

TECHNICAL DATA NOTEBOOK

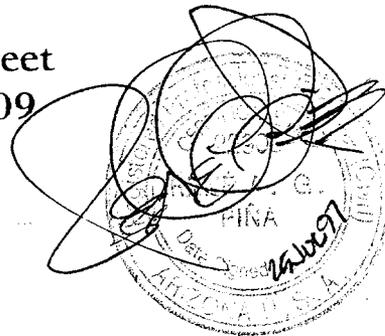
APPLICATION  
FOR  
LETTER OF MAP REVISION  
TO FEMA FIRM Panel No's  
04013C3075F and 04013C3080F

QUEEN CREEK LOMR  
(Hawes Road to SPRR)

Lying Within  
Sections 16, 17, 21, 22, 25, 26 and 27  
Township 2 South, Range 7 East,  
Gila and Salt River Baseline and Meridian  
Maricopa County, Arizona

*Prepared For*

Flood Control District  
of  
Maricopa County  
2801 West Durango Street  
Phoenix, Arizona 85009  
(602)506-1501



*Prepared By*

Collins/Piña Consulting Engineers, Inc.  
630 East 9th Street  
Tucson, Arizona 85705

COLLINS/PIÑA  
 CONSULTING ENGINEERS, INC.  
 40 EAST VIRGINIA AVENUE, SUITE 200  
 PHOENIX, ARIZONA 85004

Phone (602) 264-7505

LETTER OF TRANSMITTAL

FLOOD CONTROL DISTRICT	
RECEIVED	
APR 27 1999	
CHENG	
ADMIN	
FINANCE	
IO & M	
ENGR	MRB
REMARKS	

DATE: 4/26/99	JOB NO. 3660
ATTENTION: Mr. Mark Brewer	

TO Flood Control District of Maricopa County  
 2801 West Durango Street  
 Phoenix, AZ 85009

WE ARE SENDING YOU  Attached  Under separate cover via \_\_\_\_\_ the following items:

Shop drawings  Prints  Plans  Samples  Specifications

Copy of letter  Change order  Diskette \_\_\_\_\_

COPIES	DATE	NO.	DESCRIPTION
1	4/26/99		Check points for Queen Creek

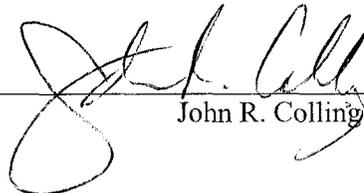
THESE ARE TRANSMITTED as checked below:

- |  |  |   |
|--|--|---|
| <input checked="" type="checkbox"/> For approval           | <input type="checkbox"/> Approved as submitted               | <input type="checkbox"/> Resubmit _____ copies for approval       |
| <input type="checkbox"/> For your use                      | <input type="checkbox"/> Approved as noted                   | <input type="checkbox"/> Submit _____ copies for distribution     |
| <input type="checkbox"/> As requested                      | <input checked="" type="checkbox"/> Returned for corrections | <input checked="" type="checkbox"/> Return _____ corrected prints |
| <input checked="" type="checkbox"/> For review and comment |  | <input type="checkbox"/> _____                                    |
| <input type="checkbox"/> FOR BIDS DUE _____ 19__           |  | <input type="checkbox"/> PRINTS RETURNED AFTER LOAN TO US         |

REMARKS: Mark: Please review these prints for comment and I will correct the plots where noted. The HEC-2 disk is for your use also.

COPY TO: \_\_\_\_\_ 3660.3

SIGNED: \_\_\_\_\_

  
 John R. Colling

IF ENCLOSURES ARE NOT AS NOTED, PLEASE NOTIFY US AT ONCE.



# Federal Emergency Management Agency

Washington, D.C. 20472

FLOOD CONTROL DISTRICT	
RECEIVED	
APR 8 0 1993	
CHECKED	INITIALS
FILED	FILE
ALIAN	CONTRACT
FINANCE	FILE
ENTER	1 HEM

CERTIFIED MAIL  
RETURN RECEIPT REQUESTED

The Honorable Mark Schnepf  
Mayor, Town of Queen Creek  
22350 South Ellsworth Road  
Queen Creek, Arizona 85242

IN REPLY REFER TO:  
Case No.: 97-09-1116P

Community: Town of Queen Creek, Arizona  
Community No.: 040132  
Panels Affected: 04013C2695 F, 3075 F,  
and 3080 F

Effective Date of **APR 16 1998**  
This Revision:

102-D

Dear Mayor Schnepf:

This responds to a request that the Federal Emergency Management Agency (FEMA) revise the effective Flood Insurance Rate Map (FIRM) for Maricopa County, Arizona and Incorporated Areas (the effective FIRM for your community), in accordance with Part 65 of the National Flood Insurance Program (NFIP) regulations. In a letter dated August 19, 1997, Mr. Hasan Mushtaq, P.E., Engineering Division, Flood Control District of Maricopa County, requested that FEMA revise the FIRM to show the effects of a detailed study of existing conditions along Queen Creek from Hawes Road to the Southern Pacific Railroad (SPRR).

All data required to complete our review of this request were submitted with letters from Mr. René A. G. Piña, P.E., Project Engineer, Collins/Piña Engineering, and Mr. Mushtaq. Because this Letter of Map Revision (LOMR) is based on a detailed hydrologic or hydraulic study conducted by a Federal, State, or local agency to replace an approximate study conducted by FEMA, fees were not assessed for the review.

We have completed our review of the submitted data and the flood data shown on the effective FIRM. We have revised the FIRM to modify the floodplain boundary delineations of the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood) along Queen Creek from Hawes Road to the SPRR. As a result of the modifications, the width of the Special Flood Hazard Area (SFHA), the area that would be inundated by the base flood, for Queen Creek decreased. The modifications are shown on the enclosed annotated copies of FIRM Panel(s) 04013C2695 F, 04013C3075 F, and 04013C3080 F. This LOMR hereby revises the above-referenced panel(s) of the effective FIRM dated December 3, 1993.

Because this revision request also affects the unincorporated areas of Maricopa County, a separate LOMR for that community was issued on the same date as this LOMR.

The modifications are effective as of the date shown above. The map panel(s) as listed above and as modified by this letter will be used for all flood insurance policies and renewals issued for your community.

A review of the determination made by this LOMR and any requests to alter this determination should be made within 30 days. Any request to alter the determination must be based on scientific or technical data.

We are processing a revised FIRM and Flood Insurance Study (FIS) report for Maricopa County; therefore, we will not physically revise and republish the FIRM and FIS report for your community to incorporate the modifications made by this LOMR at this time. Preliminary copies of the FIRM and FIS report were submitted to your community for review on December 24, 1997.

For informational purposes, detailed flood hazard data for Queen Creek have been shown on the enclosed annotated copies of the Summary of Discharges Table and Flood Profile Panel(s). We will incorporate the modifications made by this LOMR and the detailed flood hazard data in revised preliminary copies of the FIRM and FIS report. The revised preliminary copies are scheduled to be delivered for review within 2 months.

This revision affects effective FIRM Panel 04013C3075 F, which is currently shown at a scale of 1"=2,000'. When the revised preliminary FIRM is distributed, portions of FIRM Panel 04013C3075 F will be replaced by FIRM Panel 04013C3060 G, which will be shown at a scale of 1"=1,000'.

This LOMR is based on minimum floodplain management criteria established under the NFIP. Your community is responsible for approving all floodplain development, and for ensuring all necessary permits required by Federal or State law have been received. State, county, and community officials, based on knowledge of local conditions and in the interest of safety, may set higher standards for construction in the SFHA. If the State, county, or community has adopted more restrictive or comprehensive floodplain management criteria, these criteria take precedence over the minimum NFIP criteria.

Because this LOMR will not be printed and distributed to primary users, such as local insurance agents and mortgage lenders, your community will serve as a repository for these new data. We encourage you to disseminate the information reflected by this LOMR throughout the community, so that interested persons, such as property owners, local insurance agents, and mortgage lenders, may benefit from the information. We also encourage you to prepare an article for publication in your community's local newspaper. This article should describe the changes that have been made and the assistance that officials of your community will give to interested persons by providing these data and interpreting the NFIP maps.

This determination has been made pursuant to Section 206 of the Flood Disaster Protection Act of 1973 (Public Law 93-234) and is in accordance with the National Flood Insurance Act of 1968, as amended (Title XIII of the Housing and Urban Development Act of 1968, Public Law 90-448), 42 U.S.C. 4001-4128, and 44 CFR Part 65. Pursuant to Section 1361 of the National Flood Insurance Act of 1968, as amended, communities participating in the NFIP are required to adopt and enforce floodplain management regulations that meet or exceed NFIP criteria. These criteria are the minimum requirements and do not supersede any State or local requirements of a more stringent nature. This includes adoption of the effective FIRM to which the regulations apply and the modifications described in this LOMR.

If you have any questions regarding floodplain management regulations for your community or the NFIP in general, please contact the Consultation Coordination Officer (CCO) for your community. Information on the CCO for your community may be obtained by contacting the Director, Mitigation Division of FEMA in San Francisco, California, at (415) 923-7177. If you have any technical questions regarding this LOMR, please contact Mr. Mike Grimm of our staff in Washington, DC, either by telephone at (202) 646-2878 or by facsimile at (202) 646-4596.

Sincerely,



Matthew B. Miller, P.E., Chief  
Hazards Study Branch  
Mitigation Directorate

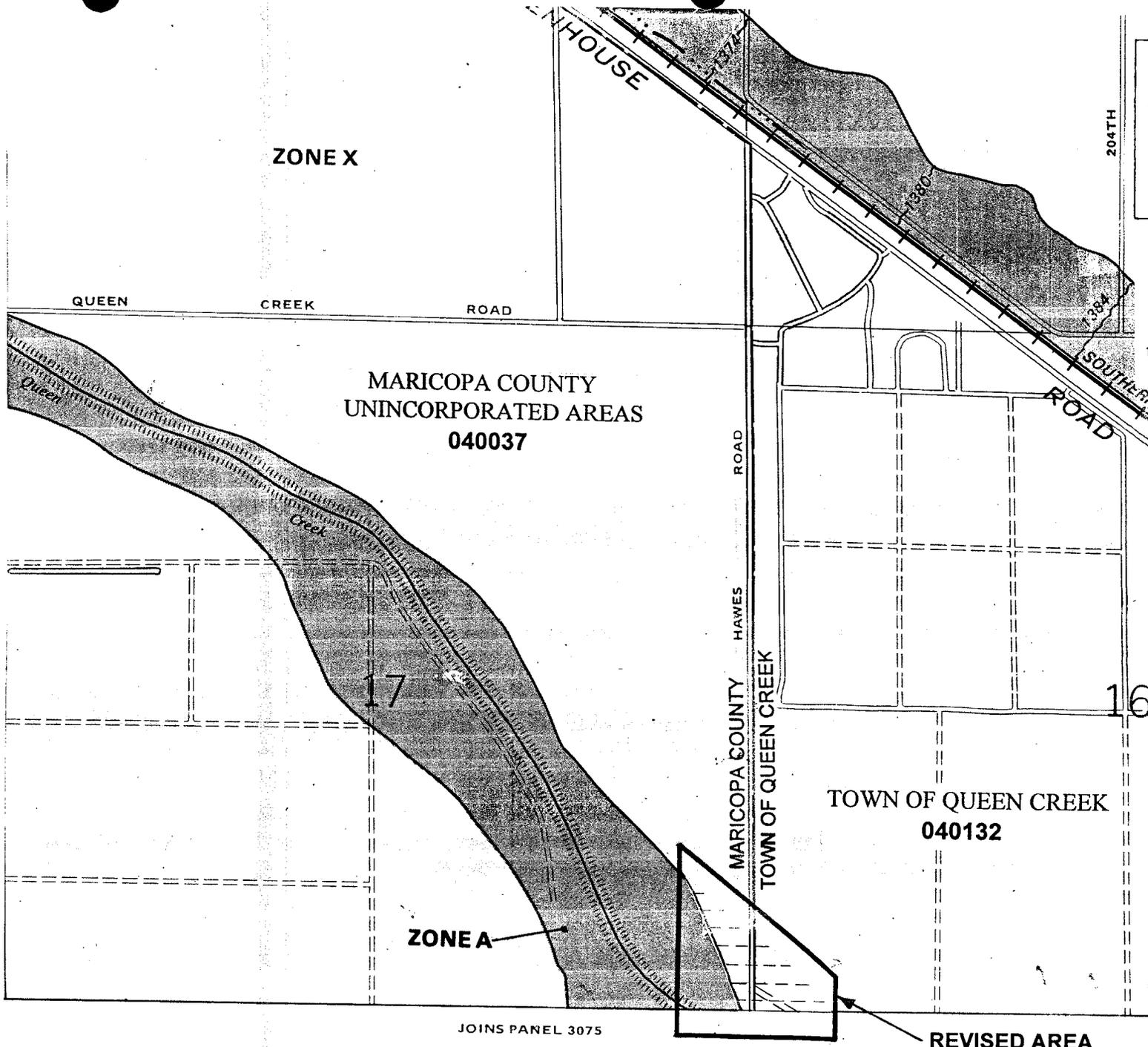
Enclosure(s)

cc: The Honorable Janice K. Brewer  
Chairman, Maricopa County  
Board of Supervisors

Mr. Dick Schaner  
Town Engineer  
Town of Queen Creek

Mr. Hasan Mushtaq, P.E. ✓  
Engineering Division  
Flood Control District  
of Maricopa County

Mr. René A. G. Piña, P.E.  
Project Engineer  
Collins/Piña Engineering



**MAP LEGEND**

 Areas of 500-year flood; areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood.



APPROXIMATE SCALE IN FEET

1000 0 1000

**NATIONAL FLOOD INSURANCE PROGRAM**

**FIRM**  
FLOOD INSURANCE RATE MAP

MARICOPA COUNTY,  
ARIZONA AND  
INCORPORATED AREAS

PANEL 2695 OF 4350

**REVISED TO  
REFLECT LOMR  
DATED APR 16 1998**

COMMUNITY	NUMBER	PANEL	SUFFIX
MESA, CITY OF	0044	2695	F
QUEEN CREEK, TOWN OF	040132	2695	F

MAP NUMBER  
04013C2695 F

MAP REVISED:  
DECEMBER 3, 1993



Federal Emergency Management Agency

**REVISED AREA**

MARICOPA COUNTY  
TOWN OF QUEEN CREEK

SCOTILLO 17

16 ROAD

15

ZONE A

ZONE A

ZONE X

MARICOPA COUNTY  
UNINCORPORATED AREAS  
040037

TOWN OF QUEEN CREEK  
040132



Queen Creek

22

20

21

ZONE X

APPROXIMATE SCALE IN FEET

2000 0 2000

ZONE A

NATIONAL FLOOD INSURANCE PROGRAM

**FIRM**  
FLOOD INSURANCE RATE MAP

MARICOPA COUNTY,  
ARIZONA AND  
INCORPORATED AREAS

PANEL 3075 OF 4350

**REVISED TO  
SELECT LOWR**

CONTAINS	NUMBER	ANNUAL FIRM FLOOD INSURANCE RATE MAP
MARICOPA COUNTY	040044	3075
GILBERT TOWNSHIP	040044	3075
MARICOPA COUNTY UNINCORPORATED AREAS	040037	3075
UNINCORPORATED AREAS	040132	3075
UNINCORPORATED AREAS	040132	3075

**DATED APR 16 1998**

MAP NUMBER  
04013C3075F

MAP REVISED:  
DECEMBER 3, 1993



Federal Emergency Management Agency

**MAP LEGEND**



Revised 100-Year Floodplain



Areas of 500-year flood; areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood.

CHANDLER

HEIGHTS

ROAD

ROAD

HAWES

AVENUE

ELLSWORTH

29

28

27

LANDING STRIP

THIS AREA IS SHOWN ON  
MAP NUMBER 04013C3080

MARICOPA COUNTY  
UNINCORPORATED AREAS  
040037

33

34

JOINS PANEL 3075

TOWN OF QUEEN CREEK  
040132

SOUTHERN  
RITTENHOUSE  
ROAD  
PACIFIC  
1436

TOV  
N

ZONE A

REVISED AREA

TOWN OF QUEEN CREEK  
MARICOPA COUNTY

MARICOPA COUNTY  
UNINCORPORATED AREAS  
040037

MARICOPA COUNTY  
UNINCORPORATED AREAS  
040037

RM1121

ZONE AH

1444 1446

LIMIT OF  
DETAILED  
STUDY

NATIONAL FLOOD INSURANCE PROGRAM

**FIRM**  
FLOOD INSURANCE RATE MAP

MARICOPA COUNTY,  
ARIZONA AND  
INCORPORATED AREAS

PANEL 3080 OF 4350

**REVISED TO  
REFLECT LOMR  
DATED APR 16 1998**

MAP NUMBER  
04013C3080 F

MAP REVISED:  
DECEMBER 3, 1993



Federal Emergency Management Agency

CLOUD ROAD

TOWN OF QUEEN CREEK  
CORPORATE AREA  
040132

26

CRIMSON

Landing

TOWN OF  
CORPO

MAP LEGEND

-  Revised 100-Year Floodplain
-  Areas of 500-year flood; areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood.



APPROXIMATE SCALE IN FEET

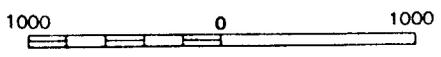


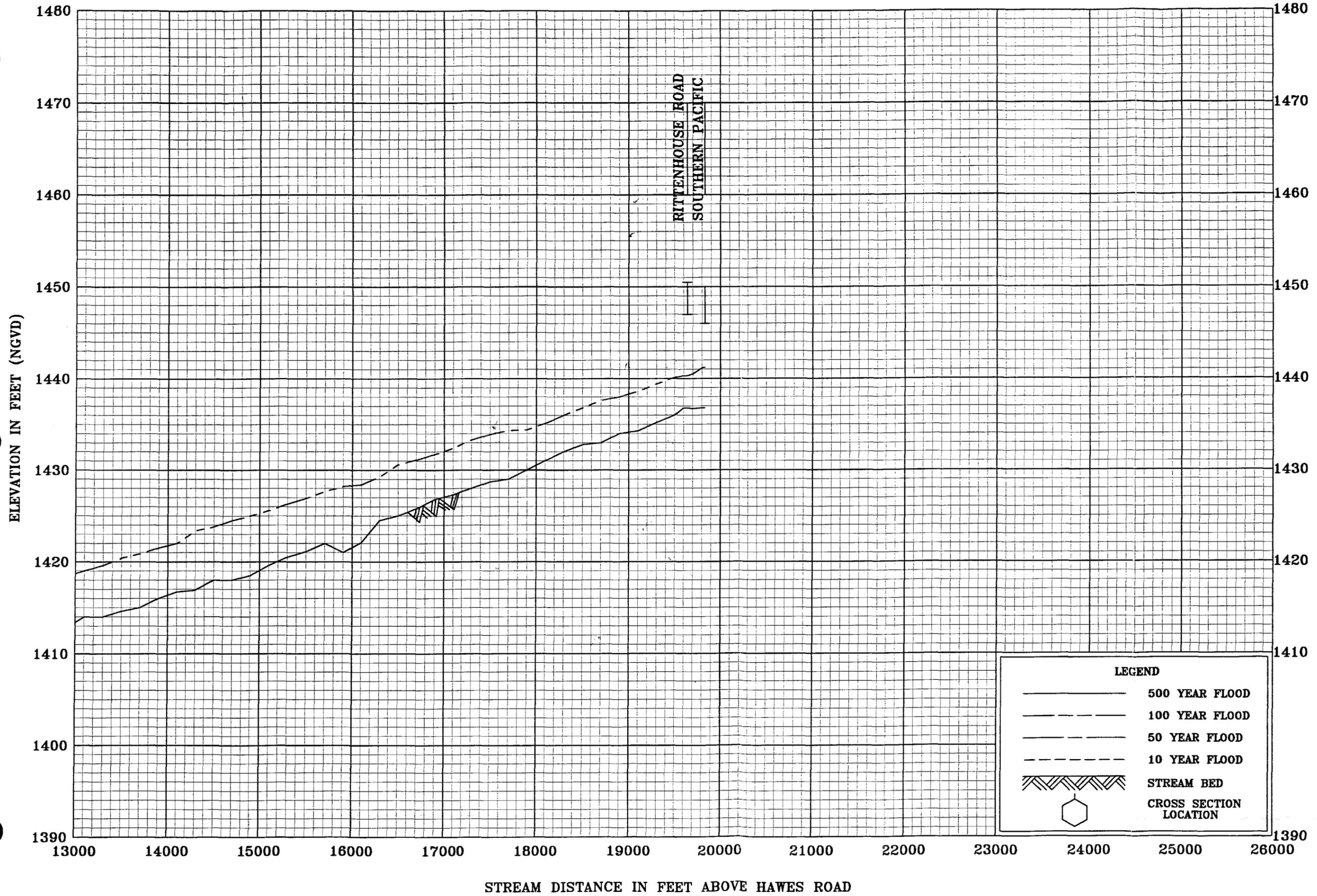
Table 3. Summary of Discharges (Cont'd)

Flooding Source and Location	Drainage Area (Square Miles)	Peak Discharges (cfs)			
		10-Year	50-Year	100-Year	500-Year
Moon Valley Wash-South Branch					
Upstream of the confluence with Moon Valley					
Wash-North Branch	--1	--1	--1	695	--1
Upstream of Canterbury Drive	--1	--1	--1	460	--1
Downstream of the Diversion Channel	--1	--1	--1	399	--1
Upstream of 7th Street	--1	--1	--1	114	--1
Moon Valley Wash-North Split					
Upstream of the confluence with Moon Valley					
Wash-North Branch	--1	--1	--1	976	--1
Diversion Channel					
Upstream of the confluence with Moon Valley					
Wash-North Branch	--1	--1	--1	243	--1
Queen Creek					
At Hawes Road	26.50	--1	--1	3,010	--1

<sup>1</sup>Not Computed

REVISED DATA

REVISED TO  
REFLECT LOMR  
DATED APR 16 1986

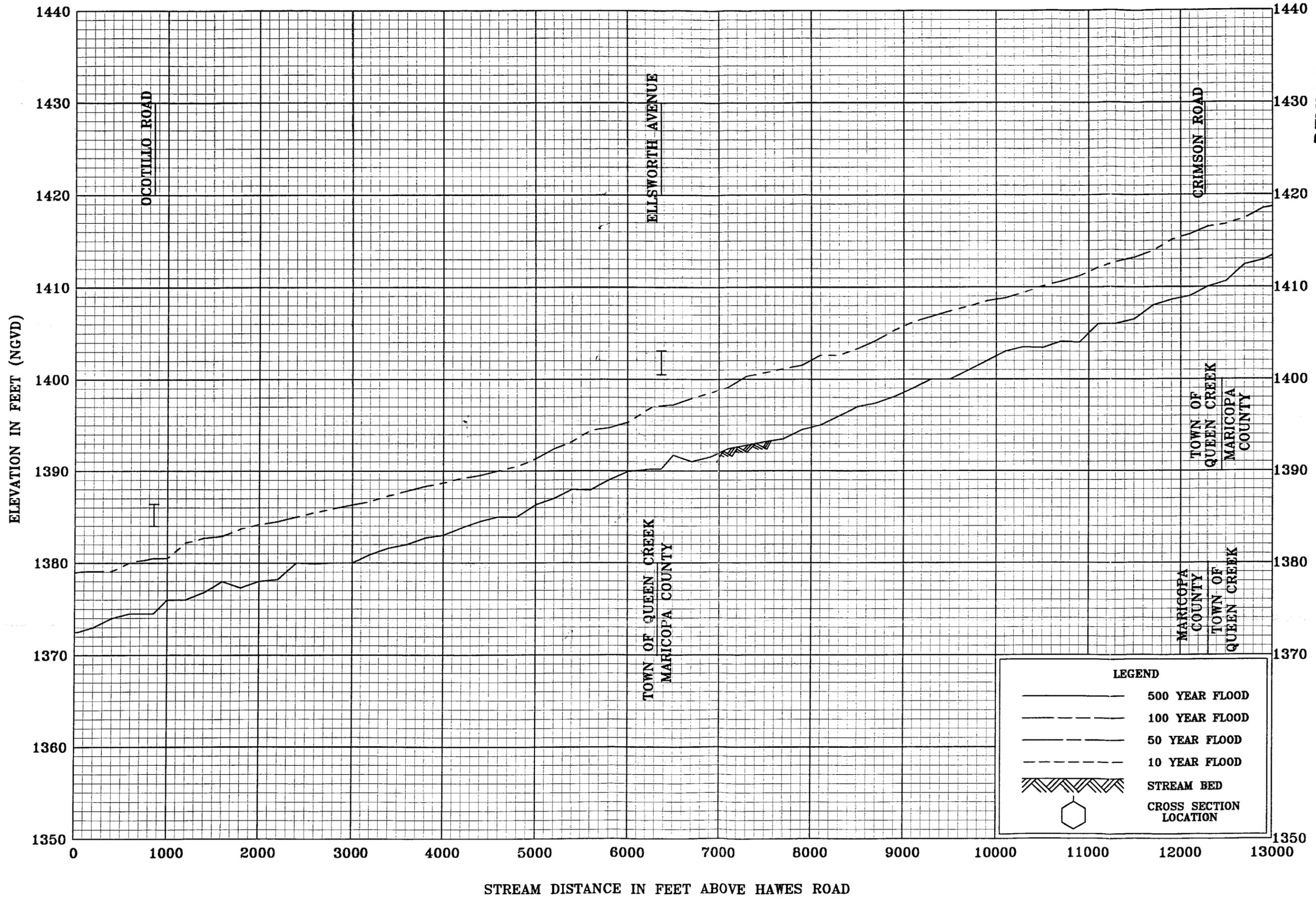


REVISED TO  
REFLECT LOMR  
DATED APR 16 1998

FLOOD PROFILES  
QUEEN CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY  
MARICOPA COUNTY, AZ  
AND INCORPORATED AREAS

1042P



**REVISED TO REFLECT LOMR DATED APR 16 1998**

**FLOOD PROFILES**

**QUEEN CREEK**

**FEDERAL EMERGENCY MANAGEMENT AGENCY**

**MARICOPA COUNTY, AZ**

**AND INCORPORATED AREAS**

**1041P**



# Federal Emergency Management Agency

Washington, D.C. 20472

CERTIFIED MAIL  
RETURN RECEIPT REQUESTED

The Honorable Janice K. Brewer  
Chairman, Maricopa County Board  
of Supervisors  
301 Jefferson Street  
Phoenix, Arizona 85003

IN REPLY REFER TO:  
Case No.: 97-09-1116P

Community: Maricopa County, Arizona  
Community No.: 040037  
Panels Affected: 04013C2695 F, 3075 F, and  
3080 F

Effective Date of **APR 16 1998**  
This Revision:

102-D

Dear Ms. Brewer:

This responds to a request that the Federal Emergency Management Agency (FEMA) revise the effective Flood Insurance Rate Map (FIRM) for Maricopa County, Arizona and Incorporated Areas (the effective FIRM for your community), in accordance with Part 65 of the National Flood Insurance Program (NFIP) regulations. In a letter dated August 19, 1997, Mr. Hasan Mushtaq, P.E., Engineering Division, Flood Control District of Maricopa County, requested that FEMA revise the FIRM to show the effects of a detailed study of existing conditions along Queen Creek from Hawes Road to the Southern Pacific Railroad (SPRR).

All data required to complete our review of this request were submitted with letters from Mr. René A. G. Piña, P.E., Project Engineer, Collins/Piña Engineering, and Mr. Mushtaq. Because this Letter of Map Revision (LOMR) is based on a detailed hydrologic or hydraulic study conducted by a Federal, State, or local agency to replace an approximate study conducted by FEMA, fees were not assessed for the review.

We have completed our review of the submitted data and the flood data shown on the effective FIRM. We have revised the FIRM to modify the floodplain boundary delineations of the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood) along Queen Creek from Hawes Road to the SPRR. As a result of the modifications, the width of the Special Flood Hazard Area (SFHA), the area that would be inundated by the base flood, for Queen Creek decreased. The modifications are shown on the enclosed annotated copies of FIRM Panel(s) 04013C2695 F, 04013C3075 F, and 04013C3080 F. This LOMR hereby revises the above-referenced panel(s) of the effective FIRM dated December 3, 1993.

Because this revision request also affects the Town of Queen Creek, a separate LOMR for that community was issued on the same date as this LOMR.

The modifications are effective as of the date shown above. The map panel(s) as listed above and as modified by this letter will be used for all flood insurance policies and renewals issued for your community.

A review of the determination made by this LOMR and any requests to alter this determination should be made within 30 days. Any request to alter the determination must be based on scientific or technical data.

We are processing a revised FIRM and Flood Insurance Study (FIS) report for Maricopa County; therefore, we will not physically revise and republish the FIRM and FIS report for your community to incorporate the modifications made by this LOMR at this time. Preliminary copies of the FIRM and FIS report were submitted to your community for review on December 24, 1997. :

For informational purposes, detailed flood hazard data for Queen Creek have been shown on the enclosed annotated copies of the Summary of Discharges Table and Flood Profile Panel(s). We will incorporate the modifications made by this LOMR and the detailed flood hazard data in revised preliminary copies of the FIRM and FIS report. The revised preliminary copies are scheduled to be delivered for review within 2 months.

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Sincerely,

  
 Matthew B. Miller, P.E., Chief  
Hazards Study Branch  
Mitigation Directorate

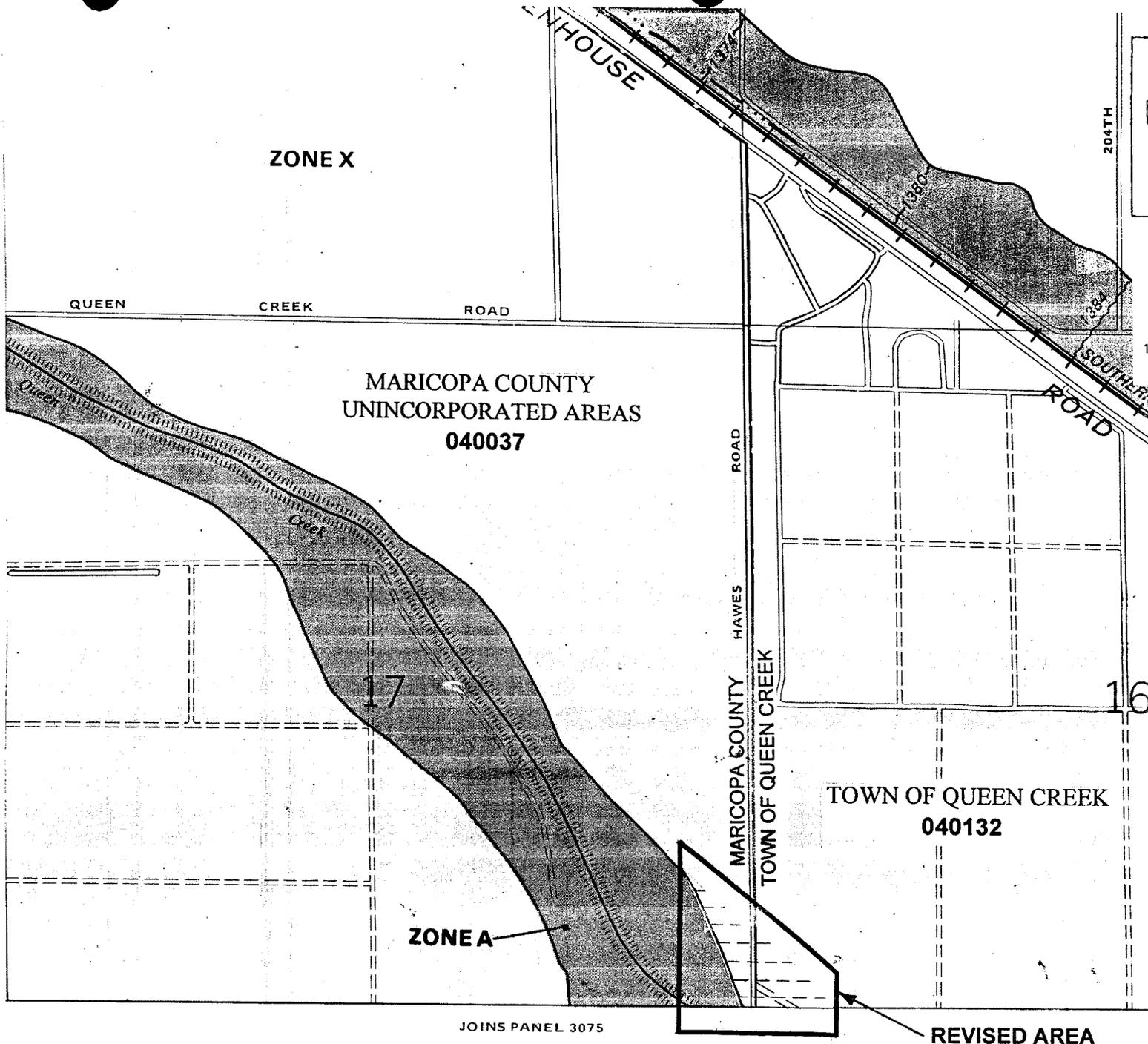
Enclosure(s)

cc: The Honorable Mark Schnepf  
Mayor, Town of Queen Creek

Mr. Dick Schafer  
Town Engineer  
Town of Queen Creek

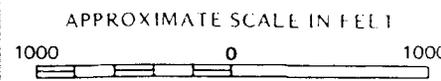
Mr. Hasan Mushtaq, P.E. ✓  
Engineering Division  
Flood Control District  
of Maricopa County

Mr. René A. G. Piña, P.E.  
Project Engineer  
Collins/Piña Engineering



**MAP LEGEND**

 Areas of 500-year flood; areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood.



NATIONAL FLOOD INSURANCE PROGRAM

**FIRM**  
FLOOD INSURANCE RATE MAP

MARICOPA COUNTY,  
ARIZONA AND  
INCORPORATED AREAS

PANEL 2695 OF 4350

CONTAINS

REVISED TO	NUMBER	SUFFIX
040044	00044	2595

**REFLECT LOMR**

**DATED** APR 16 1998

MAP NUMBER  
04013C2695 F

MAP REVISED:  
DECEMBER 3, 1993



Federal Emergency Management Agency

MARICOPA COUNTY  
TOWN OF QUEEN CREEK

COTILLO 17

16 ROAD

15

ZONE A

ZONE A

ZONE X

MARICOPA COUNTY  
UNINCORPORATED AREAS  
040037

TOWN OF QUEEN CREEK  
040132

Queen Creek

22

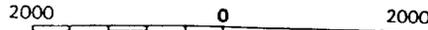


20

21

ZONE X

APPROXIMATE SCALE IN FEET



ZONE A

NATIONAL FLOOD INSURANCE PROGRAM

**FIRM**  
FLOOD INSURANCE RATE MAP

MARICOPA COUNTY,  
ARIZONA AND  
INCORPORATED AREAS

PANEL 3075 OF 4350

**REVISED TO  
REFLECT LOMR  
DATED APR 16 1993**

MAP NUMBER  
04013C3075F

MAP REVISED:  
DECEMBER 3, 1993



Federal Emergency Management Agency

MAP LEGEND



Revised 100-Year Floodplain



Areas of 500-year flood; areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood.

ROAD

CHANDLER HEIGHTS

ROAD

AVENUE

HAWES

28

27

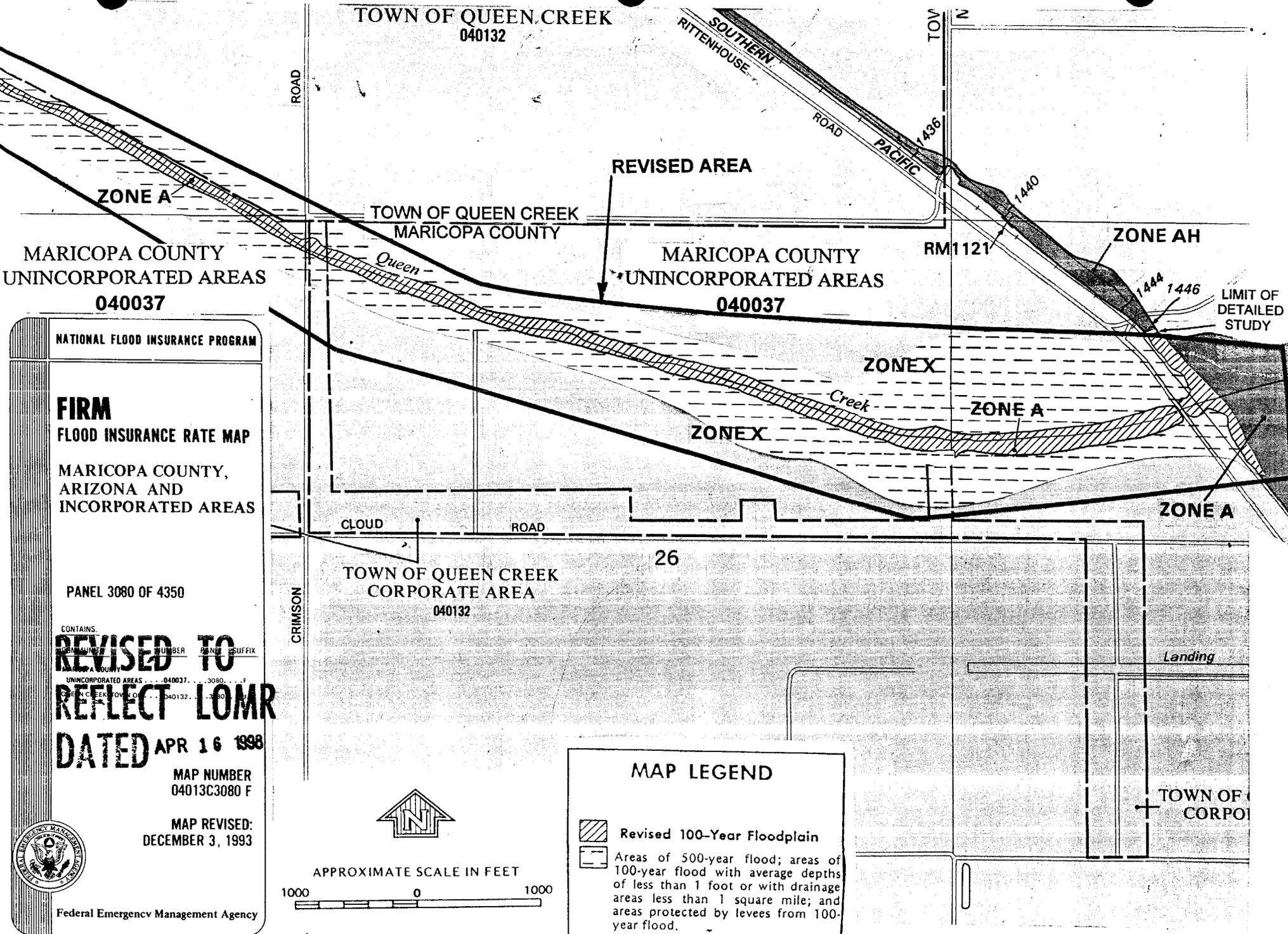
MARICOPA COUNTY  
UNINCORPORATED AREAS  
040037

33

34

THIS AREA IS SHOWN ON  
MAP NUMBER 04013C3080

JOINS PANEL 3075



NATIONAL FLOOD INSURANCE PROGRAM

**FIRM**  
FLOOD INSURANCE RATE MAP

MARICOPA COUNTY,  
ARIZONA AND  
INCORPORATED AREAS

PANEL 3080 OF 4350

CONTAINS:

TOWN OF QUEEN CREEK	040037	3080	F
MARICOPA COUNTY UNINCORPORATED AREAS	040037	3080	F
TOWN OF QUEEN CREEK CORPORATE AREA	040132	3080	F

**REVISED TO REFLECT LOMR**  
**DATED APR 16 1998**

MAP NUMBER  
04013C3080 F

MAP REVISED:  
DECEMBER 3, 1993



Federal Emergency Management Agency

**MAP LEGEND**

-  Revised 100-Year Floodplain
-  Areas of 500-year flood; areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood.

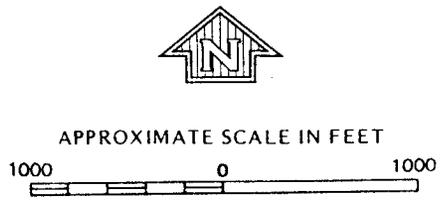


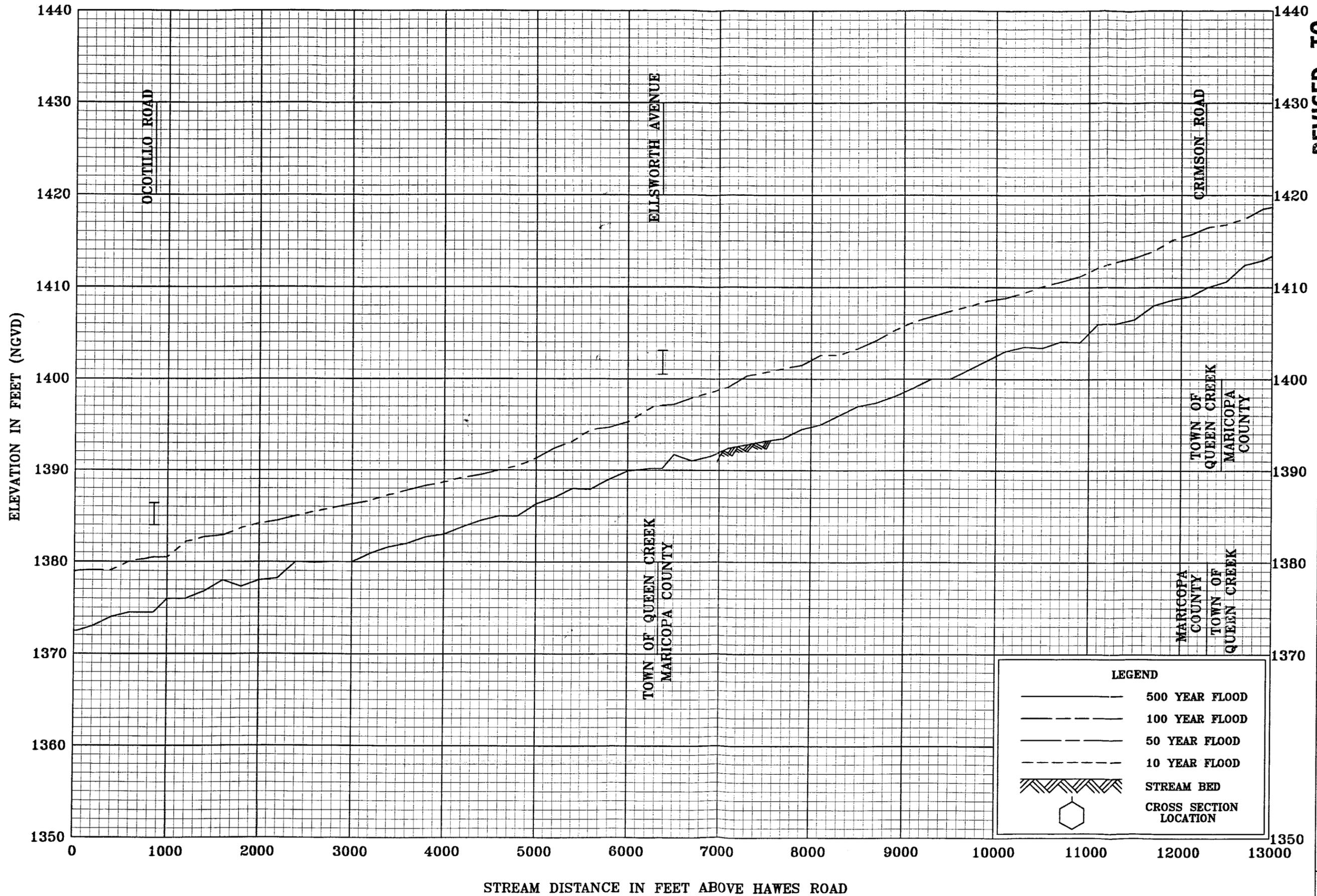
Table 3. Summary of Discharges (Cont'd)

Flooding Source and Location	Drainage Area (Square Miles)	Peak Discharges (cfs)			
		10-Year	50-Year	100-Year	500-Year
Moon Valley Wash-South Branch					
Upstream of the confluence with Moon Valley Wash-North Branch	--1	--1	--1	695	--1
Upstream of Canterbury Drive	--1	--1	--1	460	--1
Downstream of the Diversion Channel	--1	--1	--1	399	--1
Upstream of 7th Street	--1	--1	--1	114	--1
Moon Valley Wash-North Split					
Upstream of the confluence with Moon Valley Wash-North Branch	--1	--1	--1	976	--1
Diversion Channel					
Upstream of the confluence with Moon Valley Wash-North Branch	--1	--1	--1	243	--1
Queen Creek At Hawes Road	26.50	--1	--1	3,010	--1

<sup>1</sup>Not Computed

REVISED DATA

REVISED TO  
REFLECT LOMR  
DATED APR 16 1998

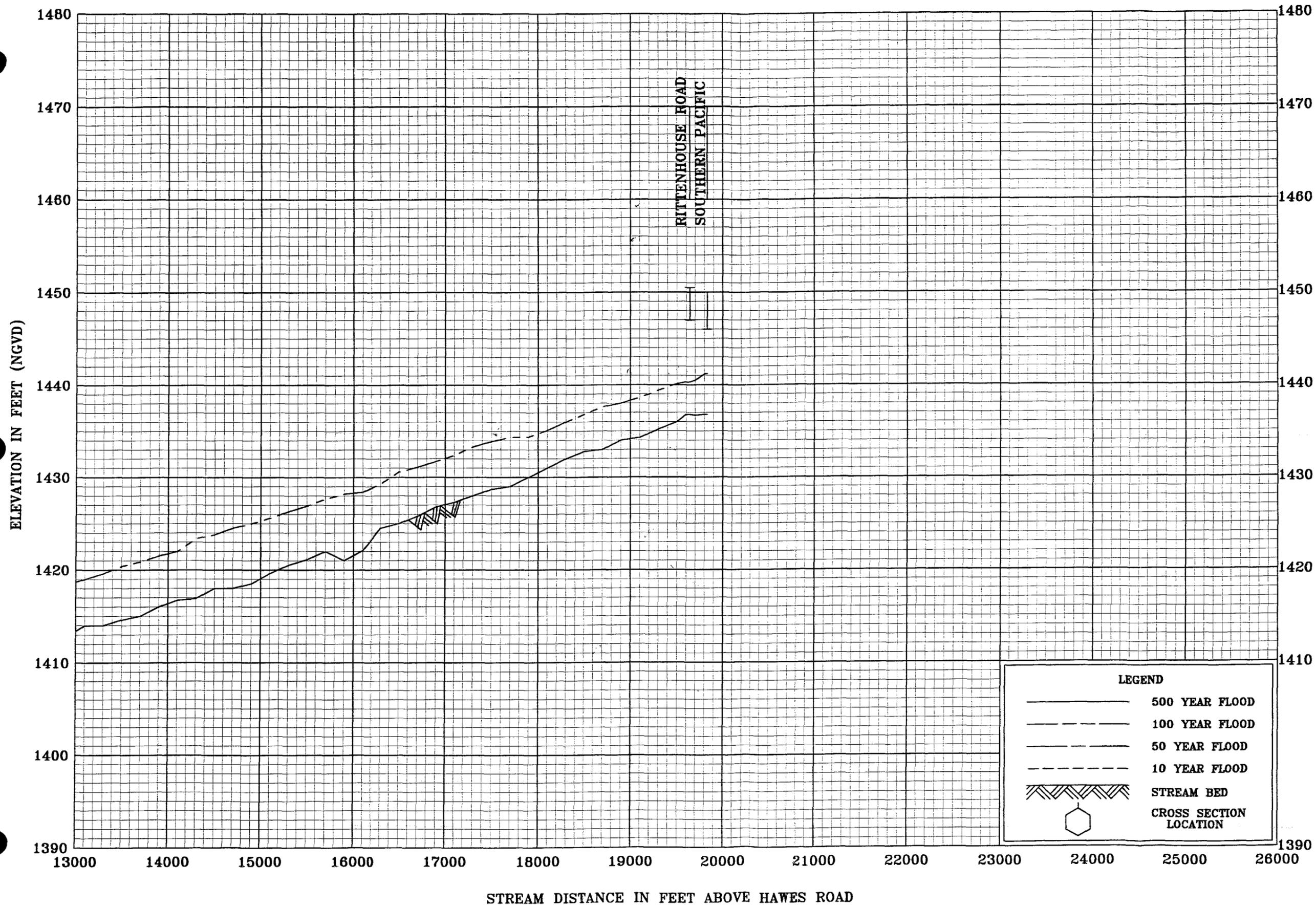


**REVISED TO REFLECT LOWR DATED APR 16 1998**

**FLOOD PROFILES  
QUEEN CREEK**

**FEDERAL EMERGENCY MANAGEMENT AGENCY  
MARICOPA COUNTY, AZ  
AND INCORPORATED AREAS**

**1041P**



**REVISED TO**

**REFLECT LOMR**

**DATED APR 16 1998**

FLOOD PROFILES  
**QUEEN CREEK**

FEDERAL EMERGENCY MANAGEMENT AGENCY  
**MARICOPA COUNTY, AZ**  
AND INCORPORATED AREAS

**1042P**



# Federal Emergency Management Agency

Washington, D.C. 20472

REC'D
RECEIVED
APR 16 1998
COMMUNITY
NO.
PANELS
AFFECTED
DATE
REVISION
1/1/98

CERTIFIED MAIL  
RETURN RECEIPT REQUESTED

IN REPLY REFER TO:  
Case No.: 97-09-1116P

The Honorable Mark Schnepf  
Mayor, Town of Queen Creek  
22350 South Ellsworth Road  
Queen Creek, Arizona 85242

Community: Town of Queen Creek, Arizona  
Community No.: 040132  
Panels Affected: 04013C2695 F, 3075 F,  
and 3080 F

Effective Date of **APR 16 1998**  
This Revision:

102-D

Dear Mayor Schnepf:

This responds to a request that the Federal Emergency Management Agency (FEMA) revise the effective Flood Insurance Rate Map (FIRM) for Maricopa County, Arizona and Incorporated Areas (the effective FIRM for your community), in accordance with Part 65 of the National Flood Insurance Program (NFIP) regulations. In a letter dated August 19, 1997, Mr. Hasan Mushtaq, P.E., Engineering Division, Flood Control District of Maricopa County, requested that FEMA revise the FIRM to show the effects of a detailed study of existing conditions along Queen Creek from Hawes Road to the Southern Pacific Railroad (SPRR).

All data required to complete our review of this request were submitted with letters from Mr. René A. G. Piña, P.E., Project Engineer, Collins/Piña Engineering, and Mr. Mushtaq. Because this Letter of Map Revision (LOMR) is based on a detailed hydrologic or hydraulic study conducted by a Federal, State, or local agency to replace an approximate study conducted by FEMA, fees were not assessed for the review.

We have completed our review of the submitted data and the flood data shown on the effective FIRM. We have revised the FIRM to modify the floodplain boundary delineations of the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood) along Queen Creek from Hawes Road to the SPRR. As a result of the modifications, the width of the Special Flood Hazard Area (SFHA), the area that would be inundated by the base flood, for Queen Creek decreased. The modifications are shown on the enclosed annotated copies of FIRM Panel(s) 04013C2695 F, 04013C3075 F, and 04013C3080 F. This LOMR hereby revises the above-referenced panel(s) of the effective FIRM dated December 3, 1993.

Because this revision request also affects the unincorporated areas of Maricopa County, a separate LOMR for that community was issued on the same date as this LOMR.

The modifications are effective as of the date shown above. The map panel(s) as listed above and as modified by this letter will be used for all flood insurance policies and renewals issued for your community.

A review of the determination made by this LOMR and any requests to alter this determination should be made within 30 days. Any request to alter the determination must be based on scientific or technical data.

We are processing a revised FIRM and Flood Insurance Study (FIS) report for Maricopa County; therefore, we will not physically revise and republish the FIRM and FIS report for your community to incorporate the modifications made by this LOMR at this time. Preliminary copies of the FIRM and FIS report were submitted to your community for review on December 24, 1997.

For informational purposes, detailed flood hazard data for Queen Creek have been shown on the enclosed annotated copies of the Summary of Discharges Table and Flood Profile Panel(s). We will incorporate the modifications made by this LOMR and the detailed flood hazard data in revised preliminary copies of the FIRM and FIS report. The revised preliminary copies are scheduled to be delivered for review within 2 months.

This revision affects effective FIRM Panel 04013C3075 F, which is currently shown at a scale of 1"=2,000'. When the revised preliminary FIRM is distributed, portions of FIRM Panel 04013C3075 F will be replaced by FIRM Panel 04013C3060 G, which will be shown at a scale of 1"=1,000'.

This LOMR is based on minimum floodplain management criteria established under the NFIP. Your community is responsible for approving all floodplain development, and for ensuring all necessary permits required by Federal or State law have been received. State, county, and community officials, based on knowledge of local conditions and in the interest of safety, may set higher standards for construction in the SFHA. If the State, county, or community has adopted more restrictive or comprehensive floodplain management criteria, these criteria take precedence over the minimum NFIP criteria.

Because this LOMR will not be printed and distributed to primary users, such as local insurance agents and mortgage lenders, your community will serve as a repository for these new data. We encourage you to disseminate the information reflected by this LOMR throughout the community, so that interested persons, such as property owners, local insurance agents, and mortgage lenders, may benefit from the information. We also encourage you to prepare an article for publication in your community's local newspaper. This article should describe the changes that have been made and the assistance that officials of your community will give to interested persons by providing these data and interpreting the NFIP maps.

This determination has been made pursuant to Section 206 of the Flood Disaster Protection Act of 1973 (Public Law 93-234) and is in accordance with the National Flood Insurance Act of 1968, as amended (Title XIII of the Housing and Urban Development Act of 1968, Public Law 90-448), 42 U.S.C. 4001-4128, and 44 CFR Part 65. Pursuant to Section 1361 of the National Flood Insurance Act of 1968, as amended, communities participating in the NFIP are required to adopt and enforce floodplain management regulations that meet or exceed NFIP criteria. These criteria are the minimum requirements and do not supersede any State or local requirements of a more stringent nature. This includes adoption of the effective FIRM to which the regulations apply and the modifications described in this LOMR.

If you have any questions regarding floodplain management regulations for your community or the NFIP in general, please contact the Consultation Coordination Officer (CCO) for your community. Information on the CCO for your community may be obtained by contacting the Director, Mitigation Division of FEMA in San Francisco, California, at (415) 923-7177. If you have any technical questions regarding this LOMR, please contact Mr. Mike Grimm of our staff in Washington, DC, either by telephone at (202) 646-2878 or by facsimile at (202) 646-4596.

Sincerely,



Matthew B. Miller, P.E., Chief  
Hazards Study Branch  
Mitigation Directorate

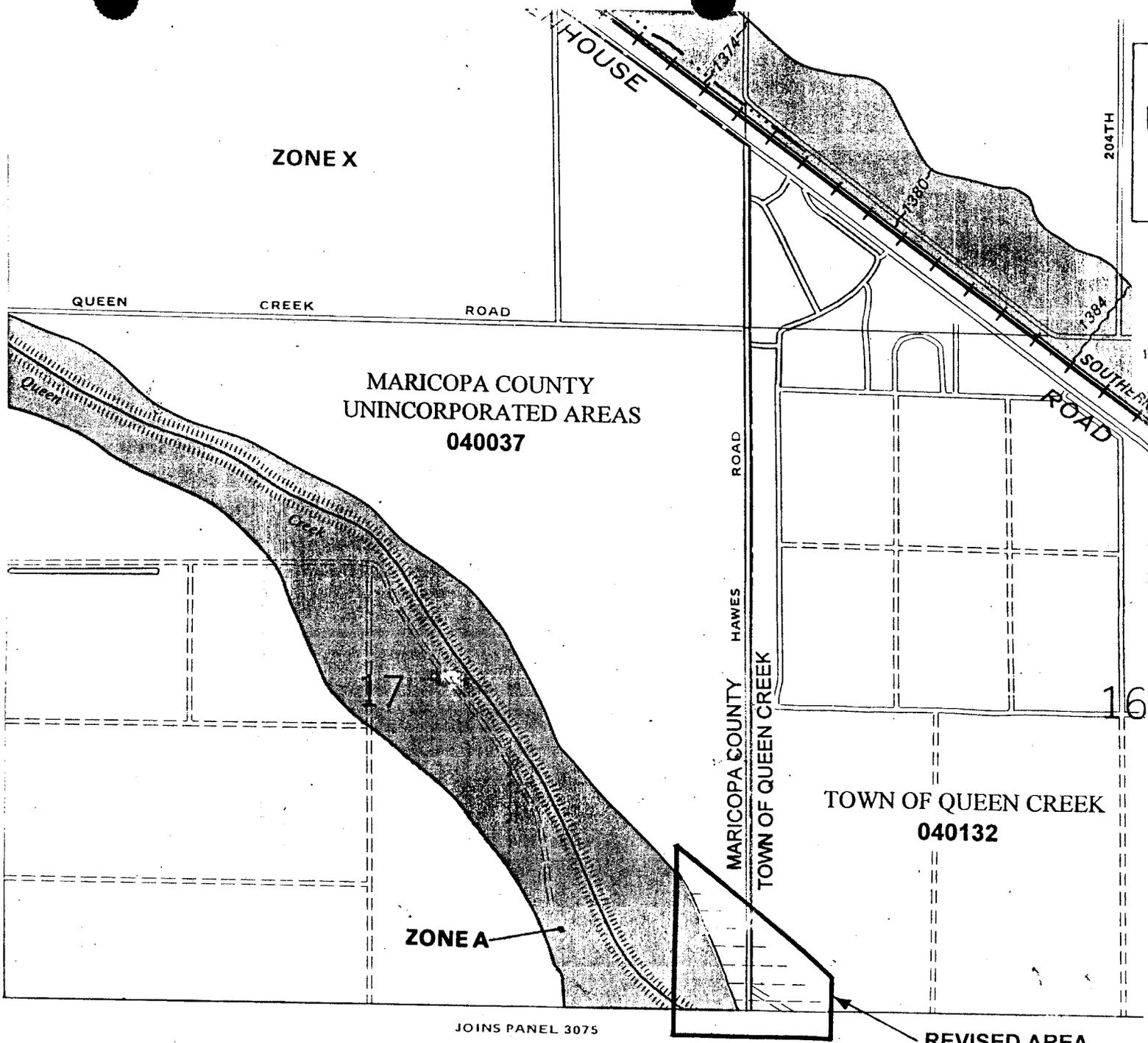
Enclosure(s)

cc: The Honorable Janice K. Brewer  
Chairman, Maricopa County  
Board of Supervisors

Mr. Dick Schaner  
Town Engineer  
Town of Queen Creek

Mr. Hasan Mushtaq, P.E.  
Engineering Division  
Flood Control District  
of Maricopa County

Mr. René A. G. Piña, P.E.  
Project Engineer  
Collins/Piña Engineering



**MAP LEGEND**

 Areas of 500-year flood; areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100 year flood.



APPROXIMATE SCALE IN FEET

1000 0 1000

**NATIONAL FLOOD INSURANCE PROGRAM**

**FIRM**  
FLOOD INSURANCE RATE MAP

MARICOPA COUNTY,  
ARIZONA AND  
INCORPORATED AREAS

PANEL 2695 OF 4350

CONTAINS

COMMUNITY	NUMBER	PANEL	SHEET
GILBERT TOWN OF	04044	2695	1
MARICOPA COUNTY UNINCORPORATED AREAS	04037	2695	1
MESA CITY OF	04048	2695	1
QUEEN CREEK TOWN OF	040132	2695	1

MAP NUMBER  
04013C2695 F

MAP REVISED:  
DECEMBER 3, 1993

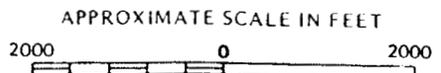


Federal Emergency Management Agency

JOINS PANEL 2695

MARICOPA COUNTY  
TOWN OF QUEEN CREEK

MARICOPA COUNTY  
UNINCORPORATED AREAS  
040037



NATIONAL FLOOD INSURANCE PROGRAM

# FIRM FLOOD INSURANCE RATE MAP

MARICOPA COUNTY,  
ARIZONA AND  
INCORPORATED AREAS

PANEL 3075 OF 4350

CONTAINS

COMMUNITY	NUMBER	PANEL	SUFFIX
GILBERT, TOWN OF	040044	3075	F
MARICOPA COUNTY, UNINCORPORATED AREAS	040037	3075	F
QUEEN CREEK, TOWN OF	040132	3075	F

MAP NUMBER  
04013C3075F

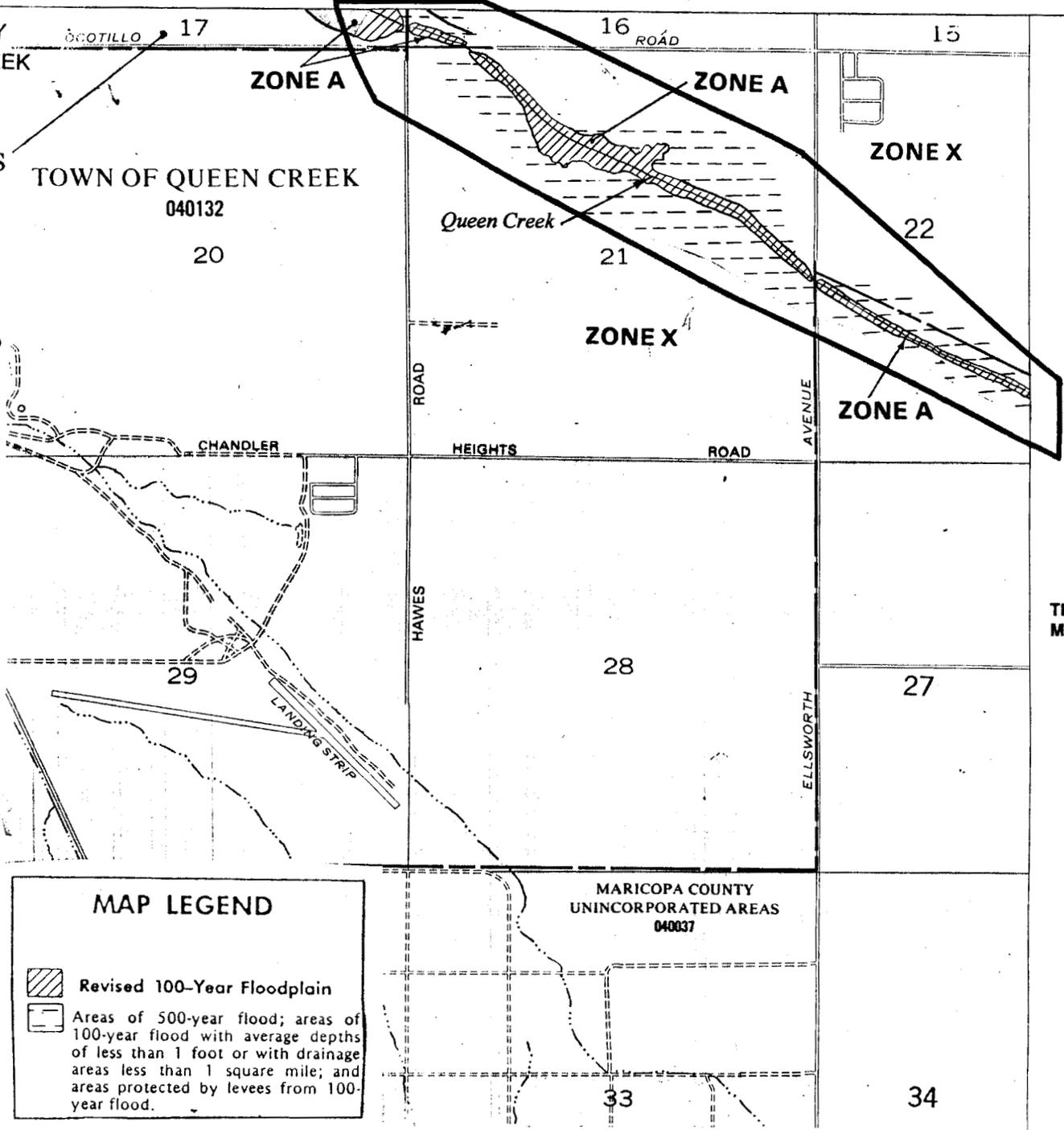
MAP REVISED:  
DECEMBER 3, 1993



Federal Emergency Management Agency

### MAP LEGEND

- Revised 100-Year Floodplain
- Areas of 500-year flood; areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood.



THIS AREA IS SHOWN ON  
MAP NUMBER 04013C3080

JOINS PANEL 3075

TOWN OF QUEEN CREEK  
040132

SOUTHERN  
RITTENHOUSE  
ROAD  
PACIFIC

TOV  
N

ZONE A

REVISED AREA

TOWN OF QUEEN CREEK  
MARICOPA COUNTY

MARICOPA COUNTY  
UNINCORPORATED AREAS  
040037

MARICOPA COUNTY  
UNINCORPORATED AREAS  
040037

RM1121

ZONE AH

1444 1446

LIMIT OF  
DETAILED  
STUDY

NATIONAL FLOOD INSURANCE PROGRAM

**FIRM**  
FLOOD INSURANCE RATE MAP

MARICOPA COUNTY,  
ARIZONA AND  
INCORPORATED AREAS

PANEL 3080 OF 4350

CONTAINS  
COMMUNITY NUMBER PANEL SUFFIX  
MARICOPA COUNTY UNINCORPORATED AREAS 040037 3080  
QUEEN CREEK TOWN OF 040132 3080

MAP NUMBER  
04013C3080 F

MAP REVISED:  
DECEMBER 3, 1993



Federal Emergency Management Agency

TOWN OF QUEEN CREEK  
CORPORATE AREA  
040132

26

CRIMSON

CLOUD ROAD

ZONE X

ZONE X

ZONE A

ZONE A

Landing

TOWN OF  
CORPO

MAP LEGEND

- Revised 100-Year Floodplain
- Areas of 500-year flood; areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood.



APPROXIMATE SCALE IN FEET

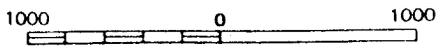


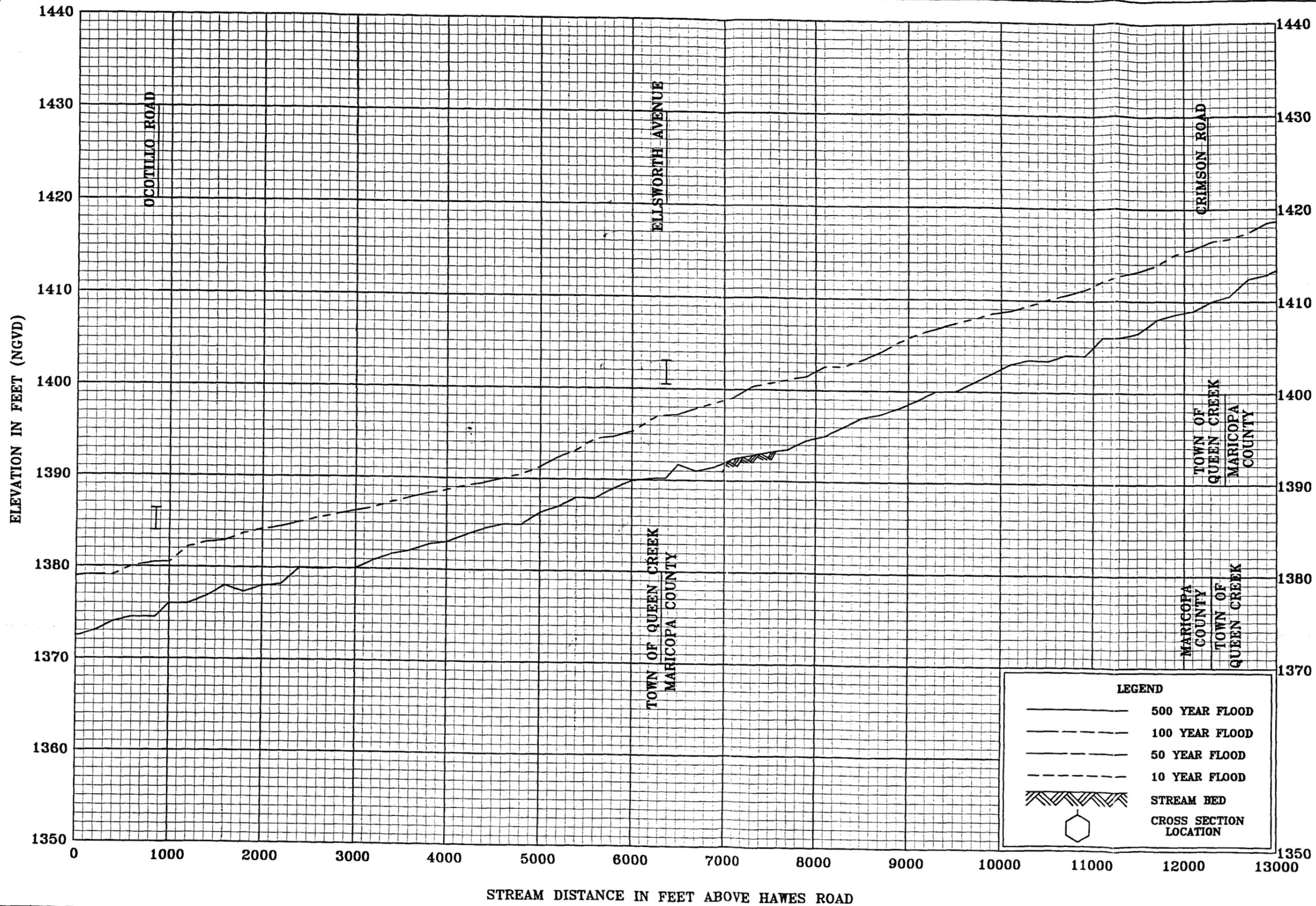
Table 3. Summary of Discharges (Cont'd)

<u>Flooding Source and Location</u>	<u>Drainage Area (Square Miles)</u>	<u>Peak Discharges (cfs)</u>			
		<u>10-Year</u>	<u>50-Year</u>	<u>100-Year</u>	<u>500-Year</u>
Moon Valley Wash-South Branch					
Upstream of the confluence with Moon Valley					
Wash-North Branch	--1	--1	--1	695	--1
Upstream of Canterbury Drive	--1	--1	--1	460	--1
Downstream of the Diversion Channel	--1	--1	--1	399	--1
Upstream of 7th Street	--1	--1	--1	114	--1
Moon Valley Wash-North Split					
Upstream of the confluence with Moon Valley					
Wash-North Branch	--1	--1	--1	976	--1
Diversion Channel					
Upstream of the confluence with Moon Valley					
Wash-North Branch	--1	--1	--1	243	--1
Queen Creek					
At Hawes Road	26.50	--1	--1	3,010	--1

<sup>1</sup>Not Computed

REVISED DATA



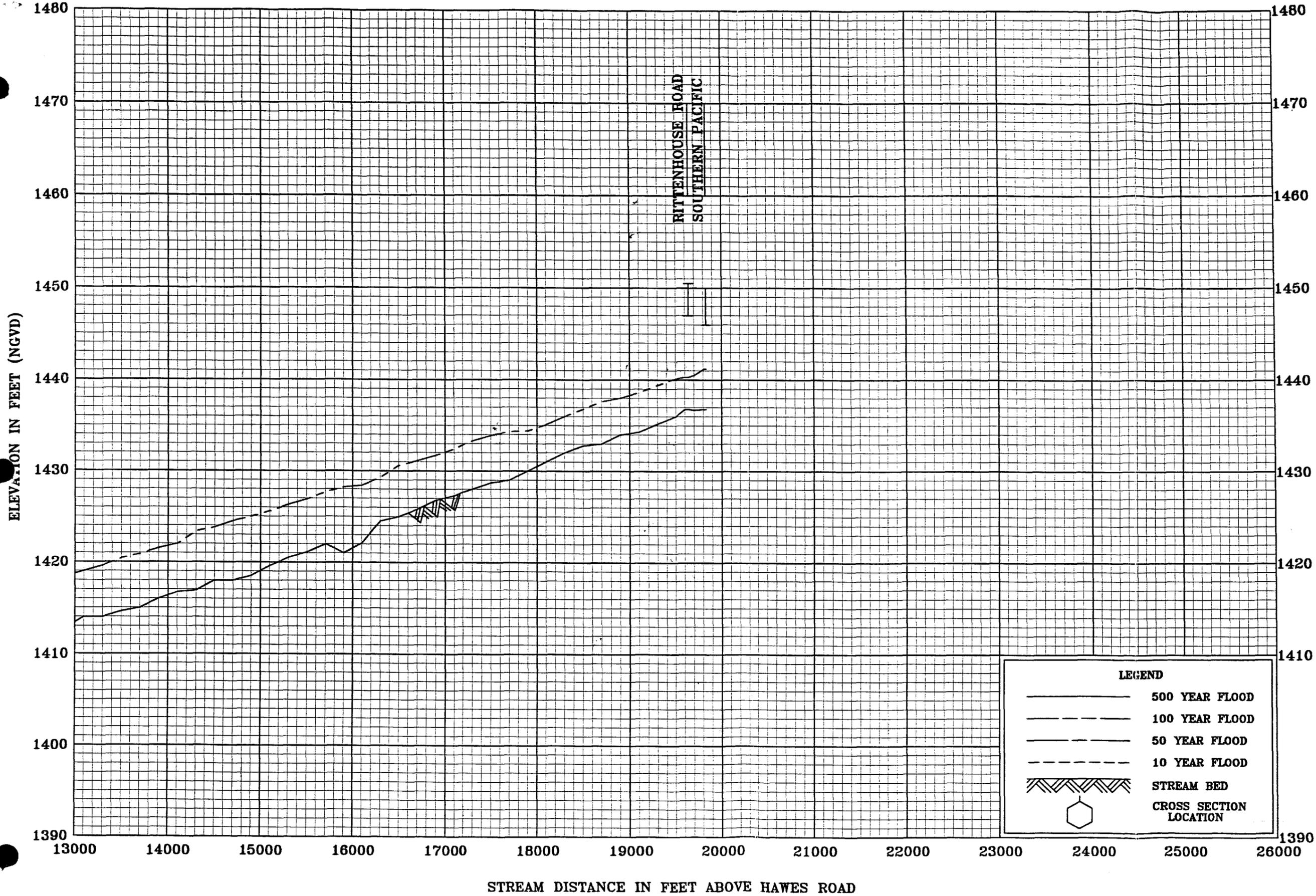


**REVISED TO  
REFLECT LOMR  
DATED APR 16 1998**

**FLOOD PROFILES  
QUEEN CREEK**

**FEDERAL EMERGENCY MANAGEMENT AGENCY  
MARICOPA COUNTY, AZ  
AND INCORPORATED AREAS**

**1041P**



**REVISED TO  
REFLECT LOMR  
DATED APR 16 1998**

**FLOOD PROFILES  
QUEEN CREEK**

**FEDERAL EMERGENCY MANAGEMENT AGENCY  
MARICOPA COUNTY, AZ  
AND INCORPORATED AREAS**

**1042P**



# Federal Emergency Management Agency

Washington, D.C. 20472

CERTIFIED MAIL  
RETURN RECEIPT REQUESTED

The Honorable Janice K. Brewer  
Chairman, Maricopa County Board  
of Supervisors  
301 Jefferson Street  
Phoenix, Arizona 85003

IN REPLY REFER TO:  
Case No.: 97-09-1116P

Community: Maricopa County, Arizona  
Community No.: 040037  
Panels Affected: 04013C2695 F, 3075 F, and  
3080 F  
Effective Date of **APR 16 1998**  
This Revision:

102-D

Dear Ms. Brewer:

This responds to a request that the Federal Emergency Management Agency (FEMA) revise the effective Flood Insurance Rate Map (FIRM) for Maricopa County, Arizona and Incorporated Areas (the effective FIRM for your community), in accordance with Part 65 of the National Flood Insurance Program (NFIP) regulations. In a letter dated August 19, 1997, Mr. Hasan Mushtaq, P.E., Engineering Division, Flood Control District of Maricopa County, requested that FEMA revise the FIRM to show the effects of a detailed study of existing conditions along Queen Creek from Hawes Road to the Southern Pacific Railroad (SPRR).

All data required to complete our review of this request were submitted with letters from Mr. René A. G. Piña, P.E., Project Engineer, Collins/Piña Engineering, and Mr. Mushtaq. Because this Letter of Map Revision (LOMR) is based on a detailed hydrologic or hydraulic study conducted by a Federal, State, or local agency to replace an approximate study conducted by FEMA, fees were not assessed for the review.

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Sincerely,



 Matthew B. Miller, P.E., Chief  
Hazards Study Branch  
Mitigation Directorate

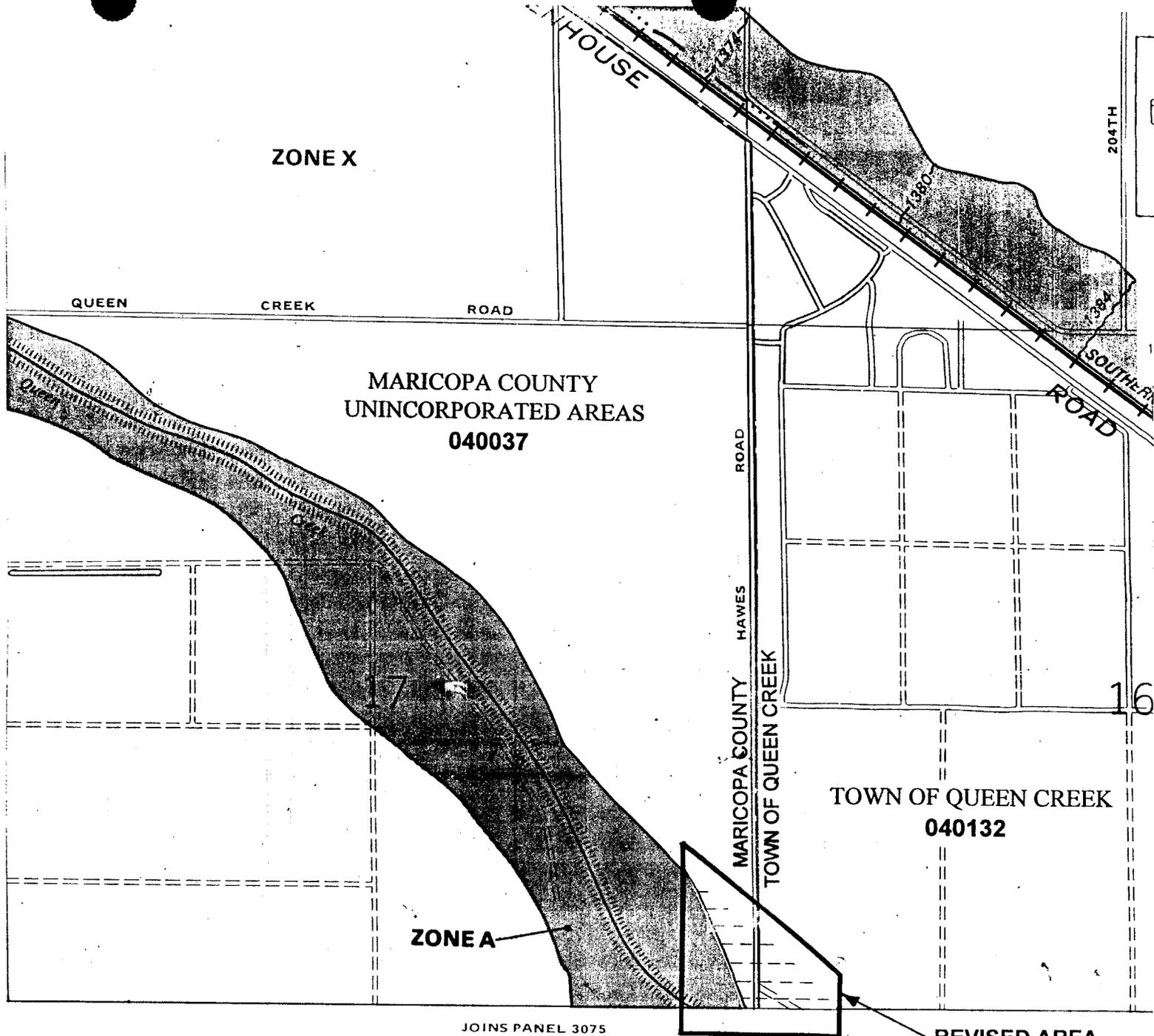
Enclosure(s)

cc: The Honorable Mark Schnepf  
Mayor, Town of Queen Creek

Mr. Dick Schāner  
Town Engineer  
Town of Queen Creek

Mr. Hasan Mushtaq, P.E. ✓  
Engineering Division  
Flood Control District  
of Maricopa County

Mr. René A. G. Piña, P.E.  
Project Engineer  
Collins/Piña Engineering

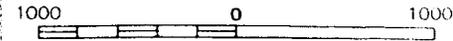


### MAP LEGEND

 Areas of 500-year flood; areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100 year flood.



APPROXIMATE SCALE IN FEET



NATIONAL FLOOD INSURANCE PROGRAM

## FIRM FLOOD INSURANCE RATE MAP

MARICOPA COUNTY,  
ARIZONA AND  
INCORPORATED AREAS

PANEL 2695 OF 4350

CONTAINS

COMMUNITY	NUMBER	PANEL	SUFFIX
GILBERT TOWN OF	04044	2695	
MARICOPA COUNTY UNINCORPORATED AREAS	04037	2695	
MESA, CITY OF	04042	2695	
QUEEN CREEK TOWN OF	04032	2695	

MAP NUMBER  
04013C2695 F

MAP REVISED:  
DECEMBER 3, 1993



Federal Emergency Management Agency

JOINS PANEL 2695

MARICOPA COUNTY  
TOWN OF QUEEN CREEK

SCOTILLO

17

16

ROAD

15

ZONE A

ZONE A

ZONE X

MARICOPA COUNTY  
UNINCORPORATED AREAS  
040037

TOWN OF QUEEN CREEK  
040132

Queen Creek

22

20

21

ZONE X

ZONE A

APPROXIMATE SCALE IN FEET

2000 0 2000

NATIONAL FLOOD INSURANCE PROGRAM

**FIRM**  
FLOOD INSURANCE RATE MAP

MARICOPA COUNTY,  
ARIZONA AND  
INCORPORATED AREAS

PANEL 3075 OF 4350

CONTAINS

COMMUNITY	NUMBER	PANEL	SUFFIX
GILBERT TOWN OF	040044	3075	F
MARICOPA COUNTY	040037	3075	F
UNINCORPORATED AREAS	040132	3075	F

MAP NUMBER  
04013C3075F

MAP REVISED:  
DECEMBER 3, 1993



Federal Emergency Management Agency

### MAP LEGEND

-  Revised 100-Year Floodplain
-  Areas of 500-year flood; areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood.

CHANDLER

HEIGHTS

ROAD

HAWES

AVENUE

29

28

27

LANDING STRIP

THIS AREA IS SHOWN ON  
MAP NUMBER 04013C3080

MARICOPA COUNTY  
UNINCORPORATED AREAS  
040037

33

34

JOINS PANEL 3075

TOWN OF QUEEN CREEK  
040132

SOUTHERN RITTENHOUSE ROAD  
PACIFIC ROAD

TOV N

ROAD

REVISED AREA

1436

1440

ZONE A

TOWN OF QUEEN CREEK  
MARICOPA COUNTY

ZONE AH

MARICOPA COUNTY  
UNINCORPORATED AREAS  
040037

MARICOPA COUNTY  
UNINCORPORATED AREAS  
040037

RM1121

1444 1446

LIMIT OF  
DETAILED  
STUDY

NATIONAL FLOOD INSURANCE PROGRAM

**FIRM**  
FLOOD INSURANCE RATE MAP

MARICOPA COUNTY,  
ARIZONA AND  
INCORPORATED AREAS

PANEL 3080 OF 4350

CONTAINS

COMMUNITY	NUMBER	PANEL	SUFFIX
MARICOPA COUNTY UNINCORPORATED AREAS	040037	3080	F
QUEEN CREEK TOWN OF	040132	3080	F

MAP NUMBER  
04013C3080 F

MAP REVISED:  
DECEMBER 3, 1993



Federal Emergency Management Agency

TOWN OF QUEEN CREEK  
CORPORATE AREA  
040132

26

CLOUD ROAD

CRIMSON

ZONE X

Creek

ZONE A

ZONE X

ZONE A

Landing

TOWN OF  
CORPO

MAP LEGEND



Revised 100-Year Floodplain  
Areas of 500-year flood; areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood.



APPROXIMATE SCALE IN FEET

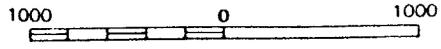


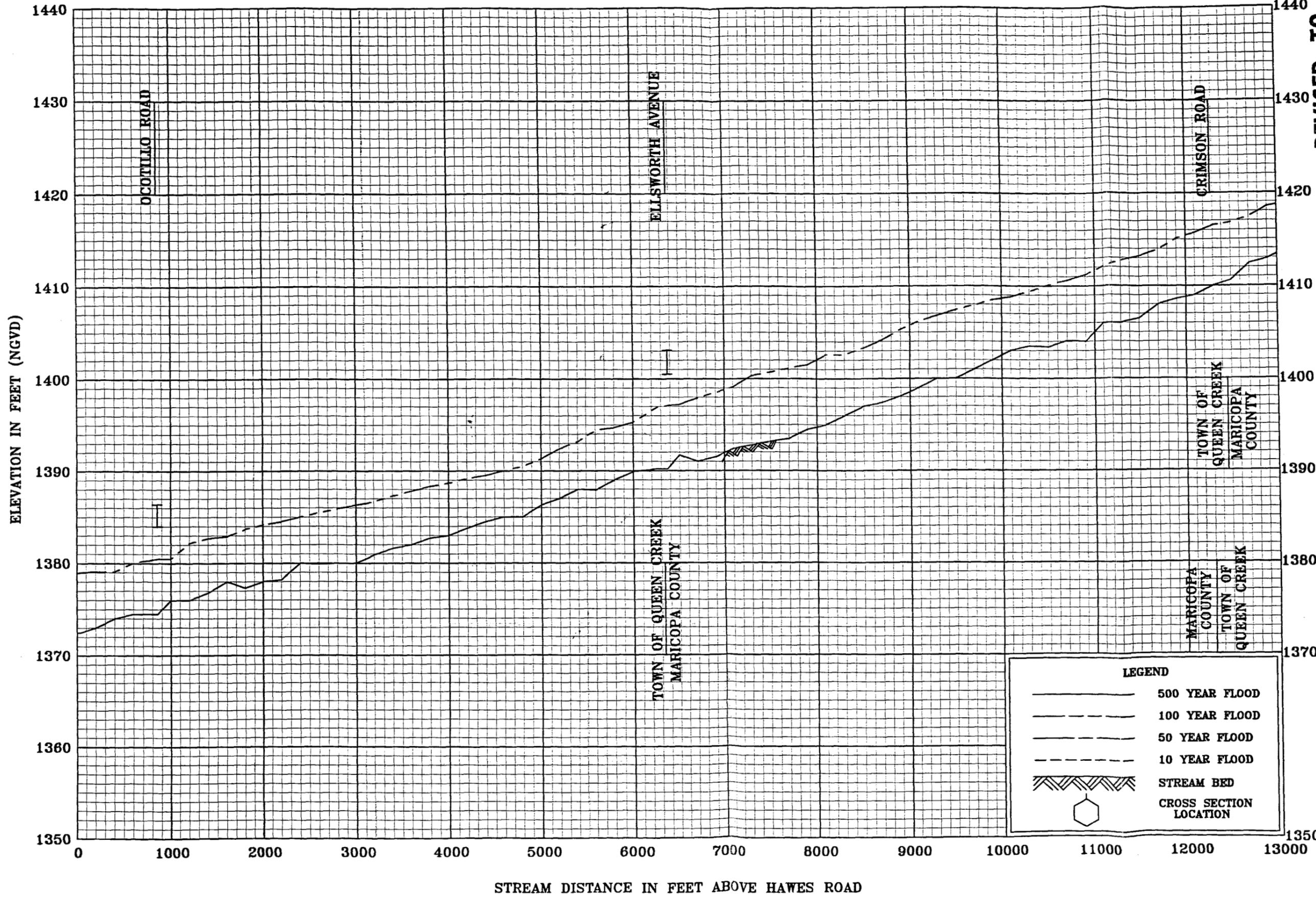
Table 3. Summary of Discharges (Cont'd)

Flooding Source and Location	Drainage Area (Square Miles)	Peak Discharges (cfs)			
		10-Year	50-Year	100-Year	500-Year
Moon Valley Wash-South Branch					
Upstream of the confluence with Moon Valley					
Wash-North Branch	--1	--1	--1	695	--1
Upstream of Canterbury Drive	--1	--1	--1	460	--1
Downstream of the Diversion Channel	--1	--1	--1	399	--1
Upstream of 7th Street	--1	--1	--1	114	--1
Moon Valley Wash-North Split					
Upstream of the confluence with Moon Valley					
Wash-North Branch	--1	--1	--1	976	--1
Diversion Channel					
Upstream of the confluence with Moon Valley					
Wash-North Branch	--1	--1	--1	243	--1
Queen Creek					
At Hawes Road	26.50	--1	--1	3,010	--1

<sup>1</sup>Not Computed

REVISED DATA

REVISED TO  
 10/11/10  
 10/11/10  
 APR 10 1990



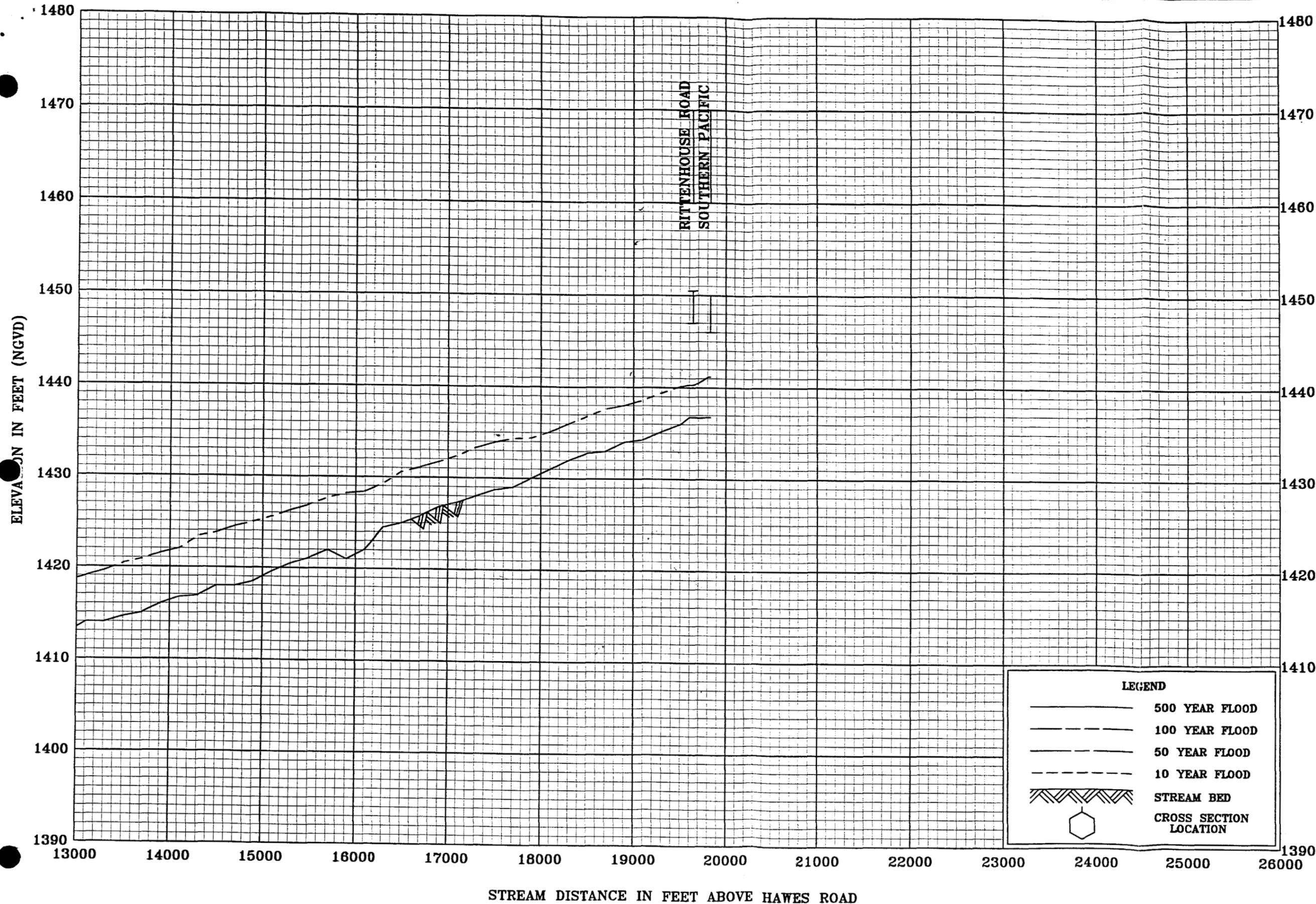
LEGEND	
	500 YEAR FLOOD
	100 YEAR FLOOD
	50 YEAR FLOOD
	10 YEAR FLOOD
	STREAM BED
	CROSS SECTION LOCATION

REVISED TO  
REFLECT LOMR  
DATED APR 16 1996

FLOOD PROFILES  
QUEEN CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY  
MARICOPA COUNTY, AZ  
AND INCORPORATED AREAS

1041P



**REVISED TO REFLECT LOMR DATED APR 16 1998**  
**FLOOD PROFILES**  
**QUEEN CREEK**  
**FEDERAL EMERGENCY MANAGEMENT AGENCY**  
**MARICOPA COUNTY, AZ**  
**AND INCORPORATED AREAS**  
**1042P**

## **SECTION 1: GENERAL DOCUMENTATION AND CORRESPONDENCE**

### 1.4 General Correspondence

#### 1.4.6 FEMA Technical Consultant

After making several periodic inquiries at the FEMA Documents Distribution Center, from November 1996 through April 1997, we were referred to the FEMA Project Library. In April of 1997, we requested copies of the hydraulic analysis of record for Queen Creek Wash, in the vicinity of the current study. A negative response was received, the FEMA Projects Library not having copies of the technical backup data for the stream in question.

#### 1.4.7 Public Notices

Notices about the study was published in the Arizona Republic, for regional notification, and the Gilbert Gazette, for local notification.

### 1.5 Contract Documents

A copy of the contract Scope of Work is enclosed, following.

## **TABLE OF CONTENTS**

### **SECTION 1: GENERAL DOCUMENTATION AND CORRESPONDENCE**

- 1.4 General Correspondence
- 1.5 Contract Documents

### **SECTION 2: MAPPING AND SURVEY INFORMATION**

- 2.1 Description of Mapping and Survey Information
- 2.3 Survey Field Notes
- 2.5 Hydraulic Analysis Maps
- 2.6 FIRM

### **SECTION 3: HYDROLOGIC ANALYSIS**

- 3.1 Method Description

### **SECTION 4: HYDRAULIC ANALYSIS**

- 4.1 Method Description
- 4.2 Parameter Estimation
- 4.7 Results

### **SECTION 6: REFERENCE MATERIALS**



**Michael Baker Jr., Inc.**

*A Unit of Michael Baker Corporation*

3601 Eisenhower Avenue, Suite 600  
Alexandria, Virginia 22304

(703) 960-8800  
FAX (703) 960-9125

May 16, 1997

Mr. Rene A.G. Pina, P.E.  
Collin / Pina, Consulting Engineers, Inc.  
630 East 9th Street  
Tucson, AZ 85705

RE: Case Number B9709100

Dear Mr. Pina:

This letter is in response to your May 13, 1997, telephone conversation with me. During that conversation I informed you that the technical backup data for Queen Creek Wash in Maricopa County, AZ., were not available in our files

The hydrologic and Hydraulic analyses for this study were performed by the U.S. Army Corps of Engineers, Los Angeles District under Inter-Agency Agreement Nos. IAA-H-15-72 and IAA-H-15-73. This study was completed in April 1973. Additional hydrologic and hydraulic analyses for many streams within the county were performed by Harris-Toups Associates under contract No. H-4008. This work was completed in February 1978 and January 1979. You may wish to contact Maricopa County who maintains the repository, or you may contact the U.S. Army Corps of Engineers, who performed the Flood Insurance Study.

If you have any questions regarding your request or this letter, or if we may be of further assistance, please contact me at (703) 960-8800 extension 5329.

Sincerely,

Venkatraj Venkataiah  
Librarian

RECEIVED

MAY 19 1997

COLLINS/PINA  
Consulting Engineers



A Total Quality Corporation

April 30, 1997

Ms. Diana H. Bradley  
FEMA Project Library  
Michael Baker Jr., Inc.  
3601 Eisenhower Avenue, Suite 600  
Alexandria, Virginia 22304

**Re: FIS Backup Data  
Queen Creek, Maricopa County, Arizona  
FEMA FIRM Community No. 040132,  
Panel No's 04013C3075F, 04013C3080F and 04013C2695F  
Collins/Piña Project No. 3660.3**

Dear Ms. Bradley:

Our firm is currently investigating particulars about the FIRM for Queen Creek Wash, in Maricopa County, Arizona. We have obtained copies of the corresponding FIRM Panels, but are in need of the supporting FIS mapping data and HEC-2 model, used in preparing the most recent FIRM, updated in DEC 93.

We hereby respectfully request copies of such information as may be available in the archives of the FEMA Projects Library, with respect to the above FIRM. We enclose annotated excerpts of the corresponding panels, as well as a composite of the USGS maps which encompass the project area

Finally, as agreed during our telephonic conversation, we enclose a payment voucher for the data request initiation fee. If you have questions about this or any other matter, please let us know.

Sincerely,

COLLINS/PINA CONSULTING ENGINEERS, INC.

  
René A.G. Piña, P.E.  
Project Engineer

RAGP:ragp

xc: Project File

Jerry A. Collins  
Raul Fco. G. Piña, P.E., P.L.S.  
Bayard T. Stevenson III, P.E., P.L.S.  
John C. Siath, P.E., P.L.S.  
John E. Melanson, P.E.  
René A.G. Piña, P.E.  
David C. Logue, P.E.  
King Fai Lai, P.E.  
E. Bruce Wilson, P.E., P.L.S.  
Charles A. Horvath  
Wilbur C. DuBois III, P.E.  
Jeff D. Temple, P.E.  
Richard G. Wood, P.E., P.L.S.  
Michael L. Schloeman, P.L.S.  
Stephen A. Sample, P.L.S.  
Richard B. Howell, Jr., P.L.S.  
Arthur A. Witzell, P.L.S.

630 East 9th Street  
Tucson, Arizona 85705  
520.623.7980 phone  
520.884.5278 fax

3800 North Central  
Suite 200  
Phoenix, Arizona 85012  
602.264.7505 phone  
602.264.0568 fax

TOWN OF QUEEN CREEK  
040132

PACIFIC  
ROAD

RM 1121

ZONE AH

LIMIT OF DETAILED STUDY

PROJECT LIMITS

ZONE A

END PROJECT

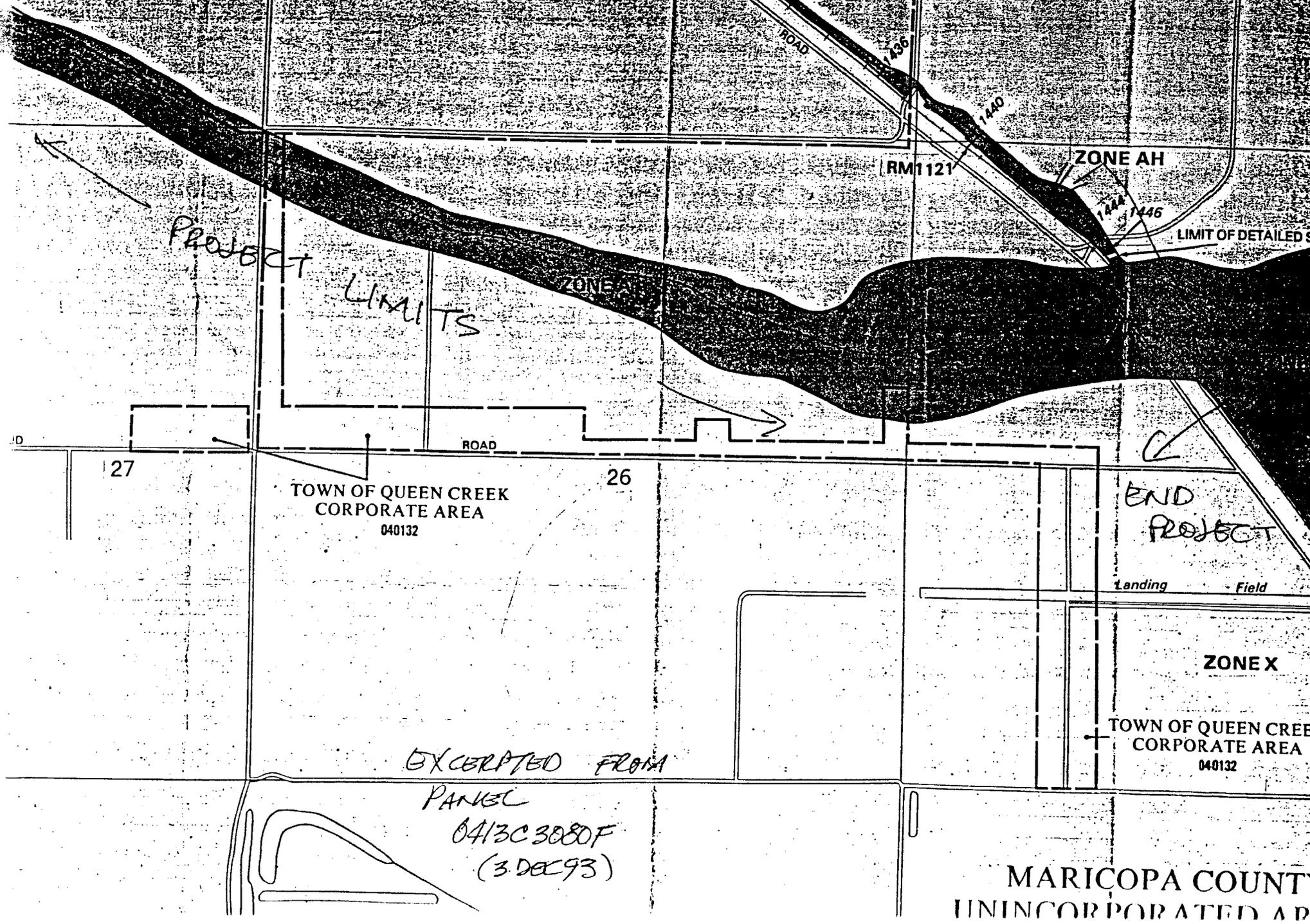
Landing Field

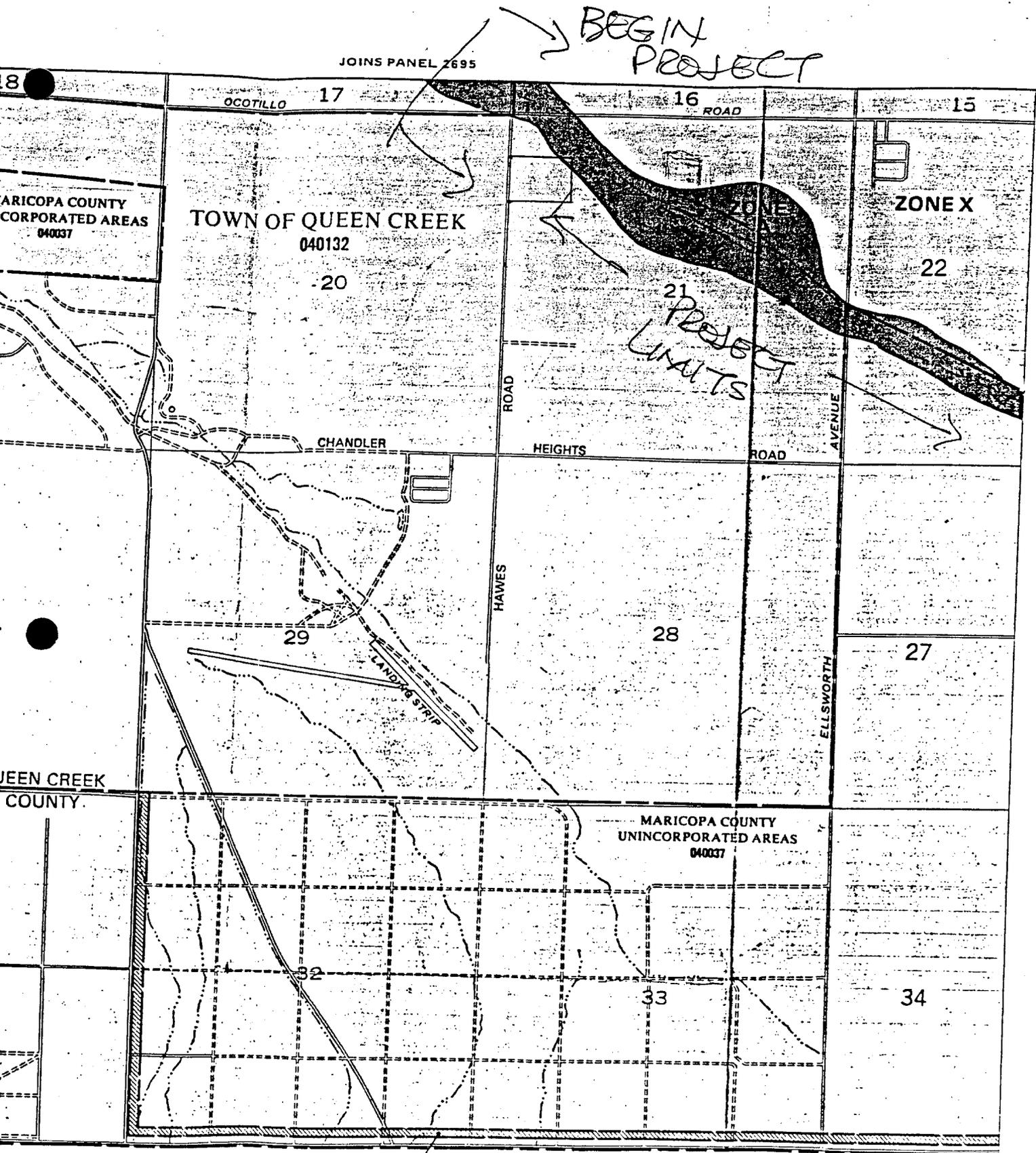
ZONE X

TOWN OF QUEEN CREEK  
CORPORATE AREA  
040132

EXCERPTED FROM  
PARCEL  
0413C3080F  
(3 DEC 93)

MARICOPA COUNTY  
UNINCORPORATED AREA





TOWN OF QUEEN CREEK  
040132

EXCERPTED FROM  
PANEL  
0413C 3075F  
(3 DEC 93)

Arizona  
Boys Ranch



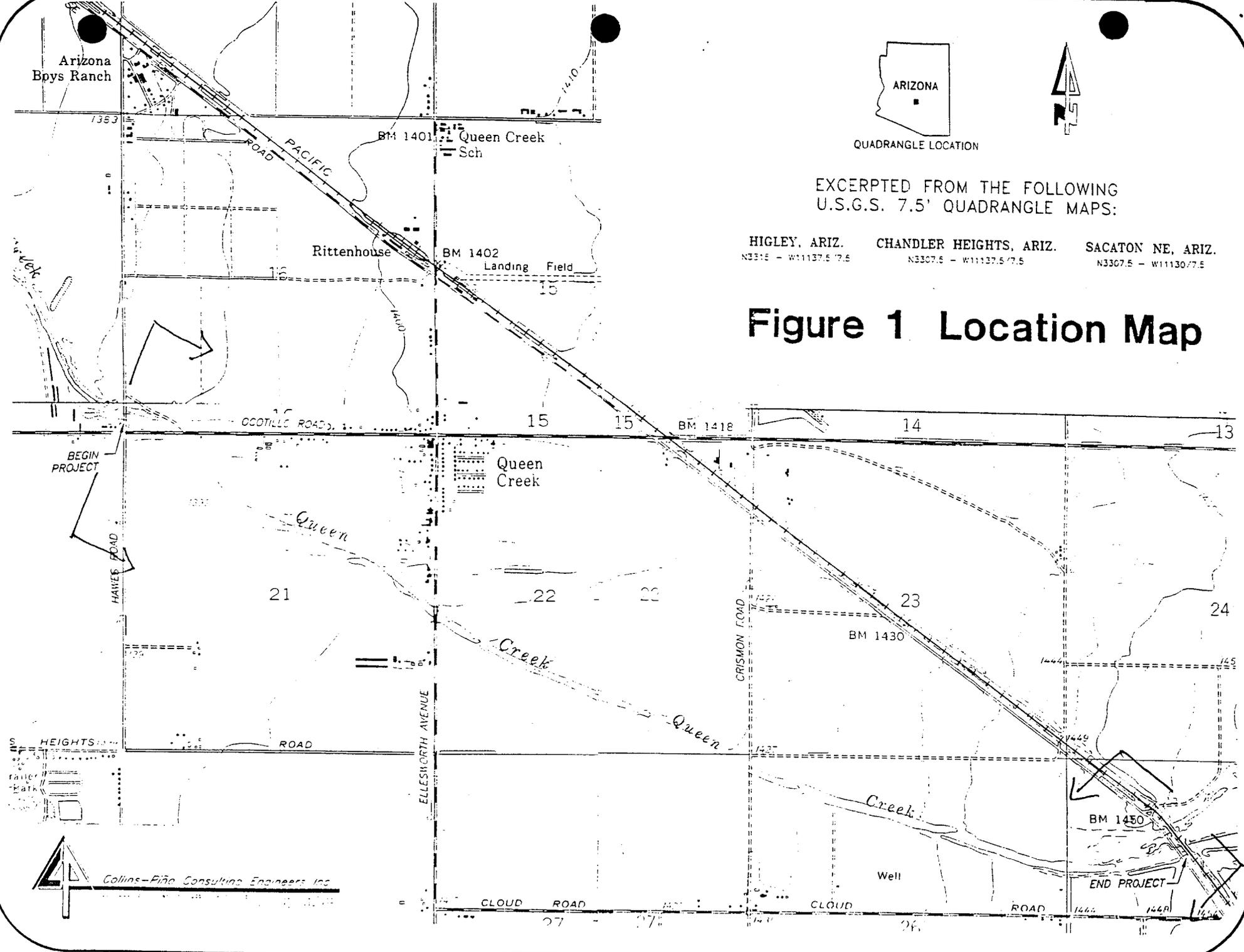
QUADRANGLE LOCATION



EXCERPTED FROM THE FOLLOWING  
U.S.G.S. 7.5' QUADRANGLE MAPS:

HIGLEY, ARIZ. N3315 - W11137.5 / 7.5	CHANDLER HEIGHTS, ARIZ. N3307.5 - W11137.5 / 7.5	SACATON NE, ARIZ. N3307.5 - W11130 / 7.5
---	---	---

# Figure 1 Location Map



Collins-Piña Consulting Engineers, Inc.

Initial Fee Payment Procedures

If you wish to expedite the receipt of your check or money order for the non-refundable fee of \$90 required to initiate data requests for categories 1-3, you may send it overnight by the carrier of your choice. Check or money orders for the initiation fee must be made out to the NATIONAL FLOOD INSURANCE PROGRAM and mailed to:

FEMA Project Library  
c/o Michael Baker Jr., Inc.  
3601 Eisenhower Avenue  
Suite 600  
Alexandria, Virginia 22304  
(703) 960-8800

If you wish to pay by credit card, please complete the form below and send it to either:

- the address noted above or
- fax (703) 329 - 3023

**CREDIT CARD INFORMATION**

Name as it Appears on Credit Card: COLLINS PINA CONSULT ENG  
(Please Print)

Mailing Address for your receipt: 630 EAST 9TH STREET  
(Please Print) TUCSON, ARIZONA 85705

Daytime Telephone No.: (520) 623 7980

VISA  MASTERCARD

AMOUNT PAID: \$90.00

CREDIT CARD #: 

4	7	9	8	1	0	6	9	7	7	0	1	0	0	2	7
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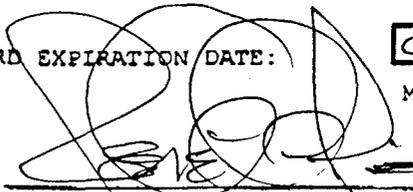
CREDIT CARD EXPIRATION DATE: 

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9	7
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Month Year

SIGNATURE: 

DATE: 30 APR 97

# THE ARIZONA REPUBLIC

97225R  
**ANNOUNCEMENT OF FLOOD HAZARD STUDY**  
 The Flood Control District of Maricopa County under authority of the National Flood Insurance Act of 1968 (P.L. 90-448), as amended, and the Flood Disaster Protection Act of 1973 (P.L. 93-234), is funding a detailed study of flood hazard areas along Queen Creek Wash, between the bridges on Hawes Road and Ritterhouse Road, in Queen Creek, Arizona. The study is being performed for the Flood Control District by Collins/Pina Consulting Engineers, Inc.  
 The purpose of this study is to examine and evaluate flood hazard in areas which are developed or which are likely to be developed, and to determine flood elevations for those areas along the existing Queen Creek Wash channel. These flood elevations will be used by Maricopa County to carry out floodplain management and by the Federal Emergency Management Agency to determine flood insurance rates under the National Flood Insurance Program.  
 This announcement is intended to notify all interested persons of the commencement of this study so that they may have an opportunity to bring any relevant facts and technical data concerning local flood hazards to the attention of the Flood Control District for consideration in the course of this study. Such information should be addressed to Mr. Raju Shah, Flood Control District of Maricopa County, 2801 West Durango Street, Phoenix, Arizona 85009, telephone (602) 506-1501, fax (602) 506-4601.  
 Published: April 17, 1997

STATE OF ARIZONA }  
 COUNTY OF MARICOPA } SS.

TOM BIANCO, being first duly sworn, upon oath deposes and says: That he is the legal advertising manager of the Arizona Business Gazette, a newspaper of general circulation in the county of Maricopa, State of Arizona, published at Phoenix, Arizona, by Phoenix Newspapers Inc., which also publishes The Arizona Republic, and that the copy hereto attached is a true copy of the advertisement published in the said paper on the dates as indicated.

The Arizona Republic

April 17, 1997

*Tom Bianco*

Sworn to before me this  
 17 day of  
 April A.D. 1997



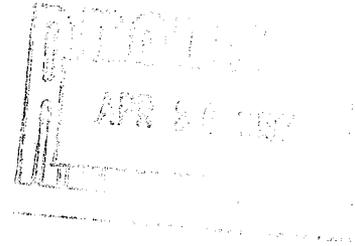
*Mary Lee Booher*  
 Notary Public



P.O. BOX 1547 • MESA, ARIZONA 85211

P.O. Number: \_\_\_\_\_

Invoice Number: \_\_\_\_\_



STATE OF ARIZONA  
County of Maricopa

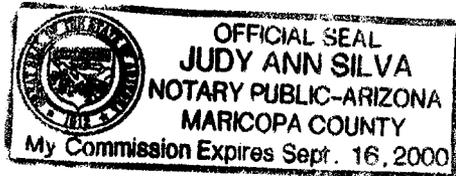
I, \_\_\_\_\_, Legal Clerk,  
acknowledge that the attached hereto was  
published in a newspaper of general circulation at  
Mesa, Arizona, County of Maricopa on the  
following dates:

M-Mesa T-Tempe C-Chandler G-Gilbert S-Spottsdale

*Harve Berg*  
LEGAL CLERK

Subscribed and sworn to before me this  
date: \_\_\_\_\_

*Judy Ann Silva*  
NOTARY PUBLIC



**AFFIDAVIT OF PUBLICATION**

**ANNOUNCEMENT OF  
FLOOD HAZARD STUDY**

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Pub Apr 14, 1997

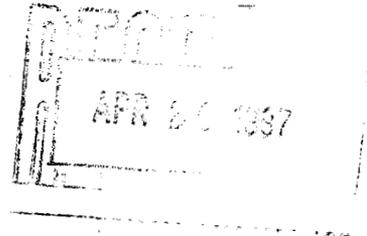
MG-549264



P.O. BOX 1547 • MESA, ARIZONA 85211

P.O. Number: \_\_\_\_\_

Invoice Number: \_\_\_\_\_



STATE OF ARIZONA  
County of Maricopa

I, \_\_\_\_\_, Legal Clerk;  
acknowledge that the attached hereto was  
published in a newspaper of general circulation at  
Mesa, Arizona, County of Maricopa on the  
following dates:

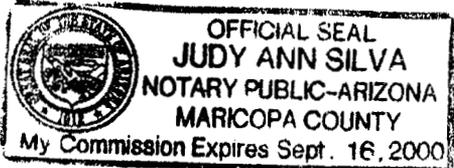
\_\_\_\_\_

M-Mesa T-Tempe C-Chandler G-Gilbert S-Spottsdale

*Harvey George*  
LEGAL CLERK

Subscribed and sworn to before me this  
date: \_\_\_\_\_

*Judy Ann Silva*  
NOTARY PUBLIC



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Pub Apr 14, 1997  
MG-549264

**SCOPE OF WORK  
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY  
FLOODPLAIN DELINEATION  
FOR QUEEN CREEK (SPRR to Hawes Road)**

**GENERAL**

The project consists of approximately 4.0 river miles of floodplain delineation of Queen Creek, beginning at the Queen Creek crossing under the Southern Pacific Railroad (SPRR) and ending at the creek crossing over Hawes Road, as shown on Exhibit A. Analysis of the reach in question will encompass verification of the hydraulic analysis of record for the bridge crossings over Hawes Road, Ocotillo Road, Ellsworth Avenue and Rittenhouse Road, as well as the SPRR bridge.

This will require development of topographic data for the record, for floodplain and floodway delineations along the Queen Creek reach in question, using the HEC-2 water surface profiles model. Modeling of the regulatory floodplain will be accomplished, keeping in mind the available model of record that was used to generate the current Federal Emergency Management Agency (FEMA) Flood Insurance Risk Map (FIRM) for the aforementioned reach. All work and methodology must meet the requirements of the Arizona Department of Water Resources (ADWR) and FEMA for floodplain delineations. The study findings and recommendations must be reviewed and accepted by FEMA and the Town of Queen Creek, as well as the DISTRICT. All work under this Scope will be completed within 120 calendar days.

**TASK 1 - COORDINATION**

- 1.1 The CONSULTANT will submit a project schedule showing coordination meetings and completion dates for each of the tasks.
- 1.2 Minutes of project meetings shall be recorded by the CONSULTANT and submitted to the DISTRICT.
- 1.3 A bi-monthly progress report shall be submitted. At a minimum, the monthly report shall contain the following:
  - a. A description of the work accomplished by task during the reporting month.
  - b. Percent (%) completed for the month and percent (%) cumulative completed for each task.
  - c. A brief description of the work to be accomplished in the following month.
  - d. A description of any problems encountered.

- 1.4 A meeting with officials from the Town of Queen Creek may be necessary, to identify local flooding problems and obtain information on current and planned public works projects, channel modifications, storm drain systems, development, and corporate limits.
- 1.5 A meeting with officials from the SPRR may be necessary, to obtain "as-built" information about their structure crossing over Queen Creek, at the upstream end of the reach studied under this contract.
- 1.6 The CONSULTANT will arrange for the publication of one (1) Public Information Notice in two (2) newspapers, one local to the Town of Queen Creek, and another with state-wide distribution. The DISTRICT will provide the CONSULTANT with a format sample of the notice to be published.

## **TASK 2 - DATA COLLECTION**

- 2.1 The CONSULTANT will collect and review pertinent data available from the DISTRICT and other outside sources. Data to be collected will include previous flood hazard reports and hydrology for the study area; existing topographic mapping; historical flooding information; as-built plans for existing structures; geotechnical data on the fill such as soil parameters and compaction test results; FEMA Flood Hazard Boundary Maps and any Letters of Map Amendment and/or Revisions; and any other pertinent information.
- 2.2 The DISTRICT will make available to the CONSULTANT all of the hydrologic and hydraulic design references/documents of record, including previous hydraulic model data, as appropriate.
- 2.3 The CONSULTANT shall obtain "as-built" information for any and all drainage structures crossing the Queen Creek reach under study.
- 2.4 The CONSULTANT will generate topographic mapping for the project area, based on photogrammetric methodology, and will include it in its project deliverables, in conformance with the current DISTRICT Hydrologic Information System (HIS) standards and provisions. Supplementary mapping beyond the limits of the hydraulic model, will be obtained from USGS 7.5' quadrangle topographic coverage or references furnished by the DISTRICT, as necessary.

## **TASK 3 - TOPOGRAPHIC MAPPING**

- 3.1 An aerial survey subcontractor shall be retained by the consultant as part of this contract. The consultant will coordinate all the aerial surveying work with the aerial surveying subcontractor to ensure that specifications of the aerial surveying work are met. The consultant is responsible for ensuring that the topographic mapping

completely covers the area of delineation. The accuracy of the mapping and quality control on surveys will be per FEMA Document 37, Flood Insurance Study Guidelines and Specifications for Study Contractors, January 1995.

- 3.2 Digital contour and planimetric data for this study will be developed and delivered in magnetic media, in accordance with the current DISTRICT HIS Data Delivery Specifications (HISDD Specifications), as identified in the Data Delivery Specifications for HIS, Revision 2.1, dated 14 February, 1996, and the October, 1996, Addendum.
- 3.3 The consultant shall use a Digital Terrain Model to develop topographic mapping with a contour interval of 1-foot, and horizontal scale of 1 inch = 100 feet, with spot elevations on all section line and mid-section line roads.
- 3.4 Ground Control:
  - a. The consultant shall provide all survey control using 1983 NAD.
  - b. The consultant shall systematically set panel points and establish horizontal and vertical control throughout the areas to be mapped for use in compilation by the aerial survey contractor. Where readily available, surveys will tie into the State Plane Coordinate System. Field control will be sufficient to readily allow for compilation of maps by the aerial survey contractor at the desired map scale and contour interval, and will be based on the National Geodetic Vertical Data of 1929 (NGVD 29). The consultant will provide a conversion factor to the North American Vertical Datum of 1988 (NAVD 88), including documentation of how it was derived, to allow comparison of NGVD 29 elevations to NAVD 88 elevations. The documentation on the conversion factor will be included in the Technical Data Notebook.
  - c. The horizontal and vertical control points shall be located and marked by the consultant. The controls for the aerial mapping will be in sufficient numbers and will be in locations that will be compatible with the accuracy of the mapping requirements. The controls will be of at least third order accuracy. Section corners, quarter corners, and mid-section points will be used for control points wherever possible.
- 3.5 The consultant will provide permanent non-erasable topographic mylars of the work study drawings. The drawings will be 24" X 36" in size, with a horizontal scale of 1 inch = 100 feet and a contour interval of 1 foot for all mapping. A cover sheet will be part of the work study drawings and shall have on it the project title, date of topographic mapping, and a location map showing geographic range covered by each specific mapping sheet. A cover sheet template will be provided by the DISTRICT, in magnetic form, for use in generating the required drawings. Each drawing will include the floodplain and floodway delineations, and a minimum of a north arrow, scale,

section corners and quarter corners, current and proposed streets and highway names, State Plane Coordinate System, major drainage features, corporate boundaries, cross section lines, channel station center line, index map, the floodplain and floodway computed water surface elevations, rate of flow, base flood elevations (BFE), and a description and elevation of each elevation reference mark (ERMs). A note explaining the proper means to convert the NGVD 29 elevations to NAVD 88 elevations shall be included in "NOTES" in the map border. See Section 5.0 of the Hydrologic Information System Data Delivery specifications for how the drawings are to be laid out. The mapping will have an accuracy such that ninety percent (90%) of all contours will be within one-half contour of the true elevations and the remaining ten percent (10%) of the contours will not be in error by more than one contour interval.

#### **TASK 4 - FIELD SURVEY**

4.1 Prepare topographic mapping with a contour interval of 1-foot and a horizontal scale of 1 inch = 100 feet, for all floodplain/floodway delineation areas.

4.2 Ground Control for Floodplain Delineations:

4.2.1 All topographic mapping and survey work will meet or exceed Federal Emergency Management Agency (FEMA) minimum criteria as defined in FEMA Document 37, Flood Insurance Study Guidelines and Specifications for Study Contractors, January 1995. This includes, but is not limited to: the establishment of "permanent" elevation reference marks (ERMs); field control; and verification of profiles by the ground survey profile procedure.

4.2.2 Horizontal and Vertical Control: Systematically set panel points and establish horizontal and vertical control throughout the area to be mapped for use in compilation by the aerial survey contractor. Where readily available, surveys will tie into State Plane Coordinate System 1983 NAD. Field control shall be sufficient, at least one "permanent" point per mile, such point(s) being used as Elevation Reference Marks (ERMs). Surveys will be based on the National Geodetic Vertical Datum of 1929 (NGVD 29), per FEMA guidelines. The consultant will provide a conversion factor, including documentation of how it was derived, to allow comparison of NGVD 29 elevations to North American Vertical Datum 1988 (NAVD 88) elevations. The documentation on the conversion factor will be included in the Technical Data Notebook. "Permanent" survey points will consist of existing monuments, such as brass caps or similar survey monuments. Elevation Reference Marks will be labeled on available maps and described so that they can be easily located in the field.

4.2.3 All aerial targets are to be removed following completion of the topographic mapping.

- 4.3 The CONSULTANT shall field verify the information provided in all "as-built" reference drawings.
- 4.4 Copies of the survey field books and office calculations must be included in the Technical Data Notebooks. If DISTRICT approval is obtained, this information can be submitted separately.

#### **TASK 5 - FLOODPLAIN HYDROLOGY**

Existing and future conditions hydrologic analyses have already been conducted for the Queen Creek reach in question, in the definition of the current FEMA FIRM. It is anticipated, therefore, that the CONSULTANT will not provide additional hydrologic analysis for this project.

#### **TASK 6 - FLOODPLAIN DELINEATION**

- 6.1 Floodplain delineations must be obtained using the latest version of the U.S. Army Corps of Engineers HEC-2 Water Surface Profile computer model and methodology acceptable to FEMA. This model will simulate the effects on the floodplain of the geomorphology, flow changes, bridges, culverts, hydraulic roughness factors, effective flow limitations, split-flows, and other considerations. The study will be prepared using the guidelines established in FEMA Document 37, Flood Insurance Study Guidelines and FIA Document 12, Appeals, Revisions, and Amendments to Flood Insurance Maps, January 1995.
- 6.2 The delineation work shall meet requirements for floodplain and floodway delineations, as prescribed by FEMA and ADWR.
- 6.3 Floodways are to be determined initially using the equal conveyance encroachment method 4, but only encroachment method 1 will be used in the final analysis. Floodway encroachment will be limited to features that do not cause the regulatory water surface elevation to rise beyond the one-foot allowable maximum.
- 6.4 Manning "n" values are to be determined using the methodology in the USGS report, "Estimated Manning's Roughness Coefficients for Stream Channels and Flood Plains in Maricopa County, Arizona", dated April 1991. Copies of the report are available through the DISTRICT.
- 6.5 The consultant is to make refinements to the HEC-2 model based on review of the model results by the DISTRICT, ADWR, FEMA, and the FEMA Technical Evaluation Contractor. The consultant shall review the HEC-2 model results for reasonableness. Adjustments to the input parameters for obtaining the most realistic results is normal to the scope.

## 6.6 Cross Sections

6.6.1 Cross section stationing will be from left to right looking downstream, centered along the Queen Creek thalweg. The base reference for location of hydraulic cross-sections will be intersection of the centerline of Hawes Road with the Queen Creek thalweg, and will be identified as station 100+00, along the cross-section (the intent is to establish that Sta 100+00 will correspond to the channel thalweg, at each cross-section analyzed). Cross sections will be spaced approximately every 200 feet, unless geographic or structural constraints dictate otherwise, and will extend the full width of the area inundated by 100-year flood waters. Identification of cross sections will be in river miles, increasing upstream. Stationing will also reference tie with specified river mile stationing of previous FEMA studies. Initial cross-section orientation may need to be altered, after obtaining the first HEC-2 model run, to ensure that final cross-sections are perpendicular to flow, per FEMA criteria.

6.6.2 All cross sections will be plotted, and the plots included in the appropriate submittals. The cross-section plots will show water surface profiles, ineffective flow areas, "n" values, encroachments, channel stationing and other pertinent information. All plots are to be accompanied by a legend. These plots are to be available at all reviews.

6.6.3 Cross section plots are limited to one plot at the following three stages of work: a) a plot of the digitized GR-card data for all cross-sections along the centerline of Casandro Wash, to be used as a check of input data and for working sections during compilation of the floodplain model; b) a plot of the hydraulic cross-sections for the completed floodplain model run, which show floodplain water surface elevation, ineffective flow areas, "n" factor, and encroachments, to be used as draft data for development of the floodway model; c) a plot of the final floodway model cross-sections which will show Type 1 encroachments and encroached conditions water surface elevation, in addition to the data covered in items a) and b). The cross-sections generated under item c), will be incorporated into the Final Report submitted.

- 6.7 For floodplains identified as ponding areas, it is preferable to analyze the area by using the HEC-2 model, which will provide anticipated water surface elevations. If appropriate, identify the ponded floodplains as lying within the floodway. The purpose of this floodway modification is to allow ponding to seek a constant stage throughout the areal extent of the ponds.
- 6.8 Flood zones must be determined according to FEMA criteria and clearly labeled on the final drawings.
- 6.9 The total area of the floodplain and floodway must be determined for each reach, in square miles and acres.

6.10 The findings of the floodplain/floodway delineation study will be presented in Section 4 of the Technical Data Notebook and will be prepared in accordance with ADWR State Standards Attachment 1-90 (SSA 1-90). The report will be organized as specified by the DISTRICT standards, following SSA 1-90 format.

6.14 The CONSULTANT shall fill out all the forms required by FEMA for submittal of Floodplain Delineation Studies.

#### **TASK 7 - HIS DATA**

Digital data will be prepared in conformance with the DISTRICT HISDDS, Revision 2.1. The following themes are the ones generally used for the data developed for Floodplain Delineation Studies. However, for this study there may not be data for every theme identified here, or the consultant might develop data for themes not listed here. Therefore, only those themes for which there is data need to be completed. If the consultant has data that doesn't fit one of the themes listed here, the DISTRICT Project Manager shall be contacted to determine the appropriate theme for that data.

- a. NDXPRJ (FCD Project Map Index)
- b. PRJ (Project Boundaries)
- c. CARTO (Cartographic Features)
- d. CORNERS (if any)
- e. CTRL (Miscellaneous Control Survey Points)
- f. LDUSE (Land Use, if not provided by the DISTRICT)
- g. STRCT (Structure)
- h. DQ (Data Quality)
- i. PRJ (Project Identification)
- j. FPCTLFCD (FCD Reference Marks)
- k. FPSRFFCD (Floodplain FCD Water Surface Elevation)
- l. FPXFCD (Floodplain FCD Cross Section)
- m. FPZNFCD (Floodplain FCD Zone)

- n. CNL (Canal System, if any)
- o. FLTY (FCD Project Facility, if any)
- p. RR (Railroad System, if any)
- q. STRTDTL (Street Detail)
- r. UTLTY (Utilities)
- s. ELV (Elevation (Land))
- t. SOIL (Soil Type Area, if not provided by FCD)
- u. VEG (Vegetation, if any)
- v. DRNBSN (Drainage Sub-basin Area)
- w. DRNPTH (Drainage Path)
- x. LAKE (if any)
- y. RIVER (if any)

#### **TASK 8 - DELIVERABLES**

The following deliverables shall be prepared by the CONSULTANT:

- 8.1 FEMA Submittal: The CONSULTANT will prepare a FIRM LOMR Application submittal and deliver it to the DISTRICT, for submittal to FEMA. The DISTRICT will secure the necessary local agency signatures, and submit the actual LOMR Application to FEMA. The following items are considered deliverables for the FEMA submittal:
  - 8.1.1 Original Affidavits of Publication of Public Notices, provided by the DISTRICT.
  - 8.1.2 Three (3) complete topographic base map copies, with the floodplain and/or floodway delineations shown. All drawings will be signed and sealed by persons of appropriate professional registration(s). Each registrant will provide a specific statement as to what service they performed.
  - 8.1.3 Three (3) complete copies of the project Technical Data Notebook, including HEC-1 and HEC-2 input/output files on diskettes, as appropriate. The Technical Data Notebook will be prepared in accordance with ADWR State

Standards Attachment 1-90 (SSA 1-90). The notebook will be organized as specified by the DISTRICT, following SSA 1-90 format.

8.1.4 Three (3) sets of completed FEMA forms will be submitted in a notebook separate from the Final Report.

8.1.5 Three (3) sets of complete survey notes will be submitted in a notebook separate from the Final Report.

8.1.6 Three (3) copies of the current FEMA FIRM panels, showing the proposed delineation.

8.1.7 One copy in magnetic media (3.5" HD Diskettes) of the DTM and topogrammetric mapping drawing files (AutoCAD 'DWG) developed for this project.

8.2 Final Submittal: The following products are considered deliverables for the final submittal to the DISTRICT, after FEMA approval is issued:

8.2.1 Two (2) complete set of non-erasable topographic photomylar copies of the work study drawings. Sheets shall be 24" X 36" in size, numbered and referenced to the delineation maps.

8.2.2 Two (2) complete sets of mylars and two (2) complete copies of sealed topographic base maps, annotated with the floodplain and/or floodway delineations. All drawings will be signed and sealed by persons of appropriate professional registration(s). Each registrant will provide a specific statement as to what service they performed.

8.2.3 Two (2) complete copies of the Technical Data Notebook including HEC-1 and HEC-2 input/output files on diskettes. The Technical Data Notebook will be prepared in accordance with ADWR State Standards Attachment 1-90 (SSA 1-90). The notebook will be organized as specified by the DISTRICT, following SSA 1-90 format. This submittal of the Technical Data Notebook shall include any correspondence and/or meeting minutes with the reviewing agencies, and shall reflect any revisions required by those reviewing agencies. Revisions may include, but are not limited to, modifications to the delineation maps, the HEC-2 model, and/or the Final Report.

## SECTION 2: MAPPING AND SURVEY INFORMATION

### 2.1 Description of Mapping and Survey Information

After field reconnaissance and coordination with an aerial photogrammetric subcontractor, field surveys were conducted, utilizing a GPS Unit. The information obtained from the field survey was combined with aerial coverage, to develop topogrammetric mapping at 1"= 100' and 1' ground elevation contours.

### 2.3 Survey Field Notes

A copy of the complete field survey notes file is enclosed, following.

### 2.5 Hydraulic Analysis Maps

The topogrammetric data obtained from the field surveys is presented in 8 sub-reaches for the Queen Creek Wash reach analyzed. Hydraulic cross sections were placed 200' apart, with the base cross section, No. 1000+00, located at the centerline of the bridge structure on Hawes Road. Hydraulic parameters and modeling methods are as recommended in the Corps of Engineers HEC-2 Manual.

### 2.6 FIRM

Two FIRM panels are affected by the updated modeling of the Queen Creek Wash reach analyzed, and will require revision: FIRM Panel Numbers 04013C3075F and 04013C3080F, issued in December 1993.

## **SECTION 3: HYDROLOGIC ANALYSIS**

### **3.1 Method Description**

No hydrologic analysis was conducted for this study. Peak flow values were provided by Flood Control District of Maricopa county staff, as identified in the Queen Creek Area Master Drainage Study, commissioned by the district in 1991. Accordingly, Q100 value used for hydraulic modeling of the reach analyzed is 3010 cfs.

FINAL REPORT  
QUEEN CREEK AREA DRAINAGE MASTER STUDY  
FCD CONTRACT NO. 86-23

Prepared For: Flood Control District of Maricopa County  
3335 West Durango Street  
Phoenix, Arizona 85009

Prepared By: Wood & Associates, Inc.  
4105 North 20th Street  
Suite 130  
Phoenix, Arizona 85016



Revised: August 1991  
January 1991  
WA Job No. 86328

TABLE C-1

Flooding Source and Location	Peak Discharge (cfs)		
	10-year	50-year	100-year
Queen Creek from East Maricopa Floodway to Sanoqui Wash Confluence	3300	4750	5500
Queen Creek from Sanoqui Wash Confluence to County Line	2250	2750	3010

TABLE C-2

## SUMMARY OF DISCHARGES

Flooding Source and Location	Peak Discharge (cfs)		
	10-year	50-year	100-year
Sanoqui Wash from Queen Creek Confluence to Hawes Road	1550	2950	3700
Sanoqui Wash from Hawes Road to County Line	1150	2150	2700

## SECTION 4: HYDRAULIC ANALYSIS

### 4.1 Method Description

Following guidance from the HEC-2 Manual, hydraulic profile cross sections were chosen at 200' intervals, along the reach analyzed. These cross sections describe the Queen Creek Wash channel and overbank areas. Because the technical documentation for the current FIRM is not available, the FIRM floodplain was graphically superimposed over the newly developed topogrammetric mapping, and a starting WSEL was chosen graphically from the composite mapping, downstream of the base hydraulic cross section at Hawes Road. Five bridge structures are included in the hydraulic analysis, two being considered the limits of the current study: the Hawes road Bridge and the SPRR Bridge. Modeling of these bridge structures was accomplished using the Special Bridge Routine in HEC-2.

### 4.2 Parameter Estimation

Hydraulic parameters were estimated in accordance with Maricopa County guidance. A copy of the documentation involved is enclosed.

### 4.7 Results

Q100 peak flows are fully contained in the Queen Creek Wash channel, and are safely conveyed under the five bridge crossings modeled. The flow regime is normal, with flow velocities ranging between 5 and 7 feet per second, which is sufficiently calm to ensure minimal deleterious erosion to the channel banks, especially after they area covered with stabilized vegetation. In potentially problematic areas, at entrance and exit from the bridge structures, more durable bank protection has been afforded, as either sandbags or dumped rock rip-rap.

Over the years, excess material from the leveling of adjoining agricultural fields has been piled adjoining the existing channel banks. The current hydraulic model shows that anticipated WSEL100's are generally below or near the edge of the natural channel bank, so that these earthen berms do not especially provide a hydraulic capacity function for the Queen Creek Wash reach analyzed.

**4.5**

In the vicinity of the SPRR/Rittenhouse Road Bridge, the hydraulic modeling results of the 1997 LOMR Project for the Queen Creek Wash differ substantially from the existing FEMA FIRM. The current FIRM shows significant flooding to both the south and east, upstream of the bridge.

The peak 100-year flows utilized in the 1997 hydraulic model were provided by the Flood Control District of Maricopa. Using these flows, the current hydraulic model demonstrates that the entire 100-year peak within the Queen Creek Wash flows beneath the SPRR/ Rittenhouse Bridge without overtopping the bridge or creating an upstream backwater effect. The 100-year peak, downstream of the bridge, is conveyed within the banks of the natural channel. These hydraulic results were obtained from the HEC-2 model (see the HEC-2 output included in the Technical Data Notebook) are shown on the Floodplain Delineation Exhibit and the modified FEMA FIRM.

Jerry A. Collins  
Raul Fco. G. Piña, P.E., P.L.S.  
  
William A. Cowie, P.E.  
Wilbur C. DuBois III, P.E.  
Charles A. Horvath  
Timothy E. Kelly, P.E.  
King Fai Lai, P.E.  
David C. Logue, P.E.  
John E. Melanson, P.E.  
René A.G. Piña, P.E.  
John C. Siath, P.E., P.L.S.  
Bayard T. Stevenson III, P.E., P.L.S.  
Jeff D. Temple, P.E.  
E. Bruce Wilson, P.E., P.L.S.  
Richard G. Green, R.L.A.  
J. Leonard Fontes, Jr., P.L.S.  
Richard B. Howell, Jr., P.L.S.  
Stephen A. Sample, P.L.S.  
Michael L. Schloeman, P.L.S.  
Arthur A. Witzell, P.L.S.

**Tucson**

33 North Stone Avenue  
15th Floor  
Bank of America Plaza  
Tucson, Arizona 85701  
520.623.7980 phone  
520.884.5278 fax  
cpe-tcn@worldnet.att.net

**Phoenix**

40 East Virginia Avenue  
Suite 200  
Phoenix, Arizona 85004  
602.264.7505 phone  
602.264.0568 fax  
cpe-phx@worldnet.att.net

**Nogales**

270 West View Point Drive  
Nogales, Arizona 85621  
520.281.2705 phone  
520.281.2706 fax

## SECTION 6: REFERENCE MATERIALS

Estimated Manning's Roughness Coefficients for Stream Channels and Flood Plains in Maricopa County, Arizona, prepared for the Flood Control District of Maricopa County, by B.W. Thomsen and H.W. Hjalmarson, U.S. Geological survey Water Resources Division, April 1991.

Open-Channel Hydraulics, Ven Te Chow, Ph. D., published as part of an engineering series by the McGraw-Hill Book Company, 1959.

HEC-2, Water Surface Profiles Manual and Computer Program, U.S. Army Corps of Engineers Hydrologic Engineering Center, September 1991.

Queen Creek Area Drainage Master Study, Final Report, FCDMC Contract No. 86-23, prepared by Wood and Associates, Inc., August 1991.

**TECHNICAL DATA NOTEBOOK**  
**FIELD RECONNAISSANCE**  
**AND**  
**HYDRAULIC PARAMETER ESTIMATION**

**QUEEN CREEK LOMR**  
**(Hawes Road to SPRR)**

**Lying Within**  
**Sections 16, 17, 21, 22, 25, 26 and 27**  
**Township 2 South, Range 7 East,**  
**Gila and Salt River Baseline and Meridian**  
**Maricopa County, Arizona**

*Prepared For*

**Flood Control District**  
**of**  
**Maricopa County**  
**2801 West Durango Street**  
**Phoenix, Arizona 85009**  
**(602)506-1501**

*Prepared By*

**Collins/Piña Consulting Engineers, Inc.**  
**630 East 9th Street**  
**Tucson, Arizona 85705**  
**(520)623-7980**

**MARCH 1997**

## TABLE OF CONTENTS

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3. CONCLUSIONS .....	2
4. REFERENCES .....	2

### LIST OF EXHIBITS

- Exhibit 1 - Project Location Map
- Exhibit 2 - Photograph Viewpoint Index

### APPENDICES

- Appendix A - Field Photographs
- Appendix B - Bridge Structure Dimensions

1. **INTRODUCTION**

In March of 1997, Collins/Piña Consulting Engineers, Inc., conducted a reconnaissance field visit to the Queen Creek Wash, photographing sample reaches of the subject channel. This was accomplished, in order to provide documentation for the record, in support of the Manning's "n" values that have been used in the hydraulic model for the same reach. The study area limits are identified in Figure 1. Figure 2 identifies the locations along the reach, where photographs were taken; and the photographs are included in the appendix.

2. **DISCUSSION**

Manning's values for the wash were estimated, in accordance with the findings and methodologies identified in two main references: "Estimated Manning's Roughness Coefficients for Stream Channels and Flood Plains in Maricopa County, Arizona", prepared by the U.S. Geological Survey (USGS) Water Resources Division for the Flood Control District of Maricopa County in 1991; and "Open-Channel Hydraulics", by Ven Te Chow, Ph.D., and published in 1959.

Observations of wash vegetation and "n" value characteristics, in the channel and overbank areas, were noted and recorded during the field visit. Field photographs were taken, to complement the record. The photographs and recorded observations are included in the appendix.

The typical channel cross-section has been found to include a fairly clean and regular stream bed, made of sandy-silty material, of widths varying between 30' and 40', and depths of 6' to 8'. Channel banks are generally covered with medium-dense brush and small trees. At bridge crossings, channel and banks have been cleared and regraded for the construction effort, and the banks have

been covered with a protective lining of river-run cobbles; these are expected to revert to brush vegetation on banks, with the passage of time. Overbank areas are mostly used for agricultural purposes, and have been cleared up to the wash; overburden has been piled against the wash banks, creating a 3' to 5' levee that adds to the natural stream depth. The channel has a fairly straight alignment, with no abrupt changes in direction, as it flows in a northwesterly direction.

### 3. CONCLUSIONS

**Manning's "n" Values.-** Topographic and ground cover conditions along the Queen Creek Wash reach under study are fairly consistent, and identify distinct "n" value regions. It is recommended that the NH record option be used in the HEC-2 hydraulic model of the wash, to identify the contrasting "n" value characteristics of the modeled stream.

**Expansion and Contraction Coefficients -** There are no abrupt changes in channel width evidenced in the Queen Creek Wash reach studied, except at the upstream project limits, where the combined effect of the SPRR and Rittenhouse Road bridges constrain the wash floodplain, directing it into the channel. There are several bridge crossings, at which points it is recommended that contraction and expansion coefficients of 0.3 and 0.5 are used in the channel HEC-2 hydraulic model.

**Hydraulic Jump/Drop Analysis -** Hydraulic jumps are not anticipated in the study reach. The overall average channel slope along the 4-mile reach is 0.00326 ft/ft, which is very gentle.

**Road Crossings and Drainage Structures -** Five bridges allow roads to cross over the Queen Creek reach studied: at Hawes Road, Ocotillo Road, Ellsworth

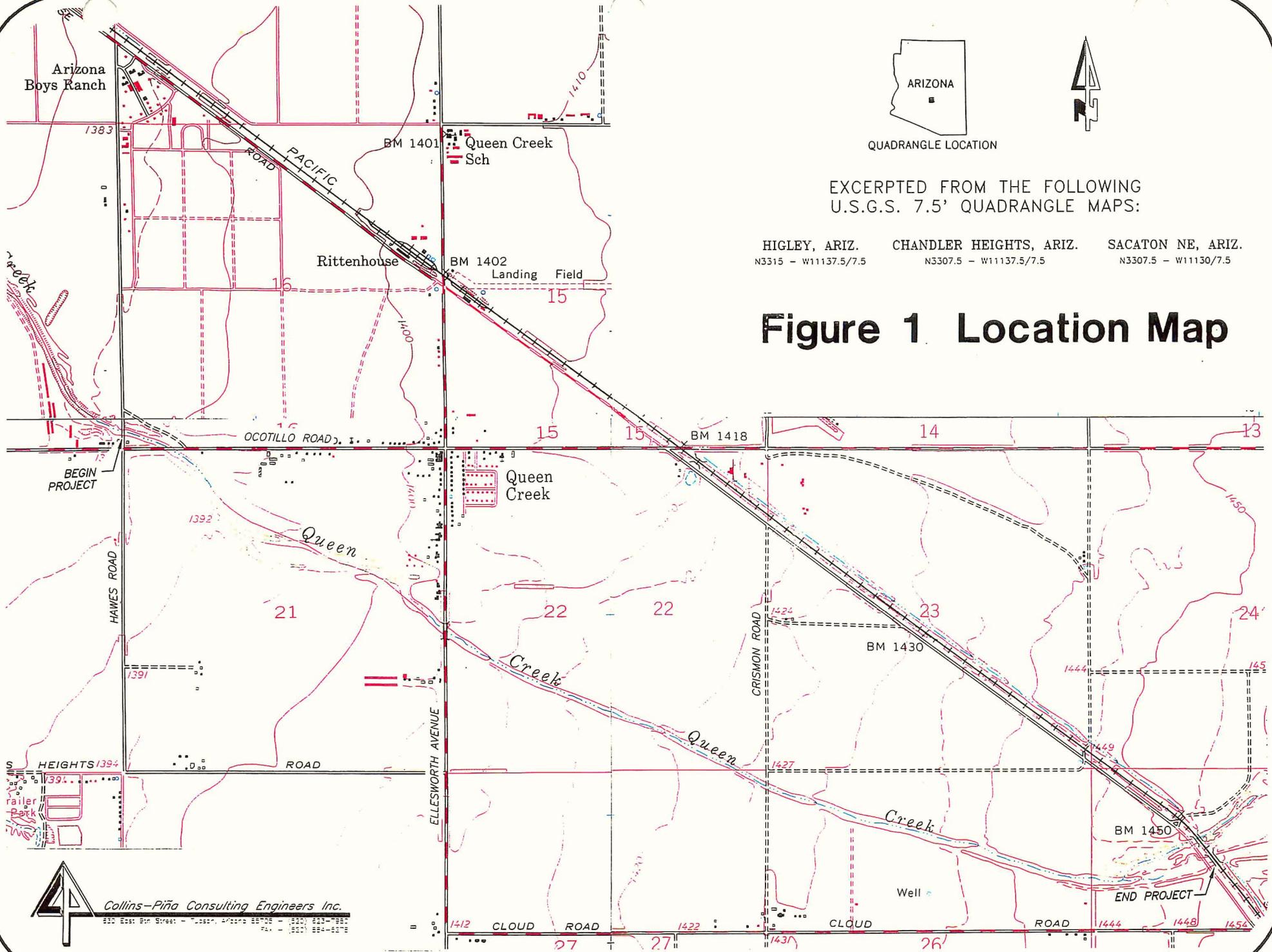
Avenue, Rittenhouse Road and the S.P.R.R. The ford crossing at Crismon Road is over unimproved channel bed. Data for the bridges was obtained from Maricopa County Department of Transportation records, and is included in the appendix.

5. **REFERENCES**

Estimated Manning's Roughness Coefficients for Stream Channels and Flood Plains in Maricopa County, Arizona, prepared for the Flood Control District of Maricopa County, by B.W. Thomsen and H.W. Hjalmarson, U.S. Geological Survey Water Resources Division, April, 1991.

Open-Channel Hydraulics, Ven Te Chow, Ph. D., published as part of an engineering series by McGraw-Hill Book Company, 1959.

HEC-2, Water Surface Profiles Manual, U.S. Army Corps of Engineers' Hydrologic Engineering Center, September, 1991.



QUADRANGLE LOCATION



EXCERPTED FROM THE FOLLOWING  
U.S.G.S. 7.5' QUADRANGLE MAPS:

- |                                       |   |   |
|---------------------------------------|---|---|
| HIGLEY, ARIZ.<br>N3315 - W11137.5/7.5 | CHANDLER HEIGHTS, ARIZ.<br>N3307.5 - W11137.5/7.5 | SACATON NE, ARIZ.<br>N3307.5 - W11130/7.5 |
|---------------------------------------|---|---|

# Figure 1 Location Map



Collins-Piña Consulting Engineers Inc.  
830 East 8th Street - Tucson, Arizona 85706 - (520) 623-7887  
Fax: (520) 624-8278

Arizona  
Boys Ranch



QUADRANGLE LOCATION



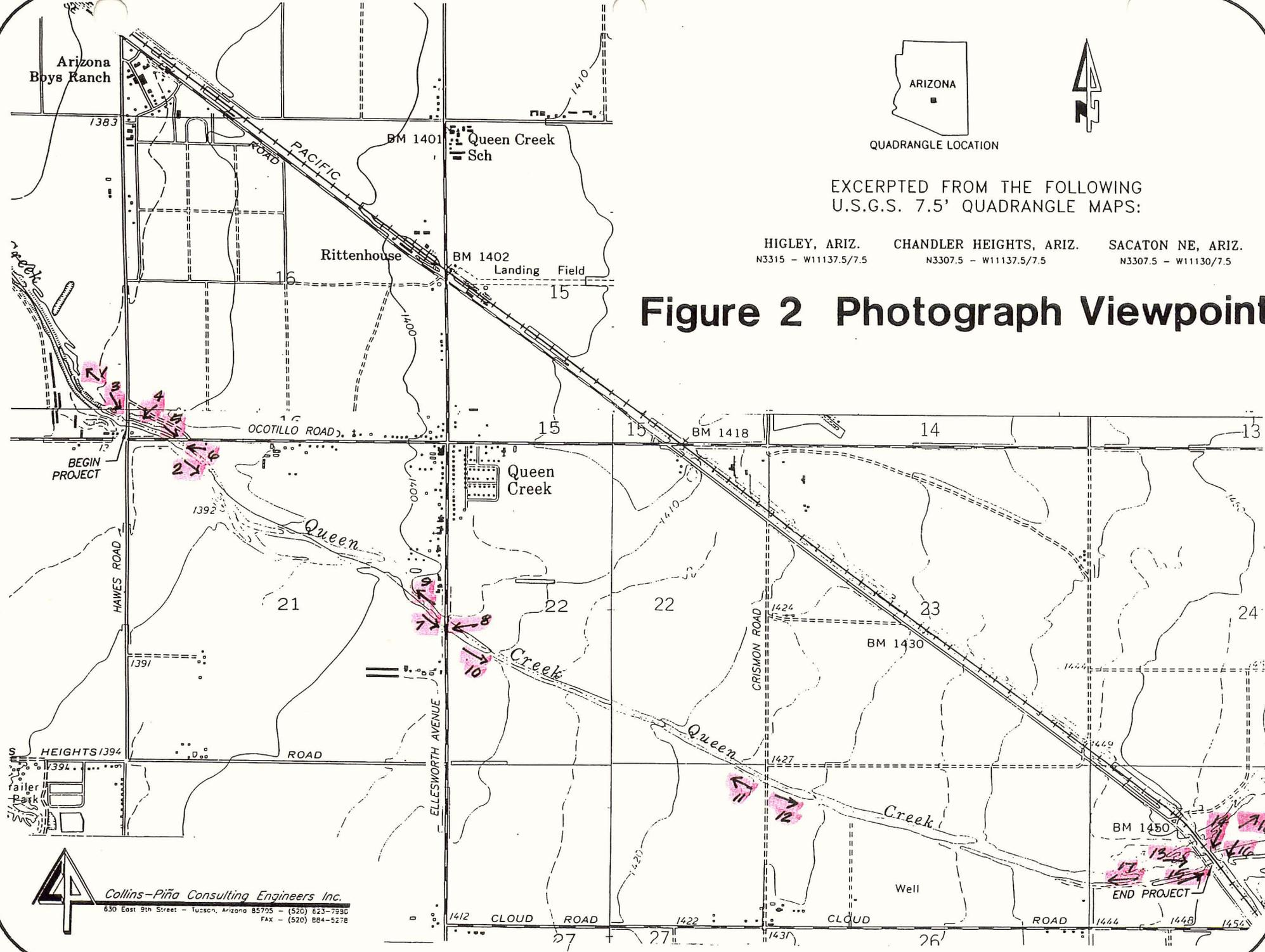
EXCERPTED FROM THE FOLLOWING  
U.S.G.S. 7.5' QUADRANGLE MAPS:

HIGLEY, ARIZ.  
N3315 - W11137.5/7.5

CHANDLER HEIGHTS, ARIZ.  
N3307.5 - W11137.5/7.5

SACATON NE, ARIZ.  
N3307.5 - W11130/7.5

# Figure 2 Photograph Viewpoint



BEGIN PROJECT

END PROJECT

**4** Collins-Piña Consulting Engineers Inc.  
630 East 9th Street - Tucson, Arizona 85705 - (520) 623-7930  
FAX - (520) 884-5278



**01.- Looking Downstream (Northwest) from Hawes Road Bridge**

**Streambed n = 0.028**  
**River Bank n = 0.035**  
**Overbank n = 0.045**



**02.- Looking Upstream (Southeast) from Ocotillo Road Bridge**



**03.- Looking onto West Face (Downstream) of Hawes Road Bridge**

Streambed  $n = 0.024$   
River Bank  $n = 0.030$   
Overbank  $n = 0.045$



**04.- Looking onto East Face (Upstream) of Hawes Road Bridge**



**05.- Looking onto North Face (Downstream) of Ocotillo Road Bridge**

**Streambed  $n = 0.024$**   
**River Bank  $n = 0.030$**   
**Overbank  $n = 0.045$**



**06.- Looking onto South Face (Upstream) of Ocotillo Road Bridge**



07.- Looking onto West Face (Downstream) of Ellsworth Avenue Bridge

Streambed  $n = 0.024$   
River Bank  $n = 0.030$   
Overbank  $n = 0.045$



08.- Looking onto East Face (Upstream) of Ellsworth Avenue Bridge



09.- Looking Downstream (Northwest) from Ellsworth Avenue Bridge

Streambed  $n = 0.030$   
River Bank  $n = 0.040$   
Overbank  $n = 0.045$



10.- Looking Upstream (Southeast) from Ellsworth Avenue Bridge

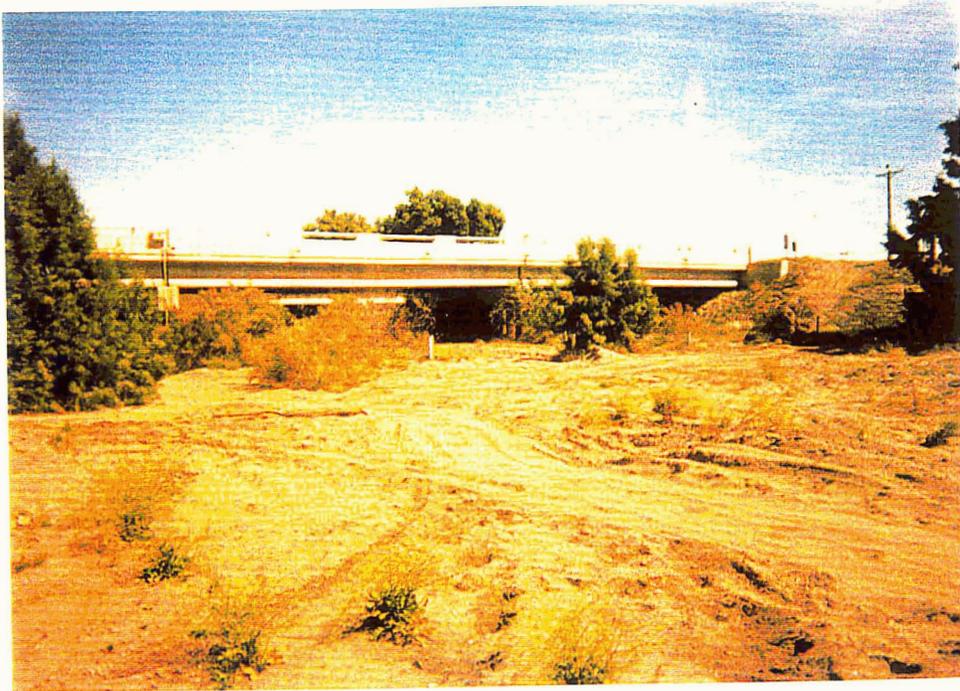


**11.- Looking Downstream (Northwest) from Crismon Road Ford**

**Streambed n = 0.030**  
**River Bank n = 0.045**  
**Overbank n = 0.045**



**12.- Looking Upstream (Southeast) from Crismon Road Ford**



13.- Looking onto Southwest Face (Downstream) of Rittenhouse Road Bridge

Streambed  $n = 0.030$   
River Bank  $n = 0.035$   
Overbank  $n = 0.045$



14.- Looking onto Northeast Face (Upstream) of Rittenhouse Road Bridge



15.- Looking onto Southwest Face (Downstream) of SPRR Bridge

Streambed  $n = 0.028$   
River Bank  $n = 0.035$   
Overbank  $n = 0.045$



16.- Looking onto Northeast Face (Upstream) of SPRR Bridge



**17.- Looking Downstream (Southwest) from Rittenhouse Road Ford**

**Streambed n = 0.030**  
**River Bank n = 0.040**  
**Overbank n = 0.045**



**18.- Looking Upstream (Northeast) from SPRR Bridge**

Fed. Road Dist. No.	STAT.
1	ARIZONA

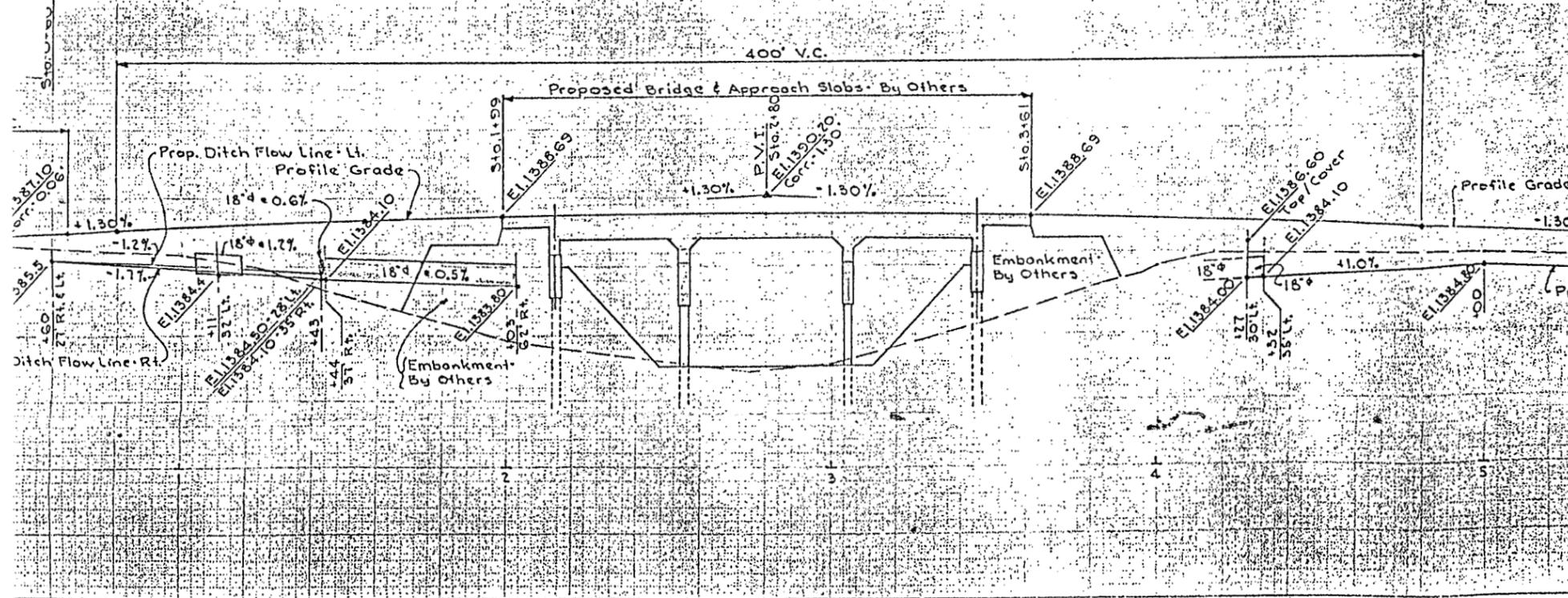
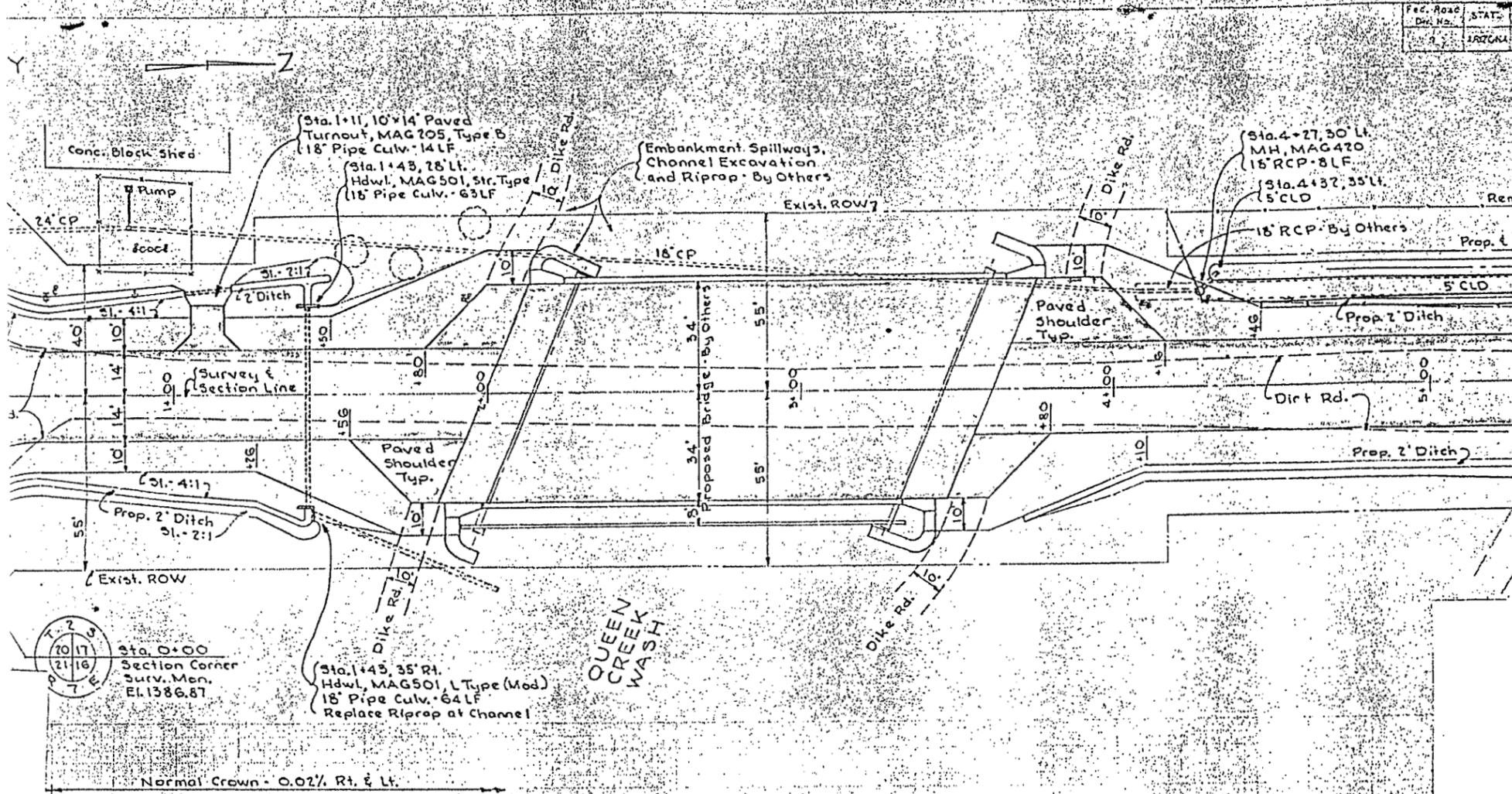
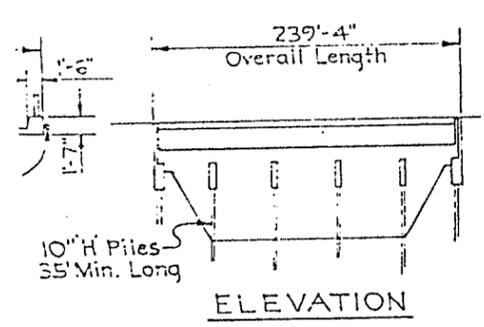
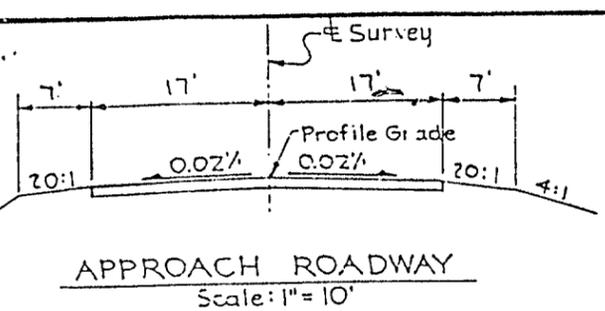
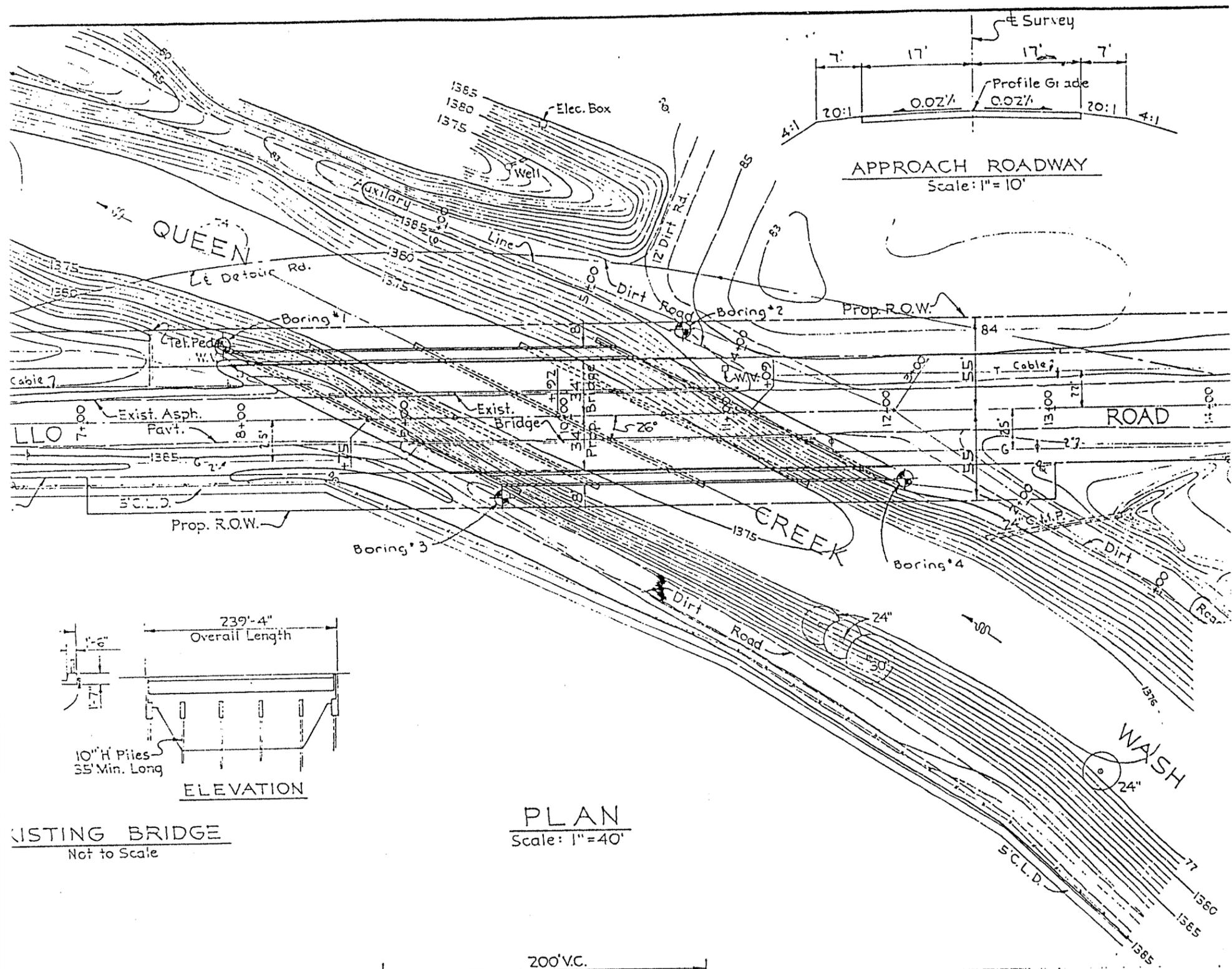


PLATE 3 CROSS SECTION - DOTTED  
CHARLES TRAINING COMPANY  
MADE IN U.S.A.

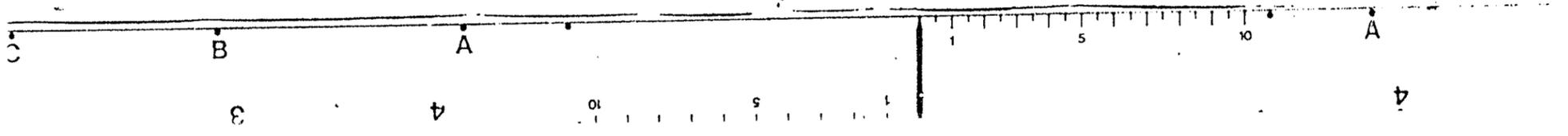
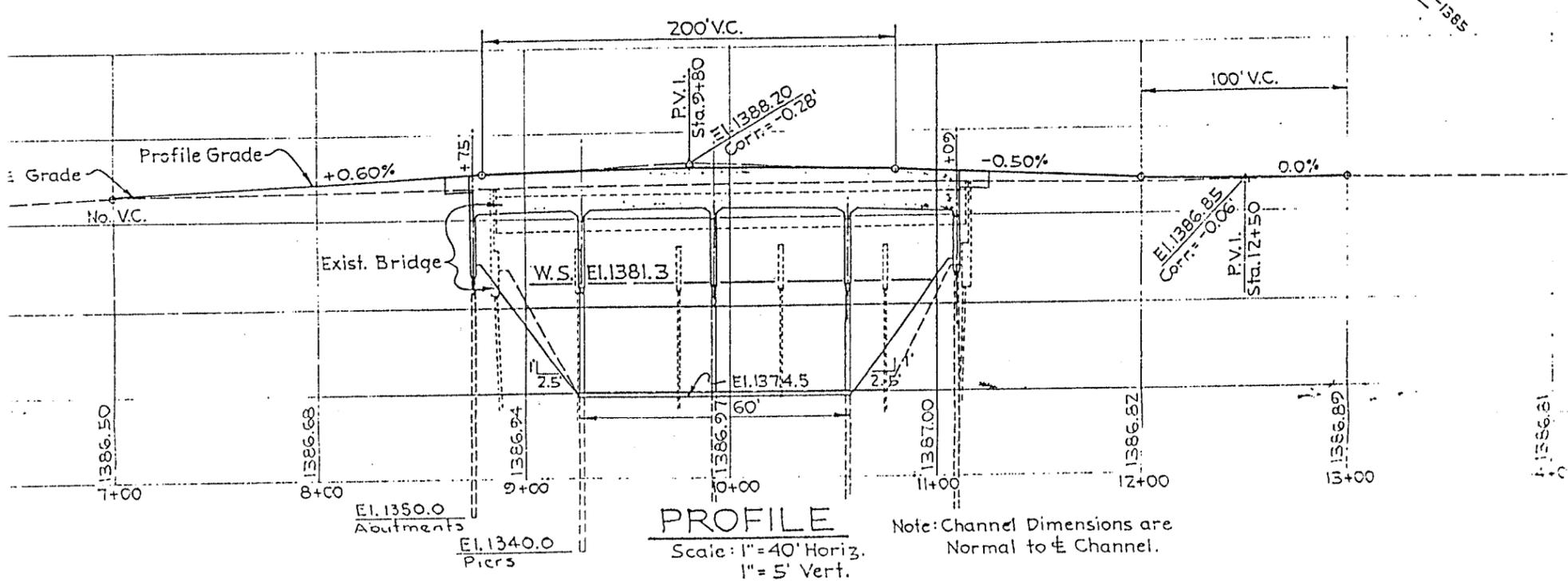


Hawes Road Bridge  
As-Built (Jan 1991)



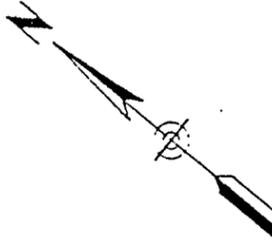
**EXISTING BRIDGE**  
Not to Scale

**PLAN**  
Scale: 1" = 40'

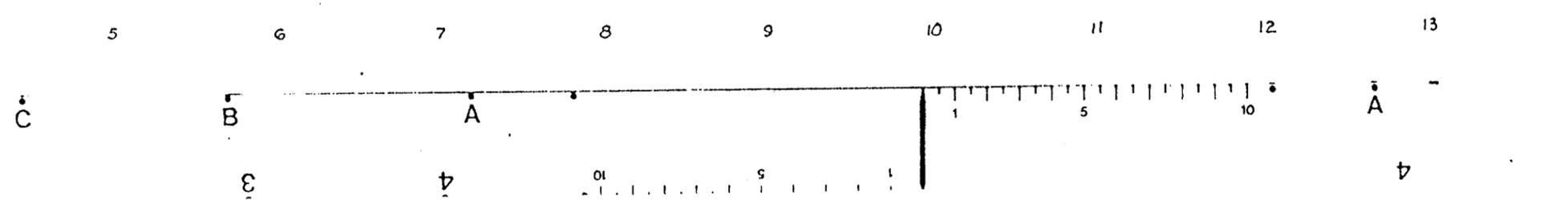
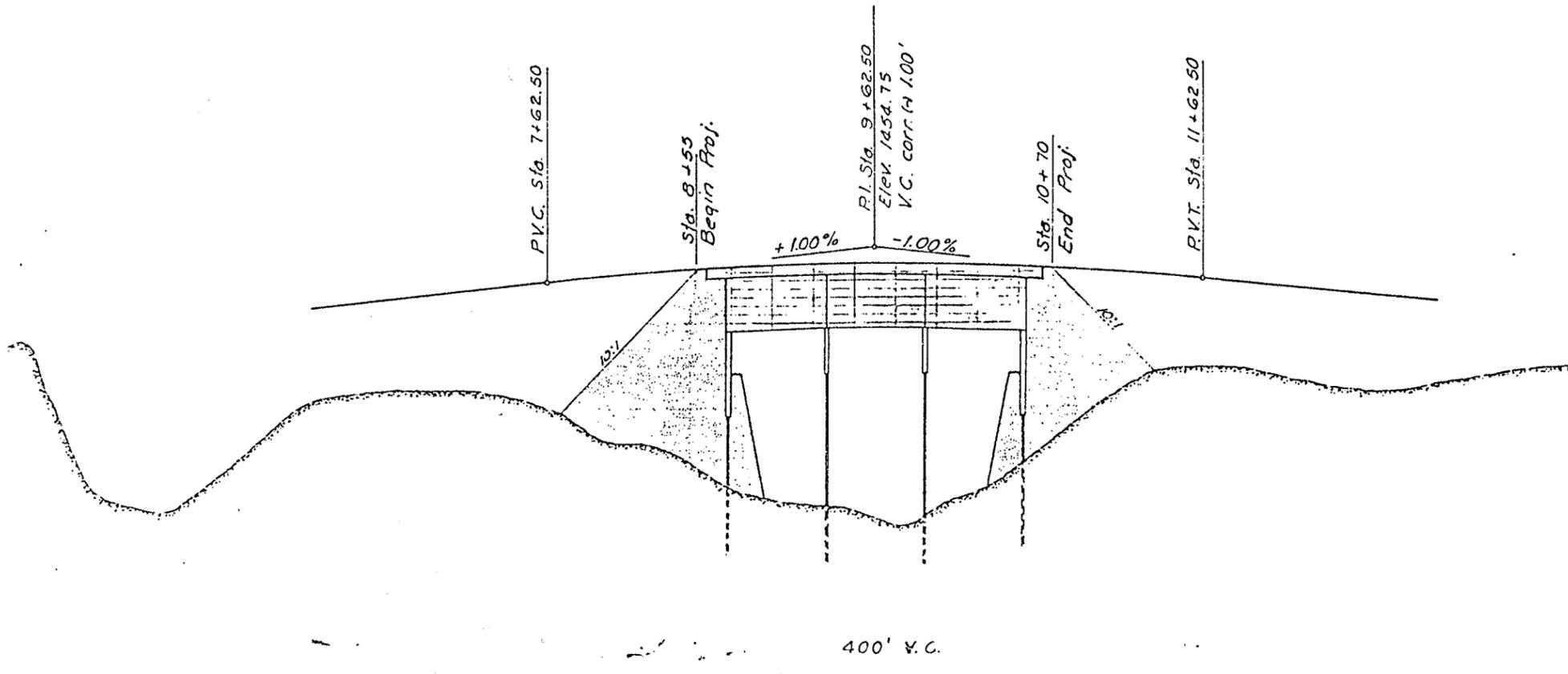
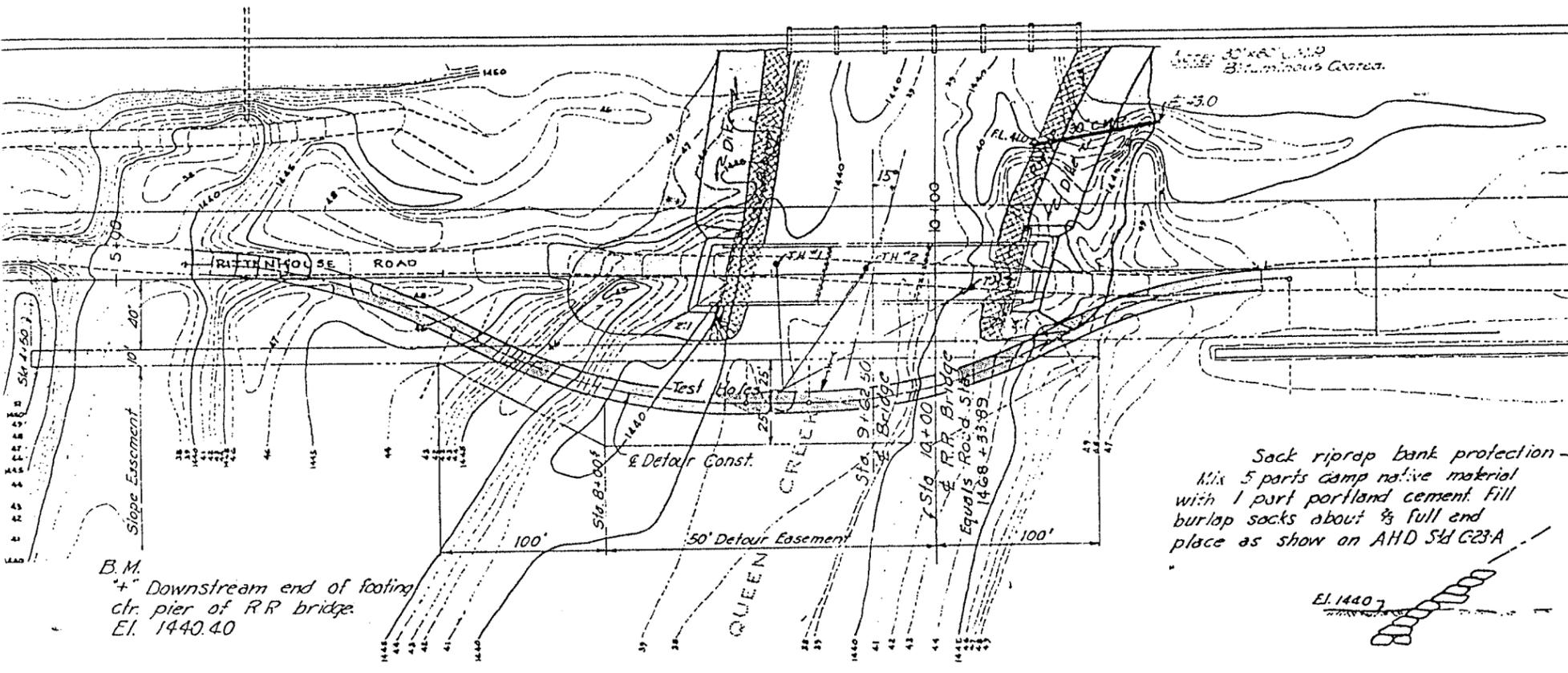




D... QUEEN CREEK BRIDGE



SPRR Bridge



Rittenhouse Road Bridge  
As-Built (Mar 1969)

EXHIBIT 1

Revision Requestor and Community Official Form

**PUBLIC BURDEN DISCLOSURE NOTICE**

Public reporting burden for this form is estimated to average 2.13 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and reviewing the form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden, to: Information Collections Management, Federal Emergency Management Agency, 500 C Street, S.W., Washington, DC 20472; and to the Office of Management and Budget, Paperwork Reduction Project (3067-0148), Washington, DC 20503.

**1. OVERVIEW**

1. The basis for this revision request is (are): *(check all that apply)*

- Physical change
  - Existing
  - Proposed
- Improved methodology
- Improved data
- Floodway revision
- Other \_\_\_\_\_

Explain \_\_\_\_\_

2. Flooding Source: Queen Creek Wash

3. Project Name/Identifier: FCDMC No. C-69-96-026-5

4. FEMA zone designations affected: A

(example: A, AH, AO, A1-A30, A99, AE, V, V1-30, VE, B, C, D, X)

5. The NFIP map panel(s) affected for all impacted communities is (are):

Community No.	Community Name	County	State	Map No.	Panel No.	Effective Date
EX: 480301	Katy, City	Harris, Fort Bend	TX	480301	0005D	02/08/83
480287	Harris County	Harris	TX	48201C	0220G	09/28/90
040132	Queen Creek	Maricopa	AZ	04013C	3075F	12/03/93
040132	Queen Creek	Maricopa	AZ	04013C	3080F	12/03/93

6. The area of revision encompasses the following types of flooding, structures, and associated disciplines: *(check all that apply)*

Types of Flooding

- Riverine
- Coastal
- Alluvial Fan
- Shallow Flooding (e.g. Zones AO and AH)
- Lakes

Affected by wind/wave action

- Yes
- No

Structures

- Channelization
- Levee/Floodwall
- Bridge/Culvert
- Dam
- Coastal
- Fill
- Pump Station
- None
- Channel Relocation
- Excavation
- Other (describe) \_\_\_\_\_

Disciplines\*

- Water Resources
- Hydrology
- Hydraulics
- Sediment Transport
- Interior Drainage
- Structural
- Geotechnical
- Land Surveying
- Other (describe) \_\_\_\_\_

Other (describe) \_\_\_\_\_

\* Attach completed "Certification by Registered Professional Engineer and/or Land Surveyor" Form for each discipline checked. (Form 2)

**2. FLOODWAY INFORMATION**

- 7. Does the affected flooding source have a floodway designated on the effective FIRM or FBFM?  Yes  No
  - Does the revised floodway delineation differ from that shown on the effective FIRM or FBFM?  Yes  No
- If yes, give reason: \_\_\_\_\_

Attach copy of either a public notice distributed by the community stating the community's intent to revise the floodway or a statement by the community that it has notified all affected property owners and affected adjacent jurisdictions.

9. Does the State have jurisdiction over the floodway or its adoption by communities participating in the NFIP?  Yes  No

If yes, attach a copy of a letter notifying the appropriate State agency of the floodway revision and documentation of the approval of the revised floodway by the appropriate State agency.

### 3. PROPOSED ENCROACHMENTS

10. With floodways:

1A. Does the revision request involve fill, new construction, substantial improvement, or other development in the floodway?  Yes  No

1B. If yes, does the development cause the 100-year water surface elevation to increase at any location by more than 0.000 feet?  Yes  No

11. Without floodways:

2A. Does the revision request involve fill, new construction, substantial improvement, or other development in the 100-year floodplain?  Yes  No

2B. If yes, does the cumulative effect of all development that has occurred since the effective SFHA was originally identified cause the 100-year water surface elevation to increase at any location by more than one foot (or other surcharge limit if community or state has adopted more stringent criteria)?  Yes  No

If the answer to either Items 1B or 2B is yes, please provide documentation that all requirements of Section 65.12 of the NFIP regulations have been met, regarding evaluation of alternatives, notice to individual legal property owners, concurrence of CEO, and certification that no insurable structures are impacted.

### 4. REVISION REQUESTOR ACKNOWLEDGEMENT

12. Having read NFIP Regulations, 44 CFR Ch. I, parts 59, 60, 61, and 72, I believe that the proposed revision  is  is not in compliance with the requirements of the aforementioned NFIP Regulations.

### 5. COMMUNITY OFFICIAL ACKNOWLEDGEMENT

13. Was this revision request reviewed by the community for compliance with the community's adopted floodplain management ordinances?  Yes  No

14. Does this revision request have the endorsement of the community?  Yes  No

If no to either of the above questions, please explain: \_\_\_\_\_

Please note that community acknowledgement and/or notification is required for all requests as outlined in Section 65.4 (b) of the NFIP Regulations.

### 6. OPERATION AND MAINTENANCE

15. Does the physical change involve a flood control structure (e.g. levees, floodwalls, channelization, basins, dams)?  Yes  No

If yes, please provide the following information for each of the new flood control structures:

A. Inspection of the flood control project will be conducted periodically by \_\_\_\_\_ (entity) \_\_\_\_\_ with a maximum interval of \_\_\_\_\_ months between inspections.

B. Based on the results of scheduled periodic inspections, appropriate maintenance of the flood control facilities will be conducted by \_\_\_\_\_ (entity) \_\_\_\_\_ to ensure the integrity and degree of flood protection of the structure.

C. A formal plan of operation, including documentation of the flood warning system, specific actions and assignments of responsibility by individual name or title, and provisions for testing the plan at intervals not less than one year,  has  has not been prepared for the flood control structure.

D. The community is willing to assume responsibility for  performing  overseeing compliance with the maintenance and operation plans of the \_\_\_\_\_

(Name)

flood control structure. If not performed promptly by an owner other than the community, the community will provide the necessary services without cost to the Federal government.

Attach operation and maintenance plans

#### 7. REQUESTED RESPONSE FROM FEMA

16. After examining the pertinent NFIP regulations and reviewing the document entitled "Appeals, Revisions, and Amendments to Flood Insurance Maps: A Guide for Community Officials," dated January 1990, this request is for a:

\_\_\_ a. CLOMR A letter from FEMA commenting on whether a proposed project, if built as proposed, would justify a map revision (LOMR or PMR), or proposed hydrology changes (see 44 CFR Ch. 1, Parts 60, 65, and 72).

X b. LOMR A letter from FEMA officially revising the current NFIP map to show changes to floodplains, floodways, or flood elevations. LOMRs typically depict decreased flood hazards. (See 44 CFR Ch. 1, Parts 60 and 65.)

\_\_\_ c. PMR A reprinted NFIP map incorporating changes to floodplains, floodways, or flood elevations. Because of the time and cost involved to change, reprint, and redistribute an NFIP map, a PMR is usually processed when a revision reflects increased flood hazards or large-scope changes. (See 44 CFR Ch. 1, Parts 60 and 65.)

\_\_\_ d. Other: Describe \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

#### 8. FORMS INCLUDED

17. Form 2 entitled "Certification by Registered Professional Engineer And/Or Land Surveyor" must be submitted.

The following forms should be included with this request if (check the included forms):

- |  |   |
|--|---|
| • Hydrologic analysis for flooding source differs from that used to develop FIRM                                       | <input type="checkbox"/> Hydrologic Analysis Form (Form 3)                    |
| • Hydraulic analysis for riverine flooding differs from that used to develop FIRM                                      | <input checked="" type="checkbox"/> Riverine Hydraulic Analysis Form (Form 4) |
| • The request is based on updated topographic information or a revised floodplain or floodway delineation is requested | <input checked="" type="checkbox"/> Riverine/Coastal Mapping Form (Form 5)    |
| • The request involves any type of channel modification  | <input type="checkbox"/> Channelization Form (Form 6)                         |
| • The request involves new bridge or culvert or revised analysis of an existing bridge or culvert                      | <input checked="" type="checkbox"/> Bridge/Culvert Form (Form 7)              |
| • The request involves a new revised levee/floodwall system  | <input type="checkbox"/> Levee/Floodwall System Analysis Form (Form 8)        |
| • The request involves analysis of coastal flooding  | <input type="checkbox"/> Coastal Analysis Form (Form 9)                       |
| • The request involves coastal structures credited as providing protection from the 100-year flood                     | <input type="checkbox"/> Coastal Structures (Form 10)                         |
| • The request involves an existing, proposed, or modified dam  | <input type="checkbox"/> Dam Form (Form 11)                                   |
| • The request involves structures credited as providing protection from the 100-year flood on an alluvial fan          | <input type="checkbox"/> Alluvial Fan Flooding Form (Form 12)                 |

EXHIBIT 2

Notarized copies of Public Notice

# THE ARIZONA REPUBLIC

STATE OF ARIZONA }  
COUNTY OF MARICOPA } SS.

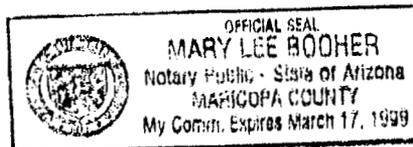
TOM BIANCO, being first duly sworn, upon oath deposes and says: That he is the legal advertising manager of the Arizona Business Gazette, a newspaper of general circulation in the county of Maricopa, State of Arizona, published at Phoenix, Arizona, by Phoenix Newspapers Inc., which also publishes The Arizona Republic, and that the copy hereto attached is a true copy of the advertisement published in the said paper on the dates as indicated.

The Arizona Republic

April 17, 1997



Sworn to before me this  
17 day of  
April A.D. 1997

  
Notary Public

**ANNOUNCEMENT OF FLOOD HAZARD STUDY** 97725R  
The Flood Control District of Maricopa County under authority of the National Flood Insurance Act of 1968 (P.L. 90-448), as amended, and the Flood Disaster Protection Act of 1973 (P.L. 93-234), is funding a detailed study of flood hazard areas along Queen Creek Wash, between the bridges on Hayes Road and Riffenhouse Road, in Queen Creek, Arizona. The study is being performed for the Flood Control District by Collins/Pina Consulting Engineers, Inc.  
The purpose of this study is to examine and evaluate flood hazard in areas which are developed or which are likely to be developed, and to determine flood elevations for those areas along the existing Queen Creek Wash channel. These flood elevations will be used by Maricopa County to carry out floodplain management and by the Federal Emergency Management Agency to determine flood insurance rates under the National Flood Insurance Program.  
This announcement is intended to notify all interested persons of the commencement of this study so that they may have an opportunity to bring any relevant facts and technical data concerning local flood hazards to the attention of the Flood Control District for consideration in the course of this study. Such information should be addressed to Mr. Raju Shah, Flood Control District of Maricopa County, 2801 West Durango Street, Phoenix, Arizona 85009, telephone (602) 506-1501, fax (602) 506-4601.  
Published: April 17, 1997



P.O. BOX 1547 • MESA, ARIZONA 85211

P.O. Number: \_\_\_\_\_

Invoice Number: \_\_\_\_\_

STATE OF ARIZONA  
County of Maricopa

I, \_\_\_\_\_, Legal Clerk,  
acknowledge that the attached hereto was  
published in a newspaper of general circulation at  
Mesa, Arizona, County of Maricopa on the  
following dates:

\_\_\_\_\_

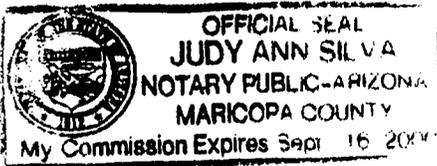
M-Mesa T-Tempe C-Chandler G-Gilbert S-Scottsdale

*Marie Gorge*  
LEGAL CLERK

Subscribed and sworn to before me this  
date: \_\_\_\_\_

*Judy Ann Silva*

NOTARY PUBLIC



**AFFIDAVIT OF PUBLICATION**

**ANNOUNCEMENT OF  
FLOOD HAZARD STUDY**

The Flood Control District of Maricopa County under authority to the National Flood Insurance Act of 1968 (P.L. 90-448), as amended, and the Flood Disaster Protection Act of 1973 (P.L. 93-234), is funding a detailed study of flood hazard areas along Queen Creek Wash, between the bridges on Hawes Road and Rittenhouse Road, in Queen Creek, Arizona. The study is being performed for the Flood Control District by Collins/Pina Consulting Engineers, Inc.

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Pub Apr 14, 1997

MG-549264

MESA TRIBUNE LEGAL ADS ARE ALSO PUBLISHED IN THE GILBERT TRIBUNE

EXHIBIT 3

Set of LOMR Application Forms

**PUBLIC BURDEN DISCLOSURE NOTICE**

Public reporting burden for this form is estimated to average .23 hour per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and reviewing the form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden, to: Information Collections Management, Federal Emergency Management Agency, 500 C Street, S.W., Washington, DC 20472; and to the Office of Management and Budget, Paperwork Reduction Project (3067-0148), Washington, DC 20503.

1. This certification is in accordance with 44 CFR Ch. I, Section 65.2.
2. I am licensed with an expertise in Civil Engineering  
[example: water resources (*hydrology, hydraulics, sediment transport, interior drainage*)\*, structural, geotechnical, land surveying.]
3. I have 16 years experience in the expertise listed above.
4. I have  prepared  reviewed the attached supporting data and analyses related to my expertise.
5. I  have  have not visited and physically viewed the project.
6. In my opinion, the following analyses and/or designs, is/are being certified:  
Hydraulics and Re-mapping.
7. Based upon the following review, the modifications in place have been constructed in general accordance with plans and specifications.

Basis for above statement: (check all that apply)

- a.  Viewed all phases of actual construction.
- b.  Compared plans and specifications with as-built survey information.
- c.  Examined plans and specifications and compared with completed projects.
- d.  Other \_\_\_\_\_

8. All information submitted in support of this request is correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Name: René A.G. Piña, P.E.  
(please print or type)

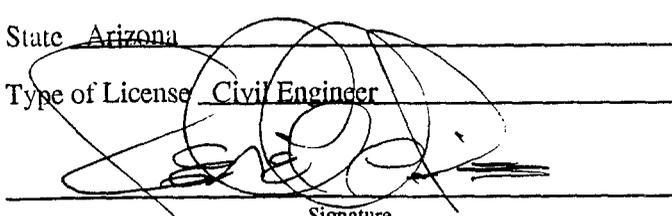
Title: Project Engineer  
(please print or type)

Registration No. 22903

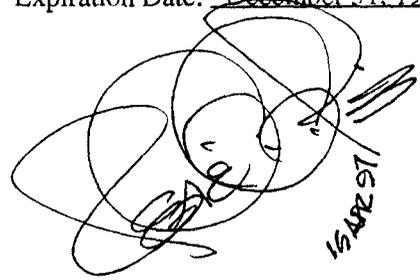
Expiration Date: December 31, 1997

State Arizona

Type of License Civil Engineer

  
Signature

April 15, 1997  
Date

  
15 APR 97

\*Specify Subdiscipline

Seal  
(Optional)

Note: Insert not applicable (N/A) when statement does not apply.

**PUBLIC BURDEN DISCLOSURE NOTICE**

Public reporting burden for this form is estimated to average .23 hour per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and reviewing the form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden, to: Information Collections Management, Federal Emergency Management Agency, 500 C Street, S.W., Washington, DC 20472; and to the Office of Management and Budget, Paperwork Reduction Project (3067-0148), Washington, DC 20503.

1. This certification is in accordance with 44 CFR Ch. I, Section 65.2.
2. I am licensed with an expertise in Land Surveying  
[example: water resources (*hydrology, hydraulics, sediment transport, interior drainage*)\*, structural, geotechnical, land surveying.]
3. I have 16 years experience in the expertise listed above.
4. I have  prepared  reviewed the attached supporting data and analyses related to my expertise.
5. I  have  have not visited and physically viewed the project.
6. In my opinion, the following analyses and/or designs, is/are being certified:  
Field collected ground control data for aerial photogrammetric mapping, field verified photogrammetry
7. Based upon the following review, the modifications in place have been constructed in general accordance with plans and specifications.

Basis for above statement: (check all that apply)

- a.  Viewed all phases of actual construction.
- b.  Compared plans and specifications with as-built survey information.
- c.  Examined plans and specifications and compared with completed projects.
- d.  Other Conventional and G.P.S. Field Survey

8. All information submitted in support of this request is correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Name: Arthur A. Witzell, R.L.S.  
(please print or type)

Title: Field Surveyor  
(please print or type)

Registration No. 26412

Expiration Date: December 31, 1998

State Arizona

Type of License Land Surveyor

  
Signature



April 15, 1997  
Date

\*Specify Subdiscipline

Seal  
(Optional)

Note: Insert not applicable (N/A) when statement does not apply.

**PUBLIC BURDEN DISCLOSURE NOTICE**

Public reporting burden for this form is estimated to average 2.25 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and reviewing the form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden, to: Information Collections Management, Federal Emergency Management Agency, 500 C Street, S.W., Washington, DC 20472; and to the Office of Management and Budget, Paperwork Reduction Project (3067-0148), Washington, DC 20503.

Community Name: Queen Creek

Flooding Source: Queen Creek Wash  
*(One form for each flooding source)*

Project Name/Identifier: FCDMC Contract No. C-69-96-026-5

**1. REACH TO BE REVISED**

Downstream limit: Hawes Road Bridge at Queen Creek Wash

Upstream limit: SPRR Bridge at Queen Creek Wash

**2. EFFECTIVE FIS**

- Not studied
- Studied by approximate methods  
Downstream limit of study Queen Creek Wash, Upstream from Highley Road  
Upstream limit of study SPRR Bridge at Queen Creek Wash
- Studied by detailed methods  
Downstream limit of study \_\_\_\_\_  
Upstream limit of study \_\_\_\_\_
- Floodway delineated  
Downstream limit of Floodway \_\_\_\_\_  
Upstream limit of Floodway \_\_\_\_\_

**3. HYDRAULIC ANALYSIS**

Why is the hydraulic analysis different from that used to develop the FIRM? *(Check all that apply)*

- Not studied in FIS
- Improved hydrologic data/analysis. Explain: \_\_\_\_\_  
\_\_\_\_\_
- Improved hydraulic analysis. Explain: Complete HEC-2 analysis, using FCDMC topogrammetric mapping  
(Jan 1997; 1" = 100' with 1' contour intervals) and "as-built" information for two (2) new bridge structures  
(Ocotillo Road and Ellsworth Avenue)
- Flood control structure. Explain: \_\_\_\_\_  
\_\_\_\_\_
- Other. Explain: \_\_\_\_\_  
\_\_\_\_\_

**3. RIVERINE HYDRAULIC ANALYSIS FORM**  
**Models Submitted**

**For areas which have detailed flooding:**

All input and output listings along with files on diskette (*if available*) for each of the models listed below (items 1, 2, 3, 4, and 5) and summary of the source of input parameters used in the models must be provided. The summary must include a complete description of any changes made from model to model (e.g. duplicate effective model to corrected effective model). At a minimum, the Duplicate Effective (item 1) and the Revised or Post-Project Conditions (item 4) models must be submitted. See instructions for directions on when other models may be required.

**For areas which do not have detailed flooding:**

Only the 100-year flood profile is required. A hydraulic model is not required for areas which do not have detailed flooding; however, BFEs may not be added to the revised FIRM. If a hydraulic model is developed for the area, items 3 and 4 described below must be submitted.

If hydraulic models are not developed, hydraulic analyses for existing or pre-project conditions and revised or post-project conditions must be submitted. All calculations must be submitted for these analyses. (See item 6 below)

1. Duplicate Effective Model

Natural    Floodway  
       

Copies of the hydraulic analysis used in the effective FIS, referred to as the effective models (10-, 50-, 100-, and 500-year multi-profile runs and the floodway run) must be obtained and then reproduced on the requestor's equipment to produce the duplicate effective model. This is required to assure that the effective model input data has been transferred correctly to the requestor's equipment and to assure that the revised data will be integrated into the effective data to provide a continuous FIS model upstream and downstream of the revised reach.

2. Corrected Effective Model

Natural    Floodway  
       

The corrected effective model is the model that corrects any errors that occur in the duplicate effective model, adds any additional cross sections to the duplicate effective model, or incorporates more detailed topographic information than that used in the currently effective model. The corrected effective model must not reflect any man-made physical changes since the date of the effective model. An error could be a technical error in the modeling procedures, or any construction in the floodplain that occurred prior to the date of the effective model but was not incorporated into the effective model.

3. Existing or Pre-Project Conditions Model

Natural    Floodway  
       

The duplicate effective or corrected model is modified to produce the existing or pre-project conditions model to reflect any modifications that have occurred within the floodplain since the date of the effective model but prior to the construction of the project for which the revision is being requested. If no modification has occurred since the date of the effective model, then this model would be identical to the corrected effective or duplicate effective model.

N/A; No FIS HEC-2

4. Revised or Post-Project Conditions Model

Natural    Floodway  
       

The existing or pre-project conditions model (*or duplicate effective or corrected effective model, as appropriate*) is revised to reflect revised or post-project conditions. This model must incorporate any physical changes to the floodplain since the effective model was produced as well as the effects of the project. When the request is for proposed project this model should reflect proposed conditions.

5. Other: Please attach a sheet describing all other models or calculations submitted.

Natural    Floodway  
       

6. Hydraulic Analyses (Only if Hydraulic Models are not developed)

Natural    Floodway  
       

Please attach all calculations for the existing or pre-project conditions and the revised or post-project conditions. Proceed to Form 5, "Riverine/Coastal Mapping Form".

4. MODEL PARAMETERS (from model used to revise 100-year water surface elevation)

1. Discharges:	Upstream Limit	Downstream Limit
10-year . . . . .	_____	_____
50-year . . . . .	_____	_____
100-year . . . . .	3010 cfs	3010 cfs
500-year . . . . .	_____	_____

Attach diagram showing changes in 100-year discharge

2. Explain how the starting water surface elevations were determined \_\_\_\_\_  
 \_\_\_\_\_

3. Give range of friction loss coefficients (*Manning's "N"*) Channel . . . . . 0.024 - 0.035  
 Overbanks . . . . . 0.040 - 0.045

If friction loss coefficients are different anywhere along the revised reach from those used to develop the FIRM, give location, value used in the effective FIS, and revised values and an explanation as to how the revised values were determined.

<u>Location</u>	<u>FIS</u>	<u>Revised</u>
N/A; No FIS HEC-2	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Explain: \_\_\_\_\_  
 \_\_\_\_\_

4. Describe how the cross section geometry data were determined (*e.g., field survey, topographic map, taken from previous study*) and list cross sections that were added.  
 \_\_\_\_\_  
 Hydraulic cross sections were taken from 1997 FCDMC Mapping (1" = 100', 1' contour interval)  
 \_\_\_\_\_  
 Hydraulic structures were obtained from MCDOT "As-Built" plans and field survey  
 \_\_\_\_\_

5. Were natural channel banks selected as the location of the left and right channel banks in the model?  
 Yes  No If no, explain why not: \_\_\_\_\_

K:\1240\FORMS\4\FEMA395.FRM

6. Explain how reach lengths for channel and overbanks were determined:

Location of hydraulic cross sections and hydraulic parameters were chosen using standard engineering methods and guidance from HEC-2 Users Manual and FCDMC Drainage Manual.

5. RESULTS (from model used to revise 100-year water surface elevations)

1. Do the results indicate:

- a. Water surface elevations higher than end points of cross sections?  Yes  No
- b. Supercritical depth?  Yes  No
- c. Critical depth?  Yes  No
- d. Other unique situations?  Yes  No

If yes to any of the above, attach an explanation that discusses the situation and how it is presented on the profiles, tables, and maps.

2. What is the maximum change in energy gradient between cross-sections? 1.16

Specify location Cross Section 1054.00

What is the distance between the cross-sections in 2 above? 200

4. What is the maximum distance between cross-sections? 253

Specify location Cross Section 1062.50

5. Floodway determination **N/A; No FIS HEC-2**

a. What is the maximum surcharge allowed by the community or State? \_\_\_\_\_ foot

b. What is the maximum surcharge for the revised conditions? \_\_\_\_\_ foot

Specify location \_\_\_\_\_

c. What is the maximum velocity? \_\_\_\_\_ fps

Specify location \_\_\_\_\_

d. Are there any negative surcharge values at any cross-section?  Yes  No

If yes, the floodway may need to be sidened. If it is not widened, please explain and indicate the maximum negative surcharge.

Explain: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

5. RESULTS (Cont'd)

6. Is the discharge value used to determine the floodway anywhere different from that used to determine the natural 100-year flood elevations? . . . . .  Yes  No

If Yes, explain:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

7. Do 100-year water surface elevations increase at any location? . . . . .  Yes  No

If yes, please attach a list of the locations where the increases occur. state whether or not the increases are located on the requestor's property, and provide an explanation of the reason for the increases. (For example: State if the to fill placed within the floodway fringe or placrrently adopted floodway )

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Please attach a completed comparison table entitled: Water Surface Elevation Check (See page 6)

6. REVISED FIRM/FBFM AND FLOOD PROFILES

A. The revised water surface elevations tie into those computed by the effective FIS Model (10-, 50-, 100-, and 500-year), downstream of the project at cross-section \_\_\_\_\_ within \_\_\_\_\_ feet (vertical) and upstream of the project at cross section \_\_\_\_\_ within \_\_\_\_\_ feet (vertical). N/A; No FIS HEC-2 or BFE's

B. The revised floodway elevations tie into those computed by the effective FIS model, downstream of the project at cross section \_\_\_\_\_ within \_\_\_\_\_ feet (vertical) and upstream of the project at cross section \_\_\_\_\_ within \_\_\_\_\_ feet (vertical). N/A; No FIS HEC-2 or BFE's

C. Attach profiles, at the same vertical and horizontal scale as the profiles in the effective FIS report, showing stream bed and profiles of all floods studied (without encroachment). Also, label all cross sections, road crossings (including low chord and top-of-road data), culverts, tributaries, corporate limits, and study limits. If channel distance has changed, the stationing should be revised for all profile sheets.

D. Attach a Floodway Data Table showing data for each cross section listed in the published Floodway Data Table in the FIS report.

Proceed to Riverine/Coastal Mapping Form.

FEDERAL EMERGENCY MANAGEMENT AGENCY  
**WATER SURFACE ELEVATION CHECK**

COMMUNITY NAME Flood Control District of Maricopa County	FLOODING SOURCE Queen Creek	PROJECT NAME/IDENTIFIER Queen Creek LOMR
--	--------------------------------	---

SECNO	EFFECTIVE			DUPLICATE EFFECTIVE			CORRECTED EFFECTIVE			EXISTING/PRE-PROJECT			REVISED/PROJECT		
	NCWSEL <sup>1</sup>	FCWSEL <sup>2</sup>	SURC. <sup>3</sup>	NCWSEL <sup>1</sup>	FCWSEL <sup>2</sup>	SURC. <sup>3</sup>	NCWSEL <sup>1</sup>	FCWSEL <sup>2</sup>	SURC. <sup>3</sup>	NCWSEL <sup>1</sup>	FCWSEL <sup>2</sup>	SURC. <sup>3</sup>	NCWSEL <sup>1</sup>	FCWSEL <sup>2</sup>	SURC. <sup>3</sup>
999.60													1378.92		
1000.40													1378.98		
1002.00													1379.11		
1004.00													1379.11		
1006.00													1380.08		
1007.50													1380.26		
1008.50													1380.48		
1010.00													1380.42		
1012.00													1382.17		
1014.00													1382.71		
1016.00													1382.92		
1018.00													1383.66		
1018.00													1383.66		

COMMENTS:

N/A; No FIS HEC-2 or BFE's

For additional revised project cross-section data refer to sheets 6A through 6H, attached.

1 - 100-year (natural) Water Surface Elevation

2 - Encroachment (floodway) Water Surface Elevation

3 - Surcharge Value

Include all cross sections in the models between tie-in points. Any interpolated values should be indicated in parentheses.

MT-2 Form 4 Page 6 of 6H

Sheet 1 of 9

FEDERAL EMERGENCY MANAGEMENT AGENCY  
 WATER SURFACE ELEVATION CHECK

COMMUNITY NAME Flood Control District of Maricopa County  
 FLOODING SOURCE Queen Creek  
 PROJECT NAME/IDENTIFIER Queen Creek LOMR

SECNO	EFFECTIVE			DUPLICATE EFFECTIVE			CORRECTED EFFECTIVE			EXISTING/PRE-PROJECT			REVISED/PROJECT		
	NCWSEL <sup>1</sup>	FCWSEL <sup>2</sup>	SURC. <sup>3</sup>	NCWSEL <sup>1</sup>	FCWSEL <sup>2</sup>	SURC. <sup>3</sup>	NCWSEL <sup>1</sup>	FCWSEL <sup>2</sup>	SURC. <sup>3</sup>	NCWSEL <sup>1</sup>	FCWSEL <sup>2</sup>	SURC. <sup>3</sup>	NCWSEL <sup>1</sup>	FCWSEL <sup>2</sup>	SURC. <sup>3</sup>
1020.00													1384.21		
1022.00													1384.48		
1024.00													1385.01		
1026.00													1385.47		
1028.00													1385.87		
1030.00													1386.26		
1032.00													1386.71		
1034.00													1387.28		
1036.00													1387.77		
1038.00													1388.31		
1040.00													1388.67		
1042.00													1389.22		
1044.00													1389.48		

COMMENTS:

N/A; No FIS HEC-2 or BFE's

For additional revised project cross-section data refer to sheets 6A through 6H, attached.

1 - 100-year (natural) Water Surface Elevation

2 - Encroachment (floodway) Water Surface Elevation

3 - Surcharge Value

Include all cross sections in the models between tie-in points. Any interpolated values should be indicated in parentheses.

MT-2 Form 4 Page 6A of 6H

Sheet 2 of 9

FEDERAL EMERGENCY MANAGEMENT AGENCY  
**WATER SURFACE ELEVATION CHECK**

COMMUNITY NAME Flood Control District of Maricopa County	FLOODING SOURCE Queen Creek	PROJECT NAME/IDENTIFIER Queen Creek LOMR
--	--------------------------------	---

SECNO	EFFECTIVE			DUPLICATE EFFECTIVE			CORRECTED EFFECTIVE			EXISTING/PRE-PROJECT			REVISED/PROJECT		
	NCWSEL <sup>1</sup>	FCWSEL <sup>2</sup>	SURC. <sup>3</sup>	NCWSEL <sup>1</sup>	FCWSEL <sup>2</sup>	SURC. <sup>3</sup>	NCWSEL <sup>1</sup>	FCWSEL <sup>2</sup>	SURC. <sup>3</sup>	NCWSEL <sup>1</sup>	FCWSEL <sup>2</sup>	SURC. <sup>3</sup>	NCWSEL <sup>1</sup>	FCWSEL <sup>2</sup>	SURC. <sup>3</sup>
1046.00													1390.00		
1048.00													1390.54		
1050.00													1391.29		
1052.00													1392.39		
1054.00													1393.17		
1056.00													1394.42		
1058.00													1394.71		
1060.00													1395.26		
1062.50													1396.94		
1063.70													1397.08		
1064.00													1397.20		
1066.00													1397.92		
1068.00													1398.49		

COMMENTS:

**N/A; No FIS HEC-2 or BFE's**

For additional revised project cross-section data refer to sheets 6A through 6H, attached.

1 - 100-year (natural) Water Surface Elevation

2 - Encroachment (floodway) Water Surface Elevation

3 - Surcharge Value

Include all cross sections in the models between tie-in points. Any interpolated values should be indicated in parentheses.

MT-2 Form 4 Page 6B of 6H

Sheet 3 of 9

FEDERAL EMERGENCY MANAGEMENT AGENCY  
**WATER SURFACE ELEVATION CHECK**

COMMUNITY NAME Flood Control District of Maricopa County	FLOODING SOURCE Queen Creek	PROJECT NAME/IDENTIFIER Queen Creek LOMR
--	--------------------------------	---

SECNO	EFFECTIVE			DUPLICATE EFFECTIVE			CORRECTED EFFECTIVE			EXISTING/PRE-PROJECT			REVISED/PROJECT		
	NCWSEL <sup>1</sup>	FCWSEL <sup>2</sup>	SURC. <sup>3</sup>	NCWSEL <sup>1</sup>	FCWSEL <sup>2</sup>	SURC. <sup>3</sup>	NCWSEL <sup>1</sup>	FCWSEL <sup>2</sup>	SURC. <sup>3</sup>	NCWSEL <sup>1</sup>	FCWSEL <sup>2</sup>	SURC. <sup>3</sup>	NCWSEL <sup>1</sup>	FCWSEL <sup>2</sup>	SURC. <sup>3</sup>
1070.00													1399.10		
1072.00													1400.26		
1074.00													1400.71		
1076.00													1401.10		
1078.00													1401.49		
1080.00													1402.57		
1082.00													1402.59		
1084.00													1403.28		
1086.00													1404.18		
1088.00													1405.34		
1090.00													1406.21		
1092.00													1406.85		
1094.00													1407.37		

COMMENTS:

**N/A; No FIS HEC-2 or BFE's**

For additional revised project cross-section data refer to sheets 6A through 6H, attached.

1 - 100-year (natural) Water Surface Elevation

2 - Encroachment (floodway) Water Surface Elevation

3 - Surcharge Value

Include all cross sections in the models between tie-in points. Any interpolated values should be indicated in parentheses.

MT-2 Form 4 Page 6C of 6H

Sheet 4 of 9

FEDERAL EMERGENCY MANAGEMENT AGENCY  
**WATER SURFACE ELEVATION CHECK**

COMMUNITY NAME Flood Control District of Maricopa County	FLOODING SOURCE Queen Creek	PROJECT NAME/IDENTIFIER Queen Creek LOMR
--	--------------------------------	---

SECNO	EFFECTIVE			DUPLICATE EFFECTIVE			CORRECTED EFFECTIVE			EXISTING/PRE-PROJECT			REVISED/PROJECT		
	NCWSEL <sup>1</sup>	FCWSEL <sup>2</sup>	SURC. <sup>3</sup>	NCWSEL <sup>1</sup>	FCWSEL <sup>2</sup>	SURC. <sup>3</sup>	NCWSEL <sup>1</sup>	FCWSEL <sup>2</sup>	SURC. <sup>3</sup>	NCWSEL <sup>1</sup>	FCWSEL <sup>2</sup>	SURC. <sup>3</sup>	NCWSEL <sup>1</sup>	FCWSEL <sup>2</sup>	SURC. <sup>3</sup>
1096.00													1407.93		
1098.00													1408.52		
1100.00													1408.85		
1102.00													1409.42		
1104.00													1410.13		
1106.00													1410.59		
1108.00													1411.19		
1110.00													1412.07		
1112.00													1412.74		
1114.00													1413.22		
1116.00													1413.91		
1118.00													1415.05		
1120.00													1415.69		

COMMENTS:

**N/A; No FIS HEC-2 or BFE's**

For additional revised project cross-section data refer to sheets 6A through 6H, attached.

1 - 100-year (natural) Water Surface Elevation

2 - Encroachment (floodway) Water Surface Elevation

3 - Surchage Value

Include all cross sections in the models between tie-in points. Any interpolated values should be indicated in parentheses.

MT-2 Form 4 Page 6D of 6H

Sheet 5 OF 9

FEDERAL EMERGENCY MANAGEMENT AGENCY  
**WATER SURFACE ELEVATION CHECK**

COMMUNITY NAME Flood Control District of Maricopa County	FLOODING SOURCE Queen Creek	PROJECT NAME/IDENTIFIER Queen Creek LOMR
--	--------------------------------	---

SECNO	EFFECTIVE			DUPLICATE EFFECTIVE			CORRECTED EFFECTIVE			EXISTING/PRE-PROJECT			REVISED/PROJECT		
	NCWSEL <sup>1</sup>	FCWSEL <sup>2</sup>	SURC. <sup>3</sup>	NCWSEL <sup>1</sup>	FCWSEL <sup>2</sup>	SURC. <sup>3</sup>	NCWSEL <sup>1</sup>	FCWSEL <sup>2</sup>	SURC. <sup>3</sup>	NCWSEL <sup>1</sup>	FCWSEL <sup>2</sup>	SURC. <sup>3</sup>	NCWSEL <sup>1</sup>	FCWSEL <sup>2</sup>	SURC. <sup>3</sup>
1122.00													1416.50		
1124.00													1416.77		
1126.00													1417.42		
1128.00													1418.50		
1130.00													1419.01		
1132.00													1419.64		
1134.00													1420.39		
1136.00													1420.89		
1138.00													1421.49		
1140.00													1422.03		
1142.00													1423.41		
1144.00													1423.82		
1146.00													1424.50		

COMMENT:

**N/A; No FIS HEC-2 or BFE's**

For additional revised project cross-section data refer to sheets 6A through 6H, attached.

1 - 100-year (natural) Water Surface Elevation

2 - Encroachment (floodway) Water Surface Elevation

3 - Surchage Value

Include all cross sections in the models between tie-in points. Any interpolated values should be indicated in parentheses.

MT-2 Form 4 Page 6E of 6H

Sheet 6 of 9

FEDERAL EMERGENCY MANAGEMENT AGENCY  
**WATER SURFACE ELEVATION CHECK**

COMMUNITY NAME **Flood Control District of Maricopa County** FLOODING SOURCE **Queen Creek** PROJECT NAME/IDENTIFIER **Queen Creek LOMR**

SECNO	EFFECTIVE			DUPLICATE EFFECTIVE			CORRECTED EFFECTIVE			EXISTING/PRE-PROJECT			REVISED/PROJECT		
	NCWSEL <sup>1</sup>	FCWSEL <sup>2</sup>	SURC. <sup>3</sup>	NCWSEL <sup>1</sup>	FCWSEL <sup>2</sup>	SURC. <sup>3</sup>	NCWSEL <sup>1</sup>	FCWSEL <sup>2</sup>	SURC. <sup>3</sup>	NCWSEL <sup>1</sup>	FCWSEL <sup>2</sup>	SURC. <sup>3</sup>	NCWSEL <sup>1</sup>	FCWSEL <sup>2</sup>	SURC. <sup>3</sup>
1148.00													1425.01		
1150.00													1425.64		
1152.00													1426.34		
1154.00													1426.87		
1156.00													1427.65		
1158.00													1428.15		
1160.00													1428.37		
1162.00													1429.31		
1164.00													1430.58		
1166.00													1431.08		
1168.00													1431.70		
1170.00													1432.45		
1172.00													1433.26		

COMMENT:  
**N/A; No FIS HEC-2 or BFE's**  
 For additional revised project cross-section data refer to sheets 6A through 6H, attached.

1 - 100-year (natural) Water Surface Elevation      2 - Encroachment (floodway) Water Surface Elevation      3 - Surcharge Value

FEDERAL EMERGENCY MANAGEMENT AGENCY  
 WATER SURFACE ELEVATION CHECK

COMMUNITY NAME Flood Control District of Maricopa County	FLOODING SOURCE Queen Creek	PROJECT NAME/IDENTIFIER Queen Creek LOMR
--	--------------------------------	---

SECNO	EFFECTIVE			DUPLICATE EFFECTIVE			CORRECTED EFFECTIVE			EXISTING/PRE-PROJECT			REVISED/PROJECT		
	NCWSEL <sup>1</sup>	FCWSEL <sup>2</sup>	SURC. <sup>3</sup>	NCWSEL <sup>1</sup>	FCWSEL <sup>2</sup>	SURC. <sup>3</sup>	NCWSEL <sup>1</sup>	FCWSEL <sup>2</sup>	SURC. <sup>3</sup>	NCWSEL <sup>1</sup>	FCWSEL <sup>2</sup>	SURC. <sup>3</sup>	NCWSEL <sup>1</sup>	FCWSEL <sup>2</sup>	SURC. <sup>3</sup>
1174.00													1433.86		
1176.00													1434.26		
1178.00													1434.37		
1180.00													1435.14		
1182.00													1436.02		
1184.00													1436.77		
1186.00													1437.56		
1188.00													1438.00		
1190.00													1438.62		
1192.00													1439.44		
1194.00													1440.09		
1195.00													1440.25		
1195.40													1440.32		

COMMENT:

**N/A; No FIS HEC-2 or BFE's**

For additional revised project cross-section data refer to sheets 6A through 6H, attached.

1 - 100-year (natural) Water Surface Elevation

2 - Encroachment (floodway) Water Surface Elevation

3 - Surcharge Value

Include all cross sections in the models between tie-in points. Any interpolated values should be indicated in parentheses.

MT-2 Form 4 Page 6G of 6H

Sheet 8 of 9



**PUBLIC BURDEN DISCLOSURE NOTICE**

Public reporting burden for this form is estimated to average 1.5 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and reviewing the form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden, to: Information Collections Management, Federal Emergency Management Agency, 500 C Street, S.W., Washington, DC 20472; and to the Office of Management and Budget, Paperwork Reduction Project (3067-0148), Washington, DC 20503.

Community Name: Queen Creek

Flooding Source: Queen Creek Wash

Project Name/Identifier: FCDMC Contract No. C-69-96-026-5

**1. MAPPING CHANGES**

1. A topographic work map of suitable scale, contour interval, and planimetric definition must be submitted showing (*indicate N/A when not applicable*):
- |    |   | Included   |
|----|---|--|
| A. | Revised approximate 100-year floodplain boundaries (Zone A) .....   | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A |
| B. | Revised detailed 100- and 500-year floodplain boundaries .....  | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A |
| C. | Revised 100-year floodway boundaries .....  | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A |
| D. | Location and alignment of all cross sections used in the revised hydraulic model with stationing control indicated .....                                      | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A |
| E. | Stream alignments, road and dam alignments .....  | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A |
| F. | Current community boundaries .....  | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A |
| G. | Effective 100- and 500-year floodplain and 100-year floodway boundaries from the FIRM/FBFM reduced or enlarged to the scale of the topographic work map ..... | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A |
| H. | <u>Tie-ins</u> between the <u>effective</u> and <u>revised</u> 100- and 500-year floodplains and 100-year floodway boundaries .....                           | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A |
| I. | The requestor's property boundaries and community easements .....   | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A |
| J. | The signed certification of a registered professional engineer .....  | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A |
| K. | Location and description of reference marks .....   | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A |
| L. | Vertical datum (example: NGVD, NAVD, etc.) .....  | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A |
| M. | Coastal zone designations tie into adjacent areas not being revised .....   | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A |
| N. | Location and alignment of all coastal transects used to revise the coastal analyses .....   | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A |

If any of the items above are marked no or N/A, please explain: (B&C&H) - No FIS HEC-2 or BFE's;

(I) Requestor is FCDMC; (M&N) not near coastal zone

2. What is the source and date of the updated topographic information (*example: orthophoto maps, July 1985; field survey, May 1979, beach profiles, June 1987, etc.*)? \_\_\_\_\_

3. What is the scale and contour interval of the following workmaps?  
 a. Effective FIS 1" = 1000' & 1" = 200' scale N/A Contour interval \_\_\_\_\_  
 b. Revision Request 1" = 100' scale 1' Contour interval \_\_\_\_\_

**NOTE:** Revised topographic information must be of equal or greater detail.

4. Attach an annotated FIRM and FBFM at the scale of the effective FIRM and FBFM showing the revised 100-year and 500-year floodplains and the 100-year floodway boundaries and how they tie into those shown on the effective FIRM and FBFM downstream and upstream of the revision or adjacent to the area of revision for coastal studies.  
 Attach additional pages if needed.

5. Flood Boundaries and 100-year water surface elevations:

Has the 100-year floodplain been shifted or increased or the 100-year water surface elevation increased at any location on property other than the requestor's or community's?  Yes  No

If yes, please give the location of shift or increase and an explanation for the increase.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

a. Have the affected property owners been notified of this shift or increase and the effect it will have on their property? . . . . .  Yes  No

If yes, please attach letters from these property owners stating they have no objections to the revised flood boundaries if a LOMR is being requested.

b. What is the number of insurable structures that will be impacted by this shift or increase? \_\_\_\_\_

6. Have the floodway boundaries shifted or increased at any location compared to those shown on the effective FBFM or FIRM? . . . . .  Yes  No

If yes, explain:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

7. If a V-zone has been designated, has it been delineated to extend landward to the heel of the primary frontal dune?  Yes  No

If no, explain:

\_\_\_\_\_ N/A \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

8. Manual or digital map submission:

- Manual
- Digital

Digital map submissions may be used to update digital FIRM's (DFIRM's). For updating DFIRM's, these submissions must be coordinated with FEMA Headquarters as far in advance of submission as possible.

2. EARTH FILL PLACEMENT

1. The fill is:  Existing  Proposed

2. Has fill been/will be placed in the regulatory floodway? .....  Yes  No

If yes, please attach completed Riverine Hydraulic Analysis Form.

3. Has fill been/will be placed in floodway fringe (area between the floodway and 100-year floodplain boundaries)? .....  Yes  No

If yes, then complete A, B, C, and D below.

A. Are fill slopes for granular materials steeper than one vertical on one-and-one-half horizontal? .....  Yes  No

If yes, justify steeper slopes \_\_\_\_\_  
\_\_\_\_\_

B. Is adequate erosion protection provided for fill slopes exposed to moving flood waters? (Slopes exposed to flows with velocities of up to 5 feet per second (fps) during the 100-year flood must, at a minimum, be protected by a cover of grass, vines, weeds, or similar vegetation; slopes exposed to flows with velocities greater than 5 fps during the 100-year flood must, at a minimum, be protected by stone or rock riprap.) .....  Yes  No

If no, describe erosion protection provided \_\_\_\_\_  
\_\_\_\_\_

C. Has all fill placed in revised 100-year floodplain been compacted to 95 percent of the maximum density obtainable with the Standard Proctor Test Method or acceptable equivalent method? .....  Yes  No

D. Can structures conceivably be constructed on the fill at any time in the future? .....  Yes  No

If yes, provide certification of fill compaction (item C. above) by the community's NFIP permit official, a registered professional engineer, or an accredited soils engineer.

4. Has fill been/will be placed in a V-zone? N/A .....  Yes  No

If yes, is the fill protected from erosion by a flood control structure such as a revetment or seawall? .....  Yes  No

If yes, attach the coastal structures form.

**PUBLIC BURDEN DISCLOSURE NOTICE**

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Community Name: Queen Creek

Flooding Source: Queen Creek Wash

Project Name/Identifier: FCDMC Contract No. C-69-96-026-5

**1. IDENTIFIER**

1. Name of roadway, railroad, etc.: Hawes Road
2. Location of bridge/culvert along flooding source (in terms of stream distance or cross-section identifier):  
HEC-2 Cross Sections 999.60 and 1000.40; 4.545 River Miles
3. This revision reflects (check one of the following):
  - New bridge/culvert not modeled in the FIS
  - Modified bridge/culvert previously modeled in the FIS
  - New analysis of bridge/culvert previously modeled in the FIS

(Explain why new analysis was performed) No FIS HEC-2

**2. BACKGROUND**

Provide the following information about the structure:

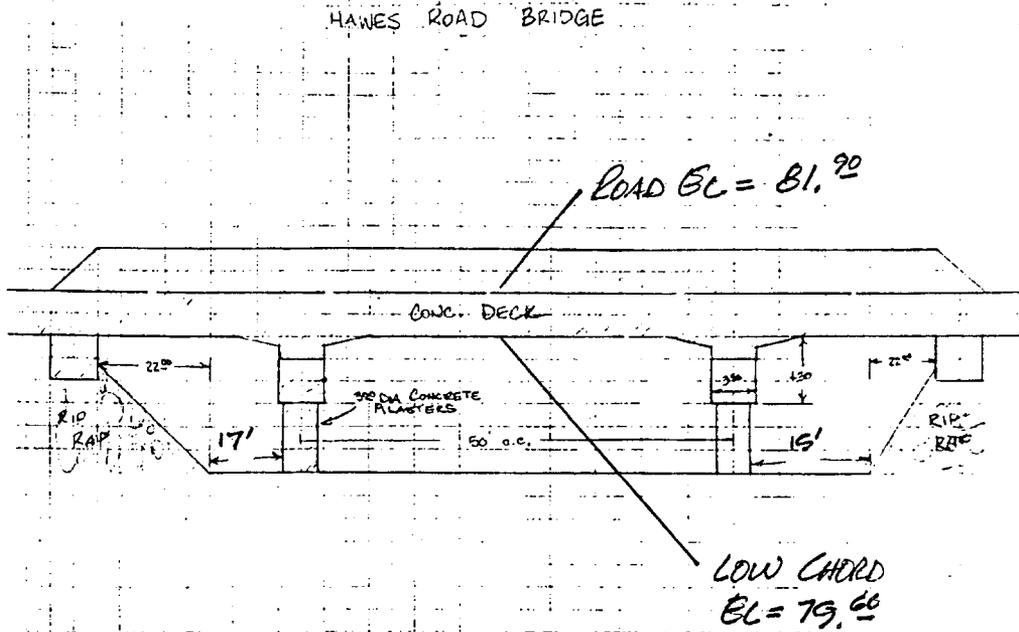
1. Dimension, material, and shape (e.g. two 10 x 5 feet reinforced concrete box culvert; three 30-foot span bridge with 2 rows of two 3-foot diameter circular piers; 40-foot wide ogee shape spillway) Three 40' spans, flat slab bridge (MCDOT), with two (2) rows 5 - 3' 0 circular piers
2. Entrance geometry of culvert/type of bridge opening (e.g. 30°-75° wing walls with square top edge, sloping embankments and vertical abutments) Sloping embankments and vertical abutments; 23° skew
3. Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8) HEC-2 with special bridge routine

If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structure(s). (Attach justification)

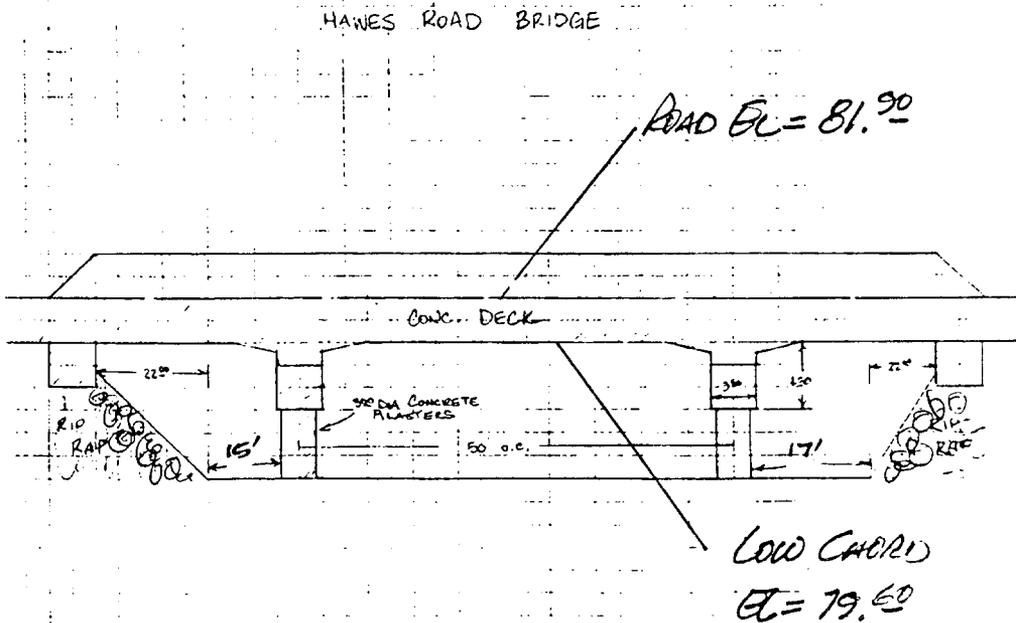
Note: If any items do not apply to submitted hydraulic analysis, indicate by N/A  
\*One form per new/revised bridge/culvert

3. ANALYSIS

Sketch the downstream face of the structure together with the road profile. Show, at a minimum, the maximum low chord elevation, invert elevation, minimum top of road elevation, and ineffective flow widths.



Sketch the upstream face of the structure together with the road profile. Show, at a minimum, the maximum low chord elevation, invert elevation, and minimum top of road elevation.





**Looking onto West Face (Downstream) of Hawes Road Bridge**



**Looking onto East Face (Upstream) of Hawes Road Bridge**

3. ANALYSIS (Cont'd)

Sketch the plan view of the structure(s). Show, at a minimum, the skew angle, cross-section locations, distances between cross sections, and length of structure(s).

← flow

SEE ATTACHED SKETCH  
EXCERPTED FROM  
"AS-BUILT" PLANS

Attach plans of the structure(s) certified by a registered Professional Engineer.

Culvert length or bridge width (ft.)

76'

Calculated culvert/bridge (ft<sup>2</sup>) by the hydraulic model, if applicable

600 SF

Total culvert/bridge area (ft<sup>2</sup>)

606 SF



Elevations Above Which Flow is Effective for Overbanks

	Left Overbank	Right Overbank
Upstream face	N/A	N/A
Downstream face	N/A	N/A

Minimum Top of Road Elevation

	Left Overbank	Right Overbank
Upstream face		
Downstream face		

100-Year Elevations

	Water-Surface Elevations	Energy Gradient Elevations
Upstream face	1378.98	1379.33
Downstream face	1378.92	1379.28

Discharge

	Low Flow	Pressure Flow	Weir Flow	Total Flow
--	----------	---------------	-----------	------------

Amount of flow through/over the structure(s) (cfs)	3010	0	0	3010
--	------	---	---	------

The maximum depth of flow over the roadway/railroad (ft.)			0	
---	--	--	---	--

Weir length (ft.)			0	
-------------------	--	--	---	--

Top Widths

	Total Floodplain Width	Total Effective Flow Width	Floodway Width
--	------------------------	----------------------------	----------------

Upstream face	126.62	126.62	126.62
Downstream face	126.03	126.03	126.03

**3. ANALYSIS (Cont'd)**

Loss Coefficients

Entrance loss coefficient	0.2
Manning's "n" value assigned to the structure(s)	0.028
Friction loss coefficient through structure(s)	0.2
Other loss coefficients (e.g., bend, manhole, etc.)	N/A
Total loss coefficient	0.2
Weir coefficient	3.0
Pier coefficient	1.15
Contraction loss coefficient	0.1
Expansion loss coefficient	0.3

**4. SEDIMENT TRANSPORT CONSIDERATIONS**

1. A. Is there any indication from historical records that sediment transport (*including scour and deposition*) can affect the 100-year water surface elevations? . . . . .  Yes  No
- B. Based on the conditions (*such as geomorphology, vegetative cover and development of the watershed and stream bed, and bank conditions*), is there a potential for debris and sediment transport (*including scour and deposition*) to affect the 100-year water surface elevations and/or conveyance capacity through the bridge/culvert? . . . .  Yes  No

2. If the answer to either 1A or 1B is yes:

A. What is the estimated sediment (*bed material*) load?

\_\_\_\_\_ cfs (*attach gradation curve*)

Explain method used to estimate the sediment transport and the depth of scour and/or deposition \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

B. Will sediment accumulate anywhere through the bridge/culvert?  Yes  No

If yes, explain the impact on the conveyance capacity through the bridge/culvert? \_\_\_\_\_

\_\_\_\_\_

**5. FLOODWAY ANALYSIS**

Explain method of bridge encroachment

(floodway run) \_\_\_\_\_ N/A

\_\_\_\_\_

\_\_\_\_\_

5. FLOODWAY ANALYSIS (Cont'd)

Comments (*explain any unusual situations*):

Attach analysis.

**PUBLIC BURDEN DISCLOSURE NOTICE**

Public reporting burden for this form is estimated to average 2 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and reviewing the form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden, to: Information Collections Management, Federal Emergency Management Agency, 500 C Street, S.W., Washington, DC 20472; and to the Office of Management and Budget, Paperwork Reduction Project (3067-0148), Washington, DC 20503.

Community Name: Queen Creek

Flooding Source: Queen Creek Wash

Project Name/Identifier: FCDMC Contract No. C-69-96-026-5

**1. IDENTIFIER**

1. Name of roadway, railroad, etc.: Ocotillo Road
2. Location of bridge/culvert along flooding source (in terms of stream distance or cross-section identifier):  
HEC-2 Cross Sections 1007.50 and 1008.50; 4.797 River Miles
3. This revision reflects (check one of the following):
  - New bridge/culvert not modeled in the FIS
  - Modified bridge/culvert previously modeled in the FIS
  - New analysis of bridge/culvert previously modeled in the FIS

(Explain why new analysis was performed) No FIS HEC-2

\_\_\_\_\_

\_\_\_\_\_

**2. BACKGROUND**

Provide the following information about the structure:

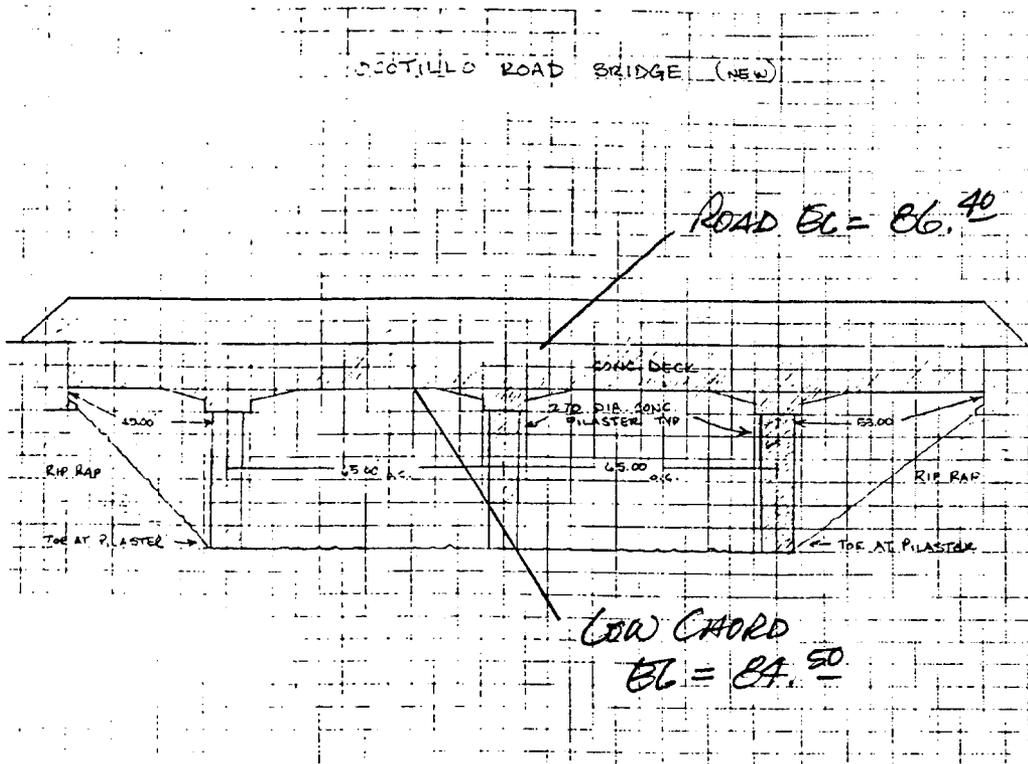
1. Dimension, material, and shape (e.g. two 10 x 5 feet reinforced concrete box culvert; three 30-foot span bridge with 2 rows of two 3-foot diameter circular piers; 40-foot wide ogee shape spillway) Four span (MCDOT) flat-slab bridge (2-22.8' and 2 - 28.5'), with three (3) rows of 9 - 30" 0 circular piers
2. Entrance geometry of culvert/type of bridge opening (e.g. 30°-75° wing walls with square top edge, sloping embankments and vertical abutments) Sloping embankments and vertical abutments; 26° skew
3. Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8) HEC-2 with special bridge routine

If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structure(s). (Attach justification)

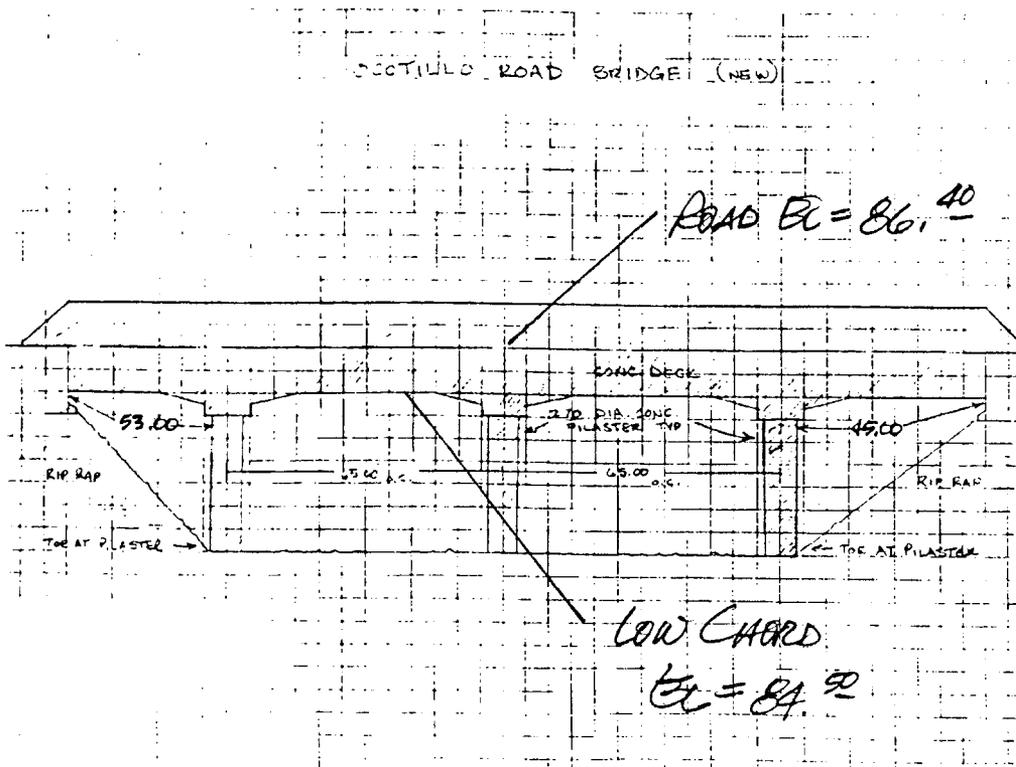
Note: If any items do not apply to submitted hydraulic analysis, indicate by N/A  
\*One form per new/revised bridge/culvert

### 3. ANALYSIS

Sketch the downstream face of the structure together with the road profile. Show, at a minimum, the maximum low chord elevation, invert elevation, minimum top of road elevation, and ineffective flow widths.

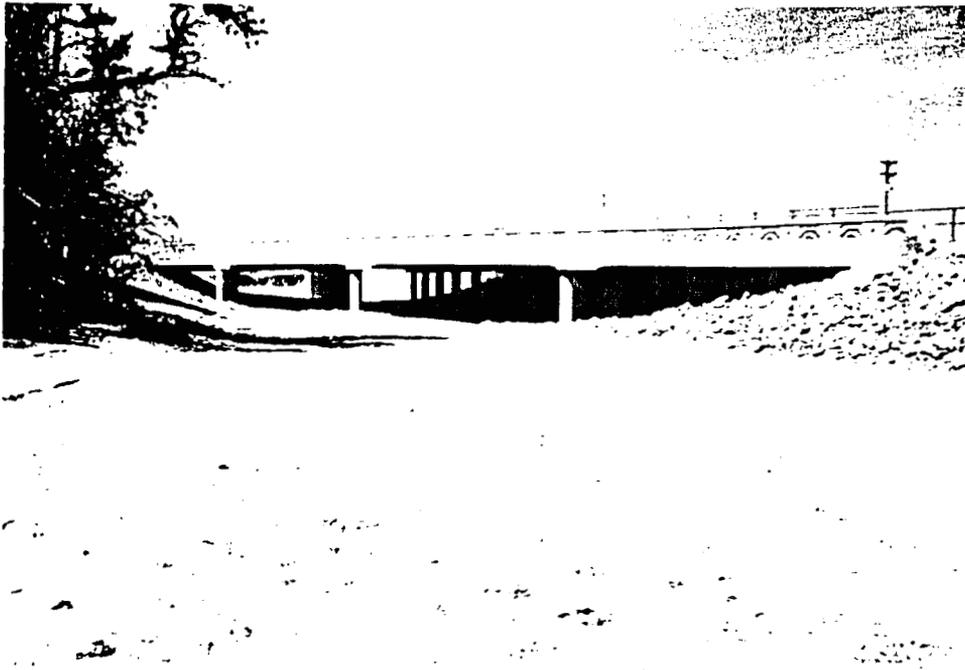


Sketch the upstream face of the structure together with the road profile. Show, at a minimum, the maximum low chord elevation, invert elevation, and minimum top of road elevation.





Looking onto North Face (Downstream) of Ocotillo Road Bridge



Looking onto South Face (Upstream) of Ocotillo Road Bridge

3. ANALYSIS (Cont'd)

Sketch the plan view of the structure(s). Show, at a minimum, the skew angle, cross-section locations, distances between cross sections, and length of structure(s).

← flow

SEE ATTACHED SKETCH  
EXCERPTED FROM  
"AS-BUILT" PLANS

Attach plans of the structure(s) certified by a registered Professional Engineer.

Culvert length or bridge width (ft.)

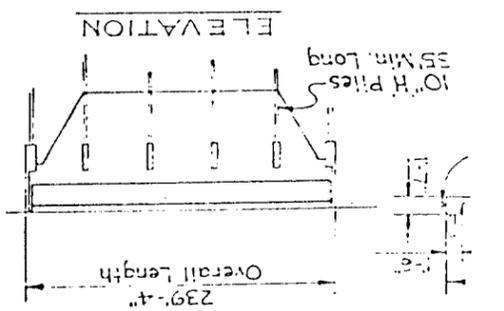
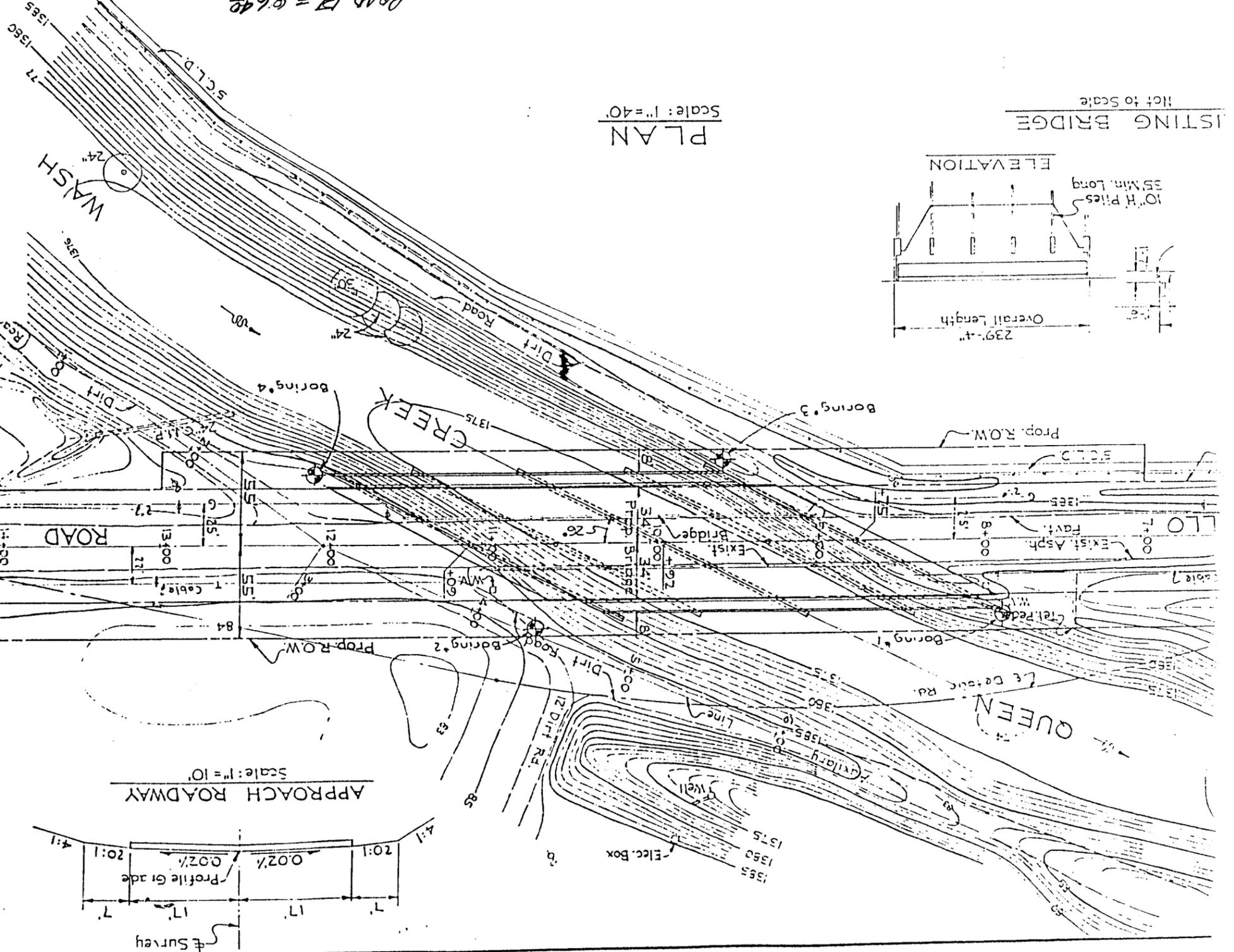
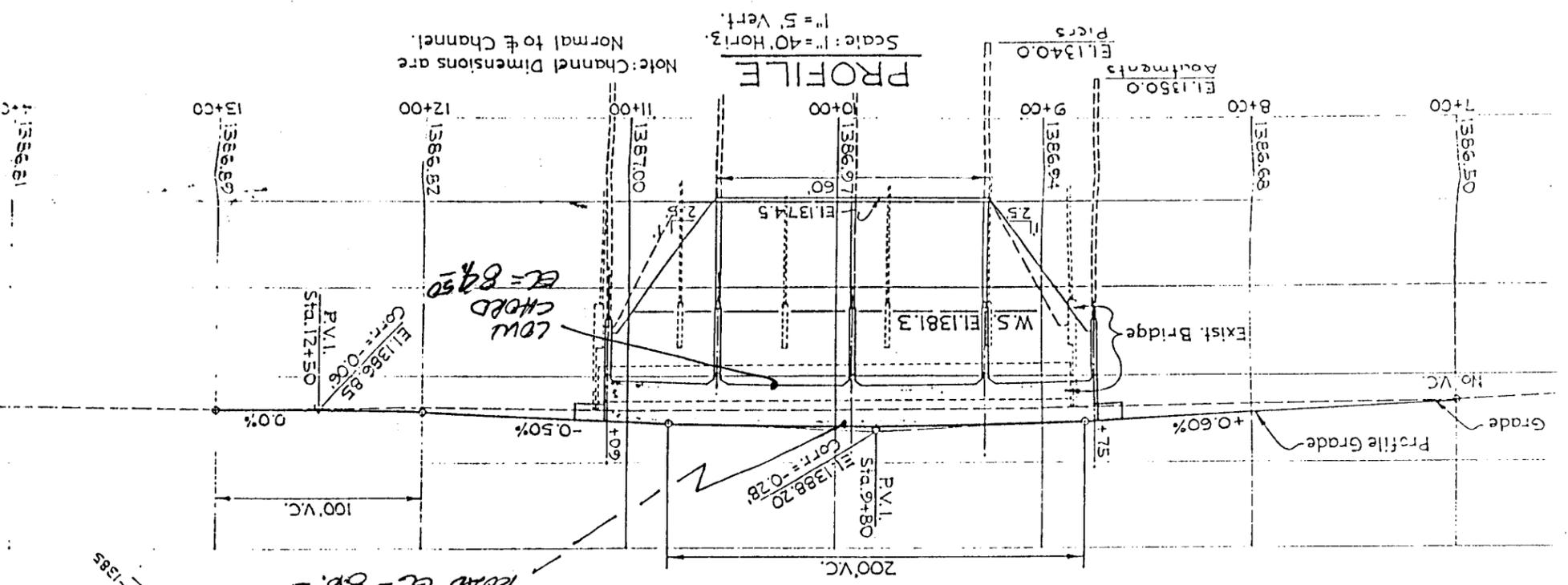
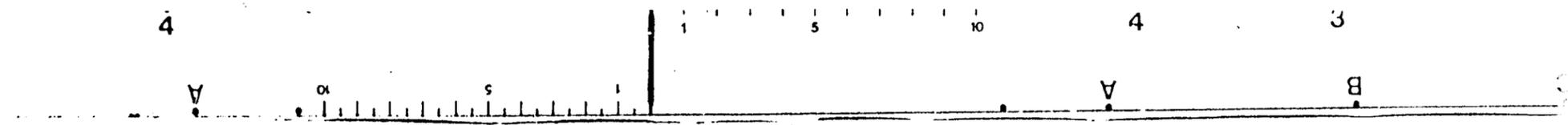
84'

Calculated culvert/bridge (ft<sup>2</sup>) by the hydraulic model, if applicable

689 SF

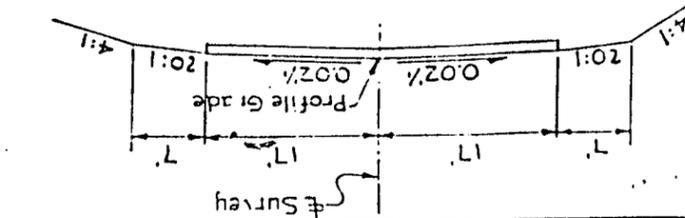
Total culvert/bridge area (ft<sup>2</sup>)

724 SF



### APPROACH ROADWAY

Scale: 1" = 10'



3 ANALYSIS (Cont'd)

Elevations Above Which Flow is Effective for Overbanks

	Left Overbank	Right Overbank
Upstream face	N/A	N/A
Downstream face	N/A	N/A

Minimum Top of Road Elevation

	Left Overbank	Right Overbank
Upstream face		
Downstream face		

100-Year Elevations

	Water-Surface Elevations	Energy Gradient Elevations
Upstream face	1380.48	1381.02
Downstream face	1380.26	1380.85

<u>Discharge</u>	Low Flow	Pressure Flow	Weir Flow	Total Flow
Amount of flow through/over the structure(s) (cfs)	3010	0	0	3010
The maximum depth of flow over the roadway/railroad (ft.)				0
Weir length (ft.)				0

<u>Top Widths</u>	Total Floodplain Width	Total Effective Flow Width	Floodway Width
Upstream face	94.92	94.92	94.92
Downstream face	94.19	94.19	94.19

3. ANALYSIS (Cont'd)

Loss Coefficients

Entrance loss coefficient	0.2
Manning's "n" value assigned to the structure(s)	0.028
Friction loss coefficient through structure(s)	0.2
Other loss coefficients (e.g., bend, manhole, etc.)	N/A
Total loss coefficient	0.2
Weir coefficient	3.0
Pier coefficient	1.15
Contraction loss coefficient	0.1
Expansion loss coefficient	0.3

4. SEDIMENT TRANSPORT CONSIDERATIONS

1. A. Is there any indication from historical records that sediment transport (*including scour and deposition*) can affect the 100-year water surface elevations? . . . . .  Yes  No
- B. Based on the conditions (*such as geomorphology, vegetative cover and development of the watershed and stream bed, and bank conditions*), is there a potential for debris and sediment transport (*including scour and deposition*) to affect the 100-year water surface elevations and/or conveyance capacity through the bridge/culvert? . . . .  Yes  No
2. If the answer to either 1A or 1B is yes:
  - A. What is the estimated sediment (*bed material*) load?  
 \_\_\_\_\_ cfs (*attach gradation curve*)  
 Explain method used to estimate the sediment transport and the depth of scour and/or deposition \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
  - B. Will sediment accumulate anywhere through the bridge/culvert?  Yes  No  
 If yes, explain the impact on the conveyance capacity through the bridge/culvert? \_\_\_\_\_  
 \_\_\_\_\_

5. FLOODWAY ANALYSIS

Explain method of bridge encroachment

(floodway run) \_\_\_\_\_ N/A \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

5. FLOODWAY ANALYSIS (Cont'd)

Comments (*explain any unusual situations*):

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Attach analysis.

**PUBLIC BURDEN DISCLOSURE NOTICE**

Public reporting burden for this form is estimated to average 2 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and reviewing the form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden, to: Information Collections Management, Federal Emergency Management Agency, 500 C Street, S.W., Washington, DC 20472; and to the Office of Management and Budget, Paperwork Reduction Project (3067-0148), Washington, DC 20503.

Community Name: Queen Creek

Flooding Source: Queen Creek Wash

Project Name/Identifier: FCDMC Contract No. C-69-96-026-5

**1. IDENTIFIER**

1. Name of roadway, railroad, etc.: Ellsworth Avenue

2. Location of bridge/culvert along flooding source (in terms of stream distance or cross-section identifier):  
HEC-2 Cross Sections 1062.50 and 1063.70; 5.740 River Miles

3. This revision reflects (check one of the following):

- New bridge/culvert not modeled in the FIS
- Modified bridge/culvert previously modeled in the FIS
- New analysis of bridge/culvert previously modeled in the FIS

(Explain why new analysis was performed) No FIS HEC-2

**2. BACKGROUND**

Provide the following information about the structure:

1. Dimension, material, and shape (e.g. two 10 x 5 feet reinforced concrete box culvert; three 30-foot span bridge with 2 rows of two 3-foot diameter circular piers; 40-foot wide ogee shape spillway) Three (3) 40' Spans, (MCDOT) flat slab bridge, with two (2) rows of 6 - 30" 0 circular piers

2. Entrance geometry of culvert/type of bridge opening (e.g. 30°-75° wing walls with square top edge, sloping embankments and vertical abutments) Sloping embankments and vertical abutments; 42° skew

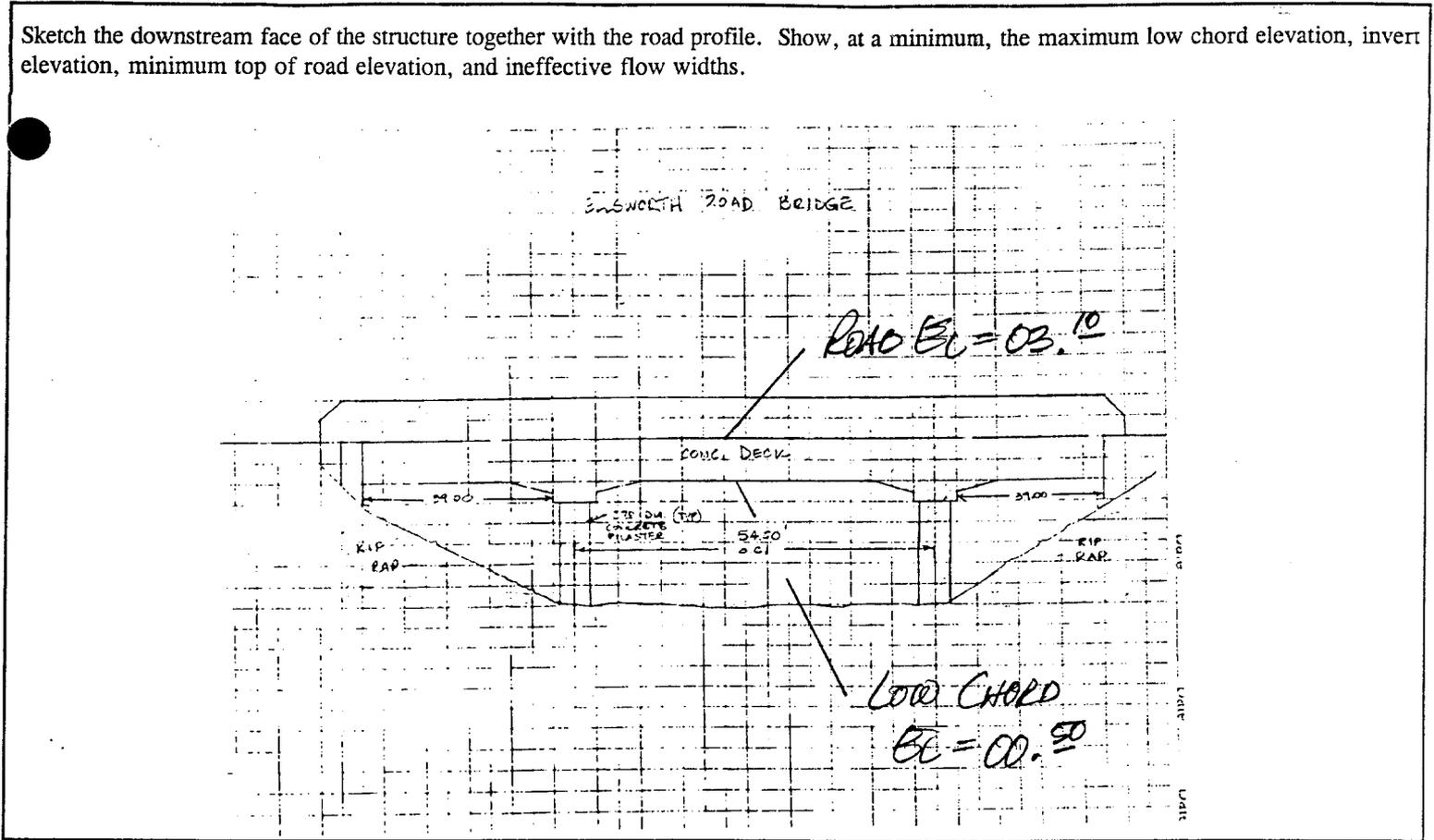
3. Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8) HEC-2 with special bridge routine

If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structure(s). (Attach justification)

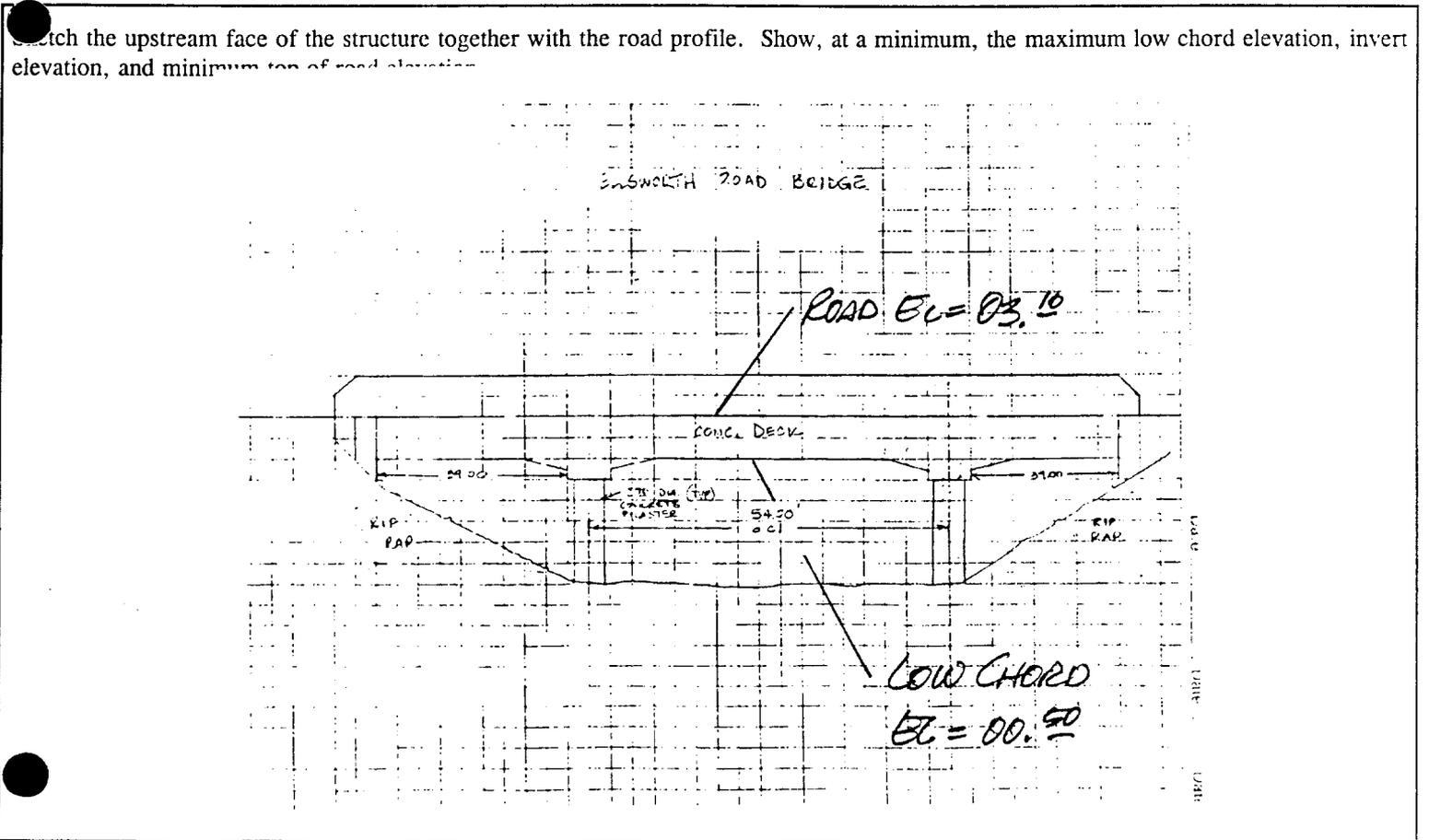
Note: If any items do not apply to submitted hydraulic analysis, indicate by N/A  
\*One form per new/revised bridge/culvert

3. ANALYSIS

Sketch the downstream face of the structure together with the road profile. Show, at a minimum, the maximum low chord elevation, invert elevation, minimum top of road elevation, and ineffective flow widths.

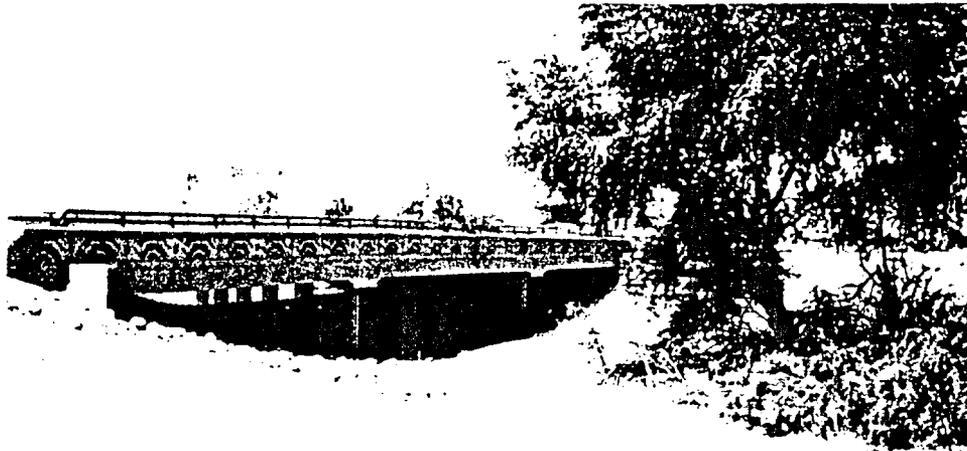


Sketch the upstream face of the structure together with the road profile. Show, at a minimum, the maximum low chord elevation, invert elevation, and minimum top of road elevation.





**Looking onto West Face (Downstream) of Ellsworth Avenue Bridge**



**Looking onto East Face (Upstream) of Ellsworth Avenue Bridge**

3. ANALYSIS (Cont'd)

Sketch the plan view of the structure(s). Show, at a minimum, the skew angle, cross-section locations, distances between cross sections, and length of structure(s).

← flow

SEE ATTACHED SKETCH  
EXCERPTED FROM  
"AS-BUILT" PLANS

Attach plans of the structure(s) certified by a registered Professional Engineer.

Culvert length or bridge width (ft.)

84'

Calculated culvert/bridge (ft<sup>2</sup>) by the hydraulic model, if applicable

830 SF

Total culvert/bridge area (ft<sup>2</sup>)

832 SF



Elevations Above Which Flow is Effective for Overbanks

	Left Overbank	Right Overbank
Upstream face	N/A	N/A
Downstream face	N/A	N/A

Minimum Top of Road Elevation

	Left Overbank	Right Overbank
Upstream face		
Downstream face		

100-Year Elevations

	Water-Surface Elevations	Energy Gradient Elevations
Upstream face	1397.08	1397.66
Downstream face	1396.94	1397.56

<u>Discharge</u>	Low Flow	Pressure Flow	Weir Flow	Total Flow
Amount of flow through/over the structure(s) (cfs)	3010	0	0	3010
The maximum depth of flow over the roadway/railroad (ft.)			0	
Weir length (ft.)			0	

<u>Top Widths</u>	Total Floodplain Width	Total Effective Flow Width	Floodway Width
Upstream face	94.24	94.24	94.24
Downstream face	93.60	93.60	93.60

**3. ANALYSIS (Cont'd)**

Loss Coefficients

Entrance loss coefficient	0.2
Manning's "n" value assigned to the structure(s)	0.028
Friction loss coefficient through structure(s)	0.2
Other loss coefficients (e.g., bend, manhole, etc.)	N/A
Total loss coefficient	0.2
Weir coefficient	3.0
Pier coefficient	1.15
Contraction loss coefficient	0.1
Expansion loss coefficient	0.3

**4. SEDIMENT TRANSPORT CONSIDERATIONS**

1. A. Is there any indication from historical records that sediment transport (*including scour and deposition*) can affect the 100-year water surface elevations? . . . . .  Yes  No
- B. Based on the conditions (*such as geomorphology, vegetative cover and development of the watershed and stream bed, and bank conditions*), is there a potential for debris and sediment transport (*including scour and deposition*) to affect the 100-year water surface elevations and/or conveyance capacity through the bridge/culvert? . . . .  Yes  No

2. If the answer to either 1A or 1B is yes:

A. What is the estimated sediment (*bed material*) load?  
 \_\_\_\_\_ cfs (*attach gradation curve*)

Explain method used to estimate the sediment transport and the depth of scour and/or deposition \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

- B. Will sediment accumulate anywhere through the bridge/culvert?  Yes  No
- If yes, explain the impact on the conveyance capacity through the bridge/culvert? \_\_\_\_\_  
 \_\_\_\_\_

**5. FLOODWAY ANALYSIS**

Explain method of bridge encroachment  
 (floodway run) \_\_\_\_\_ N/A  
 \_\_\_\_\_  
 \_\_\_\_\_

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5. FLOODWAY ANALYSIS (Cont'd)

Comments (*explain any unusual situations*):

Attach analysis.

**PUBLIC BURDEN DISCLOSURE NOTICE**

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Community Name: Queen Creek

Flooding Source: Queen Creek Wash

Project Name/Identifier: FCDMC Contract No. C-69-96-026-5

**1. IDENTIFIER**

1. Name of roadway, railroad, etc.: Rittenhouse Road
2. Location of bridge/culvert along flooding source (in terms of stream distance or cross-section identifier):  
HEC-2 Cross Sections 1195.00 and 1195.40; 8.243 River Mile
3. This revision reflects (check one of the following):
  - New bridge/culvert not modeled in the FIS
  - Modified bridge/culvert previously modeled in the FIS
  - New analysis of bridge/culvert previously modeled in the FIS

(Explain why new analysis was performed) No FIS HEC-2

**2. BACKGROUND**

Provide the following information about the structure:

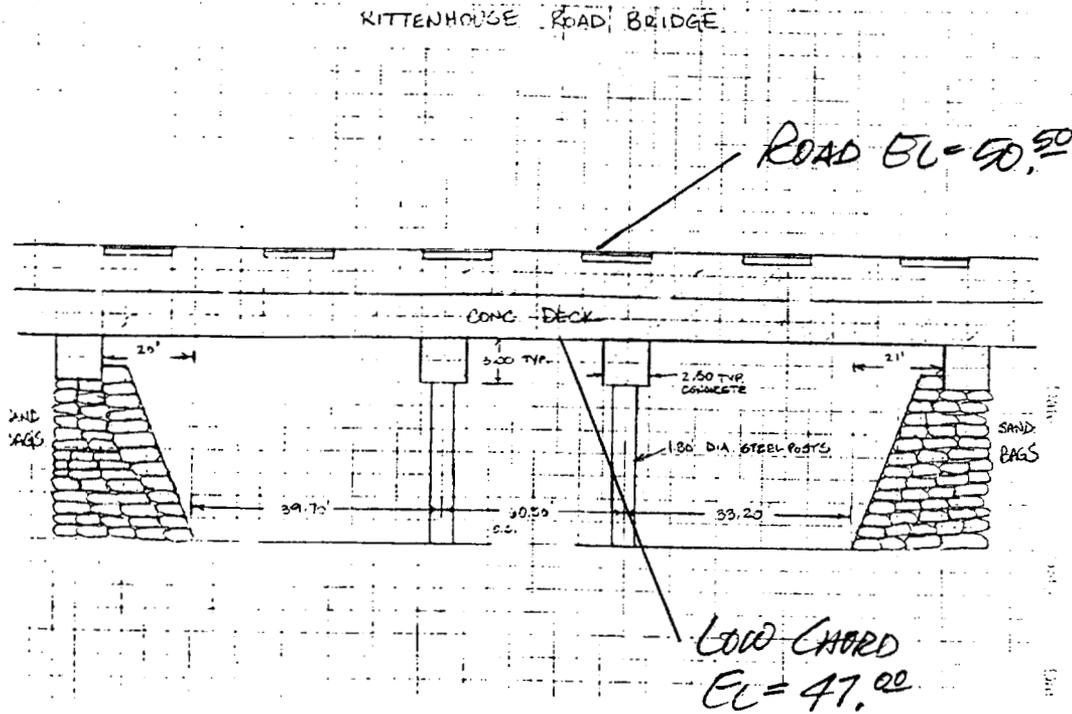
1. Dimension, material, and shape (e.g. two 10 x 5 feet reinforced concrete box culvert; three 30-foot span bridge with 2 rows of two 3-foot diameter circular piers; 40-foot wide ogee shape spillway) Three (3) 60' Span. (MCDOT)  
Flat slab bridge, with two (2) rows of 10 - 16" 0 circular piers
2. Entrance geometry of culvert/type of bridge opening (e.g. 30°-75° wing walls with square top edge, sloping embankments and vertical abutments) Sloping embankments and vertical abutments; 15° skew
3. Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8) HEC-2 with special bridge routine

If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structure(s). (Attach justification)

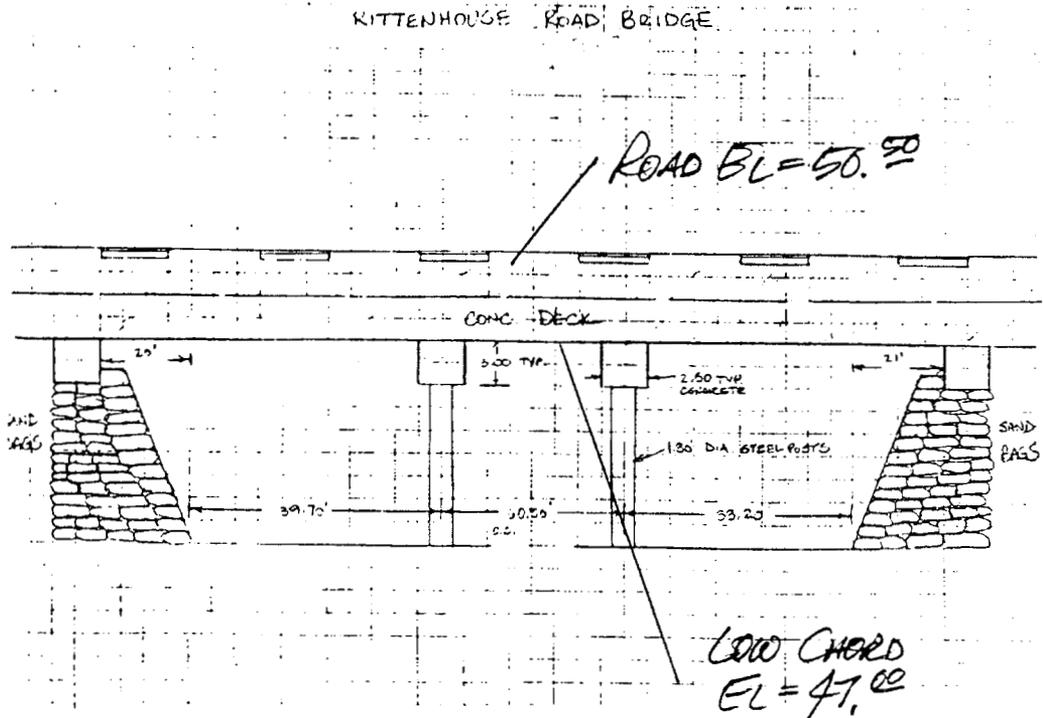
Note: If any items do not apply to submitted hydraulic analysis, indicate by N/A  
\*One form per new/revised bridge/culvert

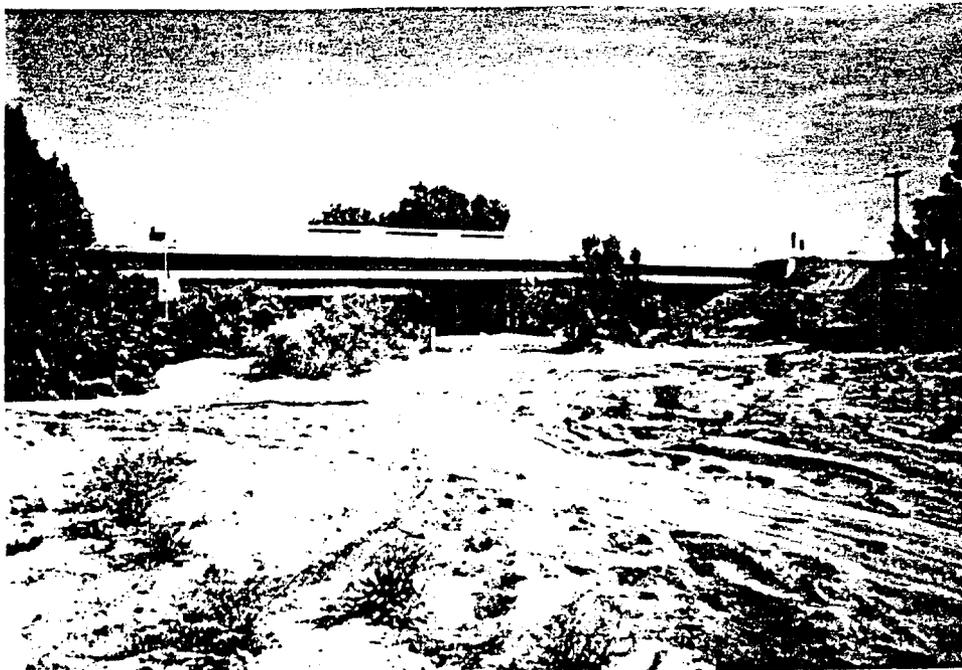
### 3. ANALYSIS

Sketch the downstream face of the structure together with the road profile. Show, at a minimum, the maximum low chord elevation, invert elevation, minimum top of road elevation, and ineffective flow widths.



Sketch the upstream face of the structure together with the road profile. Show, at a minimum, the maximum low chord elevation, invert elevation, and minimum top of road elevation.





Looking onto Southwest Face (Downstream) of Rittenhouse Road Bridge



Looking onto Northeast Face (Upstream) of Rittenhouse Road Bridge

3. ANALYSIS (Cont'd)

Sketch the plan view of the structure(s). Show, at a minimum, the skew angle, cross-section locations, distances between cross sections, and length of structure(s).

← flow

SEE ATTACHED SKETCH  
EXCERPTED FROM  
"AS-BUILT" PLANS

Attach plans of the structure(s) certified by a registered Professional Engineer.

Culvert length or bridge width (ft.)

38'

Calculated culvert/bridge (ft<sup>2</sup>) by the hydraulic model, if applicable

1455 SF

Total culvert/bridge area (ft<sup>2</sup>)

1456 SF



Elevations Above Which Flow is Effective for Overbanks

	Left Overbank	Right Overbank
Upstream face	N/A	N/A
Downstream face	N/A	N/A

Minimum Top of Road Elevation

	Left Overbank	Right Overbank
Upstream face		
Downstream face		

100-Year Elevations

	Water-Surface Elevations	Energy Gradient Elevations
Upstream face	1440.32	1440.94
Downstream face	1440.25	1440.90

<u>Discharge</u>	Low Flow	Pressure Flow	Weir Flow	Total Flow
Amount of flow through/over the structure(s) (cfs)	3010	0	0	3010
The maximum depth of flow over the roadway/railroad (ft.)			0	
Weir length (ft.)			0	

<u>Top Widths</u>	Total Floodplain Width	Total Effective Flow Width	Floodway Width
Upstream face	140.26	140.26	140.26
Downstream face	140.06	140.06	140.06

3. ANALYSIS (Cont'd)

Loss Coefficients

Entrance loss coefficient	0.2
Manning's "n" value assigned to the structure(s)	0.028
Friction loss coefficient through structure(s)	0.2
Other loss coefficients (e.g., bend, manhole, etc.)	N/A
Total loss coefficient	0.2
Weir coefficient	3.0
Pier coefficient	1.15
Contraction loss coefficient	0.1
Expansion loss coefficient	0.3

4. SEDIMENT TRANSPORT CONSIDERATIONS

1. A. Is there any indication from historical records that sediment transport (*including scour and deposition*) can affect the 100-year water surface elevations? . . . . .  Yes  No
- B. Based on the conditions (*such as geomorphology, vegetative cover and development of the watershed and stream bed, and bank conditions*), is there a potential for debris and sediment transport (*including scour and deposition*) to affect the 100-year water surface elevations and/or conveyance capacity through the bridge/culvert? . . . .  Yes  No

2. If the answer to either 1A or 1B is yes:

A. What is the estimated sediment (*bed material*) load?  
 \_\_\_\_\_ cfs (*attach gradation curve*)

Explain method used to estimate the sediment transport and the depth of scour and/or deposition \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

B. Will sediment accumulate anywhere through the bridge/culvert?  Yes  No  
 If yes, explain the impact on the conveyance capacity through the bridge/culvert? \_\_\_\_\_  
 \_\_\_\_\_

5. FLOODWAY ANALYSIS

Explain method of bridge encroachment  
 (floodway run) \_\_\_\_\_ N/A  
 \_\_\_\_\_  
 \_\_\_\_\_

5. FLOODWAY ANALYSIS (Cont'd)

Comments (*explain any unusual situations*):

Attach analysis.

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Community Name: Queen Creek

Flooding Source: Queen Creek Wash

Project Name/Identifier: FCDMC Contract No. C-69-96-026-5

**1. IDENTIFIER**

1. Name of roadway, railroad, etc.: SPRR
2. Location of bridge/culvert along flooding source (in terms of stream distance or cross-section identifier):  
HEC-2 Cross Sections 1197.10 and 1197.30
3. This revision reflects (check one of the following):
  - New bridge/culvert not modeled in the FIS
  - Modified bridge/culvert previously modeled in the FIS
  - New analysis of bridge/culvert previously modeled in the FIS

(Explain why new analysis was performed) No FIS HEC-2

**2. BACKGROUND**

Provide the following information about the structure:

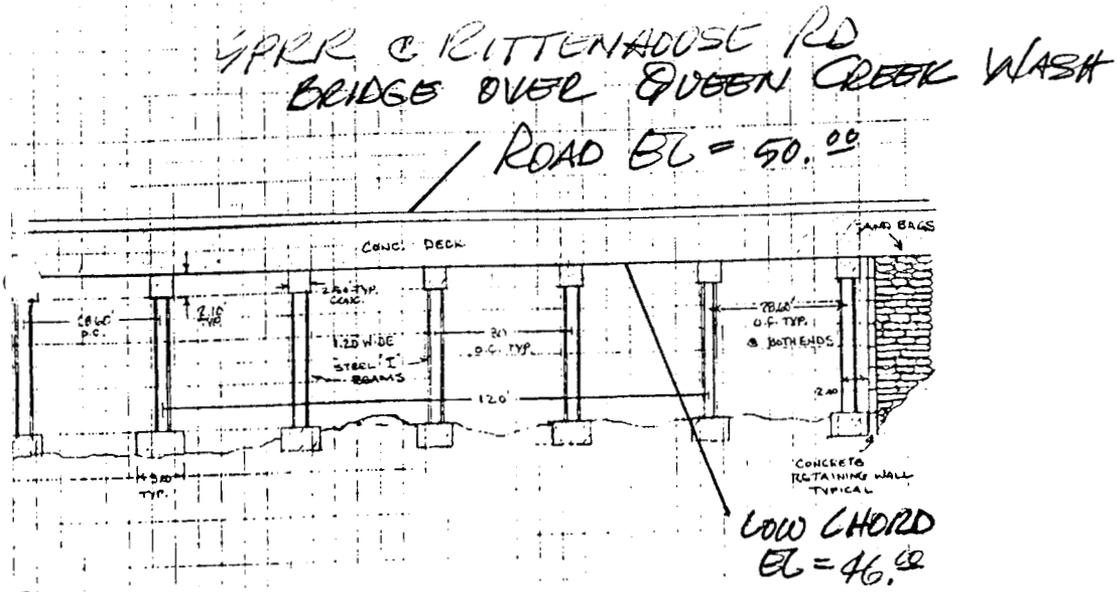
1. Dimension, material, and shape (e.g. two 10 x 5 feet reinforced concrete box culvert; three 30-foot span bridge with 2 rows of two 3-foot diameter circular piers; 40-foot wide ogee shape spillway) Six 30' Span (SPRR) Trestle Bridge, With five (5) steel trestle piers (1-Beam)
2. Entrance geometry of culvert/type of bridge opening (e.g. 30°-75° wing walls with square top edge, sloping embankments and vertical abutments) Sloping embankments and vertical abutments; 15° skew
3. Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8) HEC-2 with special bridge routine

If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structure(s). (Attach justification)

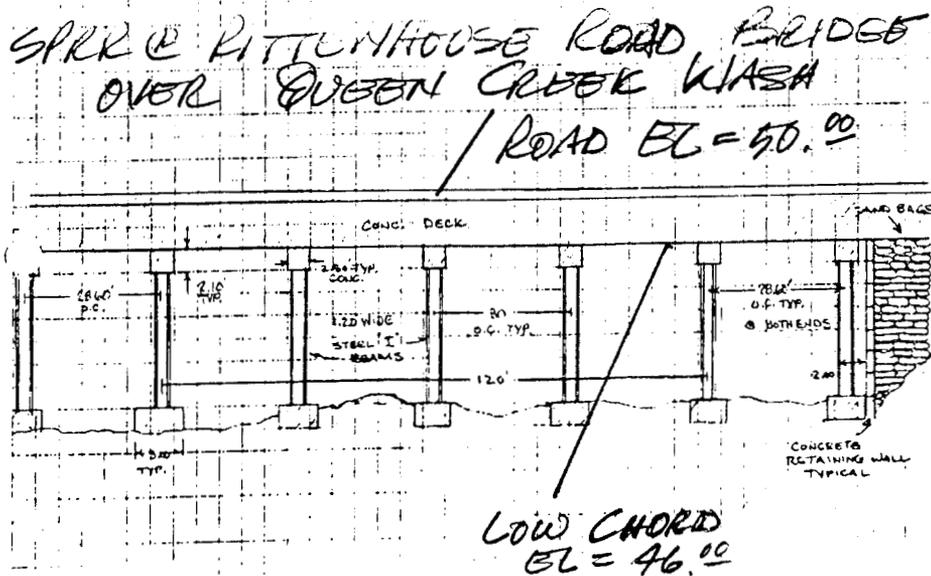
Note: If any items do not apply to submitted hydraulic analysis, indicate by N/A  
\*One form per new/revised bridge/culvert

3. ANALYSIS

Sketch the downstream face of the structure together with the road profile. Show, at a minimum, the maximum low chord elevation, invert elevation, minimum top of road elevation, and ineffective flow widths.



Sketch the upstream face of the structure together with the road profile. Show, at a minimum, the maximum low chord elevation, invert elevation, and minimum top of road elevation.





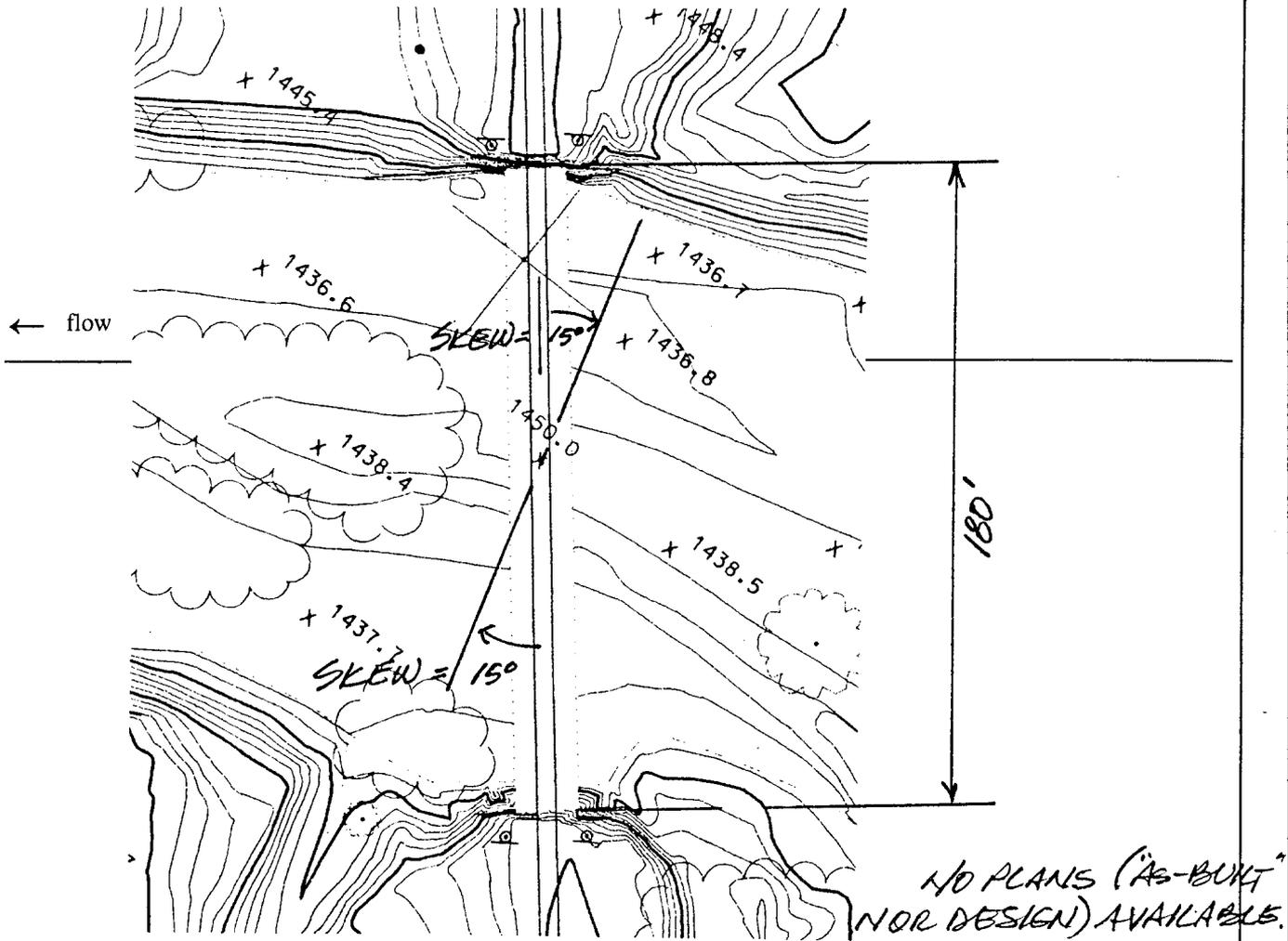
Looking onto Southwest Face (Downstream) of SPRR Bridge



Looking onto Northeast Face (Upstream) of SPRR Bridge

3. ANALYSIS (Cont'd)

Sketch the plan view of the structure(s). Show, at a minimum, the skew angle, cross-section locations, distances between cross sections, and length of structure(s).



Attach plans of the structure(s) certified by a registered Professional Engineer.

Culvert length or bridge width (ft.)

18'

Calculated culvert/bridge (ft<sup>2</sup>) by the hydraulic model, if applicable

1676 SF

Total culvert/bridge area (ft<sup>2</sup>)

1676 SF

Elevations Above Which Flow is Effective for Overbanks

	Left Overbank	Right Overbank
Upstream face	N/A	N/A
Downstream face	N/A	N/A

Minimum Top of Road Elevation

	Left Overbank	Right Overbank
Upstream face		
Downstream face		

100-Year Elevations

	Water-Surface Elevations	Energy Gradient Elevations
Upstream face	1441.23	1441.46
Downstream face	1441.22	1441.45

Discharge

Low Flow                      Pressure Flow                      Weir Flow                      Total Flow

Amount of flow through/over the structure(s) (cfs)	3010	0	0	3010
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The maximum depth of flow over the roadway/railroad (ft.)				0
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Weir length (ft.)				0
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Top Widths

	Total Floodplain Width	Total Effective Flow Width	Floodway Width
Upstream face	183.77	183.77	183.77
Downstream face	183.72	183.72	183.72

3. ANALYSIS (Cont'd)

Loss Coefficients

Entrance loss coefficient	0.2
Manning's "n" value assigned to the structure(s)	0.028
Friction loss coefficient through structure(s)	0.2
Other loss coefficients (e.g., bend, manhole, etc.)	N/A
Total loss coefficient	0.2
Weir coefficient	3.0
Pier coefficient	1.15
Contraction loss coefficient	0.1
Expansion loss coefficient	0.3

4. SEDIMENT TRANSPORT CONSIDERATIONS

1.
  - A. Is there any indication from historical records that sediment transport (*including scour and deposition*) can affect the 100-year water surface elevations? . . . . .  Yes  No
  - B. Based on the conditions (*such as geomorphology, vegetative cover and development of the watershed and stream bed, and bank conditions*), is there a potential for debris and sediment transport (*including scour and deposition*) to affect the 100-year water surface elevations and/or conveyance capacity through the bridge/culvert? . . . .  Yes  No
2. If the answer to either 1A or 1B is yes:
  - A. What is the estimated sediment (*bed material*) load?  
 \_\_\_\_\_ cfs (*attach gradation curve*)  
 Explain method used to estimate the sediment transport and the depth of scour and/or deposition \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
  - B. Will sediment accumulate anywhere through the bridge/culvert?  Yes  No  
 If yes, explain the impact on the conveyance capacity through the bridge/culvert? \_\_\_\_\_  
 \_\_\_\_\_

5. FLOODWAY ANALYSIS

Explain method of bridge encroachment  
 (floodway run) \_\_\_\_\_ N/A  
 \_\_\_\_\_  
 \_\_\_\_\_

5. FLOODWAY ANALYSIS (Cont'd)

Comments (*explain any unusual situations*):

Attach analysis.

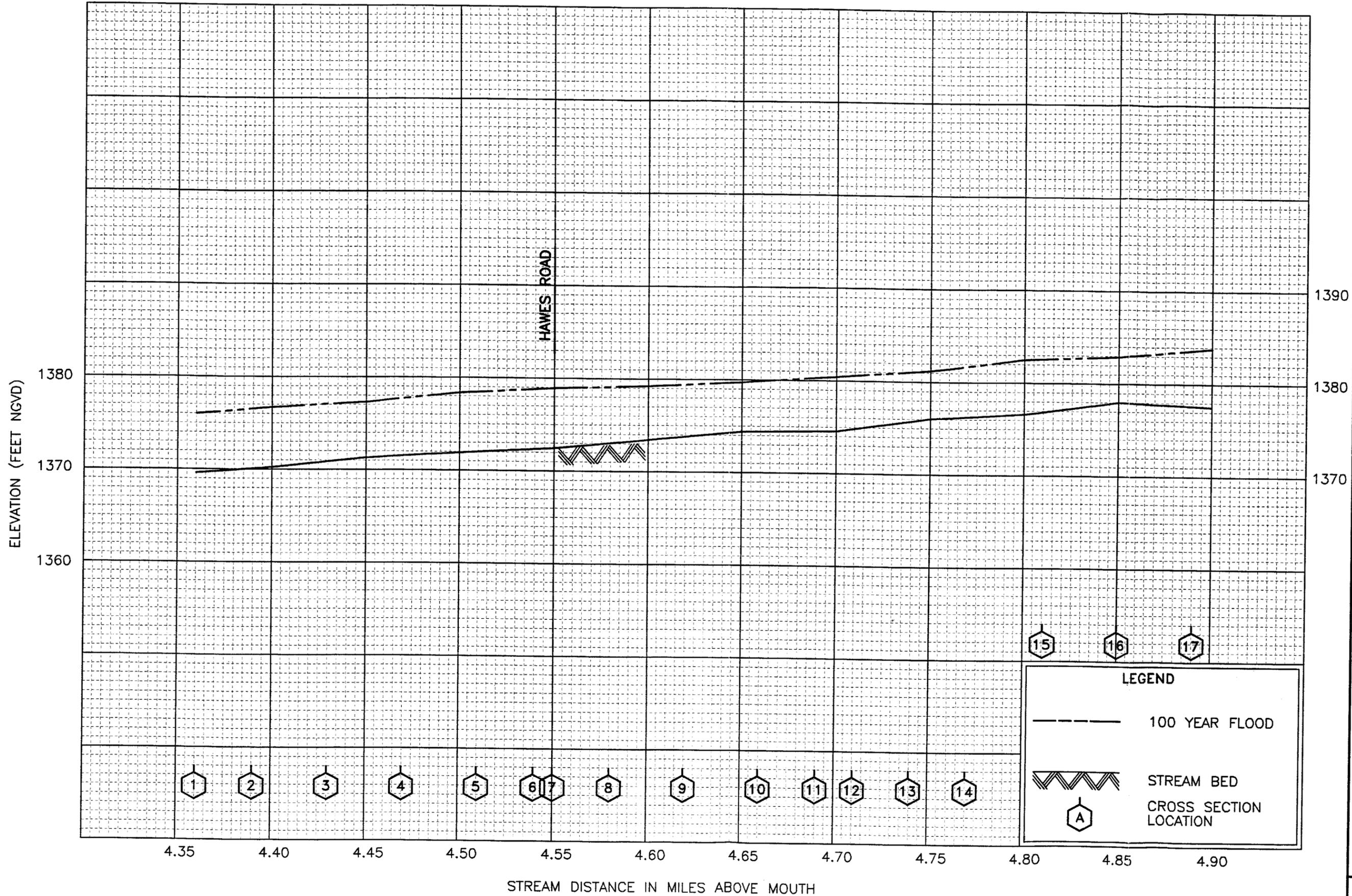
EXHIBIT 4

Revised Profile Plot

X-SECT	Station	Mile	WSEL
1	990+30	4.36	1376
2	992+00	4.39	1376.66
3	994+00	4.43	1377.07
4	996+00	4.47	1377.33
5	998+00	4.51	1378.43
6	99+60	4.54	1378.92
7	1000+40	4.55	1378.98
8	1002+00	4.58	1379.11
9	1004+00	4.62	1379.11
10	1006+00	4.66	1380.08
11	1007+50	4.69	1380.26
12	1008+50	4.71	1380.48
13	1010+00	4.74	1380.42
14	1012+00	4.77	1382.17
15	1014+00	4.81	1382.71
16	1016+00	4.85	1382.92
17	1018+00	4.89	1383.66
18	1020+00	4.92	1384.21
19	1022+00	4.96	1384.48
20	1024+00	5.00	1385.01
21	1026+00	5.04	1385.47
22	1028+00	5.08	1385.87
23	1030+00	5.11	1386.26
24	1032+00	5.15	1386.71
25	1034+00	5.19	1387.28
26	1036+00	5.23	1387.77
27	1038+00	5.27	1388.31
28	1040+00	5.30	1388.67
29	1042+00	5.34	1389.22
30	1044+00	5.38	1389.48
31	1046+00	5.42	1390
32	1048+00	5.46	1390.54
33	1050+00	5.49	1391.29
34	1052+00	5.53	1392.39
35	1054+00	5.57	1393.17
36	1056+00	5.61	1394.42
37	1058+00	5.64	1394.71
38	1060+00	5.68	1395.26

X-SECT	Station	Mile	WSEL
39	1062+50	5.73	1396.94
40	1063+70	5.75	1397.08
41	1064+00	5.76	1397.2
42	1066+00	5.80	1397.92
43	1068+00	5.83	1398.49
44	1070+00	5.87	1399.1
45	1072+00	5.91	1400.26
46	1074+00	5.95	1400.71
47	1076+00	5.99	1401.1
48	1078+00	6.02	1401.49
49	1080+00	6.06	1402.57
50	1082+00	6.10	1402.59
51	1084+00	6.14	1403.28
52	1086+00	6.17	1404.18
53	1088+00	6.21	1405.34
54	1090+00	6.25	1406.21
55	1092+00	6.29	1406.85
56	1094+00	6.33	1407.37
57	1096+00	6.36	1407.93
58	1098+00	6.40	1408.52
59	1100+00	6.44	1408.85
60	1102+00	6.48	1409.42
61	1104+00	6.52	1410.13
62	1106+00	6.55	1410.59
63	1108+00	6.59	1411.19
64	1110+00	6.63	1412.07
65	1112+00	6.67	1412.74
66	1114+00	6.71	1413.22
67	1116+00	6.74	1413.91
68	1118+00	6.78	1415.05
69	1120+00	6.82	1415.69
70	1122+00	6.86	1416.5
71	1124+00	8.89	1416.77
72	1126+00	6.93	1417.42
73	1128+00	6.97	1418.5
74	1130+00	7.01	1419.01
75	1132+00	7.05	1419.64
76	1134+00	7.08	1420.39

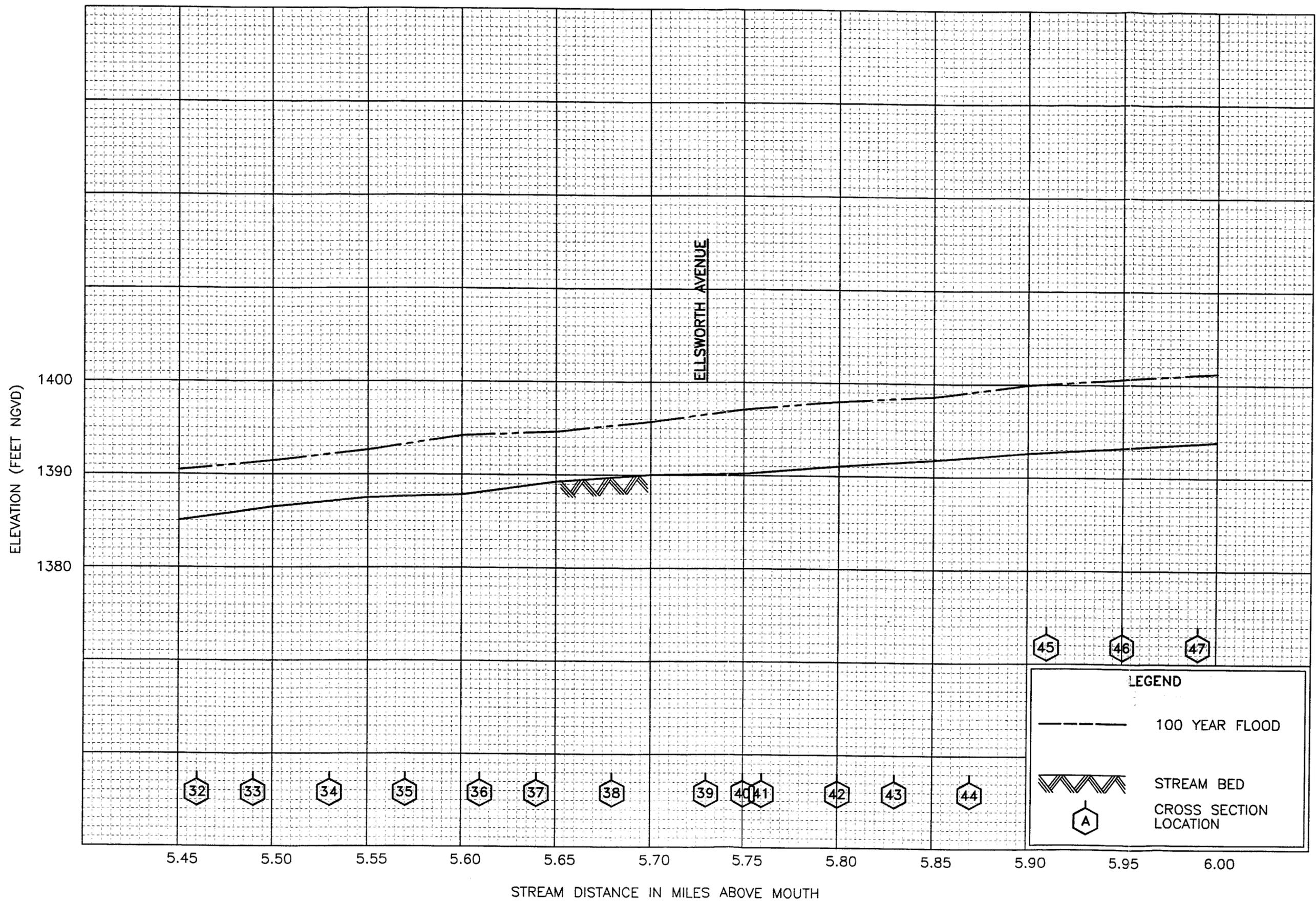
X-SECT	Station	Mile	WSEL
77	1136+00	7.12	1420.89
78	1138+00	7.16	1421.49
79	1140+00	7.20	1422.03
80	1142+00	7.24	1423.41
81	1144+00	7.27	1423.82
82	1146+00	7.31	1424.5
83	1148+00	7.35	1425.01
84	1150+00	7.39	1425.64
85	1152+00	7.42	1426.34
86	1154+00	7.46	1426.87
87	1156+00	7.50	1427.65
88	1158+00	7.54	1428.15
89	1160+00	7.58	1428.37
90	1162+00	7.61	1429.31
91	1164+00	7.65	1430.58
92	1166+00	7.69	1431.08
93	1168+00	7.73	1431.7
94	1170+00	7.77	1432.45
95	1172+00	7.80	1433.26
96	1174+00	7.84	1433.86
97	1176+00	7.88	1434.26
98	1178+00	7.92	1434.37
99	1180+00	7.96	1435.14
100	1182+00	7.99	1436.02
101	1184+00	8.03	1436.77
102	1186+00	8.07	1437.56
103	1188+00	8.11	1438
104	1190+00	8.14	1438.62
105	1192+00	8.18	1439.44
106	1194+00	8.22	1440.09
107	1195+00	8.24	1440.25
108	1195+40	8.25	1440.32
109	1196+00	8.26	1440.52
110	1197+10	8.28	1441.22
111	1197+00	8.28	1441.23
112	1198+00	8.30	1441.22
113	1200+00	8.33	1441.8



**FLOOD PROFILES**  
**QUEEN CREEK**

FEDERAL EMERGENCY MANAGEMENT AGENCY  
MARICOPA COUNTY ARIZONA  
AND INCORPORATED AREAS



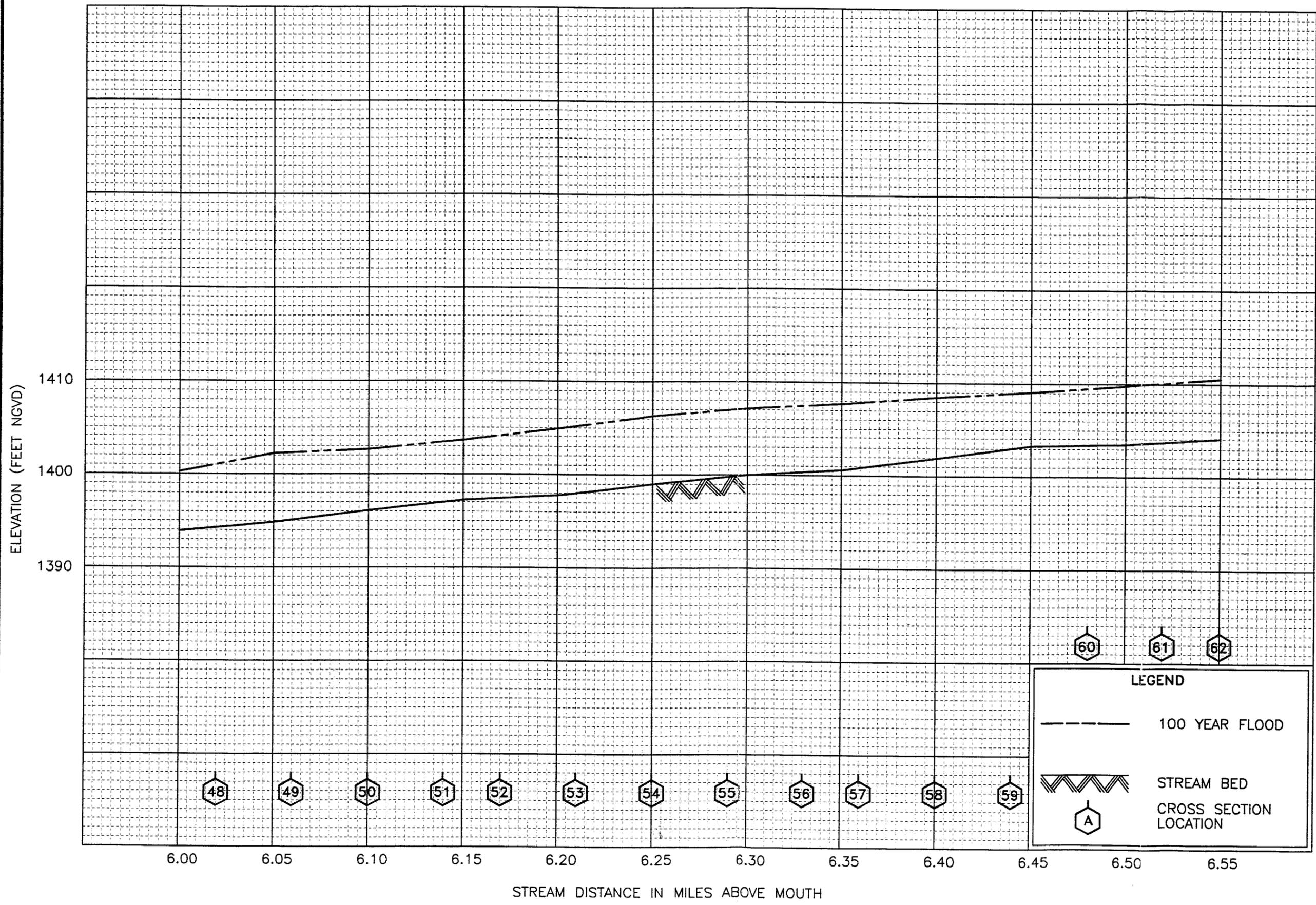


**FLOOD PROFILES**  
**QUEEN CREEK**

FEDERAL EMERGENCY MANAGEMENT AGENCY  
MARICOPA COUNTY ARIZONA  
AND INCORPORATED AREAS

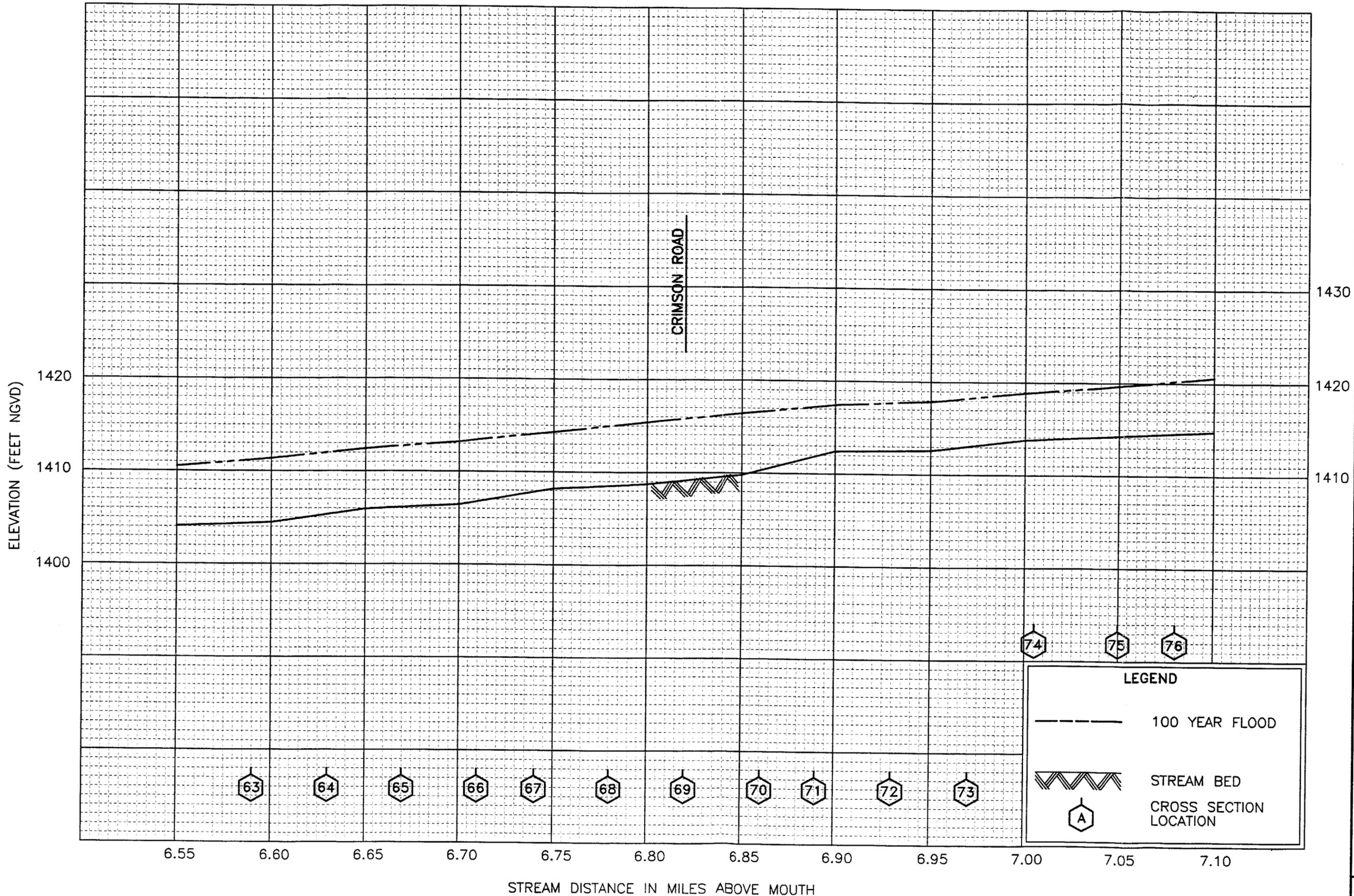
**LEGEND**

-  100 YEAR FLOOD
-  STREAM BED
-  CROSS SECTION LOCATION



**FLOOD PROFILES**  
**QUEEN CREEK**

FEDERAL EMERGENCY MANAGEMENT AGENCY  
MARICOPA COUNTY ARIZONA  
AND INCORPORATED AREAS

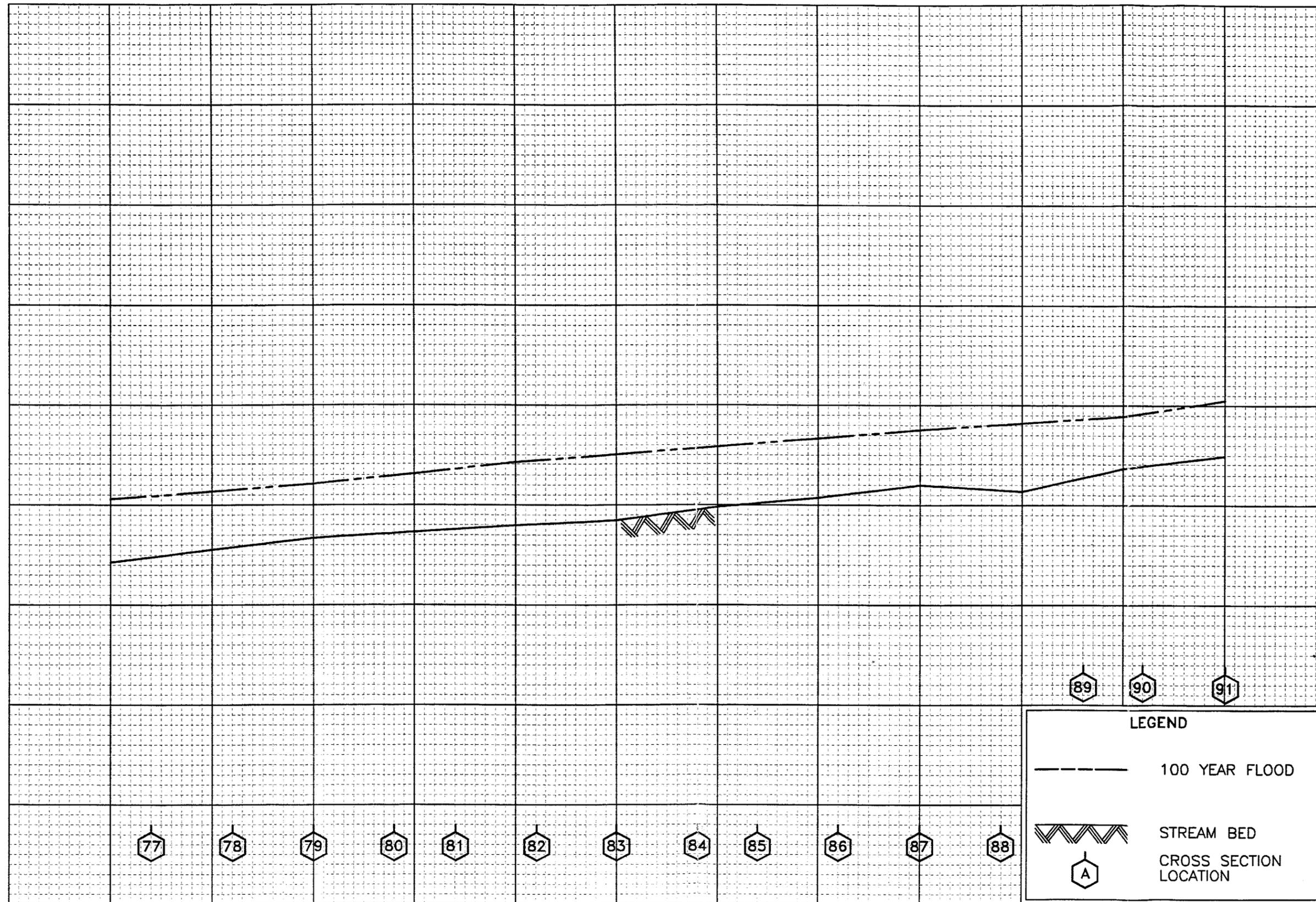


**FLOOD PROFILES**  
**QUEEN CREEK**

FEDERAL EMERGENCY MANAGEMENT AGENCY  
MARICOPA COUNTY ARIZONA  
AND INCORPORATED AREAS

ELEVATION (FEET NGVD)

1430  
1420  
1410



7.10 7.15 7.20 7.25 7.30 7.35 7.40 7.45 7.50 7.55 7.60 7.65

STREAM DISTANCE IN MILES ABOVE MOUTH

FLOOD PROFILES

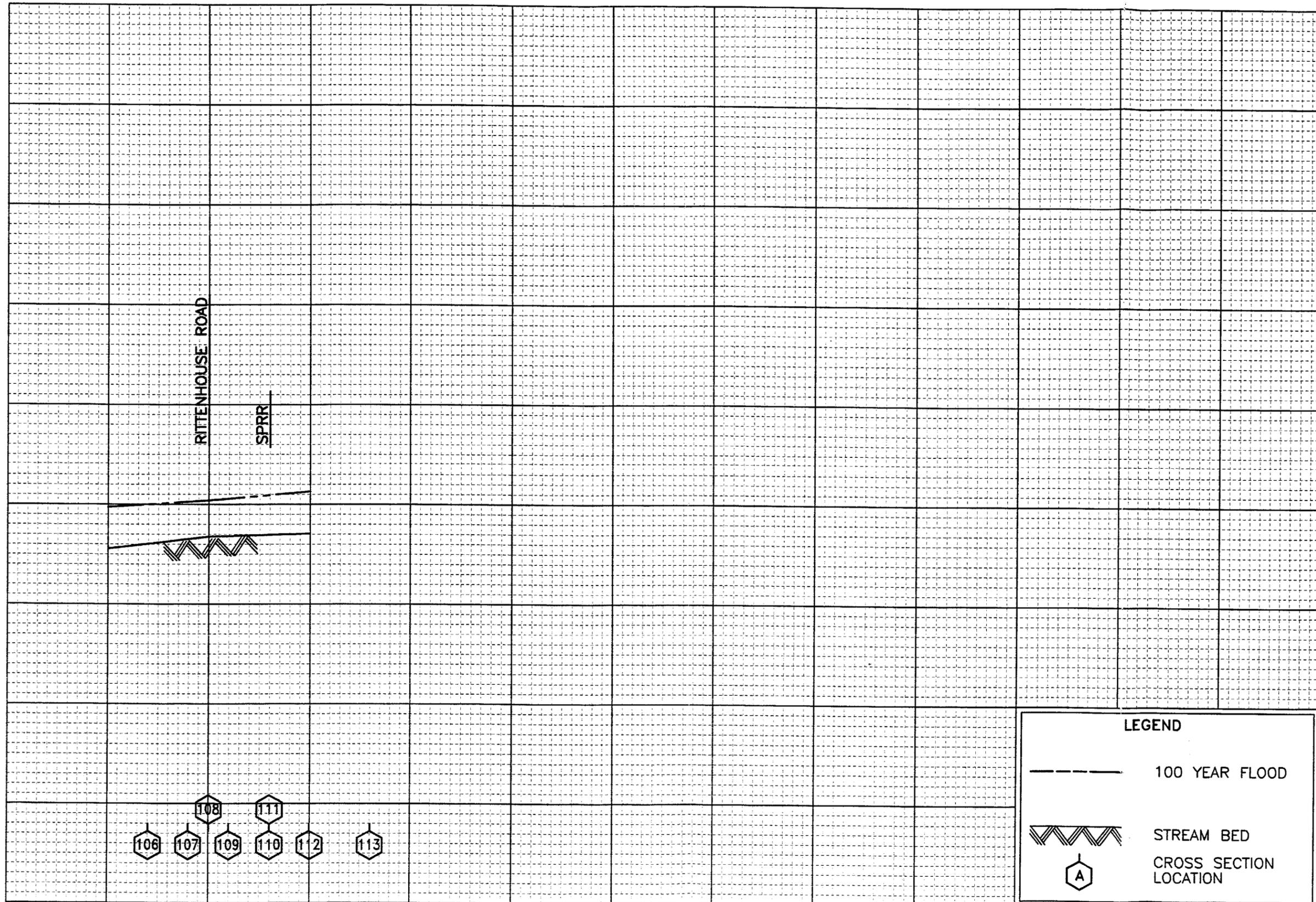
QUEEN CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MARICOPA COUNTY ARIZONA  
AND INCORPORATED AREAS



ELEVATION (FEET NGVD)



8.20 8.25 8.30

STREAM DISTANCE IN MILES ABOVE MOUTH

**LEGEND**

- 100 YEAR FLOOD
- ~~~~~ STREAM BED
- ⬡ A CROSS SECTION LOCATION

1460  
1450  
1440  
1430

**FLOOD PROFILES**

**QUEEN CREEK**

FEDERAL EMERGENCY MANAGEMENT AGENCY

MARICOPA COUNTY ARIZONA  
AND INCORPORATED AREAS

EXHIBIT 5

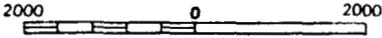
Annotated Floodplain/Floodway Map

to change special flood hazard areas, to change zone designations, to update map format, to add roads and road names, to reflect updated topographic information, and to incorporate previously issued letters of map revision.

To determine if flood insurance is available, contact an insurance agent or call the National Flood Insurance Program at (800) 638-6620.



APPROXIMATE SCALE IN FEET



**NATIONAL FLOOD INSURANCE PROGRAM**

**FIRM**

**FLOOD INSURANCE RATE MAP**

**MARICOPA COUNTY,  
ARIZONA AND  
INCORPORATED AREAS**

**PANEL 3075 OF 4350**

CONTAINS:

<u>COMMUNITY</u>	<u>NUMBER</u>	<u>PANEL</u>	<u>SUFFIX</u>
GILBERT, TOWN OF . . . . .	040044 . . . . .	3075 . . . . .	F
MARICOPA COUNTY, UNINCORPORATED AREAS . . . . .	040037 . . . . .	3075 . . . . .	F
QUEEN CREEK, TOWN OF . . . . .	040132 . . . . .	3075 . . . . .	F

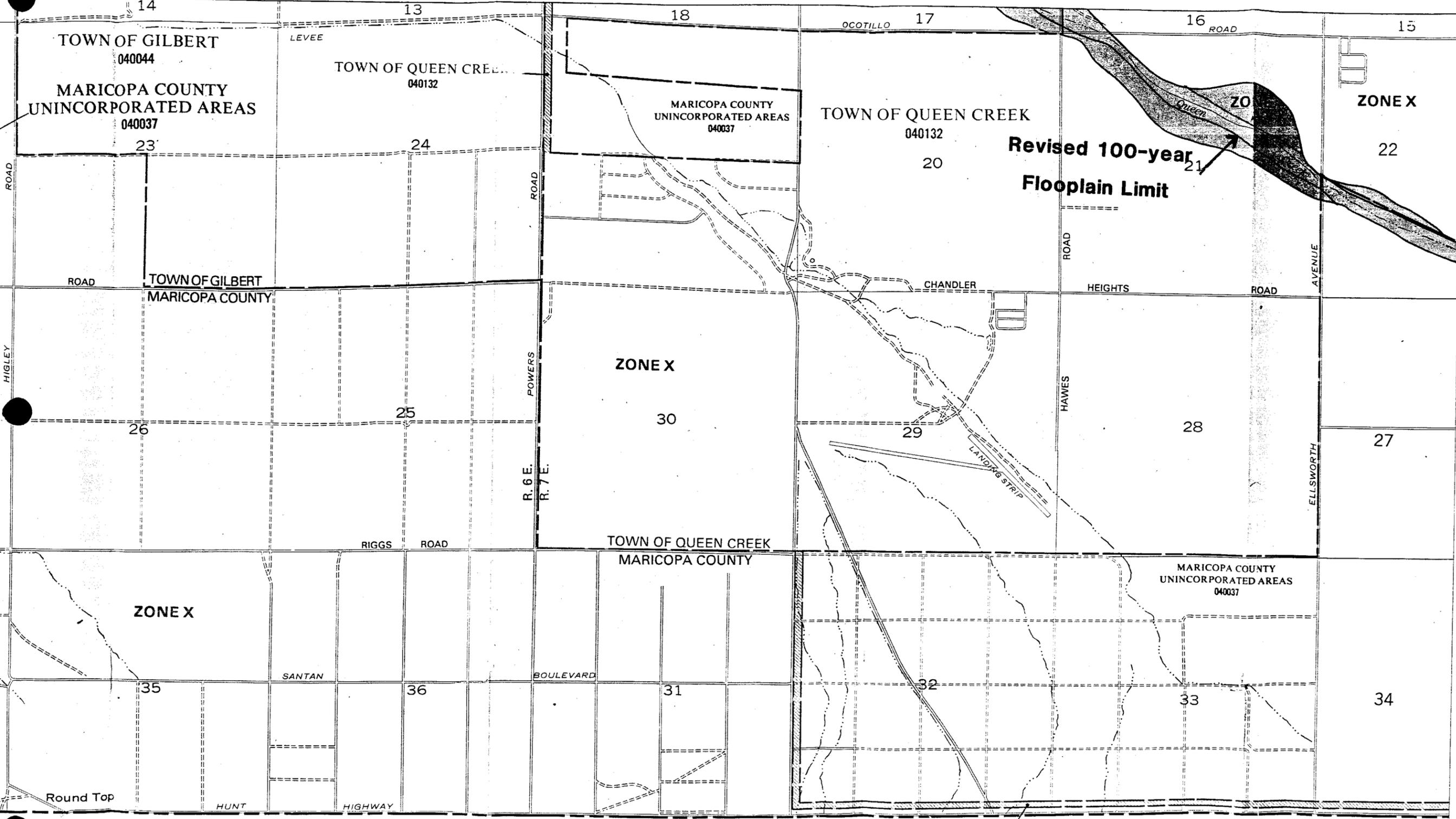
**MAP NUMBER  
04013C3075**

**MAP REVISED:**



**Federal Emergency Management Agency**

*PROPOSED REVISED FIRM*



T

APRIL 15, 1986

**EFFECTIVE DATE (S) OF REVISION (S) TO THIS PANEL:**

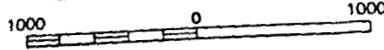
Map revised September 4, 1991 to update corporate limits, to change base flood elevations, to add special flood hazard areas, to change special flood hazard areas, to change zone designations, to update map format, to add roads and road names and to incorporate previously issued letter of map revision

Map revised DECEMBER 3, 1993 to change base flood elevations, to add base flood elevations, to add special flood hazard areas, to change special flood hazard areas, to change zone designations, to update map format, to add roads and road names, to reflect updated topographic information, and to incorporate previously issued letters of map revision

To determine if flood insurance is available, contact an insurance agent or call the National Flood Insurance Program at (800) 638-6620.



APPROXIMATE SCALE IN FEET



**NATIONAL FLOOD INSURANCE PROGRAM**

**FIRM  
FLOOD INSURANCE RATE MAP  
MARICOPA COUNTY,  
ARIZONA AND  
INCORPORATED AREAS**

**PANEL 3080 OF 4350**

**CONTAINS:**

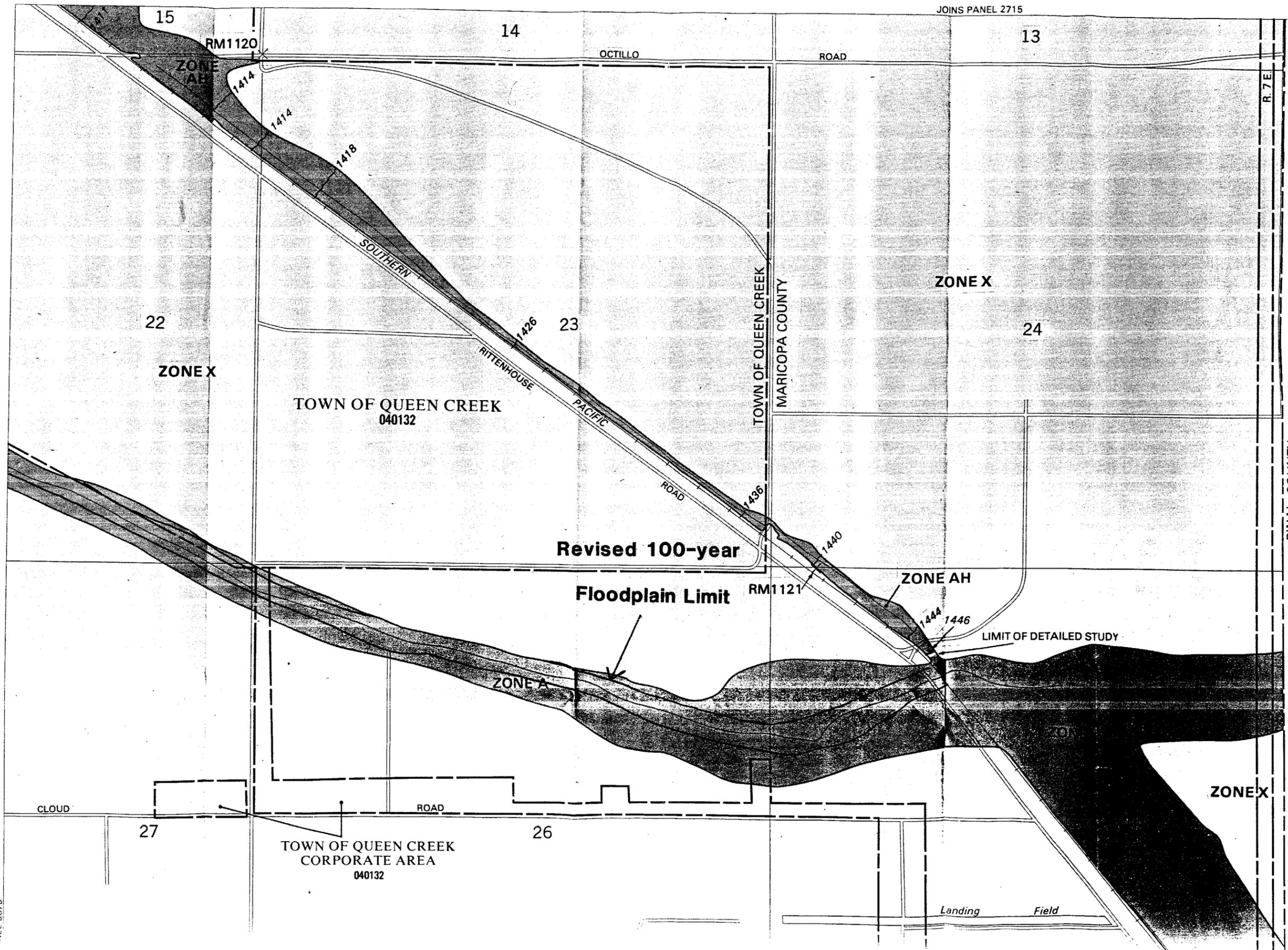
COMMUNITY	NUMBER	PANEL	SUFFIX
MARICOPA COUNTY UNINCORPORATED AREAS	. . . 040037	. . . 3080	. . . F
QUEEN CREEK, TOWN OF	. . . 040132	. . . 3080	. . . F

**MAP NUMBER  
04013C3080**

**MAP REVISED:**



*Proposed Revised FIRM*



REFERENCE MARK	ELEVATION (FT. NGVD)	
RM1120	1415.08	1 in.
RM1121	1441.68	Hub feet
RM1122	1459.95	P.K.

EXHIBIT 6

Hardcopy HEC-2 Output

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1*****
* HEC-2 WATER SURFACE PROFILES *
* *
* Version 4.6.2; May 1991 *
* *
* RUN DATE 03MAY99 TIME 11:50:30 *
*****

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*****
* U.S. ARMY CORPS OF ENGINEERS *
* HYDROLOGIC ENGINEERING CENTER *
* 609 SECOND STREET, SUITE D *
* DAVIS, CALIFORNIA 95616-4687 *
* (916) 756-1104 *
*****

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X X XXXXXXXX XXXXX XXXXX
X X X X X X
X X X X X
XXXXXXXX XXXX X XXXXX XXXXX
X X X X X
X X X X X X
X X XXXXXXXX XXXXX XXXXXXXX

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PAGE 1

THIS RUN EXECUTED 03MAY99 11:50:30

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*****
HEC-2 WATER SURFACE PROFILES
Version 4.6.2; May 1991
*****

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T1 QUEEN CREEK WASH (Hawes Road to SPRR) LOMR
T2 QUEEN CREEK - EXISTING CONDITIONS, NAT CHAN W/BERMS (MAR 1997)
T3 100-YEAR STORM PEAK RUNOFF MODEL ('91FIS) ** HECRUN03.DAT **

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J1 ICHECK INQ NINV IDIR STRT METRIC HVINS Q WSEL FQ
3010 1376.00

J2 NPROF IPLOT PRFVS XSECV XSECH FN ALLDC IBW CHNIM ITRACE
-1 -1

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J3 VARIABLE CODES FOR SUMMARY PRINTOUT
100 105 150

```

NC	0.040	0.040	0.032	0.1	0.3					
Downstream Limits of 1997 Aerial Photogrammetry										
X1	990.3	25	938	1053						
X3	10							1378.00	1378.00	
GR	1377.0	840	1376.0	852	1375.0	870	1375.0	880	1375.0	884
GR	1375.0	888	1375.0	893	1380.0	911	1378.0	933	1377.0	938
GR	1375.0	955	1370.0	975	1369.6	988	1369.9	1000	1370.0	1006
GR	1370.0	1023	1371.0	1025	1374.0	1036	1381.0	1053	1381.0	1058
GR	1377.0	1073	1375.3	1112	1375.9	1150	1376.0	1192	1376.2	1300

X1	992.0	22	944	1055	172	172	172			
X3	10							1378.00	1378.00	
GR	1377.0	748	1376.0	773	1375.8	800	1376.0	840	1376.0	880
GR	1376.0	888	1380.0	904	1380.0	922	1376.0	944	1372.0	955
GR	1371.0	961	1370.0	983	1370.0	994	1370.1	1000	1371.0	1023
GR	1383.0	1055	1383.0	1062	1380.0	1067	1377.0	1078	1376.9	1112
GR	1377.0	1280	1378.0	1450						

X1	994.0	22	938	1052	200	200	200			
X3	10							1378.00	1378.00	
GR	1377.0	670	1376.0	834	1376.0	840	1376.0	860	1376.0	881
GR	1377.0	888	1382.0	902	1382.0	913	1379.0	924	1378.0	938
GR	1373.0	955	1371.0	966	1371.0	1000	1371.0	1017	1373.0	1033
GR	1381.0	1052	1381.0	1066	1378.0	1073	1377.0	1079	1376.9	1112
GR	1377.0	1120	1378.0	1300						

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PAGE 2

NC			0.030							
X1	996.0	13	946	1044	200	200	200			
GR	1379.0	888	1382.0	916	1382.0	935	1379.0	946	1378.0	955
GR	1372.0	976	1371.6	1000	1372.0	1024	1377.0	1044	1384.0	1063
GR	1384.0	1069	1378.0	1083	1377.1	1112				

NC				0.3	0.5					
X1	998.0	16	944	1070	200	200				
GR	1378.4	888	1379.0	900	1381.0	911	1386.0	917	1386.0	930
GR	1379.0	944	1377.0	947	1372.0	978	1372.0	1000	1372.0	1026
GR	1386.0	1070	1387.0	1075	1387.0	1078	1380.0	1090	1379.0	1102
GR	1379.0	1112								

NC			0.028							
Centerline of Travelway and Bridge at Hawes Road is at Sta 1000+00										
X1	999.6	14	925	1078	166	166	166			
X3	10							1380.00	1380.00	
GR	1381.1	777	1381.6	808	1382.0	855	1382.4	891	1382.0	916
GR	1382.0	925	1372.5	965	1372.5	1000	1372.5	1035	1382.0	1078
GR	1382.4	1099	1382.2	1140	1382.0	1179	1386.0	1223		

SB	1.15	1.6	2.6		70	6	600	3		
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X1	1000.4				84	84	84			
X2			1	1379.60	1381.90					
X3	10							1381.90	1381.90	
BT	5	892	1382.40		917	1382.00		1000	1381.90	
BT	1077	1382.00		1098	1382.40					

NC				0.1	0.3					
X1	1002.0	10	914	1080	160	160	160			
GR	1380.2	888	1381.0	898	1384.0	902	1384.0	914	1373.0	958
GR	1373.0	1000	1373.0	1029	1384.0	1080	1384.0	1097	1380.8	1112

X1	1004.0	13	927	1060	200	200	200			
GR	1385.6	888	1385.0	901	1385.0	927	1375.0	958	1374.0	970
GR	1374.0	1000	1374.0	1003	1375.0	1023	1376.0	1033	1385.0	1060
GR	1385.0	1084	1384.0	1095	1385.0	1112				

NC				0.3	0.5					
X1	1006.0	9	927	1073	200	200	200			
GR	1386.5	888	1385.0	916	1385.0	927	1374.5	961	1374.5	1000
GR	1374.5	1039	1385.0	1073	1385.0	1084	1383.0	1112		

Centerline of Travelway and Bridge at Ocotillo Road is at Sta 1008+13.12

X1	1006.8	10	945	1055	80	80	80			
X3	10							1385.00	1385.00	
GR	1384.2	900	1385.0	930	1385.0	945	1374.5	960	1374.5	1000
GR	1374.5	1035	1385.0	1055	1390.0	1075	1390.0	1085	1386.6	1120

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PAGE 3

SB	1.15	1.6	2.6		60	7.5	688.5	2.5		
X1	1009.0				220	220	220			
X2			1	1384.00	1386.40					
X3	10							1386.40	1386.40	
BT	3	778	1386.50		1000	1386.4		1222	1386.50	

X1	1010.0	12	946	1069	100	100	100			
GR	1383.6	888	1383.0	911	1386.0	924	1386.0	946	1377.0	972
GR	1377.0	1000	1376.0	1043	1380.0	1054	1381.0	1060	1385.0	1069
GR	1386.0	1107	1386.0	1112						

NC			0.030	0.1	0.3					
X1	1012.0	14	937	1078	200	200	200			
GR	1383.0	888	1385.0	906	1386.0	910	1386.0	937	1378.0	964
GR	1377.0	971	1376.0	1000	1376.0	1028	1380.0	1045	1382.0	1074
GR	1386.0	1078	1386.0	1094	1383.0	1217	1383.0	1223		

NC			0.032							
X1	1014.0	13	933	1077	200	200	200			
GR	1384.5	888	1385.0	903	1386.0	917	1386.0	933	1377.0	955
GR	1376.8	1000	1377.0	1034	1378.0	1049	1388.0	1077	1389.0	1083

GR	1389.0	1089	1384.0	1105	1383.9	1112				
NC			0.035							
X1	1016.0	14	941	1084	200	200	200			
GR	1385.0	888	1386.0	905	1388.0	913	1388.0	941	1380.0	955
GR	1379.0	962	1378.0	970	1378.0	1000	1378.0	1040	1379.0	1045
GR	1390.0	1084	1390.0	1095	1385.0	1107	1384.8	1112		
X1	1018.0	14	936	1069	200	200	200			
GR	1385.0	888	1388.0	905	1388.0	918	1384.0	936	1383.0	946
GR	1380.0	957	1379.0	964	1378.0	973	1377.3	1000	1378.0	1036
GR	1391.0	1069	1391.0	1078	1385.0	1083	1385.0	1112		
X1	1020.0	17	946	1080	200	200	200			
GR	1385.0	888	1385.0	904	1390.0	920	1389.0	930	1385.0	946
GR	1384.0	955	1381.0	964	1379.0	975	1378.0	994	1378.0	1000
GR	1378.0	1043	1379.0	1048	1380.0	1073	1391.0	1080	1391.0	1089
GR	1386.0	1103	1385.9	1112						
X1	1022.0	27	943	1062	200	200	200			
X3	10							1388.00	1388.00	
GR	1386.5	750	1386.0	763	1385.0	815	1381.6	850	1382.0	878
GR	1382.5	888	1383.0	892	1390.0	905	1390.0	920	1386.0	931
GR	1385.0	943	1379.0	962	1379.0	966	1380.0	983	1380.0	997
GR	1379.5	1000	1379.0	1004	1378.2	1028	1379.0	1050	1388.0	1062
GR	1391.0	1069	1391.0	1078	1387.0	1090	1386.0	1099	1385.5	1112
GR	1386.0	1150	1387.0	1193						

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PAGE 4

X1	1024.0	24	916	1100	200	200	200			
X3	10							1388.00	1388.00	
GR	1384.0	718	1384.0	742	1383.0	782	1380.0	800	1380.0	812
GR	1383.0	833	1387.0	870	1393.0	883	1393.0	894	1386.0	916
GR	1385.0	927	1382.0	936	1381.0	944	1380.0	951	1380.0	966
GR	1381.0	1000	1381.0	1014	1380.0	1024	1381.0	1059	1393.0	1100
GR	1393.0	1109	1387.0	1123	1387.0	1193	1387.5	1250		
X1	1026.0	16	924	1100	200	200	200			
GR	1386.5	855	1392.0	877	1392.0	900	1388.0	913	1387.0	924
GR	1382.0	940	1381.0	966	1380.0	967	1379.9	1000	1380.0	1035
GR	1382.0	1045	1383.0	1066	1392.0	1100	1392.0	1107	1389.0	1117
GR	1388.0	1158								
X1	1028.0	29	908	1104	200	200	200			
X3	10							1388.00	1388.00	
GR	1386.4	670	1386.0	747	1385.0	768	1383.0	785	1385.0	810
GR	1386.0	833	1386.0	864	1387.0	881	1393.0	897	1393.0	908
GR	1385.0	940	1383.0	961	1382.0	978	1381.0	982	1380.3	1000
GR	1380.0	1017	1380.0	1047	1382.0	1057	1384.0	1080	1385.0	1085

GR	1392.0	1104	1393.0	1109	1393.0	1114	1387.0	1128	1387.0	1156
GR	1388.0	1160	1389.0	1168	1389.0	1233	1389.3	1300		
X1	1030.0	28	953	1078	200	200	200			
X3	10							1388.00	1388.00	
GR	1387.0	650	1386.9	700	1386.7	770	1386.0	820	1386.0	828
GR	1386.0	833	1386.0	882	1388.0	893	1393.0	903	1393.0	913
GR	1385.0	953	1383.0	966	1382.0	985	1381.0	990	1380.8	1000
GR	1380.0	1036	1380.0	1045	1383.0	1056	1384.0	1073	1385.0	1078
GR	1395.0	1105	1395.0	1113	1388.0	1128	1387.0	1133	1386.2	1167
GR	1387.0	1208	1388.0	1215	1389.0	1220				

X1	1032.0	19	923	1114	200	200	200			
X3	10							1388.00	1388.00	
GR	1387.4	650	1387.0	780	1386.0	820	1386.0	860	1386.0	864
GR	1385.0	888	1395.0	916	1395.0	923	1384.0	973	1383.0	987
GR	1382.0	998	1382.0	1000	1381.0	1014	1380.9	1034	1381.0	1059
GR	1395.0	1114	1395.0	1124	1390.0	1133	1387.0	1143		

X1	1034.0	12	915	1087	200	200	200			
GR	1388.0	888	1390.0	897	1394.0	908	1394.0	915	1383.0	957
GR	1382.0	966	1382.0	983	1381.6	1000	1382.0	1043	1395.0	1087
GR	1395.0	1100	1390.0	1112						

X1	1036.0	24	914	1103	200	200	200			
X3	10							1390.00	1390.00	
GR	1389.5	670	1389.0	682	1388.7	720	1388.7	800	1388.0	816
GR	1388.0	861	1387.0	886	1395.0	902	1395.0	914	1385.0	948
GR	1384.0	964	1383.0	967	1382.5	1000	1382.0	1020	1382.0	1035
GR	1384.0	1042	1385.0	1058	1397.0	1103	1397.0	1114	1389.0	1132
GR	1388.0	1139	1387.5	1162	1387.5	1215	1388.0	1265		

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PAGE 5

X1	1038.0	22	928	1067	200	200	200			
X3	10							1390.00	1390.00	
GR	1390.0	600	1389.0	790	1389.0	818	1389.0	850	1389.0	858
GR	1390.0	888	1396.0	901	1396.0	912	1391.0	928	1384.0	942
GR	1383.0	950	1382.7	1000	1383.0	1038	1385.0	1044	1386.0	1056
GR	1388.0	1067	1397.0	1097	1397.0	1107	1390.0	1123	1389.0	1278
GR	1389.0	1302	1390.0	1318						

X1	1040.0	17	928	1069	200	200	200			
GR	1390.0	888	1396.0	914	1396.0	920	1394.0	928	1384.0	950
GR	1383.9	972	1384.0	977	1385.0	988	1384.5	1000	1384.0	1007
GR	1383.0	1035	1383.0	1048	1385.0	1054	1388.0	1069	1398.0	1098
GR	1398.0	1108	1390.0	1123						

X1	1042.0	16	916	1073	200	200	200			
GR	1390.0	844	1391.0	874	1392.0	883	1397.0	897	1397.0	906

GR	1388.0	916	1386.0	923	1385.0	944	1384.0	1000	1383.8	1028
GR	1384.0	1045	1386.0	1054	1387.0	1073	1397.0	1099	1397.0	1108
GR	1391.0	1123								
X1	1044.0	14	944	1076	200	200	200			
GR	1392.0	888	1392.0	894	1398.0	910	1398.0	921	1389.0	944
GR	1387.0	953	1386.0	962	1385.0	965	1384.5	1000	1385.0	1056
GR	1388.0	1076	1397.0	1105	1397.0	1115	1392.0	1132		
X1	1046.0	15	918	1110	200	200	200			
GR	1394.0	883	1401.0	903	1401.0	918	1388.0	954	1386.0	968
GR	1385.0	971	1385.0	988	1385.2	1000	1385.0	1017	1385.0	1025
GR	1386.0	1030	1385.0	1063	1398.0	1110	1398.0	1120	1393.0	1134
X1	1048.0	20	886	1056	200	200	200			
GR	1393.9	833	1394.0	837	1395.0	844	1400.0	854	1402.0	872
GR	1402.0	886	1388.0	926	1388.0	944	1387.0	968	1386.0	971
GR	1385.3	1000	1385.0	1012	1385.0	1025	1387.0	1038	1392.0	1056
GR	1393.0	1065	1398.0	1080	1398.0	1094	1394.0	1100	1391.9	1112
X1	1050.0	16	888	1058	200	200	200			
GR	1395.0	861	1402.0	877	1402.0	888	1390.0	922	1389.0	950
GR	1388.0	982	1387.0	984	1386.3	1000	1387.0	1035	1390.0	1047
GR	1393.0	1058	1394.0	1068	1399.0	1088	1399.0	1102	1395.0	1112
GR	1393.0	1123								
X1	1052.0	25	926	1079	200	200	200			
X3	10							1394.00	1394.00	
GR	1396.0	615	1395.4	700	1395.3	800	1395.6	850	1396.0	860
GR	1396.0	866	1399.0	887	1399.0	898	1394.0	926	1391.0	940
GR	1390.0	954	1387.0	957	1387.0	1000	1388.0	1018	1389.0	1024
GR	1390.0	1034	1393.0	1052	1394.0	1079	1395.0	1112	1397.0	1124
GR	1401.0	1133	1401.0	1143	1396.0	1160	1396.0	1172	1396.5	1275

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PAGE 6

NC			0.032							
X1	1054.0	12	925	1057	200	200	200			
GR	1396.0	894	1403.0	913	1403.0	925	1391.0	963	1390.0	967
GR	1388.0	971	1388.0	1000	1389.0	1026	1395.0	1057	1402.0	1074
GR	1402.0	1082	1396.0	1100						
X1	1056.0	11	955	1087	200	200	200			
GR	1396.3	888	1397.0	933	1397.0	942	1396.0	955	1388.0	957
GR	1387.9	1000	1388.0	1006	1389.0	1027	1404.0	1087	1404.0	1098
GR	1398.0	1112								
NC			0.030							
X1	1058.0	13	950	1090	200	200	200			
GR	1397.0	888	1397.0	925	1403.0	938	1403.0	950	1390.0	972

GR	1389.0	976	1389.0	1000	1389.0	1026	1390.0	1028	1392.0	1047
GR	1405.0	1090	1405.0	1100	1390.0	1112				
NC				0.3	0.5					
X1	1060.0	14	948	1104	200	200	200			
GR	1397.7	888	1398.0	917	1402.0	925	1403.0	944	1403.0	948
GR	1390.0	987	1389.9	1000	1390.0	1012	1391.0	1018	1392.0	1039
GR	1394.0	1056	1405.0	1104	1405.0	1113	1399.0	1238		

NC 0.028  
Centerline of Travelway and Bridge at Ellsworth Avenue is at Sta 1062+95

X1	1062.2	12	945	1056	220	220	220			
X3	10							1402.00	1402.00	
GR	1397.7	888	1398.0	903	1399.0	916	1401.0	923	1401.0	945
GR	1394.0	961	1391.0	976	1390.2	1000	1391.0	1032	1400.0	1056
GR	1402.0	1067	1402.0	1167						

SB	1.15	1.6	2.6		60	5	830	2.5		
X1	1063.7				150	150	150			
X2			1	1400.50	1403.10					
X3	10							1403.10	1403.10	
BT	3	892	1403.30		1000	1403.10		1100	1403.30	

X1	1064.0	9	935	1074	30	30	30			
GR	1402.4	888	1401.0	935	1392.0	974	1391.7	1000	1392.0	1014
GR	1394.0	1037	1402.0	1074	1402.0	1096	1399.0	1106		

NC			0.030	0.1	0.3					
X1	1066.0	10	964	1092	200	200	200			
GR	1401.0	888	1400.0	964	1392.0	984	1391.0	988	1391.0	1000
GR	1391.0	1017	1395.0	1043	1406.0	1092	1406.0	1102	1400.0	1123

NC			0.032							
X1	1068.0	12	964	1082	200	200	200			
GR	1401.0	894	1401.7	927	1401.0	964	1392.0	988	1391.5	1000
GR	1392.0	1020	1394.0	1040	1406.0	1082	1406.0	1089	1405.0	1099
GR	1401.0	1105	1400.0	1134						

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PAGE 7

NC			0.035							
X1	1070.0	14	965	1078	200	200	200			
GR	1401.0	905	1402.0	907	1402.8	943	1402.0	957	1401.0	965
GR	1393.0	991	1392.4	1000	1393.0	1023	1395.0	1032	1395.0	1039
GR	1406.0	1078	1406.0	1096	1402.0	1103	1401.0	1227		

X1	1072.0	14	936	1047	200	200	200			
GR	1402.0	888	1403.0	905	1404.0	917	1404.0	936	1397.0	967
GR	1395.0	980	1393.0	986	1392.8	1000	1393.0	1020	1398.0	1047
GR	1406.0	1069	1406.0	1087	1402.0	1094	1401.0	1117		

X1	1074.0	15	957	1055	200	200	200			
GR	1402.0	888	1404.0	916	1405.0	931	1405.0	940	1404.0	957
GR	1394.0	981	1393.2	1000	1394.0	1014	1396.0	1043	1398.0	1055
GR	1408.0	1084	1408.0	1089	1407.0	1098	1403.0	1106	1402.0	1114
X1	1076.0	18	960	1045	200	200	200			
GR	1402.0	888	1402.0	900	1403.0	902	1404.0	920	1405.0	933
GR	1405.0	948	1404.0	953	1399.0	960	1396.0	977	1394.0	981
GR	1393.5	1000	1394.0	1014	1399.0	1045	1408.0	1077	1408.0	1085
GR	1407.0	1096	1403.0	1100	1404.0	1112				
X1	1078.0	12	954	1047	200	200	200			
GR	1404.0	888	1405.0	916	1406.0	927	1406.0	954	1395.0	986
GR	1394.5	1000	1395.0	1015	1400.0	1047	1407.0	1077	1407.0	1093
GR	1404.0	1100	1403.0	1109						
X1	1080.0	14	925	1043	200	200	200			
GR	1405.0	888	1406.0	910	1406.0	913	1400.0	925	1398.0	943
GR	1395.0	981	1395.0	1000	1395.0	1008	1396.0	1022	1399.0	1034
GR	1400.0	1043	1408.0	1076	1408.0	1092	1404.0	1103		
X1	1082.0	14	944	1043	200	200	200			
GR	1405.0	877	1407.0	902	1407.0	933	1403.0	944	1399.0	966
GR	1396.0	972	1396.0	1000	1396.0	1014	1400.0	1026	1402.0	1043
GR	1408.0	1065	1408.0	1082	1406.0	1089	1405.0	1112		
X1	1084.0	14	957	1035	200	200	200			
GR	1406.2	888	1407.0	898	1408.0	911	1408.0	935	1401.0	957
GR	1399.0	976	1397.0	984	1397.0	1000	1397.0	1014	1402.0	1035
GR	1409.0	1056	1409.0	1073	1407.0	1078	1406.0	1112		
X1	1086.0	16	967	1045	200	200	200			
GR	1407.0	888	1407.0	900	1408.0	911	1409.0	922	1409.0	951
GR	1403.0	967	1401.0	981	1398.0	985	1397.4	1000	1398.0	1017
GR	1403.0	1045	1410.0	1067	1410.0	1084	1408.0	1089	1407.0	1096
GR	1406.5	1112								

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PAGE 8

X1	1088.0	15	955	1058	200	200	200			
GR	1407.0	877	1408.0	883	1409.0	894	1410.0	902	1410.0	937
GR	1405.0	955	1401.0	980	1399.0	982	1398.1	1000	1399.0	1023
GR	1411.0	1058	1411.0	1073	1408.0	1078	1407.0	1094	1406.9	1112
X1	1090.0	14	935	1058	200	200	200			
GR	1409.0	878	1410.0	898	1411.0	905	1411.0	935	1403.0	963
GR	1401.0	977	1399.0	987	1399.0	1000	1399.0	1010	1400.0	1023
GR	1411.0	1058	1411.0	1076	1408.0	1085	1407.5	1112		

X1	1092.0	13	943	1067	200	200	200			
GR	1410.0	888	1411.0	903	1412.0	921	1412.0	926	1411.0	943
GR	1405.0	946	1400.0	977	1400.0	1000	1400.0	1011	1412.0	1067
GR	1412.0	1084	1409.0	1089	1408.0	1112				
X1	1094.0	11	955	1074	200	200	200			
GR	1410.0	888	1410.0	902	1411.0	952	1410.0	955	1402.0	977
GR	1400.0	1000	1400.0	1005	1401.0	1030	1413.0	1074	1413.0	1093
GR	1409.0	1103								
X1	1096.0	12	953	1076	200	200	200			
GR	1410.0	888	1411.0	946	1411.0	953	1404.0	968	1401.0	985
GR	1401.0	1000	1401.0	1012	1402.0	1032	1414.0	1076	1414.0	1097
GR	1410.0	1103	1409.0	1112						
X1	1098.0	14	938	1078	200	200	200			
GR	1411.0	866	1412.0	922	1412.0	938	1404.0	971	1403.0	986
GR	1402.4	1000	1402.0	1008	1402.0	1029	1403.0	1049	1404.0	1056
GR	1413.0	1078	1413.0	1083	1412.0	1094	1410.0	1107		
X1	1100.0	14	934	1058	200	200	200			
GR	1411.0	866	1412.0	890	1413.0	901	1413.0	934	1405.0	955
GR	1404.0	964	1403.0	983	1403.0	1000	1403.0	1022	1404.0	1033
GR	1414.0	1058	1414.0	1072	1411.0	1079	1410.0	1100		
X1	1102.0	13	940	1067	200	200	200			
GR	1412.0	888	1414.0	911	1415.0	935	1415.0	940	1406.0	955
GR	1405.0	964	1404.0	982	1403.5	1000	1404.0	1028	1414.0	1067
GR	1414.0	1085	1411.0	1092	1410.9	1112				
X1	1104.0	15	943	1056	200	200	200			
GR	1414.0	877	1414.0	888	1414.0	908	1415.0	916	1415.0	943
GR	1406.0	966	1405.0	976	1404.0	988	1403.4	1000	1404.0	1031
GR	1409.0	1056	1415.0	1074	1415.0	1089	1412.0	1097	1411.0	1112
X1	1106.0	16	944	1052	200	200	200			
GR	1414.0	883	1414.0	910	1415.0	920	1415.0	932	1414.0	944
GR	1406.0	966	1405.0	977	1404.1	1000	1405.0	1018	1409.0	1052
GR	1417.0	1073	1417.0	1076	1416.0	1087	1413.0	1094	1412.0	1106
GR	1411.8	1112								

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PAGE 9

X1	1108.0	14	946	1060	200	200	200			
GR	1414.0	888	1414.0	910	1415.0	915	1415.0	946	1407.0	967
GR	1406.0	976	1405.0	981	1404.0	1000	1405.0	1014	1414.0	1060
GR	1416.0	1067	1416.0	1083	1413.0	1089	1412.0	1112		
X1	1110.0	15	936	1067	200	200	200			
GR	1414.0	877	1414.0	886	1415.0	901	1416.0	911	1416.0	936

GR	1406.0	968	1406.0	1000	1406.0	1008	1410.0	1043	1418.0	1067
GR	1418.0	1073	1417.0	1084	1414.0	1090	1413.0	1104	1412.8	1112
X1	1112.0	13	944	1045	200	200	200			
GR	1414.0	873	1414.0	883	1415.0	904	1416.0	916	1416.0	944
GR	1406.0	972	1406.0	1000	1406.0	1013	1411.0	1045	1418.0	1069
GR	1418.0	1089	1414.0	1099	1413.0	1117				
X1	1114.0	15	945	1045	200	200	200			
GR	1414.5	888	1415.0	894	1415.0	901	1416.0	927	1417.0	935
GR	1417.0	945	1410.0	967	1407.0	991	1406.5	1000	1407.0	1023
GR	1411.0	1045	1419.0	1064	1419.0	1089	1415.0	1098	1414.0	1112
X1	1116.0	17	944	1075	200	200	200			
GR	1415.0	872	1415.0	902	1416.0	905	1417.0	924	1418.0	942
GR	1418.0	944	1411.0	963	1409.0	974	1408.0	977	1408.0	1000
GR	1408.0	1003	1410.0	1029	1419.0	1075	1420.0	1082	1420.0	1090
GR	1416.0	1100	1415.0	1112						
X1	1118.0	18	951	1066	200	200	200			
GR	1415.8	888	1416.0	894	1416.0	900	1416.0	902	1417.0	905
GR	1417.0	913	1416.0	951	1411.0	956	1410.0	984	1409.0	987
GR	1408.6	1000	1409.0	1011	1414.0	1059	1415.0	1066	1420.0	1080
GR	1420.0	1100	1416.0	1109	1416.0	1112				
X1	1120.0	15	950	1065	200	200	200			
GR	1417.0	888	1417.0	894	1418.0	933	1419.0	944	1419.0	950
GR	1412.0	966	1410.0	977	1409.0	988	1409.0	1000	1409.0	1011
GR	1416.0	1065	1421.0	1078	1421.0	1085	1420.0	1102	1417.0	1112

Centerline of Travelway and Ford at Crismon Road is at Sta 1121+80

X1	1122.0	10	894	1044	200	200	200			
GR	1418.0	866	1418.0	894	1414.0	916	1410.0	986	1410.0	1000
GR	1410.0	1016	1417.0	1044	1421.0	1097	1421.0	1225	1419.0	1256
X1	1124.0	14	926	1053	200	200	200			
GR	1419.8	888	1420.0	901	1421.0	923	1421.0	926	1415.0	950
GR	1413.0	951	1412.0	954	1411.0	987	1410.6	1000	1411.0	1022
GR	1421.0	1053	1421.0	1080	1420.0	1092	1419.8	1112		
X1	1126.0	12	936	1064	200	200	200			
GR	1419.8	888	1420.0	895	1421.0	912	1421.0	936	1413.0	964
GR	1412.4	1000	1413.0	1035	1422.0	1064	1422.0	1068	1421.0	1089
GR	1420.0	1100	1419.8	1112						

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PAGE 10

X1	1128.0	11	927	1066	200	200	200			
GR	1420.0	866	1421.0	893	1423.0	911	1423.0	927	1415.0	956
GR	1413.0	966	1412.9	1000	1413.0	1033	1415.0	1047	1421.0	1066

GR	1421.0	1128								
X1	1130.0	12	928	1065	200	200	200			
GR	1421.0	838	1421.0	886	1423.0	910	1423.0	928	1415.0	955
GR	1414.0	960	1414.0	1000	1414.0	1008	1415.0	1045	1422.0	1065
GR	1422.0	1089	1421.7	1112						
X1	1132.0	13	938	1068	200	200	200			
GR	1422.0	842	1422.0	894	1424.0	911	1424.0	938	1415.0	961
GR	1414.0	1000	1414.0	1005	1415.0	1017	1415.0	1039	1423.0	1068
GR	1423.0	1087	1422.0	1099	1422.0	1110				
X1	1134.0	11	926	1069	200	200	200			
GR	1422.5	888	1425.0	902	1425.0	926	1415.0	964	1414.6	1000
GR	1415.0	1035	1416.0	1043	1424.0	1069	1424.0	1089	1423.0	1099
GR	1422.8	1112								
X1	1136.0	17	928	1072	200	200	200			
GR	1423.0	868	1423.0	901	1424.0	914	1425.0	921	1426.0	928
GR	1419.0	946	1418.0	953	1416.0	974	1415.0	994	1415.0	1000
GR	1415.0	1007	1416.0	1018	1417.0	1045	1425.0	1072	1425.0	1089
GR	1424.0	1098	1424.0	1183						
X1	1138.0	14	952	1075	200	200	200			
GR	1425.0	872	1425.0	907	1426.0	933	1426.0	952	1420.0	971
GR	1417.0	988	1416.0	1000	1416.0	1013	1416.0	1022	1417.0	1072
GR	1427.0	1075	1426.0	1099	1425.0	1109	1424.6	1163		
X1	1140.0	16	944	1063	200	200	200			
GR	1426.0	877	1427.0	901	1428.0	916	1428.0	927	1422.0	944
GR	1420.0	954	1418.0	977	1417.0	983	1416.7	1000	1417.0	1016
GR	1418.0	1023	1420.0	1038	1426.0	1063	1426.0	1080	1425.0	1095
GR	1425.0	1134								
X1	1142.0	17	918	1069	200	200	200			
GR	1426.0	855	1426.0	872	1427.0	903	1428.0	907	1428.0	918
GR	1420.0	955	1418.0	976	1417.0	984	1416.9	1000	1417.0	1016
GR	1418.0	1024	1419.0	1043	1427.0	1069	1427.0	1087	1426.0	1099
GR	1425.0	1107	1425.0	1112						
X1	1144.0	17	922	1043	200	200	200			
GR	1427.0	855	1428.0	865	1428.0	896	1429.0	900	1430.0	906
GR	1430.0	922	1422.0	946	1420.0	960	1418.0	993	1418.0	1000
GR	1418.0	1027	1421.0	1043	1429.0	1065	1429.0	1069	1428.0	1085
GR	1426.0	1100	1426.0	1112						

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PAGE 11

X1	1146.0	17	938	1073	200	200	200			
GR	1428.0	866	1428.0	872	1429.0	888	1430.0	905	1430.0	916

GR	1424.0	938	1421.0	955	1418.0	987	1418.0	993	1418.5	1000
GR	1419.0	1011	1420.0	1034	1421.0	1047	1428.0	1073	1428.0	1095
GR	1427.0	1103	1426.0	1123						
X1	1148.0	17	916	1055	200	200	200			
GR	1428.0	844	1429.0	888	1430.0	898	1430.0	916	1423.0	944
GR	1422.0	954	1422.0	967	1419.0	990	1418.5	1000	1419.0	1016
GR	1420.0	1022	1421.0	1045	1423.0	1055	1428.0	1073	1428.0	1106
GR	1427.0	1122	1427.0	1125						
X1	1150.0	13	926	1095	200	200	200			
GR	1429.5	888	1430.0	912	1430.0	926	1422.0	957	1420.0	987
GR	1419.6	1000	1420.0	1011	1423.0	1034	1424.0	1074	1430.0	1095
GR	1430.0	1106	1429.0	1112	1428.0	1178				
X1	1152.0	16	936	1077	200	200	200			
GR	1429.0	813	1430.0	830	1430.0	838	1429.0	846	1428.0	936
GR	1423.0	950	1422.0	977	1421.0	986	1420.5	1000	1420.5	1022
GR	1421.0	1040	1431.0	1077	1431.0	1090	1429.0	1100	1429.0	1104
GR	1430.0	1186								
X1	1154.0	18	920	1054	200	200	200			
GR	1430.0	872	1429.0	881	1429.0	910	1430.0	914	1430.0	920
GR	1424.0	935	1423.0	944	1423.0	980	1422.0	984	1421.1	1000
GR	1422.0	1014	1423.0	1034	1424.0	1038	1430.0	1054	1431.0	1064
GR	1431.0	1074	1430.0	1078	1430.0	1134				
X1	1156.0	14	930	1078	200	200	200			
GR	1430.0	823	1430.0	923	1428.0	930	1424.0	950	1423.0	966
GR	1422.0	988	1422.0	1000	1422.0	1018	1423.0	1039	1424.0	1047
GR	1433.0	1078	1433.0	1089	1431.0	1100	1431.0	1189		
X1	1158.0	16	955	1079	200	200	200			
GR	1430.0	833	1429.7	944	1429.0	955	1422.0	977	1421.0	990
GR	1421.0	1000	1422.0	1006	1423.0	1045	1424.0	1070	1426.0	1079
GR	1431.0	1094	1434.0	1107	1434.0	1118	1433.0	1128	1431.0	1145
GR	1431.0	1167								
X1	1160.0	16	931	1054	200	200	200			
GR	1430.3	888	1430.0	931	1425.0	947	1424.6	966	1423.0	988
GR	1422.1	1000	1423.0	1005	1424.0	1010	1425.0	1022	1425.0	1038
GR	1428.0	1054	1435.0	1073	1435.0	1079	1433.0	1092	1432.0	1139
GR	1432.0	1162								
X1	1162.0	15	916	1048	200	200	200			
GR	1432.0	866	1431.0	888	1432.0	912	1432.0	913	1431.0	916
GR	1427.0	927	1426.0	933	1426.0	980	1425.0	987	1424.5	1000
GR	1425.0	1016	1426.0	1026	1434.0	1048	1434.0	1106	1433.0	1112

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X1	1164.0	9	916	1073	200	200	200			
GR	1433.0	853	1433.0	916	1430.0	935	1426.0	963	1425.0	1000
GR	1426.0	1038	1427.0	1054	1434.0	1073	1434.5	1167		
X1	1166.0	15	943	1080	200	200	200			
GR	1433.0	850	1433.0	905	1434.0	917	1434.0	926	1433.0	933
GR	1433.0	938	1434.0	943	1426.0	972	1426.0	1000	1426.0	1013
GR	1425.8	1034	1426.0	1052	1427.0	1056	1435.0	1080	1435.0	1265
X1	1168.0	15	935	1079	200	200	200			
GR	1433.7	833	1433.7	902	1434.0	922	1435.0	930	1435.0	932
GR	1434.0	935	1431.0	950	1429.0	964	1428.0	977	1427.0	997
GR	1427.0	1000	1426.8	1033	1427.0	1058	1435.0	1079	1435.8	1223
X1	1170.0	9	933	1079	200	200	200			
GR	1434.0	844	1435.0	923	1435.0	933	1429.0	963	1428.0	972
GR	1427.3	1000	1428.0	1047	1436.0	1079	1436.0	1200		
X1	1172.0	13	922	1069	200	200	200			
GR	1434.6	844	1435.0	901	1436.0	913	1436.0	922	1429.0	953
GR	1428.0	991	1428.0	1000	1428.0	1011	1429.0	1053	1436.0	1069
GR	1437.0	1084	1437.0	1093	1436.6	1200				
X1	1174.0	12	894	1080	200	200	200			
GR	1435.0	794	1435.0	894	1433.0	903	1430.0	945	1429.0	972
GR	1429.0	994	1429.0	1000	1428.7	1038	1429.0	1054	1436.0	1080
GR	1436.9	1147	1437.0	1199						
X1	1176.0	13	897	1112	200	200	200			
GR	1435.0	800	1436.0	892	1436.0	895	1435.0	897	1432.0	906
GR	1430.0	931	1429.0	977	1429.0	1000	1429.0	1011	1430.0	1085
GR	1438.0	1112	1438.0	1123	1437.0	1234				
X1	1178.0	14	866	1080	200	200	200			
GR	1440.0	844	1439.0	866	1431.0	934	1431.0	997	1431.0	1000
GR	1430.0	1011	1430.4	1023	1430.4	1034	1430.0	1045	1430.0	1057
GR	1439.0	1080	1439.0	1085	1438.0	1095	1437.8	1123		
X1	1180.0	12	892	1120	200	200	200			
GR	1438.0	837	1439.0	865	1440.0	883	1440.0	892	1433.0	933
GR	1432.0	977	1431.0	983	1431.0	1000	1431.0	1056	1441.0	1120
GR	1441.0	1127	1438.0	1145						
X1	1182.0	14	881	1084	200	200	200			
GR	1439.0	855	1440.0	867	1440.0	881	1436.0	892	1434.0	915
GR	1433.0	955	1432.0	978	1432.0	1000	1432.0	1061	1441.0	1084
GR	1441.0	1085	1440.0	1100	1438.0	1107	1437.0	1165		

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X1	1184.0	13	878	1089	200	200	200			
GR	1439.0	766	1440.0	861	1440.0	878	1437.0	893	1435.0	911
GR	1434.0	977	1433.0	994	1433.0	1000	1432.8	1038	1433.0	1066
GR	1441.0	1089	1441.0	1102	1440.0	1225				

X1	1186.0	15	891	1078	200	200	200			
GR	1440.0	861	1441.0	866	1442.0	875	1442.0	886	1441.0	891
GR	1435.0	913	1434.0	922	1433.0	964	1433.1	1000	1433.0	1044
GR	1434.0	1059	1439.0	1078	1440.0	1103	1440.4	1156	1440.0	1214

X1	1188.0	14	888	1112	200	200	200			
GR	1441.0	855	1442.0	871	1442.0	877	1441.0	888	1436.0	915
GR	1435.0	945	1434.0	957	1434.0	1000	1434.0	1020	1435.0	1050
GR	1436.0	1080	1441.0	1112	1442.0	1123	1442.0	1167		

NC			0.032							
X1	1190.0	12	891	1085	200	200	200			
GR	1442.0	866	1443.0	878	1443.0	891	1436.0	937	1435.0	957
GR	1434.3	1000	1435.0	1022	1436.0	1056	1437.0	1068	1441.0	1085
GR	1442.0	1098	1442.0	1136						

NC			0.030							
X1	1192.0	13	888	1106	200	200	200			
GR	1442.0	833	1443.0	866	1443.0	888	1437.0	935	1436.0	948
GR	1435.2	977	1436.0	994	1436.0	1000	1436.0	1038	1437.0	1083
GR	1442.0	1106	1443.0	1115	1443.0	1173				

NC			0.3		0.5					
X1	1194.0	15	886	1098	200	200	200			
GR	1442.0	854	1443.0	866	1443.0	868	1442.0	886	1438.0	913
GR	1437.0	938	1436.0	988	1436.0	1000	1436.2	1011	1437.0	1056
GR	1438.0	1086	1441.0	1098	1442.0	1106	1443.0	1120	1443.0	1239

Centerline of Travelway and Bridge at Rittenhouse Road is at Sta 1195+80

X1	1195.4	10	920	1090	140	140	140			
X3	10							1448.00	1448.00	
GR	1449.8	777	1450.0	816	1450.7	877	1450.5	920	1436.8	935
GR	1436.8	1000	1436.8	1065	1450.5	1090	1450.0	1173	1449.5	1223

SB	1.15	1.6	2.6		130	2.6	1455	1.5		
X1	1196.2				80	80	80			
X2		1	1447.00	1450.50						
X3	10							1450.50	1450.50	
BT	3	978	1450.70		1000	1450.50		1131	1450.40	

NC			0.028							
Centerline of Railroad Tracks and Bridge at SPRR is at Sta 1197+30										
X1	1197.1	7	883	1094	90	90	90			
X3	10							1447.00	1447.00	
GR	1450.3	800	1450.0	883	1436.8	910	1436.8	1000	1436.8	1080
GR	1450.0	1094	1450.3	1212						

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SB	1.15	1.6	2.6		178	5	1676	1		
X1	1197.5				40	40	40			
X2			1	1446.00	1450.00					
X3	10							1450.00	1450.00	
BT	3	984	1450.00		1000	1450.00		1094	1450.00	
NC			0.030							
X1	1198.0	17	877	1092	50	50	50			
GR	1450.0	777	1450.0	822	1443.0	877	1442.0	910	1439.0	933
GR	1438.0	944	1437.0	953	1437.0	961	1438.0	972	1438.0	1000
GR	1438.0	1005	1437.6	1023	1437.0	1062	1437.0	1075	1444.0	1092
GR	1444.0	1096	1440.0	1123						
NC			0.032	0.1	0.3					
X1	1200.0	23	916	1123	200	200	200			
X3	10							1442.00	1442.00	
GR	1445.0	710	1444.0	765	1444.0	780	1444.0	825	1444.0	835
GR	1444.0	887	1445.0	893	1445.0	895	1442.0	903	1442.0	906
GR	1443.0	911	1443.0	916	1439.0	927	1439.0	961	1438.0	977
GR	1437.5	1000	1438.0	1016	1439.0	1109	1444.0	1123	1440.0	1138
GR	1440.0	1143	1445.0	1156	1445.0	1192				

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SECNO	DEPTH	CWSEL	CRISW	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

\*PROF 1

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CCHV= .100 CEHV= .300  
 \*SECNO 990.300

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1378.00 ELREA= 1378.00

990.300	6.40	1376.00	.00	1376.00	1376.79	.79	.00	.00	1377.00
3010.0	.0	3010.0	.0	.0	422.5	.0	.0	.0	1381.00
.00	.00	7.12	.00	.000	.032	.000	.000	1369.60	946.50
.003266	0.	0.	0.	0	0	0	.00	94.36	1040.86

\*SECNO 992.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1378.00 ELREA= 1378.00									
992.000	6.66	1376.66	.00	.00	1377.24	.58	.43	.02	1376.00
3010.0	.0	3010.0	.0	.0	491.5	.0	1.8	.4	1383.00
.01	.00	6.12	.00	.000	.032	.000	.000	1370.00	944.00
.001969	172.	172.	172.	2	0	0	.00	94.08	1038.08

\*SECNO 994.000

3280 CROSS SECTION 994.00 EXTENDED .07 FEET

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1378.00 ELREA= 1378.00									
994.000	6.07	1377.07	.00	.00	1377.65	.58	.41	.00	1378.00
3010.0	.0	3010.0	.0	.0	494.6	.0	4.1	.8	1381.00
.02	.00	6.09	.00	.000	.032	.000	.000	1371.00	941.15
.002126	200.	200.	200.	2	0	0	.00	101.52	1042.67

\*SECNO 996.000

3265 DIVIDED FLOW

3280 CROSS SECTION 996.00 EXTENDED .23 FEET									
996.000	5.73	1377.33	.00	.00	1378.34	1.02	.56	.13	1379.00
3010.0	.0	3009.5	.5	.0	371.5	1.0	6.1	1.3	1377.00
.02	.00	8.10	.55	.000	.030	.040	.000	1371.60	957.35
.003920	200.	200.	200.	2	0	0	.00	94.85	1112.00

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SECNO	DEPTH	CWSEL	CRISW	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

CCHV= .300 CEHV= .500

\*SECNO 998.000

3265 DIVIDED FLOW

3280 CROSS SECTION 998.00 EXTENDED .04 FEET

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.46

998.000	6.43	1378.43	.00	.00	1379.00	.57	.52	.14	1379.00
3010.0	.0	3010.0	.0	.0	497.8	.0	8.1	1.7	1386.00
.03	.02	6.05	.00	.040	.030	.000	.000	1372.00	888.00
.001829	200.	200.	200.	2	0	0	.00	102.16	1046.23

\*SECNO 999.600

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1380.00 ELREA= 1380.00

999.600	6.42	1378.92	.00	.00	1379.28	.36	.22	.06	1382.00
3010.0	.0	3010.0	.0	.0	628.5	.0	10.2	2.2	1382.00
.04	.00	4.79	.00	.000	.028	.000	.000	1372.50	938.00
.000970	166.	166.	166.	1	0	0	.00	126.03	1064.03

SPECIAL BRIDGE

5070, VARIABLE ELCHU OR ELCHD ON SB CARD NOT SPECIFIED

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
1.15	1.60	2.60	.00	70.00	6.00	600.00	3.00	1372.50	1372.50	

\*SECNO 1000.400

CLASS A LOW FLOW

3420 BRIDGE W.S.= 1378.84 BRIDGE VELOCITY= 5.72 CALCULATED CHANNEL AREA= 526.

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
.00	1379.33	.06	0.	3010.	600.	606.	1379.60	1381.90	0.

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SECNO	DEPTH	CWSEL	CRISW	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1381.90 ELREA= 1381.90

1000.400	6.48	1378.98	.00	.00	1379.33	.35	.05	.00	1382.00
3010.0	.0	3010.0	.0	.0	637.2	.0	11.4	2.4	1382.00
.05	.00	4.72	.00	.000	.028	.000	.000	1372.50	937.71

.000933 84. 84. 84. 0 0 0 .00 126.62 1064.33

CCHV= .100 CEHV= .300

\*SECNO 1002.000  
 1002.000 6.11 1379.11 .00 .00 1379.51 .40 .16 .02 1384.00  
 3010.0 .0 3010.0 .0 .0 595.0 .0 13.7 2.9 1384.00  
 .06 .00 5.06 .00 .000 .028 .000 .000 1373.00 933.56  
 .001137 160. 160. 160. 2 0 0 .00 123.77 1057.33

\*SECNO 1004.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .59

1004.000 5.11 1379.11 .00 .00 1380.02 .91 .36 .15 1385.00  
 3010.0 .0 3010.0 .0 .0 393.3 .0 16.0 3.4 1385.00  
 .06 .00 7.65 .00 .000 .028 .000 .000 1374.00 945.25  
 .003277 200. 200. 200. 2 0 0 .00 97.09 1042.34

CCHV= .300 CEHV= .500

\*SECNO 1006.000

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.50

1006.000 5.58 1380.08 .00 .00 1380.57 .49 .42 .13 1385.00  
 3010.0 .0 3010.0 .0 .0 535.5 .0 18.1 3.9 1385.00  
 .07 .00 5.62 .00 .000 .028 .000 .000 1374.50 942.95  
 .001456 200. 200. 200. 3 0 0 .00 114.11 1057.05

\*SECNO 1006.800

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SECNO	DEPTH	CWSEL	CRISW	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1385.00 ELREA= 1385.00

1006.800 5.64 1380.14 .00 .00 1380.76 .62 .13 .07 1385.00  
 3010.0 .0 3010.0 .0 .0 475.7 .0 19.0 4.0 1385.00  
 .08 .00 6.33 .00 .000 .028 .000 .000 1374.50 951.95

.001705 80. 80. 80. 2 0 0 .00 93.79 1045.74

SPECIAL BRIDGE

5070, VARIABLE ELCHU OR ELCHD ON SB CARD NOT SPECIFIED

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	1.15	1.60	2.60	.00	60.00	7.50	688.50	2.50	1374.50	1374.50

\*SECNO 1009.000  
CLASS A LOW FLOW

3420 BRIDGE W.S.= 1379.73 BRIDGE VELOCITY= 8.78 CALCULATED CHANNEL AREA= 343.

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
.00	1380.94	.24	0.	3010.	689.	724.	1384.00	1386.40	0.

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1386.40 ELREA= 1386.40

1009.000	5.88	1380.38	.00	.00	1380.94	.57	.19	.00	1385.00
3010.0	.0	3010.0	.0	.0	498.5	.0	21.5	4.5	1385.00
.09	.00	6.04	.00	.000	.028	.000	.000	1374.50	951.60
.001477	220.	220.	220.	0	0	0	.00	94.60	1046.20

\*SECNO 1010.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

1010.000	4.30	1380.30	1380.30	.00	1381.89	1.60	.29	.52	1386.00
3010.0	.0	3010.0	.0	.0	296.8	.0	22.4	4.7	1385.00
.09	.00	10.14	.00	.000	.028	.000	.000	1376.00	962.48
.007952	100.	100.	100.	3	15	0	.00	93.30	1055.78

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SECNO	DEPTH	CWSEL	CRISW	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

CCHV= .100 CEHV= .300

\*SECNO 1012.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.91

1012.000	6.21	1382.21	.00	.00	1382.75	.54	.75	.11	1386.00
3010.0	.0	3010.0	.0	.0	510.4	.0	24.2	5.2	1386.00
.10	.00	5.90	.00	.000	.030	.000	.000	1376.00	949.75
.002190	200.	200.	200.	2	0	0	.00	124.47	1074.22

\*SECNO 1014.000

1014.000	5.93	1382.73	.00	.00	1383.11	.38	.34	.02	1386.00
3010.0	.0	3010.0	.0	.0	610.6	.0	26.8	5.8	1388.00
.11	.00	4.93	.00	.000	.032	.000	.000	1376.80	940.99
.001334	200.	200.	200.	2	0	0	.00	121.26	1062.25

\*SECNO 1016.000

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .62

1016.000	4.94	1382.94	.00	.00	1383.60	.66	.41	.08	1388.00
3010.0	.0	3010.0	.0	.0	462.8	.0	29.3	6.3	1390.00
.12	.00	6.50	.00	.000	.035	.000	.000	1378.00	949.85
.003484	200.	200.	200.	2	0	0	.00	109.12	1058.97

\*SECNO 1018.000

1018.000	6.37	1383.67	.00	.00	1384.18	.52	.57	.01	1384.00
3010.0	.0	3010.0	.0	.0	521.7	.0	31.5	6.8	1391.00
.13	.00	5.77	.00	.000	.035	.000	.000	1377.30	939.32
.002394	200.	200.	200.	2	0	0	.00	111.07	1050.39

\*SECNO 1020.000

1020.000	6.22	1384.22	.00	.00	1384.57	.36	.37	.02	1385.00
3010.0	.0	3010.0	.0	.0	627.3	.0	34.2	7.4	1391.00
.14	.00	4.80	.00	.000	.035	.000	.000	1378.00	953.06
.001498	200.	200.	200.	2	0	0	.00	122.63	1075.68

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SECNO	DEPTH	CWSEL	CRISW	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

\*SECNO 1022.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=					1388.00	ELREA=	1388.00		
1022.000	6.29	1384.49	.00	.00	1384.97	.48	.36	.04	1385.00
3010.0	.0	3010.0	.0	.0	543.5	.0	36.9	7.9	1388.00
.15	.00	5.54	.00	.000	.035	.000	.000	1378.20	944.62
.002157	200.	200.	200.	2	0	0	.00	112.70	1057.32

\*SECNO 1024.000

3280 CROSS SECTION 1024.00 EXTENDED 1.01 FEET

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=					1388.00	ELREA=	1388.00		
1024.000	5.01	1385.01	.00	.00	1385.42	.41	.44	.01	1386.00
3010.0	.0	3010.0	.0	.0	588.4	.0	39.5	8.5	1393.00
.16	.00	5.12	.00	.000	.035	.000	.000	1380.00	926.88
.002286	200.	200.	200.	2	0	0	.00	145.82	1072.70

\*SECNO 1026.000

1026.000	5.57	1385.47	.00	.00	1385.84	.36	.42	.00	1387.00
3010.0	.0	3010.0	.0	.0	622.1	.0	42.2	9.2	1392.00
.17	.00	4.84	.00	.000	.035	.000	.000	1379.90	928.88
.001914	200.	200.	200.	2	0	0	.00	146.47	1075.35

\*SECNO 1028.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=					1388.00	ELREA=	1388.00		
1028.000	5.87	1385.87	.00	.00	1386.25	.38	.41	.01	1393.00
3010.0	.0	3010.0	.0	.0	605.1	.0	45.1	9.9	1392.00
.18	.00	4.97	.00	.000	.035	.000	.000	1380.00	936.53
.002171	200.	200.	200.	2	0	0	.00	150.82	1087.35

\*SECNO 1030.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=					1388.00	ELREA=	1388.00		
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SECNO	DEPTH	CWSEL	CRISW	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA

SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
1030.000	6.26	1386.26	.00	.00	1386.72	.46	.44	.02	1385.00
3010.0	.0	3010.0	.0	.0	554.5	.0	47.7	10.5	1385.00
.19	.00	5.43	.00	.000	.035	.000	.000	1380.00	953.00
.002261	200.	200.	200.	1	0	0	.00	125.00	1078.00

\*SECNO 1032.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=				1388.00 ELREA=		1388.00			
1032.000	5.81	1386.71	.00	.00	1387.24	.54	.50	.02	1395.00
3010.0	.0	3010.0	.0	.0	512.7	.0	50.2	11.1	1395.00
.20	.00	5.87	.00	.000	.035	.000	.000	1380.90	960.72
.002814	200.	200.	200.	0	0	0	.00	120.69	1081.40

\*SECNO 1034.000

1034.000	5.68	1387.28	.00	.00	1387.76	.48	.51	.01	1394.00
3010.0	.0	3010.0	.0	.0	544.0	.0	52.6	11.6	1395.00
.21	.00	5.53	.00	.000	.035	.000	.000	1381.60	940.65
.002304	200.	200.	200.	2	0	0	.00	120.23	1060.88

\*SECNO 1036.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=				1390.00 ELREA=		1390.00			
1036.000	5.77	1387.77	.00	.00	1388.25	.48	.49	.00	1395.00
3010.0	.0	3010.0	.0	.0	540.5	.0	55.1	12.2	1397.00
.22	.00	5.57	.00	.000	.035	.000	.000	1382.00	938.59
.002602	200.	200.	200.	2	0	0	.00	129.78	1068.38

\*SECNO 1038.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=				1390.00 ELREA=		1390.00			
1038.000	5.61	1388.31	.00	.00	1388.69	.38	.43	.01	1391.00
3010.0	.0	3010.0	.0	.0	611.7	.0	57.7	12.8	1388.00
.23	.00	4.92	.00	.000	.035	.000	.000	1382.70	933.38
.001795	200.	200.	200.	2	0	0	.00	133.62	1067.00

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SECNO	DEPTH	CWSEL	CRISW	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV

TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
*SECNO 1040.000									
1040.000	5.67	1388.67	.00	.00	1389.12	.46	.41	.02	1394.00
3010.0	.0	3009.5	.5	.0	553.9	.6	60.4	13.4	1388.00
.25	.00	5.43	.84	.000	.035	.040	.000	1383.00	939.73
.002395	200.	200.	200.	2	0	0	.00	131.20	1070.93
*SECNO 1042.000									
1042.000	5.42	1389.22	.00	.00	1389.51	.30	.37	.02	1388.00
3010.0	.7	2999.9	9.4	.8	686.7	6.4	63.3	14.1	1387.00
.26	.84	4.37	1.47	.040	.035	.040	.000	1383.80	914.65
.001487	200.	200.	200.	2	0	0	.00	164.12	1078.77
*SECNO 1044.000									
1044.000	4.98	1389.48	.00	.00	1389.95	.48	.39	.05	1389.00
3010.0	.2	3004.5	5.3	.3	541.8	3.5	66.1	14.8	1388.00
.27	.70	5.55	1.51	.040	.035	.040	.000	1384.50	942.78
.002613	200.	200.	200.	2	0	0	.00	137.98	1080.76
*SECNO 1046.000									
1046.000	5.00	1390.00	.00	.00	1390.48	.47	.52	.00	1401.00
3010.0	.0	3010.0	.0	.0	544.6	.0	68.6	15.4	1398.00
.28	.00	5.53	.00	.000	.035	.000	.000	1385.00	948.46
.002615	200.	200.	200.	2	0	0	.00	132.63	1081.08
*SECNO 1048.000									
1048.000	5.54	1390.54	.00	.00	1391.10	.56	.60	.03	1402.00
3010.0	.0	3010.0	.0	.0	499.1	.0	71.0	16.0	1392.00
.29	.00	6.03	.00	.000	.035	.000	.000	1385.00	918.77
.003468	200.	200.	200.	1	0	0	.00	131.95	1050.72
*SECNO 1050.000									
1050.000	4.99	1391.29	.00	.00	1392.08	.79	.90	.07	1402.00
3010.0	.0	3010.0	.0	.0	422.0	.0	73.1	16.6	1393.00
.29	.00	7.13	.00	.000	.035	.000	.000	1386.30	918.36
.006138	200.	200.	200.	2	0	0	.00	133.36	1051.72

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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV

TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

\*SECNO 1052.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1394.00 ELREA= 1394.00

1052.000	5.39	1392.39	.00	.00	1393.15	.76	1.07	.00	1394.00
3010.0	.0	3010.0	.0	.0	431.4	.0	75.1	17.2	1394.00
.30	.00	6.98	.00	.000	.035	.000	.000	1387.00	933.53
.004717	200.	200.	200.	2	0	0	.00	114.79	1048.32

\*SECNO 1054.000

1054.000	5.17	1393.17	.00	.00	1394.31	1.14	1.04	.12	1403.00
3010.0	.0	3010.0	.0	.0	351.0	.0	76.9	17.6	1395.00
.31	.00	8.58	.00	.000	.032	.000	.000	1388.00	956.13
.005782	200.	200.	200.	2	0	0	.00	91.41	1047.54

\*SECNO 1056.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.76

1056.000	6.52	1394.42	.00	.00	1394.97	.55	.61	.06	1396.00
3010.0	.0	3010.0	.0	.0	505.7	.0	78.9	18.1	1404.00
.32	.00	5.95	.00	.000	.032	.000	.000	1387.90	955.39
.001868	200.	200.	200.	2	0	0	.00	93.31	1048.70

\*SECNO 1058.000

3265 DIVIDED FLOW

3280 CROSS SECTION 1058.00 EXTENDED 4.72 FEET

1058.000	5.71	1394.71	.00	.00	1395.50	.79	.46	.07	1403.00
3010.0	.0	2994.5	15.5	.0	418.9	8.9	81.0	18.5	1405.00
.33	.00	7.15	1.75	.000	.030	.040	.000	1389.00	964.02
.002845	200.	200.	200.	2	0	0	.00	95.75	1112.00

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SECNO	DEPTH	CWSEL	CRISW	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV

TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

CCHV= .300 CEHV= .500  
 \*SECNO 1060.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .66

1060.000	5.36	1395.26	.00	.00	1396.60	1.34	.83	.28	1403.00
3010.0	.0	3010.0	.0	.0	323.9	.0	82.7	18.9	1405.00
.33	.00	9.29	.00	.000	.030	.000	.000	1389.90	971.21
.006524	200.	200.	200.	2	0	0	.00	90.30	1061.51

\*SECNO 1062.200

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.94

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1402.00 ELREA= 1402.00

1062.200	6.64	1396.84	.00	.00	1397.48	.64	.66	.21	1401.00
3010.0	.0	3010.0	.0	.0	470.0	.0	84.7	19.4	1400.00
.34	.00	6.40	.00	.000	.028	.000	.000	1390.20	954.49
.001729	220.	220.	220.	2	0	0	.00	93.11	1047.60

SPECIAL BRIDGE

5070, VARIABLE ELCHU OR ELCHD ON SB CARD NOT SPECIFIED

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	1.15	1.60	2.60	.00	60.00	5.00	830.00	2.50	1390.20	1390.20

\*SECNO 1063.700

CLASS A LOW FLOW

3420 BRIDGE W.S.= 1396.74 BRIDGE VELOCITY= 6.45 CALCULATED CHANNEL AREA= 466.

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SECNO	DEPTH	CWSEL	CRISW	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA

SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
.00	1397.59	.14	0.	3010.	830.	832.	1400.50	1403.10	0.

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1403.10 ELREA= 1403.10

1063.700	6.79	1396.99	.00	.00	1397.59	.60	.11	.00	1401.00
3010.0	.0	3010.0	.0	.0	482.8	.0	86.4	19.7	1400.00
.35	.00	6.23	.00	.000	.028	.000	.000	1390.20	954.18
.001597	150.	150.	150.	0	0	0	.00	93.79	1047.96

\*SECNO 1064.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .59

1064.000	5.10	1396.80	.00	.00	1397.92	1.12	.08	.26	1401.00
3010.0	.0	3010.0	.0	.0	353.9	.0	86.7	19.8	1402.00
.35	.00	8.50	.00	.000	.028	.000	.000	1391.70	953.18
.004617	30.	30.	30.	2	0	0	.00	96.80	1049.97

CCHV= .100 CEHV= .300

\*SECNO 1066.000

1066.000	6.83	1397.83	.00	.00	1398.67	.84	.71	.03	1400.00
3010.0	.0	3010.0	.0	.0	409.8	.0	88.4	20.2	1406.00
.36	.00	7.34	.00	.000	.030	.000	.000	1391.00	969.41
.002830	200.	200.	200.	2	0	0	.00	86.23	1055.63

\*SECNO 1068.000

1068.000	6.93	1398.43	.00	.00	1399.26	.83	.59	.00	1401.00
3010.0	.0	3010.0	.0	.0	411.8	.0	90.3	20.6	1406.00
.36	.00	7.31	.00	.000	.032	.000	.000	1391.50	970.86
.003097	200.	200.	200.	2	0	0	.00	84.65	1055.50

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SECNO	DEPTH	CWSEL	CRISW	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV

TIME SLOPE	VLOB XLOBL	VCH XLCH	VROB XLOBR	XNL ITRIAL	XNCH IDC	XNR ICONT	WTN CORAR	ELMIN TOPWID	SSTA ENDST
*SECNO 1070.000									
1070.000	6.67	1399.07	.00	.00	1400.11	1.04	.79	.06	1401.00
3010.0	.0	3010.0	.0	.0	367.1	.0	92.1	21.0	1406.00
.37	.00	8.20	.00	.000	.035	.000	.000	1392.40	971.28
.005210	200.	200.	200.	2	0	0	.00	82.15	1053.42

\*SECNO 1072.000

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.51

1072.000	7.45	1400.25	.00	.00	1400.82	.57	.66	.05	1404.00
3010.0	.0	2997.1	12.9	.0	494.7	7.0	94.1	21.4	1398.00
.38	.00	6.06	1.84	.000	.035	.040	.000	1392.80	952.59
.002278	200.	200.	200.	2	0	0	.00	100.61	1053.20

\*SECNO 1074.000

1074.000	7.50	1400.70	.00	.00	1401.26	.56	.44	.00	1404.00
3010.0	.0	2988.8	21.2	.0	498.2	10.6	96.4	21.9	1398.00
.39	.00	6.00	2.00	.000	.035	.040	.000	1393.20	964.91
.002090	200.	200.	200.	2	0	0	.00	97.93	1062.84

\*SECNO 1076.000

1076.000	7.60	1401.10	.00	.00	1401.72	.62	.44	.02	1399.00
3010.0	5.0	2991.0	14.1	3.1	470.4	7.8	98.7	22.3	1399.00
.40	1.61	6.36	1.80	.040	.035	.040	.000	1393.50	957.07
.002333	200.	200.	200.	2	0	0	.00	95.38	1052.45

\*SECNO 1078.000

1078.000	6.99	1401.49	.00	.00	1402.43	.94	.62	.10	1406.00
3010.0	.0	3000.7	9.3	.0	384.3	4.7	100.7	22.7	1400.00
.41	.00	7.81	1.96	.000	.035	.040	.000	1394.50	967.12
.004268	200.	200.	200.	2	0	0	.00	86.26	1053.38

\*SECNO 1080.000

3301 HV CHANGED MORE THAN HVINS

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SECNO Q	DEPTH QLOB	CWSEL QCH	CRISW QROB	WSELK ALOB	EG ACH	HV AROB	HL VOL	OLOSS TWA	L-BANK ELEV R-BANK ELEV
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TIME SLOPE	VLOB XLOBL	VCH XLCH	VROB XLOBR	XNL ITRIAL	XNCH IDC	XNR ICONT	WTN CORAR	ELMIN TOPWID	SSTA ENDST
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3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.06

1080.000	7.57	1402.57	.00	.00	1402.86	.29	.36	.07	1400.00
3010.0	8.6	2982.8	18.7	6.6	687.0	13.6	103.2	23.2	1400.00
.42	1.29	4.34	1.37	.040	.035	.040	.000	1395.00	919.86
.001006	200.	200.	200.	2	0	0	.00	133.76	1053.61

\*SECNO 1082.000

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .50

1082.000	6.59	1402.59	.00	.00	1403.36	.78	.36	.15	1403.00
3010.0	.0	3009.3	.7	.0	425.5	.7	105.8	23.8	1402.00
.43	.00	7.07	1.02	.000	.035	.040	.000	1396.00	946.22
.003948	200.	200.	200.	2	0	0	.00	98.97	1045.19

\*SECNO 1084.000

1084.000	6.28	1403.28	.00	.00	1404.27	.99	.84	.06	1401.00
3010.0	21.6	2984.0	4.4	8.2	372.5	2.5	107.6	24.2	1402.00
.43	2.63	8.01	1.79	.040	.035	.040	.000	1397.00	949.83
.004499	200.	200.	200.	2	0	0	.00	89.02	1038.84

\*SECNO 1086.000

1086.000	6.78	1404.18	.00	.00	1405.26	1.08	.96	.03	1403.00
3010.0	3.3	3002.7	4.0	1.9	359.7	2.2	109.4	24.6	1403.00
.44	1.80	8.35	1.82	.040	.035	.040	.000	1397.40	963.85
.005174	200.	200.	200.	2	0	0	.00	84.86	1048.71

\*SECNO 1088.000

1088.000	7.24	1405.34	.00	.00	1406.19	.85	.91	.02	1405.00
3010.0	.1	3009.9	.0	.2	406.1	.0	111.1	25.0	1411.00
.45	.70	7.41	.00	.040	.035	.000	.000	1398.10	953.78
.004011	200.	200.	200.	2	0	0	.00	87.71	1041.49

\*SECNO 1090.000

1090.000	7.21	1406.21	.00	.00	1406.89	.69	.68	.02	1411.00
3010.0	.0	3010.0	.0	.0	453.2	.0	113.1	25.4	1411.00
.46	.00	6.64	.00	.000	.035	.000	.000	1399.00	951.78
.002952	200.	200.	200.	2	0	0	.00	90.97	1042.75

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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK	ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK	ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA	
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST	
*SECNO 1092.000										
1092.000	6.85	1406.85	.00	.00	1407.47	.62	.57	.01	1411.00	
3010.0	.0	3010.0	.0	.0	478.2	.0	115.2	25.8	1412.00	
.47	.00	6.29	.00	.000	.035	.000	.000	1400.00	945.07	
.002734	200.	200.	200.	2	0	0	.00	97.90	1042.97	
*SECNO 1094.000										
1094.000	7.37	1407.37	.00	.00	1408.01	.64	.54	.01	1410.00	
3010.0	.0	3010.0	.0	.0	469.3	.0	117.4	26.3	1413.00	
.47	.00	6.41	.00	.000	.035	.000	.000	1400.00	962.23	
.002637	200.	200.	200.	2	0	0	.00	91.14	1053.36	
*SECNO 1096.000										
1096.000	6.93	1407.93	.00	.00	1408.52	.59	.50	.01	1411.00	
3010.0	.0	3010.0	.0	.0	489.1	.0	119.6	26.7	1414.00	
.48	.00	6.15	.00	.000	.035	.000	.000	1401.00	959.58	
.002401	200.	200.	200.	2	0	0	.00	94.17	1053.74	
*SECNO 1098.000										
1098.000	6.52	1408.52	.00	.00	1408.96	.44	.42	.02	1412.00	
3010.0	.0	3010.0	.0	.0	567.0	.0	122.0	27.2	1413.00	
.49	.00	5.31	.00	.000	.035	.000	.000	1402.00	952.35	
.001891	200.	200.	200.	2	0	0	.00	114.70	1067.05	
*SECNO 1100.000										
1100.000	5.85	1408.85	.00	.00	1409.47	.62	.46	.05	1413.00	
3010.0	.0	3010.0	.0	.0	476.8	.0	124.4	27.7	1414.00	
.50	.00	6.31	.00	.000	.035	.000	.000	1403.00	944.89	
.002828	200.	200.	200.	2	0	0	.00	100.24	1045.13	
*SECNO 1102.000										
1102.000	5.92	1409.42	.00	.00	1410.11	.69	.62	.02	1415.00	
3010.0	.0	3010.0	.0	.0	451.5	.0	126.6	28.1	1414.00	
.51	.00	6.67	.00	.000	.035	.000	.000	1403.50	949.30	
.003372	200.	200.	200.	2	0	0	.00	99.83	1049.13	

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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
*SECNO 1104.000									
1104.000	6.73	1410.13	.00	.00	1410.68	.56	.56	.01	1415.00
3010.0	.0	3007.7	2.3	.0	502.6	1.9	128.8	28.6	1409.00
.52	.00	5.98	1.19	.000	.035	.040	.000	1403.40	955.45
.002368	200.	200.	200.	2	0	0	.00	103.93	1059.38
*SECNO 1106.000									
1106.000	6.49	1410.59	.00	.00	1411.27	.68	.55	.04	1414.00
3010.0	.0	3004.3	5.7	.0	454.7	3.3	131.0	29.1	1409.00
.53	.00	6.61	1.73	.000	.035	.040	.000	1404.10	953.38
.003205	200.	200.	200.	2	0	0	.00	102.80	1056.17
*SECNO 1108.000									
1108.000	7.19	1411.19	.00	.00	1412.02	.83	.71	.04	1415.00
3010.0	.0	3010.0	.0	.0	412.8	.0	133.0	29.5	1414.00
.54	.00	7.29	.00	.000	.035	.000	.000	1404.00	955.99
.003942	200.	200.	200.	2	0	0	.00	89.67	1045.66
*SECNO 1110.000									
1110.000	6.07	1412.07	.00	.00	1412.77	.69	.73	.01	1416.00
3010.0	.0	3010.0	.0	.0	451.2	.0	135.0	29.9	1418.00
.54	.00	6.67	.00	.000	.035	.000	.000	1406.00	948.56
.003408	200.	200.	200.	2	0	0	.00	100.67	1049.23
*SECNO 1112.000									
1112.000	6.74	1412.74	.00	.00	1413.36	.62	.58	.01	1416.00
3010.0	.0	3001.4	8.6	.0	475.6	5.2	137.1	30.4	1411.00
.55	.00	6.31	1.65	.000	.035	.040	.000	1406.00	953.13
.002523	200.	200.	200.	2	0	0	.00	97.83	1050.96
*SECNO 1114.000									
1114.000	6.72	1413.22	.00	.00	1413.97	.75	.58	.04	1417.00
3010.0	.0	2997.3	12.7	.0	429.5	5.9	139.2	30.8	1411.00
.56	.00	6.98	2.17	.000	.035	.040	.000	1406.50	956.88
.003322	200.	200.	200.	2	0	0	.00	93.39	1050.27

SECNO	DEPTH	CWSEL	CRISW	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
*SECNO 1116.000									
1116.000	5.91	1413.91	.00	.00	1414.83	.92	.81	.05	1418.00
3010.0	.0	3010.0	.0	.0	391.1	.0	141.1	31.3	1419.00
.57	.00	7.70	.00	.000	.035	.000	.000	1408.00	955.10
.004992	200.	200.	200.	2	0	0	.00	93.88	1048.99
*SECNO 1118.000									
1118.000	6.45	1415.05	.00	.00	1415.67	.62	.81	.03	1416.00
3010.0	.0	3010.0	.0	.0	477.4	.0	143.1	31.7	1415.00
.58	.00	6.31	.02	.000	.035	.040	.000	1408.60	951.94
.003354	200.	200.	200.	2	0	0	.00	114.22	1066.16
*SECNO 1120.000									
1120.000	6.69	1415.69	.00	.00	1416.35	.66	.67	.01	1419.00
3010.0	.0	3010.0	.0	.0	461.4	.0	145.2	32.2	1416.00
.59	.00	6.52	.00	.000	.035	.000	.000	1409.00	957.57
.003341	200.	200.	200.	2	0	0	.00	105.01	1062.58
*SECNO 1122.000									
1122.000	6.50	1416.50	.00	.00	1416.87	.38	.49	.03	1418.00
3010.0	.0	3010.0	.0	.0	611.5	.0	147.7	32.8	1417.00
.60	.00	4.92	.00	.000	.035	.000	.000	1410.00	902.26
.001898	200.	200.	200.	2	0	0	.00	139.74	1042.00
*SECNO 1124.000									
1124.000	6.17	1416.77	.00	.00	1417.45	.67	.48	.09	1421.00
3010.0	.0	3010.0	.0	.0	456.6	.0	150.2	33.3	1421.00
.61	.00	6.59	.00	.000	.035	.000	.000	1410.60	942.91
.003163	200.	200.	200.	2	0	0	.00	96.99	1039.90
*SECNO 1126.000									
1126.000	5.02	1417.42	.00	.00	1418.30	.88	.79	.06	1421.00
3010.0	.0	3010.0	.0	.0	400.8	.0	152.1	33.8	1422.00
.61	.00	7.51	.00	.000	.035	.000	.000	1412.40	948.53
.005047	200.	200.	200.	2	0	0	.00	100.71	1049.24

SECNO	DEPTH	CWSEL	CRISW	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

## \*SECNO 1128.000

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.42

1128.000	5.60	1418.50	.00	.00	1419.02	.52	.69	.04	1423.00
3010.0	.0	3010.0	.0	.0	521.7	.0	154.2	34.3	1421.00
.62	.00	5.77	.00	.000	.035	.000	.000	1412.90	943.30
.002491	200.	200.	200.	2	0	0	.00	114.79	1058.09

## \*SECNO 1130.000

1130.000	5.01	1419.01	.00	.00	1419.62	.61	.57	.03	1423.00
3010.0	.0	3010.0	.0	.0	479.7	.0	156.5	34.8	1422.00
.63	.00	6.27	.00	.000	.035	.000	.000	1414.00	941.48
.003304	200.	200.	200.	2	0	0	.00	114.97	1056.45

## \*SECNO 1132.000

1132.000	5.64	1419.64	.00	.00	1420.31	.67	.68	.02	1424.00
3010.0	.0	3010.0	.0	.0	459.4	.0	158.7	35.3	1423.00
.64	.00	6.55	.00	.000	.035	.000	.000	1414.00	949.13
.003465	200.	200.	200.	2	0	0	.00	106.71	1055.84

## \*SECNO 1134.000

1134.000	5.79	1420.39	.00	.00	1420.90	.52	.58	.02	1425.00
3010.0	.0	3010.0	.0	.0	522.4	.0	161.0	35.8	1424.00
.65	.00	5.76	.00	.000	.035	.000	.000	1414.60	943.52
.002452	200.	200.	200.	2	0	0	.00	113.74	1057.27

## \*SECNO 1136.000

1136.000	5.89	1420.89	.00	.00	1421.48	.58	.55	.02	1426.00
3010.0	.0	3010.0	.0	.0	491.1	.0	163.3	36.4	1425.00
.66	.00	6.13	.00	.000	.035	.000	.000	1415.00	941.13
.003119	200.	200.	200.	2	0	0	.00	117.01	1058.14

## \*SECNO 1138.000

1138.000	5.49	1421.49	.00	.00	1422.08	.59	.60	.00	1426.00
3010.0	.0	3010.0	.0	.0	487.8	.0	165.5	36.9	1427.00
.67	.00	6.17	.00	.000	.035	.000	.000	1416.00	966.28
.002934	200.	200.	200.	2	0	0	.00	107.07	1073.35

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SECNO	DEPTH	CWSEL	CRISW	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

\*SECNO 1140.000

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .64

1140.000	5.33	1422.03	.00	.00	1423.09	1.06	.87	.14	1422.00
3010.0	.0	3010.0	.0	.0	364.0	.0	167.5	37.4	1426.00
.67	.03	8.27	.00	.000	.035	.000	.000	1416.70	943.91
.007072	200.	200.	200.	2	0	0	.00	102.55	1046.46

\*SECNO 1142.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.78

1142.000	6.51	1423.41	.00	.00	1423.88	.47	.73	.06	1428.00
3010.0	.0	3010.0	.0	.0	545.7	.0	169.6	37.9	1427.00
.68	.00	5.52	.00	.000	.035	.000	.000	1416.90	939.23
.002225	200.	200.	200.	2	0	0	.00	118.11	1057.33

\*SECNO 1144.000

1144.000	5.82	1423.82	.00	.00	1424.44	.62	.51	.04	1430.00
3010.0	.0	2983.4	26.6	.0	470.6	10.9	171.9	38.4	1421.00
.69	.00	6.34	2.43	.000	.035	.040	.000	1418.00	940.54
.002950	200.	200.	200.	2	0	0	.00	110.22	1050.76

\*SECNO 1146.000

1146.000	6.50	1424.50	.00	.00	1425.00	.50	.55	.01	1424.00
3010.0	.3	3009.7	.0	.5	529.2	.0	174.3	38.9	1428.00
.70	.72	5.69	.00	.040	.035	.000	.000	1418.00	936.18
.002562	200.	200.	200.	2	0	0	.00	123.80	1059.98

\*SECNO 1148.000

1148.000	6.51	1425.01	.00	.00	1425.55	.54	.54	.01	1430.00
3010.0	.0	2995.9	14.1	.0	505.4	7.3	176.6	39.5	1423.00

.71	.00	5.93	1.94	.000	.035	.040	.000	1418.50	935.97
.002862	200.	200.	200.	2	0	0	.00	126.25	1062.23

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SECNO	DEPTH	CWSEL	CRISW	WSELK	EG	HV	HL	OLOSS	L-BANK	ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK	ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA	
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST	

\*SECNO 1150.000

1150.000	6.04	1425.64	.00	.00	1426.22	.59	.66	.01	1430.00
3010.0	.0	3010.0	.0	.0	490.3	.0	178.9	40.1	1430.00
.72	.00	6.14	.00	.000	.035	.000	.000	1419.60	942.90
.003848	200.	200.	200.	2	0	0	.00	136.83	1079.73

\*SECNO 1152.000

1152.000	5.84	1426.34	.00	.00	1426.86	.51	.63	.01	1428.00
3010.0	.0	3010.0	.0	.0	523.2	.0	181.3	40.7	1431.00
.73	.00	5.75	.00	.000	.035	.000	.000	1420.50	940.64
.002592	200.	200.	200.	2	0	0	.00	119.12	1059.77

\*SECNO 1154.000

1154.000	5.77	1426.87	.00	.00	1427.51	.64	.61	.04	1430.00
3010.0	.0	3010.0	.0	.0	468.6	.0	183.5	41.2	1430.00
.74	.00	6.42	.00	.000	.035	.000	.000	1421.10	927.83
.003693	200.	200.	200.	2	0	0	.00	117.81	1045.65

\*SECNO 1156.000

1156.000	5.65	1427.65	.00	.00	1428.12	.47	.59	.02	1428.00
3010.0	.0	3010.0	.0	.0	546.8	.0	185.9	41.8	1433.00
.75	.00	5.51	.00	.000	.035	.000	.000	1422.00	931.75
.002447	200.	200.	200.	2	0	0	.00	127.82	1059.57

\*SECNO 1158.000

1158.000	7.15	1428.15	.00	.00	1428.51	.36	.38	.01	1429.00
3010.0	.0	3000.0	10.0	.0	621.7	6.9	188.6	42.4	1426.00
.76	.00	4.83	1.45	.000	.035	.040	.000	1421.00	957.69
.001483	200.	200.	200.	2	0	0	.00	127.75	1085.44

\*SECNO 1160.000

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .57

1160.000	6.27	1428.37	.00	.00	1429.10	.73	.48	.11	1430.00
3010.0	.0	3009.9	.1	.0	440.2	.2	191.0	43.0	1428.00
.77	.00	6.84	.78	.000	.035	.040	.000	1422.10	936.21
.004527	200.	200.	200.	2	0	0	.00	118.79	1055.01

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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

\*SECNO 1162.000

1162.000	4.81	1429.31	.00	.00	1430.22	.92	1.07	.06	1431.00
3010.0	.0	3010.0	.0	.0	392.1	.0	192.9	43.5	1434.00
.78	.00	7.68	.00	.000	.035	.000	.000	1424.50	920.64
.006419	200.	200.	200.	2	0	0	.00	114.47	1035.11

\*SECNO 1164.000

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.53

1164.000	5.58	1430.58	.00	.00	1431.06	.49	.80	.04	1433.00
3010.0	.0	3010.0	.0	.0	536.5	.0	195.1	44.1	1434.00
.79	.00	5.61	.00	.000	.035	.000	.000	1425.00	931.35
.002730	200.	200.	200.	2	0	0	.00	132.36	1063.71

\*SECNO 1166.000

1166.000	5.28	1431.08	.00	.00	1431.65	.56	.56	.02	1434.00
3010.0	.0	3010.0	.0	.0	500.0	.0	197.5	44.6	1435.00
.80	.00	6.02	.00	.000	.035	.000	.000	1425.80	953.60
.002869	200.	200.	200.	2	0	0	.00	114.63	1068.23

\*SECNO 1168.000

1168.000	4.90	1431.70	.00	.00	1432.33	.63	.66	.02	1434.00
3010.0	.0	3010.0	.0	.0	471.6	.0	199.7	45.2	1435.00
.80	.00	6.38	.00	.000	.035	.000	.000	1426.80	946.52
.003845	200.	200.	200.	2	0	0	.00	123.81	1070.33

\*SECNO 1170.000

1170.000	5.15	1432.45	.00	.00	1433.10	.65	.77	.01	1435.00
3010.0	.0	3010.0	.0	.0	464.9	.0	201.8	45.7	1436.00
.81	.00	6.47	.00	.000	.035	.000	.000	1427.30	945.75

.003822 200. 200. 200. 2 0 0 .00 119.05 1064.80

\*SECNO 1172.000

1172.000 5.26 1433.26 .00 .00 1433.73 .47 .61 .02 1436.00  
3010.0 .0 3010.0 .0 .0 546.4 .0 204.2 46.3 1436.00  
.82 .00 5.51 .00 .000 .035 .000 .000 1428.00 934.15  
.002480 200. 200. 200. 2 0 0 .00 128.58 1062.73

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SECNO	DEPTH	CWSEL	CRISW	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

\*SECNO 1174.000

1174.000 5.16 1433.86 .00 .00 1434.17 .31 .43 .02 1435.00  
3010.0 .0 3010.0 .0 .0 668.4 .0 206.9 47.0 1436.00  
.84 .00 4.50 .00 .000 .035 .000 .000 1428.70 899.15  
.001867 200. 200. 200. 2 0 0 .00 172.89 1072.04

\*SECNO 1176.000

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.40

1176.000 5.26 1434.26 .00 .00 1434.44 .19 .26 .01 1435.00  
3010.0 .0 3010.0 .0 .0 869.0 .0 210.5 47.9 1438.00  
.85 .00 3.46 .00 .000 .035 .000 .000 1429.00 899.23  
.000946 200. 200. 200. 2 0 0 .00 200.13 1099.36

\*SECNO 1178.000

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .50

1178.000 4.37 1434.37 .00 .00 1434.87 .50 .34 .09 1439.00  
3010.0 .0 3010.0 .0 .0 530.0 .0 213.7 48.7 1439.00  
.86 .00 5.68 .00 .000 .035 .000 .000 1430.00 905.34  
.003741 200. 200. 200. 2 0 0 .00 162.84 1068.17

\*SECNO 1180.000

1180.000 4.14 1435.14 .00 .00 1435.68 .54 .80 .01 1440.00  
3010.0 .0 3010.0 .0 .0 508.3 .0 216.1 49.4 1441.00  
.87 .00 5.92 .00 .000 .035 .000 .000 1431.00 920.47  
.004256 200. 200. 200. 2 0 0 .00 162.02 1082.49

\*SECNO 1182.000

1182.000	4.02	1436.02	.00	.00	1436.47	.45	.78	.01	1440.00
3010.0	.0	3010.0	.0	.0	559.2	.0	218.5	50.2	1441.00
.88	.00	5.38	.00	.000	.035	.000	.000	1432.00	891.95
.003552	200.	200.	200.	2	0	0	.00	179.32	1071.27

\*SECNO 1184.000

1184.000	3.97	1436.77	.00	.00	1437.30	.52	.81	.02	1440.00
3010.0	.0	3010.0	.0	.0	518.8	.0	221.0	51.0	1441.00
.89	.00	5.80	.00	.000	.035	.000	.000	1432.80	895.03
.004639	200.	200.	200.	2	0	0	.00	181.82	1076.85

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SECNO	DEPTH	CWSEL	CRISW	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

\*SECNO 1186.000

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.55

1186.000	4.56	1437.56	.00	.00	1437.89	.33	.57	.02	1441.00
3010.0	.0	3010.0	.0	.0	655.9	.0	223.7	51.8	1439.00
.90	.00	4.59	.00	.000	.035	.000	.000	1433.00	903.61
.001928	200.	200.	200.	2	0	0	.00	168.92	1072.53

\*SECNO 1188.000

1188.000	4.00	1438.00	.00	.00	1438.43	.43	.51	.03	1441.00
3010.0	.0	3010.0	.0	.0	572.2	.0	226.5	52.7	1441.00
.91	.00	5.26	.00	.000	.035	.000	.000	1434.00	904.21
.003505	200.	200.	200.	2	0	0	.00	188.57	1092.79

\*SECNO 1190.000

1190.000	4.32	1438.62	.00	.00	1439.23	.61	.75	.05	1443.00
3010.0	.0	3010.0	.0	.0	480.6	.0	228.9	53.5	1441.00
.92	.00	6.26	.00	.000	.032	.000	.000	1434.30	919.76
.004044	200.	200.	200.	2	0	0	.00	155.14	1074.90

\*SECNO 1192.000

1192.000	4.24	1439.44	.00	.00	1439.93	.49	.69	.01	1443.00
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3010.0	.0	3010.0	.0	.0	536.3	.0	231.3	54.2	1442.00
.93	.00	5.61	.00	.000	.030	.000	.000	1435.20	915.85
.002970	200.	200.	200.	2	0	0	.00	178.39	1094.24

CCHV= .300 CEHV= .500

\*SECNO 1194.000

1194.000	4.09	1440.09	.00	.00	1440.49	.40	.53	.03	1442.00
3010.0	.0	3010.0	.0	.0	596.0	.0	233.9	55.1	1441.00
.94	.00	5.05	.00	.000	.030	.000	.000	1436.00	898.87
.002359	200.	200.	200.	2	0	0	.00	195.50	1094.37

\*SECNO 1195.400

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1448.00 ELREA= 1448.00

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SECNO	DEPTH	CWSEL	CRISW	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

1195.400	3.57	1440.37	.00	.00	1440.97	.60	.38	.10	1450.50
3010.0	.0	3010.0	.0	.0	482.3	.0	235.6	55.6	1450.50
.95	.00	6.24	.00	.000	.030	.000	.000	1436.80	931.09
.003131	140.	140.	140.	2	0	0	.00	140.41	1071.51

SPECIAL BRIDGE

5070, VARIABLE ELCHU OR ELCHD ON SB CARD NOT SPECIFIED

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
1.15	1.60	2.60	.00	130.00	2.60	1455.00	1.50	1436.80	1436.80	

\*SECNO 1196.200

CLASS A LOW FLOW

3420 BRIDGE W.S.= 1440.33 BRIDGE VELOCITY= 6.43 CALCULATED CHANNEL AREA= 468.

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
.00	1441.01	.06	0.	3010.	1455.	1456.	1447.00	1450.50	0.

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1450.50 ELREA= 1450.50

1196.200	3.63	1440.43	.00	.00	1441.01	.58	.04	.00	1450.50
3010.0	.0	3010.0	.0	.0	490.7	.0	236.5	55.9	1450.50
.95	.00	6.13	.00	.000	.030	.000	.000	1436.80	931.03
.002961	80.	80.	80.	0	0	0	.00	140.59	1071.62

\*SECNO 1197.100

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.78

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1447.00 ELREA= 1447.00

1197.100	4.19	1440.99	.00	.00	1441.25	.26	.14	.10	1450.00
3010.0	.0	3010.0	.0	.0	740.0	.0	237.8	56.2	1450.00
.96	.00	4.07	.00	.000	.028	.000	.000	1436.80	901.42
.000930	90.	90.	90.	2	0	0	.00	183.02	1084.45

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SECNO	DEPTH	CWSEL	CRISW	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

SPECIAL BRIDGE

5070, VARIABLE ELCHU OR ELCHD ON SB CARD NOT SPECIFIED

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	1.15	1.60	2.60	.00	178.00	5.00	1676.00	1.00	1436.80	1436.80

\*SECNO 1197.500

CLASS A LOW FLOW

3420 BRIDGE W.S.= 1440.97 BRIDGE VELOCITY= 4.07 CALCULATED CHANNEL AREA= 740.

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
.00	1441.26	.02	0.	3010.	1676.	1676.	1446.00	1450.00	0.

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1450.00 ELREA= 1450.00

1197.500	4.21	1441.01	.00	.00	1441.26	.25	.02	.00	1450.00
3010.0	.0	3010.0	.0	.0	743.0	.0	238.4	56.4	1450.00

.96	.00	4.05	.00	.000	.028	.000	.000	1436.80	901.39
.000917	40.	40.	40.	0	0	0	.00	183.07	1084.46

\*SECNO 1198.000

3265 DIVIDED FLOW

3280 CROSS SECTION 1198.00 EXTENDED .94 FEET

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .53

1198.000	3.94	1440.94	.00	.00	1441.49	.54	.08	.14	1443.00
3010.0	.0	3006.5	3.5	.0	507.7	3.0	239.2	56.6	1444.00
.96	.00	5.92	1.16	.000	.030	.040	.000	1437.00	918.10
.003259	50.	50.	50.	2	0	0	.00	172.84	1123.00

CCHV= .100 CEHV= .300

\*SECNO 1200.000

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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1442.00 ELREA= 1442.00

1200.000	4.19	1441.69	.00	.00	1442.07	.37	.56	.02	1443.00
3010.0	.0	3010.0	.0	.0	614.3	.0	241.7	57.4	1444.00
.98	.00	4.90	.00	.000	.032	.000	.000	1437.50	919.58
.002459	200.	200.	200.	2	0	0	.00	196.97	1116.55

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THIS RUN EXECUTED 03MAY99 11:50:31

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HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991

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NOTE- ASTERISK (\*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

100-YEAR STORM PEAK RUNO

SUMMARY PRINTOUT TABLE 100

SECNO	EGLWC	ELLC	EGPRS	ELTRD	QPR	QWEIR	CLASS	H3	DEPTH	CWSEL	VCH	EG
1000.400	1379.33	1379.60	.00	1381.90	3010.00	.00	1.00	.06	6.48	1378.98	4.72	1379.33
1009.000	1380.94	1384.00	.00	1386.40	3010.00	.00	1.00	.24	5.88	1380.38	6.04	1380.94
1063.700	1397.59	1400.50	.00	1403.10	3010.00	.00	1.00	.14	6.79	1396.99	6.23	1397.59
1196.200	1441.01	1447.00	.00	1450.50	3010.00	.00	1.00	.06	3.63	1440.43	6.13	1441.01
1197.500	1441.26	1446.00	.00	1450.00	3010.00	.00	1.00	.02	4.21	1441.01	4.05	1441.26

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100-YEAR STORM PEAK RUNO

SUMMARY PRINTOUT TABLE 105

SECNO	CWSEL	HL	OLOSS	TOPWID	QLOB	QCH	QROB
* 998.000	1378.43	.52	.14	102.16	.00	3010.00	.00
999.600	1378.92	.22	.06	126.03	.00	3010.00	.00
1000.400	1378.98	.05	.00	126.62	.00	3010.00	.00
1002.000	1379.11	.16	.02	123.77	.00	3010.00	.00
* 1006.000	1380.08	.42	.13	114.11	.00	3010.00	.00
1006.800	1380.14	.13	.07	93.79	.00	3010.00	.00
1009.000	1380.38	.19	.00	94.60	.00	3010.00	.00
* 1010.000	1380.30	.29	.52	93.30	.00	3010.00	.00

*	1060.000	1395.26	.83	.28	90.30	.00	3010.00	.00
*	1062.200	1396.84	.66	.21	93.11	.00	3010.00	.00
	1063.700	1396.99	.11	.00	93.79	.00	3010.00	.00
*	1064.000	1396.80	.08	.26	96.80	.00	3010.00	.00

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	1194.000	1440.09	.53	.03	195.50	.00	3010.00	.00
	1195.400	1440.37	.38	.10	140.41	.00	3010.00	.00
	1196.200	1440.43	.04	.00	140.59	.00	3010.00	.00
*	1197.100	1440.99	.14	.10	183.02	.00	3010.00	.00
	1197.500	1441.01	.02	.00	183.07	.00	3010.00	.00
*	1198.000	1440.94	.08	.14	172.84	.00	3006.50	3.50

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100-YEAR STORM PEAK RUNO

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
	990.300	.00	.00	.00	1369.60	3010.00	1376.00	.00	1376.79	32.66	7.12	422.51	526.67
	992.000	172.00	.00	.00	1370.00	3010.00	1376.66	.00	1377.24	19.69	6.12	491.52	678.37
	994.000	200.00	.00	.00	1371.00	3010.00	1377.07	.00	1377.65	21.26	6.09	494.60	652.76
	996.000	200.00	.00	.00	1371.60	3010.00	1377.33	.00	1378.34	39.20	8.10	372.49	480.74
*	998.000	200.00	.00	.00	1372.00	3010.00	1378.43	.00	1379.00	18.29	6.05	497.84	703.90
	999.600	166.00	.00	.00	1372.50	3010.00	1378.92	.00	1379.28	9.70	4.79	628.52	966.33
	1000.400	84.00	1381.90	1379.60	1372.50	3010.00	1378.98	.00	1379.33	9.33	4.72	637.15	985.40
	1002.000	160.00	.00	.00	1373.00	3010.00	1379.11	.00	1379.51	11.37	5.06	594.98	892.75
*	1004.000	200.00	.00	.00	1374.00	3010.00	1379.11	.00	1380.02	32.77	7.65	393.28	525.82
*	1006.000	200.00	.00	.00	1374.50	3010.00	1380.08	.00	1380.57	14.56	5.62	535.51	788.96

1006.800	80.00	.00	.00	1374.50	3010.00	1380.14	.00	1380.76	17.05	6.33	475.65	728.88
1009.000	220.00	1386.40	1384.00	1374.50	3010.00	1380.38	.00	1380.94	14.77	6.04	498.51	783.11
* 1010.000	100.00	.00	.00	1376.00	3010.00	1380.30	1380.30	1381.89	79.52	10.14	296.77	337.55
* 1012.000	200.00	.00	.00	1376.00	3010.00	1382.21	.00	1382.75	21.90	5.90	510.41	643.20
1014.000	200.00	.00	.00	1376.80	3010.00	1382.73	.00	1383.11	13.34	4.93	610.59	824.09
* 1016.000	200.00	.00	.00	1378.00	3010.00	1382.94	.00	1383.60	34.84	6.50	462.76	509.94
1018.000	200.00	.00	.00	1377.30	3010.00	1383.67	.00	1384.18	23.94	5.77	521.73	615.21
1020.000	200.00	.00	.00	1378.00	3010.00	1384.22	.00	1384.57	14.98	4.80	627.33	777.62
1022.000	200.00	.00	.00	1378.20	3010.00	1384.49	.00	1384.97	21.57	5.54	543.53	648.04
1024.000	200.00	.00	.00	1380.00	3010.00	1385.01	.00	1385.42	22.86	5.12	588.38	629.51
1026.000	200.00	.00	.00	1379.90	3010.00	1385.47	.00	1385.84	19.14	4.84	622.08	688.01
1028.000	200.00	.00	.00	1380.00	3010.00	1385.87	.00	1386.25	21.71	4.97	605.05	646.01
1030.000	200.00	.00	.00	1380.00	3010.00	1386.26	.00	1386.72	22.61	5.43	554.55	632.95
1032.000	200.00	.00	.00	1380.90	3010.00	1386.71	.00	1387.24	28.14	5.87	512.66	567.39

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SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
1034.000	200.00	.00	.00	1381.60	3010.00	1387.28	.00	1387.76	23.04	5.53	543.95	627.02
1036.000	200.00	.00	.00	1382.00	3010.00	1387.77	.00	1388.25	26.02	5.57	540.46	590.10
1038.000	200.00	.00	.00	1382.70	3010.00	1388.31	.00	1388.69	17.95	4.92	611.75	710.39
1040.000	200.00	.00	.00	1383.00	3010.00	1388.67	.00	1389.12	23.95	5.43	554.51	615.03
1042.000	200.00	.00	.00	1383.80	3010.00	1389.22	.00	1389.51	14.87	4.37	693.93	780.58
1044.000	200.00	.00	.00	1384.50	3010.00	1389.48	.00	1389.95	26.13	5.55	545.59	588.80
1046.000	200.00	.00	.00	1385.00	3010.00	1390.00	.00	1390.48	26.15	5.53	544.59	588.64
1048.000	200.00	.00	.00	1385.00	3010.00	1390.54	.00	1391.10	34.68	6.03	499.08	511.16
1050.000	200.00	.00	.00	1386.30	3010.00	1391.29	.00	1392.08	61.38	7.13	422.01	384.18

1052.000	200.00	.00	.00	1387.00	3010.00	1392.39	.00	1393.15	47.17	6.98	431.43	438.28
1054.000	200.00	.00	.00	1388.00	3010.00	1393.17	.00	1394.31	57.82	8.58	351.01	395.84
* 1056.000	200.00	.00	.00	1387.90	3010.00	1394.42	.00	1394.97	18.68	5.95	505.70	696.50
1058.000	200.00	.00	.00	1389.00	3010.00	1394.71	.00	1395.50	28.45	7.15	427.80	564.32
* 1060.000	200.00	.00	.00	1389.90	3010.00	1395.26	.00	1396.60	65.24	9.29	323.92	372.65
* 1062.200	220.00	.00	.00	1390.20	3010.00	1396.84	.00	1397.48	17.29	6.40	470.01	723.88
1063.700	150.00	1403.10	1400.50	1390.20	3010.00	1396.99	.00	1397.59	15.97	6.23	482.85	753.25
* 1064.000	30.00	.00	.00	1391.70	3010.00	1396.80	.00	1397.92	46.17	8.50	353.94	442.99
1066.000	200.00	.00	.00	1391.00	3010.00	1397.83	.00	1398.67	28.30	7.34	409.84	565.78
1068.000	200.00	.00	.00	1391.50	3010.00	1398.43	.00	1399.26	30.97	7.31	411.76	540.91
1070.000	200.00	.00	.00	1392.40	3010.00	1399.07	.00	1400.11	52.10	8.20	367.07	417.02
* 1072.000	200.00	.00	.00	1392.80	3010.00	1400.25	.00	1400.82	22.78	6.06	501.69	630.61
1074.000	200.00	.00	.00	1393.20	3010.00	1400.70	.00	1401.26	20.90	6.00	508.85	658.46
1076.000	200.00	.00	.00	1393.50	3010.00	1401.10	.00	1401.72	23.33	6.36	481.26	623.21
1078.000	200.00	.00	.00	1394.50	3010.00	1401.49	.00	1402.43	42.68	7.81	389.05	460.75
* 1080.000	200.00	.00	.00	1395.00	3010.00	1402.57	.00	1402.86	10.06	4.34	707.29	949.01
* 1082.000	200.00	.00	.00	1396.00	3010.00	1402.59	.00	1403.36	39.48	7.07	426.15	479.04

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PAGE 44

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
1084.000	200.00	.00	.00	1397.00	3010.00	1403.28	.00	1404.27	44.99	8.01	383.11	448.77
1086.000	200.00	.00	.00	1397.40	3010.00	1404.18	.00	1405.26	51.74	8.35	363.77	418.48
1088.000	200.00	.00	.00	1398.10	3010.00	1405.34	.00	1406.19	40.11	7.41	406.29	475.30
1090.000	200.00	.00	.00	1399.00	3010.00	1406.21	.00	1406.89	29.52	6.64	453.16	554.01
1092.000	200.00	.00	.00	1400.00	3010.00	1406.85	.00	1407.47	27.34	6.29	478.20	575.66
1094.000	200.00	.00	.00	1400.00	3010.00	1407.37	.00	1408.01	26.37	6.41	469.33	586.11

1096.000	200.00	.00	.00	1401.00	3010.00	1407.93	.00	1408.52	24.01	6.15	489.08	614.31
1098.000	200.00	.00	.00	1402.00	3010.00	1408.52	.00	1408.96	18.91	5.31	566.98	692.23
1100.000	200.00	.00	.00	1403.00	3010.00	1408.85	.00	1409.47	28.28	6.31	476.83	565.99
1102.000	200.00	.00	.00	1403.50	3010.00	1409.42	.00	1410.11	33.72	6.67	451.50	518.33
1104.000	200.00	.00	.00	1403.40	3010.00	1410.13	.00	1410.68	23.68	5.98	504.46	618.58
1106.000	200.00	.00	.00	1404.10	3010.00	1410.59	.00	1411.27	32.05	6.61	457.97	531.69
1108.000	200.00	.00	.00	1404.00	3010.00	1411.19	.00	1412.02	39.42	7.29	412.80	479.39
1110.000	200.00	.00	.00	1406.00	3010.00	1412.07	.00	1412.77	34.08	6.67	451.16	515.64
1112.000	200.00	.00	.00	1406.00	3010.00	1412.74	.00	1413.36	25.23	6.31	480.75	599.21
1114.000	200.00	.00	.00	1406.50	3010.00	1413.22	.00	1413.97	33.22	6.98	435.34	522.22
1116.000	200.00	.00	.00	1408.00	3010.00	1413.91	.00	1414.83	49.92	7.70	391.14	426.01
1118.000	200.00	.00	.00	1408.60	3010.00	1415.05	.00	1415.67	33.54	6.31	477.37	519.72
1120.000	200.00	.00	.00	1409.00	3010.00	1415.69	.00	1416.35	33.41	6.52	461.35	520.76
1122.000	200.00	.00	.00	1410.00	3010.00	1416.50	.00	1416.87	18.98	4.92	611.53	690.94
1124.000	200.00	.00	.00	1410.60	3010.00	1416.77	.00	1417.45	31.63	6.59	456.56	535.16
1126.000	200.00	.00	.00	1412.40	3010.00	1417.42	.00	1418.30	50.47	7.51	400.78	423.68
* 1128.000	200.00	.00	.00	1412.90	3010.00	1418.50	.00	1419.02	24.91	5.77	521.74	603.12
1130.000	200.00	.00	.00	1414.00	3010.00	1419.01	.00	1419.62	33.04	6.27	479.68	523.67
1132.000	200.00	.00	.00	1414.00	3010.00	1419.64	.00	1420.31	34.65	6.55	459.44	511.31
1134.000	200.00	.00	.00	1414.60	3010.00	1420.39	.00	1420.90	24.52	5.76	522.45	607.88

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SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
1136.000	200.00	.00	.00	1415.00	3010.00	1420.89	.00	1421.48	31.19	6.13	491.08	538.93
1138.000	200.00	.00	.00	1416.00	3010.00	1421.49	.00	1422.08	29.34	6.17	487.75	555.73
* 1140.000	200.00	.00	.00	1416.70	3010.00	1422.03	.00	1423.09	70.72	8.27	364.00	357.92

*	1142.000	200.00	.00	.00	1416.90	3010.00	1423.41	.00	1423.88	22.25	5.52	545.71	638.19
	1144.000	200.00	.00	.00	1418.00	3010.00	1423.82	.00	1424.44	29.50	6.34	481.49	554.14
	1146.000	200.00	.00	.00	1418.00	3010.00	1424.50	.00	1425.00	25.62	5.69	529.69	594.73
	1148.000	200.00	.00	.00	1418.50	3010.00	1425.01	.00	1425.55	28.62	5.93	512.61	562.68
	1150.000	200.00	.00	.00	1419.60	3010.00	1425.64	.00	1426.22	38.48	6.14	490.34	485.23
	1152.000	200.00	.00	.00	1420.50	3010.00	1426.34	.00	1426.86	25.92	5.75	523.20	591.23
	1154.000	200.00	.00	.00	1421.10	3010.00	1426.87	.00	1427.51	36.93	6.42	468.56	495.33
	1156.000	200.00	.00	.00	1422.00	3010.00	1427.65	.00	1428.12	24.47	5.51	546.76	608.50
	1158.000	200.00	.00	.00	1421.00	3010.00	1428.15	.00	1428.51	14.83	4.83	628.60	781.54
*	1160.000	200.00	.00	.00	1422.10	3010.00	1428.37	.00	1429.10	45.27	6.84	440.40	447.35
	1162.000	200.00	.00	.00	1424.50	3010.00	1429.31	.00	1430.22	64.19	7.68	392.11	375.68
*	1164.000	200.00	.00	.00	1425.00	3010.00	1430.58	.00	1431.06	27.30	5.61	536.49	576.11
	1166.000	200.00	.00	.00	1425.80	3010.00	1431.08	.00	1431.65	28.69	6.02	500.01	561.94
	1168.000	200.00	.00	.00	1426.80	3010.00	1431.70	.00	1432.33	38.45	6.38	471.60	485.41
	1170.000	200.00	.00	.00	1427.30	3010.00	1432.45	.00	1433.10	38.22	6.47	464.90	486.89
	1172.000	200.00	.00	.00	1428.00	3010.00	1433.26	.00	1433.73	24.80	5.51	546.44	604.39
	1174.000	200.00	.00	.00	1428.70	3010.00	1433.86	.00	1434.17	18.67	4.50	668.38	696.69
*	1176.000	200.00	.00	.00	1429.00	3010.00	1434.26	.00	1434.44	9.46	3.46	869.02	978.56
*	1178.000	200.00	.00	.00	1430.00	3010.00	1434.37	.00	1434.87	37.41	5.68	530.03	492.10
	1180.000	200.00	.00	.00	1431.00	3010.00	1435.14	.00	1435.68	42.56	5.92	508.30	461.39
	1182.000	200.00	.00	.00	1432.00	3010.00	1436.02	.00	1436.47	35.52	5.38	559.16	505.08
	1184.000	200.00	.00	.00	1432.80	3010.00	1436.77	.00	1437.30	46.39	5.80	518.82	441.91
*	1186.000	200.00	.00	.00	1433.00	3010.00	1437.56	.00	1437.89	19.28	4.59	655.89	685.53

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SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
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1188.000	200.00	.00	.00	1434.00	3010.00	1438.00	.00	1438.43	35.05	5.26	572.19	508.41
1190.000	200.00	.00	.00	1434.30	3010.00	1438.62	.00	1439.23	40.44	6.26	480.63	473.35
1192.000	200.00	.00	.00	1435.20	3010.00	1439.44	.00	1439.93	29.70	5.61	536.31	552.35
1194.000	200.00	.00	.00	1436.00	3010.00	1440.09	.00	1440.49	23.59	5.05	595.99	619.72
1195.400	140.00	.00	.00	1436.80	3010.00	1440.37	.00	1440.97	31.31	6.24	482.27	537.97
1196.200	80.00	1450.50	1447.00	1436.80	3010.00	1440.43	.00	1441.01	29.61	6.13	490.69	553.17
* 1197.100	90.00	.00	.00	1436.80	3010.00	1440.99	.00	1441.25	9.30	4.07	739.98	987.28
1197.500	40.00	1450.00	1446.00	1436.80	3010.00	1441.01	.00	1441.26	9.17	4.05	743.02	993.83
* 1198.000	50.00	.00	.00	1437.00	3010.00	1440.94	.00	1441.49	32.59	5.92	510.72	527.29
1200.000	200.00	.00	.00	1437.50	3010.00	1441.69	.00	1442.07	24.59	4.90	614.32	606.95

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100-YEAR STORM PEAK RUNO

SUMMARY PRINTOUT TABLE 150

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
990.300	3010.00	1376.00	.00	.00	.00	94.36	.00
992.000	3010.00	1376.66	.00	.66	.00	94.08	172.00
994.000	3010.00	1377.07	.00	.42	.00	101.52	200.00
996.000	3010.00	1377.33	.00	.25	.00	94.85	200.00
* 998.000	3010.00	1378.43	.00	1.10	.00	102.16	200.00
999.600	3010.00	1378.92	.00	.49	.00	126.03	166.00
1000.400	3010.00	1378.98	.00	.06	.00	126.62	84.00
1002.000	3010.00	1379.11	.00	.13	.00	123.77	160.00
* 1004.000	3010.00	1379.11	.00	.00	.00	97.09	200.00
* 1006.000	3010.00	1380.08	.00	.96	.00	114.11	200.00
1006.800	3010.00	1380.14	.00	.06	.00	93.79	80.00

1009.000	3010.00	1380.38	.00	.24	.00	94.60	220.00
* 1010.000	3010.00	1380.30	.00	-.08	.00	93.30	100.00
* 1012.000	3010.00	1382.21	.00	1.92	.00	124.47	200.00
1014.000	3010.00	1382.73	.00	.52	.00	121.26	200.00
* 1016.000	3010.00	1382.94	.00	.21	.00	109.12	200.00
1018.000	3010.00	1383.67	.00	.73	.00	111.07	200.00
1020.000	3010.00	1384.22	.00	.55	.00	122.63	200.00
1022.000	3010.00	1384.49	.00	.27	.00	112.70	200.00
1024.000	3010.00	1385.01	.00	.52	.00	145.82	200.00
1026.000	3010.00	1385.47	.00	.46	.00	146.47	200.00
1028.000	3010.00	1385.87	.00	.39	.00	150.82	200.00
1030.000	3010.00	1386.26	.00	.39	.00	125.00	200.00
1032.000	3010.00	1386.71	.00	.45	.00	120.69	200.00

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SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
1034.000	3010.00	1387.28	.00	.57	.00	120.23	200.00
1036.000	3010.00	1387.77	.00	.48	.00	129.78	200.00
1038.000	3010.00	1388.31	.00	.54	.00	133.62	200.00
1040.000	3010.00	1388.67	.00	.35	.00	131.20	200.00
1042.000	3010.00	1389.22	.00	.55	.00	164.12	200.00
1044.000	3010.00	1389.48	.00	.26	.00	137.98	200.00
1046.000	3010.00	1390.00	.00	.53	.00	132.63	200.00
1048.000	3010.00	1390.54	.00	.54	.00	131.95	200.00
1050.000	3010.00	1391.29	.00	.75	.00	133.36	200.00
1052.000	3010.00	1392.39	.00	1.11	.00	114.79	200.00

1054.000	3010.00	1393.17	.00	.77	.00	91.41	200.00
* 1056.000	3010.00	1394.42	.00	1.26	.00	93.31	200.00
1058.000	3010.00	1394.71	.00	.29	.00	95.75	200.00
* 1060.000	3010.00	1395.26	.00	.55	.00	90.30	200.00
* 1062.200	3010.00	1396.84	.00	1.58	.00	93.11	220.00
1063.700	3010.00	1396.99	.00	.14	.00	93.79	150.00
* 1064.000	3010.00	1396.80	.00	-.18	.00	96.80	30.00
1066.000	3010.00	1397.83	.00	1.03	.00	86.23	200.00
1068.000	3010.00	1398.43	.00	.60	.00	84.65	200.00
1070.000	3010.00	1399.07	.00	.64	.00	82.15	200.00
* 1072.000	3010.00	1400.25	.00	1.18	.00	100.61	200.00
1074.000	3010.00	1400.70	.00	.45	.00	97.93	200.00
1076.000	3010.00	1401.10	.00	.39	.00	95.38	200.00
1078.000	3010.00	1401.49	.00	.39	.00	86.26	200.00
* 1080.000	3010.00	1402.57	.00	1.08	.00	133.76	200.00
* 1082.000	3010.00	1402.59	.00	.02	.00	98.97	200.00

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SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
1084.000	3010.00	1403.28	.00	.69	.00	89.02	200.00
1086.000	3010.00	1404.18	.00	.90	.00	84.86	200.00
1088.000	3010.00	1405.34	.00	1.16	.00	87.71	200.00
1090.000	3010.00	1406.21	.00	.87	.00	90.97	200.00
1092.000	3010.00	1406.85	.00	.64	.00	97.90	200.00
1094.000	3010.00	1407.37	.00	.52	.00	91.14	200.00
1096.000	3010.00	1407.93	.00	.56	.00	94.17	200.00

1098.000	3010.00	1408.52	.00	.59	.00	114.70	200.00
1100.000	3010.00	1408.85	.00	.33	.00	100.24	200.00
1102.000	3010.00	1409.42	.00	.57	.00	99.83	200.00
1104.000	3010.00	1410.13	.00	.71	.00	103.93	200.00
1106.000	3010.00	1410.59	.00	.46	.00	102.80	200.00
1108.000	3010.00	1411.19	.00	.60	.00	89.67	200.00
1110.000	3010.00	1412.07	.00	.88	.00	100.67	200.00
1112.000	3010.00	1412.74	.00	.66	.00	97.83	200.00
1114.000	3010.00	1413.22	.00	.48	.00	93.39	200.00
1116.000	3010.00	1413.91	.00	.69	.00	93.88	200.00
1118.000	3010.00	1415.05	.00	1.14	.00	114.22	200.00
1120.000	3010.00	1415.69	.00	.64	.00	105.01	200.00
1122.000	3010.00	1416.50	.00	.81	.00	139.74	200.00
1124.000	3010.00	1416.77	.00	.27	.00	96.99	200.00
1126.000	3010.00	1417.42	.00	.65	.00	100.71	200.00
* 1128.000	3010.00	1418.50	.00	1.08	.00	114.79	200.00
1130.000	3010.00	1419.01	.00	.50	.00	114.97	200.00
1132.000	3010.00	1419.64	.00	.64	.00	106.71	200.00
1134.000	3010.00	1420.39	.00	.74	.00	113.74	200.00

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SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
1136.000	3010.00	1420.89	.00	.50	.00	117.01	200.00
1138.000	3010.00	1421.49	.00	.60	.00	107.07	200.00
* 1140.000	3010.00	1422.03	.00	.54	.00	102.55	200.00
* 1142.000	3010.00	1423.41	.00	1.38	.00	118.11	200.00

1144.000	3010.00	1423.82	.00	.41	.00	110.22	200.00
1146.000	3010.00	1424.50	.00	.68	.00	123.80	200.00
1148.000	3010.00	1425.01	.00	.51	.00	126.25	200.00
1150.000	3010.00	1425.64	.00	.63	.00	136.83	200.00
1152.000	3010.00	1426.34	.00	.70	.00	119.12	200.00
1154.000	3010.00	1426.87	.00	.53	.00	117.81	200.00
1156.000	3010.00	1427.65	.00	.78	.00	127.82	200.00
1158.000	3010.00	1428.15	.00	.50	.00	127.75	200.00
* 1160.000	3010.00	1428.37	.00	.22	.00	118.79	200.00
1162.000	3010.00	1429.31	.00	.94	.00	114.47	200.00
* 1164.000	3010.00	1430.58	.00	1.27	.00	132.36	200.00
1166.000	3010.00	1431.08	.00	.51	.00	114.63	200.00
1168.000	3010.00	1431.70	.00	.61	.00	123.81	200.00
1170.000	3010.00	1432.45	.00	.75	.00	119.05	200.00
1172.000	3010.00	1433.26	.00	.81	.00	128.58	200.00
1174.000	3010.00	1433.86	.00	.60	.00	172.89	200.00
* 1176.000	3010.00	1434.26	.00	.40	.00	200.13	200.00
* 1178.000	3010.00	1434.37	.00	.11	.00	162.84	200.00
1180.000	3010.00	1435.14	.00	.77	.00	162.02	200.00
1182.000	3010.00	1436.02	.00	.88	.00	179.32	200.00
1184.000	3010.00	1436.77	.00	.76	.00	181.82	200.00
* 1186.000	3010.00	1437.56	.00	.79	.00	168.92	200.00

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SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
1188.000	3010.00	1438.00	.00	.44	.00	188.57	200.00

1190.000	3010.00	1438.62	.00	.63	.00	155.14	200.00
1192.000	3010.00	1439.44	.00	.82	.00	178.39	200.00
1194.000	3010.00	1440.09	.00	.65	.00	195.50	200.00
1195.400	3010.00	1440.37	.00	.27	.00	140.41	140.00
1196.200	3010.00	1440.43	.00	.06	.00	140.59	80.00
* 1197.100	3010.00	1440.99	.00	.56	.00	183.02	90.00
1197.500	3010.00	1441.01	.00	.02	.00	183.07	40.00
* 1198.000	3010.00	1440.94	.00	-.07	.00	172.84	50.00
1200.000	3010.00	1441.69	.00	.75	.00	196.97	200.00

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SUMMARY OF ERRORS AND SPECIAL NOTES

WARNING SECNO= 998.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 1004.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 1006.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 1010.000 PROFILE= 1 CRITICAL DEPTH ASSUMED

CAUTION SECNO= 1010.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

WARNING SECNO= 1012.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 1016.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 1056.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 1060.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 1062.200 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 1064.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

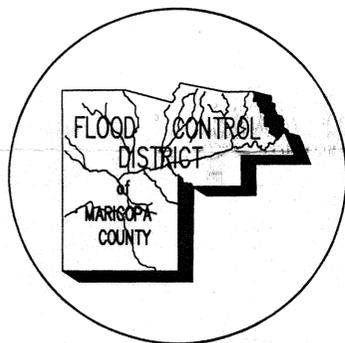
WARNING SECNO= 1072.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 1080.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 1082.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE  
WARNING SECNO= 1128.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE  
WARNING SECNO= 1140.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE  
WARNING SECNO= 1142.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE  
WARNING SECNO= 1160.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE  
WARNING SECNO= 1164.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE  
WARNING SECNO= 1176.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE  
WARNING SECNO= 1178.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE  
WARNING SECNO= 1186.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE  
WARNING SECNO= 1197.100 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE  
WARNING SECNO= 1198.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

EXHIBIT 7

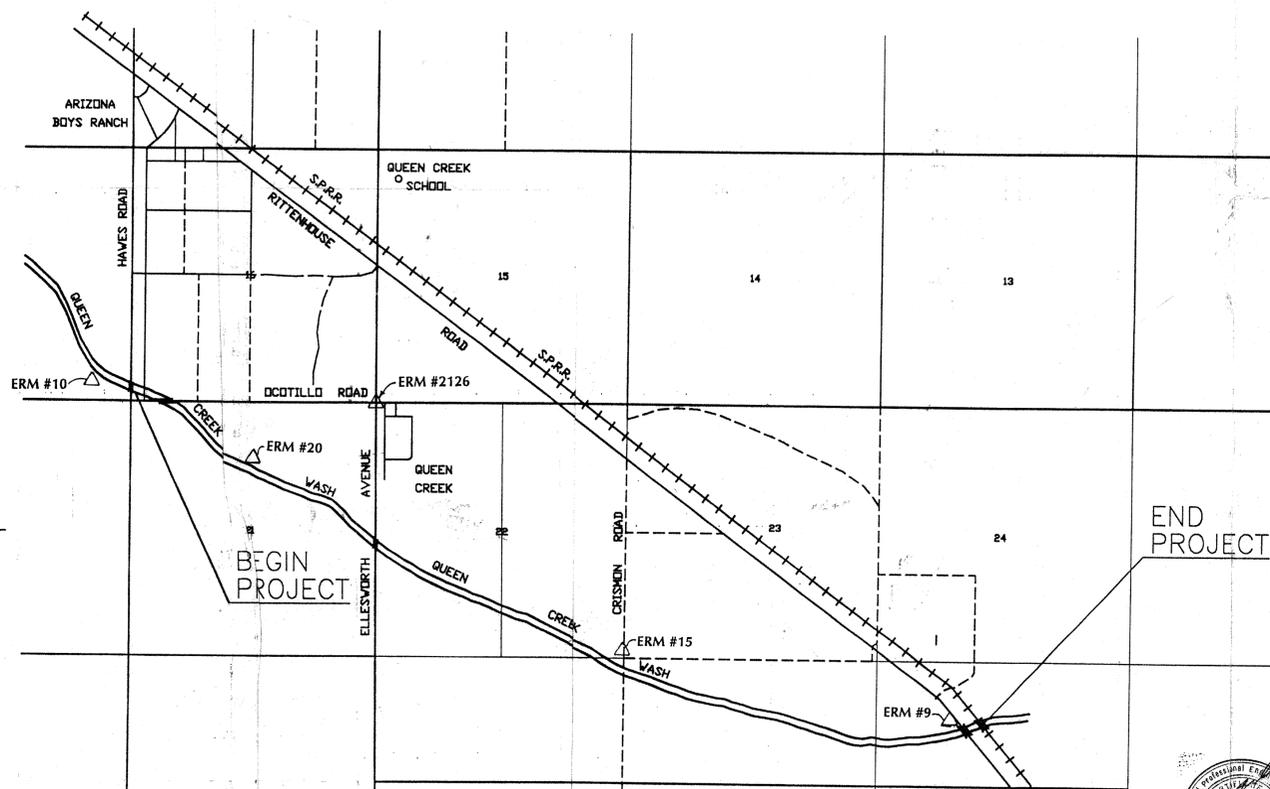
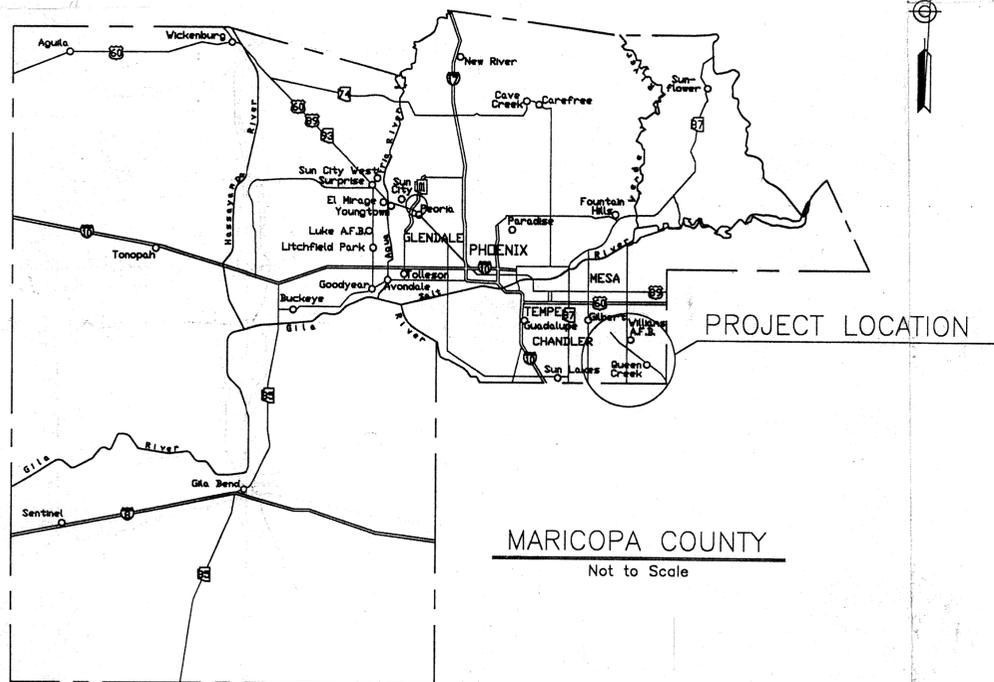
Work Maps at 1"=100'



# FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

## QUEEN CREEK WASH (HAWES ROAD TO S.P.R.R.) FLOODPLAIN DELINEATION STUDY

FOR  
FEMA FIRM LOMR REQUEST  
F.C.D.M.C. PROJECT NO. 95-43-3  
C.P.E. JOB NO. 3660.3



### ELEVATION REFERENCE MARKS

ERM No.	Description
9	Cut "X", end of curb by gate, 75' ± NW of Rittenhouse Road Bridge over Queen Creek Wash. Reference Elevation is 1,448.7 NAVD 88
15	Found Aluminum Cap, Stamped ERM #15. Reference Elevation is 1,419.1 NAVD 88
20	Found Aluminum Cap, Stamped ERM #20. Reference Elevation is 1,387.5 NAVD 88
10	Found Aluminum Cap, Stamped ERM #10. Reference Elevation is 1,376.4 NAVD 88
2126	Found Brass Cap in Hand Hole, Elisworth & Ocotillo Road. Reference Elevation is 1,399.2 NAVD 88

### FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

ISSUED

CHIEF ENGINEER AND GENERAL MANAGER \_\_\_\_\_ DATE \_\_\_\_\_

BOARD OF DIRECTORS OF THE FLOOD CONTROL DISTRICT

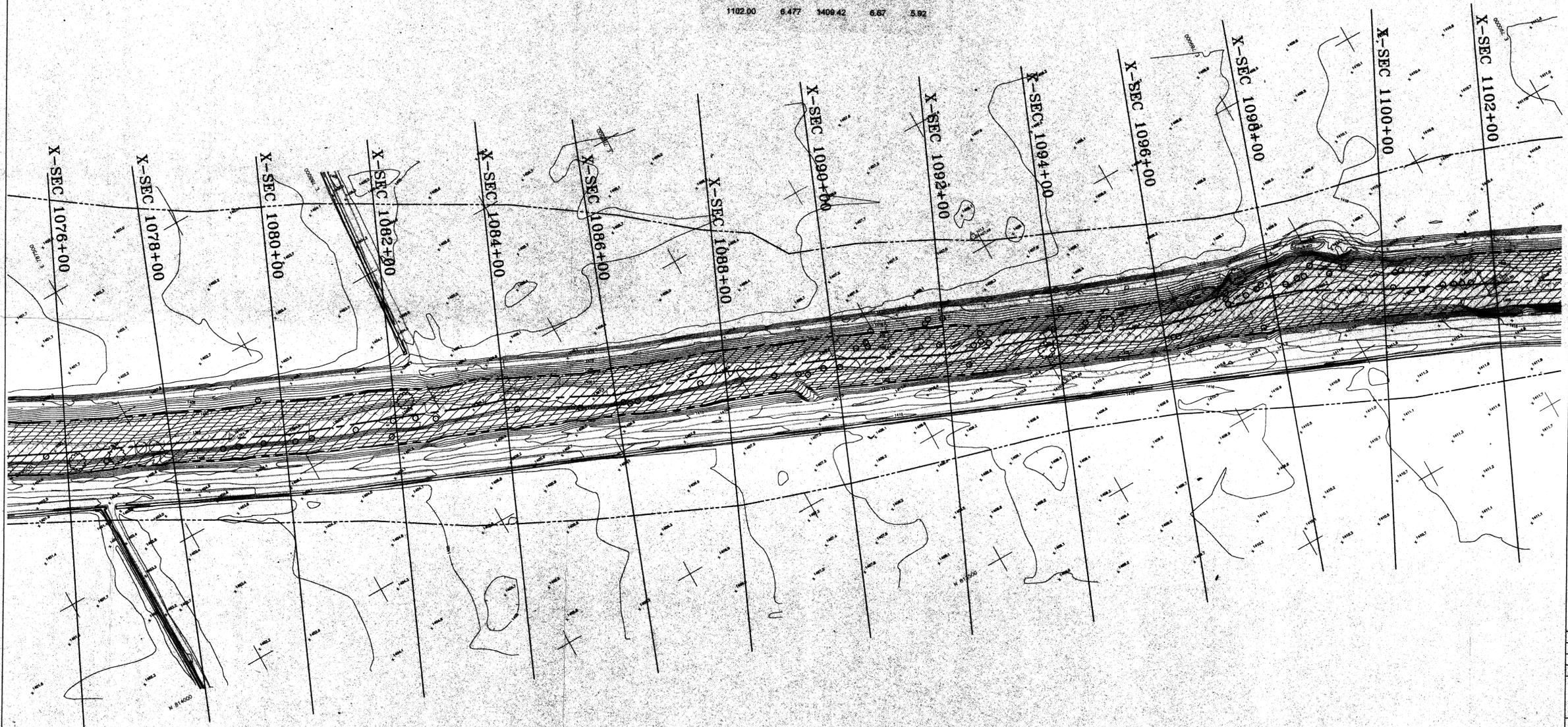
BETSEY BAYLESS - CHAIRMAN

DISTRICT 1 TOM RAWLES  
DISTRICT 2 DON STAPLEY  
DISTRICT 3 BETSEY BAYLESS  
DISTRICT 4 EDWARD KING  
DISTRICT 5 MARY ROSE GARRIDO WILCOX



**SELECTED HYDRAULIC DATA**

SECNO	DIST	CWSEL	VCH	DEPTH
1076.00	6.885	1401.10	6.35	7.60
1078.00	6.023	1401.48	7.30	6.88
1080.00	6.081	1402.57	4.34	7.37
1082.00	6.096	1402.90	7.07	6.58
1084.00	6.136	1403.23	8.01	6.28
1086.00	6.174	1404.16	8.35	6.78
1088.00	6.212	1405.34	7.41	7.24
1090.00	6.250	1406.21	9.84	7.21
1092.00	6.288	1406.85	8.29	6.85
1094.00	6.326	1407.37	6.41	7.37
1096.00	6.364	1407.93	8.15	6.93
1098.00	6.402	1408.52	5.31	6.52
1100.00	6.439	1409.85	6.31	5.88
1102.00	6.477	1409.42	6.67	5.92

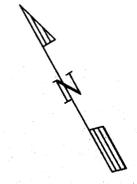


REMOVE

CONSTRUCT

**LEGEND**

- QUEEN CREEK WASH CENTERLINE
- 1997 FIS FLOODPLAIN LIMITS
- FEMA FIRM FLOODPLAIN LIMITS
- FLOODWAY AREAS IN ZONE AE



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Scale in Feet

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NO.	REVISION	BY	DATE

**FLOOD CONTROL DISTRICT  
OF MARICOPA COUNTY  
ENGINEERING DIVISION**  
FLOODPLAIN DELINEATION  
QUEEN CREEK WASH  
(SPRR TO HAWES ROAD)

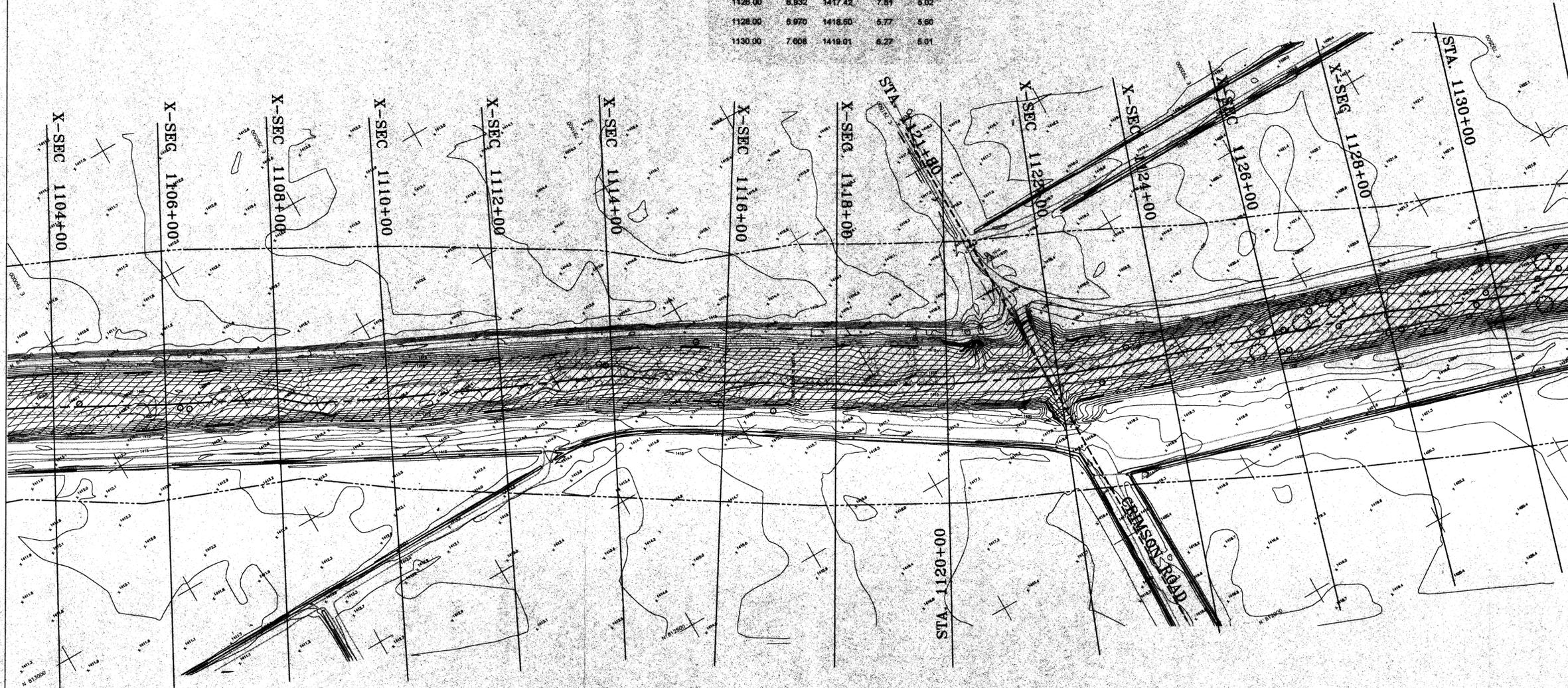
	BY	DATE
DESIGNED		
DRAWN		
CHECKED		



Use of the information contained in this document is limited to the specific project for which it was prepared. It is not to be used for any other project without the written consent of the engineer. The engineer assumes no responsibility for the accuracy of the information contained herein, and the user of this information does so at their own risk. The engineer's liability is limited to the professional services rendered by the engineer. The user of this information does so at their own risk. The engineer's liability is limited to the professional services rendered by the engineer.

**SELECTED HYDRAULIC DATA**

SECNO	DIST	CWSEL	VCH	DEPTH
1104.00	6.535	1410.13	5.86	6.73
1106.00	6.553	1410.59	6.81	6.48
1108.00	6.581	1411.19	7.29	7.19
1110.00	6.629	1412.07	6.67	6.07
1112.00	6.667	1412.74	6.31	6.74
1114.00	6.705	1413.22	6.89	6.73
1116.00	6.742	1413.91	7.70	5.91
1118.00	6.780	1415.05	6.31	6.46
1120.00	6.818	1415.69	6.52	6.69
1122.00	6.856	1416.50	4.92	6.50
1124.00	6.894	1416.77	6.59	6.17
1126.00	6.932	1417.42	7.91	6.02
1128.00	6.970	1418.50	6.77	5.60
1130.00	7.008	1419.01	6.27	6.01

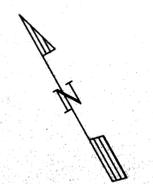


REMOVE

CONSTRUCT

**LEGEND**

- QUEEN CREEK WASH CENTERLINE
- 1997 FIS FLOODPLAIN LIMITS
- FEMA FIRM FLOODPLAIN LIMITS
- FLOODWAY AREAS IN ZONE AE

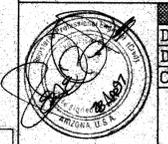


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Scale in Feet

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NO.	REVISION	BY	DATE

**FLOOD CONTROL DISTRICT  
OF MARICOPA COUNTY  
ENGINEERING DIVISION**  
**FLOODPLAIN DELINEATION  
QUEEN CREEK WASH  
(SPRR TO HAWES ROAD)**

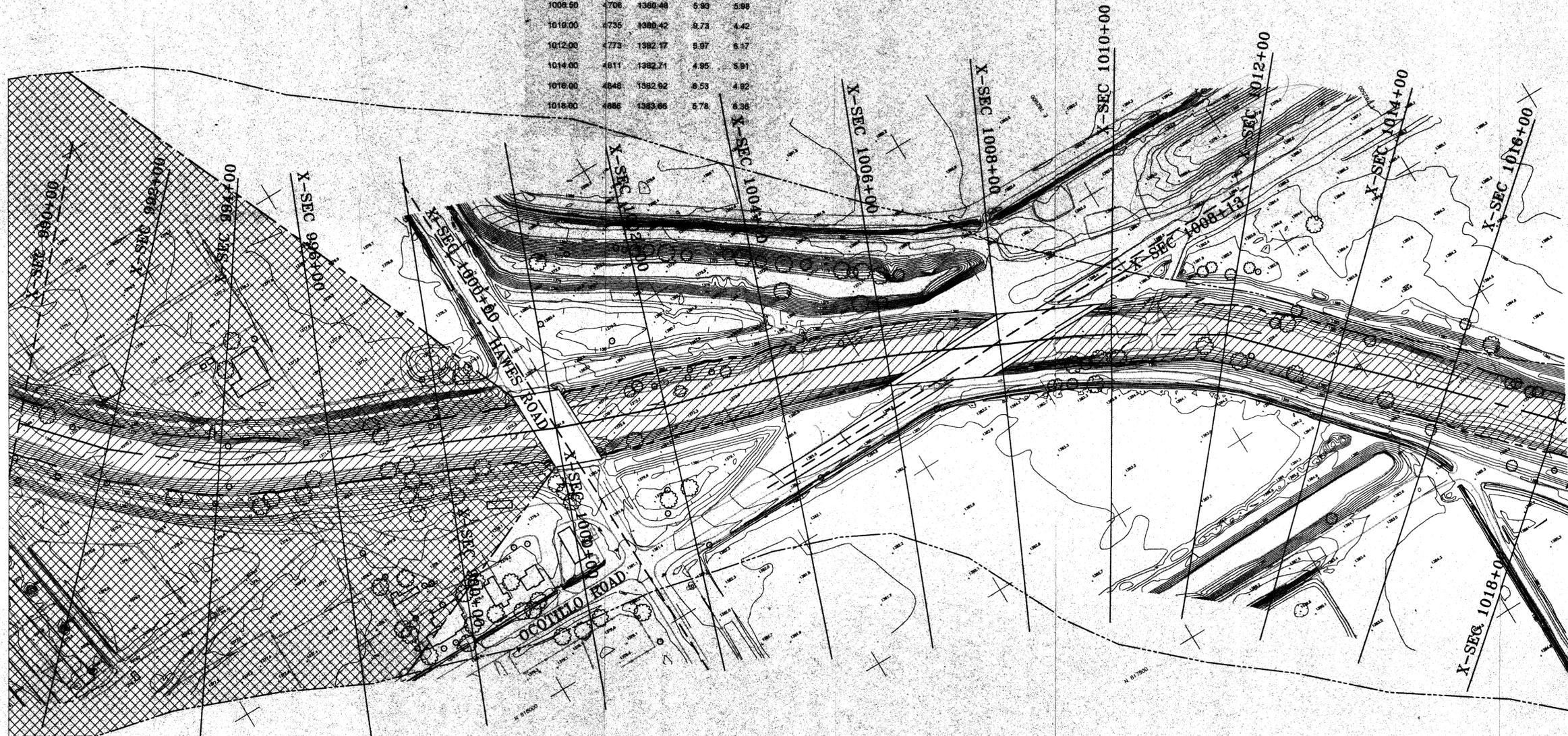
	BY	DATE
DESIGNED		
DRAWN		
CHECKED		



The information contained in this document is the property of the engineer and shall not be used for any other purpose without the written consent of the engineer. The engineer shall not be held responsible for any errors or omissions in this document. The engineer shall not be held responsible for any damages or injuries resulting from the use of this document. The engineer shall not be held responsible for any claims or liabilities resulting from the use of this document. The engineer shall not be held responsible for any claims or liabilities resulting from the use of this document.

**SELECTED HYDRAULIC DATA**

SECNO	DIST	CWSEL	VCH	DEPTH
980.00	4.382	1376.00	7.12	8.40
982.00	4.384	1376.86	6.42	6.68
984.00	4.432	1377.07	6.09	8.07
986.00	4.470	1377.93	6.10	5.73
988.00	4.508	1378.43	6.05	6.43
989.80	4.538	1378.92	4.79	6.42
1000.46	4.553	1378.98	4.72	6.48
1002.00	4.583	1378.11	5.06	6.11
1004.00	4.621	1379.11	7.65	5.11
1006.00	4.659	1380.08	5.82	5.56
1007.50	4.668	1380.26	6.18	5.76
1008.60	4.706	1380.48	5.93	5.88
1010.00	4.735	1380.42	6.73	4.42
1012.00	4.773	1382.17	6.97	6.17
1014.00	4.811	1382.71	4.95	3.91
1016.00	4.848	1382.92	6.53	4.82
1018.00	4.886	1383.85	5.78	6.38

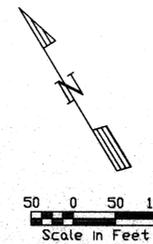


REMOVE

CONSTRUCT

**LEGEND**

- QUEEN CREEK WASH CENTERLINE
- 1997 FIS FLOODPLAIN LIMITS
- FEMA FIRM FLOODPLAIN LIMITS
- 1997 FIS FLOODWAY LIMITS
- FLOODWAY AREAS IN ZONE AE
- SPECIAL FLOOD HAZARD AREAS INUNDATED BY 100-YR FLOOD



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NO.	REVISION	BY	DATE

**FLOOD CONTROL DISTRICT  
OF MARICOPA COUNTY  
ENGINEERING DIVISION  
FLOODPLAIN DELINEATION  
QUEEN CREEK WASH  
(SPRR TO HAWES ROAD)**

	BY	DATE
DESIGNED		
DRAWN		
CHECKED		



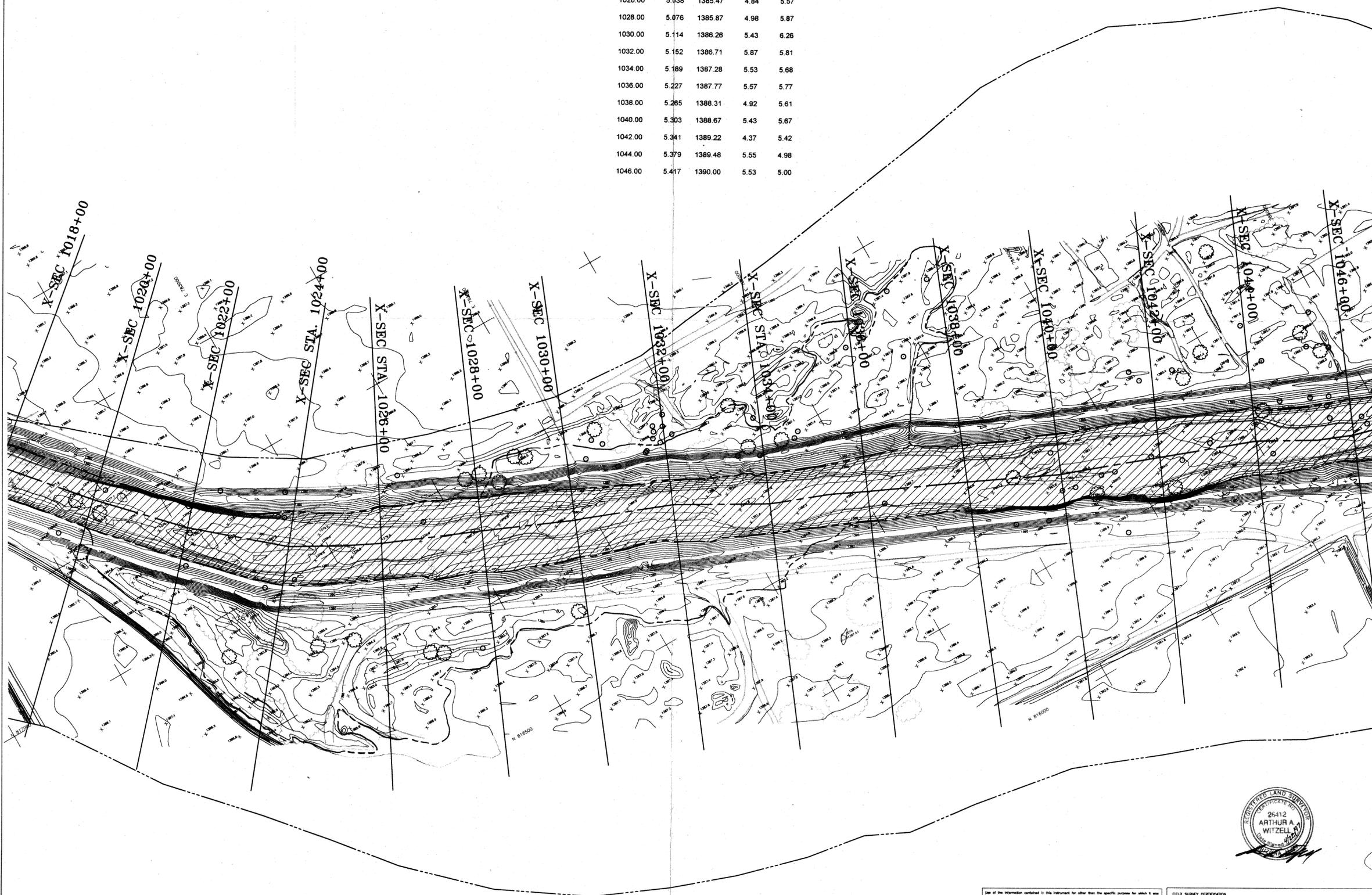
Use of the information contained in this report for other than the project for which it was prepared is the user's responsibility. The user shall indemnify and hold the engineer harmless for any and all claims, damages, losses, and expenses, including reasonable attorneys' fees, arising out of or from the use of the information contained in this report, whether or not such claims, damages, losses, and expenses result in whole or in part from the negligence of the engineer.

FIELD SKETCH CERTIFICATION  
The field sketch of this project is to provide general location and reference information only. It is not intended to be used as a basis for design or construction. The field sketch is not a substitute for a detailed engineering survey or plan.

CIVIL ENGINEERING CERTIFICATION  
I, the undersigned, being a duly licensed Professional Engineer in the State of Arizona, do hereby certify that I am the author of the design and drawings herein, or that I am a duly licensed Professional Engineer in the State of Arizona, and that I am a duly licensed Professional Engineer in the State of Arizona, and that I am a duly licensed Professional Engineer in the State of Arizona.

**SELECTED HYDRAULIC DATA**

SECNO	DIST	CWSEL	VCH	DEPTH
1018.00	0.038	1383.66	5.78	6.36
1020.00	4.924	1384.21	4.80	6.21
1022.00	4.962	1384.48	5.54	6.28
1024.00	5.000	1385.01	5.12	5.01
1026.00	5.038	1385.47	4.84	5.57
1028.00	5.076	1385.87	4.98	5.87
1030.00	5.114	1386.28	5.43	6.26
1032.00	5.152	1386.71	5.87	5.81
1034.00	5.189	1387.28	5.53	5.68
1036.00	5.227	1387.77	5.57	5.77
1038.00	5.265	1388.31	4.92	5.61
1040.00	5.303	1388.67	5.43	5.67
1042.00	5.341	1389.22	4.37	5.42
1044.00	5.379	1389.48	5.55	4.98
1046.00	5.417	1390.00	5.53	5.00

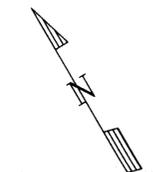


REMOVE

CONSTRUCT

**LEGEND**

- QUEEN CREEK WASH CENTERLINE
- 1997 FIS FLOODPLAIN LIMITS
- FEMA FIRM FLOODPLAIN LIMITS
- FLOODWAY AREAS IN ZONE AE



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Scale in Feet

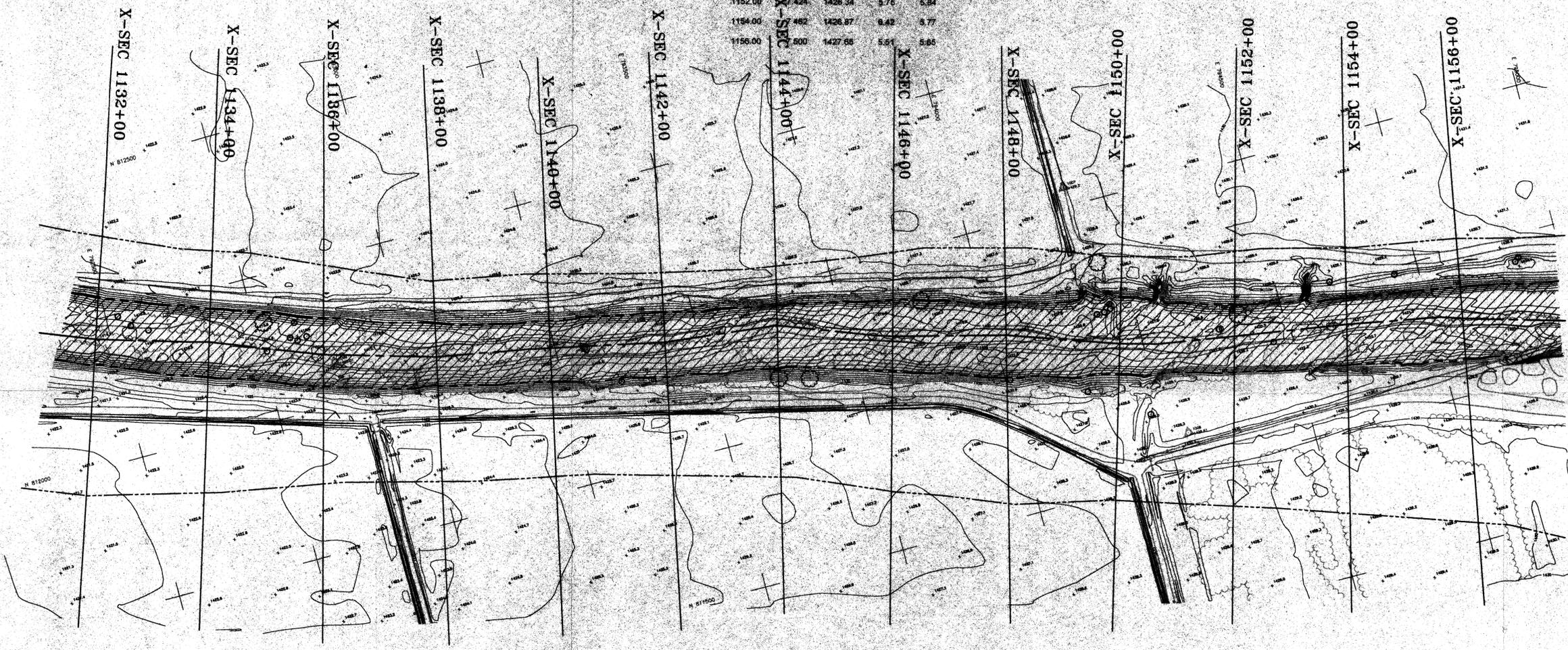
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NO.	REVISION	BY	DATE
<b>FLOOD CONTROL DISTRICT OF MARICOPA COUNTY ENGINEERING DIVISION</b>			
<b>FLOODPLAIN DELINEATION QUEEN CREEK WASH (SPRR TO HAWES ROAD)</b>			
	DESIGNED	BY	DATE
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Use of the information contained in this instrument is limited to the specific project for which it was prepared and for which it was intended. It is not to be used for any other purpose without the express written consent of the engineer. The engineer assumes no responsibility for any errors or omissions in this instrument or for any consequences arising therefrom. The engineer's liability is limited to the amount of the fee received for the preparation of this instrument. No representation is made as to the accuracy or completeness of the information provided to the engineer. The engineer's liability is limited to the amount of the fee received for the preparation of this instrument. No representation is made as to the accuracy or completeness of the information provided to the engineer.

**SELECTED HYDRAULIC DATA**

SECTNO	DIST	CWSEL	VCH	DEPTH
1132.00	7.048	1419.64	6.55	5.64
1134.00	7.089	1420.39	5.76	5.79
1136.00	7.121	1420.89	6.13	5.89
1138.00	7.158	1421.49	6.17	5.48
1140.00	7.197	1422.03	6.27	5.33
1142.00	7.235	1423.41	5.52	6.61
1144.00	7.273	1423.62	6.34	5.82
1146.00	7.311	1424.50	5.89	6.30
1148.00	7.349	1425.01	5.93	6.51
1150.00	7.388	1425.94	6.14	6.04
1152.00	7.424	1426.34	5.76	5.94
1154.00	7.462	1426.87	6.43	5.77
1156.00	7.500	1427.66	5.51	5.85



REMOVE

CONSTRUCT

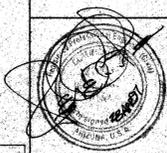
**LEGEND**

- QUEEN CREEK WASH CENTERLINE
- 1997 FIS FLOODPLAIN LIMITS
- FEMA FIRM FLOODPLAIN LIMITS
- FLOODWAY AREAS IN ZONE AE

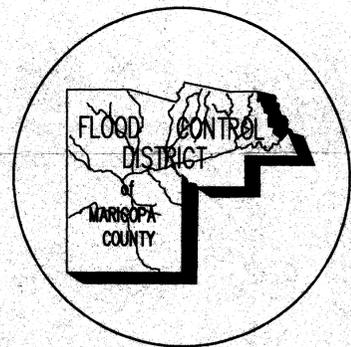


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Scale in Feet

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NO.	REVISION	BY	DATE
<b>FLOOD CONTROL DISTRICT OF MARICOPA COUNTY ENGINEERING DIVISION</b>			
<b>FLOODPLAIN DELINEATION QUEEN CREEK WASH (SPRR TO HAWES ROAD)</b>			
		BY	DATE
	DESIGNED		
	DRAWN		
	CHECKED		



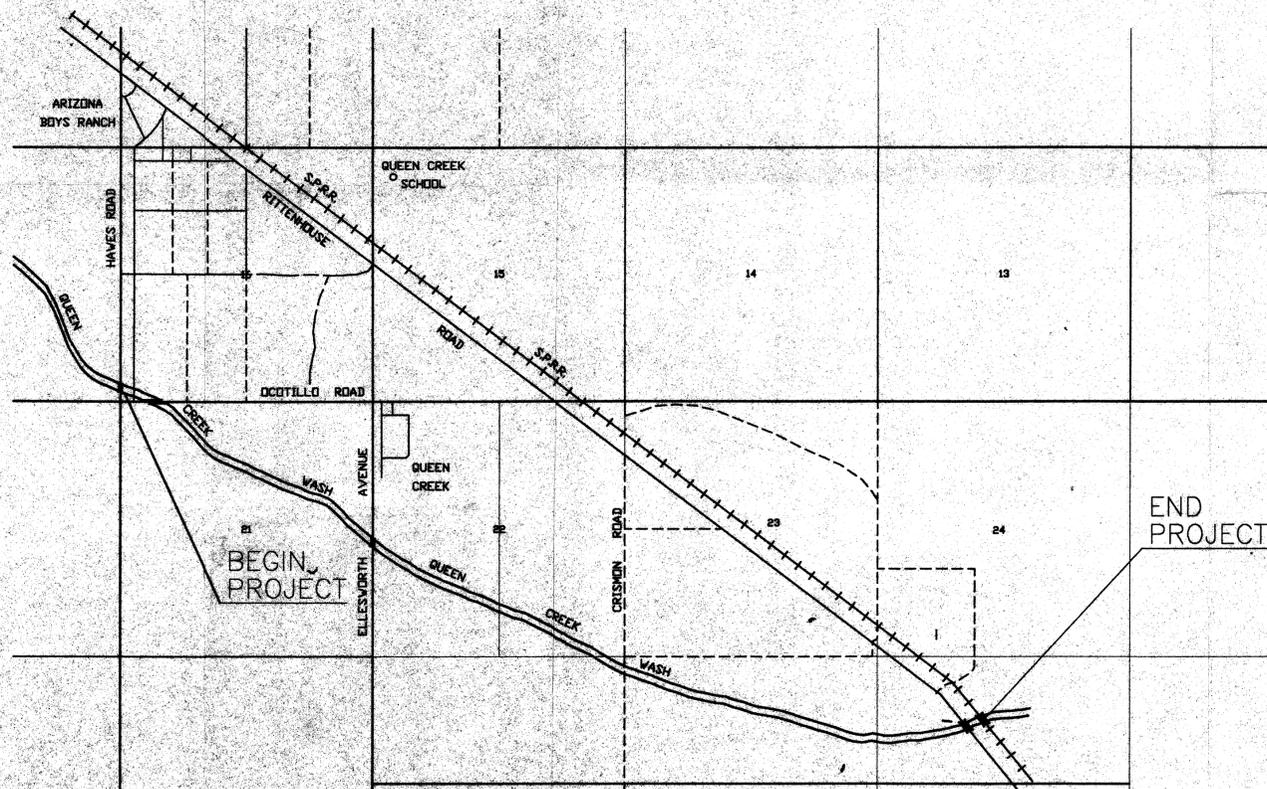
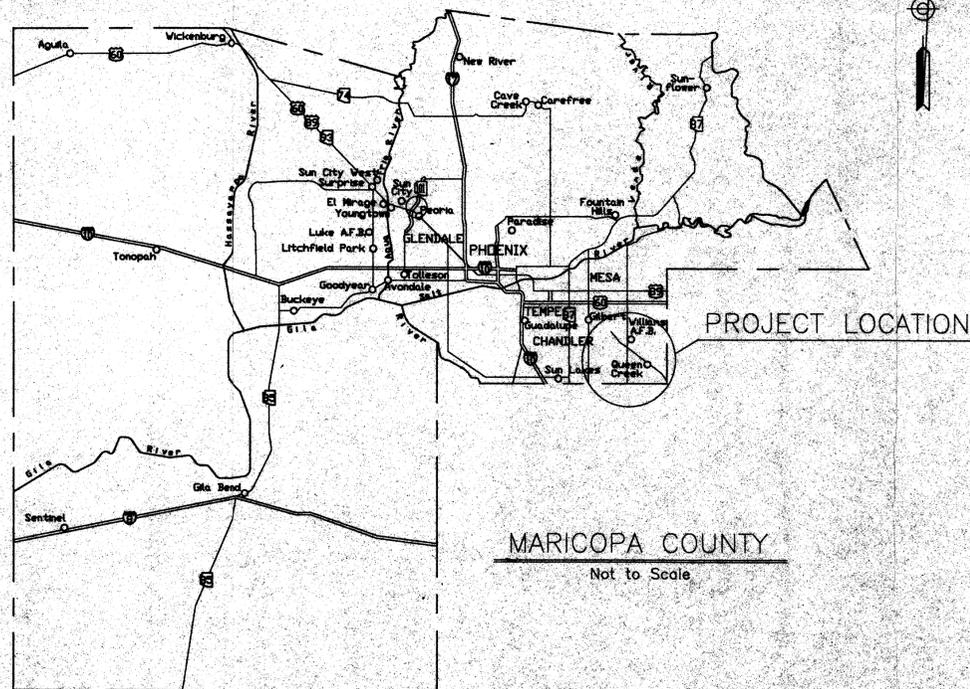
FIELD SURVEY CERTIFICATION: The work of this surveyor is in accordance with the laws of the State of Arizona, and the rules and regulations of the Board of Surveyors and Land Surveyors of the State of Arizona. I certify that the work herein was done by me or under my direct supervision and that I am a duly Licensed Professional Engineer in the State of Arizona. My registration is No. 26412. I am not licensed to practice in any other state. My registration is valid until 12/31/2010.



# FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

## QUEEN CREEK WASH (HAWES ROAD TO S.P.R.R.) FLOODPLAIN DELINEATION STUDY

FOR  
FEMA FIRM LOMR REQUEST  
F.C.D.M.C. PROJECT NO. 95-43-3  
C.P.E. JOB NO. 3660.3

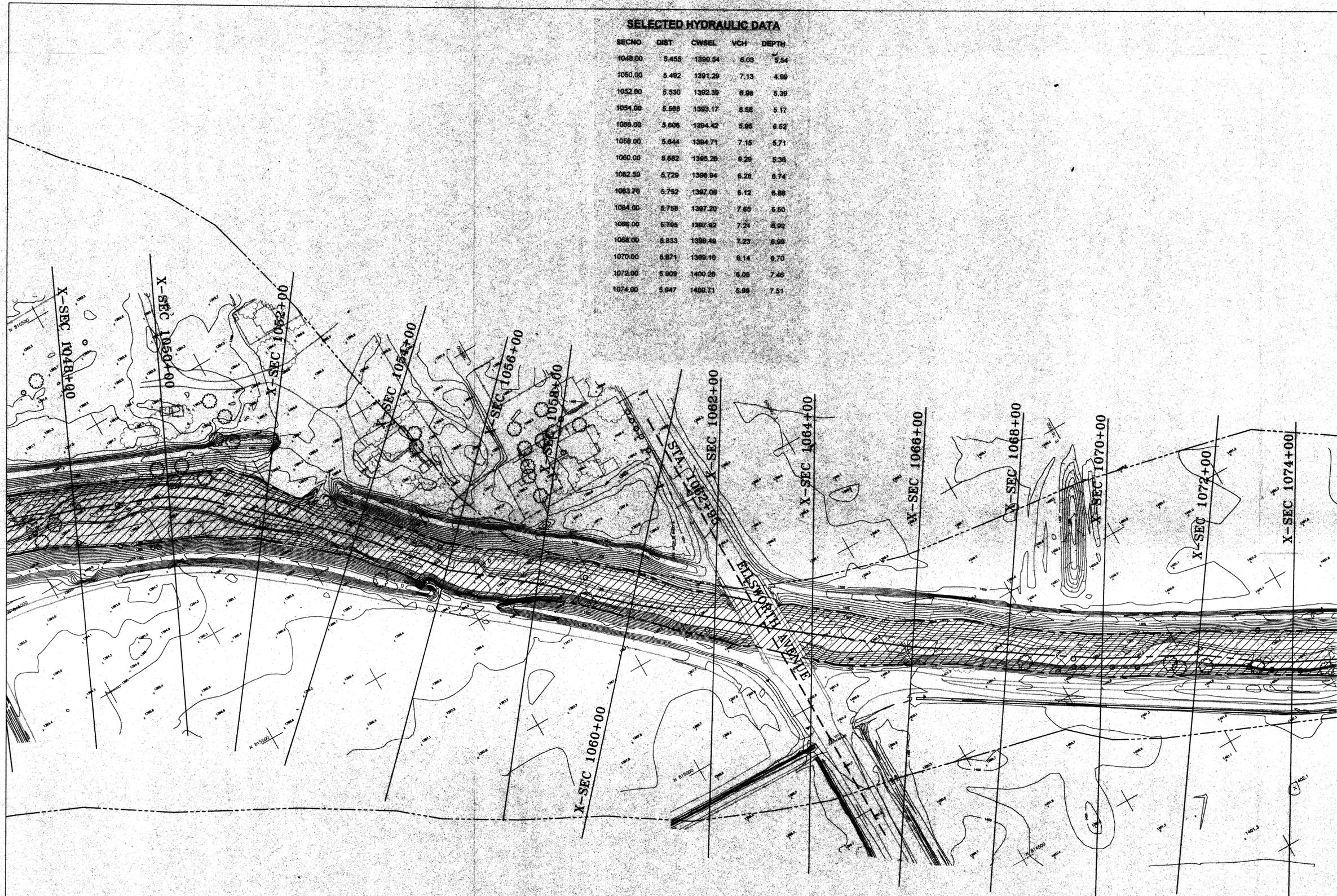


**VICINITY MAP**  
Not to Scale

<b>FLOOD CONTROL DISTRICT OF MARICOPA COUNTY</b>	
ISSUED	
CHIEF ENGINEER AND GENERAL MANAGER	DATE
BOARD OF DIRECTORS OF THE FLOOD CONTROL DISTRICT	
BETSEY BAYLESS - CHAIRMAN	
DISTRICT 1	TOM RAWLES
DISTRICT 2	DON STAPLEY
DISTRICT 3	BETSEY BAYLESS
DISTRICT 4	EDWARD KING
DISTRICT 5	MARY ROSE GARRIDO WILCOX

**SELECTED HYDRAULIC DATA**

SECNO	DIST	CWSEL	VCH	DEPTH
1048.00	5.455	1390.54	6.00	5.54
1050.00	5.462	1391.29	7.13	4.99
1052.00	5.530	1392.39	8.98	5.39
1054.00	5.599	1393.17	8.58	5.17
1056.00	5.606	1394.42	5.95	6.52
1058.00	5.644	1394.71	7.15	5.71
1060.00	5.682	1395.28	8.20	5.35
1062.00	5.729	1396.94	6.25	6.74
1063.70	5.752	1397.08	6.12	6.88
1064.00	5.758	1397.20	7.65	5.50
1066.00	5.798	1397.92	7.21	6.92
1068.00	5.833	1398.48	7.25	6.98
1070.00	5.871	1399.10	8.14	6.70
1072.00	5.908	1400.26	6.05	7.46
1074.00	5.947	1400.71	5.98	7.51

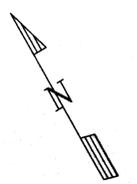


REMOVE

CONSTRUCT

**LEGEND**

- QUEEN CREEK WASH CENTERLINE
- 1997 FIS FLOODPLAIN LIMITS
- FEMA FIRM FLOODPLAIN LIMITS
- FLOODWAY AREAS IN ZONE AE



50 0 50 100  
Scale in Feet

FLOOD CONTROL DISTRICT  
OF MARICOPA COUNTY  
ENGINEERING DIVISION  
FLOODPLAIN DELINEATION  
QUEEN CREEK WASH  
(SPRR TO HAWES ROAD)

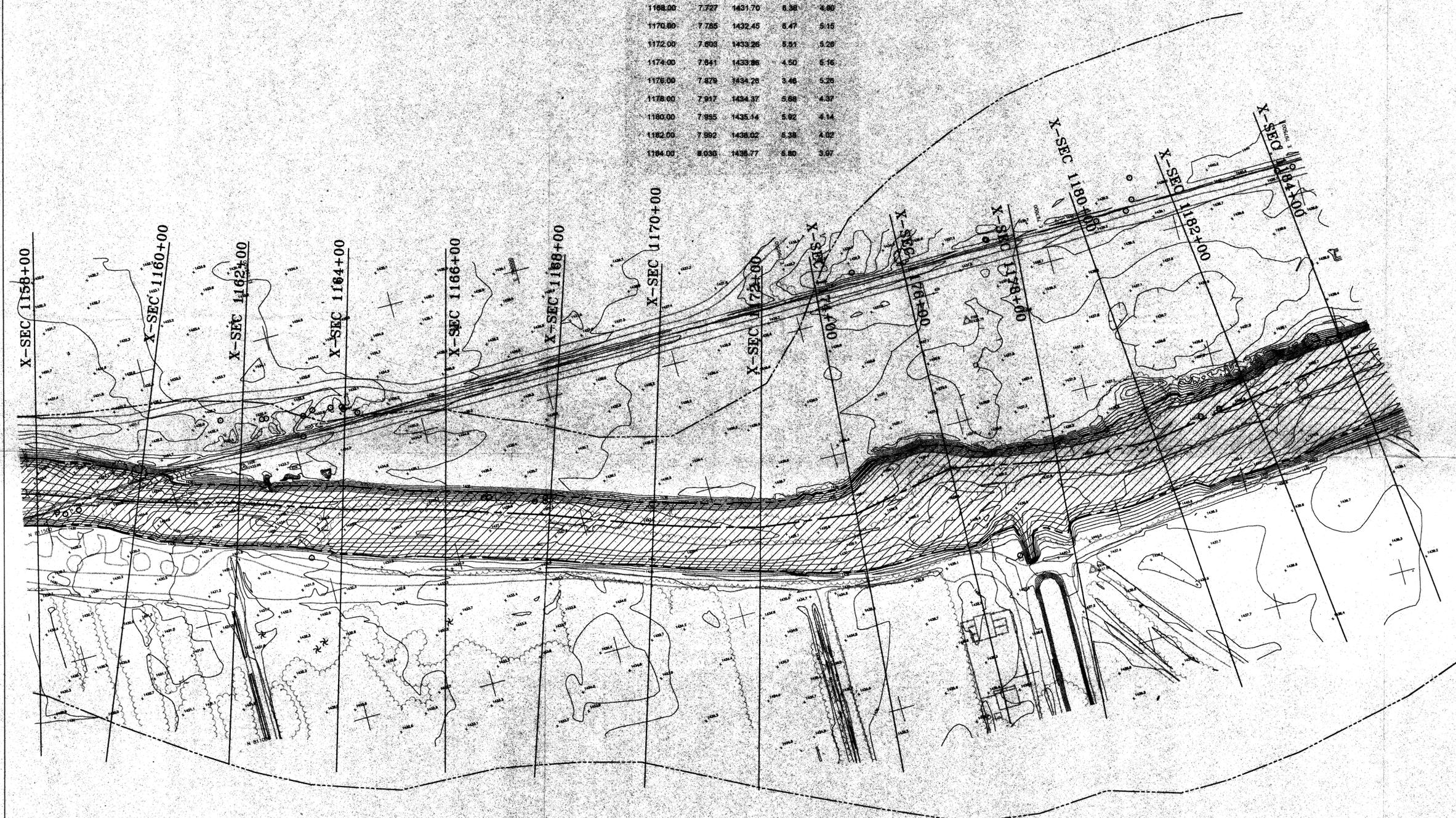
DESIGNED	BY	DATE
DRAWN		
CHECKED		



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**SELECTED HYDRAULIC DATA**

SECNO	DIST	CWSEL	VCH	DEPTH
1158.00	7.536	1428.15	4.83	7.15
1160.00	7.376	1428.37	6.54	8.27
1162.00	7.614	1429.31	7.89	4.81
1164.00	7.652	1430.58	6.61	6.88
1166.00	7.889	1431.08	8.02	8.28
1168.00	7.727	1431.70	8.38	4.80
1170.00	7.755	1432.45	8.47	5.15
1172.00	7.808	1433.26	5.51	5.28
1174.00	7.941	1433.88	4.50	5.16
1176.00	7.478	1434.28	3.46	5.25
1178.00	7.917	1434.37	5.68	4.37
1180.00	7.955	1435.14	5.52	4.14
1182.00	7.992	1436.02	5.38	4.02
1184.00	8.030	1436.77	5.80	3.97



REMOVE

CONSTRUCT

**LEGEND**

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- 1997 FIS FLOODPLAIN LIMITS
- FEMA FIRM FLOODPLAIN LIMITS
- FLOODWAY AREAS IN ZONE AE



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Scale in Feet

NO.	REVISION	BY	DATE
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**FLOOD CONTROL DISTRICT OF MARICOPA COUNTY ENGINEERING DIVISION**

**FLOODPLAIN DELINEATION QUEEN CREEK WASH (SPRR TO HAWES ROAD)**

	BY	DATE
DESIGNED		
DRAWN		
CHECKED		



FIELD SURVEY CERTIFICATION  
The work of the field survey is to provide ground elevations and horizontal control reference data to be used in the preparation of maps and plans. It is the responsibility of the field surveyor to ensure that the data is accurate and reliable. The field surveyor is not responsible for the accuracy of the data used in the preparation of maps and plans. The field surveyor is not responsible for the accuracy of the data used in the preparation of maps and plans.

**SELECTED HYDRAULIC DATA**

SECNO	DIST	CWSBL	VCH	DEPTH
1186.00	8.088	1437.66	4.85	4.66
1188.00	8.106	1438.00	5.26	4.00
1189.00	8.144	1438.82	5.28	4.32
1192.00	8.182	1439.44	5.81	4.24
1194.00	8.220	1440.09	5.85	4.09
1195.00	8.239	1440.25	6.47	3.43
1195.40	8.240	1440.32	6.34	3.52
1196.00	8.258	1440.52	6.41	3.82
1197.10	8.276	1441.22	3.85	4.42
1197.30	8.282	1441.23	3.84	4.43
1198.00	8.295	1441.22	5.43	4.22
1200.00	8.333	1441.80	4.73	4.30



REMOVE

CONSTRUCT

**LEGEND**

- QUEEN CREEK WASH CENTERLINE
- 1997 FIS FLOODPLAIN LIMITS
- FEMA FIRM FLOODPLAIN LIMITS
- 1997 FIS FLOODWAY LIMITS
- FLOODWAY AREAS IN ZONE AE
- SPECIAL FLOOD HAZARD AREAS INUNDATED BY 100-YR FLOOD



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Scale in Feet

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NO.	REVISION	BY	DATE

**FLOOD CONTROL DISTRICT  
OF MARICOPA COUNTY  
ENGINEERING DIVISION  
FLOODPLAIN DELINEATION  
QUEEN CREEK WASH  
(SPRR TO HAWES ROAD)**

	BY	DATE
DESIGNED		
DRAWN		
CHECKED		



Use of the professional engineer's seal is restricted to the work for which the seal was issued and shall not be used for any other purpose. The seal shall not be used for any work for which the engineer is not licensed. The seal shall not be used for any work for which the engineer is not licensed. The seal shall not be used for any work for which the engineer is not licensed.

FIELD SURVEY CERTIFICATION  
The work of this field survey is in double check and has been checked and approved by the engineer. The work of this field survey is in double check and has been checked and approved by the engineer. The work of this field survey is in double check and has been checked and approved by the engineer.