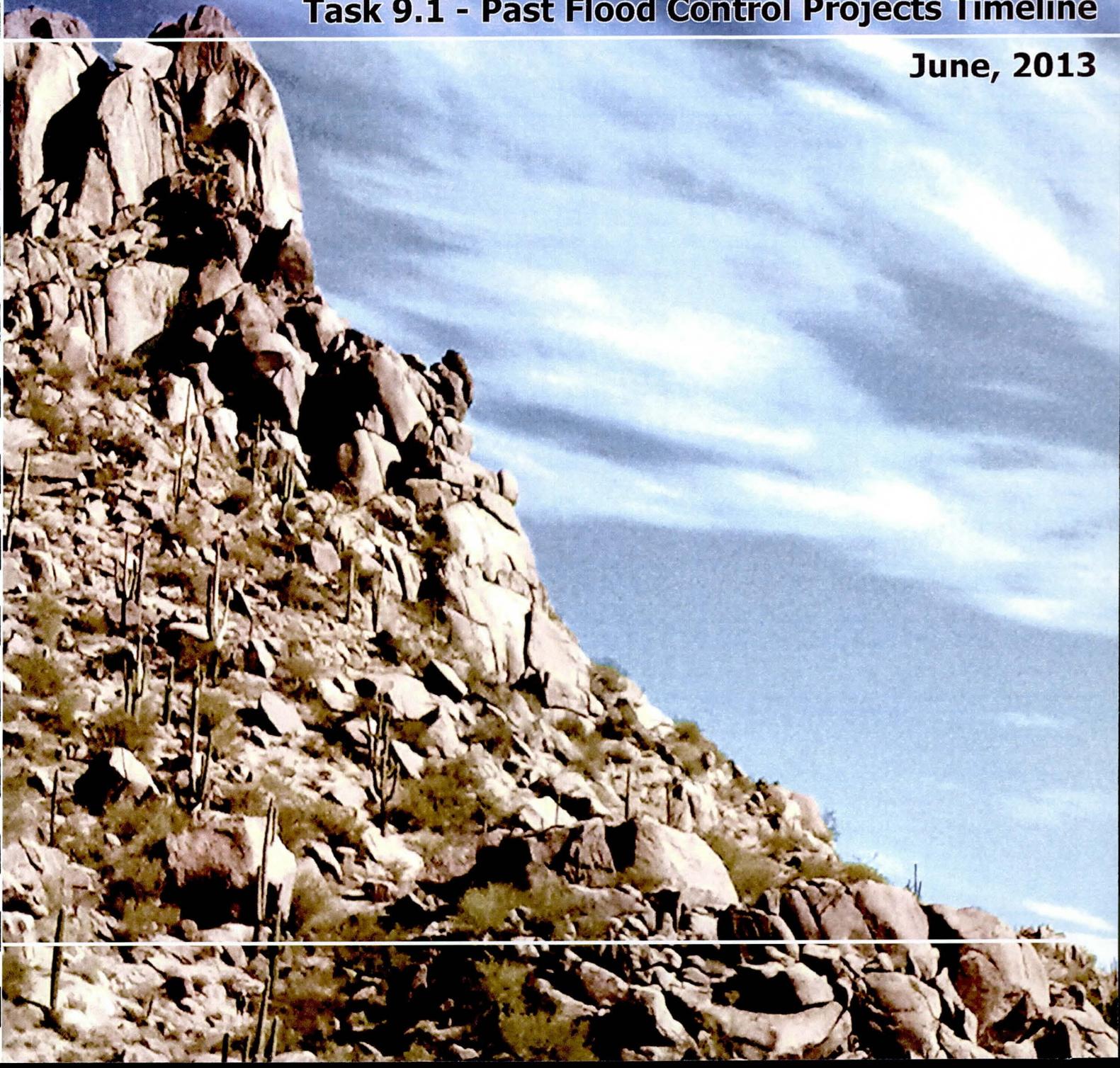




# **Flood Control District of Maricopa County**

**Pinnacle Peak West Area Drainage Master Study  
Work Assignment 1  
Task 9.1 - Past Flood Control Projects Timeline**

**June, 2013**





# Memorandum

**DATE:** June 17, 2013  
**TO:** Theresa Pinto, FCDMC  
**FROM:** Mike Kellogg, RG; Pat Quinn, PE, RLS, AVS  
**RE:** Pinnacle Peak West ADMS Work Assignment 1,  
Task 9.1  
Past Flood Control Projects Timeline



## Purpose

Task 9.1 is a research task to identify past flood control projects in the Pinnacle Peak West Area Drainage Master Study (PPW ADMS) study area and to chronicle the history of the Desert Greenbelt (DGB) project. The task comprises four primary elements:

1. Compile a temporal chronology of milestone events which occurred during the DGB project. (Appendix A)
2. Conduct interviews of key personnel, from both the public and private sector, who were directly involved in DGB. (Appendix B)
3. Develop maps to show the spatial relationship of the flood control structures that were proposed as part of DGB. (Appendix C)
4. Draft a memorandum to bring together the elements in 1, 2, and 3 in a concise summary (this document).

This memorandum is intended for internal use by the PPW ADMS project team to provide historical context of previously proposed flood control projects. This context will be valuable if the outcome of the PPW ADMS project eventually leads to design and construction of flood control structures within the study area.

## Desert Greenbelt Chronology

An extensive data collection effort yielded a voluminous record of planning studies, engineering reports, design documents, City of Scottsdale (COS) Council meeting records, newspaper articles, maps, and other DGB project-related materials. These materials were reviewed and a summary chronology of events was prepared. The following is an overview of the chronology of engineering evaluations, public outreach efforts, political events, and



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media coverage. The interrelationship of these events is shown in the Temporal Chronology timeline (Appendix A).

## Overview Chronology

- 1989 – City of Scottsdale (COS) residents pass a bond measure authorizing \$21.6 million for capital improvements that included flood control systems.
- 1990-1992 – DGB general public meetings.
- 1992 – COS adopts the Desert Greenbelt General Plan.
- 1993-1995 – Concept Design studies to identify and refine the DGB corridor alignments.
- 1995-1999 – Final Design analyses
- 1998 – Reata Pass Wash Improvement District (RPWID) is formed and covers approximately 4,400 acres in the Reata Pass Wash watershed.
- 1999 – Public opposition to DGB increases.
- 2000 – DGB becomes a major campaign issue for COS City Council and Mayoral races.
- 2001 – COS City Council votes to terminate the DGB project. The motion carried all in favor, zero opposed.

## Engineering Chronology

1. February 1992 – *Sensitivity Analysis of Reata Pass Hydrology*  
Water Resource Associates, Inc.

The purpose of the sensitivity analysis was to compare various modeling refinements for the Reata Pass watershed. Each modeling revision was compared to the baseline hydrology and several independent peak discharge methodologies. The results were to form the basis for possible modeling revisions that were to be recommended to FEMA for use in defining flood frequency series at each of the then identified alluvial fan apexes within the McDowell Mountain piedmont (Figure 1).

The results indicated that several changes in modeling techniques could be made to lower the peak 100-year discharge at the Reata Pass fan apex. The lower discharges computed by the modeling refinements were supported by numerous independent peak discharge calculations. The final conclusion was a recommendation to adopt the modeling refinement *Scenario 13*<sup>1</sup> to revise the Reata Pass apex discharge.

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<sup>1</sup> Scenario 13 required that the singular, kinematic wave routing operations be converted to eight-point-modified Puls routing and that the SCS Type IIA, 24-hour rainfall distribution be replaced by the 6-hour hypothetical distribution generated by the PH record in the HEC-1 model.

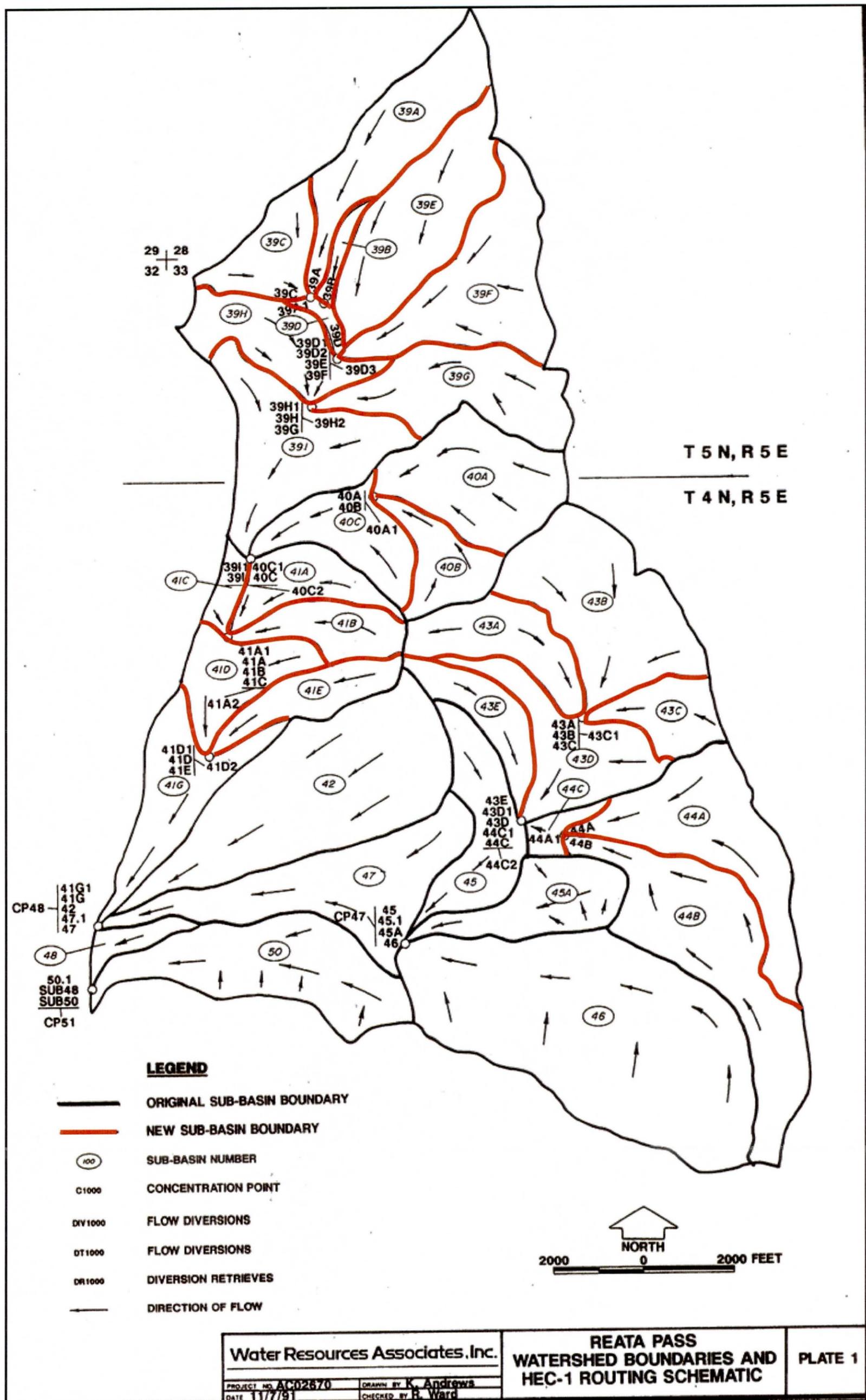


Figure 1. Sensitivity Analysis of Reata Pass Hydrology Study Map (WRA, 1992)



2. November 1992 – City of Scottsdale adopted an amendment to the Drainage Element of the General Plan which established the Desert Greenbelt concept and the proposed wash corridors. The system’s design objective was to contain the 100-year alluvial fan flood hazard north of the CAP canal (Figure 2).
3. November 1992 – *Rawhide/Pinnacle Peak Wash Alignment Study*  
Alluvial Fan Task Force

The *Rawhide/Pinnacle Peak Wash Alignment Study* was developed due to increased planning and development activity within the floodplains north of the Central Arizona Project. The primary objective for the task force was to identify and develop a stormwater management plan for the Rawhide and Pinnacle Peak washes and their associated floodplains which would 1) manage peak flows; 2) partially or completely remove the alluvial fan flooding hazard; 3) utilize and retain as much of the existing environment as possible; 4) effectively integrate with existing infrastructures; and 5) maximize public benefit (Figure 3).

Members of the Task Force:

- Michael Cousineau
- Greg Crossman, P.E.
- Kroy Ekblaw
- Bill Erickson
- Liz Hildenbrand-Crossman
- Mark Landsiedel
- Collis Lovely
- Alex McLaren, P.E.
- Jayna Shewak, L.A.
- Marilyn Sucoe

4. November 1992 – *Reata Pass/Beardsley Wash Alignment Study*  
Alluvial Fan Task Force

The *Reata Pass/Beardsley Wash Alignment Study* was developed by the Reata Pass Task Force due to increased planning and development activity within the floodplains north of the Central Arizona Project. The primary objective for the task force was to identify and develop a stormwater management plan for the Reata Pass and Beardsley Washes and their associated floodplains which would 1) reduce flood hazards and the need for flood insurance; 2) integrate with the existing environment; 3) maximize the potential for project implementation and funding; and 4) provide and integrate public recreational and cultural facilities (Figure 3).



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Members of the Task Force:

- Lisa Collins
- Michael Cousineau
- Greg Crossman, P.E.
- Kroy Ekblaw
- Bill Erickson
- Dave Gulino, P.E.
- Liz Hildenbrand-Crossman
- Elizabeth Krenzel
- Mark Landsiedel
- Alex McLaren, P.E.
- Jayna Shewak, L.A.
- Marilyn Sucoe

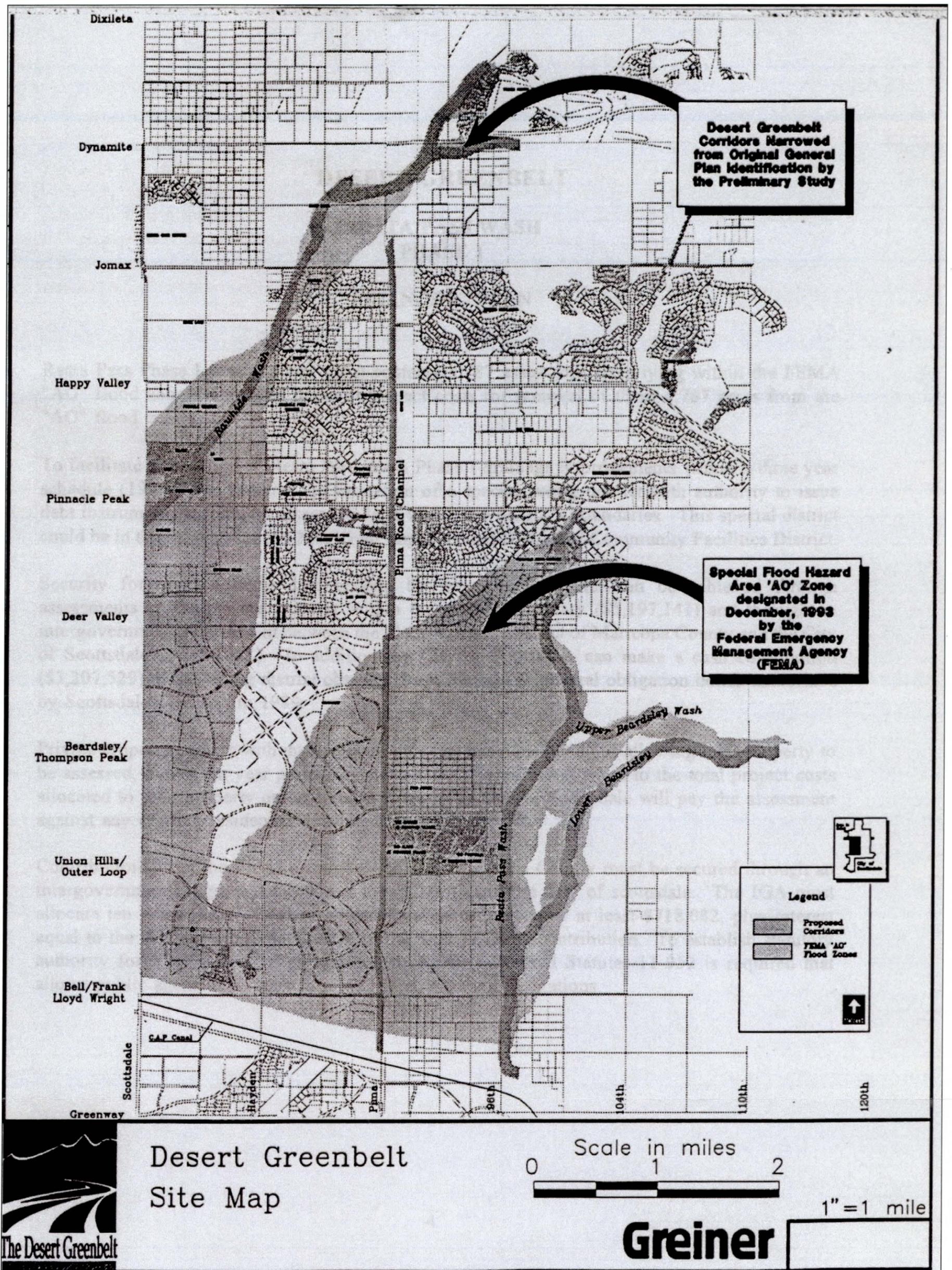


Figure 2. Desert Greenbelt Site Map (Greiner Team, 1992)



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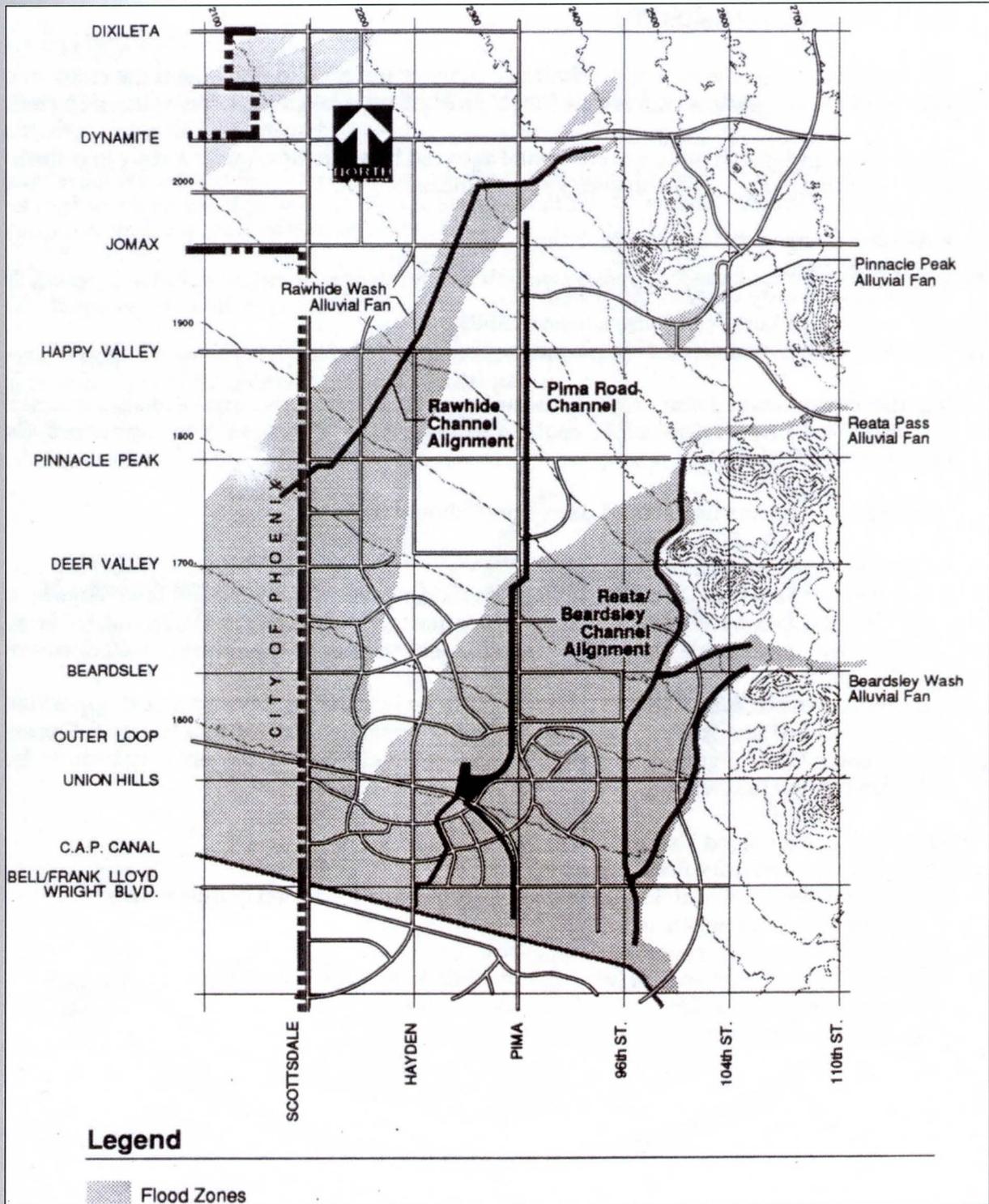


Figure 3. Recommended conceptual regional stormwater management plan (AF Task Force, 1992)



5. July 1993 – *Desert Greenbelt Preliminary Design and Analysis Study*  
Greiner Team

The study area included over 52 square miles of North Scottsdale and included three primary project corridors:

- Rawhide Wash
- Pima Road Channel
- Reata Pass/Beardsley Wash

The project included four phases along with functional elements of public participation, environmental, visual, multi-use recreation, land use, hydrology/hydraulics, and funding alternatives. The project phases were:

- Phase I – Identify Concepts
- Phase II – Develop Concepts
- Phase III – Consolidate Concepts
- Phase IV – Final Refinement/Preliminary Design

6. June 1994 – *Desert Greenbelt Preliminary Design Phase I Study*  
Greiner Team

This study comprised the second phase of the Desert Greenbelt Preliminary Design effort. Design projects included: Rawhide Wash, Reata Pass/Beardsley Wash, and Pima Road Channel (Figure 4). The results of the study for each project are summarized below (*italics* indicate direct quotes from the referenced reports):

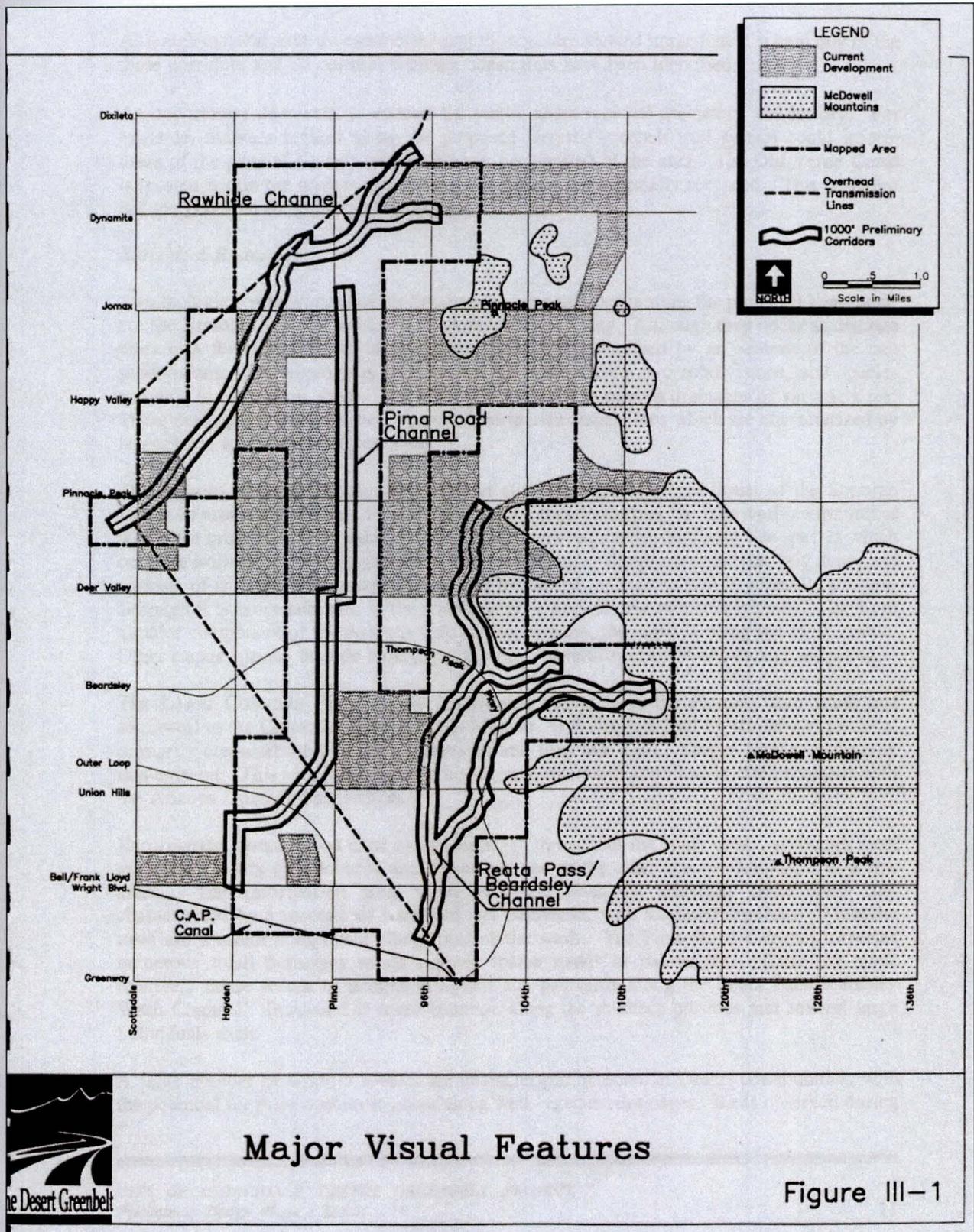
- 1) Rawhide Wash – *The anticipated design flow for the Rawhide Wash is 12,400 cubic feet per second (cfs). Stormwater control measures will include bridge crossings, collector channels, and floodwalls/levees. Large amounts of sediment are expected during these flows. Initial concepts envision a low-flow channel approximately two feet deep and 75 feet wide with an additional 250 to 300 feet of natural channel with 6-foot high levees along both sides of the wash.*



- 2) Pima Road Channel – *This channel will run parallel to Pima Road and does not follow an existing wash alignment. North of Deer Valley Road, the channel will be on the east and will shift to the west side south of Deer Valley Road. The channel begins near Jomax Road and continues fairly straight where it will eventually release into the Tournament Players Club (TPC) desert golf course retention basin. This channel will protect three square miles of existing developed area to the west of Pima Road.*

*The Pima Road Channel is expected to convey about 10,000 cfs. Stormwater control measures will include bridge crossings, collector channels, and floodwalls/levees. This channel will require significant structural improvement and indigenous revegetation. Initial channel widths and depths are under study.*

- 3) Reata Pass/Beardsley Wash – *This wash is expected to receive from 11,000 cfs up to 16,700 cfs of stormwater flows. To control these flows in the area north of Deer Valley Road, the Greiner team is considering the use of cut sections, bridge crossings, and floodwalls/levees. Initial channel widths averaging 400 feet have been identified.*



### Major Visual Features

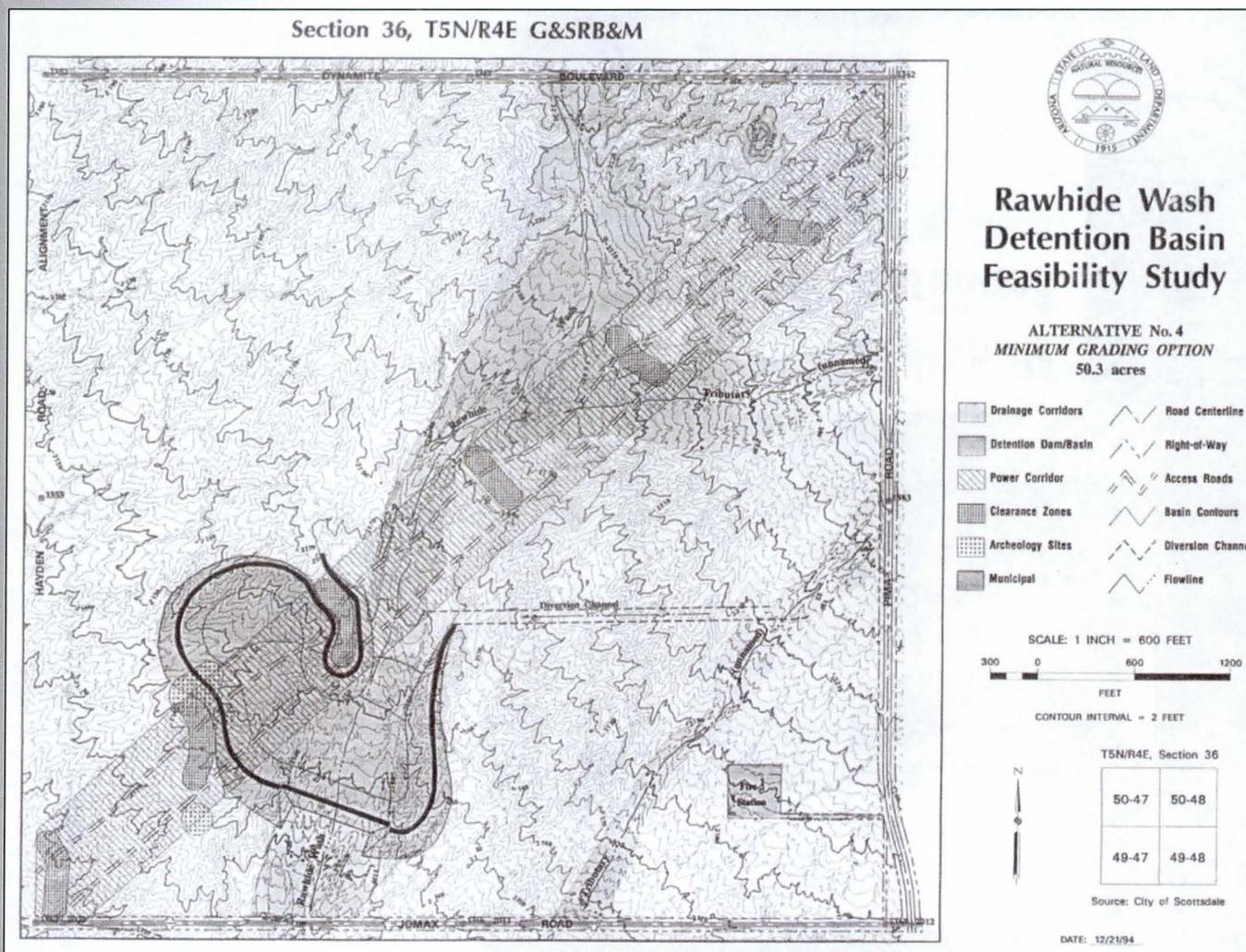
Figure III-1

Figure 4. Desert Greenbelt Preliminary Design Phase I Study (Greiner Team, 1994)



7. March 1995 – *Rawhide Wash Detention Basin Feasibility Study*  
CH2M Hill

An investigation of the feasibility of constructing a regional stormwater detention basin on Rawhide Wash at the proposed site near the intersection of Pima and Jomax Roads in Scottsdale was performed on behalf of the City of Scottsdale, the City of Phoenix, the Arizona State Land Department, and the Homebuilders Association of Central Arizona. The purpose of the detention basin was to provide flood control on Rawhide Wash and to remove downstream areas in both Phoenix and Scottsdale from the current FEMA alluvial fan floodplain designation. No fatal flaws were identified that would prevent construction of a regional stormwater detention basin for Rawhide Wash (Figure 5).



**Figure 5. Rawhide Wash Detention Basin Feasibility Study – Recommended Alternative**  
(CH2M Hill, 1995)



8. June 1995 – *City of Scottsdale Desert Greenbelt Project Final Report*, 3 Volumes.  
Greiner Team

The following text and Figure 6 are excerpted from the Executive Summary of Volume 1 of the reports:

*The Greiner team, in cooperation with the City of Scottsdale, has progressed into the second phase of the Desert Greenbelt Preliminary Design effort. The Desert Greenbelt Study addresses three separate projects: the Rawhide Wash; the Reata Pass/Beardsley Wash; and the Pima Road Channel. Results of Phase 1, developing the initial concepts, are presented in this report and summarized below.*

**PUBLIC PARTICIPATION**

*A comprehensive public participation program was initiated. Primary public issues identified include: desert preservation, project costs and benefit, need for the project, schedule and timing, and the location of trails and paths. Public concerns have been addressed in the initial designs through responses from newsletters, and small-group workshops with property owners directly impacted by a channel's location or design. Specifically, the City and the Greiner team have worked closely with property owners in the Reata Pass Wash, north of Deer Valley Road, where planned trails/paths through their properties have created concerns regarding privacy and quality of life.*

**PROJECT FINANCING**

*The Greiner team explored potential Desert Greenbelt funding sources and methods. The City's 1992 cost estimates (in millions) are listed below along with tentative funding sources.*

<b>City's 1992 Cost Estimate</b>		<b>Tentative Funding Sources:</b>	
<i>Rawhide Wash</i>	\$13	<i>City of Scottsdale 1989 Bonds</i>	\$21
<i>Pima Road Channel</i>	\$21	<i>FCDMC</i>	\$23
<i>Reata Pass/Beardsley Wash</i>	\$24	<i>ADOT</i>	\$2
		<i>Grants and Property Owner Contributions</i>	\$12
<b>TOTAL</b>	<b>\$58</b>	<b>TOTAL</b>	<b>\$58</b>



#### ENVIRONMENTAL STUDIES

*Native plants, wildlife, wetlands and cultural resources were inventoried and documented in each corridor. Plants, wildlife and wetlands: No threatened or endangered species, or wetland areas have been identified within the corridors. Common plants consist of creosote bushes, cacti and a mix of small to large trees. A diverse mix of birds, such as quail, roadrunners, woodpeckers, hawks and owls are present, as well as small mammals including coyote, desert cottontail, ground squirrels, lizards and snakes.*

#### MULTI-USE OPPORTUNITIES

*The Greiner team has studied the existing City General Plan, made recommendations for recreation components in North Scottsdale, and considered the viewpoints of homeowners, path and trail users, developers, business owners and environmental groups. The Desert Greenbelt projects will:*

- *Blend with the natural desert*
- *Integrate with existing land uses and provide sufficient community access, including public art and interpretive opportunities*
- *Prohibit use of motorized vehicles on trails and paths*
- *Offer a quality recreational experience.*
- *Provide access to the McDowell Mountain preserve.*

#### SCHEDULE

*The Desert Greenbelt Preliminary Design effort is scheduled for completion in January 1995. Phase 1 study results are summarized by wash below.*

##### *Rawhide Wash*

*The Rawhide Wash alluvial fan is the northernmost section of the Desert Greenbelt. This wash begins at approximately Dynamite Road and 96th Street and moves diagonally to the southeast where it eventually crosses into the City of Phoenix at Scottsdale Road, south of Pinnacle Peak Road. The ultimate outlet location into the City of Phoenix is under study.*

*Views of Pinnacle Peak and the New River Mountains are dynamic. Land uses range from higher-density commercial and residential in the southern segments to lower-density northern residential communities.*



*The anticipated design flow for the Rawhide Wash is 12,400 cubic feet per second (cfs). Stormwater control measures will include bridge crossings, collector channels, and floodwalls/levees. Large amounts of sediment are expected during these flows. Initial concepts envision a low-flow channel approximately two feet deep and 75 feet wide with an additional 250 to 300 feet of natural channel with 6-foot-high levees along both sides of the wash.*

#### Pima Road Channel

*This channel will run parallel to Pima Road and does not follow an existing wash alignment. North of Deer Valley Road, the channel will be on the east and will shift to the west side south of Deer Valley Road. The channel begins near Jomax Road and continues fairly straight south where it will eventually release into the Tournament Players Club (TPC) desert golf course retention basin. This channel will protect three square miles of existing developed area to the west of Pima Road.*

*This corridor provides continuous vistas to the north and south. Excellent views of Pinnacle Peak are abundant and views of the McDowell Mountains are seen to the east and southeast. In addition, long-range views of metropolitan Phoenix can be seen. Land uses along Pima Road include low-to moderate-density residential communities with commercial and office buildings at Pinnacle Peak Road.*

*The Pima Road Channel is expected to convey about 10,000 cfs. Stormwater control measures will include bridge crossings, collector channels, and floodwalls/levees. This channel will require significant structural improvement and indigenous re-vegetation. Initial channel widths and depths are under study.<sup>2</sup>*

#### Reata Pass/Beardsley Wash

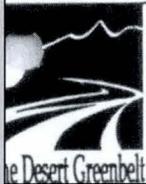
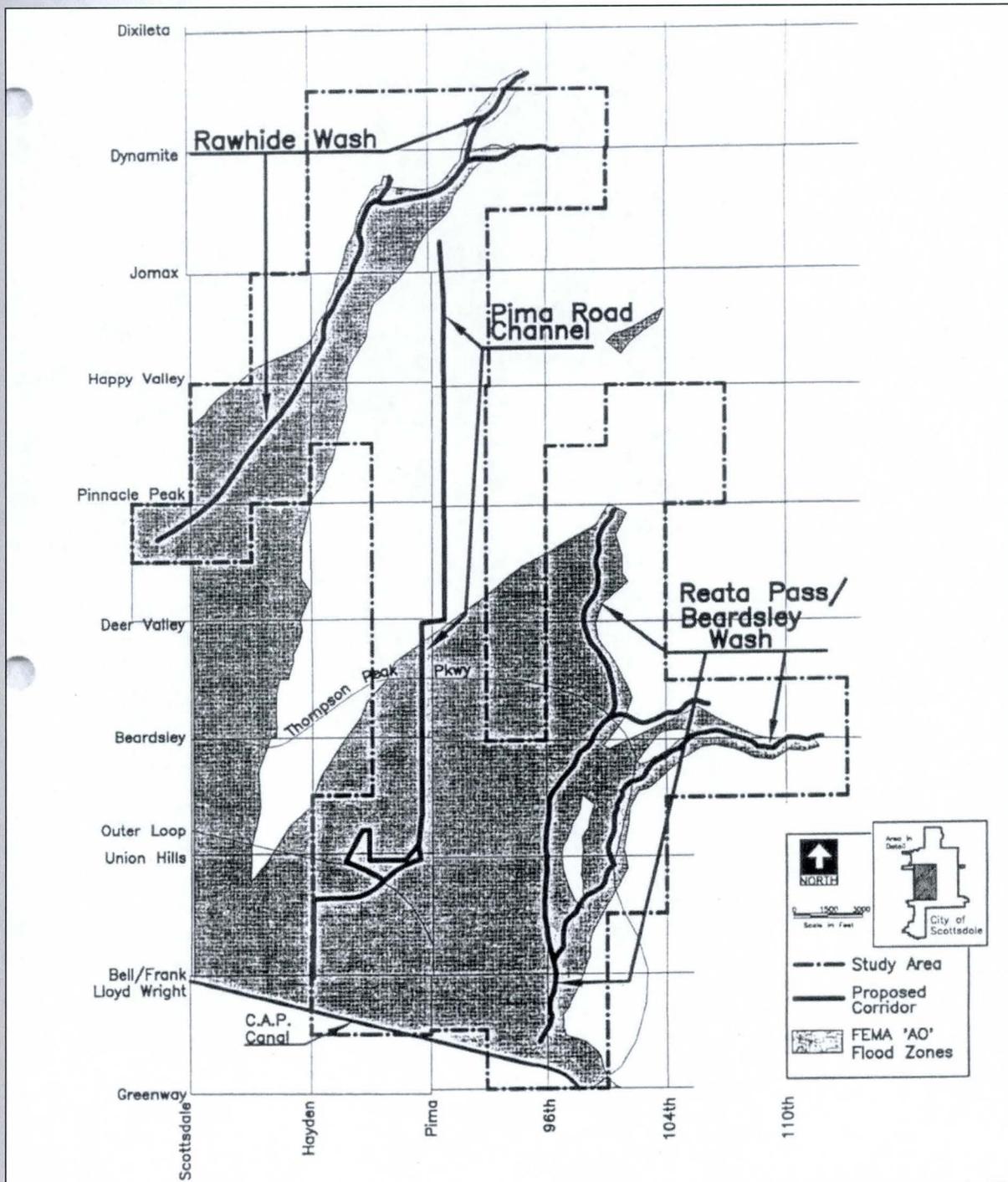
*This corridor is one of the most scenic and pristine segments of the Desert Greenbelt. The alluvial fan begins at the northwestern edge of the McDowell Mountains. Continuing south, the wash hugs the base of the McDowell Mountains, joins with the Beardsley Wash, and eventually releases into the West World Park retention basin.*

<sup>2</sup> The proposed Pima Road Channel width ranged from 40 feet to 115 feet.



*The area has incredible close- and mid-range views of the McDowell Mountains and Pinnacle Peak, and undisturbed long-range views of the Beardsley Valley and downtown City of Phoenix. Vegetation includes dense trees with relatively sparse vegetation on rocky hillsides. Existing land uses include low-density residential communities at the north from Deer Valley to Pinnacle Peak Roads. A diverse mix of land uses are planned along the remainder of the corridor which will establish the character of this future community. A wide diversity of residential communities, parks, commercial and office centers, and cultural resource areas are planned.*

*This wash is expected to receive from 11,000 cfs up to 16,700 cfs of stormwater flows. To control these flows in the area north of Deer Valley Road, the Greiner team is considering the use of cut sections, bridge crossings, and floodwalls/levees. Initial channel widths averaging 400 feet have been identified.*



## Principal Washes and Preliminary Channels

Figure I-1

Figure 6. Principal Washes and Preliminary Channels (Greiner Team, 1995)



9. June 1997 – *Pima Road Channel Recommended Design Concept and Construction Cost Estimate*  
George V. Sabol Consulting Engineers, Inc. (GVSCE)

The purpose of the project was to describe, in more detail, the recommended Pima Road Channel, including a construction cost estimate (Figure 7). The design concept included three detention basins located at Happy Valley Road, Deer Valley Road, and Union Hills Drive. The channel and basins were sized for the 100-year, 6-hour storm with hydraulic performance being evaluated for the 100-year, 24-hour storm.

10. November 1997 – *Pima Road Three Basins Project Interim Design Hydrology Memorandum*  
Stantech Consulting, Inc.

The Pima Road Three Basins Project (PR3B) was proposed as a continuous system of mainline and collector channels, detention basins, and outlet conduits that extended from approximately one-quarter mile north of Jomax Road to the U.S. Bureau of Reclamation (USBR) detention basin within the City of Scottsdale's Tournament Players Club (TPC) Golf Course (Figure 8 and Figure 9). A contiguous network of paths and trails, with five grade separated crossings, were also included in the scope of the project. The entire system was comprised of approximately 4 miles of mainline channel along Pima Road, 1.5 miles of collector channels, three regional detention basins located at Happy Valley Road, Deer Valley Road, and Union Hills Drive, approximately 5.5 miles of path and trail, and grade separated crossings structures at Hualapai Road, Thompson Peak Parkway, Pima Road at Deer Valley Road, Pinnacle Peak Road, and Happy Valley Road. The PR3B system drained a total watershed area of approximately 11.3 square miles, with peak discharges ranging from 150 cfs to 2,700 cfs.

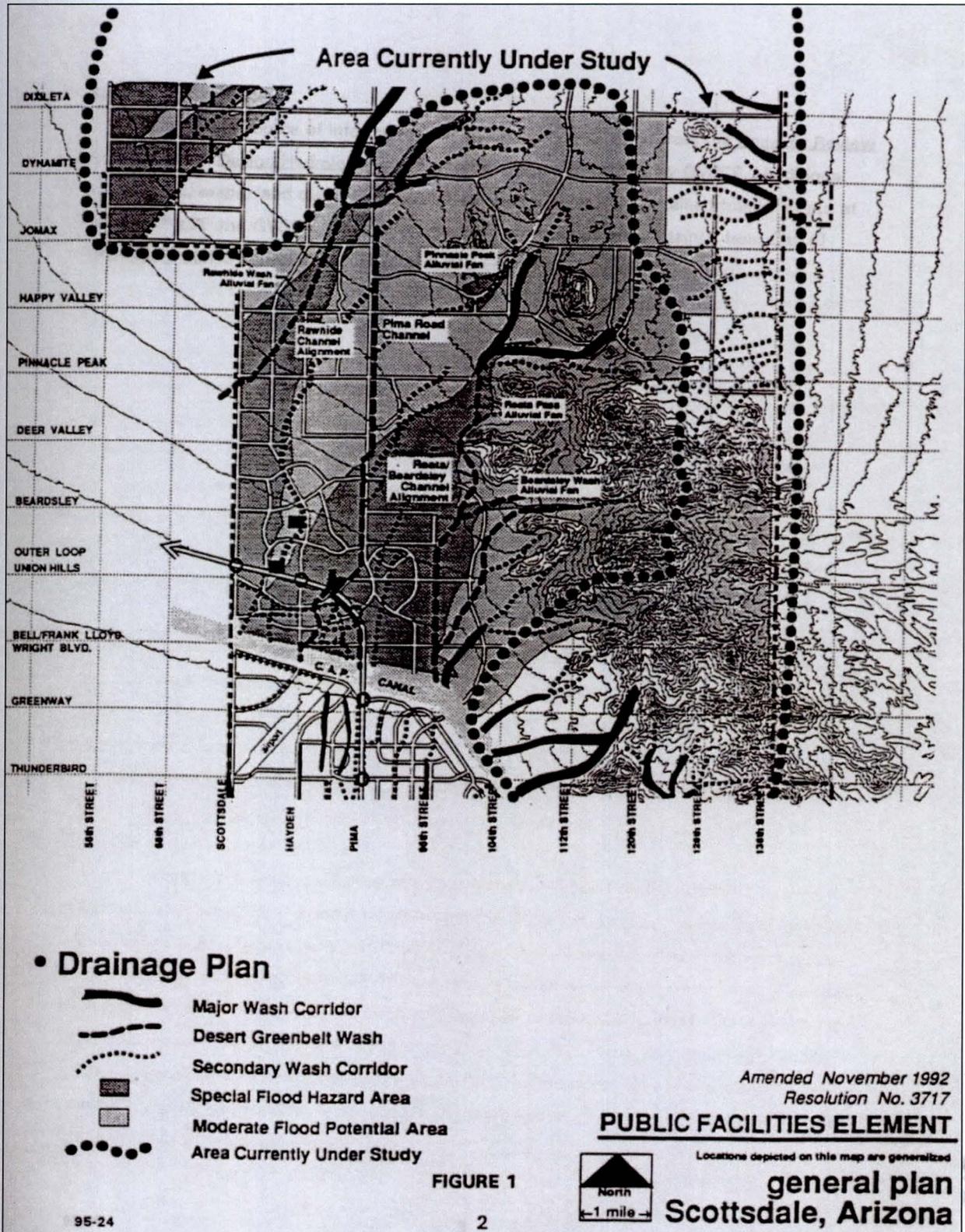


Figure 7. Pima Road Channel Recommended Design Concept and Construction Cost Estimate (GVSCE, 1997)

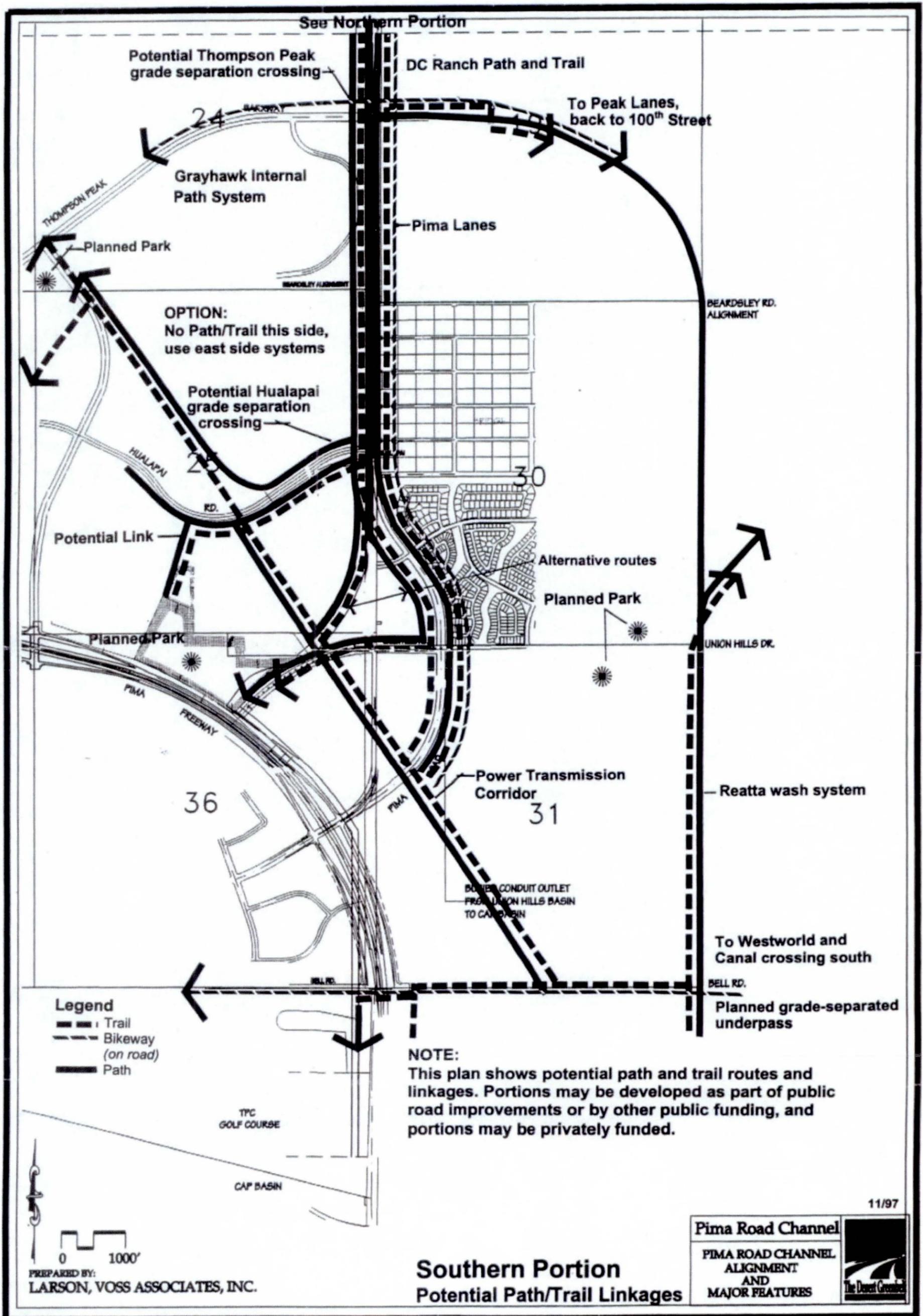


Figure 8. Pima Road Three Basins - Southern Portion (Stantech, 1997)

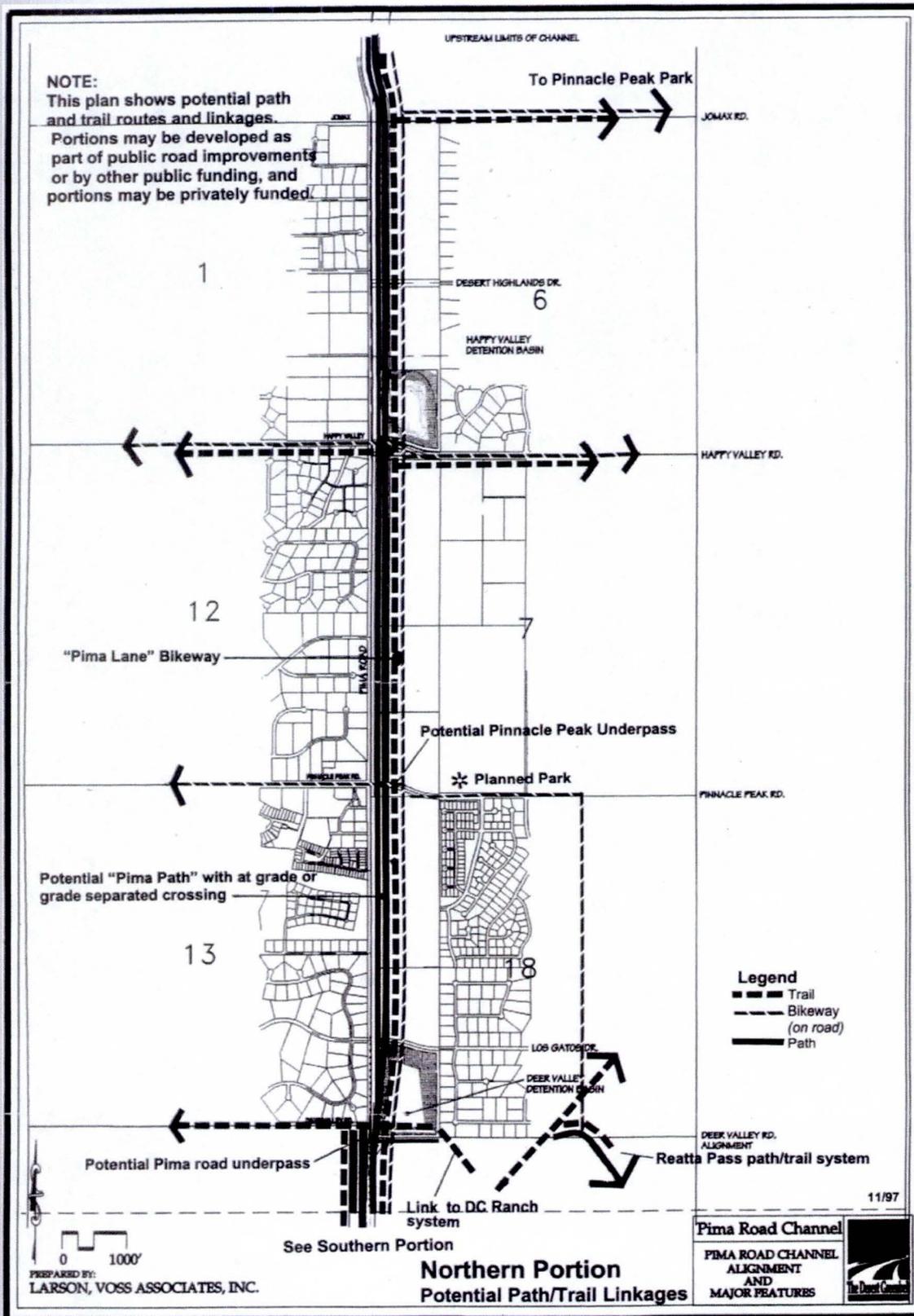


Figure 9. Pima Road Three Basins - Northern Portion (Stantech, 1997)



11. April 1998 – *Pima Road Three Basins Project Hydraulics Memorandum*  
Stantech Consulting, Inc.

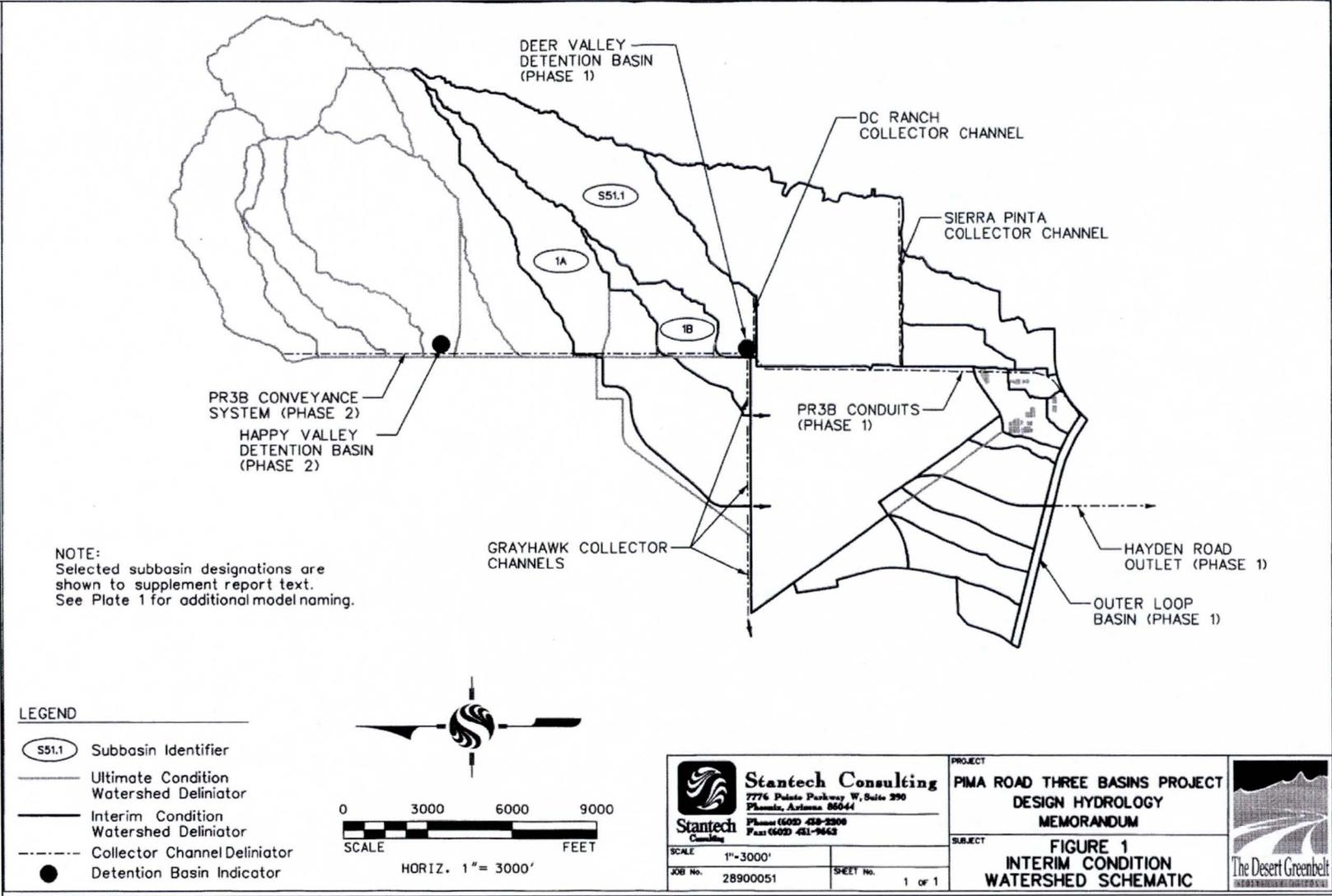
The purpose of the study was to determine the design discharges to the Pima Road conduits and to document the preliminary hydraulic design of that conduit system. The report was not intended to present the final hydraulic analysis or the final design of the conduits.

12. April 1998 – *Pima Road Three Basins Project Interim Design Hydrology Memorandum*  
Stantech Consulting, Inc.

The Pima Road Three Basins (PR3B) project was planned to be constructed in phases. The Phase I construction was to consist of all drainage facilities south of the Deer Valley Detention Basin (DVDGB) (Figure 10). The major features to be included in Phase I were the Outer Loop Basin, Hayden Road conduit system, and the Pima Road conduit system south of the DVDGB. The anticipated time span between construction of Phase I and Phase II was to be several years. The purpose of the study was to document the results of the interim condition analysis on the PR3B Phase I improvements.



Figure 10. Pima Road Three Basins Project Hydraulics Memorandum (Stantech, 1998)





13. March 1999 – *Final Drainage Report: Rawhide Wash Detention Basin*  
HDR, Inc.

The purpose of the project as to alleviate flooding along Rawhide Wash, downstream of Jomax Road and to eliminate the alluvial fan flood hazard designation. The project was sponsored by the City of Scottsdale, the City of Phoenix, the Flood Control District of Maricopa County, and the Arizona State Land Department (Figure 11).

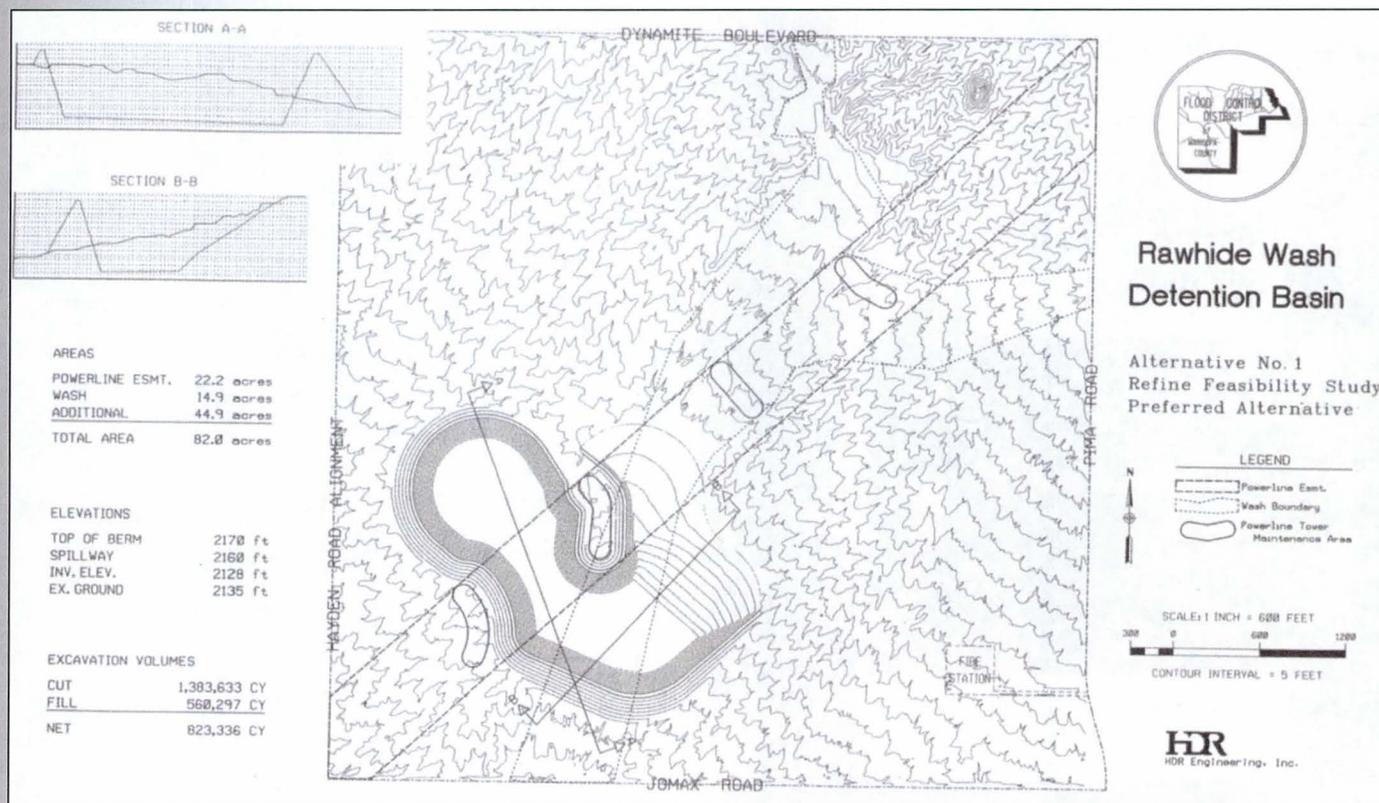


Figure 11. *Rawhide Wash Detention Basin Recommended Alternative* (HDR, 1999)



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14. March 1999 – *Pima Road Three Basins Project Ultimate Design Hydrology Memo*  
Stantech Consulting, Inc.

*(italics indicate direct quotes from the referenced reports):*

*The 10% design of the PR3B facilities requires refinement and/or revisions to the Concept Hydrology Report watershed modeling. Those changes are needed to provide additional discharge estimates at specified locations and reflect the proposed PR3B improvements.*

At the time of the study, design changes to the three basins (Happy Valley Road, Deer Valley Road, and Union Hills Drive) necessitated a revision of the original hydrology model (Figure 12).

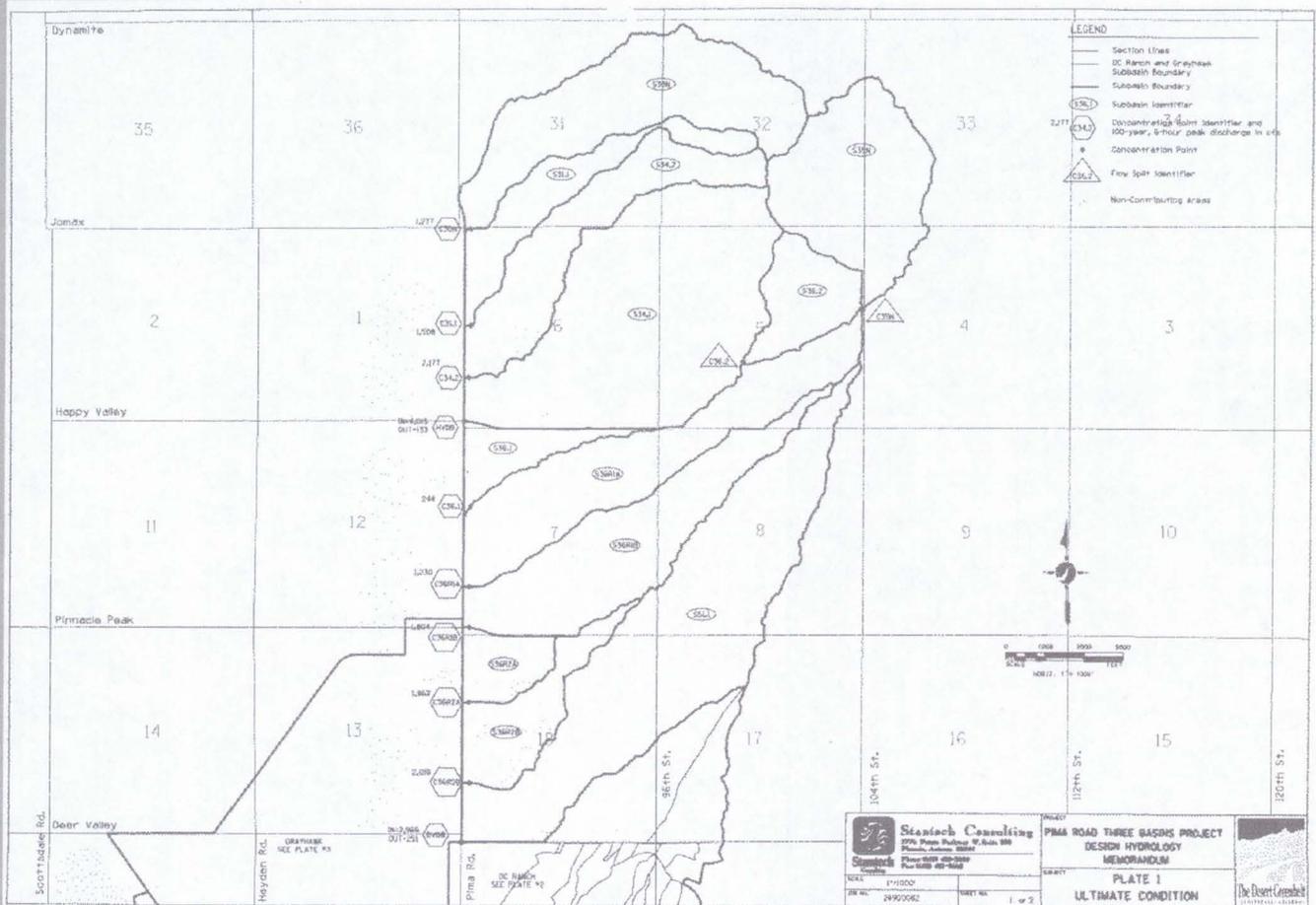
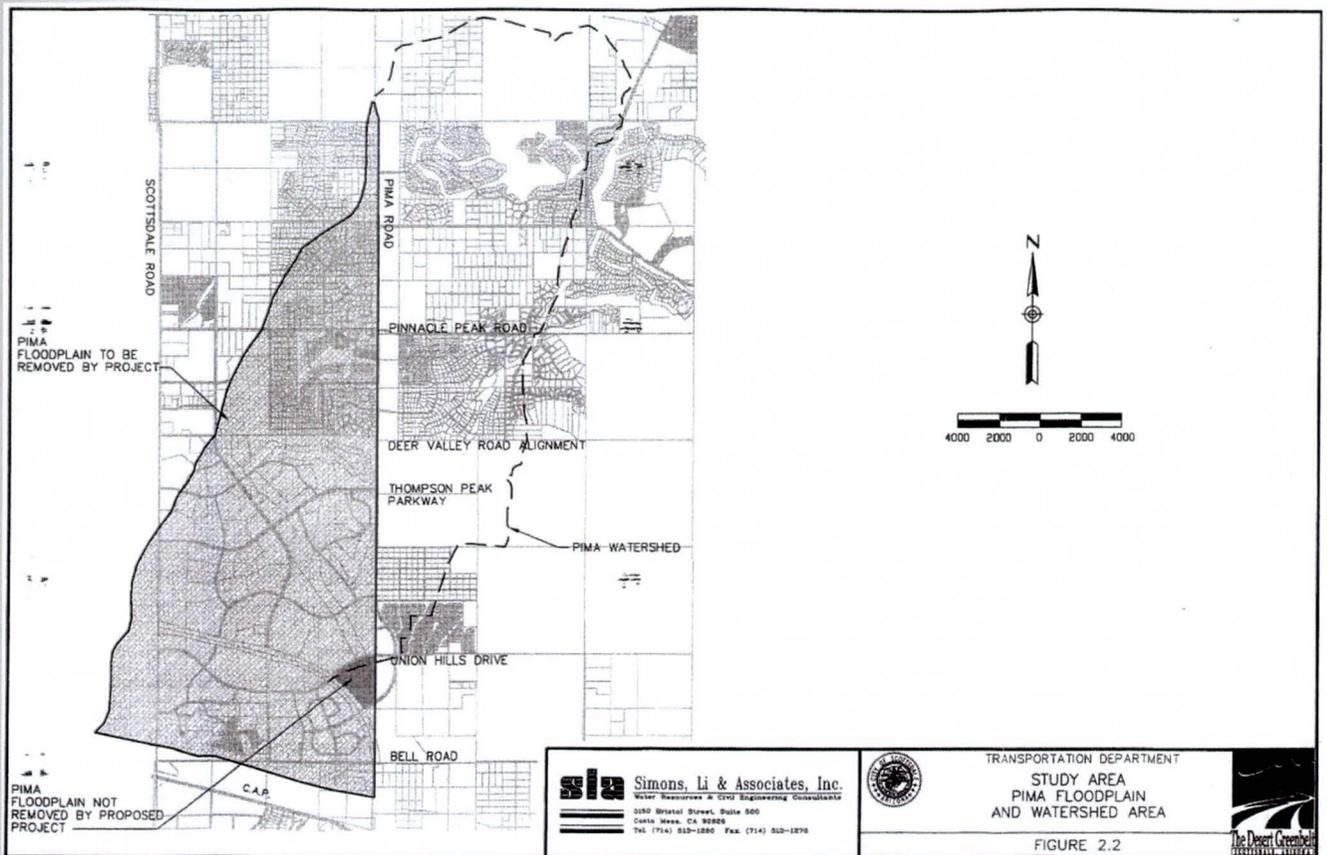


Figure 12. Pima Road Three Basins Design Hydrology - Ultimate Condition (Stantech, 1999)



15. June 1999 – *Baseline Conditions and Alternatives Analysis in Support of a 404 Permit Application for Reata Pass/Beardsley Wash and Pima Floodplain*  
Simons, Li & Associates, Inc. (SLA)

The five volume report provides baseline conditions and alternatives for the Reata Pass/Beardsley Wash and Pima Floodplain (Figure 13). The proposed flood control projects were determined to impact jurisdictional Clean Water Act Section 404 watercourses. The report presents 20 alternatives to the two primary flood control components which were: 1) an open channel system extending from the apex of Reata Pass Wash to the USBR detention basin on the north side of the CAP east of Pima Road; and 2) three detention basins connected by underground storm drains along Pima Road. The second system was to extend from one-quarter mile north of Jomax Road to the USBR detention basin west of Pima Road.



**Figure 13. Baseline Conditions and Alternatives Analysis in Support of a 404 Permit Application for Reata Pass/Beardsley Wash and Pima Floodplain (SLA, 1999)**



### Public Outreach Chronology

The DGB public outreach process was envisioned to include the following components<sup>3</sup>:

- 6 General Public Meetings
- 5 Council and Commission Public Presentations
- 11 Council and Commission Study Sessions
- 3 Public Hearings

The General Public Meetings were held between 1990 and 1992 on the following dates:

- November 5, 1990
- June 13, 1991
- November 20, 1991
- November 26, 1991
- February 13, 1992
- October 21, 1992

The Council and Commission Public Presentations were held on the following dates:

- November 14, 1990 – with Parks and Recreation Dept.
- November 15, 1990 – with Transportation Commission
- February 7, 1991 – with Bond Commission
- June 12, 1991 – with Parks and Recreation Dept.
- August 1, 1991 – with Transportation Commission

The Council and Commission Study Sessions were held on the following dates:

- October 30, 1990 – Council
- November 8, 1990 – with Development Review Board
- November 12, 1990 – with Planning Commission
- May 14, 1991 – Council
- June 6, 1991 – with Development Review Board
- June 10, 24, 1991 – with Planning Commission
- December 19, 1991 – with Transportation Commission
- February 25, 1992 – Council
- October 13, 1992 – Council
- October 22, 1992 – with Development Review Board
- October 29, 1992 – with Planning Commission

<sup>3</sup> Source: January 9, 2001 Scottsdale City Council Meeting Minutes



Documentation of one Public Hearing was found during this literature search:

- March 16, 2000

**Political Chronology**

The COS general election is held every two years (on even-numbered years). Council Member and Mayoral terms are four years. There were six COS general elections during the course of the DGB project. Table 1 shows the mayor and council members by year beginning in 1990 and concluding in 2001 (the year DGB was terminated by the city council).

**Table 1. COS general election results during DGB**

1992 (Election)	1993	1994 (Election)	1995	1996 (Election)
Mayor: Drinkwater	Mayor: Drinkwater	Mayor: Drinkwater	Mayor: Drinkwater	Mayor: Drinkwater
Council: Bielli Campana Bitter Smith Dean Soderquist	Council: Bielli Burke Campana Manross Thomas	Council: Bielli Burke Manross Soderquist Thomas	Council: Bielli Burke Manross Pettycrew Prior	Council: Bielli Manross Prior Pettycrew Thomas

1997	1998 (Election)	1999	2000 (Election)	2001
Mayor: Campana	Mayor: Campana	Mayor: Campana	Mayor: Campana	Mayor: Manross
Council: Bielli Manross Prior Robbins Thomas	Council: Manross Pettycrew Prior Robbins Thomas	Council: Lukas Pettycrew Robbins Thomas Zraket	Council: Lukas Manross Pettycrew Thomas Zraket	Council: O’Heam Ortega Pettycrew Silverman Zraket

Note that there were three new council members and a new mayor that took office during 2001, the year DGB was terminated. Anecdotal information from several sources interviewed for this memorandum indicated DGB was a significant political issue during the 2000 general election (see Appendix B).



### **Newspaper/Magazine Article Chronology**

Newspaper and magazine articles about the DGB project were collected and are included in Appendix D. In addition, the timing of the articles relative to the other project milestone events is shown in the Temporal Chronology (Appendix A). The key articles are summarized below.

1. October 2, 1992 – Arizona Republic Article: *Construction planned to ease storm runoff* (Appendix D).
2. February 1995 – The Desert Greenbelt project is featured in *Public Works* magazine. (Appendix D).
3. Toward the latter part of 1999 and the beginning of 2000 significant opposition to the Desert Greenbelt concept began to form. News stories critical of the project appeared in the Arizona Republic during mid-2000. During that time the U.S. Corps Army of Engineers was assessing the project to determine whether an Environmental Impact Study (EIS) would be required moving forward. News of this pending decision triggered much debate and argument over whether the Desert Greenbelt project was needed and whether it should continue moving forward. By the end of 2000, the project was permanently halted by a vote of the Scottsdale City Council.

As of June 2000, approximately \$19 million had been spent on the project. According to a June 19, 2000 Arizona Republic article, the expenditures included the following:

- \$6.22 million – design costs
- \$6.85 million – land acquisition and right-of-way purchases
- \$1.3 million – vegetation salvage
- \$2.16 million – construction of Pinnacle Peak bridge and storm drain under Pima Road
- \$630,000 – administrative salaries
- \$330,000 – legal costs

### **Key Project Personnel Interviews**

Telephone interviews were conducted with key personnel that were involved in the DGB project from both the public and private sectors. The following list includes the individuals that were interviewed and their role in the DGB project:



- W. Scott Ogden, Pima Road Three Basin Design Engineer
- Collis Lovely, COS DGB Technical Design Reviewer
- Don Hadder, COS Planner
- Mark Landsiedel, COS DGB Project Manager
- Kroy Ekblaw, COS DGB Planner
- George Sabol, DGB Technical Design Review Project Manager

Each interviewee was asked the following eight questions.

1. What was your involvement in the DGB project?
2. What lessons were learned from the DGB project?
3. What was your opinion regarding the project design?
4. What was your opinion regarding the public outreach program?
5. How did public perception for the project change? Why?
6. How did institutional support for the project change? Why?
7. Any reports/documents that you recommend we review?
8. Anyone else that you recommend we interview?

Appendix B contains the summary matrix of the interview responses.

### **Spatial Maps**

Appendix C contains two maps showing the spatial relationship of the major components of the DGB project; including:

- Reata Pass/Beardsley Wash Channels
- Pima Road Channel
- Pima Road Detention Basins
- Rawhide Wash Channel
- Rawhide Wash Detention Basin (1999 & 2007 designs)

These project components are shown with aerial photography backgrounds from two different years. The first base photography year date is 2001 and is intended to show the development in existence around the time that the City Council terminated the DGB project. The second base photography year date is 2012 to show the current status of development in the same area. The post-DGB developed areas are outlined in yellow based on a visual comparison of the 2012 to 2001 aerial photography to illustrate the



development which occurred despite the termination of the DGB project. The post-2001 development totals approximately 4,730 acres.

### **Summary and Conclusions**

The following summary of key conclusions are based upon the collective input from the review of the various DGB studies, reports, and news articles; interviews with key project personnel; understanding of the temporal chronology of project milestone events; and spatial relationship of DGB project components.

### **Project Design**

A significant design effort (reportedly \$6.22 million in fees) was invested in the DGB project. Consensus is that the resultant engineering designs for the project elements were technically sound and would have been effective in mitigating flood hazards in the DGB watersheds; however, the public reacted negatively to the “hard” nature of the structural components and were concerned about environmental impacts. More aesthetic “soft” treatments are now commonly used for design of flood control structures.

### **Public Outreach**

Public outreach was strong at the beginning of the DGB project, but was notably absent once the project progressed into the preliminary design and analysis phases. General public meetings for the project were scheduled during the early phases of the project (1990-1992). General public meetings did not occur during the engineering planning and design phases of the project (1994-1999).

In general, the public did not understand the dynamic nature of the flood hazard, the risk of loss of life, and the consequences of property damage. The public did not perceive the flooding hazard to be of the magnitude that was determined by the technical analyses. It was difficult to convey to the public the difference between alluvial fan flooding and riverine flooding and to explain the overall DGB concept. The difficulty in communicating flooding risk to the public, coupled with a lack of actual flooding events during this time, combined to create a sense of there being no problem and, hence, no need for a solution of the scale of the DGB project.

A recommended approach to future public outreach is to begin very early in the project and offer a sustained educational program to communicate flooding hazards, risks, and consequences and flood control benefits to the public. Emphasize that better science allows us to do a better job of flood hazard assessment and benefit/risk analysis.



### **Political Sensitivity**

The difficulty experienced in communicating to the public the type and magnitude of flood hazard was also true for communicating this information to the elected officials. Without a clear understanding of the need for the project on the part of the elected officials, the DGB project lacked a political champion. The DGB became a key issue in the 2000 City Council elections.

### **Future Development**

Opponents to the DGB strongly argued that the project would facilitate new, high-density development in North Scottsdale. Spatial analysis of the post-DGB development in the project area between 2001 when DGB was terminated and recently in 2012 indicates that 4,730 acres of development occurred in the area despite the fact that the DGB project was not built.

Along with the general opposition to the potential for increased development, there were also concerns about multi-use purposes of the DGB components. Specifically, area residents disapproved of the enhanced trail systems and future parks that would be incorporated into the channels and basins.

### **Funding**

The cost and funding of the DGB project was a major issue of public concern. The DGB project was initially envisioned to be jointly funded by the City of Scottsdale (bonds approved in 1989), Flood Control District of Maricopa County, Arizona Department of Transportation, grants, assessment districts, and developers, and/or community facilities districts.

The City of Scottsdale Floodplain and Stormwater Regulation (Chapter 37, Article II, §§ 37-57, Sep 5, 2000) established drainage facility development fees to reimburse the City of Scottsdale for financing and constructing necessary public drainage and related improvements on lands owned by the State of Arizona within the Reata Pass Wash Desert Greenbelt Improvement District No. 18902. Developers and property owners were to be assessed a drainage development fee for new construction consistent with the Reata Pass Wash Drainage Improvement Program that resulted in a demand on the drainage facilities.<sup>4</sup>

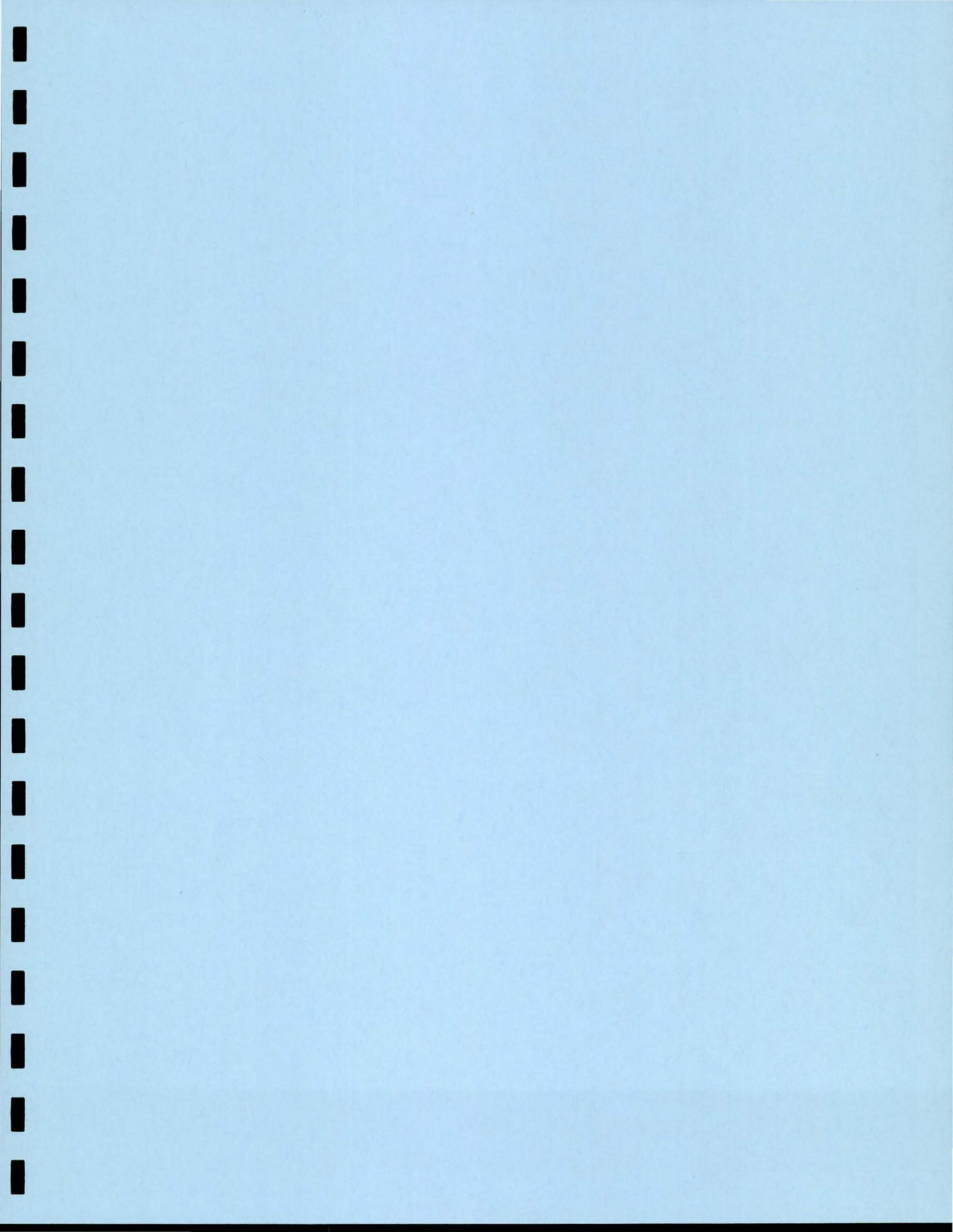
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<sup>4</sup> For more information on the proposed assessment district see City of Scottsdale Floodplain and Stormwater Regulation, Chapter 37, Article II, §§ 37-57, Sep 5, 2000.



### **Environmental Sensitivity**

The proposed DGB project was found to impact jurisdictional CWA Section 404 Waters of the U.S. The U.S. Corps Army of Engineers (Corps) assessed the project to determine whether an Environmental Impact Study (EIS) would be required. The Arizona Game and Fish Department requested that the Corps require an EIS of the DGB plan citing inadequacies in the proposed compensatory mitigation plan for disturbance of the jurisdictional watercourses. Others commented on the likely negative impacts to wildlife and natural watercourse environments of the DGB project components themselves, plus the impacts due to the anticipated consequent enhanced development. The indirect effects of the project were criticized as being understated and that long-term effects would be significant. These critics included the U.S. Fish and Wildlife Service, Environmental Protection Agency, and Sierra Club. The residents of North Scottsdale expressed concern that the DGB project would destroy the natural habitat and environments of the existing wash corridors. In the end, an Environmental Assessment was prepared for the project.





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**APPENDIX A**

TEMPORAL CHRONOLOGY

DESERT GREENBELT PROJECT – TEMPORAL CHRONOLOGY

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
OVERVIEW TIMELINE	Scottsdale bond election authorized \$21.6 million for flood control systems. <sup>5</sup>	General Public Meetings (1990-1992) <sup>7</sup>			Desert Greenbelt General Plan adopted. <sup>5</sup>	Concept Design Studies to Refine Flood Control Alignments (1993-1995) <sup>5</sup>			Final Design Analyses (1995-1999) <sup>5</sup>				Jan: Desert Greenbelt Project is terminated by Scottsdale City Council.
CONSULTANTS TIMELINE						Greiner (Rawhide, Reata, Pima Road) (1994-1995)	CH2M Hill (1995)	GVSCE (1995-1996)	Stantech (Pima Road Three Basins) (1996-1999)	HDR (Rawhide Wash) (1997-1999)	SLA (Reata/Beardsley 404 permit) (1998-1999)		
ENGINEERING TIMELINE				Feb: <i>Sensitivity Analysis of Reata Pass Hydrology</i> (WRA, Inc.) Nov: <i>Rawhide/Pinnacle Peak Wash Alignment Study</i> (Alluvial Fan Task Force) Nov: <i>Reata Pass/Beardsley Wash Alignment Study</i> (Alluvial Fan Task Force)	Jul: <i>Desert Greenbelt Preliminary Design and Analysis Study</i> (Greiner Team)	Jun: <i>Desert Greenbelt Preliminary Design Phase I Study</i> (Greiner Team)	Mar: <i>Rawhide Wash Detention Basin Feasibility Study</i> (CH2M Hill) Mar: <i>City of Scottsdale Desert Greenbelt Project Cost Estimates</i> (Greiner Team) Jun: <i>City of Scottsdale Desert Greenbelt Project Final Report</i> (Greiner Team) Aug: <i>Pima Road Detention Basin Feasibility Study</i> (PACE)	May: <i>Reata Pass/Beardsley Wash CLOMR</i> (Greiner Team)	Jun: <i>Pima Road Channel Recommended Design Concept and Construction Cost Estimate</i> (GVSCE, Inc.) Nov: <i>Desert Greenbelt Pima Road Three Basins Project 10% Design Report</i> (Stantech)	Apr: <i>Pima Road Three Basins Project Interim Design Hydrology Memorandum</i> (Stantech)	Mar: <i>Desert Greenbelt Pima Road Three Basins Project Ultimate Condition Design Hydrology</i> (Stantech) May: <i>Tract 21 Drainage Improvements Drainage Design</i> (Pentacore) May: <i>Final Drainage Report Rawhide Detention Basin</i> (HDR) Jun: <i>Baseline Conditions and Alternatives Analysis in Support of a 404 Permit Application for Reata Pass/Beardsley Wash and Pima Floodplain</i> (SLA)		
	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001

<sup>5</sup> Public Hearing: Desert Greenbelt Project. March 16, 2000

DESERT GREENBELT PROJECT – TEMPORAL CHRONOLOGY

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
<b>PUBLIC MEETINGS/OUTREACH TIMELINE</b>		General Public Meetings (1990-1992) <sup>7</sup>								April: Public protest meeting held for RPWID formation. <sup>5</sup>	Fall: Opposition to Desert Greenbelt gains momentum. <sup>6</sup>	Mar: Public Hearing <sup>5</sup>	
		Nov 5: General public meeting <sup>7</sup>	<b>General public meeting dates<sup>7</sup>:</b> June 13 Nov 20 Nov 26	<b>General public meeting dates<sup>7</sup>:</b> Feb 13 Oct 21									
<b>CITY COUNCIL/AGENCY MEETINGS TIMELINE</b>		Council Study Sessions (1990-1992) <sup>7</sup>											Jan 9: Scottsdale City Council terminates the Desert Greenbelt; motion carried 7 in favor, 0 opposed. <sup>7</sup>  Jan 9: Councilman Pettycrew moved to start a Risk Vulnerability Study and ADMP for the area formerly known as Desert Greenbelt; motion carried 7/0. <sup>7</sup>
		<b>Study Session dates:<sup>7</sup></b> Oct 30: Council Nov 8: Develop. Review Board Nov 12: Planning Commission  <b>Presentation dates:<sup>7</sup></b> Nov 14: Parks & Recreation Nov 15: Transportation Commission	<b>Study Session dates:<sup>7</sup></b> May 14: Council June 6: Develop. Review Board June 10: Planning Commission June 24: Planning Commission Dec 19: Transportation Commission  <b>Presentation dates:<sup>7</sup></b> Feb 7: Bond Commission June 12: Parks & Recreation Aug 1: Transportation Commission	<b>Study Session dates:<sup>7</sup></b> Feb 25: Council Oct 13: Council Oct 22: Development Review Board Oct 29: Planning Commission (Remote)  Nov 7: Planning Commission – Approve General Plan Amendment <sup>7</sup>  Nov 17: Adopt Alignments and GP Amendment <sup>7</sup>									
<b>POLITICAL ELECTIONS TIMELINE</b>		General Election March 27		General Election March 24		General Election March 22		General Election March 26		General Election March 10		General Election March 14	
<b>MAYOR/COUNCIL MEMBERS TIMELINE</b>	MAYOR: Drinkwater COUNCIL: Bitter Smith Campana Dean Soderquist Walton	MAYOR: Drinkwater COUNCIL: Bitter Smith Campana Dean Soderquist Walton	MAYOR: Drinkwater COUNCIL: Bielli Campana Bitter Smith Soderquist Walton	MAYOR: Drinkwater COUNCIL: Bielli Campana Bitter Smith Dean Soderquist	MAYOR: Drinkwater COUNCIL: Bielli Burke Campana Manross Thomas	MAYOR: Drinkwater COUNCIL: Bielli Burke Manross Soderquist Thomas	MAYOR: Drinkwater COUNCIL: Bielli Burke Manross Pettycrew Prior	MAYOR: Drinkwater COUNCIL: Bielli Manross Prior Pettycrew Thomas	MAYOR: Campana COUNCIL: Bielli Manross Prior Robbins Thomas	MAYOR: Campana COUNCIL: Manross Pettycrew Prior Robbins Thomas	MAYOR: Campana COUNCIL: Lukas Pettycrew Robbins Thomas Zraket	MAYOR: Campana COUNCIL: Lukas Manross Pettycrew Thomas Zraket	MAYOR: Manross COUNCIL: O’Heam Ortega Pettycrew Silverman Zraket
	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001

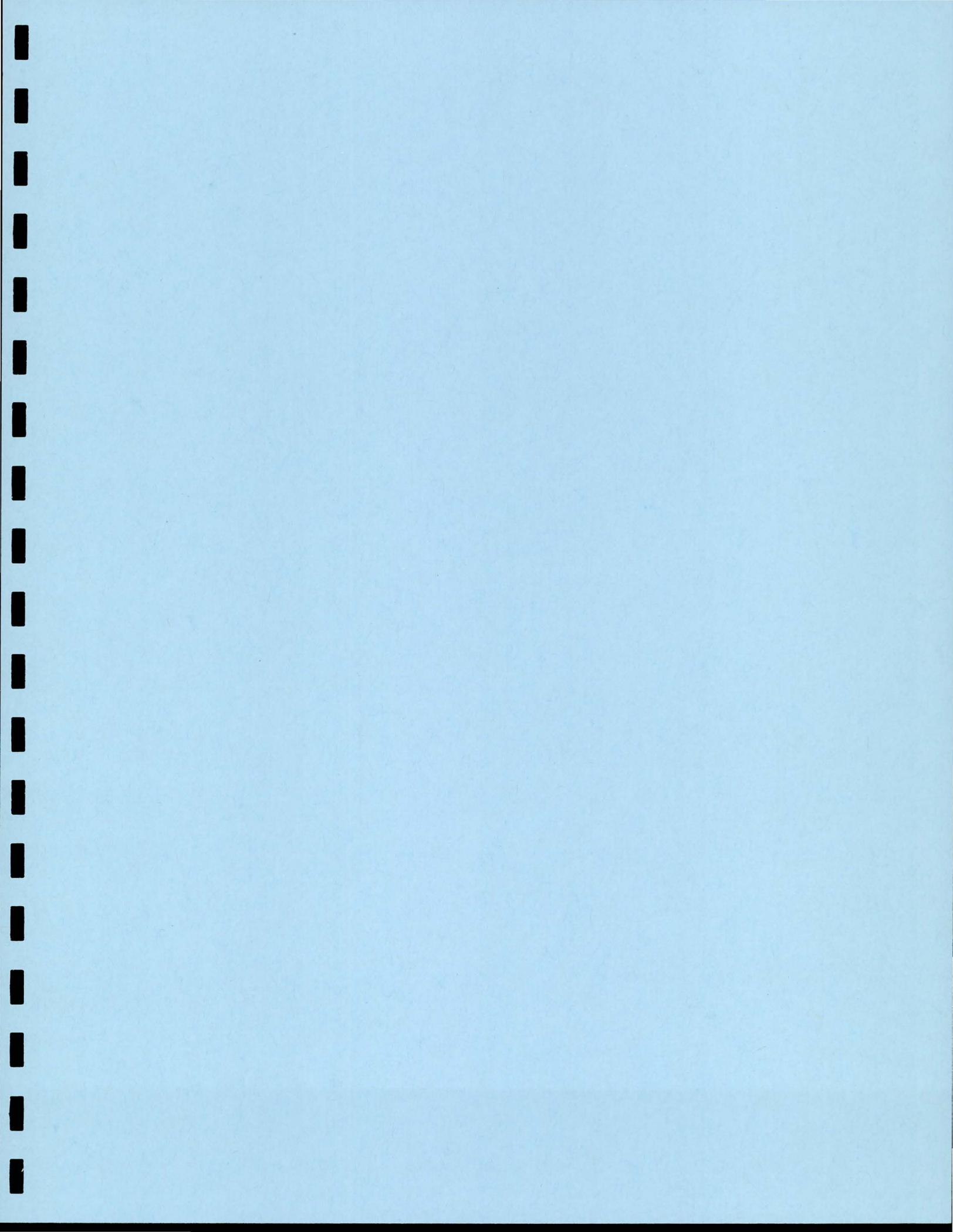
<sup>6</sup> Misc. newspaper articles

<sup>7</sup> Minutes, Scottsdale City Council Public Meeting. January 9, 2001

DESERT GREENBELT PROJECT – TEMPORAL CHRONOLOGY

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
ARTICLES TIMELINE				Oct 2: AZ Republic – Construction planned to ease storm runoff			Feb: <i>Public Works</i> magazine featured Desert Greenbelt project.				Jan 10: Scottsdale Tribune – <i>Flood control plans picking up</i>  <i>Control of Alluvial Fan Flooding, Reata Pass Channel, City of Scottsdale, Arizona</i> <sup>8</sup>	Jun 19: AZ Republic – <i>Desert Greenbelt opposition grows</i> Jun 25: EV Tribune – <i>Game &amp; Fish official slams greenbelt plan</i>	Jan 10: EV Tribune – <i>Council votes to end flood-control project</i>

<sup>8</sup> Weber, L., M. Landsiedel, and J. Rodriguez. 1999. Control of Alluvial Fan Flooding, Reata Pass Channel, City of Scottsdale, Arizona. Proceedings of the 26th Annual Water Resources Planning and Management Conference. June 6-9, 1999.





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**APPENDIX B**

INTERVIEW RESPONSES

DESERT GREENBELT PROJECT – INTERVIEW RESPONSES

WHO	W. Scott Ogden	Collis Lovely	Don Hadder	Mark Landsiedel	Kroy Ekblaw	George Sabol
<b>POSITION DURING DGB</b>	GVSCE, Stantech Consulting, FCDMC	City of Scottsdale Floodplain Administrator	City of Scottsdale	City of Scottsdale	City of Scottsdale	Project Principal, GVSCE, Inc. (1995-1996) Project Manager, Stantech Consulting (1997-1999)
<b>CURRENT POSITION</b>	JE Fuller/ Hydrology & Geomorphology, Inc.	Retired	Principle Planner City of Scottsdale	City of Flagstaff	City of Scottsdale	Senior Engineer, Stantec, Inc.
<b>INVOLVEMENT</b>	Pima Road Three Basins design.	Technical design reviewer for COS.  Reviewed all systems (Reata Wash, Rawhide Wash, and Pima Road) for the duration of the project.	Somewhat on the project periphery. Not directly involved in the day-to-day aspects of the project. Conceptualized the DGB project along with Bill Erickson. Was occasionally consulted on environmental aspects of the project due to his environmental background.	Project Manager for 7 years.	Mr. Ekblaw was as part of the initial team at the inception of DGB along with Alex McLaren and Bill Erickson. Mr. Ekblaw focused on the planning elements of the project while Mr. McLaren focused on the technical aspects.	Project Manager for Stantech. Contract with COS with funding support from District. GVSCE had a contract with COS for technical design review of Greiner work. The purpose of the design review contract was due to uncertainties and lack of confidence in the design performance in the Pima Road channel. COS had questions whether the channel would function.
<b>LESSONS LEARNED</b>	Get environmental clearances before spending money on design. The public perceived a value of the habitat downstream of the Loop 101.	Just because a project gets approved and money is spent on design does not mean politics will not change and terminate the project.  City spent \$5M over several years. The City Council and new mayor terminated the project. City bought easements and had vegetation removed from project right-of-way before DGB was terminated. There were some better candidates for the design contract than were chosen (hindsight).	Pure engineering and science will not always prevail in the public forum. Public took factual pieces of the project and manipulated them into alternate facts.  Agencies did not present enough alternatives to the public. There was a very strong anti-development group that used DGB as a poster child. The public felt that DGB would spur development in the watershed.	A technical solution was achieved and approved by FEMA, resulting in a CLOMR. The solution was not as “green” as originally hoped for. Public perception and a changing political landscape prevailed in the end.	The biggest lesson learned was the importance of conveying to the public an understanding of the difference between alluvial fan flooding and riverine flooding (e.g., wash can change its course).  Recommended not bringing up DGB to the public during the PPW ADMS project. Emphasize the goal is using better science to assess flood hazard risk.  Keep focused on the drainage issue; disassociate from other elements (e.g., multi-use). Trails are not popular.  Need to convince public and elected that the flood hazard is real (not a “phantom menace”) and the project is needed based on study; otherwise, do not go forward with the plan.	Public perceptions were incorrect from a technical standpoint. Technical facts that were reported by the public during the final public meeting were incorrect. Citizens were uninformed about the flooding hazard. Public involvement is extremely important in getting the technical facts out to the public. Property owners in N. Scottsdale felt the project would bring in undesirable development.  A better approach would be to educate the public about the consequences of the flood hazard, risk to loss of life, property damage, etc. These need to be more clearly presented to the public. The engineering and public sector communities have come a long way in better understanding high velocity flows, sedimentation, etc. and how to mitigate them.

DESERT GREENBELT PROJECT – INTERVIEW RESPONSES

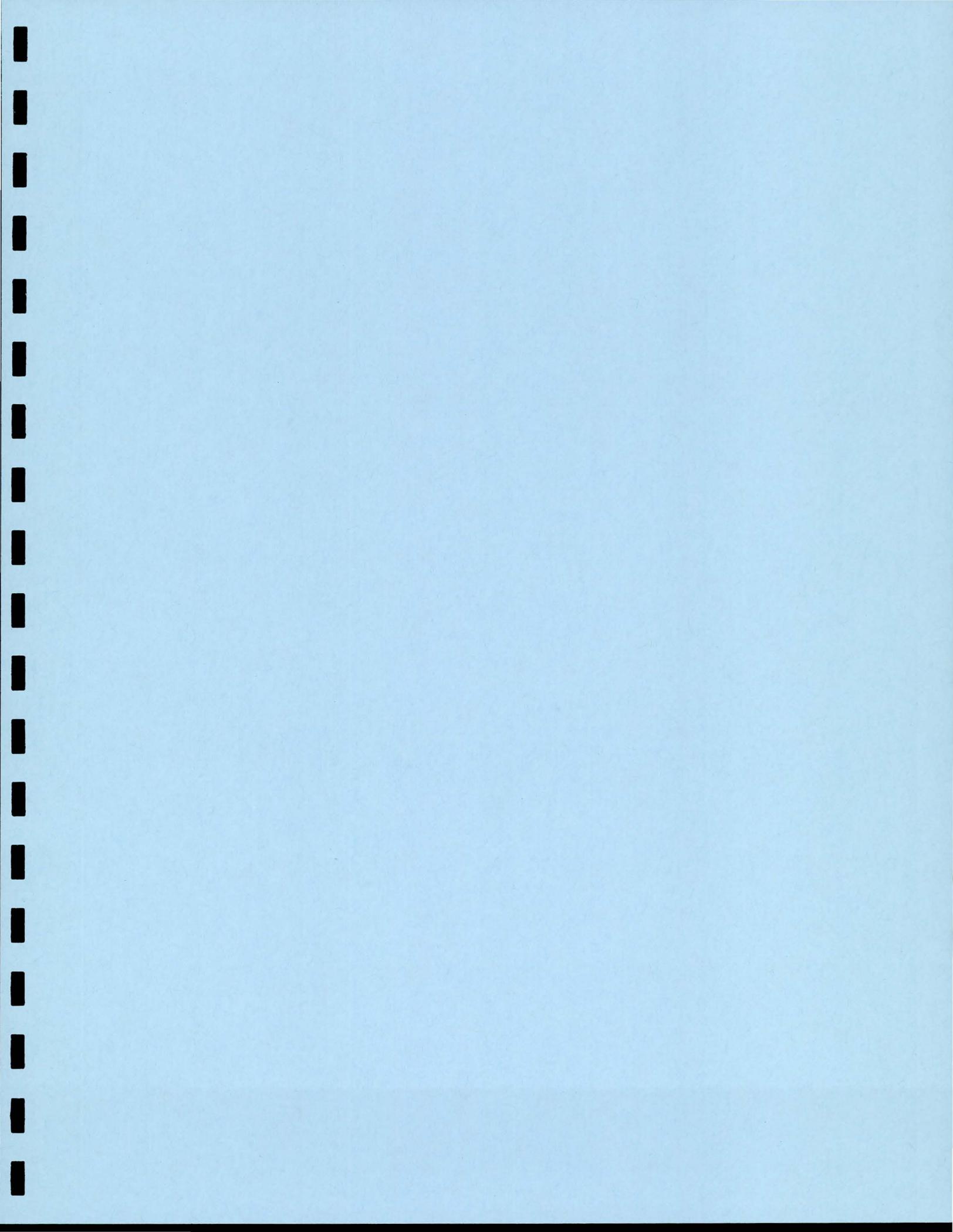
WHO	W. Scott Ogden	Collis Lovely	Don Hadder	Mark Landsiedel	Kroy Ekblaw	George Sabol
<b>PROJECT DESIGN</b>	<p>Pima Road - Original Greiner design for Pima Road was a gunnite channel with high velocities (flush through). There were public safety concerns about the high velocities immediately next to a roadway. The revised design (GVSCE then Stantech) was multiple in-line basins connected by a channel then transition into two 104" pipes with an outlet upstream of Loop 101.</p> <p>Riata Pass Wash - Original design was armor flex channel lining with soil cement banks and levees. Intent was to preserve natural habitat corridors.</p> <p>Rawhide Wash - Design was a dam at the fan apex.</p>	<p>The design was good. Reviewed and approved the technical components of the design. Cannot think of another type of design that would have removed the alluvial fan flooding hazard.</p>	<p>The solutions were over engineered from an environmental perspective. There were too many "hard edge" solutions and not enough "softer" solutions. Indian Bend Wash started the soft solution approach for Scottsdale in the 1960s. The public reacted negatively to the "hard edged" design and made them feel uncomfortable with the project.</p> <p>Some parts of the project were over-designed. Some parts did not consider site-specific factors such as geology, soils, etc. that vary from upstream to downstream in the watershed.</p> <p>The design was a more traditional USACE approach (concrete channels, hard banks, etc.). The public did not agree with that approach.</p>	<p>There were three separate projects. Reata Wash and Rawhide Wash were always thought to be very environmentally friendly designs using natural topography to the greatest extent possible. These designs became much more "hardened" at the insistence of the Flood Control District and FEMA. Pima Road Channel was always a "man-made" structure and changed little over the life of the project other than the number and location of detention basins.</p>	<p>The design makes sense.</p> <p>A large portion of the Reata Wash channel has been built. One mile is missing between Pinnacle Peak Road and Deer Valley Road alignment.</p> <p>Rawhide Wash basin does not help Scottsdale as much as Phoenix and ASLD. The basin concept would be difficult to implement because of the level of federal permitting required.</p>	<p>Stantech did an excellent job in the design. They were very confident that construction of their design could be initiated.</p>
<b>PUBLIC OUTREACH</b>	<p>Not involved.</p>	<p>Recalls having public meetings with local residents (city staff and design team members). Public meetings went fairly well.</p> <p>The biggest concern of the public was that the project would result in high density development. High density development occurred anyway, despite DGB never being constructed.</p>	<p>Attended a few outreach meetings. Felt that the team did not have a clear understanding of the community perception of the project.</p> <p>The project was presented by engineers. It was presented almost "threat-like" such that the message was "you will get flooded unless we fix the problem with an engineered solution."</p> <p>Many property owners felt that "new" development was causing problems, but that their existing properties were benign and were not contributing to any existing flooding problems. There should have been a stronger public outreach program overall.</p>	<p>It was extremely comprehensive.</p>	<p>Public outreach was extensive for portions of the project. Made adjustments along the way. The overall DGB concept was difficult to explain to the public which resulted in a high degree of suspicion and distrust of government.</p> <p>Public perception was that the DGB would enhance development. The "hot topic" was that development should pay for itself.</p> <p>The infrequent nature of desert flooding makes it difficult for the public to perceive the flood hazard risk. Some thought that the right-of-way acquisition for the Riata Pass Wash channel was a "taking".</p>	<p>Stantech wasn't involved in public outreach components. Stantech provided support as requested by COS. COS was not prepared for the public outcry that occurred. Public outreach should be done up-front and encompass education of the public of the actual consequences of the flood hazards. Technical arguments are less relevant than conveying an up-front understanding of risk, consequences, and benefits. Mr. Sabol lived in Scottsdale at the time and was not educated about the project from a resident perspective.</p>

DESERT GREENBELT PROJECT – INTERVIEW RESPONSES

WHO	W. Scott Ogden	Collis Lovely	Don Hadder	Mark Landsiedel	Kroy Ekblaw	George Sabol
<b>PUBLIC PERCEPTION CHANGE</b>	Public saw the project as a gateway to development.	The election came up (mayoral and city council) and new members were elected. DGB was made into an election issue by residents.	Opposition was consistent throughout the project. It never changed. In the beginning, the opposition was fractured into many small groups or individuals. As the project progressed, the opposition became organized and tightly managed. This gave them a stronger voice and more influence.	The project was always controversial. Many area residents and the Coalition of Pinnacle Peak (COPP) heavily promoted the idea that if the DGB was built it would “allow development”. The evidence that development was occurring, despite the lack of a regional flood control solution, was incontrovertible. Cindy Lester from the US Army Corps of Engineers Regulatory Branch really supported this theory. In the end, she was reassigned by the LA District and they wrote the EA for the project (not an EIS as Cindy was requiring).	The public perception didn’t change during the project. There was suspicion of the purpose, need, cost, and impacts throughout the timeline of the project. A major flood event might change the public perception.	COS became aware about opposition and did a good job attempting to mitigate the concerns with some success. However, it came too late; the public opposition was already too far ahead and organized.
<b>INSTIUTIONAL SUPPORT CHANGE</b>	No comment.	When the new mayor and council terminated the project, the City staff had no choice but to stop work on the project.  City technical staff approval of the project did not change even after it was terminated. No technical staff ever opposed the project.	Agency staff working on the project formed a “core team” that was very single-minded in its approach. Others in public agencies were not really given an opportunity to express any opposition to the project or elements of the project. There were others that could have helped with the public support issue if they were asked to be involved.	From the City’s perspective, there was a tremendous change in the Council over a couple of elections cycles. Many of the Council members were supported by COPP.	Never had a political champion for the project partly due to turnover.  Institutional support was driven by public feedback. There was solid support from team staff. Strong support from Dick Bowers.	Not sure institutional support really changed. Agencies were never fully supportive of the Greiner “hard” concrete solution, but were supporting of the concept of moving the flood flows out of the system as quickly as possible. The agencies evolved to “soft”, more aesthetic solutions by the late 1990s.
<b>REPORTS/DOCUMENTS</b>	SLA - Reata GVSCE/Stantech - Pima Road Three Basins HDR - Rawhide	No comment.	Terravita Bella Cera DC Ranch Grayhawk	The City and Flood Control District spent millions of dollars on designs and reports. Both have huge files to review.	Provided a video of a 7 minute presentation about the project used in the early 1990s in public outreach and on Channel 11 public service announcements.	No comment.
<b>INTERVIEW OTHERS</b>		Mark Landsiedel – Project Manager Alex McLaren – COS (retired) Kroy Ekblaw Don Hadder	Alex McLaren – COS (retired)	Alex McLaren, Collis Lovely, Dave Meinhart, Bill Erickson, George Sabol, Lan Weber, Kroy Ekblaw	Dave Meinhart, Alex McLaren, Mark Landsiedel	Mark Landsiedel, Dave Meinhart, John Rodriguez (FCDMC), Pedro Calza (FCDMC), Ed Raleigh (FCDMC), COS attorneys (Elizabeth Cooper)

DESERT GREENBELT PROJECT – INTERVIEW RESPONSES

WHO	W. Scott Ogden	Collis Lovely	Don Hadder	Mark Landsiedel	Kroy Ekblaw	George Sabol
OTHER NOTES		<p>2D modeling can't be used on alluvial fans. They are too unpredictable.</p> <p>He has newspaper articles and letters from residents opposing the project.</p> <p>He provided a copy of Public Works magazine (February 1995 issue) with an article about DGB.</p>	<p>Inconsistencies in discharge estimates and drainage solutions by individual lot owners and small developers through piecemeal studies led to the DGB concept.</p> <p>Mr. Hadder was instrumental in insisting that the south Reata Wash channel be preserved through right-of-way acquisition even though the channel was not "active". At the time, most of the flow was focused in the southeast channel.</p> <p>A 25 to 50 year flood event would get people to "wake-up" and realize the flooding hazard that exists in N. Scottsdale.</p> <p>Dave Gilbertson (sp?) may have copies of the Grayhawk Master Plan documents. His firm has since been acquired and Mr. Hadder does not recall the name.</p>	No comment	<p>Corps opposition slowed down the DGB project. Citizens became engaged and then Council changed leading to project termination.</p> <p>There will always be new players on a project of this scale and timeline. Need to account for turnover in public and stakeholder outreach.</p>	<p>Basin 53R may still be a solution.</p> <p>ADOT culverts under the L101 are a significant issue due to downstream flooding. The original DGB design resulted in very little flow getting to the L101. The L101 freeway was designed assuming DGB would reduce the inflows to the freeway embankment.</p>

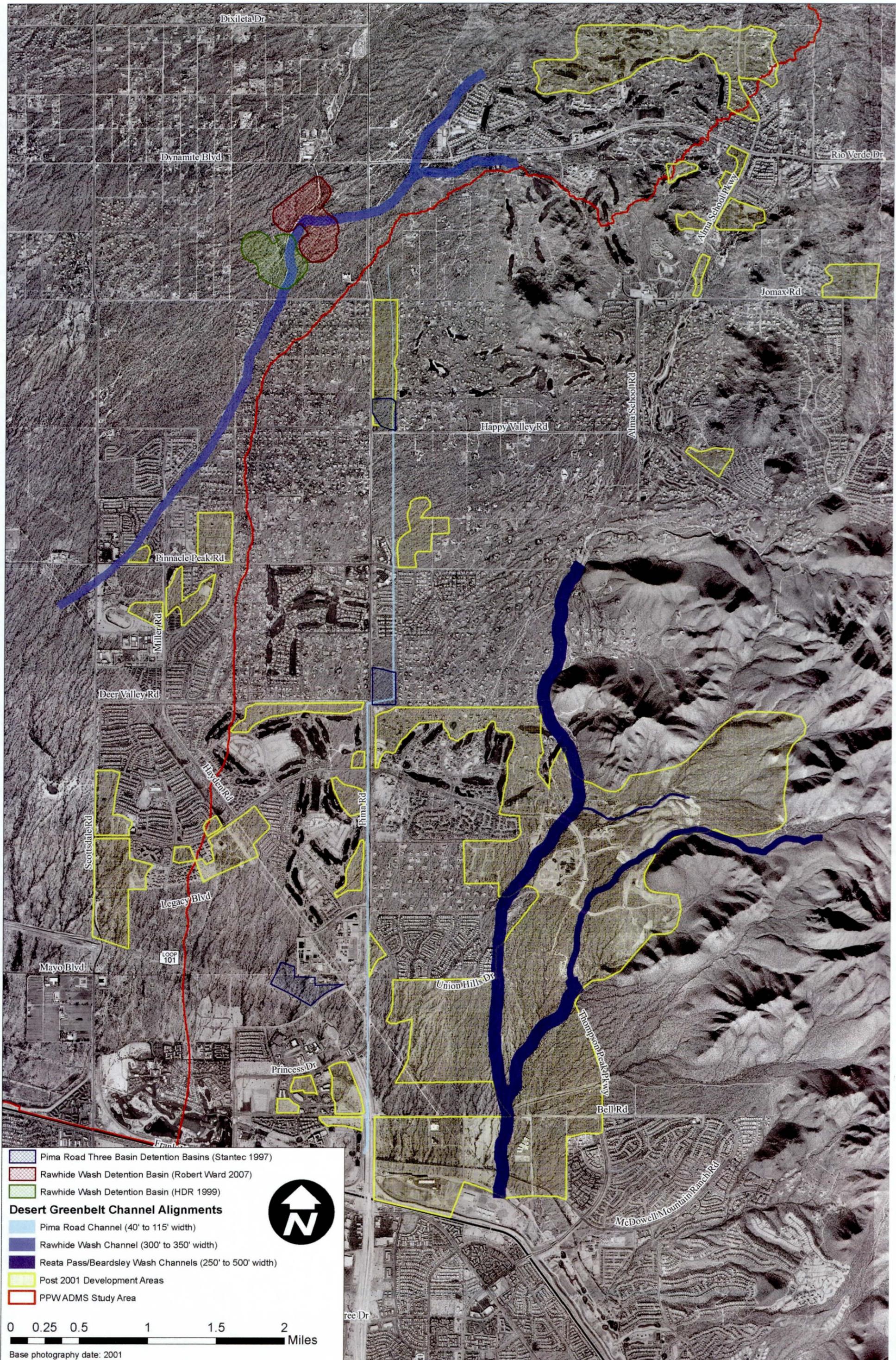




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**APPENDIX C**  
SPATIAL MAPS



Pima Road Three Basin Detention Basins (Stantec 1997)  
 Rawhide Wash Detention Basin (Robert Ward 2007)  
 Rawhide Wash Detention Basin (HDR 1999)

**Desert Greenbelt Channel Alignments**

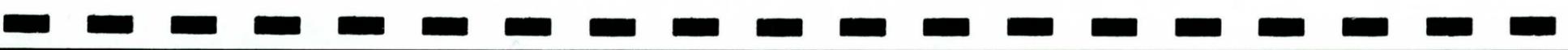
Pima Road Channel (40' to 115' width)  
 Rawhide Wash Channel (300' to 350' width)  
 Reata Pass/Beardsley Wash Channels (250' to 500' width)

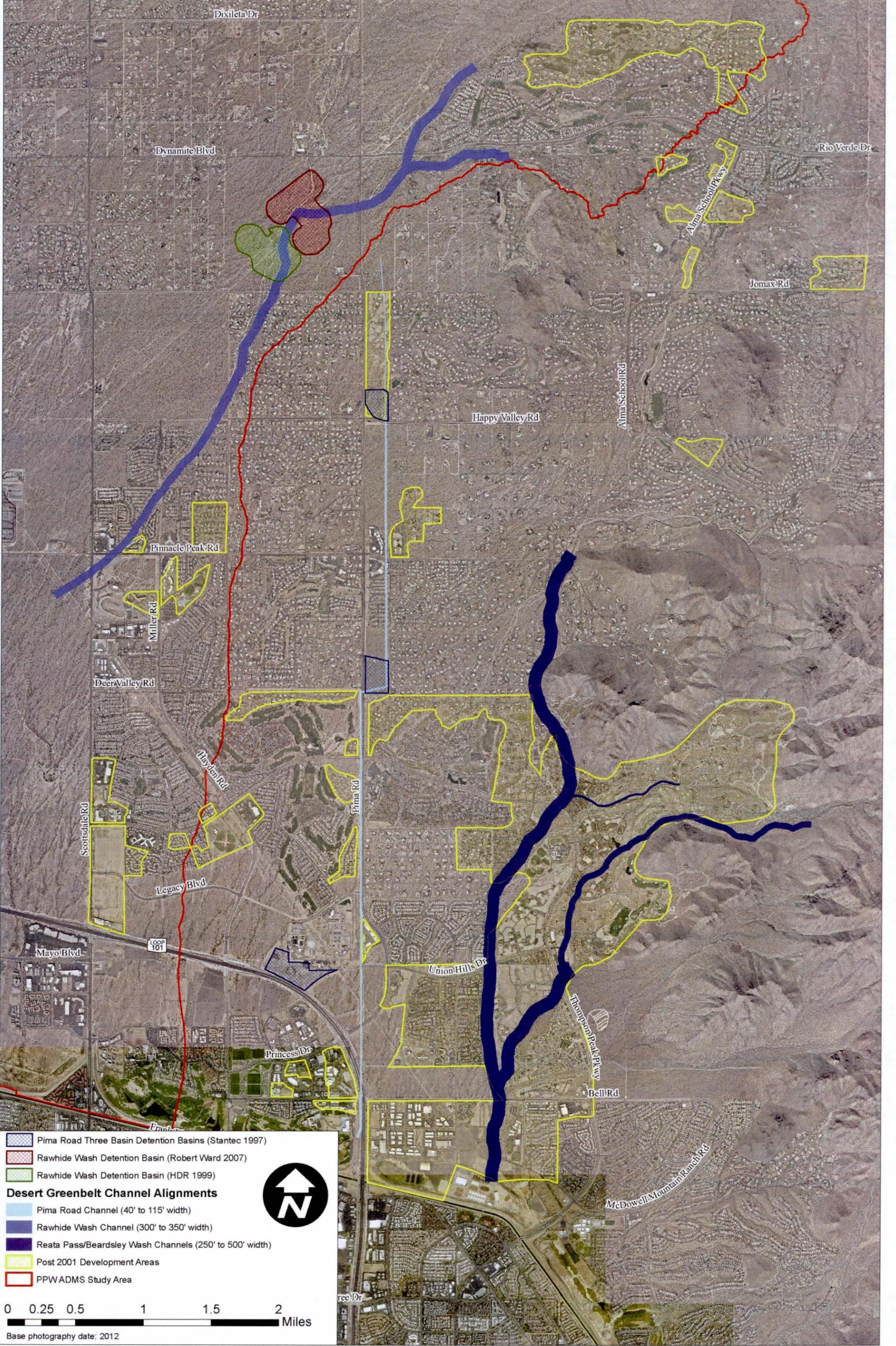
Post 2001 Development Areas  
 PPWADMS Study Area



0   0.25   0.5   1   1.5   2  
 Miles

Base photography date: 2001





-  Pima Road Three Basin Detention Basins (Stantec 1997)
-  Rawhide Wash Detention Basin (Robert Ward 2007)
-  Rawhide Wash Detention Basin (HDR 1999)

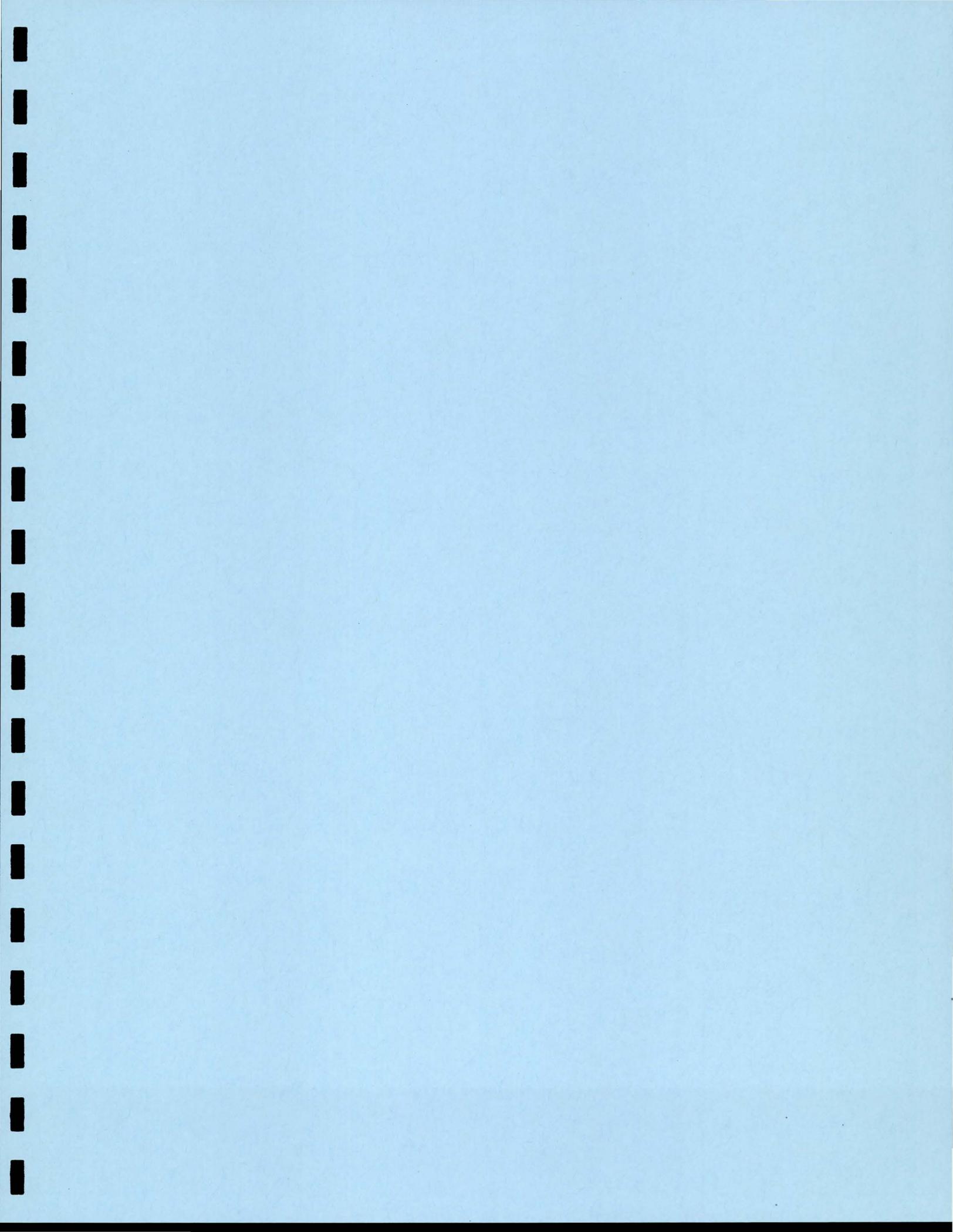
**Desert Greenbelt Channel Alignments**

-  Pima Road Channel (40' to 115' width)
-  Rawhide Wash Channel (300' to 350' width)
-  Reata Pass/Beardsley Wash Channels (250' to 500' width)
-  Post 2001 Development Areas
-  PPWADMS Study Area



0 0.25 0.5 1 1.5 2 Miles

Base photography date: 2012





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**APPENDIX D**

ARTICLES

# channel project proposed to control flooding

regional  
lan



## Construction planned to ease storm runoff

By Doug Snover  
Staff writer

SCOTTSDALE — A \$58 million plan for drainage channels to control storm flooding north of the Central Arizona Project will be introduced by city planners over the next few weeks.

Nearly all of the areas between the CAP aqueduct and Dynamite Road that have been declared "flood prone" by the federal government could be relieved of that often-expensive designation by construction of three lengthy channels to divert storm runoff, city planners say.

About 13 square miles of Scottsdale north of the CAP has been designated as flood plain by the Federal Emergency Management Agency. FEMA classifies the flood-prone areas as "AO zones" and says they are subject to storm-water flows more than a foot deep.

Anyone building within the mapped flood plains is required to take special precautions such as raising building pads above the predicted flood levels at an additional estimated cost of thousands of dollars per home.

Anyone buying a home in the area will be required to purchase flood insurance, which could run hundreds or even thousands of

dollars per year, depending on the value of the property.

Three channels, each costing millions of dollars, could be built to contain storm water and eliminate the AO designations, city officials predict. The channels also could become the basis for a "desert greenbelt" system of natural washes, jogging paths and parks.

Scottsdale planners are proposing a \$25 million Reata/Beardsley channel that would control flooding generally east of Pima Road and south of Pinnacle Peak road.

The main Reata/Beardsley channel would hug the McDowell Mountains just south of Pinnacle Peak Road, move to the west at Beardsley Road and follow 96th Street south to the CAP aqueduct, where the channel would dump its waters into CAP detention basins.

A side channel would begin near Beardsley Road at about 104th Street and connect with the main channel near 96th Street and the Bell Road alignment.

City officials also are proposing a \$20 million Pima Road channel that would carry floodwaters about six miles from Jomax Road to a proposed retention basin at Pima and Union Hills Drive, then meter the water southward into smaller channels that would carry it to the main CAP detention basins.

A third proposed channel — the \$13 million Rawhide channel — would begin near Dynamite Road east of Pima Road and carry storm

**Three channels, each costing millions of dollars, could be built to contain storm water and eliminate the AO designations, city officials predict.**

waters southwest through the Los Portones area north of Pinnacle Peak Road and across Scottsdale Road near Rawhide, just south of Pinnacle Peak Road.

Phoenix officials are considering a flood control project to continue the Rawhide channel after it crosses city limits at Scottsdale Road.

The Scottsdale Planning Commission is expected to review channel plans on Oct. 12.

Scottsdale City Council members could be asked to formally adopt the proposed channel routes at their Oct. 20 meeting. Council members were expected to review the program timetable at Tuesday's study session.

City planners calculate that construction on the first parts of the extensive channel system could begin in mid-1994. The project might take 10 years to build the primary flood control structures, and even longer to

flesh out with the full system of parks and amenities proposed.

One factor that could dictate construction phasing of the Pima and Reata/Beardsley channels is the plan to build an interim Outer Loop freeway connection between Scottsdale and Bell roads, officials acknowledge. That freeway section is expected to be open as soon as 1995.

Scottsdale has almost \$20 million available for the channel projects from the 1989 bond program, but is anticipating sharing the estimated \$58 million costs with other governmental agencies and affected landowners. However, city officials say they have not calculated the percentage of costs expected to be borne by the city, other agencies, and landowners.

Agencies that Scottsdale might ask to help fund the project are the Maricopa County Flood Control District, U.S. Bureau of Reclamation, Arizona Department of Transportation, and U.S. Army Corps of Engineers.

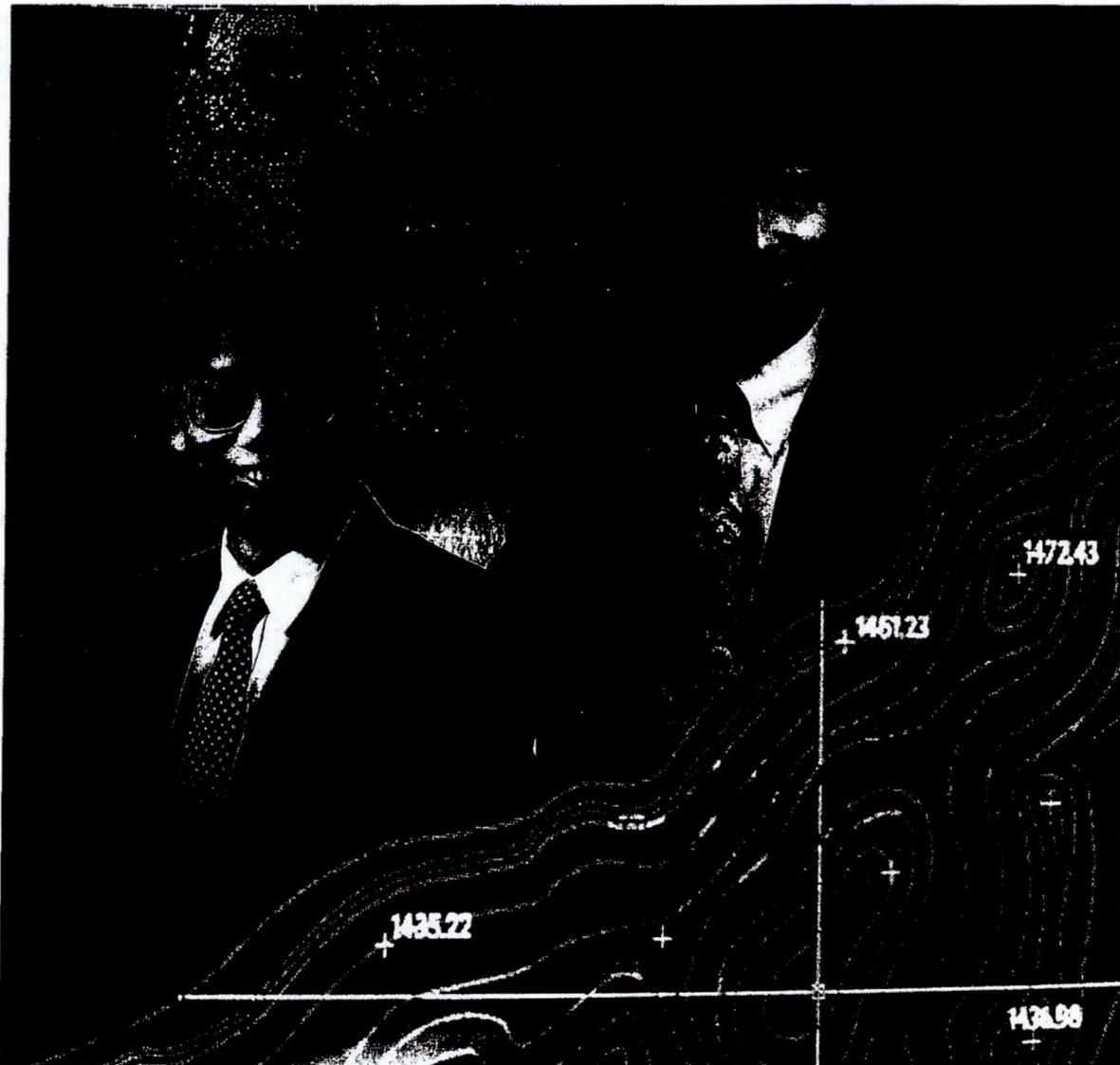
Landowners could be billed for part of the \$58 million program through local improvement districts or community facilities districts. Both types of districts allow the city to tax lands within the district to pay off construction bonds.

Much of the proposed cost would be to restore washes to their natural appearance after construction of the channels, and to build bridges that would eliminate street flooding.

# Public Works

City, County and State

February, 1995



*Pictured within a computer-enhanced illustration of the Desert Greenbelt Project are Shi-En Shiau, Project Manager, Greiner, Inc., Phoenix (left) and Mark G. Landsiedel, Project Manager, Scottsdale, Arizona. More on pages 14 and 52.*

Public Works magazine cover. February 1995

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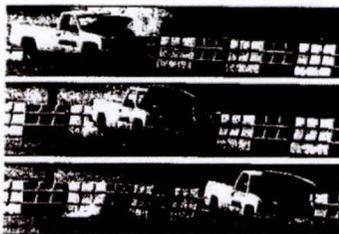
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Public Works magazine cont. February 1995. A-13 on card

## ABOUT OUR COVER

This month's computer-enhanced illustration identifies the high technology applied to the \$58-million Desert Greenbelt Project, which will provide stormwater management for a northern portion of Scottsdale, Arizona. Shown within the context of a superimposed CADD drawing from the project are Shi-En Shiau, project manager with the Phoenix office of Greiner, Inc., and Mark G. Landsiedel, project manager with the City of Scottsdale. The decisions of these men and other project team participants will shape the destiny of the area addressed by the project.

Months of computer simulations have been used to model the individual and collective effects of hydrology, sedimentation, erosion, channel treatment, and flood control schemes related to three main washes and their tributaries. The analysis will ultimately guide engineers and contractors as they work to develop 20 miles of contained wash systems in concert with their natural land forms and environs.

Although a logical part of the city's Master Plan of drainage improvements, this particular project also will eliminate approximately fourteen sq mi of "AO" Zone Special Flood Hazard Area now impacting further development of the area.

So it seems history is again repeating itself as a civilization in the desert strives to control the indispensable resource of water. For every effort aimed at irrigation, others must focus on controlling rainfall in a runaway state. Here, even modest rains in the mountains can send flash floods surging down through the foothills and across the valley floor below.

The terrain features addressed by the Desert Greenbelt Project are known as alluvial fans, which the force of water has steadily created over thousands of years. The topography presents often unpredictable paths where runoff flows into the lowest elevations. The Desert Greenbelt Project will change all that by enhancing three primary washes into high-capacity drainage channels.

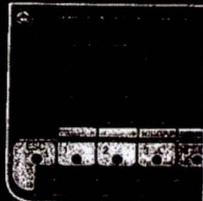
In an innovative approach, Scottsdale will preserve or reestablish much of the natural character of these channels to encourage dual use for limited recreational pursuits.

Cover Photograph

©1995, Dan Watts, Phoenix, Arizona



MULTI-POINT



REMOTE BEN



PCMCIA allow trans large volume data

tions could be easily expanded if additional features and attributes (street names, traffic signals, traffic flows, address ranges, surface conditions, culverts, etc.) were added to this database.

The photomosaic base map could serve these functions and more. A road center-line coverage could have been generated with the editing tools available in ARC/INFO directly from the digital photomosaic. Additional transportation features and attributes could have added to this coverage (similar to the ARC/INFO roads coverage derived from the AutoCAD drawing). The photomosaic might also be used to generate water and sewer line coverages and determine the locations of buildings, fences, trees, hedges, and creeks in relation to streets, administrative boundaries (zoning districts, special improvement districts, tree maintenance districts, etc.), and possibly property lines. Finally, the photomosaic can also be used to update those features in a GIS database (new streets, roads, buildings, land use changes, etc.) that are visible in the photographs:

"Superimposition of the vectors on top of the stereo image in a stereoplotter has been possible for some years, but the hardware and software requirements have made it expensive and its usefulness and cost effectiveness for original map compilation is debatable. However, for map updating or revision, superimposition is essential as it affords the best means of viewing the old map superimposed upon the new photography, giving the technician a powerful tool in seeing what changes need to be made."

The value of the two base maps is also affected by the accuracy with which the real world locations of the features are represented in the base maps. The variation between the USGS and GPS latitude/longitude coordinates ranged from 20 to 60 ft. However, there were no consistent trends (north, south offsets, etc.) and the mean variation of 20 ft is well within the  $\pm 10$ -meter published limits for 7.5-minute USGS map quadrangles noted by Colvocoresses.<sup>8</sup> There were numerous discrepancies between the locations of the roads represented in the AutoCAD coverage and those depicted in the photomosaic. The roads aligned in a north-south direction showed the greatest variation with respect to their locations on the two maps.

The spatial extent of the photomosaic prepared for this study was constrained by: 1) the lack of features that were visible in the photos and the USGS mylar composite to the west and south of the city, and 2) the rolling topography of the Story Hills and Bridger Range to the east and north of the city. The availability of GPS coordinates for the features visible in the aerial photographs and the use of an analytical stereoplotter (as advocated by Colvocoresses in the last quotation)

could have reduced one or other or both of these problems.

### Conclusions

This pilot project showed that: 1) the roads coverage and photomosaic could both be used for local government applications that do not require sub-meter accuracy, and 2) USGS mylar composites can be used to assign real-world coordinates to these data layers (if necessary) and that this approach represents an excellent way to develop an initial base map which can be updated as GPS coordinates become available. In addition, the roads coverage could have been generated directly from the USGS transportation mylar separate instead of the city's quarter section maps. However, the quarter section maps are updated more frequently than the 7.5-minute USGS map series and roads coverages prepared from these local sources could therefore be expected to require less editing (to add new streets and other improvements) than those prepared from USGS mylar separates. The photomosaic may be superior to both of these sources given that: 1) they can support a larger number of applications, and 2) sequential photographs offer numerous opportunities for updating GIS coverages over time. □ □ □

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**SHI-EN SHIAU**  
Project Manager,  
Greiner, Inc.,  
Phoenix, Arizona

**I**N the 1960s, public works and planning officials with the city of Scottsdale, Arizona undertook an innovative flood-control project along the Indian Bend Wash. They rejected the customary concrete-lined channel in favor of creating more of a dual-purpose facility bordered by manmade greenbelt interspersed with many recreational amenities. The Indian Bend Wash has been viewed ever since as a model public works undertaking and conceptually inspired the approach to a \$58-million project of similar nature planned for the alluvial floodplain north of the Central Arizona Project (CAP) Canal in North Scottsdale.

Improvements to the Rawhide Wash, Pima Road Channel, and Reata Pass/Beardsley Wash Channels are collectively referred to as "The Desert Greenbelt." They are the essential component in a stormwater management plan that will protect many square miles from flash floods. As beneficial byproduct, the AO boundaries delineated in the federal government's latest flood hazard maps will be revised and allow federally-insured lenders to cease requiring flood insurance on mortgaged properties within boundaries of flood-prone areas now outlined on the maps. Certain code-mandated construction practices, such as severely elevated building pads, also will change and make new projects more compatible with the Sonoran Desert.

This is particularly challenging terrain because the topography is an "alluvial fan," built up over thousands of years by eroded sediment carried off the foothills and deposited across the valley floor. Unlike a typical riverine system where bank overflows are usually contained by adjacent topographic formations parallel to the main channel, an alluvial fan lacks any natural containment. It also presents an unstable network of primary and secondary drainage courses that are unreliable for predicting future flowpaths and vulnerable locations.

Current engineering tools make stormwater management more possible within an alluvial fan than in the past. Computer modeling will be used extensively in this case, for example. Because the city's geographic information system will be used for future management of the project, all surveys and data sets for the alignments must also have a higher level of definition and conform to the symbology, layering, and graphic standards brought on line with the city's system.

## Scottsdale Plans \$58-Million Channel Improvements

What is happening in North Scottsdale is therefore of interest to several engineering-related disciplines.

### Three Primary Channels

After years of study, stormwater management for the area being addressed was adopted in December 1992 into the city's general plan. The Desert Greenbelt translated into \$13 million, \$20 million, and \$25 million worth of improvements planned for the Rawhide Wash, Pima Road Channel, and Reata Pass/Beardsley Wash, respectively. These three primary watercourses and several tributaries will be improved to protect the area from a 100-year flood. At present, flash floods have been triggered by a three-in. or greater rainfall within a six-hour period. Rainfall in that amount can send runoff surging off the neighboring McDowell Mountains and foothills, overcharging the natural drainage system and sending scythes of high water cutting through the valley floor endangering lives and property.

The natural character of the Sonoran Desert and the potential volume of floodwater in this area have ruled out recreating the verdant greenbelt borders of the Indian Bend Wash. Instead, the normally dry washes will be improved and modified within their native context. Where necessary, a native plant revegetation program is anticipated but recreational amenities will be kept to passive types of activities such as trails for hiking, horseback riding, bicycling, and staging areas.

A task force appointed by the city studied various alternatives that would contribute to an effective stormwater management plan. Its objective was fairly straightforward: to identify and develop a stormwater management plan for the normally dry washes and the associated floodplain. Options were studied for the three alignments that would manage peak flows, mitigate flood hazards, and maximize public benefit with the least disruption to the environment. The group then assessed various alignments on the basis of: a no action alternative, enhancement of the existing alignments, and development of alternative alignments.

Although the project requires a significant investment, this life-cycle cost analysis showed that doing nothing would ultimately cost approximately \$230 million. In that context, the three channels presented an economically logical alternative. Several years of planning have already been invested in the project which will be funded by municipal bonds and a mix of other resources as project phasing evolves with the development of the community.

The physical database and file structure to be input to the city's GIS will incorporate survey control, sectional grid, roadway system, flood zones outlined on the Federal Emergency Management Agency (FEMA) maps, utility corridors, principal washes, and environmental and cultural resource data. Added elements will reflect community input derived from an extensive, two-way public involvement and communications program.

The relevant information will be superimposed onto the city's general plan so that the data set integrated with the GIS can become an analytical tool for the disciplines in each phase of the project. Once on line, the GIS can be used to answer individual questions at a series of open houses and in preparing definitive reports, exhibits, and other documentation.

The design file products include contour maps, planimetric features, and DTM grid and TTN files. Aerial photography flown at 2100 ft has produced 1 in. = 350 ft stereographic working negatives. Each color photo covers a total width of 2650 ft and is digitized into Intergraph TTN format, along with contour files in Intergraph 3-D. In addition, Greiner will prepare several other layers using Microstation during the project's analysis and design development.

Survey crews have been using advanced, handheld GPS units that expedite their task. The channel alignments were subdivided into three "reaches" based on common horizontal and vertical control data supplied by the city. Work that would normally take days using old methods is now done in just hours by the crews.

In arriving at a functional solution, Greiner must carefully analyze the project's hydrology, hydraulics, sedimentation, and structure. Alternate solutions are analyzed using sophisticated computer programs that can create simultaneous dynamic simulations with FEMA programs to gain a clearer picture of their benefits in controlling flooding in a natural state.

This "simultaneous dynamic simulation modeling" (SDSM) is set up by running the HEC-1 hydrologic model, HEC-2 backwater surface profile model, and HEC-6 scour and sedimentation models concurrently using the same data and datum set.

Hydrographs generated from HEC-1 will be processed through a random number of models to generate accumulated storms through the design frequency life and input into the HEC-6 hydrograph module. Velocity distributions and depths within a cross-section generated from a

HEC-2 run will be compared to the maximum allowable scouring velocity for the designated channel treatment. This information will be used in HEC-6 to define erodible and/or non-erodible boundaries within a section. Channel degradation and aggregation resulting from the HEC-6 run will be used to determine the modification needs of channel configurations and treatment adequacy. Manning's "n" value corrections, and the need for sedimentation/detention basins, are incorporated into new HEC-1 and HEC-2 runs. With the sedimentation and scouring within a reach or segment defined by the HEC-6 results, an adequate channel section can then be defined.

The simulation is optimized and the flood control system stable when the input and output from all three models remain consistent. The model simulation is optimized for an accurate flow rate that is generated by the real land-use and flood control system. The flood control system is stable and, as a result, maximum flooding of a movable bed no worse than a rigid bed model. The sediment is carried through safely and/or deposited in the sedimentation basin as designed. If scouring is anticipated, it will happen at the controlled/designated low flow or pilot channel.

The technique integrates engineering and esthetic requirements. It is dynamic as it simulates, analyzes, and solves hydrology, hydraulics, sedimentation, erosion, channel treatment, and flood control schemes.

### Financing and Scheduling

Capitalizing such an ambitious project will demand a creative mix of sources. Scottsdale has identified approximately \$20 million from a 1989 bond referendum. Additional sources can include assessment districts established for benefitting property owners and developers, the Maricopa County Flood Control District, Arizona Department of Transportation, the U.S. Bureau of Reclamation, and the US Army Corps of Engineers. Costs exceeding those sources may be recovered also by establishing Community Facilities Districts and other mechanisms created by new legislation.

It will take through the year 2000 and beyond to complete the basic infrastructure for the channels. They will range in depth from six ft for the Reata Pass/Beardsley Wash and Rawhide Wash, up to eight ft for the Pima Road watercourse. Widths will range from 200 to 250 ft for the Pima, to 200 to 400 ft for the Riata Pass/Beardsley Wash, and from 350 to 400 ft for the Rawhide Wash Channel. □□□

# Desert Greenbelt opposition grows

## Costs, impact fuel hot debate

By Chip Scutari  
The Arizona Republic

After a decade of designs, engineering and planning, a 5-mile-long flood control project for north Scottsdale has succeeded in diverting one thing:

Millions in taxpayer dollars.

A virtual river of cash — about \$19 million in public money — has been spent on the Desert Greenbelt project, which is designed to funnel floodwaters off the McDowell Mountains to protect homes from a 100-year flood. A 100-year flood is a hypothetical event that has a 1 percent chance of happening in any given year.

But unlike the city's previous leaders, Scottsdale's new political regime may not support the \$100 million plan. In fact, five of the seven City Council members have publicly stated their opposition to the project.

"We continue to spend money on this project," City Councilman Tom Silverman said. "We need to bring this to a council vote right away. I'm not convinced it's good for the desert."

City records show that Scottsdale taxpayers have put in nearly \$16 million for land acquisition, design costs, condemnation of property and legal fees since 1992. County taxpayers have paid an additional \$3.5 million into the Maricopa County Flood Control District to help pay for the desert greenbelt.

By July, Scottsdale will find out whether the U.S. Army Corps of Engineers will require an environmental impact statement, an expensive and time-consuming examination of the project's impact. If required, the study would take one or two years and cost the city an additional \$200,000. If the corps OKs the greenbelt, the council could still vote to stop or postpone

## Desert Greenbelt tax dollars

Here's a breakdown of how much taxpayer money has been spent on the \$100 million flood control plan:

Total taxpayer money: **\$19 million.**



Scottsdale taxpayer portion: **\$16 million.**

### How some of the tax money is being spent:

- **\$6.22 million** on design costs.
- **\$6.85 million** on land acquisition and right-of-way purchases.
- **\$1.3 million** on plant salvage and tree removal.
- **\$2.16 million** construction of Pinnacle Peak bridge and a storm drain under Pima Road.
- **\$630,000** on administrative salaries.
- **\$330,000** on legal costs for outside attorneys.

Source: City of Scottsdale

Kee Rash/The Arizona Republic

the project.

Councilwoman Cynthia Lukas, a greenbelt critic since 1993, said the project has been "a questionable use of public money."

"We need to put this on the table and have the council vote on this," Lukas said. "No one thought this project would be of this scale or that it could tear up the desert. This is too expensive."

Despite the political landscape, city staff members still tout the project as a regional flood control system to improve existing washes, restrict flood flows that now weave widely across the desert and provide a trail network in the normally dry washes. The project would run along the foothills of the McDowells, stretching from the Central Arizona Project canal north to Dynamite Boulevard.

Phoenix is considering using natural washes instead of concrete channels to control floodwaters. Scottsdale says that's an "apples to oranges

See PROJECT | Page B5

# PROJECT | Foes multiply, speak out

From Page B1

comparison" because those areas, such as the Black Canyon Corridor, don't have homes.

Dave Meinhart, a city public works planner and greenbelt project manager, said the miles of channels, pipes and retention basins would help protect \$650 million worth of property, including 2,500 homes and 300 acres of golf courses.

Meinhart said the greenbelt would provide recreational paths and its concrete channels, made out of material called soil cement, will not harm the natural environment.

Not so, say critics, including the Environmental Protection Agency and the U.S. Department of Fish and Wildlife. There's a gulf of disagreement:

■ City officials say the greenbelt will help complete the final two-mile section of the Pima Freeway by 2002, one year ahead of schedule. Officials at the Arizona Department of Transportation say that would only happen if Scottsdale advanced ADOT a \$16 million loan this week. And that loan can't happen unless the city receives a go-ahead from the federal government.

■ City officials say the size of the project has not changed since Scottsdale submitted its original application in 1997. The corps, however, said the project has doubled in size.

■ City officials say the project won't harm the environment. Critics disagree.

"We believe the alterations of natural channels combined with subsequent increase in human activity ... would adversely affect waters and associated wildlife populations and decrease biological diversity," Fish and Wildlife wrote in a June 1998 letter to the Corps.

■ City officials say the project will protect 8,550 acres in northern Scottsdale. Critics, including the EPA, say the greenbelt will accel-

“ This project is like shooting a rabbit with a cannon. They should drive a stake through the heart of this \$100 million boondoggle.

**Bob Vairo**

Resident leading opposition

erate the pace of development.

Bob Vairo, a resident leading the greenbelt opposition, called on the council to pull the project until the public knows the real deal.

"The council should put this project on hold immediately," Vairo said. "This project is like shooting a rabbit with a cannon. They should drive a stake through the heart of this \$100 million boondoggle."

The project was scheduled to break ground in spring 1998, but it's been postponed by design approvals, a skeptical citizenry and a lawsuit. Scottsdale is suing the project's original contractor, Greiner Engineering, for \$1.3 million, claiming faulty engineering. Scottsdale dumped Greiner in 1997 after the Phoenix firm couldn't get federal and state approval for the flood control plan.

Unlike his colleagues, Scottsdale Councilman Robert Pettycrew still supports the project. Councilman George Zraket has been critical of the greenbelt but said he hasn't made a final decision.

"It's an important project that we need to look at," Pettycrew said. "It's important people know that this project is not about promoting development but flood control. It's about flood protection. But we have to continue to do public outreach."

# Game & Fish official slams greenbelt plan

### Urbanization of area could threaten desert wildlife, biologist says

BY SCOTT C. SECKEL  
TRIBUNE

The Arizona Game & Fish Department added its voice to growing concerns that the Desert Greenbelt planned for north Scottsdale will permanently destroy wildlife habitat.

The state in December wrote a letter to the Army Corps of Engineers, joining the Environmental Protection Agency, U.S. Fish & Wildlife Service and the Sierra Club in saying that the project is driven by growth that will damage the desert.

"That's pretty remarkable for Game & Fish to write a letter like that," said Robin Silver, local conservation chair of the Center for Biological Diversity. "If they're saying something, this project is going to be a real disaster. Usually they just rubber-stamp everything."

The proposed \$100 million Desert Greenbelt would be a five-mile flood control network of channels, pipes and basins designed to protect the plains west of the McDowell Mountains from a 100-year flood. The plan

was first proposed in 1989, when federal disaster experts began studying flood hazards in north Scottsdale.

A year later, voters approved a \$21 million bond issue to solve flood problems. In 1992, the Scottsdale City Council endorsed the Greenbelt idea.

Since then, controversy surrounding the plan has spread like flood waters over the desert floor. City officials hauled out pictures of last winter's flooding in Las Vegas and claimed the project is necessary to protect north Scottsdale residents. Opponents said the plan is a ruse to open the area for massive development.

U.S. Fish & Wildlife biologist Mike Martinez has reviewed the plan and is concerned that the area is becoming too urban. He has asked the corps to look into the plan's effect on bird and mammal populations.

"The flood control plan, per se, is not having as big an effect on wildlife as the urban development," Martinez said. "What the flood control plan is doing is facilitating development."

Large mammals such as mule deer and javelina could be crowded out by housing, but the effect of existing housing on wildlife has been "minimal compared to the overall scheme," Martinez

**'When you cut off the flow of water, you are changing the way Mother Nature operates.'**



**CARLA**  
(her legal name)

said.

The city claims wildlife won't be affected. Scottsdale hired a team of biologists to study the plans, but they didn't red-flag any concerns, said Dave Meinhar, who is heading the project.

State wildlife officials also asked the corps to require an extensive environmental analysis of the plan.

Scottsdale has already spent more than \$20 million on studies,

land purchases and designs.

The city's mitigation proposal for the desert is "inadequate, even for the stated impacts," said Timothy Wade of Arizona Game & Fish. Wade believes that indirect effects of the project were understated in city reports and long-term effects would be significant.

Flood channels running north and south would cut plants off from rainwater running off the McDowell.

While the McDowell Sonoran Land Trust doesn't have an official position on the project, it does have serious concerns about how the plan will affect plants and animals, said the trust's executive director, Carla (her legal name).

"When you cut off the flow of water, you are changing the way Mother Nature operates," Carla said. "You can't pretend that wouldn't have an effect."

One plant that could be affected is the Hohokam agave, one of four species in the area in

danger of extinction. Hohokam agaves are guarded by the Arizona Native Plant Law. Pollinated by insects and bats, it relies on monsoon rain to grow, according to experts at the Desert Botanical Garden in Phoenix.

If the Greenbelt cuts off streams, plants and animals will be affected, said Don Steuter, Sierra Club conservation chairman. "It's hard to imagine vegetation will stay the same," he said.

The city should link habitats so animals can travel back and forth to hunt, feed and mate, Steuter said. "When it comes to connecting areas for wildlife corridors, it's really not practical to ask developers to do that."

Migration corridors are also a concern of the U.S. Environmental Protection Agency.

Washes provide routes and cover for wildlife to move from one area to another.

And a re-engineered wash won't look anything like a natural wash to a ringtail cat. Where

### ABOUT THE PROJECT

An environmental analysis of the Desert Greenbelt project could threaten a plan to accelerate construction of the Pima Freeway, costing Scottsdale taxpayers almost \$6 million.

The study would cost \$150,000 to \$250,000, and take one to three years to finish, according to the city.

If the project is built, the Arizona Department of Transportation would use the greenbelt for drainage and give the city \$5.9 million toward the project.

However, if ADOT has to build its own drainage, it will keep the \$5.9 million, plus \$135,000 paid for by the city for related designs.

gnarled roots once protruded from craggy banks topped with brush piles, spindly container trees will sprout from shallow dirt atop contoured soil cement, Wade described in his letter.

A decision from the corps about requiring an in-depth analysis is pending.

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■ SCOTTSDALE

## **Council votes to end flood-control project**

The Scottsdale City Council voted unanimously Tuesday night to end a controversial \$100 million flood-control project.

The council also voted to immediately launch a study of the flood risk to homes in the north Scottsdale area as well as a drainage plan for the area formerly designated as the Desert Greenbelt.

Nearly 200 people, most of whom opposed the Desert Greenbelt project, attended the meeting at the Scottsdale Center for the Arts and wildly cheered the vote.

When the project went away, so did the \$50 million that had been earmarked for Desert Greenbelt from the Maricopa County Flood Control District.

The Desert Greenbelt plan was passed in 1992, aimed at protecting thousands of homes from a 100-year flood.

But while the project could potentially alleviate disaster, critics say the miles of pipelines channeling flood waters would harm the desert and encourage development.

Arizona Republic, date unknown