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Technical Memorandum

Knights Landing Flood Risk Reduction Feasibility Study

Small Communities Flood Risk Reduction Program

Financial Feasibility *July 8, 2019*

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Purpose

This memorandum has been prepared by Larsen Wurzel & Associates, Inc. (LWA) in support of the Knights Landing Flood Risk Reduction Feasibility Study under the Department of Water Resources (DWR) Small Communities Flood Risk Reduction Program (SCFRRP). LWA expects that the conclusions presented within this memorandum will be utilized to help screen and rank alternatives based on criteria established for the local community.

Following identification of preferred alternative(s), this memorandum and the supporting analysis will inform a conceptual finance plan. The conceptual finance plan will be developed in a separate technical memorandum.

Approach

The primary approach for analyzing financial feasibility starts with the assumption that the local funding required for a flood-risk reduction project will be raised through a property-based special benefit assessment. As a result, the requirements associated with imposing a benefit assessment would apply. These requirements, primarily those associated with Proposition 218 are discussed further below.

The next assumption is that the local beneficiaries would be solely responsible for long term ongoing operations and maintenance (O&M) of any improvements. Therefore, locally generated annual revenue would first be utilized to pay for the on-going O&M of the project and then, any remaining annual revenue could be allocated toward the local share of the capital cost either on a pay-go basis or to service debt.

Given the constraints inherent with the assumptions outlined above, LWA's analysis starts by determining the proportionality of assessment revenue with the following approaches to gauge the feasibility study:

1) Estimate the assessment rates required to generate, on an aggregate basis, $100,000 of annual revenue and review the resulting rates with a lens toward determining whether any particular land use resulting assessment rate exceeds a level that would otherwise preclude approval of the assessment;
2) Establish the O&M funding requirements based on project team input and determine whether there is sufficient revenue to fund adequate maintenance levels;

3) Estimate the maximum amount of annual revenue that could be generated from benefiting properties in the local community given the special benefit proportionality requirements of Proposition 218 and an assumed feasible maximum single-family residence assessment rate developed by the project team.
4) Screen and rank alternatives based on criteria established by the project team.

This information will be utilized during the alternatives development and evaluation phase to determine the capacity of the local community to fund annual operations and maintenance and cost share in the implementation of the proposed alternative.

Funding Source Memorandum provides a summary of the local funding methods used by agencies in California to fund flood management improvements and services. The table describes the general uses of the funding source and the attributes and applicability of the mechanism for flood management. In addition to these sources, local agencies supplement funding for flood work through enterprise revenues related to storm water management and general fund revenues. For purposes of this memo it was assumed a land-based assessment was the most appropriate approach to generate local matching funds.

Methodology

Special benefit assessments for flood control projects have historically utilized the following parcel attributes to apportion benefit:

- Land use;
- Parcel size;
- Parcel improvements;
    - Permanent Crop Type; and/or
    - Structure type and size; and
- Relative Damage

Proposition 218 requires first; that parcels only be assessed for the special benefits received by the service; meaning that any and all general benefits provided by the service and available to the public at large be excluded from the assessment, and second; that a property only be assessed for its proportionate share of the special benefits received. Given this, once the benefit of all special benefits received by all of parcels has been quantified, each individual parcel would be assessed based on its proportionate share of the total special benefits.

Benefit Area

LWA was provided preliminary benefit areas for alternatives evaluated in the feasibility study by the project team. **Figure 1** shows the alternatives and associated benefit area considered in this evaluation. All parcels within this benefit area were identified[1] and utilized in the analysis.

[1] Where only a portion of a parcel was included in a benefit area, a percentage of the parcel within the benefit area was used to determine the benefit received by the parcel.

Land Use

Land uses for properties within the benefit area were compiled from Yolo County Assessor's data obtained from ParcelQuest. Each land use code was evaluated and assigned to a generalized Land Use Category (e.g.: Agricultural, Single-Family Residential, Commercial, etc.) for the purpose of identifying characteristics of each category for use in apportioning special benefit. A table presenting the County's use type code and the associated land use category is included as Table 5.

Parcel Size

The Yolo County Assessor's data obtained from ParcelQuest included the acreage of each parcel. This data was reviewed for completeness. Where data was missing, the parcel size was estimated using parcel GIS data obtained from the County. For this feasibility level analysis, no effort was made to verify the accuracy of this GIS data.

Structure Type and Size

The Yolo County Assessor's data obtained from ParcelQuest also included structure size data. Structures on a parcel were evaluated as if consistent with the Land Use Category assigned to the property. For example, all structures on a parcel with Commercial land use category were evaluated as a Commercial structure type. For each alternative the respective **Table 9** provides a summary of the total structural acreage, structure size, and the average structure size per acre for each land use category.

Relative Damage Rate

The special benefit received from flood control projects is assumed to be proportional to the amount of flood damage avoided by implementing the project and/or performing O&M services. For the purpose of this analysis, a simplified approach has been used to quantify the flood damages avoided for each Land Use Category.

Composite structure depth-damage values were prepared for each Land Use Category based on the US Army Corps of Engineers Flood Damage Analysis program. The composite damage values consider the structure replacement value, the contents-to-structure ratio and the percent damage to the structure and contents for a given flood depth. The flood depth for each parcel used for this analysis was provided to LWA.

Agricultural land use was assigned a crop damage value of $300/acre based on data provided in the 2010 Central Valley Flood Protection Plan, Attachment 8F – Flood Damage Analysis.

Vacant land use was assigned a damage value of $100/acre to reflect minor damage to infrastructure and/or damage from site erosion.

For each alternative the respective **Table 10** provides the structure replacement value, the contents-to-structure ratio and the composite damage value for each Land Use Category across a range of flood depths.

The average damage per acre for each Land use Category was calculated using the following formula:

$$\begin{bmatrix} Average \\ Damage \\ per\ Acre \end{bmatrix} = \begin{bmatrix} Composite \\ Damage\ Value \\ (Table\ 2) \end{bmatrix} \times \begin{bmatrix} Average \\ SF\ per\ Acre \\ (Table\ 1) \end{bmatrix}$$

A Relative Damage Factor was calculated by normalizing the average damage per acre to the Agricultural Land Use (i.e., Agricultural = 1.0). For each alternative each respective **Table 11** summarizes the derivation of the Relative Damage Factor for each Land Use Category.

Assessment Rate

The special benefit for each parcel was determine by calculating the amount of Equivalent Benefit Units (EBU) using the following formula:

$$EBU = \begin{bmatrix} Parcel \\ Acreage \end{bmatrix} \times \begin{bmatrix} Relative \\ Damage\ Factor \\ (Table\ 3) \end{bmatrix}_{\substack{Based\ on \\ Land\ Use \\ Category}}$$

The Assessment Rate is equal to the amount of revenue required divided by the sum of EBUs from all benefitting parcels.

The assessment for a particular parcel is equal to the quantity of EBUs for that parcel multiplied by the resulting Assessment Rate per EBU. For each alternative each respective **Table 12** summarizes the EBU calculations.

In order to generate an estimated range of maximum revenue, the respective **Table 13** summarizes the aggregate assessment amount, the average assessment per parcel, and the average assessment per acre for each alternative.

Financial Feasibility Constraints

Demonstrating Federal Interest

The United States Army Corp of Engineers' (USACE) planning process has a defined approach to determine flood risk reduction benefits. The USACE analysis is based on the value of damageable property and the projected reduction in flood damages once flood risk reduction measures are implemented. Less densely populated areas with agricultural land produce lower benefits than densely populated areas. This makes demonstrating a federal interest in small communities in agricultural areas very difficult.

Securing federal funding for flood risk reduction projects will continue to become more competitive. In the past, funding for authorized projects has relied heavily on prioritizing appropriations based on a project's Benefit to Cost Ratio (BCR). This approach limits federal investments to areas that can achieve a very robust BCR and generally these projects would be in urban areas where significant benefits exist. In FY 2019 budget requests, the current administration requires ongoing flood management projects to generally have a BCR greater than 2.5. While the BCR's for projects vary each year, the competition for limited federal funding also increases as authorizations continue to outpace appropriations.

Limited Availability of Federal Funding

The USACE has historically been a major financial contributor in the development of flood risk reduction infrastructures in California. The USACE is faced with more demands for building and maintaining its projects than available federal funding allows (Carter, 2018). It is estimated the USACE has a backlog of authorized projects higher

than $96 billion. Annual appropriations for construction funding in FY 2018 and FY 2019 were $2.1 billion and $2.2 respectively, or just over 2% of the total backlog of authorized projects. However, some of the backlogged appropriations are related to projects that are unlikely to be constructed, as throughout the nation they are not competitive when compared against other projects.

There are multiple factors contributing to the growth of the USACE's backlog; Authorizations have outpaced appropriations, aging infrastructures require more significant financial investments, and construction related costs continue to escalate.

Limited Availability State Funds/Time Constraints

Following the passage of Federal Water Resources Development Act 1986, non-federal interests were required to share more of the financial and management burdens (DWR, 2016). These new requirements, coupled with the more stringent environmental regulations, resulted in further reduction in the federal share of spending for flood and water management projects. With the reduction in federal authorizations and the more stringent conditions on State and local financing of flood management projects, the State turned to general obligation (GO) bonds.

In 2006, the State passed water management bond propositions 84 and 1E. The Disaster Preparedness and Flood Protection Bond Act of 2006 (Proposition 1E) authorized $4.09 billion in general obligation bonds to rebuild and repair California's most vulnerable flood control structures to protect homes and prevent loss of life from flood-related disasters, including levee failures, flash floods, and mudslides and to protect California's drinking water supply system by rebuilding delta levees that are vulnerable to earthquakes and storms. Proposition 84 enhances these efforts with an additional $800 million for flood projects. Proposition 1 was passed on November 4, 2014 and included $395 million for flood projects. Proposition 68 was passed on June 5, 2018 and included $550 million for flood projects.

Proposition 1E funds have been allocated to conduct a Feasibility Study investigation that is consistent with DWR's SCFRR Program Guidelines (2016) and supports the (2012 and 2017) Central Valley Flood Protection Plan goals of promoting flood risk management actions to reduce flood risk to people and property protected by the State Plan of Flood Control facilities. The Project objectives include assessing community's existing flood hazards, evaluating structural, non-structural and multi-benefit projects, and making recommendations to implement a flood risk protection project that integrates other resources' needs, as much as feasible.

Limited Local Funding Sources/Proposition 218 Assessments

Funding local infrastructure and services, including flood and water management projects became more difficult when voters in California passed Proposition 13 in 1978, Proposition 62 in 1986, and Proposition 218 in 1996. Proposition 13 limited ad valorem taxes on California properties. The proposition limited the amount of tax that could be collected based on the assessed value of private property, including real estate, to 1 percent of the assessed value of the property. Proposition 13 also decreased the assessed value of the properties to 1975 values (negating three years of increased value), and limited increases of assessed value to 2 percent per year. Property that is sold or declines in value after an initial purchase may be reassessed. The enactment of Proposition 13 cut local property tax revenue significantly, causing cities and counties to raise user fees and other local taxes. In

response, voters approved Proposition 62, the Voter Approval of Taxes Act, in 1986. This proposition required that new general taxes be approved by two-thirds of the local agency's governing body and a majority of voters, and new special taxes be approved by a two-thirds majority of voters. This led local agencies and communities to use assessments and property-related fees (among other fees) to pay for government services. Proposition 218 was passed by voters in 1996 and added requirements and limits on local governments' ability to impose or increase assessments and fees.

Proposition 26, which was passed in 2010, redefined many existing fees as taxes. The impacts of institutional and legal constraints associated with raising local funding for flood infrastructure and services is described in greater detail in a 2014 Public Policy Institute of California's report ("Paying for Water in California," 2014). Constraints from Proposition 218 and 13 have been thoroughly documented by the State and also highlighted as a major challenge in DWR's January 2005 White Paper, "Responding to California's Flood Crisis."

Tax Rate and Infrastructure Burden Considerations

In order to consider an area's ability to generate additional taxes and assessment, the uses of taxing capacity for all infrastructure and services should be considered. The California Debt and Investment Advisory Commission (CDIAC) promulgates guidelines with respect to land secured financing, including the use of assessments and Mello-Roos. CDIAC's Mello-Roos Guidelines (1991) suggest that jurisdictions should integrate Mello-Roos financing into the land use regulatory framework. Local governments can create a process for coordinating the use of land secured financing through the provision of this form of integration. The main concern is that in the absence of coordinated planning, taxpayers could find themselves vulnerable to onerous overlapping tax burdens imposed by a multitude of local governments that may provide services to the same group of tax payers. This issue is analogous to the current ongoing efforts associated with planning for the future of flood management infrastructure, to the extent that there are a multitude of planning efforts, all developing concurrent funding and financing strategies. These efforts should be coordinated to ensure that there is sufficient funding capacity available from the identified beneficiaries.

Assessment Considerations

Federally backed home loans on property mapped into a 100-year flood zone require mandatory flood insurance. Alternatives that present property owners with an economic incentive to pass a land-based assessment are preferable. For example, a property owner would be more likely to support a land-based property assessment for a project that would alleviate the need to pay for mandatory flood insurance or reduce the cost of their flood insurance policy. Yolo County estimates Knights Landing has 194 flood insurance policies in place. The average cost of National Flood Insurance Program (NFIP) flood insurance in Unincorporated Yolo County is approximately $940 per policy annually (FEMA, Sept 2018). A NFIP preferred premium flood insurance policy is currently $400 annually. Alternatives that achieve a minimum 100-year level of protection for Knights Landing and reduce, or eliminate, the cost of NFIP flood insurance are preferred.

Alternative Analysis Screening Constraints

The capacity of the local community to generate funds for O&M and capital improvements is assumed to be limited by the assessment rate that would be imposed on residential properties and agricultural land. For this study, it is

assumed that the maximum annual assessment acceptable to residential property owners is $200 per single family residence and a maximum annual assessment rate of $25 per acre for agricultural land. In addition to setting a maximum parcel assessment rate, a minimum O&M cost of $15,000 per mile of levee for levees protecting the small community was set by the Knights Landing Feasibility Study team. This cost was based on the need for the levees to be maintained to meet a minimum 100-year level of protection over time. No minimum O&M cost per levee mile was established for improvements protecting predominately agricultural areas. Using this limitation, **Table 13** summarizes an estimated range of the maximum revenue that might be generated.

Alternative Analysis Screening Process

The final alternatives were screened and ranked based on an overall analysis of the community's ability to generate local matching funds as a percent of the total project cost. The ability to pay analysis was a three-step screening process. First, a maximum annual land-based assessment was calculated using a rate analysis for the benefited area(s). Second, alternatives that protected a small community that did not raise sufficient annual funding to pay for long term O&M were eliminated. Alternatives that only protected agriculture areas were not screen out due to a lack of O&M funding. Finally, the remaining alternatives were ranked based on the ability to raise local capital to protect Knights Landing with remaining assessment capacity. Alternatives that had higher local match percentages, protected Knights Landing, and raised capital for agricultural areas to improve O&M or advance levee improvement projects, were ranked higher.

Alternative Screening Results and Ranking

The existing levee system is maintained by the KLDD, CSA 6, and DWR. Both KLDD and CSA 6 have existing local funding sources to O&M portions of the levee system. DWR on the other hand, raises funds through California Water Code 12878, et seq. The required O&M funds for alternatives maintained by KLDD and CSA 6 were discounted based on an approximation of their existing funding sources for O&M. The levee O&M cost for the KLDD assessment district is approximately $6,000 per levee mile. In comparison, Yolo County has an existing ad valorem tax of approximately $6,500 per levee mile for O&M. It was assumed current DWR funding is similar to as Yolo County, or about $6,500 per levee mile for O&M. New cross levee segments were assumed to require $15,000 per mile for O&M. It was assumed O&M funding would be required for the entire perimeter of ring levees. However, additional O&M funding was limited to the geographic extent of proposed improvements outside of ring levee systems.

The ability to raise capital was determined by deducting the additional cost to fund O&M from the annual assessment to estimate the remaining assessment capacity. The remaining assessment capacity was used to estimate the amount of bond proceeds, or local capital, that could be generated over a range of debt interest rates. A debt service coverage ratio of 1.1 was assumed to be required on debt underwritten by a land-based assessment. The local capital would be available to match non-local funds to construct alternatives.

The results of the financial feasibility analysis are shown in **Tables 1 – 4. Table 1** shows the proposed, current, and increased cost per mile to O&M levees maintained by KLRDD, CSA #6, DWR and for new cross levees. **Table 2** provides a summary of the length of levee for each alternative and calculates the increased O&M. **Table 3** compares

the maximum assessment to determine if sufficient funding is available to fund O&M of the newly constructed alternatives. Alternative 11 was screened out as the cost to O&M the levees exceeded the maximum annual assessment. Alternatives 1, 3, 6, 12 and 13 were carried forward into the next stage of the analysis and the remaining assessment capacity was determined for these alternatives. **Table 4** shows the estimate of remaining assessment capacity for Alternatives 1, 3, 6, 12 and 13 as well as a range of local capital that could be raised based on varying debt interest rates from 3 percent to 7 percent. A range of local capital capacity was developed and compared to the estimated alternative cost to determine the percent of local matching funds available for each alternative. The alternatives are ranked in **Table 4** based on the percent of the project that could be paid with local capital. Alternatives that protect Knights Landing and raise additional funding to increase O&M activities and provide matching funds for agricultural areas were ranked higher.

Table 1
Knights Landing -Financial Feasibility Analysis
Increased Operations and Maintenance Costs per Levee Mile

O&M Costs	KLRDD	CSA #6	DWR [4]	Cross Levee
Proposed ($/mi.) [1] [A]	$15,000	$15,000	$15,000	$15,000
Current ($/mi.) [2] [B]	$6,000	$6,500	$6,500	$0
Increased ($/mi.) [3] [C]= [A] - [B]	$9,000	$8,500	$8,500	$15,000

Notes:

[1] Proposed cost developed by Feasibility Study Team based on budgets developed by MBK.
[2] Current Costs estimated using existing financial data from KLDD and CSA #6. Analysis assumes State is the same as CSA #6.
[3] Increased cost required to meet $15,000 per mile. All Cross Levees assumed to require full O&M funding.
[4] Additional information on actual O&M costs and benefit zones were requested, but were not received. For purposes of this feasibility level analysis, it was assumed Yolo County and DWR have the same current assessment rates.

Table 2
Knights Landing -Financial Feasibility Analysis
Operations and Maintenance Alternative Screening Analysis

Alt. [1]	KLRDD (mi.)	CSA #6 (mi.)	DWR (mi.)	Cross Levee (mi.)	Total (mi.)	Increased O&M Cost ($) [4]
1	1.7	0.7		1.9	4.30	$49,750
3	1.7	0.9		1.3	3.90	$42,450
6-KL	3.6	4.6		0.4	8.60	$77,500
6-Ag	3.1	1.3	2.6		7.00	$0
11	6.7	6	2.6		15.30	$133,400
12-KL	1.7	0.9		1.3	3.90	$42,450
12-Ag	5.0	5.1	2.6		12.70	$0
13-KL	1.7	0.7		1.9	4.30	$49,750
13-Ag	5.0	5.3	2.6		12.90	$0

Notes:
[1] KL denotes projects with benefit areas that protect all of Knights Landing. Ag denotes
[2] Maximum Single Family Assessment assumed to be $200/parcel.
[3] Maximum Agricultural Assessment assumed to be $25/acre.
[4] Increased O&M cost developed by multiplying the levee mile lengths by the marginal cost increase in Table 1.
[5] Remaining Assessment Capacity is the difference between the Max. Assessment and the Increased O&M Cost.

Table 3
Knights Landing -Financial Feasibility Analysis
Increased Operations and Maintenance Costs per Alternative

Alt. [1]	Maximum Assessment ($) [1,2]	Remaining Assessment Capacity [3]	Screening Result
1	$109,000	$59,250	Pass
3	$111,000	$68,550	Pass
6-KL	$114,000	$36,500	Pass
6-Ag	$42,000	$42,000	
11	$112,000	($21,400)	Fail
12-KL	$111,000	$68,550	Pass
12-Ag	$78,000	$78,000	
13-KL	$111,000	$61,250	Pass
13-Ag	$45,000		

[1] Maximum Single Family Assessment assumed to be $200/parcel.
[2] Maximum Agricultural Assessment assumed to be $25/acre.
[3] Remaining Assessment Capacity is the difference between the Max. Assessment and the Increased O&M Cost.

Table 4
Knights Landing -Financial Feasibility Analysis
Local Funding Analysis

Alt. [1]	Remaining Assessment Capacity $ [Table 3]	Low Int. Rate Millions $ [2,3,5]	High Int. Rate Millions $ [2,4,5]	Project Cost Millions $	Local Range High %	Local Range Low %	Non-Local Range High %	Non-Local Range Low %	Fund Capacity Ranking
1	$59,250	$1.06	$0.67	$61.4	1.7%	1.1%	98.9%	98.3%	4
3	$68,550	$1.22	$0.77	$60.1	2.0%	1.3%	98.7%	98.0%	2
6-KL	$36,500	$0.65	$0.41	$113.6	0.6%	0.4%	99.6%	99.4%	5
6-Ag	$42,000	$0.75	$0.47	$5.9					
12-KL	$68,550	$1.22	$0.77	$60.1	2.0%	1.3%	98.7%	98.0%	1
12-Ag	$78,000	$1.39	$0.88	$11.9	11.7%	7.4%	92.6%	88.3%	
13-KL	$61,250	$1.09	$0.69	$61.4	1.8%	1.1%	98.9%	98.2%	3
13-Ag	$0	$0.00	$0.00	$11.9	0.0%	0.0%	100.0%	100.0%	

Notes:
[1] For Two Benefit Zone Alternatives KL denotes improvements protect Knights landing and Ag denotes improvements
[2] Assumes 1.1 Debt Coverage Ratio
[3] Low interest rate for debt issuance assumed to be 3%
[4] High interest rate for debt issuance assumed to be 5%
[5] Term for bond repayment assumed to be 30 years.

Table 5
Knights Landing Small Communities Flood Risk Reduction
Zoning and Land use Code

Use Code		Land Use Type
10	Residential, Single Family	Residential Single
12	Residential, Multi-Family	Residential Multi
13	Residential, Multi-Family	Residential Multi
15	Residential, Single Family	Residential Single
17	Residential, Single Family	Residential Single
20	Residential, Multi-Family	Residential Multi
21	Residential, Multi-Family	Residential Multi
31	Residential, Multi-Family	Residential Multi
32	Residential, Multi-Family	Residential Multi
33	Residential, Multi-Family	Residential Multi
80	Private Recreational (Open Space)	Vacant
110	Commercial	Commercial
119	Commercial	Commercial
140	Commercial	Commercial
142	Commercial	Commercial
160	Residential, Multi-Family	Residential Multi
162	Residential, Multi-Family	Residential Multi
165	Residential, Multi-Family	Residential Multi
170	Office	Commercial
180	Office	Commercial
212	Commericial	Commercial
214	Commercial	Commercial
219	Commercial	Commercial
223	Private Recreational (Developed)	Commercial
250	Commercial	Commercial
251	Commercial	Commercial
280	Commercial	Commercial
290	Commercial	Commercial
310	Industrial	Industrial
320	Industrial	Industrial
323	Industrial	Industrial

Use Code		Land Use Type
421	Orchards/Vineyards	Agricultural
440	Cultivated Agricultural Lands	Agricultural
441	Cultivated Agricultural Lands	Agricultural
490	Rural Residential	Rural Residential
491	Rural Residential	Rural Residential
494	Rural Residential	Rural Residential
503	Water	Floodway
612	Private Recreational (Open Space)	Vacant
619	Private Recreational (Developed)	Commercial
640	Private Recreational (Developed)	Commercial
710	Public/Qusai-Public	Commercial
719	Public/Qusai-Public	Commercial
800	Vacant	Vacant
801	Vacant	Residential Single
803	Vacant	Residential Single
804	Vacant	Commercial
805	Vacant	Commercial
806	Vacant	Vacant
808	Vacant	Vacant
809	Vacant	Vacant
830	Roads	Vacant
831	Roads	Vacant
925	County Government Miscellaneous	Vacant
963	Water	Floodway
999	N/A [1]	N/A
230-130	Miscellaneous Agricultural [2]	Agricultural

[1]Land use School was coded into the "Model" tab that fell under Miscellaneous Land Uses
[2]Land Use code from Sutter County

Table 6
Knights Landing Small Communities Flood Risk Reduction
Structure Damage Value

Structure Land Use		Replacement Value	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Agricultural	**[1]**	300	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Commercial	**[2]**	85.56	7.00%	21.70%	30.20%	31.20%	32.40%	32.40%	39.80%	42.80%	51.70%	53.10%	54.10%	61.80%	64.80%	64.80%	65.50%	86.10%
School	**[3]**	144.46	7.00%	21.70%	30.20%	31.20%	32.40%	32.40%	39.80%	42.80%	51.70%	53.10%	54.10%	61.80%	64.80%	64.80%	65.50%	86.10%
Industrial	**[4]**	54.51	7.00%	21.70%	30.20%	31.20%	32.40%	32.40%	39.80%	42.80%	51.70%	53.10%	54.10%	61.80%	64.80%	64.80%	65.50%	86.10%
Residential Multi	**[5]**	84.4	13.40%	23.30%	32.10%	40.10%	47.10%	53.20%	58.60%	63.20%	67.20%	70.50%	73.20%	75.40%	77.20%	78.50%	79.50%	80.20%
Rural Residential	**[6]**	111.67	13.40%	23.30%	32.10%	40.10%	47.10%	53.20%	58.60%	63.20%	67.20%	70.50%	73.20%	75.40%	77.20%	78.50%	79.50%	80.20%
Residential Single	**[7]**	111.67	13.40%	23.30%	32.10%	40.10%	47.10%	53.20%	58.60%	63.20%	67.20%	70.50%	73.20%	75.40%	77.20%	78.50%	79.50%	80.20%
Floodway	**[8]**	0	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Vacant	**[9]**	100	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Reference Table C-1 2012 CVFPP HEC-FDA Structure and Damage Functions - CVFPP Attachment 8F Flood Damage Analysis

[1] Assumed Crop damage per acre

[2] Source: Table B-9 - Good Status for Commercial Retail

[3] Source: Table B-29 Good Status for Public and Private Schools

[4] Source: Table B-21 - Good Status for Industrial Light

[5] Source: Table B-26 - Good Status Construction Class and Quality for Multi-Family Residential

[6] Source: Table B-33 - Good Status for Single Family Residential

[7] Source: Table B-33 - Good Status for Single Family Residential

[8] Assumed damage per acre

[9] Assumed damage per acre

Table 7
Knights Landing Small Communities Flood Risk Reduction
Contents Damage Value

Land Use	Contents Damage Ratio	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Agricultural	100%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Commercial	51%	0.00%	79.80%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
School	38%	0.00%	87.80%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Industrial	31%	0.20%	87.60%	96.40%	99.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Residential Multi	50%	8.10%	13.30%	17.90%	22.00%	25.70%	28.80%	31.50%	33.80%	35.70%	37.20%	38.40%	39.20%	39.70%	40.00%	40.00%	40.00%
Rural Residential	50%	8.10%	13.30%	17.90%	22.00%	25.70%	28.80%	31.50%	33.80%	35.70%	37.20%	38.40%	39.20%	39.70%	40.00%	40.00%	40.00%
Residential Single	50%	8.10%	13.30%	17.90%	22.00%	25.70%	28.80%	31.50%	33.80%	35.70%	37.20%	38.40%	39.20%	39.70%	40.00%	40.00%	40.00%
Floodway	0%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Vacant	0%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Reference Table C-1 2012 CVFPP HEC-FDA Structure and Damage Functions - CVFPP Attachment 8F Flood Damage Analysis

Reference Table 3-10 Contents to Structure Ratio - 2012 CVFPP Attachment 8F Flood Damage Analysis

Table 8
Knights Landing Small Communities Flood Risk Reduction
Structure and Contents Value

Land Use		Replacement Value	Contents Damage Ratio	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Agricultural	**[1]**	300	100%	0.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00
Commercial	**[2]**	85.56	51%	5.99	53.39	69.47	70.33	71.36	71.36	77.69	80.26	87.87	89.07	89.92	96.51	99.08	99.08	99.68	117.30
School	**[3]**	144.46	38%	10.11	79.55	98.52	99.97	101.70	101.70	112.39	116.72	129.58	131.60	133.05	144.17	148.50	148.50	149.52	179.27
Industrial	**[4]**	54.51	31%	3.85	26.63	32.75	33.74	34.56	34.56	38.59	40.23	45.08	45.84	46.39	50.59	52.22	52.22	52.60	63.83
Residential Multi	**[5]**	84.4	50%	14.73	25.28	34.65	43.13	50.60	57.05	62.75	67.60	71.78	75.20	77.99	80.18	81.91	83.13	83.98	84.57
Rural Residential	**[6]**	111.67	50%	19.49	33.45	45.84	57.06	66.95	75.49	83.03	89.45	94.98	99.50	103.18	106.09	108.38	109.99	111.11	111.89
Residential Single	**[7]**	111.67	50%	19.49	33.45	45.84	57.06	66.95	75.49	83.03	89.45	94.98	99.50	103.18	106.09	108.38	109.99	111.11	111.89
Floodway		0	0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vacant		100	100%	0.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Reference Table 6 Reclamation District 2140 - Hamilton City Levee O&M Assessment

[1] Assumed Crop damage per acre

[2] Source: Table B-9 - Good Status for Commercial Retail

[3] Source: Table B-29 Good Status for Public and Private Schools

[4] Source: Table B-21 - Good Status for Industrial Light

[5] Source: Table B-26 - Good Status Construction Class and Quality for Multi-Family Residential

[6] Source: Table B-33 - Good Status for Single Family Residential

[7] Source: Table B-33 - Good Status for Single Family Residential

Table 9-1
Knights Landing Small Communities Flood Risk Reduction
Structure Size by Land Use

Land Use	Structural Acres [A]	Structure Size (Sq Ft.) [B]	Avg Structure Size/Acre [C = B/A]
Agricultural	0.00	0.00	0.00
Commercial	0.82	17,766.00	21,560.68
School	4.29	4,021.00	937.30
Industrial	0.17	3,200.00	19,393.94
Residential Multi	12.60	67,035.00	5,320.66
Residential Single	42.79	304,163.00	7,107.94
Rural Residential	11.98	9,420.00	786.31
Floodway	0.00	0.00	0.00
Vacant	0.00	0.00	0.00
Total	**72.65**	**405,605.00**	**5,583.00**

[A] Based on the number of acres for structures on the land uses

[B] Based on the assessor data in benefit zone

Table 10-1
Knights Landing Small Communities Flood Risk Reduction
Damage Per Acre Calculations

Land Use	Structure Replacement Value ($/Sq Ft.)	Contents Damage Ratio	Composite Damage Value		Avg Damage Units/Acre	Relative Damage/ Acre	Relative Damage per Acre
	[A] (Table 6)	[B] (Table 6)	[C] [1]		[D](Table 9)	[E] = [C] * [D]	[F]=[E]/300
Agricultural	300	100%	300.00	Acre	1	300	1.0
Commercial	85.56	51%	88.45	Building SF	21,561	1,906,961	6,356.5
School	144.46	38%	116.00	Building SF	937	108,728	362.4
Industrial	54.51	31%	43.87	Building SF	19,394	850,752	2,835.8
Residential Multi	84.4	50%	72.85	Building SF	5,321	387,635	1,292.1
Rural Residential	111.67	50%	89.45	Building SF	786	70,334	234.4
Residential Single	111.67	50%	97.96	Building SF	7,108	696,318	2,321.1
Floodway	0	0%	0.00	Acre	0	0	0.0
Vacant	100	0%	100.00	Acre	0	0	0.0

Reference Table 6 Structure and Contents Value

[1] Average depth damage for each land use

Table 11-1
Knights Landing Small Communities Flood Risk Reduction
Relative Damage Per Acre

Land Use	Composite Damage Value [A] (Table 10)	Avg Structure Size/Acre [B] (Table 9)	Average Damage per Acre [C] = [A]*[B]	Relative Damage Factor [D] = [C] /300
Agricultural	300.00	1.00	300.00	1.00
Commercial	88.45	21,560.68	1,906,960.70	6,356.54
School	116.00	937.30	108,727.63	362.43
Industrial	43.87	19,393.94	850,752.44	2,835.84
Residential Multi	72.85	5,320.66	387,635.10	1,292.12
Rural Residential	89.45	786.31	70,333.64	234.45
Residential Single	97.96	7,107.94	696,317.75	2,321.06
Floodway	0.00	0.00	-	-
Vacant	100.00	1.00	100.00	0.33

[A] Source: Table 10

[B] Source: Table 9

[D] Agricultural is assumed to have the lowest damage per acre

Table 12-1
Knights Landing Small Communities Flood Risk Reduction
EBU Summary Table

Land Use	Acres [A]	Parcels [B]	Relative Damage [C]	Total EBU [D= A*C]	Avg EBU/Parcel [E = D/B]
Agricultural	44.84	7	1.00	44.84	6.41
Commercial	10.96	30	6,356.54	69,667.63	2,322.25
School	11.24	6	362.43	4,073.66	678.94
Industrial	11.73	4	2,835.84	33,250.24	8,312.56
Residential Multi	13.91	41	1,292.12	17,978.52	438.50
Rural Residential	12.86	4	234.45	3,014.97	753.74
Residential Single	64.85	295	2,321.06	150,411.60	509.87
Floodway	14.53	2	0.00	-	0.00
Vacant	25.28	35	0.00	-	0.00
Total	**210.20**	**424**		**278,441.45**	

Notes:

[A] Acres from Table 9

[B] Based on modeling of assessor data in benefit zone.

[C] Damage per acre from Table 10

Table 13-1
Knights Landing Small Communities Flood Risk Reduction
Revenue Estimate #1

Land Use	Total Assessment	Avg Assessment/	Avg Assessment/Acre
Agricultural	$17.59	$2.51	$0.39
Commercial	$27,327.61	$910.92	$2,493.40
School	$1,597.92	$266.32	$142.16
Industrial	$13,042.64	$3,260.66	$1,112.38
Residential Multi	$7,052.20	$172.00	$506.84
Rural Residential	$1,182.64	$295.66	$91.96
Residential Single	$59,000.00	$200.00	$909.83
Floodway	$0.00	$0.00	$0.00
Vacant	$0.00	$0.00	$0.00
Total	**$109,220.61**		

Table 9-3
Knights Landing Small Communities Flood Risk Reduction
Structure Size by Land Use

Land Use	Structural Acres [A]	Structure Size (Sq Ft.) [B]	Avg Structure Size/Acre [C = B/A]
Agricultural	0.00	0.00	0.00
Commercial	0.82	17,766.00	21,560.68
School	4.29	4,021.00	937.30
Industrial	0.17	3,200.00	19,393.94
Residential Multi	12.60	67,035.00	5,320.66
Residential Single	42.79	304,163.00	7,107.94
Rural Residential	11.98	9,420.00	786.31
Floodway	0.00	0.00	0.00
Vacant	0.00	0.00	0.00
Total	**72.65**	**405,605.00**	**5,583.00**

Notes:

[A] Based on the number of acres for structures on the land uses

[B] Based on the assessor data in benefit zone

Table 10-3
Knights Landing Small Communities Flood Risk Reduction
Damage Per Acre Calculations

Land Use	Structure Replacement Value ($/Sq Ft.)	Contents Damage Ratio	Composite Damage Value		Avg Damage Units/Acre	Relative Damage/ Acre	Relative Damage per Acre
	[A] (Table 6)	[B] (Table 6)	[C] [1]		[D] (Table 9)	[E] = [C] * [D]	[F]=[E]/300
Agricultural	300	100%	300.00	Acre	1	300	1.0
Commercial	85.56	51%	85.10	Building SF	21,561	1,834,892	6,116.3
School	144.46	38%	147.06	Building SF	937	137,839	459.5
Industrial	54.51	31%	50.48	Building SF	19,394	978,934	3,263.1
Residential Multi	84.4	50%	74.51	Building SF	5,321	396,447	1,321.5
Rural Residential	111.67	50%	100.08	Building SF	786	78,697	262.3
Residential Single	111.67	50%	97.52	Building SF	7,108	693,186	2,310.6
Floodway	0	0%	0.00	Acre	0	0	0.0
Vacant	100	0%	100.00	Acre	1	100	0.3

Notes:

Reference Table 6 Structure and Contents Value

[1] Average depth damage for each land use

Table 11-3
Knights Landing Small Communities Flood Risk Reduction
Relative Damage Per Acre

Land Use	Composite Damage Value [A] (Table 10)	Avg Structure Size/Acre [B] (Table 9)	Average Damage per Acre [C] = [A]*[B]	Relative Damage Factor [D] = [C] /300
Agricultural	300.00	1.00	300.00	1.00
Commercial	85.10	21,560.68	1,834,891.95	6,116.31
School	147.06	937.30	137,839.02	459.46
Industrial	50.48	19,393.94	978,933.53	3,263.11
Residential Multi	74.51	5,320.66	396,446.61	1,321.49
Rural Residential	100.08	786.31	78,697.29	262.32
Residential Single	97.52	7,107.94	693,185.83	2,310.62
Floodway	0.00	0.00	-	-
Vacant	100.00	1.00	100.00	0.33

Notes:

[A] Source: Table 10

[B] Source: Table 9

[D] Agricultural is assumed to have the lowest damage per acre

Table 12-3
Knights Landing Small Communities Flood Risk Reduction
EBU Summary Table

Land Use	Acres [A]	Parcels [B]	Relative Damage per Acre [C]	Total EBU [D= A*C]	Avg EBU/Parcel [E = D/B]
Agricultural	388.36	10	1.00	388.36	38.84
Commercial	10.96	30	6,116.31	67,034.72	2,234.49
School	11.24	6	459.46	5,164.37	860.73
Industrial	11.73	4	3,263.11	38,259.99	9,565.00
Residential Multi	13.91	41	1,321.49	18,387.19	448.47
Rural Residential	12.86	4	262.32	3,373.49	843.37
Residential Single	64.85	295	2,310.62	150,012.34	508.52
Floodway	14.53	2	0.00	-	0.00
Vacant	25.28	35	0.33	8.43	0.24
Total	**553.72**	**427**		**282,628.89**	

Notes:

[A] Acres from Table 9

[B] Based on modeling of assessor data in benefit zone.

[C] Damage per acre from Table 10

Table 13-3
Knights Landing Small Communities Flood Risk Reduction
Revenue Estimate #1

Land Use	Total Assessment	Avg Assessment/Parcel	Avg Assessment/Acre
Agricultural	$152.74	$15.27	$0.39
Commercial	$26,364.82	$878.83	$2,405.55
School	$2,031.15	$338.53	$180.71
Industrial	$15,047.69	$3,761.92	$1,283.39
Residential Multi	$7,231.70	$176.38	$519.74
Rural Residential	$1,326.80	$331.70	$103.17
Residential Single	$59,000.00	$200.00	$909.83
Floodway	$0.00	$0.00	$0.00
Vacant	$3.31	$0.09	$0.13
Total	**$111,158.22**		

Table 9-6
Knights Landing Small Communities Flood Risk Reduction
Structure Size by Land Use - Zone A

Land Use	Structural Acres [A]	Structure Size (Sq Ft.) [B]	Avg Structure Size/Acre [C = B/A]
Agricultural	0.00	0.00	0.00
Commercial	0.82	17,766.00	21,560.68
School	4.29	4,021.00	937.30
Industrial	0.17	3,200.00	19,393.94
Residential Multi	12.60	67,035.00	5,320.66
Residential Single	42.79	304,163.00	7,107.94
Rural Residential	11.98	9,420.00	786.31
Floodway	0.00	0.00	0.00
Vacant	0.00	0.00	0.00
Total	**72.65**	**405,605.00**	**5,583.00**

Structure Size by Land Use - Zone B

Land Use	Structural Acres [A]	Structure Size (Sq Ft.) [B]	Avg Structure Size/Acre [C = B/A]
Agricultural	0.00	0.00	0.00
Commercial	0.00	0.00	0.00
School	0.00	0.00	0.00
Industrial	0.00	0.00	0.00
Residential Multi	0.00	0.00	0.00
Residential Single	0.00	0.00	0.00
Rural Residential	0.00	0.00	0.00
Floodway	0.00	0.00	0.00
Vacant	0.00	0.00	0.00
Total	**-**	**-**	**-**

Notes:

[A] Based on the number of acres for structures on the land uses

[B] Based on the assessor data in benefit zone

Table 10-6
Knights Landing Small Communities Flood Risk Reduction
Damage Per Acre Calculations - Zone A

Land Use	Structure Replacement Value ($/Sq Ft.)	Contents Damage Ratio	Composite Damage Value		Avg Damage Units/Acre	Relative Damage/ Acre	Relative Damage per Acre
	[A] (Table 6)	[B] (Table 6)	[C] [1]		[D] (Table 9)	[E] = [C] * [D]	[F]=[E]/300
Agricultural	300	100%	300.00	Acre	1	300	1.0
Commercial	85.56	51%	85.10	Building SF	21,561	1,834,892	6,116.3
School	144.46	38%	147.06	Building SF	937	137,839	459.5
Industrial	54.51	31%	50.48	Building SF	19,394	978,934	3,263.1
Residential Multi	84.4	50%	74.51	Building SF	5,321	396,447	1,321.5
Rural Residential	111.67	50%	102.45	Building SF	786	80,554	268.5
Residential Single	111.67	50%	97.52	Building SF	7,108	693,186	2,310.6
Floodway	0	0%	0.00	Acre	0	0	0.0
Vacant	100	0%	100.00	Acre	1	100	0.3

Damage Per Acre Calculations - Zone B

Land Use	Structure Replacement Value ($/Sq Ft.)	Contents Damage Ratio	Composite Damage Value		Avg Damage Units/Acre	Relative Damage/ Acre	Relative Damage per Acre
	[A] (Table 6)	[B] (Table 6)	[C] [1]		[D] (Table 9)	[E] = [C] * [D]	[F]=[E]/300
Agricultural	300	100%	300.00	Acre	1	300	1.0
Commercial	85.56	51%	0.00	Building SF	0	0	0.0
School	144.46	38%	0.00	Building SF	0	0	0.0
Industrial	54.51	31%	0.00	Building SF	0	0	0.0
Residential Multi	84.4	50%	0.00	Building SF	0	0	0.0
Rural Residential	111.67	50%	0.00	Building SF	1	0	0.0
Residential Single	111.67	50%	0.00	Building SF	0	0	0.0
Floodway	0	0%	0.00	Acre	0	0	0.0
Vacant	100	0%	0.00	Acre	1	0	0.0

Notes:

Reference Table 6 Structure and Contents Value

[1] Average depth damage for each land use

Table 11-6
Knights Landing Small Communities Flood Risk Reduction
Relative Damage Per Acre - Zone A

Land Use	Composite Damage Value [A] (Table 10)	Avg Structure Size/Acre [B] (Table 9)	Average Damage per Acre [C] = [A]*[B]	Relative Damage Factor [D] = [C] /300
Agricultural	300.00	1.00	300.00	1.00
Commercial	85.10	21,560.68	1,834,891.95	6,116.31
School	147.06	937.30	137,839.02	459.46
Industrial	50.48	19,393.94	978,933.53	3,263.11
Residential Multi	74.51	5,320.66	396,446.61	1,321.49
Rural Residential	102.45	1.00	102.45	0.34
Residential Single	97.52	7,107.94	693,185.83	2,310.62
Floodway	0.00	0.00	-	-
Vacant	100.00	1.00	100.00	0.33

Relative Damage Per Acre - Zone B

Land Use	Composite Damage Value [A] (Table 10)	Avg Structure Size/Acre [B] (Table 9)	Average Damage per Acre [C] = [A]*[B]	Relative Damage Factor [D] = [C] /300
Agricultural	300.00	1.00	300.00	1.00
Commercial	0.00	0.00	-	-
School	0.00	0.00	-	-
Industrial	0.00	0.00	-	-
Residential Multi	0.00	0.00	-	-
Rural Residential	0.00	0.00	-	-
Residential Single	0.00	0.00	-	-
Floodway	0.00	0.00	-	-
Vacant	0.00	1.00	-	-

Notes:

[A] Source: Table 10

[B] Source: Table 9

[D] Agricultural is assumed to have the lowest damage per acre

Table 12-6
Knights Landing Small Communities Flood Risk Reduction
EBU Summary Table - Zone A

Land Use	Acres [A]	Parcels [B]	Relative Damage per Acre [C]	Total EBU [D= A*C]	Avg EBU/Parcel [E = D/B]
Agricultural	1,703.18	25	1.00	1,703.18	68.13
Commercial	10.96	30	6,116.31	67,034.72	2,234.49
School	11.24	6	459.46	5,164.37	860.73
Industrial	11.73	4	3,263.11	38,259.99	9,565.00
Residential Multi	13.91	41	1,321.49	18,387.19	448.47
Rural Residential	30.76	5	268.51	8,259.51	1,651.90
Residential Single	64.85	295	2,310.62	150,012.34	508.52
Floodway	14.53	2	0.00	-	0.00
Vacant	29.87	36	0.33	9.96	0.28
Total	**1,891.02**	**444**		**288,831.26**	

EBU Summary Table - Zone B

Land Use	Acres [A]	Parcels [B]	Relative Damage per Acre [C]	Total EBU [D= A*C]	Avg EBU/Parcel [E = D/B]
Agricultural	1,678.23	8	1.00	1,678.23	209.78
Commercial	0.00	0	0.00	-	0.00
School	0.00	0	0.00	-	0.00
Industrial	0.00	0	0.00	-	0.00
Residential Multi	0.00	0	0.00	-	0.00
Rural Residential	0.00	0	0.00	-	0.00
Residential Single	0.00	0	0.00	-	0.00
Floodway	0.00	0	0.00	-	0.00
Vacant	0.00	0	0.00	-	0.00
Total	**1,678.23**	**8**		**1,678.23**	

Notes:

[A] Acres from Table 9

[B] Based on modeling of assessor data in benefit zone.

[C] Damage per acre from Table 10

Table 13-6
Knights Landing Small Communities Flood Risk Reduction
Revenue Estimate #1 -Zone A

Land Use	Total Assessment	Avg Assessment/Parcel	Avg Assessment/Acre
Agricultural	$669.86	$26.79	$0.39
Commercial	$26,364.82	$878.83	$2,405.55
School	$2,031.15	$338.53	$180.71
Industrial	$15,047.69	$3,761.92	$1,283.39
Residential Multi	$7,231.70	$176.38	$519.74
Rural Residential	$3,248.47	$649.69	$105.61
Residential Single	$59,000.00	$200.00	$909.83
Floodway	$0.00	$0.00	$0.00
Vacant	$3.92	$0.11	$0.13
Total	**$113,597.61**		

Revenue Estimate #1 - Zone B

Land Use	Total Assessment	Avg Assessment/Parcel	Avg Assessment/Acre
Agricultural	$41,955.75	$5,244.47	$25.00
Commercial	$0.00	$0.00	$0.00
School	$0.00	$0.00	$0.00
Industrial	$0.00	$0.00	$0.00
Residential Multi	$0.00	$0.00	$0.00
Rural Residential	$0.00	$0.00	$0.00
Residential Single	$0.00	$0.00	$0.00
Floodway	$0.00	$0.00	$0.00
Vacant	$0.00	$0.00	$0.00
Total	**$41,955.75**		

Table 9-12
Knights Landing Small Communities Flood Risk Reduction
Structure Size by Land Use - Zone A

Land Use	Structural Acres [A]	Structure Size (Sq Ft.) [B]	Avg Structure Size/Acre [C = B/A]
Agricultural	0.00	0.00	0.00
Commercial	0.82	17,766.00	21,560.68
School	4.29	4,021.00	937.30
Industrial	0.17	3,200.00	19,393.94
Residential Multi	12.60	67,035.00	5,320.66
Residential Single	42.79	304,163.00	7,107.94
Rural Residential	11.98	9,420.00	786.31
Floodway	0.00	0.00	0.00
Vacant	0.00	0.00	0.00
Total	**72.65**	**405,605.00**	**5,583.00**

Structure Size by Land Use - Zone B

Land Use	Structural Acres [A]	Structure Size (Sq Ft.) [B]	Avg Structure Size/Acre [C = B/A]
Agricultural	0.00	0.00	0.00
Commercial	0.00	0.00	0.00
School	0.00	0.00	0.00
Industrial	0.00	0.00	0.00
Residential Multi	0.00	0.00	0.00
Residential Single	0.00	0.00	0.00
Rural Residential	0.00	0.00	0.00
Floodway	0.00	0.00	0.00
Vacant	0.00	0.00	0.00
Total	**-**	**-**	**-**

Notes:

[A] Based on the number of acres for structures on the land uses

[B] Based on the assessor data in benefit zone

Table 10-12
Knights Landing Small Communities Flood Risk Reduction
Damage Per Acre Calculations - Zone A

Land Use	Structure Replacement Value ($/Sq Ft.)	Contents Damage Ratio	Composite Damage Value		Avg Damage Units/Acre	Relative Damage/ Acre	Relative Damage per Acre
	[A] (Table 6)	[B] (Table 6)	[C] [1]		[D] (Table 9)	[E] = [C] * [D]	[F]=[E]/300
Agricultural	300	100%	300.00	Acre	1	300	1.0
Commercial	85.56	51%	85.10	Building SF	21,561	1,834,892	6,116.3
School	144.46	38%	147.06	Building SF	937	137,839	459.5
Industrial	54.51	31%	50.48	Building SF	19,394	978,934	3,263.1
Residential Multi	84.4	50%	74.51	Building SF	5,321	396,447	1,321.5
Rural Residential	111.67	50%	100.08	Building SF	786	78,697	262.3
Residential Single	111.67	50%	97.52	Building SF	7,108	693,186	2,310.6
Floodway	0	0%	0.00	Acre	0	0	0.0
Vacant	100	0%	100.00	Acre	1	100	0.3

Damage Per Acre Calculations - Zone B

Land Use	Structure Replacement Value ($/Sq Ft.)	Contents Damage Ratio	Composite Damage Value		Avg Damage Units/Acre	Relative Damage/ Acre	Relative Damage per Acre
	[A] (Table 6)	[B] (Table 6)	[C] [1]		[D] (Table 9)	[E] = [C] * [D]	[F]=[E]/300
Agricultural	300	100%	300.00	Acre	1	300	1.0
Commercial	85.56	51%	0.00	Building SF	0	0	0.0
School	144.46	38%	0.00	Building SF	0	0	0.0
Industrial	54.51	31%	0.00	Building SF	0	0	0.0
Residential Multi	84.4	50%	0.00	Building SF	0	0	0.0
Rural Residential	111.67	50%	0.00	Building SF	1	0	0.0
Residential Single	111.67	50%	0.00	Building SF	0	0	0.0
Floodway	0	0%	0.00	Acre	0	0	0.0
Vacant	100	0%	100.00	Acre	1	100	0.3

Reference Table 6 Structure and Contents Value

[1] Average depth damage for each land use

Table 11-12
Knights Landing Small Communities Flood Risk Reduction
Relative Damage Per Acre - Zone A

Land Use	Composite Damage Value [A] (Table 10)	Avg Structure Size/Acre [B] (Table 9)	Average Damage per Acre [C] = [A]*[B]	Relative Damage Factor [D] = [C] /300
Agricultural	300.00	1.00	300.00	1.00
Commercial	85.10	21,560.68	1,834,891.95	6,116.31
School	147.06	937.30	137,839.02	459.46
Industrial	50.48	19,393.94	978,933.53	3,263.11
Residential Multi	74.51	5,320.66	396,446.61	1,321.49
Rural Residential	100.08	1.00	100.08	0.33
Residential Single	97.52	7,107.94	693,185.83	2,310.62
Floodway	0.00	0.00	-	-
Vacant	100.00	1.00	100.00	0.33

Relative Damage Per Acre - Zone B

Land Use	Composite Damage Value [A] (Table 10)	Avg Structure Size/Acre [B] (Table 9)	Average Damage per Acre [C] = [A]*[B]	Relative Damage Factor [D] = [C] /300
Agricultural	300.00	1.00	300.00	1.00
Commercial	0.00	0.00	-	-
School	0.00	0.00	-	-
Industrial	0.00	0.00	-	-
Residential Multi	0.00	0.00	-	-
Rural Residential	0.00	0.00	-	-
Residential Single	0.00	0.00	-	-
Floodway	0.00	0.00	-	-
Vacant	100.00	1.00	100.00	0.33

[A] Source: Table 10

[B] Source: Table 9

[D] Agricultural is assumed to have the lowest damage per acre

Table 12-12
Knights Landing Small Communities Flood Risk Reduction
EBU Summary Table - Zone A

Land Use	Acres [A]	Parcels [B]	Relative Damage per Acre [C]	Total EBU [D= A*C]	Avg EBU/Parcel [E = D/B]
Agricultural	286.30	9	1.00	286.30	31.81
Commercial	10.96	30	6,116.31	67,034.72	2,234.49
School	11.24	6	459.46	5,164.37	860.73
Industrial	11.73	4	3,263.11	38,259.99	9,565.00
Residential Multi	13.91	41	1,321.49	18,387.19	448.47
Rural Residential	12.86	4	262.32	3,373.49	843.37
Residential Single	64.85	295	2,310.62	150,012.34	508.52
Floodway	14.53	2	0.00	-	0.00
Vacant	25.28	35	0.33	8.43	0.24
Total	**451.66**	**426**		**282,526.83**	

EBU Summary Table - Zone B

Land Use	Acres [A]	Parcels [B]	Relative Damage per Acre [C]	Total EBU [D= A*C]	Avg EBU/Parcel [E = D/B]
Agricultural	3,113.01	25	1.00	3,113.01	124.52
Commercial	0.00	0	0.00	-	0.00
School	0.00	0	0.00	-	0.00
Industrial	0.00	0	0.00	-	0.00
Residential Multi	0.00	0	0.00	-	0.00
Rural Residential	0.00	0	0.00	-	0.00
Residential Single	0.00	0	0.00	-	0.00
Floodway	0.00	0	0.00	-	0.00
Vacant	4.59	1	0.33	1.53	1.53
Total	**3,117.60**	**26**		**3,114.54**	

Notes:

[A] Acres from Table 1

[B] Based on modeling of assessor data in benefit zone.

[C] Damage per acre from Table 2

Table 13-12
Knights Landing Small Communities Flood Risk Reduction
Revenue Estimate #1 - Zone A

Land Use	Total Assessment	Avg Assessment/Parcel	Avg Assessment/Acre
Agricultural	$112.60	$12.51	$0.39
Commercial	$26,364.82	$878.83	$2,405.55
School	$2,031.15	$338.53	$180.71
Industrial	$15,047.69	$3,761.92	$1,283.39
Residential Multi	$7,231.70	$176.38	$519.74
Rural Residential	$1,326.80	$331.70	$103.17
Residential Single	$59,000.00	$200.00	$909.83
Floodway	$0.00	$0.00	$0.00
Vacant	$3.31	$0.09	$0.13
Total	**$111,118.07**		

Revenue Estimate #1 - Zone B

Land Use	Total Assessment	Avg Assessment/Parcel	Avg Assessment/Acre
Agricultural	$77,825.25	$3,113.01	$25.00
Commercial	$0.00	$0.00	$0.00
School	$0.00	$0.00	$0.00
Industrial	$0.00	$0.00	$0.00
Residential Multi	$0.00	$0.00	$0.00
Rural Residential [1]	$0.00	$0.00	$0.00
Residential Single	$0.00	$0.00	$0.00
Floodway	$0.00	$0.00	$0.00
Vacant	$38.21	$38.21	$8.33
Total	**$77,863.46**		

Notes:

Table 9-13
Knights Landing Small Communities Flood Risk Reduction
Structure Size by Land Use -Zone A

Land Use	Structural Acres [A]	Structure Size (Sq Ft.) [B]	Avg Structure Size/Acre [C = B/A]
Agricultural	0.00	0.00	0.00
Commercial	0.82	17,766.00	21,560.68
School	4.29	4,021.00	937.30
Industrial	0.17	3,200.00	19,393.94
Residential Multi	12.60	67,035.00	5,320.66
Residential Single	42.79	304,163.00	7,107.94
Rural Residential	11.98	9,420.00	786.31
Floodway	0.00	0.00	0.00
Vacant	0.00	0.00	0.00
Total	**72.65**	**405,605.00**	**5,583.00**

Structure Size by Land Use -Zone B

Land Use	Structural Acres [A]	Structure Size (Sq Ft.) [B]	Avg Structure Size/Acre [C = B/A]
Agricultural	0.00	0.00	0.00
Commercial	0.00	0.00	0.00
School	0.00	0.00	0.00
Industrial	0.00	0.00	0.00
Residential Multi	0.00	0.00	0.00
Residential Single	0.00	0.00	0.00
Rural Residential	0.00	0.00	0.00
Floodway	0.00	0.00	0.00
Vacant	0.00	0.00	0.00
Total	-	-	-

Notes:

[A] Based on the number of acres for structures on the land uses

[B] Based on the assessor data in benefit zone

Table 10-13
Knights Landing Small Communities Flood Risk Reduction
Damage Per Acre Calculations - Zone A

Land Use	Structure Replacement Value ($/Sq Ft.)	Contents Damage Ratio	Composite Damage Value		Avg Damage Units/Acre	Relative Damage/ Acre	Relative Damage per Acre
	[A] (Table 6)	[B] (Table 6)	[C] [1]		[D] (Table 9)	[E] = [C] * [D]	[F]=[E]/300
Agricultural	300	100%	300.00	Acre	1	300	1.0
Commercial	85.56	51%	85.10	Building SF	21,561	1,834,892	6,116.3
School	144.46	38%	147.06	Building SF	937	137,839	459.5
Industrial	54.51	31%	50.48	Building SF	19,394	978,934	3,263.1
Residential Multi	84.4	50%	74.51	Building SF	5,321	396,447	1,321.5
Rural Residential	111.67	50%	100.08	Building SF	786	78,697	262.3
Residential Single	111.67	50%	97.52	Building SF	7,108	693,186	2,310.6
Floodway	0	0%	0.00	Acre	0	0	0.0
Vacant	100	0%	100.00	Acre	1	100	0.3

Damage Per Acre Calculations - Zone B

Land Use	Structure Replacement Value ($/Sq Ft.)	Contents Damage Ratio	Composite Damage Value		Avg Damage Units/Acre	Relative Damage/ Acre	Relative Damage per Acre
	[A] (Table 6)	[B] (Table 6)	[C] [1]		[D] (Table 9)	[E] = [C] * [D]	[F]=[E]/300
Agricultural	300	100%	300.00	Acre	1	300	1.0
Commercial	85.56	51%	0.00	Building SF	0	0	0.0
School	144.46	38%	0.00	Building SF	0	0	0.0
Industrial	54.51	31%	0.00	Building SF	0	0	0.0
Residential Multi	84.4	50%	0.00	Building SF	0	0	0.0
Rural Residential	111.67	50%	0.00	Building SF	0	0	0.0
Residential Single	111.67	50%	0.00	Building SF	0	0	0.0
Floodway	0	0%	0.00	Acre	0	0	0.0
Vacant	100	0%	100.00	Acre	0	0	0.0

Notes:

Reference Table 6 Structure and Contents Value

[1] Average depth damage for each land use

Table 11-13
Knights Landing Small Communities Flood Risk Reduction
Relative Damage Per Acre - Zone A

Land Use	Composite Damage Value [A] (Table 10)	Avg Structure Size/Acre [B] (Table 9)	Average Damage per Acre [C] = [A]*[B]	Relative Damage Factor [D] = [C] /300
Agricultural	300.00	1.00	300.00	1.00
Commercial	85.10	21,560.68	1,834,891.95	6,116.31
School	147.06	937.30	137,839.02	459.46
Industrial	50.48	19,393.94	978,933.53	3,263.11
Residential Multi	74.51	5,320.66	396,446.61	1,321.49
Rural Residential	100.08	1.00	100.08	0.33
Residential Single	97.52	7,107.94	693,185.83	2,310.62
Floodway	0.00	0.00	-	-
Vacant	100.00	1.00	100.00	0.33

Relative Damage Per Acre - Zone B

Land Use	Composite Damage Value [A] (Table 10)	Avg Structure Size/Acre [B] (Table 9)	Average Damage per Acre [C] = [A]*[B]	Relative Damage Factor [D] = [C] /300
Agricultural	300.00	1.00	300.00	1.00
Commercial	0.00	0.00	-	-
School	0.00	0.00	-	-
Industrial	0.00	0.00	-	-
Residential Multi	0.00	0.00	-	-
Rural Residential	0.00	0.00	-	-
Residential Single	0.00	0.00	-	-
Floodway	0.00	0.00	-	-
Vacant	100.00	0.00	-	-

Notes:

[B] Source: Table 9

[D] Agricultural is assumed to have the lowest damage per acre

Table 12-13
Knights Landing Small Communities Flood Risk Reduction
EBU Summary Table - Zone A

Land Use	Acres [A]	Parcels [B]	Relative Damage per Acre [C]	Total EBU [D= A*C]	Avg EBU/Parcel [E = D/B]
Agricultural	44.84	7	1.00	44.84	6.41
Commercial	10.96	30	6,116.31	67,034.72	2,234.49
School	11.24	6	459.46	5,164.37	860.73
Industrial	11.73	4	3,263.11	38,259.99	9,565.00
Residential Multi	13.91	41	1,321.49	18,387.19	448.47
Rural Residential	12.86	4	262.32	3,373.49	843.37
Residential Single	64.85	295	2,310.62	150,012.34	508.52
Floodway	14.53	2	0.00	-	0.00
Vacant	25.28	35	0.33	8.43	0.24
Total	**210.20**	**424**		**282,285.37**	

EBU Summary Table - Zone B

Land Use	Acres [A]	Parcels [B]	Relative Damage per Acre [C]	Total EBU [D= A*C]	Avg EBU/Parcel [E = D/B]
Agricultural	1,789.06	14	1.00	1,789.06	127.79
Commercial	0.00	0	0.00	-	0.00
School	0.00	0	0.00	-	0.00
Industrial	0.00	0	0.00	-	0.00
Residential Multi	0.00	0	0.00	-	0.00
Rural Residential	0.00	0	0.00	-	0.00
Residential Single	0.00	0	0.00	-	0.00
Floodway	0.00	0	0.00	-	0.00
Vacant	4.59	1	0.00	1.53	1.53
Total	**1,793.65**	**15**		**1,790.59**	

Notes:

[A] Acres from Table 1

[B] Based on modeling of assessor data in benefit zone.

[C] Damage per acre from Table 2

Table 13-13
Knights Landing Small Communities Flood Risk Reduction
Revenue Estimate #1 - Zone A

Land Use	Total Assessment	Avg Assessment/Parcel	Avg Assessment/Acre
Agricultural	$17.63	$2.52	$0.39
Commercial	$26,364.82	$878.83	$2,405.55
School	$2,031.15	$338.53	$180.71
Industrial	$15,047.69	$3,761.92	$1,283.39
Residential Multi	$7,231.70	$176.38	$519.74
Rural Residential	$1,326.80	$331.70	$103.17
Residential Single	$59,000.00	$200.00	$909.83
Floodway	$0.00	$0.00	$0.00
Vacant	$3.31	$0.09	$0.13
Total	**$111,023.11**		

Revenue Estimate #1 - Zone B

Land Use	Total Assessment	Avg Assessment/Parcel	Avg Assessment/Acre
Agricultural	$44,726.50	$3,194.75	$25.00
Commercial	$0.00	$0.00	$0.00
School	$0.00	$0.00	$0.00
Industrial	$0.00	$0.00	$0.00
Residential Multi	$0.00	$0.00	$0.00
Rural Residential	$0.00	$0.00	$0.00
Residential Single	$0.00	$0.00	$0.00
Floodway	$0.00	$0.00	$0.00
Vacant	$38.21	$38.21	$8.33
Total	**$44,764.71**		