00					6,400.00
TOTAL THIS SHEET			430		27,481.09		13.77		8,413.20	35,908.06

Table F-3d. Initial Construction Costs for RIP2 (For Alternatives Comparison) (TY0-TY1)

.	QUANTITY		LABOR		EQUIPMENT		MATERIAL		TOTAL	
	NO. OF UNITS	UNIT MEAS	TOTAL HRS	UNIT PRICE	COST	UNIT PRICE	COST	UNIT PRICE	COST	TOTAL
1) Removal of Hardpan (60hr/face)	1.05	AC	63	80	5,025.77					5,025.77
Bobcat or tractor with bucket	63	HR								3,141.11
asphalt and concrete recycling (2" depth)	3,378	CY								3,141.11
2) Planting Zone 1 (20hr/face)	0.06	AC	1	60	67.89					67.89
Containerized tree (250/lb/face)	14	cell								84.86
3) Planting Zone 2 (20hr/face)	0.51	AC	10	60	616.06					616.06
Containerized tree (250/lb/face)	3,536	cell								21,214.71
4) Planting Zone 3 (30hr/face)	0.45	AC	13	60	804.55					804.55
Tractor (with disc or box-blade (5hr/face))	0.45	AC	2	80	178.79					178.79
Initial herbicide (2gal/face)	1	GAL								290.53
Native seed mix (20lb/face)	9	lb								134.09
Fiber mat (100% area)	19,470	SF								581.07
5) Irrigation Installation (20hr/face)	1.02	AC	20	80	1,627.08					1,627.08
lines, sprinklers, etc.	1.02	AC								350
water (2,000 gal/day/yr)	2,034	GAL								355.92
6) Relocate Trails (10hr/face)	0.03	AC	0.30	60	18.07					203.39
Bobcat or tractor with box-blade (10hr/face)	0.03	AC	0.30	80	24.09	50	1.51			18.07
48" weed cloth	1,312	SF								25.59
3/8" crushed rock, trail suitable mix (4" depth)	16	CY								196.73
7) Relocate Parking	0.00	AC	-							-
Bobcat or tractor with box-blade (10hr/face)	0.00	AC	80	-	50					-
1" to 3/4" crushed rock, parking suitable mix (6" depth)	0	CY								-
8) Best Management Practices (1hr/100LF)	3,730	LF	37	60	2,237.72					2,237.72
signs (1/300 fencing)	6	#								621.59
post-and-cable (50% perimeter)	1,865	LF								1,864.76
bales, wattles, silt fence, etc (15% perimeter)	559	LF	5	80	400.00					400.00
9) Monitoring (data reporting)	1	#								
TOTAL THIS SHEET			153		11,000.01		3,451.09		78,947.99	93,398.19

Table F-3e. 3-year Establishment Period Costs for RIP2 (For Alternatives Comparison) (TY1-TY3)

Table F-3f. Operation and Maintenance Costs for RIP2 (For Alternatives Comparison) (TY3-TY50)

Table F-4a. Initial Construction Costs for EXOA (For Alternatives Comparison) (TY0-TY1)

Table F-4b. 3-year Establishment Period Costs for EXOA (For Alternatives Comparison) (TY1-TY3)

Table F-4c. Operation and Maintenance Costs for EXO (For Alternatives Comparison) (TY3-TY50)

Table 1-4--Operation and maintenance costs for LCRAC (3 alternatives comparison) (11-3-11-3)								
Task Description	Quantity		Labor		Equipment		Material	Total
	No. of Units	Unit Meas	Total Hrs	Unit Price	Cost	Unit Price		
1) Surveys (8hr/ac) x 10	0.87	AC	70	4,180.94				4,180.94
2) Hand Removal (10% reestablishment) (10hr/fac) x 10	0.87	AC	87	60	5,226.17			5,226.17
sediment disposal (2" depth) x 10	234	CY					2	468.42
3) Best Management Practices (1hr/100LF) x 10	2071	LF	207	60	12,425.89			12,425.89
balls, wattles, silt fence, etc (10% installation) x 10	1035	LF					3	3,106.47
fish exclusion (10% installation) x 10	22	#					500	10,833.33
sign (10% installation) x 10	22	#					100	2,166.67
post-on-cable (10% installation) x 10	20710	LF					1	20,709.81
4) Plant Replacement (20hr/fac) x 10	0.87	AC	174	60	10,452.34			10,452.34
containerized herbaceous plants (10% installation) (1,000/ac) x 10	871	cell					3	2,613.09
5) Monitoring (data reporting) x 10	10	#	200	80	16,000.00			16,000.00
TOTAL THIS SHEET			738	48,285.34			0	39,897.79

Table F-5a. Initial Construction Costs for SHORE1 (For Alternatives Comparison) (TY0-TY1)

TASK DESCRIPTION	QUANTITY			LABOR			EQUIPMENT			MATERIAL		TOTAL	
	NO. OF UNITS	UNIT MEAS	TOTAL HRS	UNIT PRICE	COST	UNIT PRICE	COST	UNIT PRICE	COST	UNIT PRICE	MATERIAL		
1) Contouring Shore (80hr/ac) bobcat or tractor with box blade coarse, 2" by 4" aggregate (10% of area) 1' depth	0.35	AC	28	80	2,215.07							2,215.07	
	28	HR						50	1,384.42			1,384.42	
2) Install Access Steps (8hr/site) bobcat or tractor with box blade limestone or granite slab (> 3 foot diameter @ 4/site) 3/4" bent metal tubing hand rail and concrete	56	CY								10	558.38	558.38	
	9	#	72	80	5,760.00							5,760.00	
	72	HR						50	3,600.00			3,600.00	
	36	#								600	21,600.00	21,600.00	
	9	#								200	1,800.00	1,800.00	
3) Plant Native Vegetation (60hr/ac) containerized herbaceous plants (50% of area @ 500/ac) containerized woody plants (50% of area @ 125/ac) native seed mix (20lb/ac) fiber mat (75% of area)	0.31	AC	18	60	1,104.69							1,104.69	
	77	cell								8	613.72	613.72	
	19	cell								15	287.68	287.68	
	6.14	LB								65	398.92	398.92	
	10,025	SF								0.50	5,012.53	5,012.53	
4) Best Management Practices (1hr/100LF) fish exclusion (Number of polygons) bales, watties, silt fence, etc (50% fencing) signs (2/access step) post-and-cable (100% polygon perimeter)	870	LF	9	60	522.18							522.18	
	21	#									500	10,500.00	10,500.00
	435	LF									3	1,305.46	1,305.46
	18	#								100	1,800.00	1,800.00	
	870	LF								1	870.31	870.31	
											44,747.00	44,747.00	
											59,333.35	59,333.35	

Table F-5b. 3-year Establishment Period Costs for SHORE1 (For Alternatives Comparison) (TY1-TY3)

TASK DESCRIPTION	QUANTITY			LABOR			EQUIPMENT			MATERIAL		TOTAL	
	NO. OF UNITS	UNIT MEAS	TOTAL HRS	UNIT PRICE	COST	UNIT PRICE	COST	UNIT PRICE	COST	UNIT PRICE	MATERIAL		
1) Surveys (8hr/ac) x 2	0.31	AC	5	60	294.58							294.58	
2) Herbicide Application (5hr/ac) x 2 herbicide (1gal/ac)	0.31	AC	3	60	184.12							184.12	
3) Plant Replacement (5hr/acre) x 2 containerized herbaceous plants (20% installation) containerized woody plants (20% installation)	0.31	GAL								150	92.06	92.06	
	31	AC	3	60	184.12							184.12	
	8	cell									8	245.49	245.49
	2	#	40	80	3,200.00					15	115.07	115.07	
4) Monitoring (data reporting) x 2											3,200.00	3,200.00	
TOTAL THIS SHEET										0	452.62	4,315.43	

Table F-5c. Operation and Maintenance Costs for SHORE1 (For Alternatives Comparison) (TY3-TY50)

Table E-5d Initial Construction Costs for SHORE2 (For Alternatives Comparison) (TY0-TY1)

Table F-5e. 3-year Establishment Period Costs for SHORE2 (For Alternatives Comparison) (TY1-TY3)

TASK DESCRIPTION	QUANTITY		LABOR			EQUIPMENT			MATERIAL		TOTAL
	NO. OF UNITS	UNIT MEAS	TOTAL HRS	UNIT PRICE	COST	UNIT PRICE	COST	UNIT PRICE	COST		
1) Surveys (8hr/acre) x 2	0.09	AC	1.4	60	86.71						86.71
2) Herbicide Application (5hr/acre) x 2	0.09	AC	0.9	60	54.19						54.19
follow-up herbicide (1gal/acre) x 2	0.2	GAL								150	27.10
3) Plant Replacement (5hr/ac) x 2	0.09	AC	0.9	60	54.19						54.19
containerized herbaceous plants (20% installation)	9	cell								8	72.26
containerized woody plants (20% installation)	2	cell								15	33.87
4) Monitoring (data reporting) x 2	2	#	40	60	2,400.00						2,400.00
TOTAL THIS SHEET			43		2,595.09				0	133.22	2,728.32

Table F-5f. Operation and Maintenance Costs for SHORE2 (For Alternatives Comparison) (TY3-TY50)

TASK DESCRIPTION	QUANTITY		LABOR			EQUIPMENT			MATERIAL		TOTAL
	NO. OF UNITS	UNIT MEAS	TOTAL HRS	UNIT PRICE	COST	UNIT PRICE	COST	UNIT PRICE	COST		
1) Surveys (8hr/acre) x 10	0.09	AC	7	60	433.54						433.54
2) Herbicide Application (10% installation) (5hr/acre) x 10	0.09	AC	5	60	270.96						270.96
herbicide (1gal/acre)	0.09	GAL								150	13.55
3) Plant Native Vegetation (10% installation) (60hr/acre) x 10	0.09	AC	54	60	3,251.57						3,251.57
containerized herbaceous plants (10% installation) x 10	23	cell								8	180.64
containerized woody plants (10% installation) x 10	6	cell								15	84.68
4) Monitoring (data reporting) x 10	10	#	200	60	12,000.00						12,000.00
TOTAL THIS SHEET			266		15,956.08				278.87		16,234.95

Table F-6a. Initial Construction Costs for DISC (For Alternatives Comparison) (TY0-TY1)

TASK DESCRIPTION	QUANTITY		LABOR		EQUIPMENT		MATERIAL		TOTAL	
	NO. OF UNITS	UNIT MEAS	TOTAL HRS	UNIT PRICE	COST	UNIT PRICE	COST	UNIT PRICE	COST	
1) Remove Hardpan (60hr/ac) bocat or tractor with bucket concrete recycling 1' depth	0.28	AC	20	80	1,600.00		50	1,000.00	12.5	5,575.42
446	HR									1,000.00
446	CY									5,575.42
2) Contouring/Drain Improvement (20hr/ac) rip rap, <24' (10% of area) 1' depth boulder (1/0.01 ac)	2.10	AC	42	80	3,356.69	50	2,097.93	17	5,753.93	5,454.63
338	CY									5,454.63
28	#									5,753.93
2) Plant Native Vegetation (60hr/ac) containerized herbaceous plants (50% of area @ 500/ac) containerized woody plants (50% of area @ 125/ac) native seed mix (20lb/ac)	2.10	AC	126	60	7,552.56					6,911.68
524	cell									6,911.68
131	cell									6,911.68
41.96	LB									6,911.68
22,846	SF									6,911.68
1071	LF									6,911.68
1071	LF									6,911.68
214	LF									6,911.68
TOTAL THIS SHEET			199		13,152.07		3,097.93		41,982.62	58,232.62

Table F-6b. 3-year Establishment Period Costs for DISC (For Alternatives Comparison) (TY1-TY3)

TASK DESCRIPTION	QUANTITY		LABOR		EQUIPMENT		MATERIAL		TOTAL	
	NO. OF UNITS	UNIT MEAS	TOTAL HRS	UNIT PRICE	COST	UNIT PRICE	COST	UNIT PRICE	COST	
1) Surveys (4hr/face) x 2	2.10	AC	17	60	1,007.01					1,007.01
2) Herbicide Application (5hr/face) x 2	2.10	AC	21	60	1,258.76					1,258.76
follow-up herbicide (1gal/c) x 2	4	GAL								629.38
3) Plant Replacement (5hr/face) x 2	2.10	AC	21	60	1,258.76					1,258.76
containerized herbaceous plants (20% installation) x 2	210	cell								1,678.35
containerized woody plants (20% installation) x 2	52	cell								1,678.35
4) Monitoring (data reporting) x 2	2	#	40	80	3,200.00					3,200.00
TOTAL THIS SHEET			99		6,724.53		0		3,094.45	9,818.98

Table F-6c. Operations and Maintenance Costs for DISC (For Alternatives Comparison) (TY3-TY50)

TASK DESCRIPTION	QUANTITY		LABOR		EQUIPMENT		MATERIAL		TOTAL	
	NO. OF UNITS	UNIT MEAS	TOTAL HRS	UNIT PRICE	COST	UNIT PRICE	COST	UNIT PRICE	COST	
1) Debris Removal (40hr/ac) x 10	2.10	AC	839	60	50,350.40					50,350.40
2) Repair (80hr/ac)	2.10	AC	168	80	13,426.77					13,426.77
bocat or tractor with bucket rip rap (<24') 10% of area 1'dep	168	HR								8,391.73
boulder (1/0.01 ac)	338	CY								5,753.93
28	#									6,911.68
3) Best Management Practices (1hr/100LF)	1071	LF	11	60	642.81					642.81
bales, wattles, silt fence, etc.	1071	LF								3,214.07
4) Herbicide Application (5hr/face) x 10	2.10	AC	105	60	6,293.80					6,293.80
herbicide (1gal/face) x 10	20.98	GAL								3,146.90
5) Monitoring x 10	10	#	200	80	16,000.00					16,000.00
TOTAL THIS SHEET			1323		86,713.78		8,391.73		19,026.59	114,132.10

Table F-7a. Initial Construction Costs for SED (For Alternatives Comparison) (TY0-TY1)

TASK DESCRIPTION	QUANTITY		LABOR			EQUIPMENT			MATERIAL		TOTAL	
	NO. OF UNITS	UNIT MEAS	TOTAL HRS	UNIT PRICE	COST	UNIT PRICE	COST	UNIT PRICE	COST	UNIT PRICE	COST	TOTAL
1) Sediment Removal (1/3 priority area) (100hr/ac)	1.58	AC	158	60	9,500.00		125	19,791.67				9,500.00
hydro-suction machine	158	HR										19,791.67
sediment disposal (6" depth)	1277	CY										8,940.56
2) Best Management Practices	1.58	AC										
sediment fence (1 hr/100LF)	1583	LF	16	60	950.00							2,533.33
fish exclusion (0.1ac site)	16	#	10	60	600.00							600.00
plant natives	1.58	AC	120	60	7,200.00							38,866.67
TOTAL THIS SHEET					11,050.00			19,791.67		10,523.89		80,232.22

Table F-7b. 3-year Establishment Period Costs for SED (For Alternatives Comparison) (TY1-TY3)

TASK DESCRIPTION	QUANTITY		LABOR			EQUIPMENT			MATERIAL		TOTAL	
	NO. OF UNITS	UNIT MEAS	TOTAL HRS	UNIT PRICE	COST	UNIT PRICE	COST	UNIT PRICE	COST	UNIT PRICE	COST	TOTAL
1) Sediment Removal (1/3 priority area) (100hr/ac) x 2	3.17	AC	633	60	38,000.00		125	79,166.67				38,000.00
hydro-suction machine	633	HR										79,166.67
sediment disposal (6" depth) x 2	5109	CY										35,762.22
2) Best Management Practices x 2	3.17	AC										
sediment fence (1 hr/100LF)	3167	LF	32	60	1,900.00							5,066.67
fish exclusion (0.1ac site)	32	#	20	60	1,200.00							1,200.00
plant natives	3.17	AC	240	60	14,400.00							20,000.00
TOTAL THIS SHEET					55,500.00			79,166.67		102,262.22		236,928.89

Table F-7c. Operations and Maintenance Costs for SED (For Alternatives Comparison) (TY3-TY50)

TASK DESCRIPTION	QUANTITY		LABOR			EQUIPMENT			MATERIAL		TOTAL	
	NO. OF UNITS	UNIT MEAS	TOTAL HRS	UNIT PRICE	COST	UNIT PRICE	COST	UNIT PRICE	COST	UNIT PRICE	COST	TOTAL
1) Sediment Removal (1/3 priority area) (100hr/ac) x 10	15.83	AC	1583	60	95,000.00		125	197,916.67				95,000.00
hydro-suction machine	1,583	hr										197,916.67
sediment disposal (6" depth) x 10	12772	CY										89,405.56
3) Best Management Practices (1 hr/100LF) x 10	15.83	AC										
sediment fence (1 hr/100LF)	15833	LF	158	60	9,500.00							25,333.33
fish exclusion (0.1ac site)	158	#	100	60	6,000.00							6,000.00
plant natives	15.83	AC	1200	60	72,000.00							383,666.67
TOTAL THIS SHEET					182,500.00			197,916.67		421,905.56		802,322.22

Table F-8a. Initial Construction Costs for WET (For Alternatives Comparison) (TY0-TY1)

Table E-8b 3-year Establishment Costs for WET (For Alternatives Comparison) (TY1-TY3)

Table F-8c. Operations and Maintenance Costs for NET (For Alternatives Comparison) (TY3-TY50)

Table F-9a. Initial Construction Costs for EDU (For Alternatives Comparison) (TY0-TY1)

TASK DESCRIPTION	QUANTITY			LABOR			EQUIPMENT			MATERIAL		TOTAL
	NO. OF UNITS	UNIT MEAS	TOTAL HRS	UNIT PRICE	COST	UNIT PRICE	COST	UNIT PRICE	COST	UNIT PRICE	COST	
1) Signage	20	#	40	60	2,400.00					200	4,000.00	6,400.00
2) Kiosk	3	#								10,000	30,000.00	30,000.00
TOTAL THIS SHEET					2,400.00					-	34,000.00	36,400.00

Table F-9b. Operation and Maintenance Costs for EDU (For Alternatives Comparison) (TY1-TY50)

TASK DESCRIPTION	QUANTITY			LABOR			EQUIPMENT			MATERIAL		TOTAL
	NO. OF UNITS	UNIT MEAS	TOTAL HRS	UNIT PRICE	COST	UNIT PRICE	COST	UNIT PRICE	COST	UNIT PRICE	COST	
1) Sign Repair/Replacement	20	#	40	60	2,400.00					100	2,000.00	4,400.00
2) Kiosk Maintenance	3	#								1,000	3,000.00	3,000.00
TOTAL THIS SHEET					2,400.00					5,000.00	5,000.00	7,400.00

Table F-10a. Initial Costs for DUCK (For Alternatives Comparison) (TY0-TY1)

MAP # AND TASK DESCRIPTION	QUANTITY			LABOR			EQUIPMENT			MATERIAL		TOTAL
	NO. OF UNITS	UNIT MEAS	TOTAL HRS	UNIT PRICE	COST	UNIT PRICE	COST	UNIT PRICE	COST	UNIT PRICE	COST	
1) Trapping (5day/week) x 3 weeks traps	15	Days	120	80	9,600.00		80	4,800.00		80	4,800.00	9,600.00
2) Animal Disposal (1/day)	60	#										600.00
TOTAL THIS SHEET					120					5,400.00		0 15,000.00

Table F-10b. Initial Costs for DUCK (For Alternatives Comparison) (TY1-TY3)

MAP # AND TASK DESCRIPTION	QUANTITY			LABOR			EQUIPMENT			MATERIAL		TOTAL
	NO. OF UNITS	UNIT MEAS	TOTAL HRS	UNIT PRICE	COST	UNIT PRICE	COST	UNIT PRICE	COST	UNIT PRICE	COST	
1) Trapping (5day/week) x 3 weeks x 2yr	15	Days	240	80	19,200.00		80	4,800.00		80	4,800.00	19,200.00
2) Animal Disposal x 2 yr	30	#										1,200.00
TOTAL THIS SHEET					240					19,200.00		0 20,400.00

Table F-10c. Operation and Maintenance Costs for DUCK (For Alternatives Comparison) (TY1-TY50)

MAP # AND TASK DESCRIPTION	QUANTITY			LABOR			EQUIPMENT			MATERIAL		TOTAL
	NO. OF UNITS	UNIT MEAS	TOTAL HRS	UNIT PRICE	COST	UNIT PRICE	COST	UNIT PRICE	COST	UNIT PRICE	COST	
1) Trapping (5day/week) x 3 weeks x 10yr	15	Days	1,200	50	60,000.00		80	4,800.00		80	4,800.00	60,000.00
trap repair and replacement	60	#										4,800.00
2) Animal Disposal (1/day) x 10yr	150	#										6,000.00
TOTAL THIS SHEET					1,200					60,000.00		0 70,800.00

Table F-11a. Average Annual Cost Unit (AACU) by Measure (For Alternatives Comparison)

		EXOT	RIP1	RIP2	EXOA	SHORE1
LEFRDS						
	\$ 1,243,530	\$ 612,814	\$ 659,711	\$ 981,112	\$ 16,179	
General Construction						
Initial Construction	\$ 31,897	\$ 147,520	\$ 240,918	\$ 28,899	\$ 59,333	
3-year Establishment Period	\$ 19,622	\$ 60,586	\$ 73,833	\$ 53,448	\$ 4,315	
subtotal	\$ 51,519	\$ 208,106	\$ 314,751	\$ 82,347	\$ 63,649	
contingency (%)	5.82%	9.36%	9.36%	14.97%	16.46%	
Contingency Value	\$ 2,999	\$ 19,479	\$ 29,460	\$ 12,325	\$ 10,477	
Subtotal	\$ 54,518	\$ 227,584	\$ 344,211	\$ 94,672	\$ 74,126	
Planning, Engineering, and Design (PED)						
PED (10%)	\$ 5,152	\$ 20,811	\$ 31,475	\$ 8,235	\$ 6,365	
PED contingency (9.22%)	\$ 475	\$ 1,918	\$ 2,901	\$ 759	\$ 587	
Subtotal	\$ 5,627	\$ 22,729	\$ 34,376	\$ 8,994	\$ 6,952	
Construction Management						
Construction Management (10%)	\$ 5,152	\$ 20,811	\$ 31,475	\$ 8,235	\$ 6,365	
Construction Management Contingency (20.08%)	\$ 1,035	\$ 4,180	\$ 6,322	\$ 1,654	\$ 1,278	
Subtotal	\$ 6,187	\$ 24,990	\$ 37,797	\$ 9,889	\$ 7,643	
Subtotal First Cost	\$ 1,309,861	\$ 88,118	\$ 1,076,096	\$ 1,094,666	\$ 104,899	
TOTAL FIRST COST	\$ 1,440,847	\$ 976,929	\$ 1,183,705	\$ 1,204,133	\$ 115,389	
Interest During Construction	\$ 81,797	\$ 55,461	\$ 67,199	\$ 68,359	\$ 6,551	
INVESTMENT COST	\$ 1,522,644	\$ 1,032,390	\$ 1,260,905	\$ 1,272,492	\$ 121,940	
Interest	\$ 57,099	\$ 38,715	\$ 46,909	\$ 47,718	\$ 4,573	
Amortization	\$ 10,772	\$ 7,303	\$ 8,849	\$ 9,002	\$ 863	
Annual Operations, Maintenance, Repair, Rehabilitation, and Replacements (OMRR&R)	\$ 731	\$ 764	\$ 838	\$ 1,876	\$ 832	
Average Annual Cost Unit (AACU)	\$ 68,602	\$ 46,782	\$ 56,596	\$ 58,597	\$ 6,267	
ANNUAL INTEREST RATE (decimal)		0.03750				
PROJECT LIFE (years)		50				
CONSTRUCTION PERIOD (months)		36				

Table F-11b. Average Annual Cost Unit (AACU) by Measure (For Alternatives Comparison)

LERRDS		SHORE2	DISC	SED	DUCK	WET	EDU
		\$ 20,353	\$ 110,632	\$ 438,100	\$ -	\$ 52,725	\$ -
General Construction							
Initial Construction	\$ 71,634	\$ 58,233	\$ 80,232	\$ 15,000	\$ 75,286	\$ 36,400	
3-year Establishment Period	\$ 7,044	\$ 9,819	\$ 236,929	\$ -	\$ 6,274	\$ -	
Subtotal	\$ 78,678	\$ 68,052	\$ 317,161	\$ 15,000	\$ 81,559	\$ 36,400	
contingency (%)	16.46%	16.12%	7.54%	9.41%	7.54%	5.82%	
Contingency (risk-based)	\$ 12,951	\$ 10,967	\$ 23,914	\$ 1,411	\$ 6,149	\$ 2,119	
Subtotal	\$ 91,629	\$ 79,019	\$ 341,075	\$ 16,411	\$ 87,708	\$ 38,519	
Planning, Engineering, and Design (PED)							
PED (10%)	\$ 7,868	\$ 6,805	\$ 31,716	\$ 1,500	\$ 8,156	\$ 3,640	
PED contingency (9.22%)	\$ 725	\$ 627	\$ 2,924	\$ 138	\$ 752	\$ 336	
Subtotal	\$ 8,593	\$ 7,432	\$ 34,640	\$ 1,638	\$ 8,908	\$ 3,976	
Construction Management							
Construction Management (10%)	\$ 7,868	\$ 6,805	\$ 31,716	\$ 1,500	\$ 8,156	\$ 3,640	
Construction Management Contingency (20.08%)	\$ 1,580	\$ 1,367	\$ 6,370	\$ 301	\$ 1,638	\$ 731	
Subtotal	\$ 9,448	\$ 8,172	\$ 38,086	\$ 1,801	\$ 9,794	\$ 4,371	
Subtotal First Cost	\$ 130,023	\$ 205,256	\$ 851,901	\$ 19,850	\$ 159,134	\$ 46,865	
TOTAL FIRST COST	\$ 143,025	\$ 225,781	\$ 937,091	\$ 21,835	\$ 175,048	\$ 51,552	
Interest During Construction	\$ 8,120	\$ 12,818	\$ 53,199	\$ 1,240	\$ 9,938	\$ 2,927	
INVESTMENT COST	\$ 151,144	\$ 238,599	\$ 990,290	\$ 23,075	\$ 184,985	\$ 54,478	
Interest	\$ 5,668	\$ 8,947	\$ 37,136	\$ 865	\$ 6,937	\$ 2,043	
Amortization	\$ 1,069	\$ 1,688	\$ 7,006	\$ 163	\$ 1,309	\$ 385	
Annual Operations, Maintenance, Repair, Rehabilitation, and Replacements (OMRR&R)	\$ 1,177	\$ 2,428	\$ 17,071	\$ 1,506	\$ 803	\$ -	
Average Annual Cost Unit (AACU)	\$ 7,915	\$ 13,064	\$ 61,212	\$ 2,535	\$ 9,049	\$ 2,428	
ANNUAL INTEREST RATE (decimal)							
PROJECT LIFE (years)	50						
CONSTRUCTION PERIOD (months)	36						

