Attachment 8

Stormwater Flood Management Grant Proposal Santa Barbara County Flood Control and Water Conservation District Flood Damage Reduction Costs and Benefits

Attachment 8 consists of the following items:

- ✓ **Flood Damage Reduction Costs and Benefits.** Attachment 8 describes and quantifies the benefits and costs of each project in the proposal.

Introduction

This attachment provides information regarding the flood damage reduction costs and benefits that will be derived from the Lower Mission Creek Flood Control and Restoration Projects, Reach 1A, Phase 2 and Reach 1B. The projects will significantly reduce the risk of flood damage by increasing the flood conveyance capacity to 3,400 cfs, which equate to an increase from the existing 5-year flood conveyance to a 20-year flood flow conveyance. In addition, these projects will provide 4,000 sq. ft. of riparian and habitat extension zones along the banks and at logical places for passive open space and adds 10,000 sq. ft. of aquatic habitat for the endangered steelhead and the endangered tidewater goby. Finally, the projects also will provide water qualities benefits as a result of the bank restoration and adjacent habitat restoration occurring as part of the project.

Project Abstract

The Santa Barbara County Flood Control and Water Conservation District (SBCFCWCD), the City of Santa Barbara and the United States Army Corps of Engineers (USACE) embarked on a two decade long effort of reconnaissance studies, feasibility studies (Exhibits 3-A), planning efforts, public outreach and an Environmental Impact Statement/Environmental Impact Report (EIS/EIR) (Exhibit 3-B) to contemplate and best address the flood control measures and restoration measure that best benefit the Lower Mission Creek. According to the USACE, the primary problem affecting the lower Mission Creek is the threat of flooding to property, which affects the health, safety, and well-being of the residents of the City of Santa Barbara. As such, the proposed projects has been methodically thought out and developed to provide the maximum amount of flood protection feasible to take property owners out of harm's way.

The projects will provide improved flood protection to the thousands of residents and prevent damage to millions of dollars of valuable property. Moreover, the projects will enhance and restore deteriorated riparian habitats that will enhance channel function as opposed to undermining it. Historically, bank stabilization efforts have degraded the

natural characteristics of the creek bottom by unconfined placement of concrete material in numerous locations along the creek. Persistent non-native vegetation, especially giant reed, have invaded and overwhelmed the creek's environs because of the loss of the riparian community. Inhospitable patchy bank treatments and periodic maintenance is necessary, in part, to control bank erosion and prevent further encroachment of weedy species and subsequent loss of conveyance capacity. As such the projects provide a balanced solution to flooding that employs a sound engineering solution with a sound environment solution,

The Reach 1A, Phase 2 project has completed 100% design (as of November 2010). The plans are for the construction of floodwalls, fish ledges and extended riparian/habitat areas. This project will increase the capacity of the creek between the pedestrian bridge and Mason street from 1,500 cfs to 3,400 cfs, widen the creek channel to increase fish habitat by 3,500 sq. ft and create environmental riparian habitat and extended habitat zones by 2,000 sq. ft.

The Reach 1B project is currently in design and has obtained 60% design plans. The project will increase the capacity of the creek between Mason street and Yanonali street from 1,500 cfs to 3,400 cfs, widen the channel to increase fish habitat by 6,600 sq. ft. and create riparian habitat and extended habitat zones of 2,000 sq. ft.

Summary Distribution of Project Benefits and Identification of Beneficiaries

Figure 8-1 below summarizes the Project's benefits and beneficiaries. Local residents will benefit from flood protection, increased public safety, and habitat improvements and water quality.

Figure 8-1: Project Benefits and Beneficiaries

Project Benefits	Project Beneficiaries
Protection of residential property (structures and contents)	Local residents
Protection of commercial property (structures and contents)	Local businesses
Reduced damage to roads and streets	Local residents and visitors in the area
Increased public safety and reduced indirect costs, including emergency response, and disruption to employment, commerce, transportation, and communications	Local residents and businesses and regional users of transportation facilities
Habitat restoration	Anadromous fish, regional habitat
Water quality	Local residents, visitors, the creek and the ocean

Flood Damage Reduction Benefit Analysis (Section D1)

Flood damage reduction benefits were estimated with DWR's F-RAM model. Benefit estimates and supporting data are drawn from the US Army Corps of Engineers (USACE) economic analysis for the project (U.S. Army Corps of Engineers, 2004).

Flood Damage Categories

Flood damages were estimated for the without- and with-project conditions for the following categories.

- Residential structures and contents
- Commercial structures and contents
- Roads and highways
- Indirect costs, including emergency response, and disruption to employment, commerce, transportation, and communications
- Bank stabilization costs

Historical Flood Damages

Historical flooding in Lower Mission Creek dates back to 1862, with 20 damaging floods recorded since 1900. The most significant recent floods occurred successively in January and February of 1995. Table 1 lists estimated damages to structures and contents from recent flood events. The update of historical damages to 2012 was based on price indexes in the USACE Civil Works Construction Cost Indexes System (CWCCIS). Currently, the Mission Creek channel has the capacity to convey approximately 1500 CFS (an estimated 5-year event). The project will increase the capacity to 3400 CFS (an estimated 20-year event) thereby reducing flooding of adjacent properties.

Table 8-1: Lower Mission Creek Historical Flood Damages (2012 Dollars)

Flood Event	Structure & Content Damages	Storm Magnitude
March 1995	$10,532,824	9-Yr
January 1995	$22,708,413	55-Yr
January 1983	$4,717,752	10-Yr
February 1978	$7,727,851	11-Yr
January 1967	$34,116,466	NA
Source: (U.S. Army Corps of Engineers, 2004)		

1995 Flood, Lower Mission Creek, UPRR Crossing

Flood Damage Reduction Benefits Estimation Methodology

The USACE economic assessment is formulated to be in accordance with USACE Planning Guidance Notebook guidelines for flood damage reduction estimation (U.S. Army Corps of Engineers, April 2000). Flood damages for the without- and with-project conditions were calculated with the HEC's Flood Damage Reduction Analysis (HEC-FDA) model. Expected annual damages (EAD) were calculated with HEC's Expected Annual Damage (EAD) model.

Field surveys were completed by USACE in 1997 and 2004. The original field survey was based on a 100% field survey. The survey recorded the following items: relative First Floor Elevation (FFE), structure type, structure condition, and structure use. The purpose of the second survey was to verify any changes to residential and commercial development in the floodplain. The Lower Mission Creek floodplain was topographically mapped at a 2-foot contour interval. This mapping and field survey FFEs were combined to estimate absolute FFE. The Lower Mission Creek study area was segmented into sub-reaches to differentiate characteristics within these major reaches. Critical factors for differentiation included: discharge/frequency characteristics, overflow spatial characteristics, and economic activity.

Damage estimates have been updated from 2004 to 2012 dollars with the composite price index in the USACE Civil Works Construction Cost Indexes System (CWCCIS).

The proposed project is being constructed in reaches, seven in all. Proposition 1E funding is being requested to construct Reaches 1A-2 and 1B. The capital cost for these reaches is $13.9 million Total project capital cost is $83.1 million (Tetra Tech, Inc., 2011). Total project benefits are therefore scaled by a factor of 0.1673 (13.9/83.1 x 51.1) to estimate benefits for Reaches 1A-2 and 1B.

Residential and Commercial Structures in Floodplain – Structures and Contents Damage Estimate

USACE completed site surveys of the floodplain in 1997 and 2004 to estimate depreciated replacement value of structures in the floodplain. The structure values were based on information provided by Santa Barbara County's Clerk-Recorder Assessor Office and construction costs from Marshall & Swift. USACE structure and contents value estimates are summarized in Table 2. Residential content values are based on content to structure ratios for residential structures derived from the 1997 survey data. The survey estimated the residential content to structure value to be 64.3 percent. Commercial structure content values are based on either an expert panel that was conducted in Houma, Louisiana (1997) or data from the survey of commercial structures in the Lower Mission Creek Floodplain (1997).

Structure	**Structure**	**Depreciated Replacement Value**	
Type	Count	Structure	Contents
Comm	569	$323,524	$136,951
MFR	312	$84,252	$36,575
Public	35	$65,590	$85,216
SFR	225	$19,883	$12,785
Total	1141	$493,249	$271,527
Source: (U.S. Army Corps of Engineers, 2004), Tables E6 & E7. Dollar values updated to 2012 with the composite price index in the USACE Civil Works Construction Cost Indexes System (CWCCIS).			

Structure and content damages were estimated with HEC-FDA using the depth-damage curves summarized in Table 3 and Table 4.

Table 8-3 - Depth-Damage Curves for Residential and Non-Residential Structures

Depth		Non-Residential	
(ft)	Residential	Wood-Frame	Masonry
-1	3%	0%	0%
0	13%	1%	2%
0.5	19%	18%	12%
1	23%	18%	12%
1.5	28%	24%	17%
2	32%	27%	17%
3	40%	31%	22%
4	47%	37%	26%
5	53%	45%	29%
6	59%	45%	30%
7	63%	46%	30%
8	67%	48%	32%
9	71%	52%	42%
10	73%	52%	48%
Source: (U.S. Army Corps of Engineers, 2004), Table E10.			

Table 8-4 - Depth-Damage Curves for Residential and Non-Residential Contents

Depth		Non-Residential						
(ft)	Residential	Restaurant	Auto	Lodging	Office	Public	Retail	Warehouse
-1	2.4%	0%	0%	0%	0%	0%	0%	0%
-0.5	NA	0%	0%	0%	0%	0%	0%	0%
0	8.1%	0%	0%	0%	0%	0%	0%	0%
0.5	NA	18%	9%	8%	13%	36%	11%	8%
1	13.3%	24%	27%	15%	16%	65%	23%	12%
1.5	NA	45%	69%	18%	29%	65%	33%	16%
2	17.9%	48%	79%	22%	34%	65%	55%	20%
3	22.0%	77%	90%	38%	65%	90%	69%	27%
4	25.7%	91%	96%	43%	80%	100%	77%	31%
5	28.8%	94%	96%	45%	82%	100%	86%	39%
6	31.5%	97%	96%	45%	90%	100%	94%	46%
7	33.8%	97%	96%	45%	92%	100%	94%	53%
8	35.7%	97%	96%	45%	92%	100%	94%	61%
9	37.2%	97%	96%	45%	92%	100%	94%	68%
10	38.4%	97%	96%	53%	92%	100%	97%	73%
Source: (U.S. Army Corps of Engineers, 2004), Table E11 and Table E12.								

Estimated expected annual damage (EAD) to structures and contents for the without- and with-project conditions is summarized in Table 5. EAD estimates were calculated with HEC's Expected Annual Damage (EAD) model. The EAD estimates in Table 8-5 are scaled to estimate benefits for Reaches 1A-2 and 1B.

Road Damage Estimates

The USACE economic analysis did not calculate expected annual damages to roads for the without- and with project conditions. However, in past flood events – particularly in 1995 and 1998 – roads incurred extensive damage and cleanup costs due to flooding. DWR's F-RAM model was therefore used to estimate expected annual damages to roads for the without- and with-project conditions. F-RAM damage estimates are based on miles of inundated roads in Table 6. Linear miles of impacted roads were calculated in AutoCAD and GIS for the Lower Mission Creek floodplain without- and with-project. Separate estimates were developed for arterial, major, and minor roads, per F-RAM input requirements.

Table 8-6 - F-RAM Model Inputs: Roads

Hydrologic Event	10-Yr	25-Yr	50-Yr	100-Yr
Exceedance Probability	0.10	0.04	0.02	0.01
Impacted Roadways (miles)				
Arterial				
Without Project	0.00	0.76	1.66	2.27
With Project	0.00	0.22	0.66	2.00
Major				
Without Project	0.00	0.37	1.15	1.47
With Project	0.00	0.48	0.53	1.74
Minor				
Without Project	0.00	5.79	10.73	12.78
With Project	0.00	2.78	4.30	9.95

F-RAM expected annual damages to roads for the without- and with-project conditions are summarized in Table 8-7. The EAD estimates in Table 8-7 are scaled to estimate benefits for Reaches 1A-2 and 1B.

Table 8-7 - Present Value of Expected Annual Damage to Roads ('000 2012 Dollars)

EAD Without Project[1]	$8.4
EAD With Project[1]	$5.5
Annual Flood Damage Reduction Benefit	$2.9
Useful Life of Project[2]	75
Present Value Coefficient[3]	13.82
Present Value of Avoided Road Damages	$40.2

Notes

[1]Road damage EAD calculated with F-RAM model

[2]Default F-RAM useful life assumption for flood protection improvements.

[3] Present value in 2012 given 6% real discount rate and flood protection benefits commencing in 2016.

Source: F-RAM model. Dollar values updated to 2012 with the composite price index in the USACE Civil Works Construction Cost Indexes System (CWCCIS).

Emergency Response/Cleanup Costs

Emergency Response/cleanup costs include evacuation and re-occupation of the floodplain, flood fighting, disaster relief and increases in normal operations of police, fire, medical, governmental and industry activity. Clean-up costs include the costs of removing and disposing sediment that covered the streets, parking lots, and public property. USACE emergency response/cleanup cost estimates are based on data from City of Santa Barbara on costs incurred in the 1995 flood events. Estimated emergency response/cleanup costs by storm magnitude for the no-project condition are summarized in Table 8-8.

Table 8-8 - Emergency Response & Cleanup Costs by Storm Magnitude ('000 2012 Dollars)

Storm Magnitude	Emergency/Cleanup Cost
9-yr	$360
55-yr	$2,158
100-yr	$3,099
500-yr	$5,612

Source: (U.S. Army Corps of Engineers, 2004), Table E18. Dollar values updated to 2012 with the composite price index in the USACE Civil Works Construction Cost Indexes System (CWCCIS).

Estimated expected annual damage (EAD) of emergency response and cleanup for the without- and with-project conditions is summarized in Table 8-9. EAD estimates were calculated with HEC's Expected Annual Damage (EAD) model. The EAD estimates in Table 8-9 are scaled to estimate benefits for Reaches 1A-2 and 1B.

Table 8-9 - Present Value of Expected Annual Damage of Emergency Response and Cleanup ('000 2012 Dollars)

EAD Without Project	$29
EAD With Project	$12
Annual Flood Damage Reduction Benefit	$17.9
Useful Life of Project[1]	75
Present Value Coefficient[2]	13.82
Present Value of Avoided Emergency Response and Cleanup	$247.3

Notes

[1]Default F-RAM useful life assumption for flood protection improvements.

[2] Present value in 2012 given 6% real discount rate and flood protection benefits commencing in 2016.

Source: (U.S. Army Corps of Engineers, 2004), page 24. Dollar values updated to 2012 with the composite price index in the USACE Civil Works Construction Cost Indexes System (CWCCIS).

FEMA – Temporary Rental Assistance TRA Costs

FEMA provides grants to assist individuals and families to find suitable housing when they are displaced in cases of federally declared disasters. This assistance being directly attributable to the disaster and being an expenditure that would not be undertaken except for the disaster falls clearly under the emergency costs guidance of ER1105-2-100. Therefore, funds expended by FEMA for Temporary Rental Assistance (TRA) or Funds for Minor Emergency Home Repairs (FMEHR) in the event of flooding are NED flood damages. The average per claim expenditure by FEMA for TRA ranged from $583 to $2,034 with an overall average expenditure of $1,537 per claim. The standard deviation of the average per claim expenditures is $411. The USACE analysis assumed that TRA per claim expenditure is normally distributed with a mean of $1,537 and a standard deviation of $411. The mean of $1,537 was applied as other value to each residential structure (single family and multiple family residences) in the HEC-FDA model. The HEC-FDA calculated the TRA for the without project condition to be $23,255 (2012 dollars).

The project is expected to reduce TRA costs for residential structures in the floodplain. The average annual TRA damage amount occurring after implementation of the project is $18,117 (2012 dollars). The TRA net annual benefit is $5,138 (2012 dollars). Estimated expected annual damage (EAD) of TRA costs for the without- and with-project conditions is summarized in Table 8-10. The EAD estimates in Table 8-10 are scaled to estimate benefits for Reaches 1A-2 and 1B.

Table 8-10 - Present Value of Expected Annual Damage of FEMA TRA Costs ('000 2012 Dollars)

EAD Without Project	$3.9
EAD With Project	$3.0
Annual Flood Damage Reduction Benefit	$0.9
Useful Life of Project[1]	75
Present Value Coefficient[2]	13.82
Present Value of Avoided FEMA TRA Costs	$11.8

Notes

[1]Default F-RAM useful life assumption for flood protection improvements.

[2] Present value in 2012 given 6% real discount rate and flood protection benefits commencing in 2016.

Source: (U.S. Army Corps of Engineers, 2004), page 24. Dollar values updated to 2012 with the composite price index in the USACE Civil Works Construction Cost Indexes (CWCCIS).

Transportation Disruption Cost – With and Without the Projects

Flooding in the Lower Mission/Laguna Channel drainage area has impeded automobiles and the railroad traffic within the City of Santa Barbara. Even the threat of flooding and concern for public safety may make it necessary to detour traffic. USACE calculated transportation losses for the without- and with project conditions by calculating the additional operating cost by taking alternative routes and the traffic costs per passenger. The calculations of transportation losses are based upon the technical guidance of Institute of Water Resources Report 1-R-12, "Value of Time Saved for Use of Corps Planning Studies: Review of the Literature and Recommendations." Estimated damages by storm magnitude for the without- and with project conditions are summarized in Table 8-11. Estimated expected annual damage (EAD) of disruption to transportation for the without- and with-project conditions is summarized in Table 8-12. The EAD estimates in Table 8-12 are scaled to estimate benefits for Reaches 1A-2 and 1B.

Table 11 - Transportation Damages - ('000 2012 Dollars)

Storm Magnitude	25-yr	50-yr	100-yr	500-yr
Without Project				
Traffic Delay	$128	$243	$346	$2,042
Incremental Mileage	$42	$73	$88	$135
Railroad Losses	$0	$32	$32	$43
Total Without Project	$170	$349	$466	$2,220
With Project				
Traffic Delay	$87	$162	$296	$1,909
Incremental Mileage	$28	$50	$76	$126
Railroad Losses	$0	$32	$32	$43
Total With Project	$115	$245	$404	$2,078
Source: (U.S. Army Corps of Engineers, 2004), Table E20 and Table E28. Dollar values updated to 2012 with the composite price index in the USACE Civil Works Construction Cost Indexes System (CWCCIS).				

Flood Damage Reduction (Section D2)

Avoided Bank Stabilization Costs

The channel capacity of Lower Mission Creek depends on the stability of the creek banks. It is expected that erosion will threaten the creek's banks. The District is responsible for maintaining the creek's bank. USACE estimated the agency will spend an average of $56,250 (2012 dollars) per year to maintain the banks under the without-project condition. Bank stabilization would not be required under the with-project condition. Estimated avoided cost for bank stabilization is summarized in Table 3-13. Avoided cost estimates in Table 8-13 are scaled to estimate benefits for Reaches 1A-2 and 1B.

Table 8-13 - Present Value of Expected Annual Damage of Creek Bank Stabilization ('000 2012 Dollars)

EAD Without Project	$9.4
EAD With Project	$0.0
Annual Flood Damage Reduction Benefit	$9.4
Useful Life of Project[1]	75
Present Value Coefficient[2]	13.82
Present Value of Avoided Creek Bank Stabilization Costs	$130.1

Notes

[1]Default F-RAM useful life assumption for flood protection improvements.

[2] Present value in 2012 given 6% real discount rate and flood protection benefits commencing in 2016.

Source: (U.S. Army Corps of Engineers, 2004), page 16. Dollar values updated to 2012 with the composite price index in the USACE Civil Works Construction Cost Indexes System (CWCCIS).

Table 12 - Present Value of Expected Annual Damage of Transportation Disruption ('000 2012 Dollars)

EAD Without Project	$4.3
EAD With Project	$3.4
Annual Flood Damage Reduction Benefit	$0.9
Useful Life of Project[1]	75
Present Value Coefficient[2]	13.82
Present Value of Avoided Transportation Disruption Costs	$12.5

Notes

[1]Default F-RAM useful life assumption for flood protection improvements.

[2] Present value in 2012 given 6% real discount rate and flood protection benefits commencing in 2016.

Source: (U.S. Army Corps of Engineers, 2004), page 25. Dollar values updated to 2012 with the composite price index in the USACE Civil Works Construction Cost Indexes System (CWCCIS).

Avoided Flood Insurance Overhead Cost

The flood insurance costs that can be saved by alleviating a flood threat are the overhead and administrative cost of processing applications and operating the National Flood Insurance Program. Computer Sciences Corporation provided a list of all the FEMA policyholders within the Lower Mission Creek and Laguna Channel 100-year floodplain. The number of policies that are within the without project conditions 100-year floodplain is 237 policies. The project will reduce the size of the 100-year floodplain, causing the number of policies in the 100-year flood plan to be 174. By implementing the project, it expected that 63 policies (based on the entire 1.3 mile Reach) would not be needed. The overhead cost per policy is $218 per policy (2012 dollars). Annual avoided flood insurance overhead cost is summarized in Table 8-14. Avoided cost estimates in Table 8-14 are scaled to estimate benefits for Reaches 1A-2 and 1B.

Annual Benefit – Avoided Costs

The table below summarizes the annual benefits of the project.

Table 8-15 – Annual Benefit

(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)
Year	**Type of Benefit**	**Measure of Benefit (Units)**	**Without Project**	**With Project**	**Change Resulting from Project (e) – (d)**	**Unit $ Value (1)**	**Annual $ Value (1) (f) x (g)**	**Present Value Coefficient(1)**	**Present Value Benefit**
2016-2090	FEMA Insurance Overhead (1)	Insurance Policies	40	29	-11	($218)	$2,298	13.817	**$31,746**
2016-2090	Lower Mission Creek Riparian Habitat(2)	Acres	0.51	0.89	0.38	$4,235	$1,609	13.817	**$22,237**
Total Present Value of Discounted Benefits Based on Unit Value									**$53,983**

Comments: (1) Project would eliminate need for 63 FEMA policies. The prorated share of the reduction for Reaches 1A-2 and 1B is 11 policies. The overhead cost per policy is $218 per policy (2012 dollars). (2) Unit value of riparian habitat is the annualized cost of an acre of riparian mitigation credit from the Los Carneros Mitigation Bank. Mitigation credit cost is annualized at 6% over 75-year useful life of project. Present value coefficient based on 6% discount rate, 75-year useful life, and project benefits commencing in 2016.

Monetized Benefits Analysis (Section D3)

Riparian Habitat

In addition to the flood damage reduction benefits, the project will add 0.38 acres of riparian habitat to the watersheds of Lower Mission Creek. The riparian acreage is valued at $69,696/acre, which is the cost of an acre of riparian habitat credit at the nearby Los Carneros Mitigation Bank. Given a 6% project discount rate and 75-year project life, the annualized value per acre is $4,235. The present value benefit over the 75-year project life with benefits commencing in 2016 is $22,237.

Project Benefits and Costs Summary (Section D4)

The present value of project benefits for Reaches 1A-2 and 1B is summarized in Table 8-16.

Table 8-16 - Present Value of Project Benefits[1] ('000 2012 Dollars)

Avoided Damages	
Residential and Commercial Structures and Contents	$7,762.1
Roads	$40.2
Emergency Response/Cleanup	$247.3
FEMA Temporary Rental Assistance	$11.8
Transportation Disruption	$12.5
Subtotal Avoided Damages	**$8,073.9**
Additional Annual Benefits	
Avoided Creek Bank Stabilization Costs	$130.1
Avoided Flood Insurance Overhead	$31.9
Riparian habitat	$22.2
Subtotal Additional Annual Benefits	**$184.2**
Grand Total Benefits	**$8,258.1**

Notes

[1] Present value in 2012 given 6% real discount rate, 75 year useful project life, and flood protection benefits commencing in 2016.

Project Benefit Cost Ratio

The present value of project economic costs and benefits and the project benefit-cost ratio are summarized Table 8-17.

Table 8-17 - Present Value of Project Costs and Project Benefit-Cost Ratio ('000 2012 Dollars)

Capital Costs	**Reach 1A-2/1B**	**Other**	**Sunk**			
	Budgeted	Opportunity	Project	Economic	Discount	Present Value
Year	Cost[1]	Costs	Costs	Cost	Factor	Cost
2012	$1,504	$0	-$1,504	$0	1.000	$0
2013	$7,722	$0	$0	$7,722	0.943	$7,282
2014	$3,923	$0	$0	$3,923	0.890	$3,491
2015	$723	$0	0	$723	0.840	$607
Total	$13,872	$0	-$1,504	$12,368		$11,380
O&M Costs						
Annual O&M						$3
Present Value Coefficient[2]						13.82
Present Value of Future O&M Costs						$41
Benefit-Cost Ratio						
Present Value Economic Cost (Capital & O&M)						$11,421
Present Value Project Benefits						$8,258
Benefit-Cost Ratio						0.72

Notes

[1]From Attachment 8 Data Request.

[3]Present value in 2012 given 6% real discount rate, 75 year useful project life, and O&M costs commencing beginning of 2016.

Non-Monetized Benefits

The table below presents a summary of all the non-monetized benefits the project provides.

No.	Question	Enter "Yes", "No" or "Neg"
	Community/Social Benefits	
	Will the proposal	
1	**Provide education or technology benefits?**	No
	Examples are not limited to, but may include:	
	- Include educational features that should result in water supply, water quality, or flood damage reduction benefits?	
	- Develop, test or document a new technology for water supply, water quality, or flood damage reduction management?	
	- Provide some other education or technological benefit?	
2	**Provide social recreation or access benefits?**	Yes
	Examples are not limited to, but may include:	The projects provide 4,000 square feet of expanded habitat zones
	- Provide new or improved outdoor recreation opportunities?	
	- Provide more access to open space?	
	- Provide some other recreation or public access benefit?	
3	**Help avoid, reduce or resolve various public water resources conflicts?**	Yes
	Examples are not limited to, but may include:	The projects are found in Santa Barbara County Floodplain Management Task Force recommendation and the projects are the outcome of 20 years of collaborative planning with the City of Santa Barbara and the USACE
	- Provide more opportunities for public involvement in water management?	
	- Help avoid or resolve an existing conflict as evidenced by recurring fines or litigation?	
	- Help meet an existing state mandate (e.g., water quality, water conservation, flood control)?	
4	**Promote social health and safety?**	Yes
	Examples are not limited to, but may include:	The projects directly remove 11 parcels from the floodplain and they increase the conveyance capacity from a 5-year event to a 20-year events, which equates to a 125% increase in conveyance
	- Increase urban water supply reliability for fire-fighting and critical services following seismic events?	
	- Reduce risk to life from dam failure or flooding?	
	- Reduce exposure to water-related hazards?	

No.	Question	Enter "Yes", "No" or "Neg"
5	**Have other social benefits?**	No
	Examples are not limited to, but may include:	
	- Redress or increase inequitable distribution of environmental burdens?	
	- Have disproportionate beneficial or adverse effects on disadvantaged communities, Native Americans, or other distinct cultural groups?	
	Environmental Stewardship Benefits:	
	Will the proposal	
6	**Benefit wildlife or habitat in ways that were not quantified in Attachment 7?**	Yes
	Examples are not limited to, but may include:	The widening of the channel provides for a 10,000 sq. ft. increase fish habitat and 4,000 sq. ft. of riparian and extened native vegetation zones
	- Cause an increase in the amount or quality of terrestrial, aquatic, riparian or wetland habitat?	
	- Contribute to an existing biological opinion or recovery plan for a listed special status species?	
	- Preserve or restore designated critical habitat of a listed species?	
	- Enhance wildlife protection or habitat?	
7	**Improve water quality in ways that were not quantified in Attachment 7?**	No
	Examples are not limited to, but may include:	
	- Cause an improvement in water quality in an impaired water body or sensitive habitat?	
	- Prevent water quality degradation?	
	- Cause some other improvement in water quality?	
8	**Reduce net emissions in ways that were not quantified in Attachment 7?**	No
	Examples are not limited to, but may include:	
	- Reduce net production of greenhouse gasses?	
	- Reduce net emissions of other harmful chemicals into the air or water?	
9	**Provide other environmental stewardship benefits, other than those claimed in Sections D1, D3 or D4?**	No
	Sustainability Benefits:	
	Will the proposal	
10	**Improve the overall, long-term management of California groundwater resources?**	No
	Examples are not limited to, but may include:	
	- Reduce extraction of non-renewable groundwater?	
	- Promote aquifer storage or recharge?	
11	**Reduce demand for net diversions for the regions from the Delta?**	No
12	**Provide a long-term solution in place of a short-term one?**	Yes
	Examples are not limited to, but may include:	The project increases the conveyance capacity by 125%, which is a long-term solution.
	- Replace a temporary water supply with a more permanent supply?	
	- Replace a temporary water quality solution with a more permanent solution?	
	- Replace temporary flood control management with a more permanent solution?	
	- Replace temporary habitat with a more permanent solution?	
13	**Reduce water consumption on a permanent basis?**	No
14	**Promote energy savings or replace fossil fuel based energy sources with**	No

No.	Question	Enter "Yes", "No" or "Neg"
	renewable energy and resources?	
	Examples are not limited to, but may include:	
	- Reduce net energy use on a permanent basis?	
	- Increase renewable energy production?	
	- Include new buildings or modify buildings to include certified LEED features?	
	- Provide a net increase in recycling or reuse of materials?	
	- Replace unsustainable land or water management practices with recognized sustainable practices?	
15	**Improve water supply reliability in ways not quantified in Attachment 7?**	No
	Examples are not limited to, but may include:	
	- Provide a more flexible mix of water sources?	
	- Reduce likelihood of catastrophic supply outages?	
	- Reduce supply uncertainty?	
	- Reduce supply variability?	
16	**Other (If the above listed categories do not apply, provide non-monetized benefit description)?**	No

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