

Trilby Wash, Maricopa County, Arizona

Preliminary Economic Analysis



Los Angeles District

**Economics Group
Planning Division
January 2006**



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY

LOS ANGELES DISTRICT CORPS OF ENGINEERS
P.O. BOX 532711
LOS ANGELES, CALIFORNIA 90053-2325

February 17, 2006

Planning Division

Mr. Timothy Phillips, P.E.
Chief Engineer and General Manager
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, Arizona 85009

Dear Mr. Phillips:

We have completed the Preliminary Economic Analysis for the Trilby Wash Feasibility Study. The report document contains a preliminary level of evaluation and the associated conclusions are dependent on a number of key assumptions which the District has been made aware of. We understand the importance and magnitude of the proposed feasibility study, its significance to your District and of coordinating the development and implementation of the plan and associated feasibility study in a timely manner. We believe the analysis will be of utility to the Flood Control District of Maricopa County and that you will find value in the information provided with respect to consideration in determining potential solutions or further actions.

If you or your staff has any questions or concerns regarding this Preliminary Economics Analysis, please feel free to call me at (213) 452-3962 or Mr. Dan Sulzer, Acting Chief, Planning Division, Los Angeles District at (213) 452-3784.

Three copies of the report document are enclosed.

Sincerely,

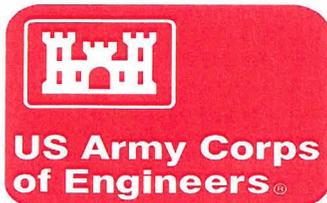
A handwritten signature in black ink, appearing to read "Alex C. Dornstauder", written over a large, stylized flourish.

Alex C. Dornstauder
Colonel, US Army
District Engineer

Enclosures

Trilby Wash, Maricopa County, Arizona

Preliminary Economic Analysis



Los Angeles District

**Economics Group
Planning Division
January 2006**

Study Background & Scope

The Trilby Wash, Maricopa County, Arizona Reconnaissance Study was initiated in 2002 and completed in 2004. The Project Management Plan (PMP) prepared during this study includes an assessment of the water resource-related problems and opportunities in the Trilby Wash watershed. Of particular concern is the flood threat posed to downstream areas by McMicken Dam. (Figure 1.1) As noted in the PMP:

McMicken Dam on Trilby Wash is an aging flood control structure protecting an increasingly urbanized community. The ability of the McMicken Dam to maintain the current level of flood protection for the benefit of the public in an increasingly urbanized environment is in serious question due to significant concerns regarding aging infrastructure, land subsidence, earth fissuring, urbanization encroachment and current dam safety standards.

Figure 1.1 McMicken Dam Near Sun Valley Parkway view southwest toward the White Tank Mountains.



The Reconnaissance Study concluded that there appear to be potential project alternatives in the study area that would be consistent with Army policies, costs, benefits, environmental operating principles, and environmental impacts. The Feasibility Study has been initiated. However, this will be a multi-year effort yielding detailed engineering, economic and environmental analyses to support the formulation and evaluation of alternatives developed to address Study Area water resources problems and opportunities.

The Maricopa County Flood Control District (the Local Sponsor) has requested that the Corps conduct a preliminary economic assessment of the potential magnitude of without project damages in the Trilby Wash Study Area, as well as the potential benefits that could be realized from flood damage reduction alternatives. The Sponsor has been made aware of the fact that this analysis and associated conclusions are dependent on a number of key assumptions. During the Feasibility Study as more detailed analysis is conducted, such assumptions could change, and such changes could have very significant impacts on the results and conclusions presented in this document. Further, the analysis presented below was conducted at a simplified level and does not comply with the requirements of Corps policies and regulations for a Feasibility level of analysis. During the Feasibility Study, more rigorous methods will be used to quantify damages, benefits and costs, which again, could potentially produce substantial differences in results.

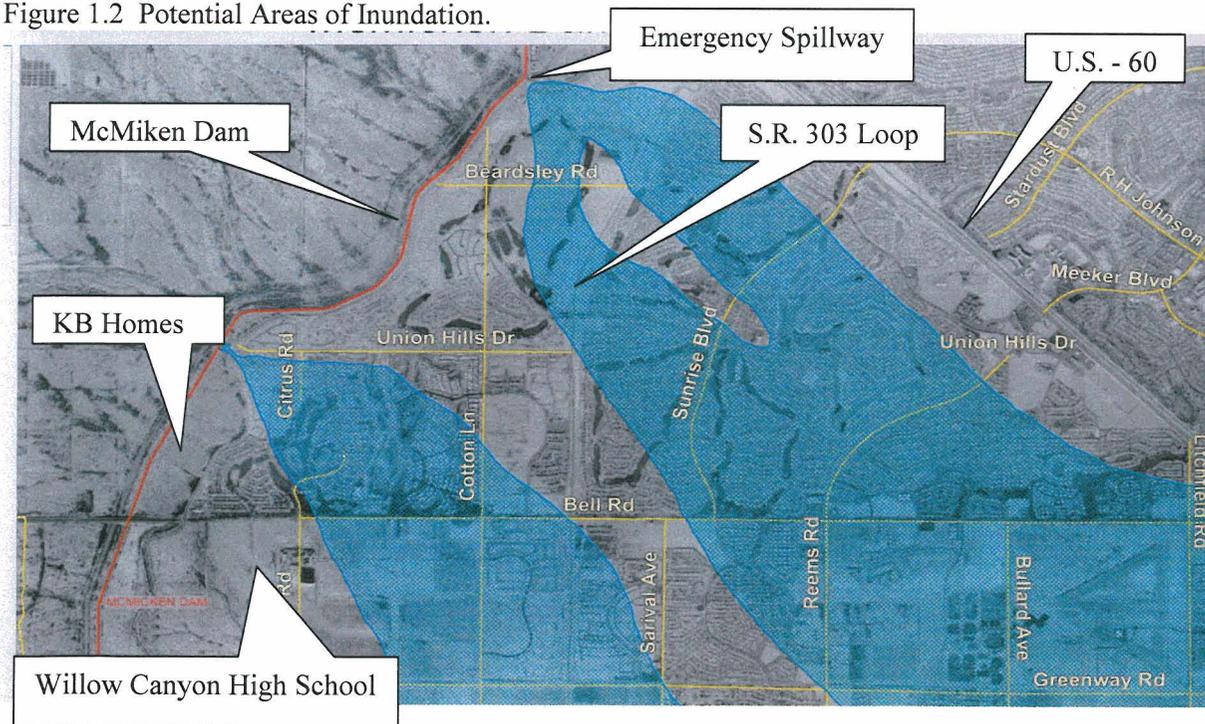
Study Area Description

Location

The Study Area is located in Maricopa County, Arizona, and is approximately thirty miles west-northwest from the City of Phoenix (see Figure 1.3). The Study Area is generally bounded by McMicken Dam and White Tank Mountain Regional Park to the west, Highway 101 to the east, Highway 60 (Phoenix-Wickenburg Highway) to the north and Interstate 10 to the South.

As shown on Figure 1.3, substantial development has taken place in the Study Area, particularly in the communities of Surprise, Sun City, and Sun City West. The areas that are currently under agricultural production are undergoing rapid conversion to primarily residential development. Also located in the middle of the Study Area is Luke Air Force Base, which is the largest fighter training base in the western world, with over 200 aircraft, 7,000 military and reserve and 1,500 civilian employees.¹

Figure 1.2 Potential Areas of Inundation.



¹ GlobalSecurity.org Website

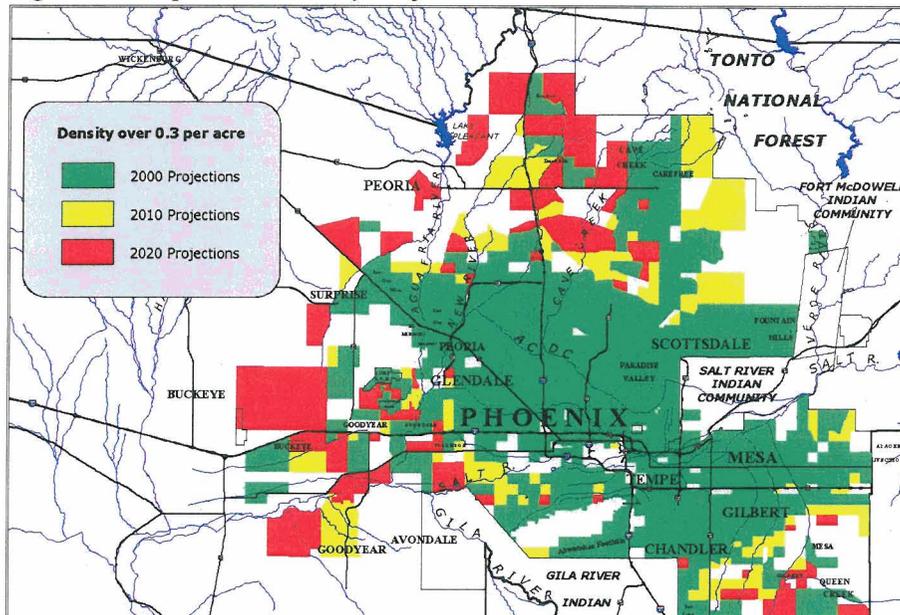
Figure 1.3 – Study Area Map



Population

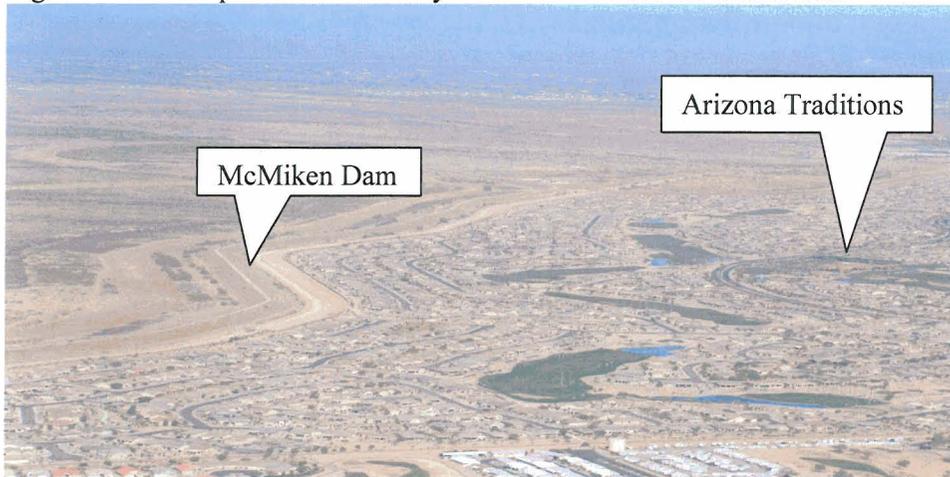
The communities that surround the Study Area have undergone tremendous development over the past decade. The Phoenix metropolitan area as a whole has been one of the fastest growing urban centers in the U.S., and this has fueled outward expansion of population and development. This is especially true for the communities to the west of the City of Phoenix that are located in and surrounding the Study Area, including Surprise, Peoria, and Glendale. For example, the City of Surprise (according to its website), has experienced a population increase from approximately 10,737 in 1995 to a current population of more than 75,000. Similarly, the Maricopa County Association of Governments website indicates that the City of Peoria's population increased from about 70,000 to over 130,000 over the same time period. The City of Glendale's population has also been growing rapidly and is currently estimated at over 235,000.

Figure 1.4 Population Density Projections 2000 to 2020



Much of the recent and planned future development is comprised of large, densely-developed master-planned communities such as Sun City West. This community, located at the northern side of the Study Area along Highway 60, is home to over 31,000 residents, according to the SunCityWest.org website.

Figure 1.5 Development Immediately Down Stream of McMiken Dam.



As noted previously, the Study Area is also home to Luke Air Force Base, which has over 7,000 military and reserve, and approximately 1,500 civilian employees.

Land Use

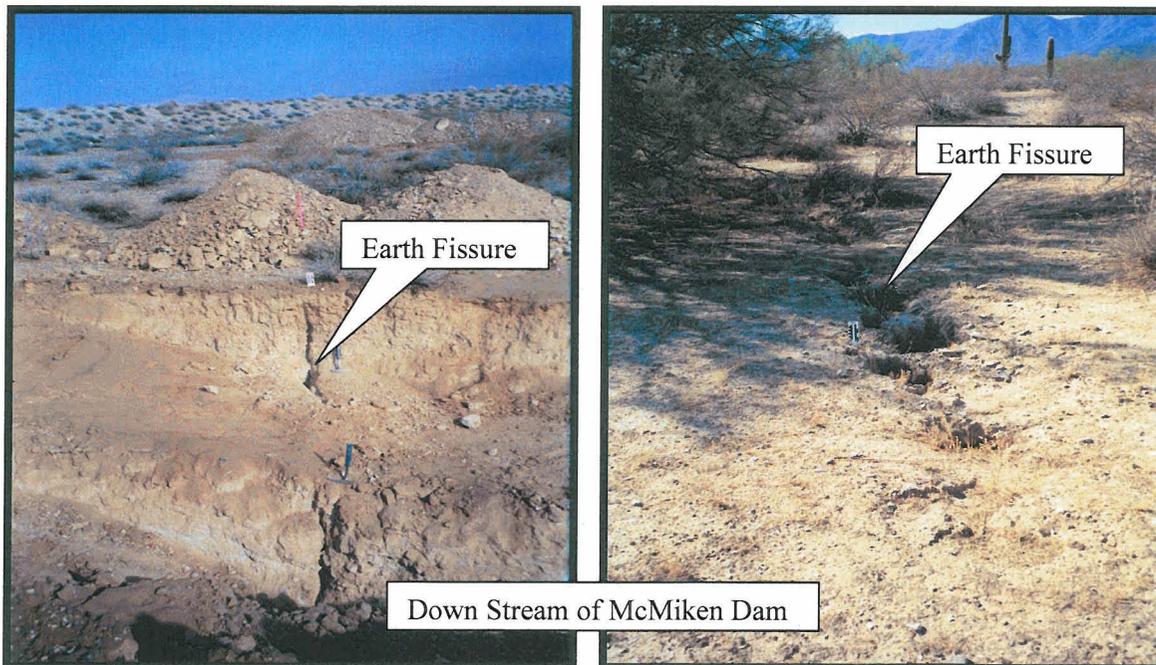
While the surrounding area is densely developed, there is still a significant portion of land in the Study Area under agricultural production. Crops include cotton, onion, grapes, alfalfa, corn, lettuce and citrus fruits. However, these lands are being rapidly converted for development. The remainder of land within the Study Area is comprised primarily of residential development, with some supporting commercial, industrial and public development, and Luke Air Force Base.

Without Project Flood Damage Analysis

Key Assumptions

Up to the present, McMicken Dam has been assumed to provide in excess of 100-year protection to downstream areas. As a result, the Study Area is not zoned by FEMA as being within the 100-year floodplain. This has enabled the rapid development of the Study Area to occur. For areas that are designated by FEMA to be within the 100-year floodplain, there is a requirement for developers to provide floodproofing to protect properties up to the 100-year level (assuming the community participates in the National Flood Insurance Program).

As noted, recent engineering analysis has revealed substantial structural problems with the dam that compromise its ability to withstand the pressures of a major flood event. It has been assumed for this analysis that due to the anticipated further degradation of the structural integrity of the dam, the Arizona Department of Water Resources will declare it unsafe, with a mandated requirement to remove the capability of the Dam to impound floodwaters by removing segments of the Dam. The date at which time the Dam would be declared unsafe and segments removed is highly uncertain. However, this analysis assumes that such action would be required within the next decade, which would roughly correspond with the beginning of the period of analysis for the Feasibility Study.

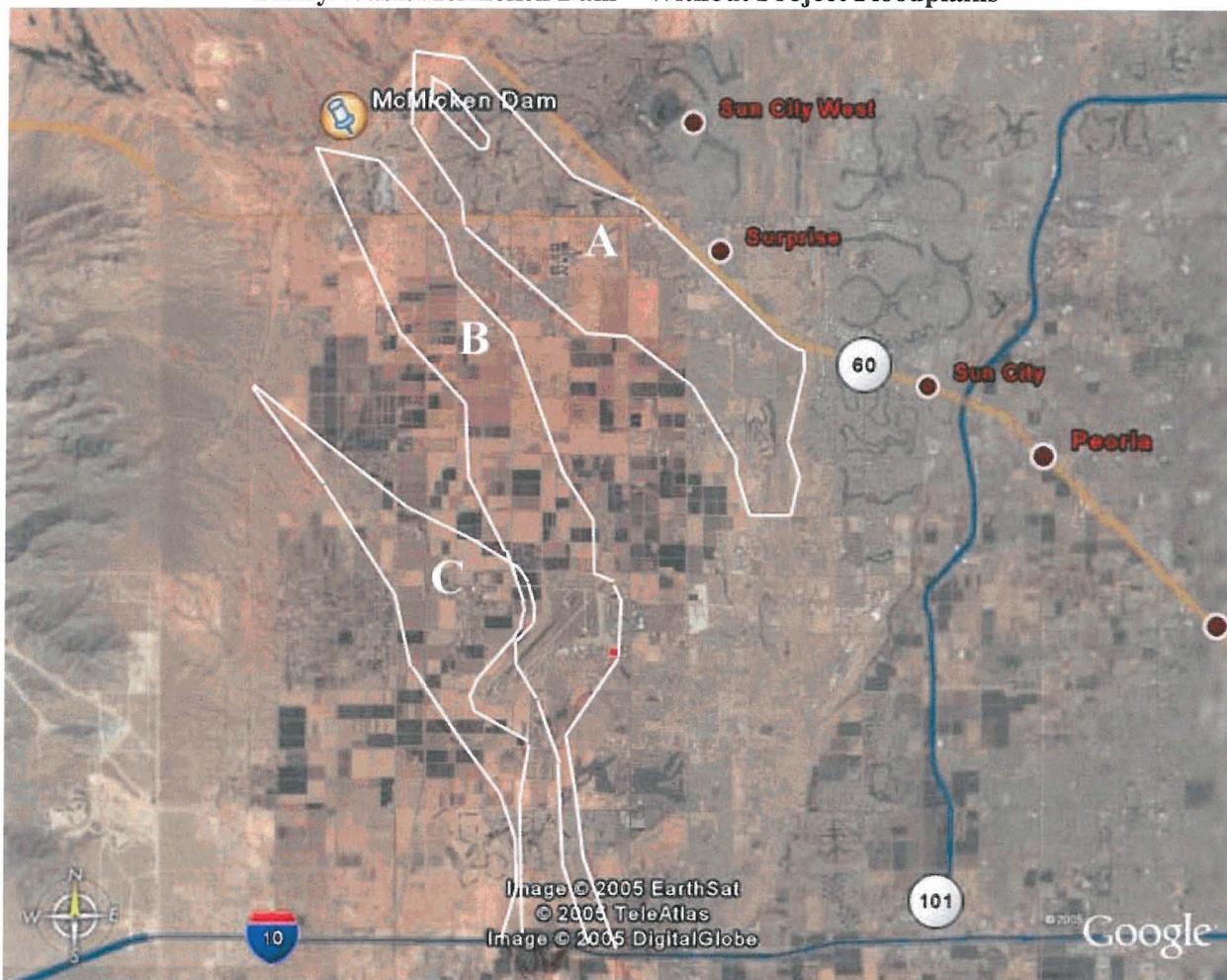


The impact of this assumption on the results of the analysis is dramatic. If it was assumed that the existing dam would remain in place, e.g., if measures could be implemented to maintain its structural integrity, damage estimates would be based upon an assumed level of protection possibly in excess of the 100-year event, with a single overflow area corresponding with the overtopping of the spillway for less probable flood events. By assuming that the Dam will need to be breached in multiple locations, this in essence eliminates any protection provided by the Dam and results in multiple large floodplains corresponding to the breach locations. These floodplains would sustain damages for very minor flood events. Further, all of the downstream floodplain areas would eventually be rezoned by FEMA as 100-year floodplain, hence requiring any future development to implement expensive floodproofing measures or build elsewhere.

Without Project Floodplain Delineations

The FCDMC has identified three locations along the Dam that would be likely selected for removal under this without project scenario, and developed overflow maps corresponding with the resulting floodplains associated with a major storm event. These floodplain delineations are shown in Figure 1.7, with the three breach floodplains designated as A, B, and C, respectively.

Figure 1.7
Trilby Wash/McMicken Dam – Without Project Floodplains



Floodplain Property Inventory

In order to assess the potential damages in the Study Area floodplains depicted in Figure 1.7, it is necessary to first develop an inventory and valuation of floodplain property. A few limitations of the inventory developed for this analysis need to be pointed out, including:

- This assessment only includes structures and contents. It does not include the value of agricultural crops, which represent a significant portion of the floodplain and would also be susceptible to flood damages. (Figure 1.8)

Figure 1.8 Agriculture along State Route 303 near Waddell Road.



- The number, type, and size of floodplain structures were determined based upon viewing aerial photography through the Google Earth software program. No assessors' data was obtained to ascertain detailed structural data, including square feet, date of construction, type of structure, type of construction, number of stories, etc. (Figures 1.9, 1.10 and 1.11)

Figure 1.9 New Home Construction immediately downstream of McMiken Dam.

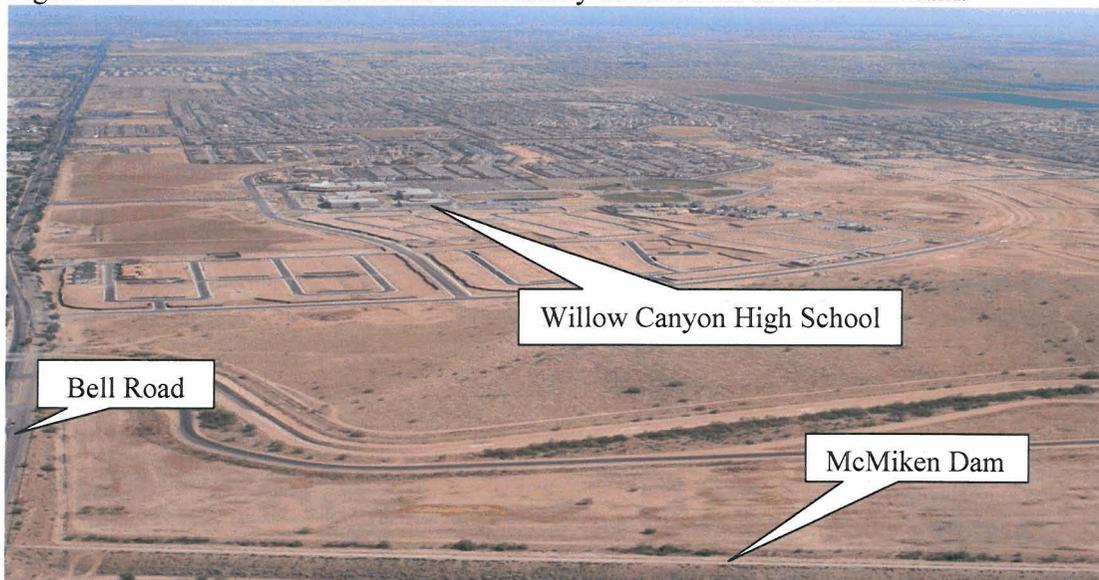


Figure 1.10 New Home Construction immediately downstream of McMiken Dam.

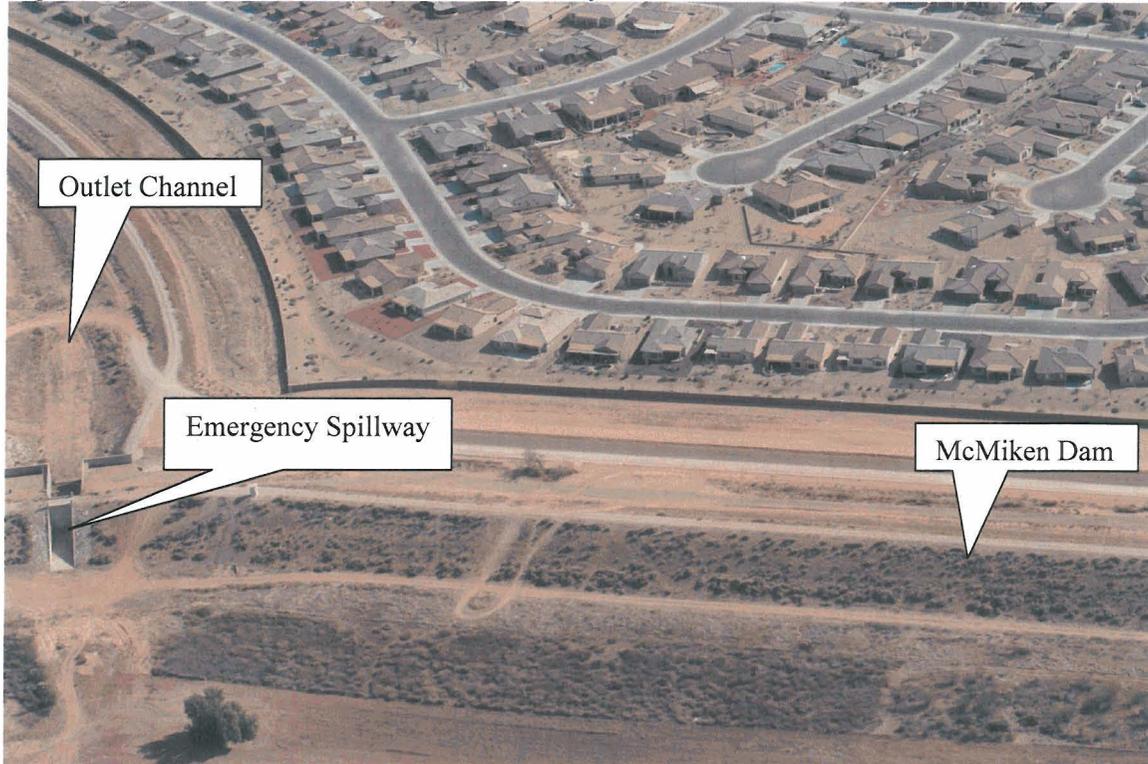
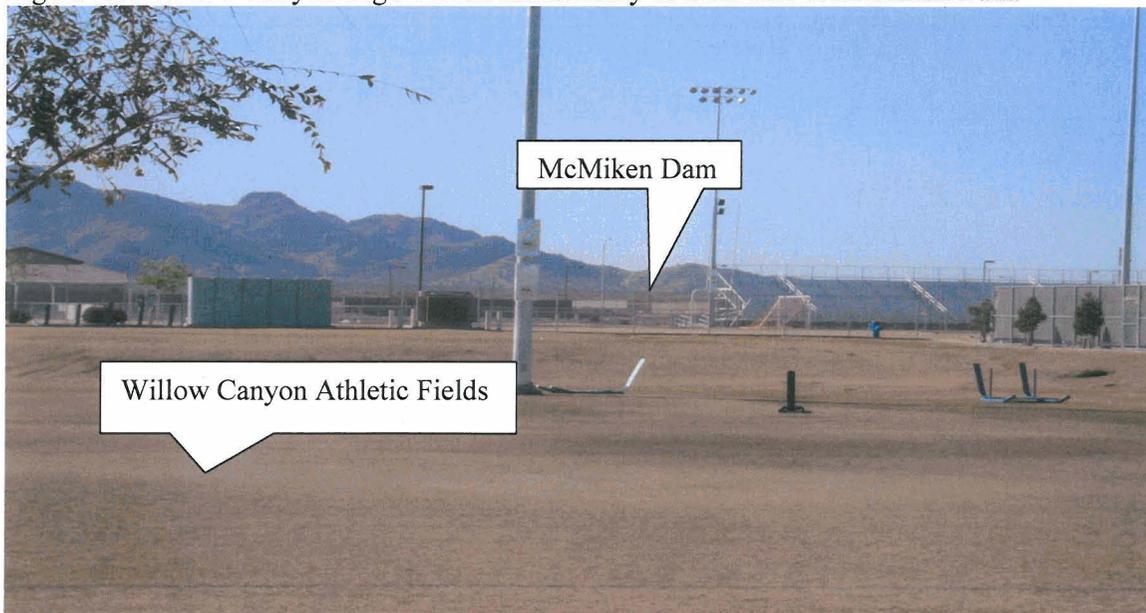


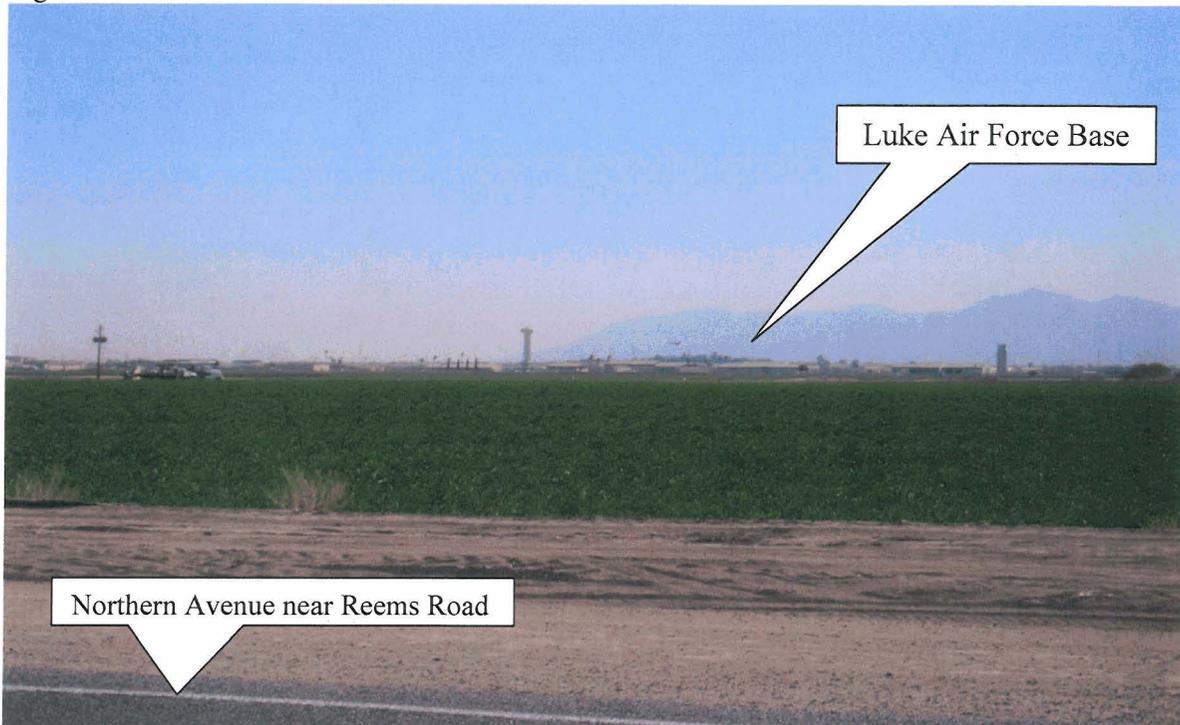
Figure 1.11 Willow Canyon High School immediately downstream of McMiken Dam.



- No detailed information was obtained from Luke AFB regarding the type of structures, type and value of contents, depth/damage relationships for unique military equipment, etc. (although some structure classifications were determined based upon a Base site map). A Reconnaissance Study conducted by the Corps in 1992 assessing localized flood damages on the Base indicated that some structures contained contents exceeding \$100 million in value, e.g., aircraft engines, parts

and supplies, tools, testers, computers, and other equipment. Further this analysis does not attempt to quantify any values or damages to the hundreds of aircraft located on the Base, or the potential impacts to National security should the Base sustain major flooding. (Figure 1.12)

Figure 1.12 Luke Air Force Base.



- The date of the Google Earth aerials is uncertain. Regardless of how recent the aerials are, the structure unit counts described below will be out of date, as it is apparent that there is substantial development taking place in these floodplains (as evidenced by the visible subdivided lots, grading, and foundations without structures built yet).

Given these limitations, following methodology was employed:

- Number of Structures: Structure unit counts were derived by viewing aerial photography of the Study Area via Google Earth software. The resolution of the images was sufficient to easily distinguish individual structures.
- Type of Structures: The aerial photographs enabled clear identification of residential structures, including single family units, mobile homes, and multi-family residences. However, for non-residential structures, classifications were deducted based upon size, configuration, location and surrounding facilities.
- Size of Structures: For single family residences, an average size of 1,600 square feet was applied to virtually all units. For all other types of structures, the size of each unit was estimated using the measurement tool provided by the Google Earth software. Hence, the square footage estimates for all commercial, industrial, public and multi-family residential structures represent the estimated size of the first floor only (since it is not possible to view the number of stories).
- Construction Quality: In the absence of any field survey data, it was assumed that all floodplain structures are of average to good construction quality.
- Condition/Depreciation: In the absence of any field survey data, it was assumed that all floodplain structures are in average to good condition, with a corresponding economic depreciation of 20% from full replacement value.

- Value of Structures: Depreciated replacement cost values are the basis for economic values and damage estimates. Note that land values are not included. DRC values were derived by first multiplying the size of the unit (square feet) times a Marshall & Swift Valuation Service multiplier to derive the replacement cost, and then deducting 20% from this value to estimate the depreciated replacement cost. M&S values were developed for each structure type in the floodplain, and are based upon construction type and quality, with adjustments for local building costs.
- Value of Contents: The value of contents were estimated as follows: residential (sfr, mfr, mh) = 50%; public (schools, churches, post offices, auditoriums, etc.) = 30%; and all other (primarily commercial and industrial) = 100%. As noted previously, this assumption certainly underestimates the value of contents for some structures on Luke AFB.

The following table summarizes the results of the structure inventory analysis.

	Breach A	Breach B	Breach C	Total
Number of Structures	20,438	5,667	744	26,849
Total Structure Value	\$ 2,059,860	\$ 554,038	\$ 78,641	\$ 2,692,540
Total Content Value	\$ 1,082,440	\$ 333,133	\$ 40,925	\$ 1,456,498
Total Property Value	\$ 3,142,301	\$ 887,172	\$ 119,566	\$ 4,149,038
Avg. Structure Value	\$ 100.79	\$ 97.77	\$ 105.70	\$ 100.28
Avg. Content Value	\$ 52.96	\$ 58.78	\$ 55.01	\$ 54.25
Content %	53%	60%	52%	54%

As shown above, this preliminary inventory indicates that there are nearly 27,000 structures in the three floodplains with a combined value of structures and contents exceeding \$4.1 billion. Over three-quarters of the number and value of structures are within the Breach A floodplain. This floodplain has very dense residential development at the north end adjacent to the Dam, as well as at the downstream limit. It should also be noted that this floodplain also corresponds with the spillway floodplain delineations that depict the potential flooded area from a major flood event exceeding the Dam's storage capacity and overtopping the spillway.

Most of the remaining structures are located in the Breach B floodplain. However, there is substantial overlap at the downstream limit of the Breach B and C floodplains. Structures in the overlap area were assigned to Breach B to avoid double counting. Breach B also includes Luke AFB.

Single-family residences comprise nearly 89% of the total structure inventory, and account for about 83% of the total property value.

It should be reiterated that these values do not include the value of agricultural crops. Further, simple content percentages were applied to estimate content values for Luke AFB structures, which may significantly underestimate the value of high-technology equipment such as flight simulators, aircraft engines, computers, testing equipment, etc. The inventory also does not include Base aircraft.

Flood Depths

Engineering Division provided estimates of discharges and flood depths for four cross sections along each of the three breach floodplains. This data was provided for the 10, 50, 100, and 500-year flood probabilities. The 5-year event has been estimated as the non-damaging flood probability, based upon the shallow depths of flooding and the likely carrying capacity of local drainage facilities and streets.

Because there are no defined channels downstream of the dam breach locations and the topography is fairly flat, flows are expected to cover the entire expanse of the floodplains shown in Figure 2 for any significant flood event, although flood depths would be shallow. For the Breach A and B floodplains, typical depths for the 10-year flood probability are estimated at approximately 0.5 feet. Maximum flood depths for the 500-year event have been estimated at about two feet. Flood depths are substantially lower for the Breach C floodplain, as shown on Table 2 below.

	Breach A	Breach B	Breach C
10 Yr			
Discharge	5,940	5,940	1,320
Avg. Flood Depth	0.5	0.6	0.2
50 Yr			
Discharge	16,110	16,110	3,580
Avg. Flood Depth	0.8	0.9	0.3
100 Yr			
Discharge	22,815	22,815	5,070
Avg. Flood Depth	1.0	1.1	0.4
500 Yr			
Discharge	45,900	45,900	10,200
Avg. Flood Depth	1.6	1.6	0.6

Flood Damages by Event/Probability

Flood damages for the 10, 50, 100 and 500-year flood probabilities were computed as follows:

- 1) Flood depths for each probability were assigned to each structure based upon the applicable data at the nearest cross section to the structure.
- 2) Since a field survey was not conducted to verify first floor elevations, a uniform distribution was assumed for all structures, with a range of zero to two feet above ground level (with a resulting mean of one foot). Inundation depths by flood probability were computed by subtracting the first floor elevation from the respective flood depths assigned in Step 1.
- 3) Structure and content damages were computed as a percentage of respective structure and content values for each structure, based upon inundation depth and type of structure. For SFRs, the generic depth/damage functions contained in Economic Guidance Memorandum

01-03 were used. For other types of structures, depth/damage functions developed by FEMA (based upon flood insurance claims data) and expert panels were applied.

- 4) A limited risk and uncertainty analysis was applied by specifying structure and content values as a probability distribution rather than a deterministic value. A normal distribution with a standard deviation equal to 20 percent of the expected value was assumed. Also, the depth/damage functions for SFRs were entered as probability distributions as well, with the mean and standard error estimates contained in the guidance.
- 5) The @Risk program, which works with Microsoft Excel, was used to develop mean damage and standard deviation estimates by flood probability for each of the three breach floodplains. The following table summarizes the resulting mean damage estimates.

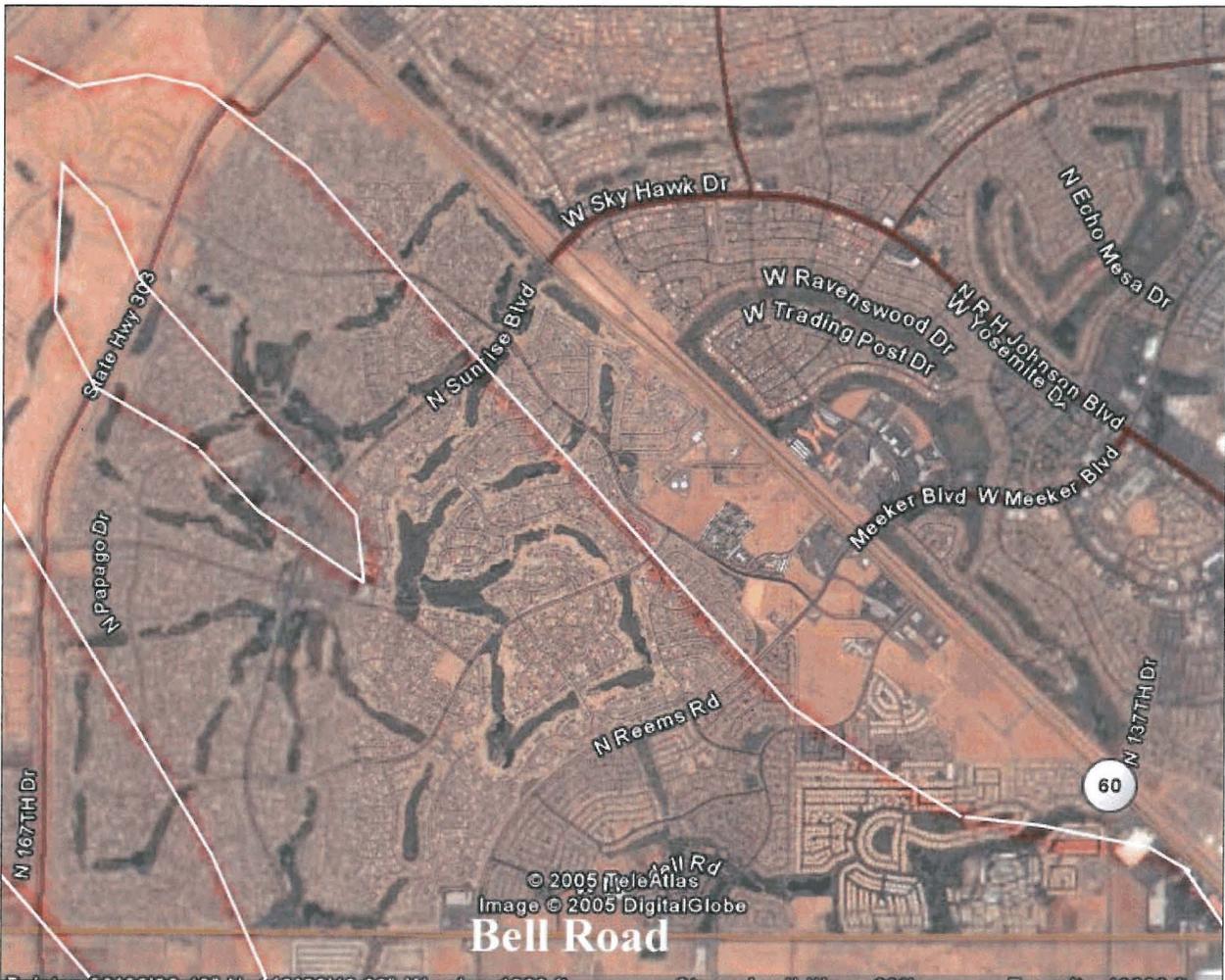
	10-Yr	50-Yr	100-Yr	500-Yr
Breach A				
Structure	\$ 124,461	\$ 189,921	\$ 228,265	\$ 331,095
Contents	\$ 79,398	\$ 117,027	\$ 139,193	\$ 195,947
Total	\$ 203,858	\$ 306,947	\$ 367,458	\$ 527,043
Breach B				
Structure	\$ 31,070	\$ 52,395	\$ 65,158	\$ 99,987
Contents	\$ 18,523	\$ 31,170	\$ 38,834	\$ 62,235
Total	\$ 49,593	\$ 83,565	\$ 103,993	\$ 162,223
Breach C				
Structure	\$ 3,508	\$ 4,414	\$ 4,901	\$ 6,357
Contents	\$ 2,325	\$ 2,842	\$ 3,135	\$ 4,012
Total	\$ 5,832	\$ 7,255	\$ 8,036	\$ 10,369
Total (All Reaches)	\$ 259,284	\$ 397,767	\$ 479,486	\$ 699,634

As shown on Table 3, damages are estimated to be very significant, ranging from about \$259 million for the 10-year flood probability to nearly \$700 million for the 500-year flood probability. Although these damage estimates are large, they are a direct result of the assumptions made for this analysis relating to the large expanse of flooding that would result from any significant flood following the specified breaches of the dam. Note that even damages for the 500-year flood represent less than 18 percent of the estimated value of structures and contents in the floodplain. Most of the estimated damages are within the Breach A floodplain, corresponding with the fact that this floodplain has the most development and property value within its boundaries. Figure 3 shows the dense development in the Breach A floodplain north of Bell Road.

Other Damages

Other damages not computed for this limited assessment include: agricultural damages to crops and farms and equipment, emergency and cleanup damages, vehicle damages, transportation costs, damages to roads and other public infrastructure, and unique damages to Luke AFB, including damages to high-value military equipment and base aircraft.

Figure 3
Breach A Floodplain – North of Bell Road



During the 1992 Reconnaissance Study, interviews with Base personnel indicated that aircraft, including several hundred F-16 fighter jets, could sustain damages from inundation levels exceeding six inches. Inundation depths of approximately seven inches would require the nose landing gear tire assemblies be removed and bearings be removed, cleaned, inspected, repacked and reinstalled. For inundation levels of about one foot, Base personnel stated that both main tire assemblies would also need to be removed, cleaned, inspected, repacked, and reinstalled. Wheel speed sensors would require inspection and replacement if damaged. The probability of a speed sensor requiring replacement was estimated at one in thirty. The total estimated cost per aircraft at the time of the study was estimated at \$354 (1992 price levels). Such damage estimates would need to be updated and verified with Base personnel during the Feasibility Study. Further, the Feasibility Study will need to document the potential for negative impacts to national security that could result from inundation of the Base.

Expected Annual Structure & Content Damages

The HEC-FDA program was utilized to compute expected annual damages to structures and contents. Input into the program included the following data for each dam breach location:

- Frequency/Discharge functions (see Table 2). Also, the statistical distributions of the functions were estimated using the graphical method and a 50-year period of record.
- Stage/Discharge functions (see Table 2). Instead of basing these functions on water surface elevations, the average flood depths were used.
- Stage/Damage functions (see Table 3). Again, damages were tied to the average flood depths for these functions. Also, R&U was applied by entering the standard deviation estimates resulting from the @Risk simulations used to compute damages by frequency.

The results of the analysis are shown below.

	Structure	Contents	Total
Breach A	\$ 19,148	\$ 13,890	\$ 33,038
Breach B	\$ 5,369	\$ 3,543	\$ 8,912
Breach C	\$ 484	\$ 375	\$ 859
Total (All Reaches)	\$ 25,001	\$ 17,808	\$ 42,809

Total structure and content EAD is estimated at \$42.8 million. Most of these damages are concentrated in the Breach A floodplain. Most of the remaining damages are within the Breach B floodplain. However, as noted previously, the structures in the overlapping portions of the Breach B and C floodplains were assigned to Breach B, so the damages shown in Table 4 may understate potential damage in the Breach C floodplain.

These damage estimates are very significant and are attributable to the large number of structures in the floodplains and the without-project assumption that the dam would be breached essentially eliminating any protection currently afforded by the dam.

Including costs and damages for categories beyond structures and contents would result in even higher estimates. However, structures and contents are the primary damage category and represent the majority of potential damages in the floodplains.

With Project Analysis

Potential Benefits

A simplified analysis was conducted to develop an estimate of the magnitude of benefits that could be realized by making the necessary improvements to the dam to assure its structural integrity and to provide a 100-year level of protection. To derive this estimate of benefits, the levee function of the HEC-FDA program was utilized, with the levee height set at just above the 100-year flood depth. The model results

show potential damages reduced of about \$36.6 million, or roughly 86 percent of without project damages. Again, this only includes structure and content damages, and the previous caveats regarding these estimates must be stressed.

Potential Alternatives & Costs

The Local Sponsor, the Corps, and Stantec, Entellus, LTM personnel developed an array of alternatives in 2004 to improve the dam and address its deficiencies. The alternatives were screened and ranked based upon various factors, including project performance, consequences of failure, cost, time and schedule, environmental consequences, opportunities for other benefits, and landscaping, aesthetics, and multi-use opportunities. Alternatives developed included:

- Increasing storage volume of the dam
- Increasing outlet capacity of the dam
- Segmentation and/or removal of portions of the dam
- Diversion of flow out of the dam
- Construction of a new dam
- Conversion of part of the dam to channel with levee
- Converting the entire dam to a system of channels and levees
- Constructing a new dam
- Constructing detention and retention facilities
- Utilizing/improving CAP storage capacity

Of the dam rehabilitation alternatives, the highest ranked alternative was segmenting and removing portions of the dam. Of the dam decommissioning and replacement alternatives, constructing a system of channels and levees was ranked highest.

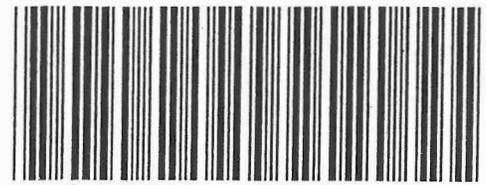
All of the preliminary designs and cost estimates were based upon an assumed minimum of a 200-year level of protection. The cost estimates prepared by Stantec Consulting, Inc. indicate that the costs for the dam rehabilitation alternative could range from \$42 million to \$64 million. Estimated costs for the dam decommissioning alternative had a much wider range, from \$54 million to \$237 million, due to the significant uncertainties given the level of analysis.

With a project cost range of \$42 million to \$237 million, the equivalent annual costs would range from \$2.3 million to \$13.3 million.

Benefit/Cost Analysis

Based upon the assumptions utilized to estimate without project damages and potential with-project benefits, even a project with a cost at the high end of the range would be well justified from an economic perspective. The expected annual benefits to structures and contents for a plan providing a 100-year level of protection were estimated at roughly \$36.6 million, while average annual costs for preliminary designs to provide a 200-year level of protection have been estimated to range anywhere between \$2.3 and \$13.3 million. Although the wide range of potential costs and the uncertainty relating to the total benefits make it impossible to specify a benefit/cost ratio, these results do show a high likelihood of identifying an economically justified alternative. Of course, it must be reiterated that these results could change substantially with more detailed engineering and economic analysis or major changes in without project assumptions.

CLERK OF THE BOARD
BASKET PICK UP



OFFICIAL RECORDS OF
MARICOPA COUNTY RECORDER
HELEN PURCELL
2005-0297457 03/10/05 15:55
4 OF 4

TOHUTAC

AMENDMENT
FCD 2004A013A

to

INTERGOVERNMENTAL AGREEMENT
FCD 2004A013

for the

TRILBY WASH
MARICOPA COUNTY, ARIZONA
FEASIBILITY STUDY

FEASIBILITY COST SHARING AGREEMENT

between the

Flood Control District of Maricopa County

and the

United States Army Corps of Engineers

AMENDMENT
IGA FCD 2004A013A

Agenda Item C-69-05-032-2-01

DATE FILED WITH MARICOPA COUNTY RECORDER March 10, 2005

AMENDMENT FCD 2004A013A is made this 5th day, of January, 2005, by and between the Department of the Army (hereinafter the "Government"), represented by the District Engineer executing this Amendment, and: The Flood Control District of Maricopa County, Arizona, represented by the CHAIRMAN OF THE BOARD, (hereinafter the "Sponsor"),

Amendment FCD 2004A013A is to replace the first two "Whereas" statements as follows:

Delete from the agreement the first two "Whereas" statements that reads as follows:

WHEREAS, Public Law 761, seventy-fifth Congress, dated June 28, 1938 authorized and directed the Secretary of War to conduct preliminary examinations and surveys of the Gila River and its tributaries in Arizona, and the Senate Energy and Water Development Appropriation Bill, 1994, dated September 7, 1993 (to accompany House Report 2445) provided funding for the U.S. Army Corps of Engineers to conduct a reconnaissance study investigating flood control, flood damage reduction, ecosystem restoration, recharge and water quality on the Agua Fria River Watershed known as Trilby Wash/McMiken Dam; and

WHEREAS, the U.S. Army Corps of Engineers has conducted a reconnaissance study investigating flood control, flood damage reduction, recharge and water quality on the Agua Fria River known as Maricopa County (Trilby Wash/McMiken Dam), Arizona, and the Energy and Water Development Appropriations Act, 2000 (Public Law 106-60), dated 29 September 1999, pursuant to this authority, and has determined that further study in the nature of a "Feasibility Phase Study" (hereinafter the "Study") is required to fulfill the intent of the study authority and to assess the extent of the Federal interest in participating in a solution to the identified problem; and

Add as the first two "Whereas" statements to the agreement the following:

WHEREAS, the Congress has authorized the Secretary of War to conduct a preliminary examination and survey for flood control of the Gila River and tributaries, Arizona and New Mexico, pursuant to Public Law 761, 75th Congress, June 28, 1938, as supplemented in accordance with the requirements of such Public Law by U.S. House of Representatives Committee on Public Works and Transportation Resolution, State of Arizona, Docket 2425, dated May 17, 1994, which authorized the Secretary of the Army to determine whether modifications of the recommendations published in various documents including House Document 216, 89th Congress, 1st Session, are advisable in the interest of flood damage reduction, environmental protection and restoration, and related purposes; and

WHEREAS, the U.S. Army Corps of Engineers has conducted a reconnaissance study of flood control issues on the Agua Fria River, a tributary of the Gila River, Maricopa County pursuant to this authority, and has determined that further study in the nature of a "Feasibility Phase Study" (hereinafter the "Study") is required to fulfill the intent of the study authority and to assess the extent of the Federal interest in participating in a solution to the identified problem; and

IN WITNESS WHEREOF, the parties hereto have executed this Agreement, which shall become effective upon the date it is signed by the District Engineer for the U.S. Army Corps of Engineers, Los Angeles District.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY, A Municipal Corporation

Recommended by:

SR 12/21/04
Timothy S. Phillips, P.E. Date
Acting Chief Engineer and General Manager

Approved and Accepted by:

Max W. White 1/5/05
Chairman, Board of Directors Date

Attest by:

Janet C. Causel 1/5/05
Clerk of the Board Date

The foregoing Intergovernmental Agreement IGA FCD 2004A013A has been reviewed pursuant to Arizona Revised Statutes § 11-952, as amended, by the undersigned General Counsel, who has determined that it is in proper form and within the powers and authority granted to the Flood Control District of Maricopa County under the laws of the State of Arizona.

Jelie M. Edmonson 12/6/04
General Counsel Date

DEPARTMENT OF THE ARMY

Alex C. Dornstauder 2.13.05
BY Date

Alex C. Dornstauder
Colonel, US Army
District Engineer

CERTIFICATION OF LEGAL REVIEW

The Feasibility Cost Sharing Agreement for the Trilby Wash, Maricopa County Arizona, Feasibility Study has been fully reviewed and approved by the Office of Counsel, USAED, Los Angeles.

Lawrence P. Mord 1/28/05
DISTRICT COUNSEL Date

CERTIFICATE OF AUTHORITY

I, Julie M. Lemmon, do hereby certify that I am the principal legal officer of the **Flood Control District of Maricopa County, Arizona**, that the **Flood Control District of Maricopa County, Arizona** is a legally constituted public body with full authority and legal capability to perform the terms of the Agreement between the Department of the Army and the **Flood Control District of Maricopa County** in connection with the **Trilby Wash Maricopa County Arizona Feasibility Study**, and to pay damages, if necessary, in the event of the failure to perform, in accordance with Section 221 of Public Law 91-611, and that the person(s) who has/have executed this Agreement on behalf of the **Flood Control District of Maricopa County, Arizona** has/have acted within their statutory authority.

IN WITNESS WHEREOF, I have made and executed this certification this 6th day of December 2004.

Julie M. Lemmon 12/6/04
GENERAL COUNSEL Date

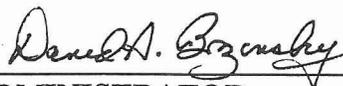
CERTIFICATION REGARDING LOBBYING

The undersigned certifies, to the best of his or her knowledge and belief that:

- (1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
- (2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.
- (3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by Section 1352, Title 31, U. S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

BY:

 12/6/2004

ADMINISTRATOR

Date

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

When Recorded Return to:
Contracts Branch
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, AZ 85009

INTERGOVERNMENTAL AGREEMENT

for the

**TRILBY WASH
MARICOPA COUNTY, ARIZONA
FEASIBILITY STUDY**

FEASIBILITY COST SHARING AGREEMENT

between the

Flood Control District of Maricopa County

and the

United States Army Corp of Engineers

IGA FCD 2004A013

Agenda Item C-69-05-032-2-00

DATE FILED WITH MARICOPA COUNTY RECORDER _____

AGREEMENT
BETWEEN THE DEPARTMENT OF THE ARMY
AND
THE FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
FOR THE
TRILBY WASH, MARICOPA COUNTY ARIZONA FEASIBILITY STUDY

THIS AGREEMENT is entered into this 29 day, of September, 2004, by and between the Department of the Army (hereinafter the "Government"), represented by the District Engineer executing this Agreement, and: The Flood Control District of Maricopa County, Arizona, represented by ANDREW KUNASEK, (hereinafter the "Sponsor"),

WITNESSETH, that

WHEREAS, Public Law 761, seventy-fifth Congress, dated June 28, 1938 authorized and directed the Secretary of War to conduct preliminary examinations and surveys of the Gila River and its tributaries in Arizona, and the Senate Energy and Water Development Appropriation Bill, 1994, dated September 7, 1993 (to accompany House Report 2425) provided funding for the U.S. Army Corps of Engineers to conduct a reconnaissance study investigating flood control, flood damage reduction, ecosystem restoration, recharge and water quality on the Agua Fria River Watershed known as Trilby Wash/McMiken Dam; and

WHEREAS, the U.S. Army Corps of Engineers has conducted a reconnaissance study investigating flood control, flood damage reduction, recharge and water quality on the Agua Fria River known as Maricopa County (Trilby Wash/McMiken Dam), Arizona, and the Energy and Water Development Appropriations Act, 2000 (Public Law 106-60), dated 29 September 1999, pursuant to this authority, and has determined that further study in the nature of a "Feasibility Phase Study" (hereinafter the "Study") is required to fulfill the intent of the study authority and to assess the extent of the Federal interest in participating in a solution to the identified problem; and

WHEREAS, Section 105 of the Water Resources Development Act of 1986 (Public Law 99-662, as amended) specifies the cost sharing requirements applicable to the Study;

WHEREAS, the Sponsor has the authority and capability to furnish the cooperation hereinafter set forth and are willing to participate in study cost sharing and financing in accordance with the terms of this Agreement; and

WHEREAS, the Sponsor and the Government understand that entering into this Agreement in no way obligates any party to implement a project and that whether the Government supports a project authorization and budgets it for implementation depends upon, among other things, the outcome of the Study and whether the proposed solution is consistent with the Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies and with the budget priorities of the Administration;

NOW THEREFORE, the parties agree as follows:

ARTICLES I - DEFINITIONS

For the purposes of this Agreement:

- A. The term "study costs" shall mean all disbursements by the Government pursuant to this Agreement, from Federal appropriations or from funds made available to the Government by the Sponsor, and all Negotiated Costs of work performed by the Sponsor pursuant to this Agreement. Study Costs shall include, but not be limited to: labor charges; direct costs; overhead expenses; supervision and administration costs; the cost of participation in the Study Management and Coordination in accordance with Article IV of this Agreement, the costs of contracts with third parties, including termination or suspensions charges; and any termination or suspension costs (ordinarily defined as those costs necessary to terminate ongoing contracts or obligations and to properly safeguard the work already accomplished) associated with this Agreement.
- B. The term "estimated Study Costs" shall mean the estimated cost of performing the Study as of the effective date of this Agreement, as specified in Article III.A. of this Agreement.
- C. The term "excess Study Costs" shall mean Study Costs that exceed the estimated Study costs and that do not result from a change in Federal law that increases the cost of the Study, or a change in the scope of the Study requested by the Sponsors.
- D. The term "study period" shall mean the time period for conducting the Study, commencing with the release to the U.S. Army Corps of Engineers Los Angeles District of initial Federal feasibility funds following the execution of this Agreement and ending when the Assistant Secretary of the Army (Civil Works) submits the feasibility report to the Office of Management and Budget (OMB) for review for consistency with the policies and programs of the President.
- E. The term "PMP" shall mean the Project Management Plan, which is attached to this Agreement and which shall not be considered binding on any party and is subject to change by the Government in consultation with the Sponsor.
- F. The term "negotiated costs" shall mean the costs of in-kind services to be provided by the Sponsor in accordance with the PMP.

G. The term "fiscal year" shall mean one fiscal year of the Government. The Government fiscal year begins on October 1 and ends on September 30.

ARTICLE II - OBLIGATIONS OF PARTIES

- A. The Government, using funds and in-kind services provided by the Sponsor and funds appropriated by the Congress of the United States, shall expeditiously prosecute and complete the Study, in accordance with the provisions of this Agreement and Federal laws, regulations, and policies.
- B. In accordance with this Article and Article III.A., III.B, and III. C. of this Agreement, the Sponsor shall contribute cash and in-kind services equal to fifty (50) percent of total Study Costs other than excess Study Costs. The Sponsor may, consistent with applicable law and regulation, contribute up to 50 percent of total Study Costs through the provision of in-kind services. The in-kind services to be provided by the Sponsor, the estimated negotiated costs for those services, and the estimated schedule under which those services are to be provided are specified in the PMP. Negotiated Costs shall be subject to an audit by the Government to determine reasonableness, allocability, and allowability.
- C. The Sponsor shall pay a fifty (50) percent share of excess Study Costs in accordance with Article III.D. of this Agreement.
- D. The Sponsor understand that the schedule of work may require the Sponsor to provide cash or in-kind services at a rate that may result in the Sponsor temporarily diverging from the obligations concerning cash and in-kind services specified in paragraph B of this Article. Such temporary divergences shall be identified in the quarterly reports provided for in Articles III.A. of this Agreement and shall not alter the obligations concerning costs and services specified in paragraph B of this Article or the obligations concerning payment specified in Article III of this Agreement.
- E. If, upon the award of any contract or the performance of any in-house work for the Study by the Government or the Sponsor, cumulative financial obligations of the Government and the Sponsor would result in Study Costs exceeding \$4,281,480.00, the Government and the Sponsor agree to defer award of that and all subsequent contracts, and performance of that and all subsequent in-house work, for the Study until the Government and the Sponsor agree to proceed. Should the Government and the Sponsor require time to arrive at a decision, the Agreement will be suspended in accordance with Article X., for a period of not to exceed six months. In the event the Government and the Sponsor have not reached an agreement to proceed by the end of their 6-month period, the Agreement may be subject to termination in accordance with Article X.
- F. No Federal funds may be used to meet the Sponsors' share of Study Costs unless the Federal granting agency verifies in writing that the expenditure of such funds is expressly authorized by statute.

- G. The award and management of any contract with a third party in furtherance of this Agreement which obligates Federal appropriations shall be exclusively within the control of the Government. The award and management of any contract by the Sponsor with a third party in furtherance of this Agreement which obligates funds of the Sponsor and does not obligate Federal appropriations shall be exclusively within the control of the Sponsor, but shall be subject to applicable Federal laws and regulations.
- H. The Government shall determine whether a response plan is required. If the Government determines that a response plan is required the Sponsor shall be responsible for the total cost of developing a response plan for addressing any hazardous substances covered under the Comprehensive Environmental Response, Compensation and Liability Act of 1980, Pub. L. No. 96-510, 94 Stat. 2767, (codified at 42 U.S.C. Sections 9601-9675), as amended, existing in, on, or under any lands, easements or rights-of-way that the Government, after consultation with the Sponsor, determines to be required for the construction, operation, and maintenance of the project. Such costs shall not be included in total study costs.

ARTICLE III - METHOD OF PAYMENT

- A. The government shall maintain current records of contributions provided by the parties, current projections of total Study Costs, and current projections of each party's share of total Study Costs and current projections of the amount of the Study Costs that will result in excess Study Costs. At least quarterly, the Government shall provide the Sponsor a report setting forth this information. Total Study Costs are currently estimated to be \$4,281,480.00 and the Sponsors' share of total Study Costs is currently estimated to be \$2,140,740.00. In order to meet the Sponsors' cash payment requirements, the Sponsor must provide a cash contribution estimated to be \$1,010,940.00. The dollar amounts set forth in this Article are based upon the Government's best estimates, which reflect the scope of the study described in the PMP, projected costs, price-level changes, and anticipated inflation. Such cost estimates are subject to adjustment by the Government and are not to be construed as the total financial responsibilities of the Government and the Sponsor.
- B. The Sponsors shall provide the cash contribution required under Article II.B. of this Agreement in accordance with the following provisions:
1. For purposes of budget planning, the Government shall notify the Sponsor by September 1 of each year of the estimated funds that will be required from the Sponsor to meet the Sponsors' share of total Study Costs for the upcoming fiscal year.
 2. No later than 60 calendar days prior to the scheduled date for the Government's issuance of the solicitation for the first contract for the Study or for the Government's anticipated first significant in-house expenditure for the Study, the Government shall notify the Sponsor in writing of the funds the Government determines to be required from the Sponsor to meet its required share of total Study Costs for the first fiscal year of the Study. No later than 30 calendar days thereafter, the Sponsor shall provide the

Government the full amount of the required funds by delivering a check payable to "FAO, USAED, Los Angeles" to the contracting officer representing the Government.

3. For the second and subsequent fiscal years of the Study, the Government shall, no later than sixty (60) calendar days prior to the beginning of the fiscal year, notify the Sponsor in writing of the funds the Government determines to be required from the Sponsor to meet the required share of total Study Costs for that fiscal year, taking into account any temporary divergences identified under Article II.D. of this Agreement. No later than 30 calendar days prior to the beginning of the fiscal year, the Sponsor shall make the full amount of the required funds available to the Government through the funding mechanism specified in paragraph B.2. of this Article.
 4. The Government shall draw from the funds provided by the Sponsor such sums as the Government deems necessary to cover the Sponsors' share of contractual and in-house fiscal obligations attributable to the Study as they are incurred.
 5. In the event the Government determines that the Sponsor must provide additional funds to meet its share of Study Costs, the Government shall so notify the Sponsor in writing. No later than 60 calendar days after receipt of such notice, the Sponsor shall make the full amount of the additional required funds available through the funding mechanism specified in paragraph B.2. of this Article.
- C. Within ninety-days (90) after the conclusion of the Study Period or termination of this Agreement, the Government shall conduct a final accounting of Study Costs, including disbursements by the Government of Federal funds, cash contributions by the Sponsor, and credits for the Negotiated Costs of the Sponsor, and shall furnish the Sponsor with the results of this accounting. Within thirty (30) days thereafter, the Government, subject to the availability of funds, shall reimburse the Sponsor for the excess, if any, of cash contributions and credits given over the required share of total Study Costs, or the Sponsors shall provide the Government any cash contributions required for the Sponsor to meet the required share of total Study Costs.
- D. The Sponsor shall provide the cash contribution for excess Study Costs as required under Article II.C. of this Agreement by delivering a check payable to "FAO, USAED, Los Angeles District" to the District Engineer as follows:
1. After the project that is the subject of this Study has been authorized for construction, no later than the date on which a Project Cooperation Agreement is entered into for the project; or
 2. In the event the project that is the subject of this Study is not authorized for construction by a date that is no later than 5 years of the date of the final report of the Chief of Engineers concerning the project, or by a date that is no later than 2 years after the date of the termination of the study, the Sponsor shall pay the share of excess costs on that date (5 years after the date of the Chief of Engineers or 2 years after the date of the termination of the study).

ARTICLE IV - STUDY MANAGEMENT AND COORDINATION

- A. To provide for consistent and effective communication, the Sponsor and the Government shall appoint named senior representatives to an Executive Committee consisting of the Los Angeles District Deputy District Engineer for Project Management, the Los Angeles District Chief of Planning Division and the Chief Engineer and General Manager of the Flood Control District of Maricopa County. The first meeting of the Executive Committee shall be within two months of the signing of this Agreement. Thereafter, the Executive Committee shall meet regularly until the end of the Study Period.
- B. Until the end of the Study Period, the Executive Committee shall generally oversee the Study consistently with the PMP.
- C. The Executive Committee may make recommendations that it deems warranted to the District Engineer on matters that it oversees, including suggestions to avoid potential sources of dispute. The Government in good faith shall consider such recommendations. The Government has the discretion to accept, reject, or modify the Executive Committee's recommendations.
- D. The Executive Committee shall appoint representatives to serve on a Study Management Team. The Study Management Team shall keep the Executive Committee informed of the progress of the Study and of significant pending issues and actions, and shall prepare periodic reports on the progress of all work items identified in the PMP.
- E. The costs of participation in the Executive Committee (including the cost to serve on the Study Management Team) shall be included in total project costs and cost shared in accordance with the provisions of this Agreement.

ARTICLE V - DISPUTES

As a condition precedent to a party bringing any suit for breach of this Agreement, that party must first notify the other parties in writing of the nature of the purported breach and seek in good faith to resolve the dispute through negotiation. If the parties cannot resolve the dispute through negotiation, they may agree to a mutually acceptable method of non-binding alternative dispute resolution with a qualified third party acceptable to all parties. The parties shall each pay an equal percent of any costs for the services provided by such a third party, as such costs are incurred. Such costs shall not be included in Study Costs. The existence of a dispute shall not excuse the parties from performance pursuant to this Agreement.

ARTICLE VI - MAINTENANCE OF RECORDS

- A. Within sixty (60) days of the effective date of this Agreement, the Government and the Sponsors shall develop procedures for keeping books, records, documents, and other evidence pertaining to costs and expenses incurred pursuant to this Agreement to the extent and in such detail as will properly reflect total Study Costs. These procedures shall incorporate, and apply as appropriate, the standards for financial management systems set forth in the Uniform Administrative Requirement for Grants and Cooperative Agreements to state and local governments at 32 C.F.R. Section 33.20. The Government and the Sponsor shall maintain such books, records, documents, and other evidence in accordance with these procedures for a minimum of three years after completion of the Study and resolution of all relevant claims arising therefrom. To the extent permitted under applicable Federal laws and regulations, the Government and the Sponsors shall each allow the other to inspect such books, documents, records, and other evidence.
- B. In accordance with 31 U.S.C. Section 7503, the Government may conduct audits in addition to any audit that the Sponsor are required to conduct under the Single Audit Act of 1984, 31 U.S.C. Sections 7501-7507. Any such Government audits shall be conducted in accordance with Government Auditing Standards and the cost principles in OMB Circular No. A-87 and other applicable cost principles and regulations. The costs of Government audits shall be included in total Study Costs and shared in accordance with the provisions of this Agreement.

ARTICLE VII - RELATIONSHIP OF PARTIES

The Government and the Sponsor act in independent capacities in the performance of their respective rights and obligations under this Agreement, and no party is to be considered the officer, agent, or employee of the other.

ARTICLE VIII - OFFICIALS NOT TO BENEFIT

No member of or delegate to the Congress, nor any resident commissioner, shall be admitted to any share or part of this Agreement, or to any benefit that may arise therefrom.

ARTICLE IX - FEDERAL AND STATE LAWS

In the exercise of the Sponsors' rights and obligations under this Agreement, the Sponsor agrees to comply with all applicable Federal and State laws and regulations, including Section 601 of Title VI of the Civil Rights Act of 1964 (Public Law 88-352) and Department of Defense Directive 5500.11 issued pursuant thereto and published in 32 C.F.R. Part 195, as well as Army Regulations 600-7, entitled "Nondiscrimination on the Basis of Handicap in Programs and Activities Assisted or Conducted by the Department of the Army."

ARTICLE X - TERMINATION OR SUSPENSION

- A. This Agreement shall terminate at the end of the Study Period, and neither the Government nor the Sponsor shall have any further obligations hereunder, except as provided in Article III.C.; provided, that prior to such time and upon thirty (30) days written notice, either party may terminate or suspend this Agreement. In addition, the Government shall terminate this Agreement immediately upon any failure of the parties to agree to extend the study under Article II.E. of this agreement, or upon the failure of the Sponsor to fulfill the obligations under Article III of this Agreement. In the event that either party elects to terminate this Agreement, both parties shall conclude their activities relating to the Study and proceed to a final accounting in accordance with Article III.C. and III D. of this Agreement. Upon termination of this Agreement, all data and information generated as part of the Study shall be made available to the parties.

- B. Any termination of this Agreement shall not relieve the parties of liability for any obligations previously incurred, including the costs of closing out or transferring any existing contracts.

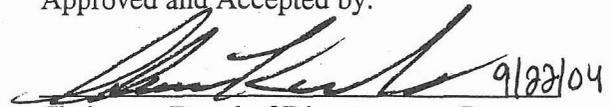
IN WITNESS WHEREOF, the parties hereto have executed this Agreement, which shall become effective upon the date it is signed by the District Engineer for the U.S. Army Corps of Engineers, Los Angeles District.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY, A Municipal Corporation

Recommended by:


Timothy S. Phillips, P.E. Date
Acting Chief Engineer and General Manager

Approved and Accepted by:


Chairman, Board of Directors Date

Attest by:


Clerk of the Board Date

The foregoing Intergovernmental Agreement IGA FCD 2004A013 has been reviewed pursuant to Arizona Revised Statutes § 11-952, as amended, by the undersigned General Counsel, who has determined that it is in proper form and within the powers and authority granted to the Flood Control District of Maricopa County under the laws of the State of Arizona.


General Counsel Date

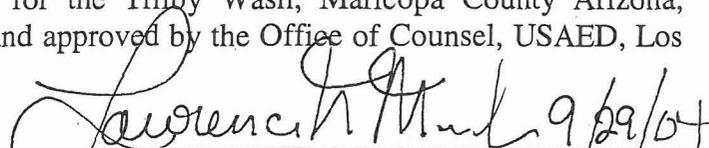
DEPARTMENT OF THE ARMY

BY  29 Sept 04

John V. Guenther
Lieutenant Colonel, US Army
Acting District Engineer

CERTIFICATION OF LEGAL REVIEW

The Feasibility Cost Sharing Agreement for the Trilby Wash, Maricopa County Arizona, Feasibility Study has been fully reviewed and approved by the Office of Counsel, USAED, Los Angeles.


DISTRICT COUNSEL Date

Attachment 1- Project Management Plan, August 2004

CERTIFICATE OF AUTHORITY

I, Julie M. Lemmon, do hereby certify that I am the principal legal officer of the **Flood Control District of Maricopa County, Arizona**, that the **Flood Control District of Maricopa County, Arizona** is a legally constituted public body with full authority and legal capability to perform the terms of the Agreement between the Department of the Army and the **Flood Control District of Maricopa County** in connection with the **Trilby Wash Maricopa County Arizona Feasibility Study**, and to pay damages, if necessary, in the event of the failure to perform, in accordance with Section 221 of Public Law 91-611, and that the person(s) who has/have executed this Agreement on behalf of the **Flood Control District of Maricopa County, Arizona** has/have acted within their statutory authority.

IN WITNESS WHEREOF, I have made and executed this certification this 28th
day of August 2004.

Julie M. Lemmon 8/28/04
Date

GENERAL COUNSEL
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

CERTIFICATION REGARDING LOBBYING

The undersigned certifies, to the best of his or her knowledge and belief that:

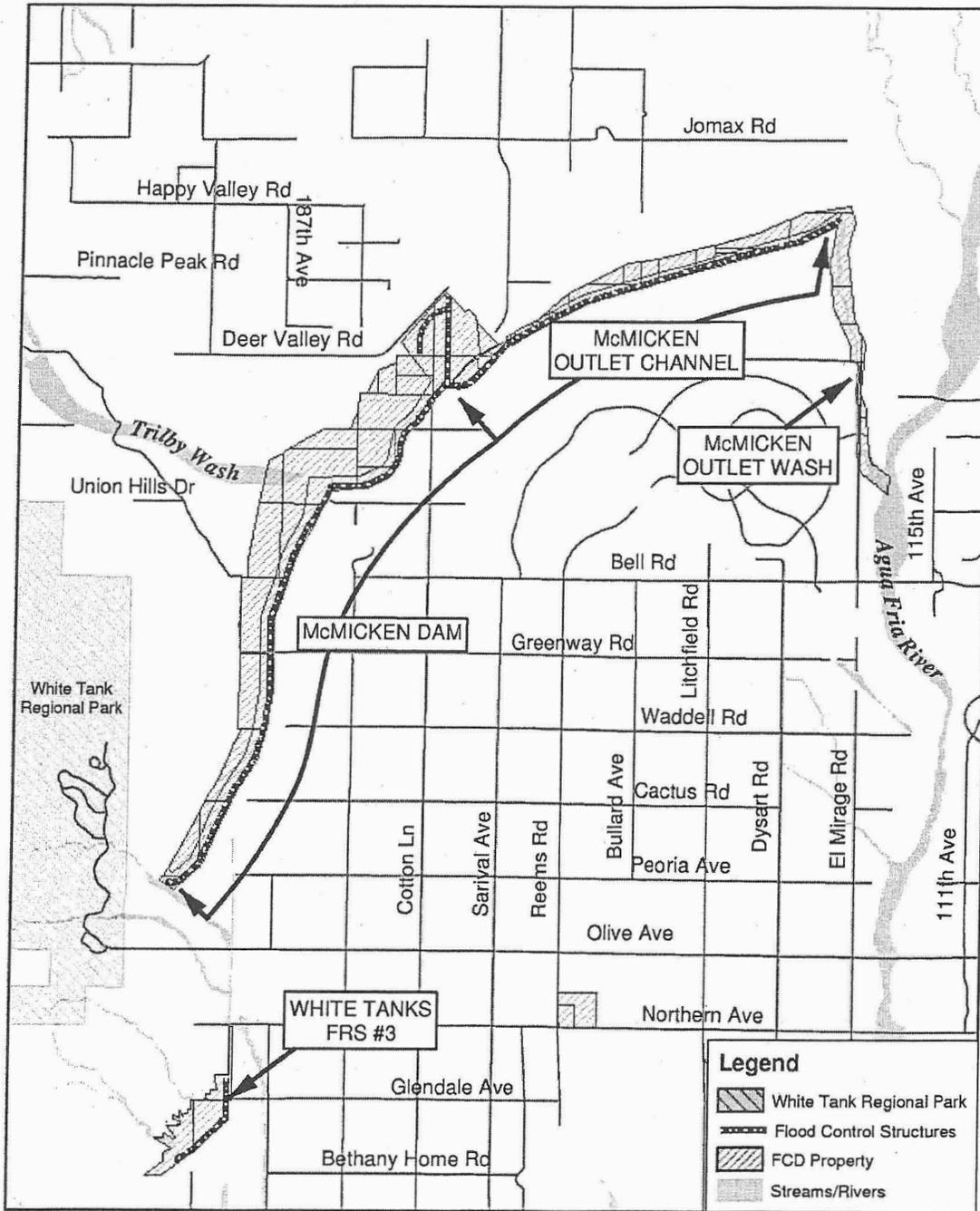
- (1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
- (2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.
- (3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by Section 1352, Title 31, U. S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

BY:

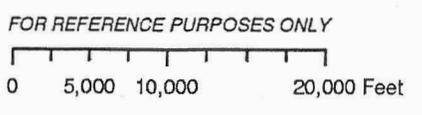
 
ADMINISTRATOR Date
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

Trilby Wash (McMicken Dam) Feasibility Study



Legend

- White Tank Regional Park
- Flood Control Structures
- FCD Property
- Streams/Rivers



Flood Control District of Maricopa County
February 4, 2004

Trilby Wash (McMicken Dam) Feasibility Study Project Management Plan

EXECUTIVE SUMMARY

PROJECT BACKGROUND

The Trilby Wash study area encompasses the Trilby Wash watershed upstream from the McMicken Dam Project to the Agua Fria River. The McMicken Dam Project includes; McMicken Dam, McMicken Dam Outlet Channel and McMicken Outlet Wash (Reference Exhibit A). The U.S. Army Corps of Engineers (Corps) has conducted a reconnaissance study investigating flood control, water quality, restoration of riparian habitat, recreation and recharge for Trilby Wash and the Project area and has determined there is federal interest in further study of the area, proposed as the Trilby Wash Feasibility Study.

Originally termed the Trilby Wash Detention Basin Dam, McMicken Dam was constructed by the Corps in 1954 and 1955 to protect Luke Air Force Base, the Litchfield Park Naval Air Facility and agriculture activities in the area from flooding. The dam is operated and maintained by the Flood Control District of Maricopa County (District). The dam also provides flood protection for critical public facilities and infrastructure such as; hospitals, schools, police and fire stations, freeways and other public roadways, railroads and canals. The ability of McMicken Dam to maintain the current level of flood protection in the long-term for the benefit of the public in an increasingly urbanized environment is in question due to significant concerns regarding aging infrastructure, land subsidence, earth fissuring, urbanization encroachment and current dam safety standards. These dam safety issues have lead the District to determine that an overall rehabilitation or replacement of the dam is required.

In 1973, the Corps evaluated transverse cracking in the dam embankment and recommended remedial treatment. Over the next four years, the Corps attempted to obtain funding to implement the remedial treatment. Failing to secure the necessary funding, the Corps recommended and breached the dam at two locations in 1977. In the 1980's, the District repaired the dam for cracking along the entire length of the embankment. As part of the project, the dam crest was raised to the original design elevation to compensate for loss of elevation due to regional subsidence. No attempt was made to estimate and incorporate future subsidence in the design of this raise. The project also included repairing the two Corps breaches from 1977.

During repairs of McMicken Dam in the 1980s, studies detected the presence of earth fissures, named the Fenne Knoll Fissures in 1982, about 600 feet from the dam at the south end. The fissures are the result of horizontal strains induced by large-scale ground subsidence caused by consolidation of the alluvial basin sediments upon groundwater withdrawal.

As part of the District's Phase II Structures Assessment Program, additional studies have been conducted to further characterize fissuring in the vicinity of the dam. While not an emergency threat to the integrity of the dam, the District has determined that the fissure risk at the southern end of the dam requires an interim dam safety measure to mitigate the risk in the near term. The intent is to avoid the development of an emergency threat to the dam that would likely require removing segments of the dam as was done in 1977 for other dam safety reasons as indicated. The District has initiated a project to install a structural solution to address the fissure risk (McMicken Dam Fissure Risk Zone Remediation Project – McMicken Dam FRZR Project).

Final design of the selected alternative is completed and construction is scheduled to start in early 2005. The McMicken Dam FRZR Project is intended to provide a permanent solution to all dam safety and flood protection issues at the southern end of the dam.

The Trilby Wash Feasibility Study will develop alternatives for the overall rehabilitation or replacement of McMicken Dam in sufficient detail so as to select an alternative that will provide long-term flood protection to the same or greater level currently provided by the McMicken Dam Project.

STUDY TASKS

The District's in-kind services for this study will consist of both in-house staff work on engineering reviews, public involvement activities and overall project management as well as Consultant contract work for geotechnical investigations and landscaping and aesthetics components. The Corps study efforts will primarily include engineering studies, socioeconomic analysis, environmental studies, plan formulation, project management and report documentation.

Major Study Tasks Are As Follows:

- Survey and Mapping
- Hydrology and Hydraulics Studies/Report
- Geotechnical Studies/Report
- Engineering Design Analysis Report
- Socioeconomic Studies
- Real Estate Analysis Report
- Environmental Studies/Report
- Fish and Wildlife Coordination Act Report
- Cultural Resources/Report
- Cost Estimates
- Public Involvement Documents and Activities
- Plan Formulation and Evaluations

STUDY SCHEDULE

The majority of the study effort is anticipated to be completed in a 2-year period assuming the study is adequately funded by the Corps and the District through the annual budget process of each. The process to authorize the design and construction of the Project will take a minimum of one additional year.

STUDY COST

The feasibility study will be cost shared at 50% federal (Corps) and 50% local (District). The total study cost estimate is \$4.3 million. The District's share of the study cost will be approximately \$2.1 million of which \$1.1 million will be in-kind services and \$1.0 million will be as cash contribution. Upon alternative selection and study completion, the District and the Corps intend to seek authorization and funding from Congress for the design and construction of the project at a cost share of the project at 65% federal and 35% local sponsor.

PROJECT MANAGEMENT PLAN DEFINITION

The project management plan for the feasibility phase, herein after referred to as the PMP, is an attachment to the Feasibility Cost Sharing Agreement (FCSA), which defines the planning

approach, activities to be accomplished, schedule, and associated costs that the Federal Government and the local sponsor will be supporting financially. The PMP, therefore defines a contract between the U.S. Army Corps of Engineers (Corps) and the Flood Control District of Maricopa County (District). The PMP describes the initial tasks of the feasibility phase, continues through the preparation of the final feasibility report, the project management plan for project implementation and design agreement, and concludes with support during the Washington-level review of the final feasibility report.

The PMP is a basis for change. Because planning is an iterative process without a predetermined outcome, more or less costs and time may be required to accomplish reformulation and evaluations of the alternatives. Changes in scope will occur as the technical picture unfolds. With clear descriptions of the scopes and assumptions outlined in the PMP, deviations are easier to identify. The impact in either time or money is easily assessed and decisions can be made on how to proceed. The PMP provides a basis for change.

The PMP is a common guide for the review and evaluation of the feasibility report. Since the PMP represents a contract between the Corps and the District, it will be used as the outline to determine if the draft feasibility report has been developed in accordance with established procedures and previous agreements.

The PMP is a study management tool. It includes scopes of work that are used for funding allocation by the project manager. It forms the basis for identifying commitments to the non-Federal sponsor and serves as a basis for performance measurement.

SUMMARY OF PROJECT MANAGEMENT PLAN CONTENTS

The PMP is comprised of the following chapters:

- Chapter 1 - Purpose and Scope. This chapter includes the definition of the PMP and a summary of the PMP requirements.
- Chapter 2 - Section 905(b) Analysis. This chapter includes the approved Section 905(b) Analysis that includes an overview of the reconnaissance study findings, the plan formulation rationale and proposed streamlining initiatives. This chapter also documents any deviations from the approved Section 905(b) Analysis that have occurred during the negotiations of the FCSA.
- Chapter 3 - Scopes of Work. This is a detailed scope of the tasks and activities that describe the work to be accomplished, in narrative form, that answers the questions: "what, how, and how much".
- Chapter 4 - Responsibility Assignment. The Organizational Breakdown Structure (OBS) defines "who" will perform work on the study. This allows the identification of the functional organization that will perform each of the tasks in a Responsibility Assignment Matrix (RAM).
- Chapter 5 - Feasibility Study Schedule. The schedule defines "when" key decision points and milestones will be accomplished.

- Chapter 6 – Feasibility Cost Estimate. This is the baseline estimate for the feasibility phase of the study.
- Chapter 7 - Quality Management Plan: This chapter supplements the Corps Quality Management Plan. It highlights any deviations to the plan and lists the members of the study team and the independent review team.
- Chapter 8 - Identification of Procedures and Criteria: This chapter identifies references to the regulations and other guidance that covers the planning process and reporting procedures.
- Chapter 9 - Coordination Mechanisms: This chapter describes the study's public involvement program.