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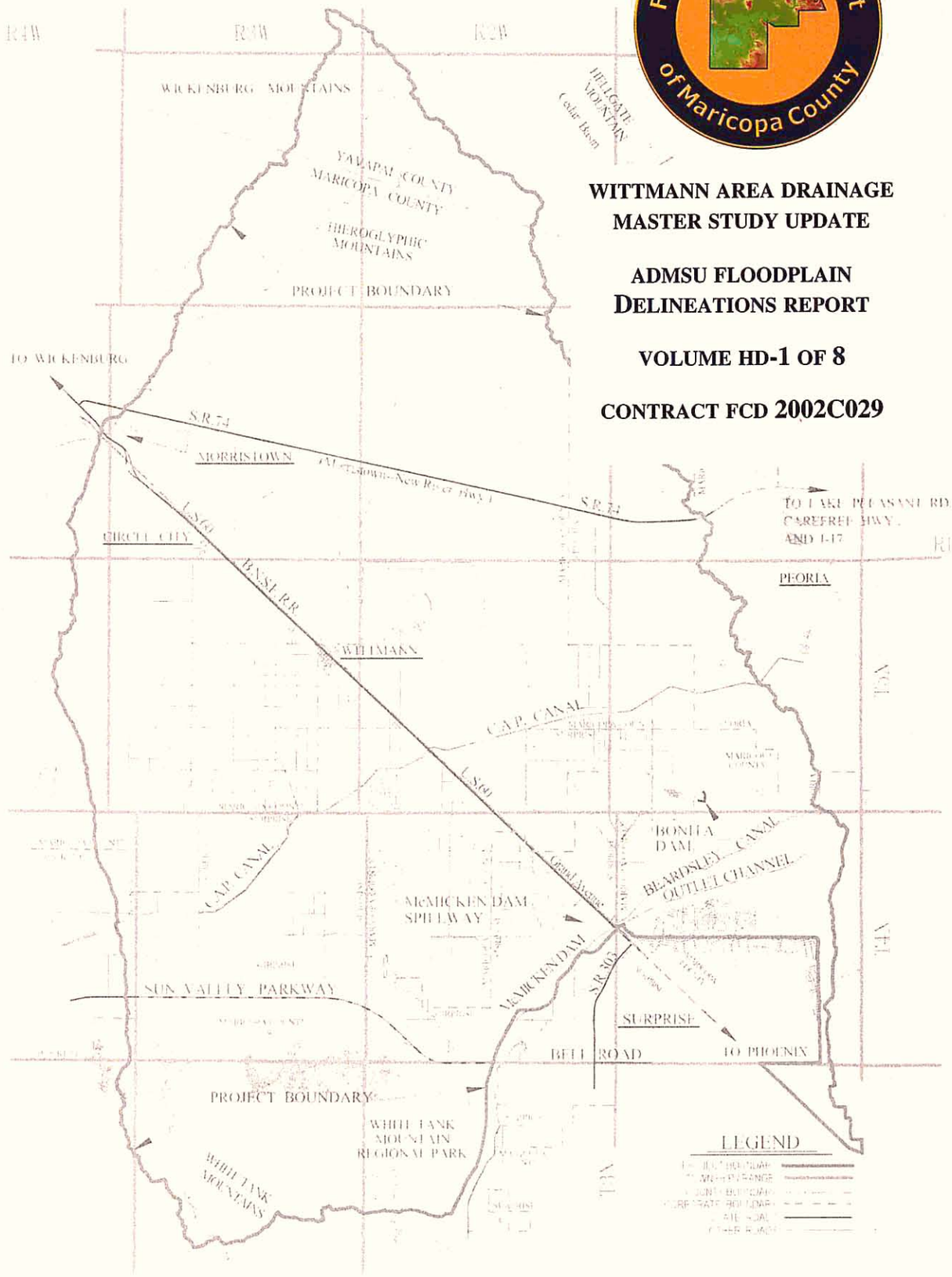

Flood Control District of Maricopa County

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

ADMSU FLOODPLAIN DELINEATIONS REPORT

VOLUME HD-1 OF 8

CONTRACT FCD 2002C029

Federal Emergency Management Agency

Washington, D.C. 20472

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CERTIFIED MAIL
RETURN RECEIPT REQUESTED

IN REPLY REFER TO:
Case No. 07-09-1634P

The Honorable Fulton Brock
Chairman, Maricopa County
Board of Supervisors
301 West Jefferson, 10th Floor
Phoenix, AZ 85003

Community: Maricopa County, AZ
Community No.: 040037

Dear Mr. Brock:

This is in regard to a Letter of Map Revision (LOMR) request dated October 5, 2005, from Mr. Michael Duncan, P.E., CFM, Flood Control District of Maricopa County, Arizona, that the Department of Homeland Security's Federal Emergency Management Agency (FEMA) evaluate the effects that updated flood hazard data as a result of up-to-date hydrologic, hydraulic, and topographic information for numerous washes within the Wittmann drainage area in north-central Maricopa County (referred to as the Wittmann Area Drainage Master Study Update) would have on the flood hazard information shown on the effective Flood Insurance Rate Map (FIRM) for Maricopa County, Arizona and Incorporated Areas. This LOMR request has been assigned Case No. 07-09-1634P. This letter identifies the submitted data as the best available flood hazard information, which is intended to improve upon that shown on the effective FIRM.

We reviewed data submitted in the application package (with appendixes) entitled "Wittmann Area Drainage Master Study Update, ADMSU Floodplain Delineation Report, Contract FCD 2002C029," prepared for the Flood Control District of Maricopa County by Entellus Inc., dated October 3, 2005. We have determined that the submitted data meet the minimum floodplain management criteria of the National Flood Insurance Program (NFIP), but FEMA cannot issue a LOMR or Physical Map Revision at this time.

In accordance with Paragraph 60.3(b)(4) of the NFIP regulations (copy enclosed), we encourage your community to make reasonable use of the draft work maps entitled "Flood Control District of Maricopa County, Wittmann Area Drainage Master Study Update, Contract F.C.D. 2002C029, Sheets B-17, B-18, C-15 to C-21, D13- to D26, E-11 to E-26, F-11 to F-26, G-11 to G-18, H-10 to H-22, I-10 to I-22, J-12 to J-19, K-11 to K-19, L-09 to L-18, M-09 to M-22, N-10 to N-22, O-13 to O-18, P-13 to P-18, Q-13 to Q-18, and R-13 to R-18" prepared by Entellus Inc, dated July 27, 2005, as the best available data for floodplain management purposes until such time as FEMA can physically revise the FIRM or issue a LOMR.

This letter is based on minimum floodplain management criteria established under the NFIP. Your community is responsible for approving all floodplain development and for ensuring that all necessary permits required by Federal or State law have been received. State, county, and community officials, based on their knowledge of local conditions and in the interest of safety, may set higher standards for construction in the Special Flood Hazard Area, the area subject to inundation by the base (1-percent-annual-chance) flood. If the State, county, or community has adopted more restrictive or comprehensive floodplain management criteria, these take precedence over the minimum NFIP criteria.

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 calling the Director, Mitigation Division of FEMA Region IX in Oakland, California at (510) 627-7175. If you have questions regarding this letter, please call our Map Assistance Center, toll free, at 1-877-FEMA MAP (1-877-336-2627).

Sincerely,

Max H. Yuan, P.E., Project Engineer
Engineering Management Section
Mitigation Directorate

For: William R. Blanton Jr., CFM, Chief
Engineering Management Section
Mitigation Directorate

Enclosure

cc: Mr. Timothy S. Phillips, P.E.
Chief Engineer and General Manager
Flood Control District of Maricopa County

Mr. Michael Duncan, P.E., CFM
Principal Civil Engineer
Flood Control District of Maricopa County

Ms. Lynn M. Thomas, P.E., CFM
Technical Supervisor
Flood Control District of Maricopa County

Mr. Ted Collins, CFM
Principal Floodplain Coordinator
Flood Control District of Maricopa County

Mr. Brian Cosson, CFM
NFIP Coordinator
Office of Dam Safety and Flood Mitigation
Arizona Department of Water Resources

Federal Emergency Management Agency

Washington, D.C. 20472

SEP 2 6 2007

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

IN REPLY REFER TO:
Case No. 07-09-1634P

Mayor Joan H. Shafer
Mayor, City of Surprise
City Hall
12425 West Bell Road
Surprise, AZ 85374-9005

Community: City of Surprise, AZ
Community No.: 040053

Dear Mayor Shafer:

This is in regard to a Letter of Map Revision (LOMR) request dated October 5, 2005, from Mr. Michael Duncan, P.E., CFM, Flood Control District of Maricopa County, Arizona, that the Department of Homeland Security's Federal Emergency Management Agency (FEMA) evaluate the effects that updated flood hazard data as a result of up-to-date hydrologic, hydraulic, and topographic information for numerous washes within the Wittmann drainage area in north-central Maricopa County (referred to as the Wittmann Area Drainage Master Study Update) would have on the flood hazard information shown on the effective Flood Insurance Rate Map (FIRM) for Maricopa County, Arizona and Incorporated Areas. This LOMR request has been assigned Case No. 07-09-1634P. This letter identifies the submitted data as the best available flood hazard information, which is intended to improve upon that shown on the effective FIRM.

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This letter is based on minimum floodplain management criteria established under the NFIP. Your community is responsible for approving all floodplain development and for ensuring that all necessary permits required by Federal or State law have been received. State, county, and community officials, based on their knowledge of local conditions and in the interest of safety, may set higher standards for construction in the Special Flood Hazard Area, the area subject to inundation by the base (1-percent-annual-chance) flood. If the State, county, or community has adopted more restrictive or comprehensive floodplain management criteria, these take precedence over the minimum NFIP criteria.

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Sincerely,

Max H. Yuan, P.E., Project Engineer
Engineering Management Section
Mitigation Directorate

For: William R. Blanton Jr., CFM, Chief
Engineering Management Section
Mitigation Directorate

Enclosure

cc: Mr. Timothy S. Phillips, P.E.
Chief Engineer and General Manager
Flood Control District of Maricopa County

Mr. Michael Duncan, P.E., CFM
Principal Civil Engineer
Flood Control District of Maricopa County

Ms. Lynn M. Thomas, P.E., CFM
Technical Supervisor
Flood Control District of Maricopa County

Mr. Ted Collins, CFM
Principal Floodplain Coordinator
Flood Control District of Maricopa County

Mr. Brian Cosson, CFM
NFIP Coordinator
Office of Dam Safety and Flood Mitigation
Arizona Department of Water Resources

Mr. Brian Pirooz, P.E.
Assistant City Engineer

Mr. Hernan A. Aristizabal, P.E.
Entellus, Inc.

Flood Control District
of Maricopa County

Board of Directors
Fulton Brock, District 1
Don Stapley, District 2
Andrew Kunasek, District 3
Max Wilson, District 4
Mary Rose Wilcox, District 5

www.fcd.maricopa.gov
2801 West Durango Street
Phoenix, Arizona 85009
Phone: 602-506-1501
Fax: 602-506-4601
TT: 602-505-5897

October 3, 2005

Craig Kennedy, Arizona Revisions Coordinator
Michael Baker Jr. Inc.
3601 Eisenhower Avenue
Alexandria, Virginia 22304-6425

Subject: Submission of Wittmann Area Floodplain Study

Dear Craig:

We have completed a study in our Wittmann watershed. The study includes 120 linear-miles of Zone AE floodplain, and 30 linear-miles of Zone A floodplain. A large portion of the study's Zone AE has upgraded and revised existing Zone A floodplain.

I am transmitting the following with this letter:

8 volumes of Technical Data Notebooks, HD-1 through HD-8
4 volumes of Hydrology, HY-Addendum and HY-1 through HY-3
1 volume of Survey, SR
1 notebook with Public Information
1 roll of 24 inch by 36 inch maps, 153 sheets

There is a CD with AutoCAD dxf files of the floodplain features at the front of Volume HD-1. If you have any questions, please contact me at 602-506-4732 or mwd@mail.maricopa.gov.

Sincerely,

Mike Duncan

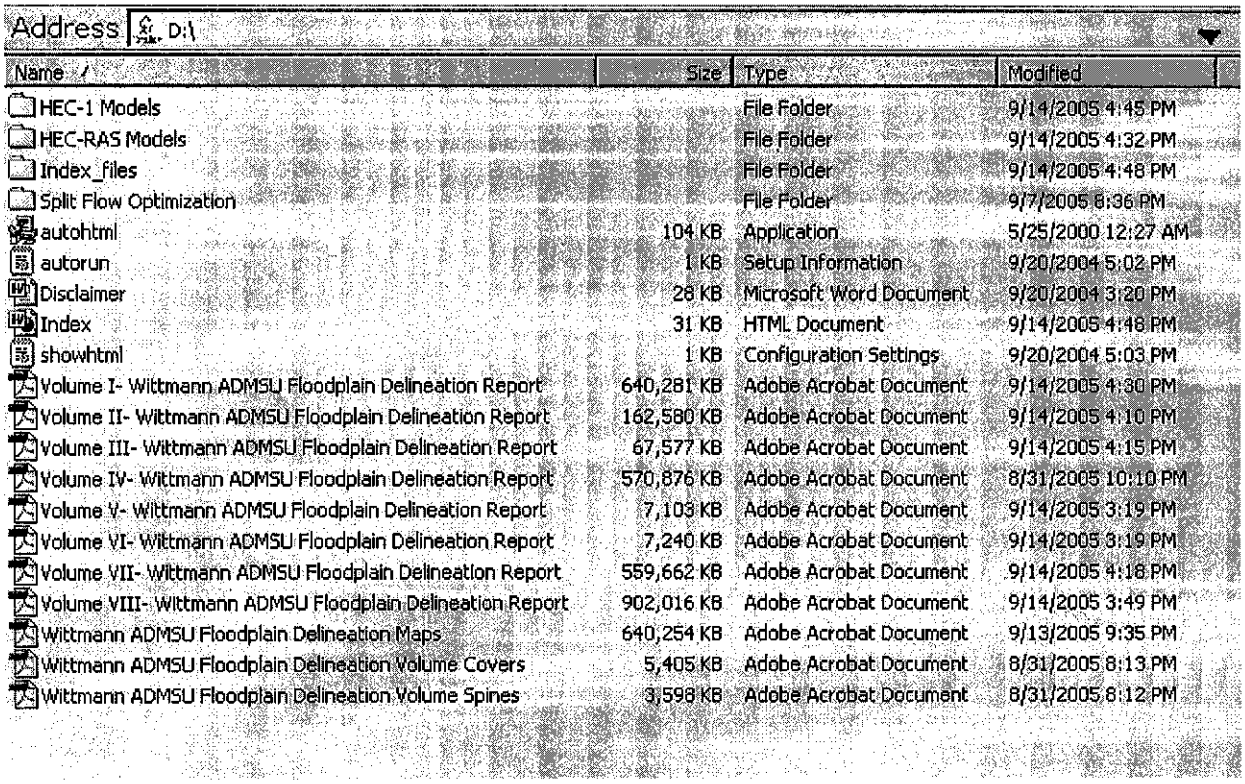
Mike Duncan, P.E., CFM
Principal Flood Delineation Engineer

Enclosures: 14 notebooks and 1 roll of maps

Copies to: Michael Godesky, Project Manager
Hazards Study Branch, Mitigation Directorate
Federal Emergency Management Agency
500 C STREET SW
WASHINGTON DC 20472-0001

Brian Pirooz, P.E.
Assistant City Engineer
City of Surprise
12425 W BELL RD STE D-100
SURPRISE AZ 85374-9002

Hernan Aristizabal, P.E.
Project Manager
Entellus
2255 N 44TH ST STE 125
PHOENIX AZ 85008-3279



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autorun	1 KB	Setup Information	9/20/2004 5:02 PM
Disclaimer	28 KB	Microsoft Word Document	9/20/2004 3:20 PM
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Volume III- Wittmann ADMSU Floodplain Delineation Report	67,577 KB	Adobe Acrobat Document	9/14/2005 4:15 PM
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Volume VIII- Wittmann ADMSU Floodplain Delineation Report	902,016 KB	Adobe Acrobat Document	9/14/2005 3:49 PM
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WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

ADMSU FLOODPLAIN DELINEATIONS REPORT

VOLUME HD-1 OF 8

Professional Engineer (Civil)
CERTIFICATE NO.
29737
HERNAN A.
ARISTIZABAL
Date Signed 12/10/15

CONTRACT FCD 2002C029

Flood Control District of Maricopa County

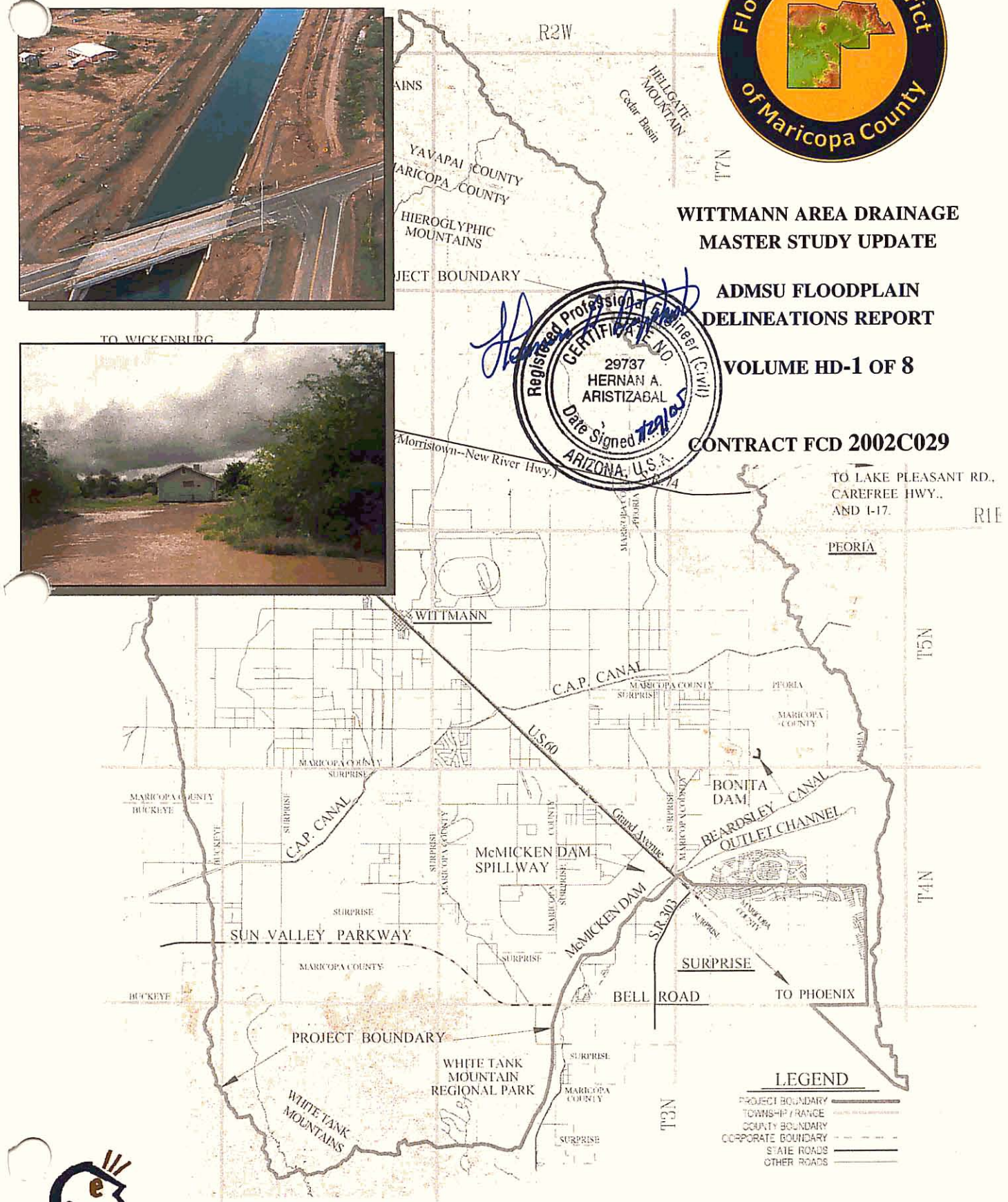
WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

ADMSU FLOODPLAIN DELINEATIONS REPORT

VOLUME HD-1 OF 8

CONTRACT FCD 2002C029

Registered Professional Engineer (Civil)
CERTIFICATE NO.
29737
HERNAN A.
ARISTIZABAL
Date Signed 12/9/05
ARIZONA, U.S.A.



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WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT 2002C029

VOLUME NAME	VOLUME ID
EXISTING CONDITIONS ANALYSIS (PART I)	EC
ADMSU HYDROLOGY	HY
GEOMORPHOLOGY REPORT	GR
SUBSIDENCE REPORT	SU
ALTERNATIVES IDENTIFICATION (PART II)	AI
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WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

FCD 2002C029

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WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

TECHNICAL DATA NOTEBOOK
FLOODPLAIN DELINEATION REPORT - VOLUME HD

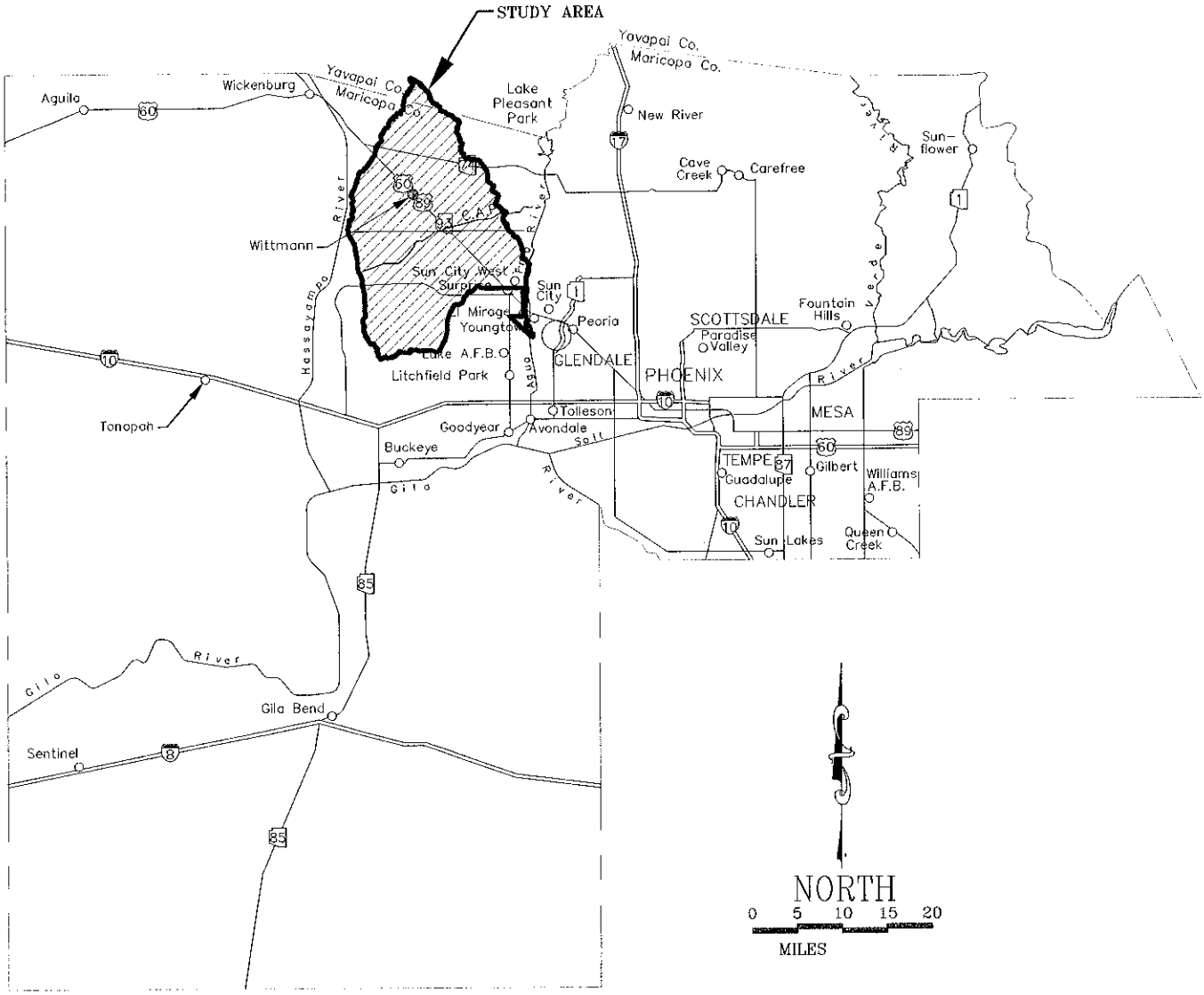
SECTION 1: INTRODUCTION

The information and analyses presented in this hydraulics report are part of the scope of work performed by Entellus, Inc. for the Flood Control District of Maricopa County (District) as part of the Wittmann Area Drainage Master Study Update (Wittmann ADMSU) under Contract FCD No. 2002C029. The purpose of this report is to present the results of the hydraulic analysis. In addition, it documents the methodology, assumptions, problems and solutions encountered during the development of the floodplain delineation study.

1.1 Project Location

The study area is located in north-central Maricopa County and is bound by the Hieroglyphic Mountains to the north and northeast, the White Tank Mountains and McMicken Dam and its outlet channel to the south, the Agua Fria River to the east, and the Hassayampa River basin to the west (**Figure HD-1.1**). The total watershed area is approximately 320 square miles. The study area consists of mostly undeveloped land. However, several small communities exist, and several developments are either under construction or in the planning stage. The unincorporated towns of Wittmann and Circle City are located along US Highway 60 (US 60) in the center of the study area. The Cities of Surprise, Peoria and the Town of Buckeye have annexed portions of the study area, although most of the area remains undeveloped or low-density scattered rural residential lands in unincorporated Maricopa County.

The watershed contains several major natural watercourses, mainly: Wittmann Wash, Trilby Wash, Iona Wash, Padelford Wash, and Picacho Wash. Additionally, several man-made features traverse the watershed and cross the natural channels including the Central Arizona Project (CAP) Canal, Sun Valley Parkway, US 60, State Route 74 (SR 74), and Burlington Northern & Santa Fe (BNSF) Railroad. Other significant structures include the McMicken Dam and outlet channel, Bonita Dam, and the Beardsley Canal.



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WITTMANN
AREA DRAINAGE MASTER STUDY UPDATE
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
CONTRACT FCD 2002C029

VICINTY MAP
FIGURE HD-1.1

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1.2 Hydraulic Methodology and Results

The hydraulic analysis was performed using the US Army Corps of Engineer's HEC-RAS V.3.1.1 program (**Reference 7**), in accordance, with BOSS RMS Version 2000 for Windows (**Reference 8**). The details of the hydraulic methodology are discussed in **Section 5**.

SECTION 2: ADWR/FEMA FORMS

Entellus

Wittmann Area Drainage Master Study Update
F.C.D. Contract No. 2002C029

FEMA Form 1: Overview and Concurrence Form

FEDERAL EMERGENCY MANAGEMENT AGENCY

OVERVIEW & CONCURRENCE FORM

O.M.B No. 3067-0148
Expires September 30, 2005

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 1 hour per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, reviewing, and submitting the form. You are not required to respond to this collection of information unless a valid OMB control number appears in the upper right corner of this 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, SW, Washington DC 20472, Paperwork Reduction Project (3067-0148). Submission of the form is required to obtain or retain benefits under the National Flood Insurance Program. **Please do not send your completed survey to the above address.**

A. REQUESTED RESPONSE FROM FEMA

This request is for a (check one):

☐ CLOMR: A letter from FEMA commenting on whether a proposed project, if built as proposed, would justify a map revision, or proposed hydrology changes (See 44 CFR Ch. 1, Parts 60, 65 & 72).

☐ LOMR: A letter from FEMA officially revising the current NFIP map to show the changes to floodplains, regulatory floodway or flood elevations. (See Parts 60 & 65 of the NFIP Regulations.)

B. OVERVIEW

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

Community No.	Community Name	State	Map No.	Panel No.	Effective Date
Ex: 480301	City of Katy	TX	480301	0005D	02/08/83
480287	Harris County	TX	48201C	0220G	09/28/90
	See attached for additional information				

2. Flooding Source: Washes within the Wittmann Area Drainage Master Study Update

3. Project Name/Identifier: Wittmann Area Drainage Master Study Update

4. FEMA zone designations affected: Zone A, AH, AE, X (choices: A, AH, AO, A1-A30, A99, AE, AR, V, V1-V30, VE, B, C, D, X)

5. Basis for Request and Type of Revision:

a. The basis for this revision request is (check all that apply)

☐ Physical Change ☒ Improved Methodology/Data

☐ Regulatory Floodway Revision ☐ Other (Attach Description)

Note: A photograph and narrative description of the area of concern is not required, but is very helpful during review.

b. The area of revision encompasses the following types of flooding and structures (check all that apply)

Types of Flooding:	☒ Riverine	☐ Coastal	☒ Shallow Flooding (e.g., Zones AO and AH)
	☐ Alluvial fan	☐ Lakes	☐ Other (Attach Description)
Structures:	☐ Channelization	☐ Levee/Floodwall	☒ Bridge/Culvert
	☐ Dam	☐ Fill	☐ Other, Attach Description

C. REVIEW FEE

Has the review fee for the appropriate request category been included? ☐ Yes Fee amount: $____

☐ No, Attach Explanation

Please see the FEMA Web site at http://www.fema.gov/fhm/frm_fees.shtm **for Fee Amounts and Exemptions.**

D. SIGNATURE

All documents submitted in support of this request are 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: Hernan A. Aristizabal	Company: Entellus, Inc.	
Mailing Address: 2255 N 44th Street Suite 125 Phoenix, AZ 85008-3279	Daytime Telephone No.: 602-244-2566	Fax No.: 602-244-8947
	E-Mail Address: hernan@entellus.com	
Signature of Requester (required): Hernan A. Aristizabal		Date: 7/29/05

As the community official responsible for floodplain management, I hereby acknowledge that we have received and reviewed this Letter of Map Revision (LOMR) or conditional LOMR request. Based upon the community's review, we find the completed or proposed project meets or is designed to meet all of the community floodplain management requirements, including the requirement that no fill be placed in the regulatory floodway, and that all necessary Federal, State, and local permits have been, or in the case of a conditional LOMR, will be obtained. In addition, we have determined that the land and any existing or proposed structures to be removed from the SFHA are or will be reasonably safe from flooding as defined in 44CFR 65.2(c), and that we have available upon request by FEMA, all analyses and documentation used to make this determination.

Community Official's Name and Title: Timothy S. Phillips, P.E., Chief Engineer and General Manager		Telephone No.: 602-506-1501
Community Name: Unincorporated Maricopa County	Community Official's Signature (required):	Date: 9/12/05

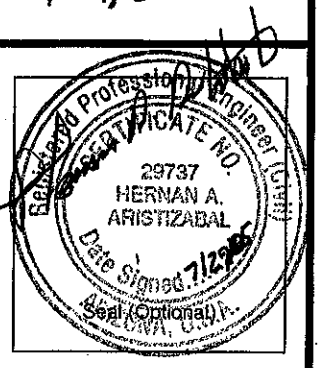
CERTIFICATION BY REGISTERED PROFESSIONAL ENGINEER AND/OR LAND SURVEYOR

This certification is to be signed and sealed by a licensed land surveyor, registered professional engineer, or architect authorized by law to certify elevation information. All documents submitted in support of this request are 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.

Certifier's Name: Hernan A. Aristizabal	License No.: 29737	Expiration Date: AZ
Company Name: Entellus, Inc.	Telephone No.: 602-244-2566	Fax No.: 602-244-8947
Signature: Hernan A. Aristizabal		Date: 7/29/05

Ensure the forms that are appropriate to your revision request are included in your submittal.

Form Name and (Number)	Required if ...
☒ Riverine Hydrology and Hydraulics Form (Form 2)	New or revised discharges or water-surface elevations
☒ Riverine Structures Form (Form 3)	Channel is modified, addition/revision of bridge/culverts, addition/revision of levee/floodwall, addition/revision of dam
☐ Coastal Analysis Form (Form 4)	New or revised coastal elevations
☐ Coastal Structures Form (Form 5)	Addition/revision of coastal structure
☐ Alluvial Fan Flooding Form (Form 6)	Flood control measures on alluvial fans



C. REVIEW FEE

Has the review fee for the appropriate request category been included? ☐ Yes Fee amount: $_____

☐ No, Attach Explanation

Please see the FEMA Web site at http://www.fema.gov/fhm/frm_fees.shtm **for Fee Amounts and Exemptions.**

D. SIGNATURE

All documents submitted in support of this request are 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: Hernan A. Aristizabal	Company: Entellus, Inc.	
Mailing Address: 2255 N 44th Street Suite 125 Phoenix, AZ 85008-3279	Daytime Telephone No.: 602-244-2566	Fax No.: 602-244-8947
	E-Mail Address: hernan@entellus.com	
Signature of Requester (required): Hernan A. Aristizabal		Date: 7/29/05

As the community official responsible for floodplain management, I hereby acknowledge that we have received and reviewed this Letter of Map Revision (LOMR) or conditional LOMR request. Based upon the community's review, we find the completed or proposed project meets or is designed to meet all of the community floodplain management requirements, including the requirement that no fill be placed in the regulatory floodway, and that all necessary Federal, State, and local permits have been, or in the case of a conditional LOMR, will be obtained. In addition, we have determined that the land and any existing or proposed structures to be removed from the SFHA are or will be reasonably safe from flooding as defined in 44CFR 65.2(c), and that we have available upon request by FEMA, all analyses and documentation used to make this determination.

Community Official's Name and Title: BRIAN PIROOZ ASST. CITY ENG.		Telephone No.: 602-583-6025
Community Name: City of Surprise	Community Official's Signature (required): Brian Pirooz	Date: 8.8.05

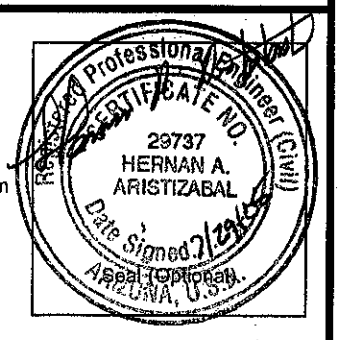
CERTIFICATION BY REGISTERED PROFESSIONAL ENGINEER AND/OR LAND SURVEYOR

This certification is to be signed and sealed by a licensed land surveyor, registered professional engineer, or architect authorized by law to certify elevation information. All documents submitted in support of this request are 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.

Certifier's Name: Hernan A. Aristizaba	License No.: 29737	Expiration Date: AZ
Company Name: Entellus, Inc.	Telephone No.: 602-244-2566	Fax No.: 602-244-8947
Signature: Hernan A. Aristizabal		Date: 7/29/05

Ensure the forms that are appropriate to your revision request are included in your submittal.

Form Name and (Number)	Required if ...
☒ Riverine Hydrology and Hydraulics Form (Form 2)	New or revised discharges or water-surface elevations
☒ Riverine Structures Form (Form 3)	Channel is modified, addition/revision of bridge/culverts, addition/revision of levee/floodwall, addition/revision of dam
☐ Coastal Analysis Form (Form 4)	New or revised coastal elevations
☐ Coastal Structures Form (Form 5)	Addition/revision of coastal structure
☐ Alluvial Fan Flooding Form (Form 6)	Flood control measures on alluvial fans



B. OVERVIEW (Cont.)

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

Community No.	Community Name	State	Map No.	Panel No.	Effective Date
40037	Maricopa County, Unincorporated Areas	AZ	04013C	0679G	7/19/2001
40037	Maricopa County, Unincorporated Areas	AZ	04013C	0680F	7/19/2001
40037	Maricopa County, Unincorporated Areas	AZ	04013C	0687G	7/19/2001
40037	Maricopa County, Unincorporated Areas	AZ	04013C	0689G	7/19/2001
40037	Maricopa County, Unincorporated Areas	AZ	04013C	0690G	7/19/2001
40037	Maricopa County, Unincorporated Areas	AZ	04013C	0694F	7/19/2001
40037	Maricopa County, Unincorporated Areas	AZ	04013C	0695G	7/19/2001
40037	Maricopa County, Unincorporated Areas	AZ	04013C	0696G	7/19/2001
40037	Maricopa County, Unincorporated Areas	AZ	04013C	0715F	7/19/2001
40037	Maricopa County, Unincorporated Areas	AZ	04013C	0720F	7/19/2001
40037	Maricopa County, Unincorporated Areas	AZ	04013C	1105G	7/19/2001
40053	City of Surprise	AZ	04013C	1105G	7/19/2001
40037	Maricopa County, Unincorporated Areas	AZ	04013C	1110G	7/19/2001
40053	City of Surprise	AZ	04013C	1110G	7/19/2001
40053	City of Surprise	AZ	04013C	1120G	7/19/2001
40037	Maricopa County, Unincorporated Areas	AZ	04013C	1130F	7/19/2001
40037	Maricopa County, Unincorporated Areas	AZ	04013C	1140G	7/19/2001
40053	City of Surprise	AZ	04013C	1140G	7/19/2001
40053	City of Surprise	AZ	04013C	1145G	7/19/2001
40037	Maricopa County, Unincorporated Areas	AZ	04013C	1155G	7/19/2001

Wittmann Area Drainage Master Study Update
F.C.D. Contract No. 2002C029

FEMA Form 2: Riverine Hydrology & Hydraulics Form

FEMA Form 2: Riverine Hydraulic Analysis

1. WASH 3 WEST
2. T4N-R3W-S08E
3. T5N-R3W-S19
4. IONA WASH
5. IONA WASH (ZONE AO)
6. IONA WASH (NORTH)
7. IONA NORTH WEST SPLIT-1
8. IONA TRIBUTARY (ZONE A)
9. IONA EAST SPLIT-1
10. IONA EAST SPLIT-2
11. TRILBY WASH
12. CIRCLE CITY AREA WASH 1
13. WASH 2 WEST (NORTH OF CAP)
14. 2 WEST TRIBUTARY-1
15. 2 WEST TRIBUTARY-2
16. WITTMANN WASH
17. WITTMANN WASH (NORTH SPLIT)
18. WITTMANN WASH (SOUTH SPLIT)
19. WITTMANN TRIBUTARY
20. T5N-R3W-S24E
21. T5N-R2W-S19E
22. T5N-R2W-S19W
23. T5N-R3W-S01S
24. T5N-R2W-S07
25. WASH 2 EAST (NORTH OF CAP)
26. 2 EAST TRIBUTARY
27. T5N-R2W-S14N (ZONE A)
28. T5N-R2W-S14S (ZONE A)
29. T5N-R2W-S14W (ZONE A)
30. T5N-R2W-S11 (ZONE A)
31. WASH 7 EAST
32. 7 EAST TRIBUTARY
33. IONA EAST (SOUTH OF CAP)
34. IONA WEST (SOUTH OF CAP)
35. WASH 2 WEST (SOUTH OF CAP)
36. WASH 1 WEST
37. WASH 1 EAST
38. WASH 2 EAST (SOUTH OF CAP)
39. 2 EAST DIKE FAILURE
40. WASH 3 EAST
41. WASH 4 EAST
42. 4 EAST DIKE FAILURE
43. WASH 5 EAST
44. WASH 5 EAST (ZONE AO)
45. WASH 6 EAST
46. 6 EAST SOUTH
47. 7 EAST-EAST SPLIT
48. 7 EAST-WEST SPLIT
49. WASH 8 EAST
50. WASH 9 EAST
51. 9 EAST SPLIT
52. WASH 10 EAST
53. 10 EAST (EAST SPLIT-1)
54. 10 EAST (EAST SPLIT-2)
55. WASH 11 EAST
56. 11 EAST DIKE FAILURE
57. BONITA DIKE CHANNEL
58. WASH 12 EAST
59. 12 EAST SPLIT
60. WASH 13 EAST
61. WASH 14 EAST

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 3067-0148
Expires September 30, 2005

PAPERWORK REDUCTION ACT

Public reporting burden for this form is estimated to average 3 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, reviewing, and submitting the form. You are not required to respond to this collection of information unless a valid OMB control number appears in the upper right corner of this 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, SW, Washington DC 20472, Paperwork Reduction Project (3067-0148). Submission of the form is required to obtain or retain benefits under the National Flood Insurance Program. **Please do not send your completed survey to the above address.**

Flooding Source: Wash 3 West
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. *Reason for New Hydrologic Analysis (check all that apply)*

☐ Not revised (skip to section 2) ☐ No existing analysis ☒ Improved data
☒ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	FIS (cfs)	Revised (cfs)

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model [TR-20, HEC-1, HEC-HMS etc.]
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the *new analysis. The document,* "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☐ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit	243rd Ave / CAP Canal	0.000		
Upstream Limit	275th Ave / Lone Mountain Road	6.370		

2. Hydraulic Method Used

Hydraulic Analysis HEC-RAS [HEC-2 , HEC-RAS, Other (Attach description)]

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. These tools do not replace engineering judgment. CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. If you disagree with a message, please attach an explanation of why the message is not valid in this case. Review of your submittal and resolution of valid modeling discrepancies will result in reduced review time.

HEC-2/HEC-RAS models reviewed with CHECK-2/CHECK-RAS? ☒ Yes ☐ No

4. Models Submitted

Duplicate Effective Model*	Natural File Name:	Floodway File Name:
Corrected Effective Model*	Natural File Name:	Floodway File Name:
Existing or Pre-Project Conditions Model	Natural File Name: 3W	Floodway File Name: 3W
Revised or Post-Project Conditions Model	Natural File Name:	Floodway File Name:
Other - (attach description)	Natural File Name:	Floodway File Name:

*Not required for revisions to approximate 1%-annual-chance floodplains (Zone A) – for details, refer to the corresponding section of the instructions.

The document "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM,** annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

D. COMMON REGULATORY REQUIREMENTS

1. For CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☐ No

For CLOMR requests, if either of the following is true, please submit evidence of compliance with Section 65.12 of the NFIP regulations:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
- The proposed project encroaches upon a SFHA with BFEs established and would result in increases above 1.00 foot.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☐ No

If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☐ No

If Yes, attach evidence of regulatory floodway revision notification. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☐ No

If Yes, please attach proof of property owner notification and acceptance (if available). Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 3067-0148
Expires September 30, 2005

PAPERWORK REDUCTION ACT

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Flooding Source: T4N-R3W-S08E
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☐ Not revised (skip to section 2) ☐ No existing analysis ☒ Improved data
☒ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	FIS (cfs)	Revised (cfs)

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model [TR-20, HEC-1, HEC-HMS etc.]
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis. The document, "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☐ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit	243rd Ave / Happy Valley	0.000		
Upstream Limit	259th Ave / Lone Mountain Road	4.891		

2. Hydraulic Method Used

Hydraulic Analysis HEC-RAS [HEC-2 , HEC-RAS, Other (Attach description)]

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. These tools do not replace engineering judgment. CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. If you disagree with a message, please attach an explanation of why the message is not valid in this case. Review of your submittal and resolution of valid modeling discrepancies will result in reduced review time.

HEC-2/HEC-RAS models reviewed with CHECK-2/CHECK-RAS? ☒ Yes ☐ No

4. Models Submitted

Duplicate Effective Model*	Natural File Name:	Floodway File Name:
Corrected Effective Model*	Natural File Name:	Floodway File Name:
Existing or Pre-Project Conditions Model	Natural File Name: T4N-R3W-S08E	Floodway File Name: T4N-R3W-S08E
Revised or Post-Project Conditions Model	Natural File Name:	Floodway File Name:
Other - (attach description)	Natural File Name:	Floodway File Name:

*Not required for revisions to approximate 1%-annual-chance floodplains (Zone A) – for details, refer to the corresponding section of the instructions.

The document "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM,** annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

D. COMMON REGULATORY REQUIREMENTS

1. For CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☐ No

For CLOMR requests, if either of the following is true, please submit evidence of compliance with Section 65.12 of the NFIP regulations:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
- The proposed project encroaches upon a SFHA with BFEs established and would result in increases above 1.00 foot.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☐ No

If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☐ No

If Yes, attach evidence of regulatory floodway revision notification. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☐ No

If Yes, please attach proof of property owner notification and acceptance (if available). Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 3067-0148
Expires September 30, 2005

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Flooding Source: T5N-R3W-S19
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☐ Not revised (skip to section 2) ☐ No existing analysis ☒ Improved data
☒ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	FIS (cfs)	Revised (cfs)

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model [TR-20, HEC-1, HEC-HMS etc.]
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis. The document, "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☐ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit	259th Ave / Dove Valley Road	0.000		
Upstream Limit	259th Ave / Dove Valley Road	0.580		

2. Hydraulic Method Used

Hydraulic Analysis HEC-RAS [HEC-2 , HEC-RAS, Other (Attach description)]

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. These tools do not replace engineering judgment. CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. If you disagree with a message, please attach an explanation of why the message is not valid in this case. Review of your submittal and resolution of valid modeling discrepancies will result in reduced review time.

HEC-2/HEC-RAS models reviewed with CHECK-2/CHECK-RAS? ☒ Yes ☐ No

4. Models Submitted

Duplicate Effective Model*	Natural File Name:	Floodway File Name:
Corrected Effective Model*	Natural File Name:	Floodway File Name:
Existing or Pre-Project Conditions Model	Natural File Name: T5N-R3W-S19	Floodway File Name: T5N-R3W-S19
Revised or Post-Project Conditions Model	Natural File Name:	Floodway File Name:
Other - (attach description)	Natural File Name:	Floodway File Name:

*Not required for revisions to approximate 1%-annual-chance floodplains (Zone A) – for details, refer to the corresponding section of the instructions.

The document "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM,** annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

D. COMMON REGULATORY REQUIREMENTS

1. For CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☐ No

For CLOMR requests, if either of the following is true, please submit evidence of compliance with Section 65.12 of the NFIP regulations:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
- The proposed project encroaches upon a SFHA with BFEs established and would result in increases above 1.00 foot.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☐ No

If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☐ No

If Yes, attach evidence of regulatory floodway revision notification. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☐ No

If Yes, please attach proof of property owner notification and acceptance (if available). Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 3067-0148
Expires September 30, 2005

PAPERWORK REDUCTION ACT

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Flooding Source: Iona Wash
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☐ Not revised (skip to section 2) ☐ No existing analysis ☒ Improved data
☒ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	FIS (cfs)	Revised (cfs)

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model [TR-20, HEC-1, HEC-HMS etc.]
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis. The document, "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☐ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit	227th Ave / CAP Canal	0.034		
Upstream Limit	243rd Ave / Lone Mountain Road	4.901	1695.8*	

2. Hydraulic Method Used

Hydraulic Analysis HEC-RAS [HEC-2 , HEC-RAS, Other (Attach description)]

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. These tools do not replace engineering judgment. CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. If you disagree with a message, please attach an explanation of why the message is not valid in this case. Review of your submittal and resolution of valid modeling discrepancies will result in reduced review time.

HEC-2/HEC-RAS models reviewed with CHECK-2/CHECK-RAS? ☒ Yes ☐ No

4. Models Submitted

Duplicate Effective Model*	Natural File Name:	Floodway File Name:
Corrected Effective Model*	Natural File Name:	Floodway File Name:
Existing or Pre-Project Conditions Model	Natural File Name: IONA WASH	Floodway File Name: IONA WASH
Revised or Post-Project Conditions Model	Natural File Name:	Floodway File Name:
Other - (attach description)	Natural File Name:	Floodway File Name:

*Not required for revisions to approximate 1%-annual-chance floodplains (Zone A) – for details, refer to the corresponding section of the instructions.

The document "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM,** annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

D. COMMON REGULATORY REQUIREMENTS

1. For CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☐ No

For CLOMR requests, if either of the following is true, please submit evidence of compliance with Section 65.12 of the NFIP regulations:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
- The proposed project encroaches upon a SFHA with BFEs established and would result in increases above 1.00 foot.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☐ No

If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☐ No

If Yes, attach evidence of regulatory floodway revision notification. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☐ No

If Yes, please attach proof of property owner notification and acceptance (if available). Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 3067-0148
Expires September 30, 2005

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Flooding Source: Iona Wash (Zone AO)
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☐ Not revised (skip to section 2) ☐ No existing analysis ☒ Improved data
☒ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	FIS (cfs)	Revised (cfs)

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model [TR-20, HEC-1, HEC-HMS etc.]
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis. The document, "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☐ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit	235th Ave / Lone Mountain Road	10.000		
Upstream Limit	243rd Ave / Carefree Highway	60.000		

2. Hydraulic Method Used

Hydraulic Analysis HEC-RAS [HEC-2 , HEC-RAS, Other (Attach description)]

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. These tools do not replace engineering judgment. CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. If you disagree with a message, please attach an explanation of why the message is not valid in this case. Review of your submittal and resolution of valid modeling discrepancies will result in reduced review time.

HEC-2/HEC-RAS models reviewed with CHECK-2/CHECK-RAS? ☐ Yes ☐ No

4. Models Submitted

Duplicate Effective Model*	Natural File Name:	Floodway File Name:
Corrected Effective Model*	Natural File Name:	Floodway File Name:
Existing or Pre-Project Conditions Model	Natural File Name: IONA_ZONE AO	Floodway File Name: IONA_ZONE AO
Revised or Post-Project Conditions Model	Natural File Name:	Floodway File Name:
Other - (attach description)	Natural File Name:	Floodway File Name:

*Not required for revisions to approximate 1%-annual-chance floodplains (Zone A) – for details, refer to the corresponding section of the instructions.

The document "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM,** annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

D. COMMON REGULATORY REQUIREMENTS

1. For CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☐ No

For CLOMR requests, if either of the following is true, please submit evidence of compliance with Section 65.12 of the NFIP regulations:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
- The proposed project encroaches upon a SFHA with BFEs established and would result in increases above 1.00 foot.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☐ No

If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☐ No

If Yes, attach evidence of regulatory floodway revision notification. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☐ No

If Yes, please attach proof of property owner notification and acceptance (if available). Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 3067-0148
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Flooding Source: Iona Wash (North)
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☐ Not revised (skip to section 2) ☐ No existing analysis ☒ Improved data
☒ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	FIS (cfs)	Revised (cfs)

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model [TR-20, HEC-1, HEC-HMS etc.]
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis. The document, "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☐ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit	243rd Ave / Carefree Highway	0.000	1772.0*	
Upstream Limit	251st Ave / Rockaway Hills Road	5.018		

2. Hydraulic Method Used

Hydraulic Analysis HEC-RAS [HEC-2 , HEC-RAS, Other (Attach description)]

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. These tools do not replace engineering judgment. CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. If you disagree with a message, please attach an explanation of why the message is not valid in this case. Review of your submittal and resolution of valid modeling discrepancies will result in reduced review time.

HEC-2/HEC-RAS models reviewed with CHECK-2/CHECK-RAS? ☒ Yes ☐ No

4. Models Submitted

Duplicate Effective Model*	Natural File Name:	Floodway File Name:
Corrected Effective Model*	Natural File Name:	Floodway File Name:
Existing or Pre-Project Conditions Model	Natural File Name: IONA_NORTH	Floodway File Name: IONA_NORTH
Revised or Post-Project Conditions Model	Natural File Name:	Floodway File Name:
Other - (attach description)	Natural File Name:	Floodway File Name:

*Not required for revisions to approximate 1%-annual-chance floodplains (Zone A) – for details, refer to the corresponding section of the instructions.

The document "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM,** annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

D. COMMON REGULATORY REQUIREMENTS

1. For CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☐ No

For CLOMR requests, if either of the following is true, please submit evidence of compliance with Section 65.12 of the NFIP regulations:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
- The proposed project encroaches upon a SFHA with BFEs established and would result in increases above 1.00 foot.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☐ No

If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☐ No

If Yes, attach evidence of regulatory floodway revision notification. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☐ No

If Yes, please attach proof of property owner notification and acceptance (if available). Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 3067-0148
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Flooding Source: Iona North West Split-1
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☐ Not revised (skip to section 2) ☐ No existing analysis ☒ Improved data
☒ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	FIS (cfs)	Revised (cfs)

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model [TR-20, HEC-1, HEC-HMS etc.]
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis. The document, "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☐ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit	251st Ave / Rockaway Hills Road	0.000		
Upstream Limit	251st Ave / S-R 74	0.549		

2. Hydraulic Method Used

Hydraulic Analysis HEC-RAS [HEC-2 , HEC-RAS, Other (Attach description)]

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. These tools do not replace engineering judgment. CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. If you disagree with a message, please attach an explanation of why the message is not valid in this case. Review of your submittal and resolution of valid modeling discrepancies will result in reduced review time.

HEC-2/HEC-RAS models reviewed with CHECK-2/CHECK-RAS? ☒ Yes ☐ No

4. Models Submitted

Duplicate Effective Model*	Natural File Name:	Floodway File Name:
Corrected Effective Model*	Natural File Name:	Floodway File Name:
Existing or Pre-Project Conditions Model	Natural File Name: IONA_North_WS-1	Floodway File Name: IONA_NORTH_WS-1
Revised or Post-Project Conditions Model	Natural File Name:	Floodway File Name:
Other - (attach description)	Natural File Name:	Floodway File Name:

*Not required for revisions to approximate 1%-annual-chance floodplains (Zone A) -- for details, refer to the corresponding section of the instructions.

The document "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM,** annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

D. COMMON REGULATORY REQUIREMENTS

1. For CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☐ No

For CLOMR requests, if either of the following is true, please submit evidence of compliance with Section 65.12 of the NFIP regulations:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
- The proposed project encroaches upon a SFHA with BFEs established and would result in increases above 1.00 foot.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☐ No

If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☐ No

If Yes, attach evidence of regulatory floodway revision notification. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☐ No

If Yes, please attach proof of property owner notification and acceptance (if available). Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 3067-0148
Expires September 30, 2005

PAPERWORK REDUCTION ACT

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Flooding Source: Iona Tributary
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☐ Not revised (skip to section 2) ☐ No existing analysis ☒ Improved data
☒ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	FIS (cfs)	Revised (cfs)

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model [TR-20, HEC-1, HEC-HMS etc.]
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis. The document, "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☐ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit	243rd Ave/ Dove Valley Road	0.000		
Upstream Limit	259th Ave/ Carefree Highway	2.420		

2. Hydraulic Method Used

Hydraulic Analysis HEC-RAS [HEC-2 , HEC-RAS, Other (Attach description)]

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. These tools do not replace engineering judgment. CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. If you disagree with a message, please attach an explanation of why the message is not valid in this case. Review of your submittal and resolution of valid modeling discrepancies will result in reduced review time.

HEC-2/HEC-RAS models reviewed with CHECK-2/CHECK-RAS? ☐ Yes ☐ No

4. Models Submitted

Duplicate Effective Model*	Natural File Name:	Floodway File Name:
Corrected Effective Model*	Natural File Name:	Floodway File Name:
Existing or Pre-Project Conditions Model	Natural File Name: IONATRIB	Floodway File Name: IONATRIB
Revised or Post-Project Conditions Model	Natural File Name:	Floodway File Name:
Other - (attach description)	Natural File Name:	Floodway File Name:

*Not required for revisions to approximate 1%-annual-chance floodplains (Zone A) – for details, refer to the corresponding section of the instructions.

The document "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM,** annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

D. COMMON REGULATORY REQUIREMENTS

1. For CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☐ No

For CLOMR requests, if either of the following is true, please submit evidence of compliance with Section 65.12 of the NFIP regulations:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
- The proposed project encroaches upon a SFHA with BFEs established and would result in increases above 1.00 foot.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☐ No

If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☐ No

If Yes, attach evidence of regulatory floodway revision notification. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☐ No

If Yes, please attach proof of property owner notification and acceptance (if available). Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 3067-0148
Expires September 30, 2005

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Flooding Source: Iona East Split-1
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☐ Not revised (skip to section 2) ☐ No existing analysis ☒ Improved data
☒ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	FIS (cfs)	Revised (cfs)

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model [TR-20, HEC-1, HEC-HMS etc.]
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis. The document, "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☐ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit	227th Ave / Patton road	0.000		
Upstream Limit	243rd Ave / Black Mtn/Cloud Road	5.261		

2. Hydraulic Method Used

Hydraulic Analysis HEC-RAS [HEC-2 , HEC-RAS, Other (Attach description)]

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. These tools do not replace engineering judgment. CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. If you disagree with a message, please attach an explanation of why the message is not valid in this case. Review of your submittal and resolution of valid modeling discrepancies will result in reduced review time.

HEC-2/HEC-RAS models reviewed with CHECK-2/CHECK-RAS? ☒ Yes ☐ No

4. Models Submitted

Duplicate Effective Model*	Natural File Name:		Floodway File Name:	
Corrected Effective Model*	Natural File Name:		Floodway File Name:	
Existing or Pre-Project Conditions Model	Natural File Name:	IONA_ES-1	Floodway File Name:	IONA_ES-1
Revised or Post-Project Conditions Model	Natural File Name:		Floodway File Name:	
Other - (attach description)	Natural File Name:		Floodway File Name:	

*Not required for revisions to approximate 1%-annual-chance floodplains (Zone A) – for details, refer to the corresponding section of the instructions.

The document "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM,** annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

D. COMMON REGULATORY REQUIREMENTS

1. For CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☐ No

For CLOMR requests, if either of the following is true, please submit evidence of compliance with Section 65.12 of the NFIP regulations:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
- The proposed project encroaches upon a SFHA with BFEs established and would result in increases above 1.00 foot.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☐ No

If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☐ No

If Yes, attach evidence of regulatory floodway revision notification. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☐ No

If Yes, please attach proof of property owner notification and acceptance (if available). Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 3067-0148
Expires September 30, 2005

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Flooding Source: Iona East Split-2
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☐ Not revised (skip to section 2) ☐ No existing analysis ☒ Improved data
☒ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	FIS (cfs)	Revised (cfs)

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model [TR-20, HEC-1, HEC-HMS etc.]
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis. The document, "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☐ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit	227th Ave / CAP Canal	0.203		
Upstream Limit	235th Ave / Patton Road	2.151		

2. Hydraulic Method Used

Hydraulic Analysis HEC-RAS [HEC-2 , HEC-RAS, Other (Attach description)]

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. These tools do not replace engineering judgment. CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. If you disagree with a message, please attach an explanation of why the message is not valid in this case. Review of your submittal and resolution of valid modeling discrepancies will result in reduced review time.

HEC-2/HEC-RAS models reviewed with CHECK-2/CHECK-RAS? ☒ Yes ☐ No

4. Models Submitted

Duplicate Effective Model*	Natural File Name:	Floodway File Name:
Corrected Effective Model*	Natural File Name:	Floodway File Name:
Existing or Pre-Project Conditions Model	Natural File Name: IONA ES-2	Floodway File Name: IONA ES-2
Revised or Post-Project Conditions Model	Natural File Name:	Floodway File Name:
Other - (attach description)	Natural File Name:	Floodway File Name:

*Not required for revisions to approximate 1%-annual-chance floodplains (Zone A) – for details, refer to the corresponding section of the instructions.

The document "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM,** annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

D. COMMON REGULATORY REQUIREMENTS

1. For CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☐ No

For CLOMR requests, if either of the following is true, please submit evidence of compliance with Section 65.12 of the NFIP regulations:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
- The proposed project encroaches upon a SFHA with BFEs established and would result in increases above 1.00 foot.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☐ No

If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☐ No

If Yes, attach evidence of regulatory floodway revision notification. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☐ No

If Yes, please attach proof of property owner notification and acceptance (if available). Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 3067-0148
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Flooding Source: Trilby Wash
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☐ Not revised (skip to section 2) ☐ No existing analysis ☒ Improved data
☒ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	FIS (cfs)	Revised (cfs)

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model [TR-20, HEC-1, HEC-HMS etc.]
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis. The document, "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☐ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit	235th Ave / Joy Ranch Road	18.481	1920.60	
Upstream Limit	235th Ave / Rockaway Hils Road	20.434		

2. Hydraulic Method Used

Hydraulic Analysis HEC-RAS [HEC-2 , HEC-RAS, Other (Attach description)]

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. These tools do not replace engineering judgment. CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. If you disagree with a message, please attach an explanation of why the message is not valid in this case. Review of your submittal and resolution of valid modeling discrepancies will result in reduced review time.

HEC-2/HEC-RAS models reviewed with CHECK-2/CHECK-RAS? ☒ Yes ☐ No

4. Models Submitted

Duplicate Effective Model*	Natural File Name: ———	Floodway File Name: ———
Corrected Effective Model*	Natural File Name:	Floodway File Name:
Existing or Pre-Project Conditions Model	Natural File Name: TRILBY	Floodway File Name: TRILBY
Revised or Post-Project Conditions Model	Natural File Name:	Floodway File Name:
Other - (attach description)	Natural File Name:	Floodway File Name:

*Not required for revisions to approximate 1%-annual-chance floodplains (Zone A) – for details, refer to the corresponding section of the instructions.

The document "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM,** annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

D. COMMON REGULATORY REQUIREMENTS

1. For CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☐ No

For CLOMR requests, if either of the following is true, please submit evidence of compliance with Section 65.12 of the NFIP regulations:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
- The proposed project encroaches upon a SFHA with BFEs established and would result in increases above 1.00 foot.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☐ No

If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☐ No

If Yes, attach evidence of regulatory floodway revision notification. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☐ No

If Yes, please attach proof of property owner notification and acceptance (if available). Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 3067-0148
Expires September 30, 2005

PAPERWORK REDUCTION ACT

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Flooding Source: Circle City Area Wash 1
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☐ Not revised (skip to section 2) ☐ No existing analysis ☒ Improved data
☒ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	FIS (cfs)	Revised (cfs)

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model [TR-20, HEC-1, HEC-HMS etc.]
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis. The document, "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☐ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit	243rd Ave/ Carefree Highway	0.401	1848.5	
Upstream Limit	243rd Ave / Black Mtn/Cloud Road	1.738		

2. Hydraulic Method Used

Hydraulic Analysis HEC-RAS [HEC-2 , HEC-RAS, Other (Attach description)]

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. These tools do not replace engineering judgment. CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. If you disagree with a message, please attach an explanation of why the message is not valid in this case. Review of your submittal and resolution of valid modeling discrepancies will result in reduced review time.

HEC-2/HEC-RAS models reviewed with CHECK-2/CHECK-RAS? ☒ Yes ☐ No

4. Models Submitted

Duplicate Effective Model*	Natural File Name:	Floodway File Name:
Corrected Effective Model*	Natural File Name:	Floodway File Name:
Existing or Pre-Project Conditions Model	Natural File Name: CC AREA WASH 1	Floodway File Name: CC AREA WASH 1
Revised or Post-Project Conditions Model	Natural File Name:	Floodway File Name:
Other - (attach description)	Natural File Name:	Floodway File Name:

*Not required for revisions to approximate 1%-annual-chance floodplains (Zone A) – for details, refer to the corresponding section of the instructions.

The document "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM,** annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

D. COMMON REGULATORY REQUIREMENTS

1. For CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☐ No

For CLOMR requests, if either of the following is true, please submit evidence of compliance with Section 65.12 of the NFIP regulations:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
- The proposed project encroaches upon a SFHA with BFEs established and would result in increases above 1.00 foot.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☐ No

If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☐ No

If Yes, attach evidence of regulatory floodway revision notification. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☐ No

If Yes, please attach proof of property owner notification and acceptance (if available). Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 3067-0148
Expires September 30, 2005

PAPERWORK REDUCTION ACT

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Flooding Source: Wash 2 West (North of CAP)
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☐ Not revised (skip to section 2) ☐ No existing analysis ☒ Improved data
☒ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	FIS (cfs)	Revised (cfs)

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model [TR-20, HEC-1, HEC-HMS etc.]
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis. The document, "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☐ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit	219th Ave / CAP Canal	0.066		
Upstream Limit	227th Ave / Lone Mountain Road	3.553		

2. Hydraulic Method Used

Hydraulic Analysis HEC-RAS [HEC-2 , HEC-RAS, Other (Attach description)]

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. These tools do not replace engineering judgment. CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. If you disagree with a message, please attach an explanation of why the message is not valid in this case. Review of your submittal and resolution of valid modeling discrepancies will result in reduced review time.

HEC-2/HEC-RAS models reviewed with CHECK-2/CHECK-RAS? ☒ Yes ☐ No

4. Models Submitted

Duplicate Effective Model*	Natural File Name:	Floodway File Name:
Corrected Effective Model*	Natural File Name:	Floodway File Name:
Existing or Pre-Project Conditions Model	Natural File Name: 2W	Floodway File Name: 2W
Revised or Post-Project Conditions Model	Natural File Name:	Floodway File Name:
Other - (attach description)	Natural File Name:	Floodway File Name:

*Not required for revisions to approximate 1%-annual-chance floodplains (Zone A) -- for details, refer to the corresponding section of the instructions.

The document "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM,** annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

D. COMMON REGULATORY REQUIREMENTS

1. For CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☐ No

For CLOMR requests, if either of the following is true, please submit evidence of compliance with Section 65.12 of the NFIP regulations:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
- The proposed project encroaches upon a SFHA with BFEs established and would result in increases above 1.00 foot.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☐ No

If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☐ No

If Yes, attach evidence of regulatory floodway revision notification. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☐ No

If Yes, please attach proof of property owner notification and acceptance (if available). Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 3067-0148
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Flooding Source: 2-West Tributary-1
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☐ Not revised (skip to section 2) ☐ No existing analysis ☒ Improved data
☒ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	FIS (cfs)	Revised (cfs)

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☒ Precipitation/Runoff Model [TR-20, HEC-1, HEC-HMS etc.]
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis. The document, "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☐ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit	219th Ave / Patton Road	0.000		
Upstream Limit	219th Ave / U.S. 60	3.413		

2. Hydraulic Method Used

Hydraulic Analysis HEC-RAS [HEC-2 , HEC-RAS, Other (Attach description)]

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. These tools do not replace engineering judgment. CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. If you disagree with a message, please attach an explanation of why the message is not valid in this case. Review of your submittal and resolution of valid modeling discrepancies will result in reduced review time.

HEC-2/HEC-RAS models reviewed with CHECK-2/CHECK-RAS? ☒ Yes ☐ No

4. Models Submitted

Duplicate Effective Model*	Natural File Name:	Floodway File Name:
Corrected Effective Model*	Natural File Name:	Floodway File Name:
Existing or Pre-Project Conditions Model	Natural File Name: 2W TRIBUTARY-1	Floodway File Name: 2W TRIBUTARY-1
Revised or Post-Project Conditions Model	Natural File Name:	Floodway File Name:
Other - (attach description)	Natural File Name:	Floodway File Name:

*Not required for revisions to approximate 1%-annual-chance floodplains (Zone A) – for details, refer to the corresponding section of the instructions.

The document "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM,** annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

D. COMMON REGULATORY REQUIREMENTS

1. For CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☐ No

For CLOMR requests, if either of the following is true, please submit evidence of compliance with Section 65.12 of the NFIP regulations:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
- The proposed project encroaches upon a SFHA with BFEs established and would result in increases above 1.00 foot.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☐ No

If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☐ No

If Yes, attach evidence of regulatory floodway revision notification. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☐ No

If Yes, please attach proof of property owner notification and acceptance (if available). Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 3067-0148
Expires September 30, 2005

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Flooding Source: 2-West Tributary-2
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☐ Not revised (skip to section 2) ☐ No existing analysis ☒ Improved data
☒ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	FIS (cfs)	Revised (cfs)

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model [TR-20, HEC-1, HEC-HMS etc.]
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis. The document, "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☐ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit	211th Ave / CAP Canal	0.084		
Upstream Limit	219th Ave / Lone Mountain Road	3.014		

2. Hydraulic Method Used

Hydraulic Analysis HEC-RAS [HEC-2 , HEC-RAS, Other (Attach description)]

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. These tools do not replace engineering judgment. CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. If you disagree with a message, please attach an explanation of why the message is not valid in this case. Review of your submittal and resolution of valid modeling discrepancies will result in reduced review time.

HEC-2/HEC-RAS models reviewed with CHECK-2/CHECK-RAS? ☒ Yes ☐ No

4. Models Submitted

Duplicate Effective Model*	Natural File Name:		Floodway File Name:	
Corrected Effective Model*	Natural File Name:		Floodway File Name:	
Existing or Pre-Project Conditions Model	Natural File Name:	2W TRIBUTARY-2	Floodway File Name:	2W TRIBUTARY-2
Revised or Post-Project Conditions Model	Natural File Name:		Floodway File Name:	
Other - (attach description)	Natural File Name:		Floodway File Name:	

*Not required for revisions to approximate 1%-annual-chance floodplains (Zone A) – for details, refer to the corresponding section of the instructions.

The document "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM,** annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

D. COMMON REGULATORY REQUIREMENTS

1. For CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☐ No

For CLOMR requests, if either of the following is true, please submit evidence of compliance with Section 65.12 of the NFIP regulations:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
- The proposed project encroaches upon a SFHA with BFEs established and would result in increases above 1.00 foot.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☐ No

If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☐ No

If Yes, attach evidence of regulatory floodway revision notification. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☐ No

If Yes, please attach proof of property owner notification and acceptance (if available). Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 3067-0148
Expires September 30, 2005

PAPERWORK REDUCTION ACT

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Flooding Source: Wittmann Wash
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☐ Not revised (skip to section 2) ☐ No existing analysis ☒ Improved data
☒ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	FIS (cfs)	Revised (cfs)

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model [TR-20, HEC-1, HEC-HMS etc.]
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis. The document, "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☐ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit	203rd Ave / CAP Canal	0.019		
Upstream Limit	219th Ave / Black Mtn/Cloud Road	5.774		

2. Hydraulic Method Used

Hydraulic Analysis HEC-RAS [HEC-2 , HEC-RAS, Other (Attach description)]

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. These tools do not replace engineering judgment. CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. If you disagree with a message, please attach an explanation of why the message is not valid in this case. Review of your submittal and resolution of valid modeling discrepancies will result in reduced review time.

HEC-2/HEC-RAS models reviewed with CHECK-2/CHECK-RAS? ☒ Yes ☐ No

4. Models Submitted

Duplicate Effective Model*	Natural File Name:	Floodway File Name:
Corrected Effective Model*	Natural File Name:	Floodway File Name:
Existing or Pre-Project Conditions Model	Natural File Name: WITT	Floodway File Name: WITT
Revised or Post-Project Conditions Model	Natural File Name:	Floodway File Name:
Other - (attach description)	Natural File Name:	Floodway File Name:

*Not required for revisions to approximate 1%-annual-chance floodplains (Zone A) – for details, refer to the corresponding section of the instructions.

The document "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM,** annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

D. COMMON REGULATORY REQUIREMENTS

1. For CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☐ No

For CLOMR requests, if either of the following is true, please submit evidence of compliance with Section 65.12 of the NFIP regulations:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
- The proposed project encroaches upon a SFHA with BFEs established and would result in increases above 1.00 foot.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☐ No

If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☐ No

If Yes, attach evidence of regulatory floodway revision notification. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☐ No

If Yes, please attach proof of property owner notification and acceptance (if available). Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 3067-0148
Expires September 30, 2005

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Flooding Source: Wittmann Wash (North Split)
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☐ Not revised (skip to section 2) ☐ No existing analysis ☒ Improved data
☒ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	FIS (cfs)	Revised (cfs)

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model [TR-20, HEC-1, HEC-HMS etc.]
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis. The document, "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☐ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit	219th Ave / Dove Valley Road	3.085		
Upstream Limit	219th Ave / Dove Valley Road	3.428		

2. Hydraulic Method Used

Hydraulic Analysis HEC-RAS [HEC-2 , HEC-RAS, Other (Attach description)]

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. These tools do not replace engineering judgment. CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. If you disagree with a message, please attach an explanation of why the message is not valid in this case. Review of your submittal and resolution of valid modeling discrepancies will result in reduced review time.

HEC-2/HEC-RAS models reviewed with CHECK-2/CHECK-RAS? ☒ Yes ☐ No

4. Models Submitted

Duplicate Effective Model*	Natural File Name:	Floodway File Name:
Corrected Effective Model*	Natural File Name:	Floodway File Name:
Existing or Pre-Project Conditions Model	Natural File Name: WITT_NORTH_SPLIT	Floodway File Name: WITT_NORTH_SPLIT
Revised or Post-Project Conditions Model	Natural File Name:	Floodway File Name:
Other - (attach description)	Natural File Name:	Floodway File Name:

*Not required for revisions to approximate 1%-annual-chance floodplains (Zone A) – for details, refer to the corresponding section of the instructions.

The document "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM,** annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

D. COMMON REGULATORY REQUIREMENTS

1. For CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☐ No

For CLOMR requests, if either of the following is true, please submit evidence of compliance with Section 65.12 of the NFIP regulations:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
- The proposed project encroaches upon a SFHA with BFEs established and would result in increases above 1.00 foot.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☐ No

If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☐ No

If Yes, attach evidence of regulatory floodway revision notification. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☐ No

If Yes, please attach proof of property owner notification and acceptance (if available). Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 3067-0148
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Flooding Source: Wittmann Wash (South Split)
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☐ Not revised (skip to section 2) ☐ No existing analysis ☒ Improved data
☒ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	FIS (cfs)	Revised (cfs)

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model [TR-20, HEC-1, HEC-HMS etc.]
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis. The document, "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☐ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.)	
			Effective	Proposed/Revised
Downstream Limit	211th Ave / CAP Canal	0.016		
Upstream Limit	211th Ave / Dixileta Drive	0.807		

2. Hydraulic Method Used

Hydraulic Analysis HEC-RAS [HEC-2 , HEC-RAS, Other (Attach description)]

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. These tools do not replace engineering judgment. CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. If you disagree with a message, please attach an explanation of why the message is not valid in this case. Review of your submittal and resolution of valid modeling discrepancies will result in reduced review time.

HEC-2/HEC-RAS models reviewed with CHECK-2/CHECK-RAS? ☒ Yes ☐ No

4. Models Submitted

Duplicate Effective Model*	Natural File Name:	Floodway File Name:
Corrected Effective Model*	Natural File Name: SOUTH	Floodway File Name:
Existing or Pre-Project Conditions Model	Natural File Name: WITH_SOUTH_SPLIT	Floodway File Name: WITH_SOUTH_SPLIT
Revised or Post-Project Conditions Model	Natural File Name:	Floodway File Name:
Other - (attach description)	Natural File Name:	Floodway File Name:

*Not required for revisions to approximate 1%-annual-chance floodplains (Zone A) -- for details, refer to the corresponding section of the instructions.

The document "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM,** annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

D. COMMON REGULATORY REQUIREMENTS

1. For CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☐ No

For CLOMR requests, if either of the following is true, please submit evidence of compliance with Section 65.12 of the NFIP regulations:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
- The proposed project encroaches upon a SFHA with BFEs established and would result in increases above 1.00 foot.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☐ No

If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☐ No

If Yes, attach evidence of regulatory floodway revision notification. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☐ No

If Yes, please attach proof of property owner notification and acceptance (if available). Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 3067-0148
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Flooding Source: Wittmann Tributary
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☐ Not revised (skip to section 2) ☐ No existing analysis ☒ Improved data
☒ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	FIS (cfs)	Revised (cfs)

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model [TR-20, HEC-1, HEC-HMS etc.]
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis. The document, "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☐ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit	219th Ave / Dove Valley Road	0.000		
Upstream Limit	219th Ave / Black Mtn/Cloud Road	2.156		

2. Hydraulic Method Used

Hydraulic Analysis HEC-RAS [HEC-2 , HEC-RAS, Other (Attach description)]

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. These tools do not replace engineering judgment. CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. If you disagree with a message, please attach an explanation of why the message is not valid in this case. Review of your submittal and resolution of valid modeling discrepancies will result in reduced review time.

HEC-2/HEC-RAS models reviewed with CHECK-2/CHECK-RAS? ☒ Yes ☐ No

4. Models Submitted

Duplicate Effective Model*	Natural File Name:	Floodway File Name:
Corrected Effective Model*	Natural File Name:	Floodway File Name:
Existing or Pre-Project Conditions Model	Natural File Name: WITMANN	Floodway File Name: WITMANN
Revised or Post-Project Conditions Model	Natural File Name: TRIBUTARY	Floodway File Name: TRIBUTARY
Other - (attach description)	Natural File Name:	Floodway File Name:

*Not required for revisions to approximate 1%-annual-chance floodplains (Zone A) – for details, refer to the corresponding section of the instructions.

The document "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM,** annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

D. COMMON REGULATORY REQUIREMENTS

1. For CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☐ No

For CLOMR requests, if either of the following is true, please submit evidence of compliance with Section 65.12 of the NFIP regulations:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
- The proposed project encroaches upon a SFHA with BFEs established and would result in increases above 1.00 foot.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☐ No

If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☐ No

If Yes, attach evidence of regulatory floodway revision notification. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☐ No

If Yes, please attach proof of property owner notification and acceptance (if available). Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 3067-0148
Expires September 30, 2005

PAPERWORK REDUCTION ACT

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Flooding Source: T5N-R3W-S24E
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☐ Not revised (skip to section 2) ☐ No existing analysis ☒ Improved data
☒ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	FIS (cfs)	Revised (cfs)

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model [TR-20, HEC-1, HEC-HMS etc.]
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis. The document, "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☐ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit	211th Ave / Lone Mountain Road	0.000		
Upstream Limit	219th Ave / Carefree Highway	2.710		

2. Hydraulic Method Used

Hydraulic Analysis HEC-RAS [HEC-2 , HEC-RAS, Other (Attach description)]

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. These tools do not replace engineering judgment. CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. If you disagree with a message, please attach an explanation of why the message is not valid in this case. Review of your submittal and resolution of valid modeling discrepancies will result in reduced review time.

HEC-2/HEC-RAS models reviewed with CHECK-2/CHECK-RAS? ☒ Yes ☐ No

4. Models Submitted

Duplicate Effective Model*	Natural File Name:	Floodway File Name:
Corrected Effective Model*	Natural File Name:	Floodway File Name:
Existing or Pre-Project Conditions Model	Natural File Name: T5N-R3W-S24E	Floodway File Name: T5N-R3W-S24E
Revised or Post-Project Conditions Model	Natural File Name:	Floodway File Name:
Other - (attach description)	Natural File Name:	Floodway File Name:

*Not required for revisions to approximate 1%-annual-chance floodplains (Zone A) – for details, refer to the corresponding section of the instructions.

The document "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM,** annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

D. COMMON REGULATORY REQUIREMENTS

1. For CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☐ No

For CLOMR requests, if either of the following is true, please submit evidence of compliance with Section 65.12 of the NFIP regulations:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
- The proposed project encroaches upon a SFHA with BFEs established and would result in increases above 1.00 foot.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☐ No

If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☐ No

If Yes, attach evidence of regulatory floodway revision notification. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☐ No

If Yes, please attach proof of property owner notification and acceptance (if available). Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 3067-0148
Expires September 30, 2005

PAPERWORK REDUCTION ACT

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Flooding Source: T5N-R2W-S19E
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☐ Not revised (skip to section 2) ☐ No existing analysis ☒ Improved data
☒ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	FIS (cfs)	Revised (cfs)

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model [TR-20, HEC-1, HEC-HMS etc.]
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis. The document, "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☐ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit	203rd Ave / US 60	0.013		
Upstream Limit	203rd Ave / Dove Valley Road	2.054		

2. Hydraulic Method Used

Hydraulic Analysis HEC-RAS [HEC-2 , HEC-RAS, Other (Attach description)]

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. These tools do not replace engineering judgment. CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. If you disagree with a message, please attach an explanation of why the message is not valid in this case. Review of your submittal and resolution of valid modeling discrepancies will result in reduced review time.

HEC-2/HEC-RAS models reviewed with CHECK-2/CHECK-RAS? ☒ Yes ☐ No

4. Models Submitted

Duplicate Effective Model*	Natural File Name:	Floodway File Name:
Corrected Effective Model*	Natural File Name:	Floodway File Name:
Existing or Pre-Project Conditions Model	Natural File Name: T5N-R2W-S19E	Floodway File Name: T5N-R2W-S19E
Revised or Post-Project Conditions Model	Natural File Name:	Floodway File Name:
Other - (attach description)	Natural File Name:	Floodway File Name:

*Not required for revisions to approximate 1%-annual-chance floodplains (Zone A) – for details, refer to the corresponding section of the instructions.

The document "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM,** annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

D. COMMON REGULATORY REQUIREMENTS

1. For CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☐ No

For CLOMR requests, if either of the following is true, please submit evidence of compliance with Section 65.12 of the NFIP regulations:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
- The proposed project encroaches upon a SFHA with BFEs established and would result in increases above 1.00 foot.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☐ No

If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☐ No

If Yes, attach evidence of regulatory floodway revision notification. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☐ No

If Yes, please attach proof of property owner notification and acceptance (if available). Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 3067-0148
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Flooding Source: T5N-R2W-S19W
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☐ Not revised (skip to section 2) ☐ No existing analysis ☒ Improved data
☒ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	FIS (cfs)	Revised (cfs)

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model [TR-20, HEC-1, HEC-HMS etc.]
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis. The document, "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☐ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit	211th Ave / US 60	0.000		
Upstream Limit	211th Ave / Black Mtn/Cloud Road	3.763		

2. Hydraulic Method Used

Hydraulic Analysis HEC-RAS [HEC-2 , HEC-RAS, Other (Attach description)]

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. These tools do not replace engineering judgment. CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. If you disagree with a message, please attach an explanation of why the message is not valid in this case. Review of your submittal and resolution of valid modeling discrepancies will result in reduced review time.

HEC-2/HEC-RAS models reviewed with CHECK-2/CHECK-RAS? ☒ Yes ☐ No

4. Models Submitted

Duplicate Effective Model*	Natural File Name:	Floodway File Name:
Corrected Effective Model*	Natural File Name:	Floodway File Name:
Existing or Pre-Project Conditions Model	Natural File Name: T5N-R2W-S19W	Floodway File Name: T5N-R2W-S19W
Revised or Post-Project Conditions Model	Natural File Name:	Floodway File Name:
Other - (attach description)	Natural File Name:	Floodway File Name:

*Not required for revisions to approximate 1%-annual-chance floodplains (Zone A) – for details, refer to the corresponding section of the instructions.

The document "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM,** annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

D. COMMON REGULATORY REQUIREMENTS

1. For CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☐ No

For CLOMR requests, if either of the following is true, please submit evidence of compliance with Section 65.12 of the NFIP regulations:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
- The proposed project encroaches upon a SFHA with BFEs established and would result in increases above 1.00 foot.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☐ No

If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☐ No

If Yes, attach evidence of regulatory floodway revision notification. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☐ No

If Yes, please attach proof of property owner notification and acceptance (if available). Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 3067-0148
Expires September 30, 2005

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Flooding Source: T5N-R3W-S01S
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☐ Not revised (skip to section 2) ☐ No existing analysis ☒ Improved data
☒ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	FIS (cfs)	Revised (cfs)

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model [TR-20, HEC-1, HEC-HMS etc.]
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis. The document, "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☐ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit	211th Ave / Carefree Highway	0.194		
Upstream Limit	211th Ave / Black Mtn/Cloud Road	0.934		

2. Hydraulic Method Used

Hydraulic Analysis HEC-RAS [HEC-2 , HEC-RAS, Other (Attach description)]

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. These tools do not replace engineering judgment. CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. If you disagree with a message, please attach an explanation of why the message is not valid in this case. Review of your submittal and resolution of valid modeling discrepancies will result in reduced review time.

HEC-2/HEC-RAS models reviewed with CHECK-2/CHECK-RAS? ☒ Yes ☐ No

4. Models Submitted

Duplicate Effective Model*	Natural File Name:	Floodway File Name:
Corrected Effective Model*	Natural File Name:	Floodway File Name:
Existing or Pre-Project Conditions Model	Natural File Name: T5N-R3W-S01S	Floodway File Name: T5N-R3W-S01S
Revised or Post-Project Conditions Model	Natural File Name:	Floodway File Name:
Other - (attach description)	Natural File Name:	Floodway File Name:

*Not required for revisions to approximate 1%-annual-chance floodplains (Zone A) – for details, refer to the corresponding section of the instructions.

The document "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM,** annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

D. COMMON REGULATORY REQUIREMENTS

1. For CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☐ No

For CLOMR requests, if either of the following is true, please submit evidence of compliance with Section 65.12 of the NFIP regulations:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
- The proposed project encroaches upon a SFHA with BFEs established and would result in increases above 1.00 foot.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☐ No

If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☐ No

If Yes, attach evidence of regulatory floodway revision notification. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☐ No

If Yes, please attach proof of property owner notification and acceptance (if available). Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 3067-0148
Expires September 30, 2005

PAPERWORK REDUCTION ACT

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Flooding Source: T5N-R2W-S07
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☐ Not revised (skip to section 2) ☐ No existing analysis ☒ Improved data
☒ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	FIS (cfs)	Revised (cfs)

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model [TR-20, HEC-1, HEC-HMS etc.]
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis. The document, "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☐ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit	211th Ave / Carefree Highway	0.048		
Upstream Limit	219th Ave / Black Mtn/Cloud Road	1.820		

2. Hydraulic Method Used

Hydraulic Analysis HEC-RAS [HEC-2 , HEC-RAS, Other (Attach description)]

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. These tools do not replace engineering judgment. CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. If you disagree with a message, please attach an explanation of why the message is not valid in this case. Review of your submittal and resolution of valid modeling discrepancies will result in reduced review time.

HEC-2/HEC-RAS models reviewed with CHECK-2/CHECK-RAS? ☒ Yes ☐ No

4. Models Submitted

Duplicate Effective Model*	Natural File Name:	Floodway File Name:
Corrected Effective Model*	Natural File Name:	Floodway File Name:
Existing or Pre-Project Conditions Model	Natural File Name: T5N-R2W-S07	Floodway File Name: T5N-R2W-S07
Revised or Post-Project Conditions Model	Natural File Name:	Floodway File Name:
Other - (attach description)	Natural File Name:	Floodway File Name:

*Not required for revisions to approximate 1%-annual-chance floodplains (Zone A) – for details, refer to the corresponding section of the instructions.

The document "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM,** annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

D. COMMON REGULATORY REQUIREMENTS

1. For CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☐ No

For CLOMR requests, if either of the following is true, please submit evidence of compliance with Section 65.12 of the NFIP regulations:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
- The proposed project encroaches upon a SFHA with BFEs established and would result in increases above 1.00 foot.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☐ No

If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☐ No

If Yes, attach evidence of regulatory floodway revision notification. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☐ No

If Yes, please attach proof of property owner notification and acceptance (if available). Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 3067-0148
Expires September 30, 2005

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Flooding Source: Wash 2 East (North of CAP)
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☐ Not revised (skip to section 2) ☐ No existing analysis ☒ Improved data
☒ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	FIS (cfs)	Revised (cfs)

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model [TR-20, HEC-1, HEC-HMS etc.]
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis. The document, "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☐ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit	195th Ave / Lone Mountain Road	1.338		
Upstream Limit	195th Ave / Dove Valley Road	2.598		

2. Hydraulic Method Used

Hydraulic Analysis HEC-RAS [HEC-2 , HEC-RAS, Other (Attach description)]

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. These tools do not replace engineering judgment. CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. If you disagree with a message, please attach an explanation of why the message is not valid in this case. Review of your submittal and resolution of valid modeling discrepancies will result in reduced review time.

HEC-2/HEC-RAS models reviewed with CHECK-2/CHECK-RAS? ☒ Yes ☐ No

4. Models Submitted

Duplicate Effective Model*	Natural File Name:	Floodway File Name:
Corrected Effective Model*	Natural File Name:	Floodway File Name:
Existing or Pre-Project Conditions Model	Natural File Name: 2EAST	Floodway File Name: 2EAST
Revised or Post-Project Conditions Model	Natural File Name:	Floodway File Name:
Other - (attach description)	Natural File Name:	Floodway File Name:

*Not required for revisions to approximate 1%-annual-chance floodplains (Zone A) – for details, refer to the corresponding section of the instructions.

The document "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM,** annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

D. COMMON REGULATORY REQUIREMENTS

1. For CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☐ No

For CLOMR requests, if either of the following is true, please submit evidence of compliance with Section 65.12 of the NFIP regulations:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
- The proposed project encroaches upon a SFHA with BFEs established and would result in increases above 1.00 foot.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☐ No

If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☐ No

If Yes, attach evidence of regulatory floodway revision notification. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☐ No

If Yes, please attach proof of property owner notification and acceptance (if available). Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 3067-0148
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Flooding Source: 2 East-Tributary
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☐ Not revised (skip to section 2) ☐ No existing analysis ☒ Improved data
☒ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	FIS (cfs)	Revised (cfs)

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model [TR-20, HEC-1, HEC-HMS etc.]
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis. The document, "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☐ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Water-Surface Elevations (ft.) Proposed/Revised
Downstream Limit	187th Ave / Lone Mountain Road	0.392		
Upstream Limit	187th Ave / Dove Valley Road	1.753		

2. Hydraulic Method Used

Hydraulic Analysis HEC-RAS [HEC-2 , HEC-RAS, Other (Attach description)]

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. These tools do not replace engineering judgment. CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. If you disagree with a message, please attach an explanation of why the message is not valid in this case. Review of your submittal and resolution of valid modeling discrepancies will result in reduced review time.

HEC-2/HEC-RAS models reviewed with CHECK-2/CHECK-RAS? ☒ Yes ☐ No

4. Models Submitted

Duplicate Effective Model*	Natural File Name:	Floodway File Name:
Corrected Effective Model*	Natural File Name:	Floodway File Name:
Existing or Pre-Project Conditions Model	Natural File Name: 2E_TRIB	Floodway File Name: 2E_TRIB
Revised or Post-Project Conditions Model	Natural File Name:	Floodway File Name:
Other - (attach description)	Natural File Name:	Floodway File Name:

*Not required for revisions to approximate 1%-annual-chance floodplains (Zone A) – for details, refer to the corresponding section of the instructions.

The document "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM,** annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

D. COMMON REGULATORY REQUIREMENTS

1. For CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☐ No

For CLOMR requests, if either of the following is true, please submit evidence of compliance with Section 65.12 of the NFIP regulations:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
- The proposed project encroaches upon a SFHA with BFEs established and would result in increases above 1.00 foot.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☐ No

If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☐ No

If Yes, attach evidence of regulatory floodway revision notification. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☐ No

If Yes, please attach proof of property owner notification and acceptance (if available). Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 3067-0148
Expires September 30, 2005

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Flooding Source: T5N-R2W-S14N
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. *Reason for New Hydrologic Analysis* (check all that apply)

☐ Not revised (skip to section 2) ☐ No existing analysis ☒ Improved data
☒ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	FIS (cfs)	Revised (cfs)

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model [TR-20, HEC-1, HEC-HMS etc.]
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the *new analysis. The document,* "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☐ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit	179th Ave / Dove Valley Road	0.000		
Upstream Limit	171st Ave / Black Mtn/Cloud Road	2.640		

2. Hydraulic Method Used

Hydraulic Analysis HEC-RAS [HEC-2 , HEC-RAS, Other (Attach description)]

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. These tools do not replace engineering judgment. CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. If you disagree with a message, please attach an explanation of why the message is not valid in this case. Review of your submittal and resolution of valid modeling discrepancies will result in reduced review time.

HEC-2/HEC-RAS models reviewed with CHECK-2/CHECK-RAS? ☐ Yes ☐ No

4. Models Submitted

Duplicate Effective Model*	Natural File Name:	Floodway File Name:
Corrected Effective Model*	Natural File Name:	Floodway File Name:
Existing or Pre-Project Conditions Model	Natural File Name: S14N	Floodway File Name: S14N
Revised or Post-Project Conditions Model	Natural File Name:	Floodway File Name:
Other - (attach description)	Natural File Name:	Floodway File Name:

*Not required for revisions to approximate 1%-annual-chance floodplains (Zone A) -- for details, refer to the corresponding section of the instructions.

The document "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM,** annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

D. COMMON REGULATORY REQUIREMENTS

1. For CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☐ No

For CLOMR requests, if either of the following is true, please submit evidence of compliance with Section 65.12 of the NFIP regulations:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
- The proposed project encroaches upon a SFHA with BFEs established and would result in increases above 1.00 foot.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☐ No

If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☐ No

If Yes, attach evidence of regulatory floodway revision notification. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☐ No

If Yes, please attach proof of property owner notification and acceptance (if available). Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 3067-0148
Expires September 30, 2005

PAPERWORK REDUCTION ACT

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Flooding Source: T5N-R2W-S14S
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☐ Not revised (skip to section 2) ☐ No existing analysis ☒ Improved data
☒ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	FIS (cfs)	Revised (cfs)

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model [TR-20, HEC-1, HEC-HMS etc.]
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis. The document, "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☐ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit	171st Ave / Lone Mountain Road	0.100		
Upstream Limit	171st Ave / Dove Valley Road	0.663		

2. Hydraulic Method Used

Hydraulic Analysis HEC-RAS [HEC-2 , HEC-RAS, Other (Attach description)]

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. These tools do not replace engineering judgment. CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. If you disagree with a message, please attach an explanation of why the message is not valid in this case. Review of your submittal and resolution of valid modeling discrepancies will result in reduced review time.

HEC-2/HEC-RAS models reviewed with CHECK-2/CHECK-RAS? ☐ Yes ☐ No

4. Models Submitted

Duplicate Effective Model*	Natural File Name:	Floodway File Name:
Corrected Effective Model*	Natural File Name:	Floodway File Name:
Existing or Pre-Project Conditions Model	Natural File Name: S14S	Floodway File Name: S14S
Revised or Post-Project Conditions Model	Natural File Name:	Floodway File Name:
Other - (attach description)	Natural File Name:	Floodway File Name:

*Not required for revisions to approximate 1%-annual-chance floodplains (Zone A) – for details, refer to the corresponding section of the instructions.

The document "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM,** annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

D. COMMON REGULATORY REQUIREMENTS

1. For CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☐ No

For CLOMR requests, if either of the following is true, please submit evidence of compliance with Section 65.12 of the NFIP regulations:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
- The proposed project encroaches upon a SFHA with BFEs established and would result in increases above 1.00 foot.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☐ No

If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☐ No

If Yes, attach evidence of regulatory floodway revision notification. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☐ No

If Yes, please attach proof of property owner notification and acceptance (if available). Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 3067-0148
Expires September 30, 2005

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Flooding Source: T5N-R2W-S14W
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☐ Not revised (skip to section 2) ☐ No existing analysis ☒ Improved data
☒ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	FIS (cfs)	Revised (cfs)

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model [TR-20, HEC-1, HEC-HMS etc.]
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis. The document, "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☐ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit	171st Ave / Lone Mountain Road	0.100		
Upstream Limit	171st Ave / Dove Valley Road	1.070		

2. Hydraulic Method Used

Hydraulic Analysis HEC-RAS [HEC-2 , HEC-RAS, Other (Attach description)]

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. These tools do not replace engineering judgment. CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. If you disagree with a message, please attach an explanation of why the message is not valid in this case. Review of your submittal and resolution of valid modeling discrepancies will result in reduced review time.

HEC-2/HEC-RAS models reviewed with CHECK-2/CHECK-RAS? ☐ Yes ☐ No

4. Models Submitted

Duplicate Effective Model*	Natural File Name:	Floodway File Name:
Corrected Effective Model*	Natural File Name:	Floodway File Name:
Existing or Pre-Project Conditions Model	Natural File Name: S14W	Floodway File Name: S14W
Revised or Post-Project Conditions Model	Natural File Name:	Floodway File Name:
Other - (attach description)	Natural File Name:	Floodway File Name:

*Not required for revisions to approximate 1%-annual-chance floodplains (Zone A) – for details, refer to the corresponding section of the instructions.

The document "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM,** annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

D. COMMON REGULATORY REQUIREMENTS

1. For CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☐ No

For CLOMR requests, if either of the following is true, please submit evidence of compliance with Section 65.12 of the NFIP regulations:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
- The proposed project encroaches upon a SFHA with BFEs established and would result in increases above 1.00 foot.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☐ No

If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☐ No

If Yes, attach evidence of regulatory floodway revision notification. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☐ No

If Yes, please attach proof of property owner notification and acceptance (if available). Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 3067-0148
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Flooding Source: T5N-R2W-S11
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☐ Not revised (skip to section 2) ☐ No existing analysis ☒ Improved data
☒ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	FIS (cfs)	Revised (cfs)

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model [TR-20, HEC-1, HEC-HMS etc.]
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis. The document, "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☐ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit	179th Ave / Dove Valley Road	0.066		
Upstream Limit	179th Ave / Carefree Highway	1.205		

2. Hydraulic Method Used

Hydraulic Analysis HEC-RAS [HEC-2 , HEC-RAS, Other (Attach description)]

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. These tools do not replace engineering judgment. CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. If you disagree with a message, please attach an explanation of why the message is not valid in this case. Review of your submittal and resolution of valid modeling discrepancies will result in reduced review time.

HEC-2/HEC-RAS models reviewed with CHECK-2/CHECK-RAS? ☐ Yes ☐ No

4. Models Submitted

Duplicate Effective Model*	Natural File Name:	Floodway File Name:
Corrected Effective Model*	Natural File Name:	Floodway File Name:
Existing or Pre-Project Conditions Model	Natural File Name: S11	Floodway File Name: S11
Revised or Post-Project Conditions Model	Natural File Name:	Floodway File Name:
Other - (attach description)	Natural File Name:	Floodway File Name:

*Not required for revisions to approximate 1%-annual-chance floodplains (Zone A) – for details, refer to the corresponding section of the instructions.

The document "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM,** annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

D. COMMON REGULATORY REQUIREMENTS

1. For CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☐ No

For CLOMR requests, if either of the following is true, please submit evidence of compliance with Section 65.12 of the NFIP regulations:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
- The proposed project encroaches upon a SFHA with BFEs established and would result in increases above 1.00 foot.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☐ No

If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☐ No

If Yes, attach evidence of regulatory floodway revision notification. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☐ No

If Yes, please attach proof of property owner notification and acceptance (if available). Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 3067-0148
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Flooding Source: Wash 7 East
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☐ Not revised (skip to section 2) ☐ No existing analysis ☒ Improved data
☒ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	FIS (cfs)	Revised (cfs)

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model [TR-20, HEC-1, HEC-HMS etc.]
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis. The document, "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☐ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit	171st Ave / CAP Canal	0.127		
Upstream Limit	171st Ave / Dove Valley Road	1.854		

2. Hydraulic Method Used

Hydraulic Analysis HEC-RAS [HEC-2 , HEC-RAS, Other (Attach description)]

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. These tools do not replace engineering judgment. CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. If you disagree with a message, please attach an explanation of why the message is not valid in this case. Review of your submittal and resolution of valid modeling discrepancies will result in reduced review time.

HEC-2/HEC-RAS models reviewed with CHECK-2/CHECK-RAS? ☒ Yes ☐ No

4. Models Submitted

Duplicate Effective Model*	Natural File Name:	Floodway File Name:
Corrected Effective Model*	Natural File Name:	Floodway File Name:
Existing or Pre-Project Conditions Model	Natural File Name: 7EAST	Floodway File Name: 7EAST
Revised or Post-Project Conditions Model	Natural File Name:	Floodway File Name:
Other - (attach description)	Natural File Name:	Floodway File Name:

*Not required for revisions to approximate 1%-annual-chance floodplains (Zone A) – for details, refer to the corresponding section of the instructions.

The document "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM,** annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

D. COMMON REGULATORY REQUIREMENTS

1. For CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☐ No

For CLOMR requests, if either of the following is true, please submit evidence of compliance with Section 65.12 of the NFIP regulations:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
- The proposed project encroaches upon a SFHA with BFEs established and would result in increases above 1.00 foot.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☐ No

If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☐ No

If Yes, attach evidence of regulatory floodway revision notification. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☐ No

If Yes, please attach proof of property owner notification and acceptance (if available). Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 3067-0148
Expires September 30, 2005

PAPERWORK REDUCTION ACT

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Flooding Source: 7 East Tributary
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☐ Not revised (skip to section 2) ☐ No existing analysis ☒ Improved data
☒ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	FIS (cfs)	Revised (cfs)

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model [TR-20, HEC-1, HEC-HMS etc.]
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis. The document, "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☐ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit	171st Ave / CAP Canal	0.043		
Upstream Limit	171st Ave / Dove Valley Road	2.039		

2. Hydraulic Method Used

Hydraulic Analysis HEC-RAS [HEC-2 , HEC-RAS, Other (Attach description)]

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. These tools do not replace engineering judgment. CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. If you disagree with a message, please attach an explanation of why the message is not valid in this case. Review of your submittal and resolution of valid modeling discrepancies will result in reduced review time.

HEC-2/HEC-RAS models reviewed with CHECK-2/CHECK-RAS? ☒ Yes ☐ No

4. Models Submitted

Duplicate Effective Model*	Natural File Name:	Floodway File Name:
Corrected Effective Model*	Natural File Name:	Floodway File Name:
Existing or Pre-Project Conditions Model	Natural File Name: 7EAST_TRIB	Floodway File Name: 7EAST_TRIB
Revised or Post-Project Conditions Model	Natural File Name:	Floodway File Name:
Other - (attach description)	Natural File Name:	Floodway File Name:

*Not required for revisions to approximate 1%-annual-chance floodplains (Zone A) – for details, refer to the corresponding section of the instructions.

The document "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM,** annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

D. COMMON REGULATORY REQUIREMENTS

1. For CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☐ No

For CLOMR requests, if either of the following is true, please submit evidence of compliance with Section 65.12 of the NFIP regulations:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
- The proposed project encroaches upon a SFHA with BFEs established and would result in increases above 1.00 foot.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☐ No

If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☐ No

If Yes, attach evidence of regulatory floodway revision notification. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☐ No

If Yes, please attach proof of property owner notification and acceptance (if available). Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 3067-0148
Expires September 30, 2005

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Flooding Source: Iona East
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☐ Not revised (skip to section 2) ☐ No existing analysis ☒ Improved data
☒ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	FIS (cfs)	Revised (cfs)

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model [TR-20, HEC-1, HEC-HMS etc.]
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis. The document, "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☐ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit	211th Ave / Deer Valley	0.741		
Upstream Limit	227th Ave / CAP Canal	3.683		

2. Hydraulic Method Used

Hydraulic Analysis HEC-RAS [HEC-2 , HEC-RAS, Other (Attach description)]

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. These tools do not replace engineering judgment. CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. If you disagree with a message, please attach an explanation of why the message is not valid in this case. Review of your submittal and resolution of valid modeling discrepancies will result in reduced review time.

HEC-2/HEC-RAS models reviewed with CHECK-2/CHECK-RAS? ☒ Yes ☐ No

4. Models Submitted

Duplicate Effective Model*	Natural File Name:	Floodway File Name:
Corrected Effective Model*	Natural File Name:	Floodway File Name:
Existing or Pre-Project Conditions Model	Natural File Name: IONA_EAST	Floodway File Name: IONA_EAST
Revised or Post-Project Conditions Model	Natural File Name:	Floodway File Name:
Other - (attach description)	Natural File Name:	Floodway File Name:

*Not required for revisions to approximate 1%-annual-chance floodplains (Zone A) – for details, refer to the corresponding section of the instructions.

The document "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM,** annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

D. COMMON REGULATORY REQUIREMENTS

1. For CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☐ No

For CLOMR requests, if either of the following is true, please submit evidence of compliance with Section 65.12 of the NFIP regulations:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
- The proposed project encroaches upon a SFHA with BFEs established and would result in increases above 1.00 foot.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☐ No

If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☐ No

If Yes, attach evidence of regulatory floodway revision notification. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☐ No

If Yes, please attach proof of property owner notification and acceptance (if available). Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 3067-0148
Expires September 30, 2005

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Flooding Source: Iona West
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☐ Not revised (skip to section 2) ☐ No existing analysis ☒ Improved data
☒ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	FIS (cfs)	Revised (cfs)

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model [TR-20, HEC-1, HEC-HMS etc.]
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis. The document, "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☐ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit	211th Ave / Beardsley Road	0.139		
Upstream Limit	227th Ave / Pinnacle Peak	2.991		

2. Hydraulic Method Used

Hydraulic Analysis HEC-RAS [HEC-2 , HEC-RAS, Other (Attach description)]

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. These tools do not replace engineering judgment. CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. If you disagree with a message, please attach an explanation of why the message is not valid in this case. Review of your submittal and resolution of valid modeling discrepancies will result in reduced review time.

HEC-2/HEC-RAS models reviewed with CHECK-2/CHECK-RAS? ☒ Yes ☐ No

4. Models Submitted

Duplicate Effective Model*	Natural File Name:	Floodway File Name:
Corrected Effective Model*	Natural File Name:	Floodway File Name:
Existing or Pre-Project Conditions Model	Natural File Name: IONA_WEST	Floodway File Name: IONA_WEST
Revised or Post-Project Conditions Model	Natural File Name:	Floodway File Name:
Other - (attach description)	Natural File Name:	Floodway File Name:

*Not required for revisions to approximate 1%-annual-chance floodplains (Zone A) – for details, refer to the corresponding section of the instructions.

The document "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM,** annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

D. COMMON REGULATORY REQUIREMENTS

1. For CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☐ No

For CLOMR requests, if either of the following is true, please submit evidence of compliance with Section 65.12 of the NFIP regulations:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
- The proposed project encroaches upon a SFHA with BFEs established and would result in increases above 1.00 foot.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☐ No

If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☐ No

If Yes, attach evidence of regulatory floodway revision notification. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☐ No

If Yes, please attach proof of property owner notification and acceptance (if available). Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 3067-0148
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Flooding Source: Wash 2 West (South of CAP)
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☐ Not revised (skip to section 2) ☐ No existing analysis ☒ Improved data
☒ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	FIS (cfs)	Revised (cfs)

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model [TR-20, HEC-1, HEC-HMS etc.]
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis. The document, "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☐ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit	179th Ave / McMicken Dam	0.232		
Upstream Limit	211th Ave / CAP Canal	7.277		

2. Hydraulic Method Used

Hydraulic Analysis HEC-RAS [HEC-2 , HEC-RAS, Other (Attach description)]

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. These tools do not replace engineering judgment. CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. If you disagree with a message, please attach an explanation of why the message is not valid in this case. Review of your submittal and resolution of valid modeling discrepancies will result in reduced review time.

HEC-2/HEC-RAS models reviewed with CHECK-2/CHECK-RAS? ☒ Yes ☐ No

4. Models Submitted

Duplicate Effective Model*	Natural File Name:	Floodway File Name:
Corrected Effective Model*	Natural File Name:	Floodway File Name:
Existing or Pre-Project Conditions Model	Natural File Name: 2W	Floodway File Name: 2W
Revised or Post-Project Conditions Model	Natural File Name:	Floodway File Name:
Other - (attach description)	Natural File Name:	Floodway File Name:

*Not required for revisions to approximate 1%-annual-chance floodplains (Zone A) – for details, refer to the corresponding section of the instructions.

The document "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM,** annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

D. COMMON REGULATORY REQUIREMENTS

1. For CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☐ No

For CLOMR requests, if either of the following is true, please submit evidence of compliance with Section 65.12 of the NFIP regulations:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
- The proposed project encroaches upon a SFHA with BFEs established and would result in increases above 1.00 foot.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☐ No

If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☐ No

If Yes, attach evidence of regulatory floodway revision notification. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☐ No

If Yes, please attach proof of property owner notification and acceptance (if available). Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 3067-0148
Expires September 30, 2005

PAPERWORK REDUCTION ACT

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Flooding Source: Wash 1 West
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☐ Not revised (skip to section 2) ☐ No existing analysis ☒ Improved data
☒ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	FIS (cfs)	Revised (cfs)

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model [TR-20, HEC-1, HEC-HMS etc.]
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis. The document, "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☐ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit	171st Ave / McMicken Dam	0.154		
Upstream Limit	195th Ave / CAP Canal	6.497		

2. Hydraulic Method Used

Hydraulic Analysis HEC-RAS [HEC-2 , HEC-RAS, Other (Attach description)]

B. HYDRAULICS (CONTINUED)

3. *Pre-Submittal Review of Hydraulic Models*

FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. These tools do not replace engineering judgment. CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. If you disagree with a message, please attach an explanation of why the message is not valid in this case. Review of your submittal and resolution of valid modeling discrepancies will result in reduced review time.

HEC-2/HEC-RAS models reviewed with CHECK-2/CHECK-RAS? ☒ Yes ☐ No

4. Models Submitted

Duplicate Effective Model*	Natural File Name:	Floodway File Name:
Corrected Effective Model*	Natural File Name:	Floodway File Name:
Existing or Pre-Project Conditions Model	Natural File Name: 1W	Floodway File Name: 1W
Revised or Post-Project Conditions Model	Natural File Name:	Floodway File Name:
Other - (attach description)	*Natural File Name:*	*Floodway File Name:*

*Not required for revisions to approximate 1%-annual-chance floodplains (Zone A) – for details, refer to the corresponding section of the instructions.

The document "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM,** annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

D. COMMON REGULATORY REQUIREMENTS

1. For CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☐ No

For CLOMR requests, if either of the following is true, please submit evidence of compliance with Section 65.12 of the NFIP regulations:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
- The proposed project encroaches upon a SFHA with BFEs established and would result in increases above 1.00 foot.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☐ No

If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☐ No

If Yes, attach evidence of regulatory floodway revision notification. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☐ No

If Yes, please attach proof of property owner notification and acceptance (if available). Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 3067-0148
Expires September 30, 2005

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Flooding Source: Wash 1 East
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☐ Not revised (skip to section 2) ☐ No existing analysis ☒ Improved data
☒ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	FIS (cfs)	Revised (cfs)

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model [TR-20, HEC-1, HEC-HMS etc.]
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis. The document, "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☐ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit	195th Ave / Jomax	0.000		
Upstream Limit	195th Ave / CAP Canal	1.310		

2. Hydraulic Method Used

Hydraulic Analysis HEC-RAS [HEC-2 , HEC-RAS, Other (Attach description)]

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. These tools do not replace engineering judgment. CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. If you disagree with a message, please attach an explanation of why the message is not valid in this case. Review of your submittal and resolution of valid modeling discrepancies will result in reduced review time.

HEC-2/HEC-RAS models reviewed with CHECK-2/CHECK-RAS? ☒ Yes ☐ No

4. Models Submitted

Duplicate Effective Model*	Natural File Name:	Floodway File Name:
Corrected Effective Model*	Natural File Name:	Floodway File Name:
Existing or Pre-Project Conditions Model	Natural File Name: 1E	Floodway File Name: 1E
Revised or Post-Project Conditions Model	Natural File Name:	Floodway File Name:
Other - (attach description)	Natural File Name:	Floodway File Name:

*Not required for revisions to approximate 1%-annual-chance floodplains (Zone A) – for details, refer to the corresponding section of the instructions.

The document "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM,** annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

D. COMMON REGULATORY REQUIREMENTS

1. For CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☐ No

For CLOMR requests, if either of the following is true, please submit evidence of compliance with Section 65.12 of the NFIP regulations:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
- The proposed project encroaches upon a SFHA with BFEs established and would result in increases above 1.00 foot.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☐ No

If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☐ No

If Yes, attach evidence of regulatory floodway revision notification. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☐ No

If Yes, please attach proof of property owner notification and acceptance (if available). Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 3067-0148
Expires September 30, 2005

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Flooding Source: Wash 2 East (South of CAP)
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☐ Not revised (skip to section 2) ☐ No existing analysis ☒ Improved data
☒ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	FIS (cfs)	Revised (cfs)

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model [TR-20, HEC-1, HEC-HMS etc.]
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis. The document, "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☐ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit	179th Ave / Pinnacle Peak	0.000		
Upstream Limit	195th Ave / CAP Canal	4.380		

2. Hydraulic Method Used

Hydraulic Analysis HEC-RAS [HEC-2 , HEC-RAS, Other (Attach description)]

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. These tools do not replace engineering judgment. CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. If you disagree with a message, please attach an explanation of why the message is not valid in this case. Review of your submittal and resolution of valid modeling discrepancies will result in reduced review time.

HEC-2/HEC-RAS models reviewed with CHECK-2/CHECK-RAS? ☒ Yes ☐ No

4. Models Submitted

Duplicate Effective Model*	Natural File Name:	Floodway File Name:
Corrected Effective Model*	Natural File Name:	Floodway File Name:
Existing or Pre-Project Conditions Model	Natural File Name: 2E	Floodway File Name: 2E
Revised or Post-Project Conditions Model	Natural File Name:	Floodway File Name:
Other - (attach description)	Natural File Name:	Floodway File Name:

*Not required for revisions to approximate 1%-annual-chance floodplains (Zone A) – for details, refer to the corresponding section of the instructions.

The document "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM,** annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

D. COMMON REGULATORY REQUIREMENTS

1. For CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☐ No

For CLOMR requests, if either of the following is true, please submit evidence of compliance with Section 65.12 of the NFIP regulations:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
- The proposed project encroaches upon a SFHA with BFEs established and would result in increases above 1.00 foot.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☐ No

If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☐ No

If Yes, attach evidence of regulatory floodway revision notification. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☐ No

If Yes, please attach proof of property owner notification and acceptance (if available). Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 3067-0148
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Flooding Source: 2 East-Dike Failure
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☐ Not revised (skip to section 2) ☐ No existing analysis ☒ Improved data
☒ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	FIS (cfs)	Revised (cfs)

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model [TR-20, HEC-1, HEC-HMS etc.]
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis. The document, "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☐ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit	179th Ave / Pinnacle Peak	0.390		
Upstream Limit	179th Ave / Pinnalce Peak	0.703		

2. Hydraulic Method Used

Hydraulic Analysis HEC-RAS [HEC-2 , HEC-RAS, Other (Attach description)]

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. These tools do not replace engineering judgment. CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. If you disagree with a message, please attach an explanation of why the message is not valid in this case. Review of your submittal and resolution of valid modeling discrepancies will result in reduced review time.

HEC-2/HEC-RAS models reviewed with CHECK-2/CHECK-RAS? ☒ Yes ☐ No

4. Models Submitted

Duplicate Effective Model*	Natural File Name:	Floodway File Name:
Corrected Effective Model*	Natural File Name:	Floodway File Name:
Existing or Pre-Project Conditions Model	Natural File Name: 2E_FAILURE	Floodway File Name: 2E_FAILURE
Revised or Post-Project Conditions Model	Natural File Name:	Floodway File Name:
Other - (attach description)	Natural File Name:	Floodway File Name:

*Not required for revisions to approximate 1%-annual-chance floodplains (Zone A) – for details, refer to the corresponding section of the instructions.

The document "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM,** annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

D. COMMON REGULATORY REQUIREMENTS

1. For CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☐ No

For CLOMR requests, if either of the following is true, please submit evidence of compliance with Section 65.12 of the NFIP regulations:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
- The proposed project encroaches upon a SFHA with BFEs established and would result in increases above 1.00 foot.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☐ No

If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☐ No

If Yes, attach evidence of regulatory floodway revision notification. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☐ No

If Yes, please attach proof of property owner notification and acceptance (if available). Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 3067-0148
Expires September 30, 2005

PAPERWORK REDUCTION ACT

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Flooding Source: Wash 3 East
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☐ Not revised (skip to section 2) ☐ No existing analysis ☒ Improved data
☒ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	FIS (cfs)	Revised (cfs)

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model [TR-20, HEC-1, HEC-HMS etc.]
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis. The document, "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☐ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit	171st Ave / Pinnacle Peak	0.214		
Upstream Limit	187th Ave / CAP Canal	6.085		

2. Hydraulic Method Used

Hydraulic Analysis HEC-RAS [HEC-2 , HEC-RAS, Other (Attach description)]

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. These tools do not replace engineering judgment. CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. If you disagree with a message, please attach an explanation of why the message is not valid in this case. Review of your submittal and resolution of valid modeling discrepancies will result in reduced review time.

HEC-2/HEC-RAS models reviewed with CHECK-2/CHECK-RAS? ☒ Yes ☐ No

4. Models Submitted

Duplicate Effective Model*	Natural File Name:	Floodway File Name:
Corrected Effective Model*	Natural File Name:	Floodway File Name:
Existing or Pre-Project Conditions Model	Natural File Name: 3E	Floodway File Name: 3E
Revised or Post-Project Conditions Model	Natural File Name:	Floodway File Name:
Other - (attach description)	Natural File Name:	Floodway File Name:

*Not required for revisions to approximate 1%-annual-chance floodplains (Zone A) – for details, refer to the corresponding section of the instructions.

The document "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM,** annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

D. COMMON REGULATORY REQUIREMENTS

1. For CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☐ No

For CLOMR requests, if either of the following is true, please submit evidence of compliance with Section 65.12 of the NFIP regulations:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
- The proposed project encroaches upon a SFHA with BFEs established and would result in increases above 1.00 foot.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☐ No

If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☐ No

If Yes, attach evidence of regulatory floodway revision notification. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☐ No

If Yes, please attach proof of property owner notification and acceptance (if available). Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 3067-0148
Expires September 30, 2005

PAPERWORK REDUCTION ACT

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Flooding Source: Wash 4 East
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☐ Not revised (skip to section 2) ☐ No existing analysis ☒ Improved data
☒ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	FIS (cfs)	Revised (cfs)

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model [TR-20, HEC-1, HEC-HMS etc.]
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis. The document, "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☐ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit	179th Ave / Jomax	0.241		
Upstream Limit	179th Ave / CAP Canal	2.418		

2. Hydraulic Method Used

Hydraulic Analysis HEC-RAS [HEC-2 , HEC-RAS, Other (Attach description)]

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. These tools do not replace engineering judgment. CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. If you disagree with a message, please attach an explanation of why the message is not valid in this case. Review of your submittal and resolution of valid modeling discrepancies will result in reduced review time.

HEC-2/HEC-RAS models reviewed with CHECK-2/CHECK-RAS? ☒ Yes ☐ No

4. Models Submitted

Duplicate Effective Model*	Natural File Name:	Floodway File Name:
Corrected Effective Model*	Natural File Name:	Floodway File Name:
Existing or Pre-Project Conditions Model	Natural File Name: 4E	Floodway File Name: 4E
Revised or Post-Project Conditions Model	Natural File Name:	Floodway File Name:
Other - (attach description)	Natural File Name:	Floodway File Name:

*Not required for revisions to approximate 1%-annual-chance floodplains (Zone A) -- for details, refer to the corresponding section of the instructions.

The document "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach a **copy of the effective FIRM and/or FBFM,** annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

D. COMMON REGULATORY REQUIREMENTS

1. For CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☐ No

For CLOMR requests, if either of the following is true, please submit evidence of compliance with Section 65.12 of the NFIP regulations:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
- The proposed project encroaches upon a SFHA with BFEs established and would result in increases above 1.00 foot.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☐ No

If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☐ No

If Yes, attach evidence of regulatory floodway revision notification. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☐ No

If Yes, please attach proof of property owner notification and acceptance (if available). Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 3067-0148
Expires September 30, 2005

PAPERWORK REDUCTION ACT

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Flooding Source: 4 East-Dike Failure
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☐ Not revised (skip to section 2) ☐ No existing analysis ☒ Improved data
☒ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	FIS (cfs)	Revised (cfs)

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model [TR-20, HEC-1, HEC-HMS etc.]
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis. The document, "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☐ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit	179th Ave / Jomax Road	0.241		
Upstream Limit	179th Ave / Patton Road	1.027		

2. Hydraulic Method Used

Hydraulic Analysis HEC-RAS [HEC-2 , HEC-RAS, Other (Attach description)]

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. These tools do not replace engineering judgment. CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. If you disagree with a message, please attach an explanation of why the message is not valid in this case. Review of your submittal and resolution of valid modeling discrepancies will result in reduced review time.

HEC-2/HEC-RAS models reviewed with CHECK-2/CHECK-RAS? ☒ Yes ☐ No

4. Models Submitted

Duplicate Effective Model*	Natural File Name:	Floodway File Name:
Corrected Effective Model*	Natural File Name:	Floodway File Name:
Existing or Pre-Project Conditions Model	Natural File Name: 4E_FAILURE	Floodway File Name: 4E_FAILURE
Revised or Post-Project Conditions Model	Natural File Name:	Floodway File Name:
Other - (attach description)	Natural File Name:	Floodway File Name:

*Not required for revisions to approximate 1%-annual-chance floodplains (Zone A) – for details, refer to the corresponding section of the instructions.

The document "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM,** annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

D. COMMON REGULATORY REQUIREMENTS

1. For CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☐ No

For CLOMR requests, if either of the following is true, please submit evidence of compliance with Section 65.12 of the NFIP regulations:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
- The proposed project encroaches upon a SFHA with BFEs established and would result in increases above 1.00 foot.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☐ No

If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☐ No

If Yes, attach evidence of regulatory floodway revision notification. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☐ No

If Yes, please attach proof of property owner notification and acceptance (if available). Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

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Flooding Source: Wash 5 East
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☐ Not revised (skip to section 2) ☐ No existing analysis ☒ Improved data
☒ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	FIS (cfs)	Revised (cfs)

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model [TR-20, HEC-1, HEC-HMS etc.]
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis. The document, "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☐ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit	163rd Ave/ Happy Valley	1.115		
Upstream Limit	179th Ave / CAP Canal	5.146		

2. Hydraulic Method Used

Hydraulic Analysis HEC-RAS [HEC-2 , HEC-RAS, Other (Attach description)]

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. These tools do not replace engineering judgment. CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. If you disagree with a message, please attach an explanation of why the message is not valid in this case. Review of your submittal and resolution of valid modeling discrepancies will result in reduced review time.

HEC-2/HEC-RAS models reviewed with CHECK-2/CHECK-RAS? ☒ Yes ☐ No

4. Models Submitted

Duplicate Effective Model*	Natural File Name:	Floodway File Name:
Corrected Effective Model*	Natural File Name:	Floodway File Name:
Existing or Pre-Project Conditions Model	Natural File Name: 5E	Floodway File Name: 5E
Revised or Post-Project Conditions Model	Natural File Name:	Floodway File Name:
Other - (attach description)	Natural File Name:	Floodway File Name:

*Not required for revisions to approximate 1%-annual-chance floodplains (Zone A) – for details, refer to the corresponding section of the instructions.

The document "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM,** annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

D. COMMON REGULATORY REQUIREMENTS

1. For CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☐ No

For CLOMR requests, if either of the following is true, please submit evidence of compliance with Section 65.12 of the NFIP regulations:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
- The proposed project encroaches upon a SFHA with BFEs established and would result in increases above 1.00 foot.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☐ No

If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☐ No

If Yes, attach evidence of regulatory floodway revision notification. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☐ No

If Yes, please attach proof of property owner notification and acceptance (if available). Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 3067-0148
Expires September 30, 2005

PAPERWORK REDUCTION ACT

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Flooding Source: 5E Zone AO
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☐ Not revised (skip to section 2) ☐ No existing analysis ☒ Improved data
☒ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	FIS (cfs)	Revised (cfs)

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model [TR-20, HEC-1, HEC-HMS etc.]
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis. The document, "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☐ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit	171st Ave / Jomax Road	0.000		
Upstream Limit	171st Ave / Patton Road	1.027		

2. Hydraulic Method Used

Hydraulic Analysis HEC-RAS [HEC-2 , HEC-RAS, Other (Attach description)]

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. These tools do not replace engineering judgment. CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. If you disagree with a message, please attach an explanation of why the message is not valid in this case. Review of your submittal and resolution of valid modeling discrepancies will result in reduced review time.

HEC-2/HEC-RAS models reviewed with CHECK-2/CHECK-RAS? ☐ Yes ☐ No

4. Models Submitted

Duplicate Effective Model*	Natural File Name:	Floodway File Name:
Corrected Effective Model*	Natural File Name:	Floodway File Name:
Existing or Pre-Project Conditions Model	Natural File Name: 5E_ZONE_AO	Floodway File Name: 5E_ZONE_AO
Revised or Post-Project Conditions Model	Natural File Name:	Floodway File Name:
Other - (attach description)	Natural File Name:	Floodway File Name:

*Not required for revisions to approximate 1%-annual-chance floodplains (Zone A) – for details, refer to the corresponding section of the instructions.

The document "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM,** annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

D. COMMON REGULATORY REQUIREMENTS

1. For CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☐ No

For CLOMR requests, if either of the following is true, please submit evidence of compliance with Section 65.12 of the NFIP regulations:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
- The proposed project encroaches upon a SFHA with BFEs established and would result in increases above 1.00 foot.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☐ No

If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☐ No

If Yes, attach evidence of regulatory floodway revision notification. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☐ No

If Yes, please attach proof of property owner notification and acceptance (if available). Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 3067-0148
Expires September 30, 2005

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Flooding Source: Wash 6 East
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☐ Not revised (skip to section 2) ☐ No existing analysis ☒ Improved data
☒ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	FIS (cfs)	Revised (cfs)

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model [TR-20, HEC-1, HEC-HMS etc.]
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis. The document, "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☐ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit	163rd Ave / Jomax Road	1.929		
Upstream Limit	171st Ave / CAP Canal	4.966		

2. Hydraulic Method Used

Hydraulic Analysis HEC-RAS [HEC-2 , HEC-RAS, Other (Attach description)]

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. These tools do not replace engineering judgment. CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. If you disagree with a message, please attach an explanation of why the message is not valid in this case. Review of your submittal and resolution of valid modeling discrepancies will result in reduced review time.

HEC-2/HEC-RAS models reviewed with CHECK-2/CHECK-RAS? ☒ Yes ☐ No

4. Models Submitted

Duplicate Effective Model*	Natural File Name:	Floodway File Name:
Corrected Effective Model*	Natural File Name:	Floodway File Name:
Existing or Pre-Project Conditions Model	Natural File Name: 6E	Floodway File Name: 6E
Revised or Post-Project Conditions Model	Natural File Name:	Floodway File Name:
Other - (attach description)	Natural File Name:	Floodway File Name:

*Not required for revisions to approximate 1%-annual-chance floodplains (Zone A) – for details, refer to the corresponding section of the instructions.

The document "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM,** annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

D. COMMON REGULATORY REQUIREMENTS

1. For CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☐ No

For CLOMR requests, if either of the following is true, please submit evidence of compliance with Section 65.12 of the NFIP regulations:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
- The proposed project encroaches upon a SFHA with BFEs established and would result in increases above 1.00 foot.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☐ No

If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☐ No

If Yes, attach evidence of regulatory floodway revision notification. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☐ No

If Yes, please attach proof of property owner notification and acceptance (if available). Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 3067-0148
Expires September 30, 2005

PAPERWORK REDUCTION ACT

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Flooding Source: 6 East South
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☐ Not revised (skip to section 2) ☐ No existing analysis ☒ Improved data
☒ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	FIS (cfs)	Revised (cfs)

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model [TR-20, HEC-1, HEC-HMS etc.]
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis. The document, "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☐ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit	155th Ave / Jomax Road	0.843		
Upstream Limit	163rd Ave / Happy Valley	2.054		

2. Hydraulic Method Used

Hydraulic Analysis HEC-RAS [HEC-2 , HEC-RAS, Other (Attach description)]

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. These tools do not replace engineering judgment. CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. If you disagree with a message, please attach an explanation of why the message is not valid in this case. Review of your submittal and resolution of valid modeling discrepancies will result in reduced review time.

HEC-2/HEC-RAS models reviewed with CHECK-2/CHECK-RAS? ☒ Yes ☐ No

4. Models Submitted

Duplicate Effective Model*	Natural File Name:	Floodway File Name:
Corrected Effective Model*	Natural File Name:	Floodway File Name:
Existing or Pre-Project Conditions Model	Natural File Name: 6ES	Floodway File Name: 6ES
Revised or Post-Project Conditions Model	Natural File Name:	Floodway File Name:
Other - (attach description)	Natural File Name:	Floodway File Name:

*Not required for revisions to approximate 1%-annual-chance floodplains (Zone A) – for details, refer to the corresponding section of the instructions.

The document "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM,** annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

D. COMMON REGULATORY REQUIREMENTS

1. For CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☐ No

For CLOMR requests, if either of the following is true, please submit evidence of compliance with Section 65.12 of the NFIP regulations:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
- The proposed project encroaches upon a SFHA with BFEs established and would result in increases above 1.00 foot.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☐ No

If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☐ No

If Yes, attach evidence of regulatory floodway revision notification. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☐ No

If Yes, please attach proof of property owner notification and acceptance (if available). Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

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Flooding Source: 7 East-East Split
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☐ Not revised (skip to section 2) ☐ No existing analysis ☒ Improved data
☒ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	FIS (cfs)	Revised (cfs)

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model [TR-20, HEC-1, HEC-HMS etc.]
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis. The document, "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☐ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit	163rd Ave / Patton Road	0.210		
Upstream Limit	171st Ave / Dixileta	1.458		

2. Hydraulic Method Used

Hydraulic Analysis HEC-RAS [HEC-2 , HEC-RAS, Other (Attach description)]

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. These tools do not replace engineering judgment. CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. If you disagree with a message, please attach an explanation of why the message is not valid in this case. Review of your submittal and resolution of valid modeling discrepancies will result in reduced review time.

HEC-2/HEC-RAS models reviewed with CHECK-2/CHECK-RAS? ☒ Yes ☐ No

4. Models Submitted

Duplicate Effective Model*	Natural File Name:	Floodway File Name:
Corrected Effective Model*	Natural File Name:	Floodway File Name:
Existing or Pre-Project Conditions Model	Natural File Name: 7E_ES	Floodway File Name: 7E_ES
Revised or Post-Project Conditions Model	Natural File Name:	Floodway File Name:
Other - (attach description)	Natural File Name:	Floodway File Name:

*Not required for revisions to approximate 1%-annual-chance floodplains (Zone A) – for details, refer to the corresponding section of the instructions.

The document "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM,** annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

D. COMMON REGULATORY REQUIREMENTS

1. For CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☐ No

For CLOMR requests, if either of the following is true, please submit evidence of compliance with Section 65.12 of the NFIP regulations:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
- The proposed project encroaches upon a SFHA with BFEs established and would result in increases above 1.00 foot.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☐ No

If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☐ No

If Yes, attach evidence of regulatory floodway revision notification. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☐ No

If Yes, please attach proof of property owner notification and acceptance (if available). Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 3067-0148
Expires September 30, 2005

PAPERWORK REDUCTION ACT

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Flooding Source: 7 East-West Split
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☐ Not revised (skip to section 2) ☐ No existing analysis ☒ Improved data
☒ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	FIS (cfs)	Revised (cfs)

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model [TR-20, HEC-1, HEC-HMS etc.]
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis. The document, "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☐ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit	171st Ave / Patton	0.046		
Upstream Limit	171st Ave / CAP Canal	0.951		

2. Hydraulic Method Used

Hydraulic Analysis HEC-RAS [HEC-2 , HEC-RAS, Other (Attach description)]

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. These tools do not replace engineering judgment. CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. If you disagree with a message, please attach an explanation of why the message is not valid in this case. Review of your submittal and resolution of valid modeling discrepancies will result in reduced review time.

HEC-2/HEC-RAS models reviewed with CHECK-2/CHECK-RAS? ☒ Yes ☐ No

4. Models Submitted

Duplicate Effective Model*	Natural File Name:	Floodway File Name:
Corrected Effective Model*	Natural File Name:	Floodway File Name:
Existing or Pre-Project Conditions Model	Natural File Name: 7E_WS	Floodway File Name: 7E_WS
Revised or Post-Project Conditions Model	Natural File Name:	Floodway File Name:
Other - (attach description)	Natural File Name:	Floodway File Name:

*Not required for revisions to approximate 1%-annual-chance floodplains (Zone A) – for details, refer to the corresponding section of the instructions.

The document "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM,** annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

D. COMMON REGULATORY REQUIREMENTS

1. For CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☐ No

For CLOMR requests, if either of the following is true, please submit evidence of compliance with Section 65.12 of the NFIP regulations:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
- The proposed project encroaches upon a SFHA with BFEs established and would result in increases above 1.00 foot.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☐ No

If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☐ No

If Yes, attach evidence of regulatory floodway revision notification. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☐ No

If Yes, please attach proof of property owner notification and acceptance (if available). Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 3067-0148
Expires September 30, 2005

PAPERWORK REDUCTION ACT

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Flooding Source: Wash 8 East
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☐ Not revised (skip to section 2) ☐ No existing analysis ☒ Improved data
☒ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	FIS (cfs)	Revised (cfs)

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model [TR-20, HEC-1, HEC-HMS etc.]
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis. The document, "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☐ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit	163rd Ave / Jomax Road	0.100		
Upstream Limit	171st Ave / CAP Canal	3.029		

2. Hydraulic Method Used

Hydraulic Analysis HEC-RAS [HEC-2 , HEC-RAS, Other (Attach description)]

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. These tools do not replace engineering judgment. CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. If you disagree with a message, please attach an explanation of why the message is not valid in this case. Review of your submittal and resolution of valid modeling discrepancies will result in reduced review time.

HEC-2/HEC-RAS models reviewed with CHECK-2/CHECK-RAS? ☒ Yes ☐ No

4. Models Submitted

Duplicate Effective Model*	Natural File Name:	Floodway File Name:
Corrected Effective Model*	Natural File Name:	Floodway File Name:
Existing or Pre-Project Conditions Model	Natural File Name: 8E	Floodway File Name: 8E
Revised or Post-Project Conditions Model	Natural File Name:	Floodway File Name:
Other - (attach description)	Natural File Name:	Floodway File Name:

*Not required for revisions to approximate 1%-annual-chance floodplains (Zone A) – for details, refer to the corresponding section of the instructions.

The document "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM,** annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

D. COMMON REGULATORY REQUIREMENTS

1. For CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☐ No

For CLOMR requests, if either of the following is true, please submit evidence of compliance with Section 65.12 of the NFIP regulations:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
- The proposed project encroaches upon a SFHA with BFEs established and would result in increases above 1.00 foot.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☐ No

If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☐ No

If Yes, attach evidence of regulatory floodway revision notification. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☐ No

If Yes, please attach proof of property owner notification and acceptance (if available). Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 3067-0148
Expires September 30, 2005

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Flooding Source: Wash 9 East
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☐ Not revised (skip to section 2) ☐ No existing analysis ☒ Improved data
☒ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	FIS (cfs)	Revised (cfs)

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model [TR-20, HEC-1, HEC-HMS etc.]
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis. The document, "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☐ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit	155th Ave / Happy Valley	0.912		
Upstream Limit	163rd Ave / CAP Canal	4.666		

2. Hydraulic Method Used

Hydraulic Analysis HEC-RAS [HEC-2 , HEC-RAS, Other (Attach description)]

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. These tools do not replace engineering judgment. CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. If you disagree with a message, please attach an explanation of why the message is not valid in this case. Review of your submittal and resolution of valid modeling discrepancies will result in reduced review time.

HEC-2/HEC-RAS models reviewed with CHECK-2/CHECK-RAS? ☒ Yes ☐ No

4. Models Submitted

Duplicate Effective Model*	Natural File Name:	Floodway File Name:
Corrected Effective Model*	Natural File Name:	Floodway File Name:
Existing or Pre-Project Conditions Model	Natural File Name: 9E	Floodway File Name: 9E
Revised or Post-Project Conditions Model	Natural File Name:	Floodway File Name:
Other - (attach description)	Natural File Name:	Floodway File Name:

*Not required for revisions to approximate 1%-annual-chance floodplains (Zone A) -- for details, refer to the corresponding section of the instructions.

The document "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM,** annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

D. COMMON REGULATORY REQUIREMENTS

1. For CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☐ No

For CLOMR requests, if either of the following is true, please submit evidence of compliance with Section 65.12 of the NFIP regulations:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
- The proposed project encroaches upon a SFHA with BFEs established and would result in increases above 1.00 foot.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☐ No

If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☐ No

If Yes, attach evidence of regulatory floodway revision notification. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☐ No

If Yes, please attach proof of property owner notification and acceptance (if available). Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

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Flooding Source: 9 East Split
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☐ Not revised (skip to section 2) ☐ No existing analysis ☒ Improved data
☒ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	FIS (cfs)	Revised (cfs)

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model [TR-20, HEC-1, HEC-HMS etc.]
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis. The document, "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☐ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit	155th Ave / Jomax Road	0.000		
Upstream Limit	155th Ave / Jomax Road	0.421		

2. Hydraulic Method Used

Hydraulic Analysis HEC-RAS [HEC-2 , HEC-RAS, Other (Attach description)]

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. These tools do not replace engineering judgment. CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. If you disagree with a message, please attach an explanation of why the message is not valid in this case. Review of your submittal and resolution of valid modeling discrepancies will result in reduced review time.

HEC-2/HEC-RAS models reviewed with CHECK-2/CHECK-RAS? ☒ Yes ☐ No

4. Models Submitted

Duplicate Effective Model*	Natural File Name:	Floodway File Name:
Corrected Effective Model*	Natural File Name:	Floodway File Name:
Existing or Pre-Project Conditions Model	Natural File Name: 9E_Split	Floodway File Name: 9E_Split
Revised or Post-Project Conditions Model	Natural File Name:	Floodway File Name:
Other - (attach description)	Natural File Name:	Floodway File Name:

*Not required for revisions to approximate 1%-annual-chance floodplains (Zone A) – for details, refer to the corresponding section of the instructions.

The document "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control *indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's* property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM,** annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

D. COMMON REGULATORY REQUIREMENTS

1. For CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☐ No

For CLOMR requests, if either of the following is true, please submit evidence of compliance with Section 65.12 of the *NFIP* regulations:

- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
- The proposed project encroaches upon a SFHA with BFEs established and would result in increases above 1.00 foot.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☐ No

If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☐ No

If Yes, attach evidence of regulatory floodway revision notification. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☐ No

If Yes, please attach proof of property owner notification and acceptance (if available). Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 3067-0148
Expires September 30, 2005

PAPERWORK REDUCTION ACT

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Flooding Source: Wash 10 East
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☐ Not revised (skip to section 2) ☐ No existing analysis ☒ Improved data
☒ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	FIS (cfs)	Revised (cfs)

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model [TR-20, HEC-1, HEC-HMS etc.]
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis. The document, "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☐ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit	147th Ave / Happy Valley	0.462		
Upstream Limit	163rd Ave / CAP Canal	4.466		

2. Hydraulic Method Used

Hydraulic Analysis HEC-RAS [HEC-2 , HEC-RAS, Other (Attach description)]

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. These tools do not replace engineering judgment. CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. If you disagree with a message, please attach an explanation of why the message is not valid in this case. Review of your submittal and resolution of valid modeling discrepancies will result in reduced review time.

HEC-2/HEC-RAS models reviewed with CHECK-2/CHECK-RAS? ☒ Yes ☐ No

4. Models Submitted

Duplicate Effective Model*	Natural File Name:	Floodway File Name:
Corrected Effective Model*	Natural File Name:	Floodway File Name:
Existing or Pre-Project Conditions Model	Natural File Name: 10E	Floodway File Name: 10E
Revised or Post-Project Conditions Model	Natural File Name:	Floodway File Name:
Other - (attach description)	Natural File Name:	Floodway File Name:

*Not required for revisions to approximate 1%-annual-chance floodplains (Zone A) -- for details, refer to the corresponding section of the instructions.

The document "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM,** annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

D. COMMON REGULATORY REQUIREMENTS

1. For CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☐ No

For CLOMR requests, if either of the following is true, please submit evidence of compliance with Section 65.12 of the NFIP regulations:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
- The proposed project encroaches upon a SFHA with BFEs established and would result in increases above 1.00 foot.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☐ No

If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☐ No

If Yes, attach evidence of regulatory floodway revision notification. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☐ No

If Yes, please attach proof of property owner notification and acceptance (if available). Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 3067-0148
Expires September 30, 2005

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Flooding Source: 10 East (East Split-1)
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☐ Not revised (skip to section 2) ☐ No existing analysis ☒ Improved data
☒ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	FIS (cfs)	Revised (cfs)

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model [TR-20, HEC-1, HEC-HMS etc.]
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis. The document, "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☐ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit	163rd Ave / Dixileta Drive	0.100		
Upstream Limit	163rd Ave / Dixileta Drive	0.850		

2. Hydraulic Method Used

Hydraulic Analysis HEC-RAS [HEC-2 , HEC-RAS, Other (Attach description)]

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. These tools do not replace engineering judgment. CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. If you disagree with a message, please attach an explanation of why the message is not valid in this case. Review of your submittal and resolution of valid modeling discrepancies will result in reduced review time.

HEC-2/HEC-RAS models reviewed with CHECK-2/CHECK-RAS? ☒ Yes ☐ No

4. Models Submitted

Duplicate Effective Model*	Natural File Name:	Floodway File Name:
Corrected Effective Model*	Natural File Name:	Floodway File Name:
Existing or Pre-Project Conditions Model	Natural File Name: 10ES1	Floodway File Name: 10ES1
Revised or Post-Project Conditions Model	Natural File Name:	Floodway File Name:
Other - (attach description)	Natural File Name:	Floodway File Name:

*Not required for revisions to approximate 1%-annual-chance floodplains (Zone A) – for details, refer to the corresponding section of the instructions.

The document "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM,** annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

D. COMMON REGULATORY REQUIREMENTS

1. For CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☐ No

For CLOMR requests, if either of the following is true, please submit evidence of compliance with Section 65.12 of the NFIP regulations:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
- The proposed project encroaches upon a SFHA with BFEs established and would result in increases above 1.00 foot.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☐ No

If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☐ No

If Yes, attach evidence of regulatory floodway revision notification. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☐ No

If Yes, please attach proof of property owner notification and acceptance (if available). Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 3067-0148
Expires September 30, 2005

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Flooding Source: 10 East (East Split-2)
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☐ Not revised (skip to section 2) ☐ No existing analysis ☒ Improved data
☒ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	FIS (cfs)	Revised (cfs)

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model [TR-20, HEC-1, HEC-HMS etc.]
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis. The document, "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☐ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit	147th Ave / Happy Valley Road	0.300		
Upstream Limit	155th Ave / Patton Road	2.634		

2. Hydraulic Method Used

Hydraulic Analysis HEC-RAS [HEC-2 , HEC-RAS, Other (Attach description)]

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. These tools do not replace engineering judgment. CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. If you disagree with a message, please attach an explanation of why the message is not valid in this case. Review of your submittal and resolution of valid modeling discrepancies will result in reduced review time.

HEC-2/HEC-RAS models reviewed with CHECK-2/CHECK-RAS? ☒ Yes ☐ No

4. Models Submitted

Duplicate Effective Model*	Natural File Name:	Floodway File Name:
Corrected Effective Model*	Natural File Name:	Floodway File Name:
Existing or Pre-Project Conditions Model	Natural File Name: 10ES2	Floodway File Name: 10ES2
Revised or Post-Project Conditions Model	Natural File Name:	Floodway File Name:
Other - (attach description)	Natural File Name:	Floodway File Name:

*Not required for revisions to approximate 1%-annual-chance floodplains (Zone A) – for details, refer to the corresponding section of the instructions.

The document "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM,** annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

D. COMMON REGULATORY REQUIREMENTS

1. For CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☐ No

For CLOMR requests, if either of the following is true, please submit evidence of compliance with Section 65.12 of the NFIP regulations:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
- The proposed project encroaches upon a SFHA with BFEs established and would result in increases above 1.00 foot.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☐ No

If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☐ No

If Yes, attach evidence of regulatory floodway revision notification. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☐ No

If Yes, please attach proof of property owner notification and acceptance (if available). Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 3067-0148
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Flooding Source: 11 East
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☐ Not revised (skip to section 2) ☐ No existing analysis ☒ Improved data
☒ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	FIS (cfs)	Revised (cfs)

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model [TR-20, HEC-1, HEC-HMS etc.]
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis. The document, "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☐ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit	139th Ave / Happy Valley	0.000		
Upstream Limit	155th Ave / CAP Canal	4.615		

2. Hydraulic Method Used

Hydraulic Analysis HEC-RAS [HEC-2 , HEC-RAS, Other (Attach description)]

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. These tools do not replace engineering judgment. CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. If you disagree with a message, please attach an explanation of why the message is not valid in this case. Review of your submittal and resolution of valid modeling discrepancies will result in reduced review time.

HEC-2/HEC-RAS models reviewed with CHECK-2/CHECK-RAS? ☒ Yes ☐ No

4. Models Submitted

Duplicate Effective Model*	Natural File Name:	Floodway File Name:
Corrected Effective Model*	Natural File Name:	Floodway File Name:
Existing or Pre-Project Conditions Model	Natural File Name: 11EAST	Floodway File Name: 11 EAST
Revised or Post-Project Conditions Model	Natural File Name:	Floodway File Name:
Other - (attach description)	Natural File Name:	Floodway File Name:

*Not required for revisions to approximate 1%-annual-chance floodplains (Zone A) – for details, refer to the corresponding section of the instructions.

The document "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM,** annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

D. COMMON REGULATORY REQUIREMENTS

1. For CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☐ No

For CLOMR requests, if either of the following is true, please submit evidence of compliance with Section 65.12 of the NFIP regulations:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
- The proposed project encroaches upon a SFHA with BFEs established and would result in increases above 1.00 foot.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☐ No

If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☐ No

If Yes, attach evidence of regulatory floodway revision notification. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☐ No

If Yes, please attach proof of property owner notification and acceptance (if available). Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 3067-0148
Expires September 30, 2005

PAPERWORK REDUCTION ACT

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Flooding Source: 11 East-Dike Failure
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☐ Not revised (skip to section 2) ☐ No existing analysis ☒ Improved data
☒ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	FIS (cfs)	Revised (cfs)

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model [TR-20, HEC-1, HEC-HMS etc.]
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis. The document, "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☐ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit	139th Ave / Happy Valley	0.000		
Upstream Limit	139th Ave / Happy Valley	0.337		

2. Hydraulic Method Used

Hydraulic Analysis HEC-RAS [HEC-2 , HEC-RAS, Other (Attach description)]

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. These tools do not replace engineering judgment. CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. If you disagree with a message, please attach an explanation of why the message is not valid in this case. Review of your submittal and resolution of valid modeling discrepancies will result in reduced review time.

HEC-2/HEC-RAS models reviewed with CHECK-2/CHECK-RAS? ☒ Yes ☐ No

4. Models Submitted

Duplicate Effective Model*	Natural File Name:	Floodway File Name:
Corrected Effective Model*	Natural File Name:	Floodway File Name:
Existing or Pre-Project Conditions Model	Natural File Name: 11EAST-FAILURE	Floodway File Name: 11 EAST-FAILURE
Revised or Post-Project Conditions Model	Natural File Name:	Floodway File Name:
Other - (attach description)	Natural File Name:	Floodway File Name:

*Not required for revisions to approximate 1%-annual-chance floodplains (Zone A) – for details, refer to the corresponding section of the instructions.

The document "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM,** annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

D. COMMON REGULATORY REQUIREMENTS

1. For CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☐ No

For CLOMR requests, if either of the following is true, please submit evidence of compliance with Section 65.12 of the NFIP regulations:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
- The proposed project encroaches upon a SFHA with BFEs established and would result in increases above 1.00 foot.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☐ No

If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☐ No

If Yes, attach evidence of regulatory floodway revision notification. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☐ No

If Yes, please attach proof of property owner notification and acceptance (if available). Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 3067-0148
Expires September 30, 2005

PAPERWORK REDUCTION ACT

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Flooding Source: Bonita Dike Channel
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☐ Not revised (skip to section 2) ☐ No existing analysis ☒ Improved data
☒ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	FIS (cfs)	Revised (cfs)

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model [TR-20, HEC-1, HEC-HMS etc.]
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis. The document, "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☐ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit	147th Ave / Patton Road	0.000		
Upstream Limit	147th Ave / Patton Road	0.283		

2. Hydraulic Method Used

Hydraulic Analysis HEC-RAS [HEC-2 , HEC-RAS, Other (Attach description)]

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. These tools do not replace engineering judgment. CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. If you disagree with a message, please attach an explanation of why the message is not valid in this case. Review of your submittal and resolution of valid modeling discrepancies will result in reduced review time.

HEC-2/HEC-RAS models reviewed with CHECK-2/CHECK-RAS? ☒ Yes ☐ No

4. Models Submitted

Duplicate Effective Model*	Natural File Name:		Floodway File Name:	
Corrected Effective Model*	Natural File Name:		Floodway File Name:	
Existing or Pre-Project Conditions Model	Natural File Name:	BONITA DIKE CHANNEL	Floodway File Name:	BONITA DIKE CHANNEL
Revised or Post-Project Conditions Model	Natural File Name:		Floodway File Name:	
Other - (attach description)	Natural File Name:		Floodway File Name:	

*Not required for revisions to approximate 1%-annual-chance floodplains (Zone A) – for details, refer to the corresponding section of the instructions.

The document "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM,** annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

D. COMMON REGULATORY REQUIREMENTS

1. For CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☐ No

For CLOMR requests, if either of the following is true, please submit evidence of compliance with Section 65.12 of the NFIP regulations:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
- The proposed project encroaches upon a SFHA with BFEs established and would result in increases above 1.00 foot.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☐ No

If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☐ No

If Yes, attach evidence of regulatory floodway revision notification. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☐ No

If Yes, please attach proof of property owner notification and acceptance (if available). Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 3067-0148
Expires September 30, 2005

PAPERWORK REDUCTION ACT

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Flooding Source: Wash 12 East
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☐ Not revised (skip to section 2) ☐ No existing analysis ☒ Improved data
☒ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	FIS (cfs)	Revised (cfs)

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model [TR-20, HEC-1, HEC-HMS etc.]
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis. The document, "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☐ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit	155th Ave / Patton Road	2.620		
Upstream Limit	155th Ave / CAP Canal	4.554		

2. Hydraulic Method Used

Hydraulic Analysis HEC-RAS [HEC-2 , HEC-RAS, Other (Attach description)]

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. These tools do not replace engineering judgment. CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. If you disagree with a message, please attach an explanation of why the message is not valid in this case. Review of your submittal and resolution of valid modeling discrepancies will result in reduced review time.

HEC-2/HEC-RAS models reviewed with CHECK-2/CHECK-RAS? ☒ Yes ☐ No

4. Models Submitted

Duplicate Effective Model*	Natural File Name:	Floodway File Name:
Corrected Effective Model*	Natural File Name:	Floodway File Name:
Existing or Pre-Project Conditions Model	Natural File Name: 12E	Floodway File Name: 12E
Revised or Post-Project Conditions Model	Natural File Name:	Floodway File Name:
Other - (attach description)	Natural File Name:	Floodway File Name:

*Not required for revisions to approximate 1%-annual-chance floodplains (Zone A) – for details, refer to the corresponding section of the instructions.

The document "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM,** annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

D. COMMON REGULATORY REQUIREMENTS

1. For CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☐ No

For CLOMR requests, if either of the following is true, please submit evidence of compliance with Section 65.12 of the NFIP regulations:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
- The proposed project encroaches upon a SFHA with BFEs established and would result in increases above 1.00 foot.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☐ No

If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☐ No

If Yes, attach evidence of regulatory floodway revision notification. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☐ No

If Yes, please attach proof of property owner notification and acceptance (if available). Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 3067-0148
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Flooding Source: 12 East Split
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☐ Not revised (skip to section 2) ☐ No existing analysis ☒ Improved data
☒ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	FIS (cfs)	Revised (cfs)

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model [TR-20, HEC-1, HEC-HMS etc.]
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis. The document, "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☐ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit	155th Ave / Dixileta Drive	3.716		
Upstream Limit	155th Ave / Dixileta Drive	4.109		

2. Hydraulic Method Used

Hydraulic Analysis HEC-RAS [HEC-2 , HEC-RAS, Other (Attach description)]

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. These tools do not replace engineering judgment. CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. If you disagree with a message, please attach an explanation of why the message is not valid in this case. Review of your submittal and resolution of valid modeling discrepancies will result in reduced review time.

HEC-2/HEC-RAS models reviewed with CHECK-2/CHECK-RAS? ☒ Yes ☐ No

4. Models Submitted

Duplicate Effective Model*	Natural File Name:	Floodway File Name:
Corrected Effective Model*	Natural File Name:	Floodway File Name:
Existing or Pre-Project Conditions Model	Natural File Name: 12E_SPLIT	Floodway File Name: 12E_SPLIT
Revised or Post-Project Conditions Model	Natural File Name:	Floodway File Name:
Other - (attach description)	Natural File Name:	Floodway File Name:

*Not required for revisions to approximate 1%-annual-chance floodplains (Zone A) – for details, refer to the corresponding section of the instructions.

The document "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM,** annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

D. COMMON REGULATORY REQUIREMENTS

1. For CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☐ No

For CLOMR requests, if either of the following is true, please submit evidence of compliance with Section 65.12 of the NFIP regulations:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
- The proposed project encroaches upon a SFHA with BFEs established and would result in increases above 1.00 foot.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☐ No

If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☐ No

If Yes, attach evidence of regulatory floodway revision notification. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☐ No

If Yes, please attach proof of property owner notification and acceptance (if available). Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 3067-0148
Expires September 30, 2005

PAPERWORK REDUCTION ACT

Public reporting burden for this form is estimated to average 3 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, reviewing, and submitting the form. You are not required to respond to this collection of information unless a valid OMB control number appears in the upper right corner of this 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, SW, Washington DC 20472, Paperwork Reduction Project (3067-0148). Submission of the form is required to obtain or retain benefits under the National Flood Insurance Program. **Please do not send your completed survey to the above address.**

Flooding Source: Wash 13 East
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☐ Not revised (skip to section 2) ☐ No existing analysis ☒ Improved data
☒ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	FIS (cfs)	Revised (cfs)

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model [TR-20, HEC-1, HEC-HMS etc.]
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis. The document, "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☐ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit	139th Ave / Jomax Road	0.848		
Upstream Limit	147th Ave / Patton Road	2.294		

2. Hydraulic Method Used

Hydraulic Analysis HEC-RAS [HEC-2 , HEC-RAS, Other (Attach description)]

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. These tools do not replace engineering judgment. CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. If you disagree with a message, please attach an explanation of why the message is not valid in this case. Review of your submittal and resolution of valid modeling discrepancies will result in reduced review time.

HEC-2/HEC-RAS models reviewed with CHECK-2/CHECK-RAS? ☒ Yes ☐ No

4. Models Submitted

Duplicate Effective Model*	Natural File Name:	Floodway File Name:
Corrected Effective Model*	Natural File Name:	Floodway File Name:
Existing or Pre-Project Conditions Model	Natural File Name: 13E	Floodway File Name: 13E
Revised or Post-Project Conditions Model	Natural File Name:	Floodway File Name:
Other - (attach description)	Natural File Name:	Floodway File Name:

*Not required for revisions to approximate 1%-annual-chance floodplains (Zone A) – for details, refer to the corresponding section of the instructions.

The document "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM,** annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

D. COMMON REGULATORY REQUIREMENTS

1. For CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☐ No

For CLOMR requests, if either of the following is true, please submit evidence of compliance with Section 65.12 of the NFIP regulations:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
- The proposed project encroaches upon a SFHA with BFEs established and would result in increases above 1.00 foot.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☐ No

If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☐ No

If Yes, attach evidence of regulatory floodway revision notification. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☐ No

If Yes, please attach proof of property owner notification and acceptance (if available). Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 3067-0148
Expires September 30, 2005

PAPERWORK REDUCTION ACT

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Flooding Source: Wash 14 East
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☐ Not revised (skip to section 2) ☐ No existing analysis ☒ Improved data
☒ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	FIS (cfs)	Revised (cfs)

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model [TR-20, HEC-1, HEC-HMS etc.]
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis. The document, "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☐ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit	147th Ave / Jomax Road	1.635		
Upstream Limit	147th Ave / Patton Road	2.244		

2. Hydraulic Method Used

Hydraulic Analysis HEC-RAS [HEC-2 , HEC-RAS, Other (Attach description)]

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. These tools do not replace engineering judgment. CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. If you disagree with a message, please attach an explanation of why the message is not valid in this case. Review of your submittal and resolution of valid modeling discrepancies will result in reduced review time.

HEC-2/HEC-RAS models reviewed with CHECK-2/CHECK-RAS? ☒ Yes ☐ No

4. Models Submitted

Duplicate Effective Model*	Natural File Name:	Floodway File Name:
Corrected Effective Model*	Natural File Name:	Floodway File Name:
Existing or Pre-Project Conditions Model	Natural File Name: 14E	Floodway File Name: 14E
Revised or Post-Project Conditions Model	Natural File Name:	Floodway File Name:
Other - (attach description)	Natural File Name:	Floodway File Name:

*Not required for revisions to approximate 1%-annual-chance floodplains (Zone A) – for details, refer to the corresponding section of the instructions.

The document "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM,** annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

D. COMMON REGULATORY REQUIREMENTS

1. For CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☐ No

For CLOMR requests, if either of the following is true, please submit evidence of compliance with Section 65.12 of the NFIP regulations:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
- The proposed project encroaches upon a SFHA with BFEs established and would result in increases above 1.00 foot.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☐ No

If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☐ No

If Yes, attach evidence of regulatory floodway revision notification. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☐ No

If Yes, please attach proof of property owner notification and acceptance (if available). Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

Wittmann Area Drainage Master Study Update
F.C.D. Contract No. 2002C029

FEMA Form 3: Riverine Structures Form

FEMA Form 3: Riverine Structure Analysis

1. IONA WASH (NORTH)
2. WASH 2 WEST (NORTH OF CAP)
3. 2 WEST TRIBUTARY-1
4. WITTMANN WASH
5. WITTMANN WASH (NORTH SPLIT)
6. T5N-R3W-S24E
7. WASH 2 WEST (SOUTH OF CAP)
8. WASH 1 WEST
9. WASH 1 EAST
10. WASH 2 EAST (SOUTH OF CAP)
11. WASH 3 EAST
12. WASH 8 EAST

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE STRUCTURES FORM

O.M.B. No. 3067-0148
Expires September 30, 2005

PAPERWORK REDUCTION ACT

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Flooding Source: Iona Wash (North)
Note: Fill out one form for each flooding source studied

A. GENERAL

Complete the appropriate section(s) for each Structure listed below:

Channelization ..... complete Section B
Bridge/Culvert ..... complete Section C
Dam..... complete Section D
Levee/Floodwall ..... complete Section E
Sediment Transport..... complete Section F (if required)

Description Of Structure

1. Name of Structure: B.N.S.F. R.R. (Bridge)

Type (check one): ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure: B.N.S.F. R.R. / 1800ft SE of 251st Ave

Downstream Limit/Cross Section: 3.040

Upstream Limit/Cross Section: 3.043

2. Name of Structure: U.S.60 East (Bridge)

Type (check one): ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure: U.S.60 East / 1600ft SE of 251st Ave

Downstream Limit/Cross Section: 2.932

Upstream Limit/Cross Section: 2.939

3. Name of Structure: U.S.60 West (Bridge)

Type (check one) ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure: U.S.60 West / 1600ft SE of 251st Ave

Downstream Limit/Cross Section: 2.952

Upstream Limit/Cross Section: 2.959

NOTE: For more structures, attach additional pages as needed.

B. CHANNELIZATION

Flooding Source:

Name of Structure:

1. Accessory Structures

The channelization includes (check one):

- ☐ Levees [Attach Section E (Levee/Floodwall)]
- ☐ Superelevated sections
- ☐ Debris basin/detention basin
- ☐ Other (Describe):
- ☐ Drop structures
- ☐ Transitions in cross sectional geometry
- ☐ Energy dissipator

2. Drawing Checklist

Attach the plans of the channelization certified by a registered professional engineer, as described in the instructions.

3. Hydraulic Considerations

The channel was designed to carry (cfs) and/or the -year flood.

The design elevation in the channel is based on (check one):

☐ Subcritical flow ☐ Critical flow ☐ Supercritical flow ☐ Energy grade line

If there is the potential for a hydraulic jump at the following locations, check all that apply and attach an explanation of how the hydraulic jump is controlled without affecting the stability of the channel.

☐ Inlet to channel ☐ Outlet of channel ☐ At Drop Structures ☐ At Transitions
☐ Other locations (specify):

4. Sediment Transport Considerations

Was sediment transport considered? ☐ Yes ☐ No If Yes, then fill out Section F (Sediment Transport).
If No, then attach your explanation for why sediment transport was not considered.

C. BRIDGE/CULVERT

Flooding Source: Iona Wash (North)

Name of Structure: B.N.S.F. R.R. (Bridge), U.S.60 East (Bridge), U.S.60 West (Bridge)

1. This revision reflects (check one):

- ☒ 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

2. Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8):
If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structures. Attach justification.

3. Attach plans of the structures certified by a registered professional engineer. The plan detail and information should include the following (check the information that has been provided):

- ☒ Dimensions (height, width, span, radius, length)
- ☒ Shape (culverts only)
- ☒ Material
- ☐ Beveling or Rounding
- ☒ Wing Wall Angle
- ☒ Skew Angle
- ☐ Distances Between Cross Sections
- ☐ Erosion Protection
- ☒ Low Chord Elevations – Upstream and Downstream
- ☒ Top of Road Elevations – Upstream and Downstream
- ☒ Structure Invert Elevations – Upstream and Downstream
- ☒ Stream Invert Elevations – Upstream and Downstream
- ☐ Cross-Section Locations

4. Sediment Transport Considerations

Was sediment transport considered? ☐ Yes ☒ No If yes, then fill out Section F (Sediment Transport).
If No, then attach your explanation for why sediment transport was not considered.

C. BRIDGE/CULVERT

2. **Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8): If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structures. Attach justification.**
   HEC-RAS with special bridge routine

3. **Attach plans of the structures certified by a registered professional engineer. The plan detail and information should include the following (check the information that has been provided):**
   Volume SR – Survey Report of "Wittmann Area Drainage Master Study Update"

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE STRUCTURES FORM

O.M.B. No. 3067-0148
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Flooding Source: Wash 2 West (North of CAP)
Note: Fill out one form for each flooding source studied

A. GENERAL

Complete the appropriate section(s) for each Structure listed below:

Channelization ..... complete Section B
Bridge/Culvert ..... complete Section C
Dam..... complete Section D
Levee/Floodwall ..... complete Section E
Sediment Transport..... complete Section F (if required)

Description Of Structure

1. Name of Structure: Patton Road (Culvert)

Type (check one): ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure: 219th Ave / 1400ft of Patton Road

Downstream Limit/Cross Section: 1.110

Upstream Limit/Cross Section: 1.127

2. Name of Structure:

Type (check one): ☐ Channelization ☐ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure:

Downstream Limit/Cross Section:

Upstream Limit/Cross Section:

3. Name of Structure:

Type (check one) ☐ Channelization ☐ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure:

Downstream Limit/Cross Section:

Upstream Limit/Cross Section:

NOTE: For more structures, attach additional pages as needed.

B. CHANNELIZATION

Flooding Source:

Name of Structure:

1. Accessory Structures

The channelization includes (check one):

- ☐ Levees [Attach Section E (Levee/Floodwall)]
- ☐ Superelevated sections
- ☐ Debris basin/detention basin
- ☐ Other (Describe):
- ☐ Drop structures
- ☐ Transitions in cross sectional geometry
- ☐ Energy dissipator

2. Drawing Checklist

Attach the plans of the channelization certified by a registered professional engineer, as described in the instructions.

3. Hydraulic Considerations

The channel was designed to carry (cfs) and/or the -year flood.

The design elevation in the channel is based on (check one):

☐ Subcritical flow ☐ Critical flow ☐ Supercritical flow ☐ Energy grade line

If there is the potential for a hydraulic jump at the following locations, check all that apply and attach an explanation of how the hydraulic jump is controlled without affecting the stability of the channel.

☐ Inlet to channel ☐ Outlet of channel ☐ At Drop Structures ☐ At Transitions
☐ Other locations (specify):

4. Sediment Transport Considerations

Was sediment transport considered? ☐ Yes ☐ No If Yes, then fill out Section F (Sediment Transport).
If No, then attach your explanation for why sediment transport was not considered.

C. BRIDGE/CULVERT

Flooding Source: Wash 2 West (North of CAP)

Name of Structure: Patton Road (Culvert)

1. This revision reflects (check one):

- ☒ 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

2. Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8):
If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structures. Attach justification.

3. Attach plans of the structures certified by a registered professional engineer. The plan detail and information should include the following (check the information that has been provided):

- ☒ Dimensions (height, width, span, radius, length)
- ☒ Shape (culverts only)
- ☒ Material
- ☐ Beveling or Rounding
- ☒ Wing Wall Angle
- ☒ Skew Angle
- ☐ Distances Between Cross Sections
- ☐ Erosion Protection
- ☒ Low Chord Elevations – Upstream and Downstream
- ☒ Top of Road Elevations – Upstream and Downstream
- ☒ Structure Invert Elevations – Upstream and Downstream
- ☒ Stream Invert Elevations – Upstream and Downstream
- ☐ Cross-Section Locations

4. Sediment Transport Considerations

Was sediment transport considered? ☐ Yes ☒ No If yes, then fill out Section F (Sediment Transport).
If No, then attach your explanation for why sediment transport was not considered.

C. BRIDGE/CULVERT

2. **Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8): If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structures. Attach justification.**
   HEC-RAS with special bridge routine

3. **Attach plans of the structures certified by a registered professional engineer. The plan detail and information should include the following (check the information that has been provided):**
   Volume SR – Survey Report of "Wittmann Area Drainage Master Study Update"

FEDERAL EMERGENCY MANAGEMENT AGENCY

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Flooding Source: 2 West Tributary-1
Note: Fill out one form for each flooding source studied

A. GENERAL

Complete the appropriate section(s) for each Structure listed below:

Channelization ..... complete Section B
Bridge/Culvert ..... complete Section C
Dam..... complete Section D
Levee/Floodwall ..... complete Section E
Sediment Transport..... complete Section F (if required)

Description Of Structure

1. **Name of Structure: Lone Mountain Road (Culvert)**

   Type (check one): ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

   Location of Structure: Lone Mountain Road / 1400ft W of 219th Ave

   Downstream Limit/Cross Section: 2.091

   Upstream Limit/Cross Section: 2.105

2. **Name of Structure:**

   Type (check one): ☐ Channelization ☐ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

   Location of Structure:

   Downstream Limit/Cross Section:

   Upstream Limit/Cross Section:

3. **Name of Structure:**

   Type (check one) ☐ Channelization ☐ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

   Location of Structure:

   Downstream Limit/Cross Section:

   Upstream Limit/Cross Section:

NOTE: For more structures, attach additional pages as needed.

B. CHANNELIZATION

Flooding Source:

Name of Structure:

1. Accessory Structures

The channelization includes (check one):

- ☐ Levees [Attach Section E (Levee/Floodwall)]
- ☐ Superelevated sections
- ☐ Debris basin/detention basin
- ☐ Other (Describe):
- ☐ Drop structures
- ☐ Transitions in cross sectional geometry
- ☐ Energy dissipator

2. Drawing Checklist

Attach the plans of the channelization certified by a registered professional engineer, as described in the instructions.

3. Hydraulic Considerations

The channel was designed to carry (cfs) and/or the -year flood.

The design elevation in the channel is based on (check one):

☐ Subcritical flow ☐ Critical flow ☐ Supercritical flow ☐ Energy grade line

If there is the potential for a hydraulic jump at the following locations, check all that apply and attach an explanation of how the hydraulic jump is controlled without affecting the stability of the channel.

☐ Inlet to channel ☐ Outlet of channel ☐ At Drop Structures ☐ At Transitions
☐ Other locations (specify):

4. Sediment Transport Considerations

Was sediment transport considered? ☐ Yes ☐ No If Yes, then fill out Section F (Sediment Transport).
If No, then attach your explanation for why sediment transport was not considered.

C. BRIDGE/CULVERT

Flooding Source: 2 West Tributary-1

Name of Structure: Lone Mountain Road (Culvert)

1. This revision reflects (check one):

- ☒ 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

2. Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8):
If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structures. Attach justification.

3. Attach plans of the structures certified by a registered professional engineer. The plan detail and information should include the following (check the information that has been provided):

- ☒ Dimensions (height, width, span, radius, length)
- ☒ Shape (culverts only)
- ☒ Material
- ☐ Beveling or Rounding
- ☒ Wing Wall Angle
- ☒ Skew Angle
- ☐ Distances Between Cross Sections
- ☐ Erosion Protection
- ☒ Low Chord Elevations – Upstream and Downstream
- ☒ Top of Road Elevations – Upstream and Downstream
- ☒ Structure Invert Elevations – Upstream and Downstream
- ☒ Stream Invert Elevations – Upstream and Downstream
- ☐ Cross-Section Locations

4. Sediment Transport Considerations

Was sediment transport considered? ☐ Yes ☒ No If yes, then fill out Section F (Sediment Transport).
If No, then attach your explanation for why sediment transport was not considered.

C. BRIDGE/CULVERT

2. **Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8): If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structures. Attach justification.**
   HEC-RAS with special bridge routine

3. **Attach plans of the structures certified by a registered professional engineer. The plan detail and information should include the following (check the information that has been provided):**
   Volume SR – Survey Report of "Wittmann Area Drainage Master Study Update"

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE STRUCTURES FORM

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Flooding Source: Wittmann Wash
Note: Fill out one form for each flooding source studied

A. GENERAL

Complete the appropriate section(s) for each Structure listed below:

Channelization ..... complete Section B
Bridge/Culvert ..... complete Section C
Dam..... complete Section D
Levee/Floodwall ..... complete Section E
Sediment Transport..... complete Section F (if required)

Description Of Structure

1. Name of Structure: Center Street (Culvert)

Type (check one): ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure: Center Street / 800ft NE of U.S.60

Downstream Limit/Cross Section: 3.321

Upstream Limit/Cross Section: 3.333

2. Name of Structure: U.S.60 East Bound (Bridge)

Type (check one): ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure: U.S.60 East / 1600ft SE of Center Street

Downstream Limit/Cross Section: 2.934

Upstream Limit/Cross Section: 2.949

3. Name of Structure: U.S.60 West Bound (Bridge)

Type (check one) ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure: U.S.60 West / 1600ft SE of Center Street

Downstream Limit/Cross Section: 2.957

Upstream Limit/Cross Section: 2.972

NOTE: For more structures, attach additional pages as needed.

FEDERAL EMERGENCY MANAGEMENT AGENCY

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Flooding Source: Wittmann Wash (cont.)
Note: Fill out one form for each flooding source studied

A. GENERAL

Complete the appropriate section(s) for each Structure listed below:

Channelization ..... complete Section B
Bridge/Culvert ..... complete Section C
Dam..... complete Section D
Levee/Floodwall ..... complete Section E
Sediment Transport..... complete Section F (if required)

Description Of Structure

1. Name of Structure: B.N.S.F RR. (Bridge)

Type (check one): ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure: B.N.S.F RR. / 1400ft SE of Center Street

Downstream Limit/Cross Section: 3.000

Upstream Limit/Cross Section: 3.008

2. Name of Structure:

Type (check one): ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure:

Downstream Limit/Cross Section:

Upstream Limit/Cross Section:

3. Name of Structure:

Type (check one) ☐ Channelization ☐ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure:

Downstream Limit/Cross Section:

Upstream Limit/Cross Section:

NOTE: For more structures, attach additional pages as needed.

B. CHANNELIZATION

Flooding Source:

Name of Structure:

1. Accessory Structures

The channelization includes (check one):

- ☐ Levees [Attach Section E (Levee/Floodwall)]
- ☐ Superelevated sections
- ☐ Debris basin/detention basin
- ☐ Other (Describe):
- ☐ Drop structures
- ☐ Transitions in cross sectional geometry
- ☐ Energy dissipator

2. Drawing Checklist

Attach the plans of the channelization certified by a registered professional engineer, as described in the instructions.

3. Hydraulic Considerations

The channel was designed to carry (cfs) and/or the -year flood.

The design elevation in the channel is based on (check one):

☐ Subcritical flow ☐ Critical flow ☐ Supercritical flow ☐ Energy grade line

If there is the potential for a hydraulic jump at the following locations, check all that apply and attach an explanation of how the hydraulic jump is controlled without affecting the stability of the channel.

☐ Inlet to channel ☐ Outlet of channel ☐ At Drop Structures ☐ At Transitions
☐ Other locations (specify):

4. Sediment Transport Considerations

Was sediment transport considered? ☐ Yes ☐ No If Yes, then fill out Section F (Sediment Transport).
If No, then attach your explanation for why sediment transport was not considered.

C. BRIDGE/CULVERT

Flooding Source: Wittmann Wash

Name of Structure: Center St.(Culvert), US60 E. Bound (Bridge), US60 W. Bound (Bridge), B.N.S.F RR. (Bridge)

1. This revision reflects (check one):

- ☒ 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

2. Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8):
If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structures. Attach justification.

3. Attach plans of the structures certified by a registered professional engineer. The plan detail and information should include the following (check the information that has been provided):

- ☒ Dimensions (height, width, span, radius, length)
- ☒ Shape (culverts only)
- ☒ Material
- ☐ Beveling or Rounding
- ☒ Wing Wall Angle
- ☒ Skew Angle
- ☐ Distances Between Cross Sections
- ☐ Erosion Protection
- ☒ Low Chord Elevations – Upstream and Downstream
- ☒ Top of Road Elevations – Upstream and Downstream
- ☒ Structure Invert Elevations – Upstream and Downstream
- ☒ Stream Invert Elevations – Upstream and Downstream
- ☐ Cross-Section Locations

4. Sediment Transport Considerations

Was sediment transport considered? ☐ Yes ☒ No If yes, then fill out Section F (Sediment Transport).
If No, then attach your explanation for why sediment transport was not considered.

C. BRIDGE/CULVERT

2. **Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8): If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structures. Attach justification.**
   HEC-RAS with special bridge routine

3. **Attach plans of the structures certified by a registered professional engineer. The plan detail and information should include the following (check the information that has been provided):**
   Volume SR – Survey Report of "Wittmann Area Drainage Master Study Update"

FEDERAL EMERGENCY MANAGEMENT AGENCY

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Flooding Source: Wittmann Wash (North Split)
Note: Fill out one form for each flooding source studied

A. GENERAL

Complete the appropriate section(s) for each Structure listed below:

Channelization ..... complete Section B
Bridge/Culvert ..... complete Section C
Dam..... complete Section D
Levee/Floodwall ..... complete Section E
Sediment Transport..... complete Section F (if required)

Description Of Structure

1. Name of Structure: Center Street (Culvert)

Type (check one): ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure: Center Street / 600ft NE of U.S.60

Downstream Limit/Cross Section: 3.321

Upstream Limit/Cross Section: 3.333

2. Name of Structure:

Type (check one): ☐ Channelization ☐ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure:

Downstream Limit/Cross Section:

Upstream Limit/Cross Section:

3. Name of Structure:

Type (check one) ☐ Channelization ☐ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure:

Downstream Limit/Cross Section:

Upstream Limit/Cross Section:

NOTE: For more structures, attach additional pages as needed.

B. CHANNELIZATION

Flooding Source:

Name of Structure:

1. Accessory Structures

The channelization includes (check one):

- ☐ Levees [Attach Section E (Levee/Floodwall)]
- ☐ Superelevated sections
- ☐ Debris basin/detention basin
- ☐ Other (Describe):
- ☐ Drop structures
- ☐ Transitions in cross sectional geometry
- ☐ Energy dissipator

2. Drawing Checklist

Attach the plans of the channelization certified by a registered professional engineer, as described in the instructions.

3. Hydraulic Considerations

The channel was designed to carry (cfs) and/or the -year flood.

The design elevation in the channel is based on (check one):

☐ Subcritical flow ☐ Critical flow ☐ Supercritical flow ☐ Energy grade line

If there is the potential for a hydraulic jump at the following locations, check all that apply and attach an explanation of how the hydraulic jump is controlled without affecting the stability of the channel.

☐ Inlet to channel ☐ Outlet of channel ☐ At Drop Structures ☐ At Transitions
☐ Other locations (specify):

4. Sediment Transport Considerations

Was sediment transport considered? ☐ Yes ☐ No If Yes, then fill out Section F (Sediment Transport).
If No, then attach your explanation for why sediment transport was not considered.

C. BRIDGE/CULVERT

Flooding Source: Wittmann Wash (North Split)

Name of Structure: Center Street (Culvert)

1. This revision reflects (check one):

- ☒ 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

2. Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8):
If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structures. Attach justification.

3. Attach plans of the structures certified by a registered professional engineer. The plan detail and information should include the following (check the information that has been provided):

- ☒ Dimensions (height, width, span, radius, length)
- ☒ Shape (culverts only)
- ☒ Material
- ☐ Beveling or Rounding
- ☒ Wing Wall Angle
- ☒ Skew Angle
- ☐ Distances Between Cross Sections
- ☐ Erosion Protection
- ☒ Low Chord Elevations – Upstream and Downstream
- ☒ Top of Road Elevations – Upstream and Downstream
- ☒ Structure Invert Elevations – Upstream and Downstream
- ☒ Stream Invert Elevations – Upstream and Downstream
- ☐ Cross-Section Locations

4. Sediment Transport Considerations

Was sediment transport considered? ☐ Yes ☒ No If yes, then fill out Section F (Sediment Transport).
If No, then attach your explanation for why sediment transport was not considered.

C. BRIDGE/CULVERT

2. **Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8): If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structures. Attach justification.**
   HEC-RAS with special bridge routine

3. **Attach plans of the structures certified by a registered professional engineer. The plan detail and information should include the following (check the information that has been provided):**
   Volume SR – Survey Report of "Wittmann Area Drainage Master Study Update"

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE STRUCTURES FORM

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Flooding Source: T5N-R3W-S24E
Note: Fill out one form for each flooding source studied

A. GENERAL

Complete the appropriate section(s) for each Structure listed below:

Channelization ..... complete Section B
Bridge/Culvert ..... complete Section C
Dam..... complete Section D
Levee/Floodwall ..... complete Section E
Sediment Transport..... complete Section F (if required)

Description Of Structure

1. Name of Structure: B.N.S.F. RR. (Bridge)

Type (check one): ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure: B.N.S.F. RR. / 300ft NW of 211th Ave

Downstream Limit/Cross Section: 0.678

Upstream Limit/Cross Section: 0.681

2. Name of Structure: U.S.60 (Culvert)

Type (check one): ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure: U.S.60 / 600ft NW of 211th Ave

Downstream Limit/Cross Section: 0.612

Upstream Limit/Cross Section: 0.658

3. Name of Structure:

Type (check one) ☐ Channelization ☐ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure:

Downstream Limit/Cross Section:

Upstream Limit/Cross Section:

NOTE: For more structures, attach additional pages as needed.

B. CHANNELIZATION

Flooding Source:

Name of Structure:

1. Accessory Structures

The channelization includes (check one):

- ☐ Levees [Attach Section E (Levee/Floodwall)]
- ☐ Superelevated sections
- ☐ Debris basin/detention basin
- ☐ Other (Describe):
- ☐ Drop structures
- ☐ Transitions in cross sectional geometry
- ☐ Energy dissipator

2. Drawing Checklist

Attach the plans of the channelization certified by a registered professional engineer, as described in the instructions.

3. Hydraulic Considerations

The channel was designed to carry (cfs) and/or the -year flood.

The design elevation in the channel is based on (check one):

☐ Subcritical flow ☐ Critical flow ☐ Supercritical flow ☐ Energy grade line

If there is the potential for a hydraulic jump at the following locations, check all that apply and attach an explanation of how the hydraulic jump is controlled without affecting the stability of the channel.

☐ Inlet to channel ☐ Outlet of channel ☐ At Drop Structures ☐ At Transitions
☐ Other locations (specify):

4. Sediment Transport Considerations

Was sediment transport considered? ☐ Yes ☐ No If Yes, then fill out Section F (Sediment Transport).
If No, then attach your explanation for why sediment transport was not considered.

C. BRIDGE/CULVERT

Flooding Source: T5N-R3W-S24E

Name of Structure: B.N.S.F. RR. (Bridge), U.S.60 (Culvert)

1. This revision reflects (check one):

- ☒ 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

2. Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8):
If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structures. Attach justification.

3. Attach plans of the structures certified by a registered professional engineer. The plan detail and information should include the following (check the information that has been provided):

- ☒ Dimensions (height, width, span, radius, length)
- ☒ Shape (culverts only)
- ☒ Material
- ☐ Beveling or Rounding
- ☒ Wing Wall Angle
- ☒ Skew Angle
- ☐ Distances Between Cross Sections
- ☐ Erosion Protection
- ☒ Low Chord Elevations – Upstream and Downstream
- ☒ Top of Road Elevations – Upstream and Downstream
- ☒ Structure Invert Elevations – Upstream and Downstream
- ☒ Stream Invert Elevations – Upstream and Downstream
- ☐ Cross-Section Locations

4. Sediment Transport Considerations

Was sediment transport considered? ☐ Yes ☒ No If yes, then fill out Section F (Sediment Transport).
If No, then attach your explanation for why sediment transport was not considered.

C. BRIDGE/CULVERT

2. **Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8): If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structures. Attach justification.**
   HEC-RAS with special bridge routine

3. **Attach plans of the structures certified by a registered professional engineer. The plan detail and information should include the following (check the information that has been provided):**
   Volume SR – Survey Report of "Wittmann Area Drainage Master Study Update"

FEDERAL EMERGENCY MANAGEMENT AGENCY

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Flooding Source: Wash 2 West (South of CAP)
Note: Fill out one form for each flooding source studied

A. GENERAL

Complete the appropriate section(s) for each Structure listed below:

Channelization ..... complete Section B
Bridge/Culvert ..... complete Section C
Dam..... complete Section D
Levee/Floodwall ..... complete Section E
Sediment Transport..... complete Section F (if required)

Description Of Structure

1. Name of Structure: Deer Valley (Bridge)

Type (check one): ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure: Deer Valley Road / 1200ft W of 187th Ave

Downstream Limit/Cross Section: 2.163

Upstream Limit/Cross Section: 2.173

2. Name of Structure:

Type (check one): ☐ Channelization ☐ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure:

Downstream Limit/Cross Section:

Upstream Limit/Cross Section:

3. Name of Structure:

Type (check one) ☐ Channelization ☐ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure:

Downstream Limit/Cross Section:

Upstream Limit/Cross Section:

NOTE: For more structures, attach additional pages as needed.

B. CHANNELIZATION

Flooding Source:

Name of Structure:

1. Accessory Structures

The channelization includes (check one):

- ☐ Levees [Attach Section E (Levee/Floodwall)]
- ☐ Superelevated sections
- ☐ Debris basin/detention basin
- ☐ Other (Describe):
- ☐ Drop structures
- ☐ Transitions in cross sectional geometry
- ☐ Energy dissipator

2. Drawing Checklist

Attach the plans of the channelization certified by a registered professional engineer, as described in the instructions.

3. Hydraulic Considerations

The channel was designed to carry (cfs) and/or the -year flood.

The design elevation in the channel is based on (check one):

☐ Subcritical flow ☐ Critical flow ☐ Supercritical flow ☐ Energy grade line

If there is the potential for a hydraulic jump at the following locations, check all that apply and attach an explanation of how the hydraulic jump is controlled without affecting the stability of the channel.

☐ Inlet to channel ☐ Outlet of channel ☐ At Drop Structures ☐ At Transitions
☐ Other locations (specify):

4. Sediment Transport Considerations

Was sediment transport considered? ☐ Yes ☐ No If Yes, then fill out Section F (Sediment Transport).
If No, then attach your explanation for why sediment transport was not considered.

C. BRIDGE/CULVERT

Flooding Source: Wash 2 West (South of CAP)

Name of Structure: Deer Valley (Bridge)

1. This revision reflects (check one):

- ☒ 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

2. Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8):
If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structures. Attach justification.

3. Attach plans of the structures certified by a registered professional engineer. The plan detail and information should include the following (check the information that has been provided):

- ☒ Dimensions (height, width, span, radius, length)
- ☒ Shape (culverts only)
- ☒ Material
- ☐ Beveling or Rounding
- ☒ Wing Wall Angle
- ☒ Skew Angle
- ☐ Distances Between Cross Sections
- ☐ Erosion Protection
- ☒ Low Chord Elevations – Upstream and Downstream
- ☒ Top of Road Elevations – Upstream and Downstream
- ☒ Structure Invert Elevations – Upstream and Downstream
- ☒ Stream Invert Elevations – Upstream and Downstream
- ☐ Cross-Section Locations

4. Sediment Transport Considerations

Was sediment transport considered? ☐ Yes ☒ No If yes, then fill out Section F (Sediment Transport).
If No, then attach your explanation for why sediment transport was not considered.

C. BRIDGE/CULVERT

2. **Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8): If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structures. Attach justification.**
   HEC-RAS with special bridge routine

3. **Attach plans of the structures certified by a registered professional engineer. The plan detail and information should include the following (check the information that has been provided):**
   Volume SR – Survey Report of "Wittmann Area Drainage Master Study Update"

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE STRUCTURES FORM

O.M.B. No. 3067-0148
Expires September 30, 2005

PAPERWORK REDUCTION ACT

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Flooding Source: Wash 1 West
Note: Fill out one form for each flooding source studied

A. GENERAL

Complete the appropriate section(s) for each Structure listed below:

Channelization ..... complete Section B
Bridge/Culvert ..... complete Section C
Dam..... complete Section D
Levee/Floodwall..... complete Section E
Sediment Transport..... complete Section F (if required)

Description Of Structure

1. Name of Structure: Deer Valley (Bridge)

Type (check one): ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure: Deer Valley Road / 600ft E of 179th Ave

Downstream Limit/Cross Section: 1.058

Upstream Limit/Cross Section: 1.089

2. Name of Structure:

Type (check one): ☐ Channelization ☐ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure:

Downstream Limit/Cross Section:

Upstream Limit/Cross Section:

3. Name of Structure:

Type (check one) ☐ Channelization ☐ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure:

Downstream Limit/Cross Section:

Upstream Limit/Cross Section:

NOTE: For more structures, attach additional pages as needed.

B. CHANNELIZATION

Flooding Source:

Name of Structure:

1. Accessory Structures

The channelization includes (check one):

- ☐ Levees [Attach Section E (Levee/Floodwall)]
- ☐ Superelevated sections
- ☐ Debris basin/detention basin
- ☐ Other (Describe):
- ☐ Drop structures
- ☐ Transitions in cross sectional geometry
- ☐ Energy dissipator

2. Drawing Checklist

Attach the plans of the channelization certified by a registered professional engineer, as described in the instructions.

3. Hydraulic Considerations

The channel was designed to carry (cfs) and/or the -year flood.

The design elevation in the channel is based on (check one):

☐ Subcritical flow ☐ Critical flow ☐ Supercritical flow ☐ Energy grade line

If there is the potential for a hydraulic jump at the following locations, check all that apply and attach an explanation of how the hydraulic jump is controlled without affecting the stability of the channel.

☐ Inlet to channel ☐ Outlet of channel ☐ At Drop Structures ☐ At Transitions
☐ Other locations (specify):

4. Sediment Transport Considerations

Was sediment transport considered? ☐ Yes ☐ No If Yes, then fill out Section F (Sediment Transport).
If No, then attach your explanation for why sediment transport was not considered.

C. BRIDGE/CULVERT

Flooding Source: Wash 1 West

Name of Structure: Deer Valley (Bridge)

1. This revision reflects (check one):

- ☒ 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

2. Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8):
If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structures. Attach justification.

3. Attach plans of the structures certified by a registered professional engineer. The plan detail and information should include the following (check the information that has been provided):

- ☒ Dimensions (height, width, span, radius, length)
- ☒ Shape (culverts only)
- ☒ Material
- ☐ Beveling or Rounding
- ☒ Wing Wall Angle
- ☒ Skew Angle
- ☐ Distances Between Cross Sections
- ☐ Erosion Protection
- ☒ Low Chord Elevations – Upstream and Downstream
- ☒ Top of Road Elevations – Upstream and Downstream
- ☒ Structure Invert Elevations – Upstream and Downstream
- ☒ Stream Invert Elevations – Upstream and Downstream
- ☐ Cross-Section Locations

4. Sediment Transport Considerations

Was sediment transport considered? ☐ Yes ☒ No If yes, then fill out Section F (Sediment Transport).
If No, then attach your explanation for why sediment transport was not considered.

C. BRIDGE/CULVERT

2. **Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8): If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structures. Attach justification.**
   HEC-RAS with special bridge routine

3. **Attach plans of the structures certified by a registered professional engineer. The plan detail and information should include the following (check the information that has been provided):**
   Volume SR – Survey Report of "Wittmann Area Drainage Master Study Update"

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Flooding Source: Wash 1 East
Note: Fill out one form for each flooding source studied

A. GENERAL

Complete the appropriate section(s) for each Structure listed below:

Channelization ..... complete Section B
Bridge/Culvert ..... complete Section C
Dam..... complete Section D
Levee/Floodwall ..... complete Section E
Sediment Transport..... complete Section F (if required)

Description Of Structure

1. Name of Structure: B.N.S.F. RR. (Bridge)

Type (check one): ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure: B.N.S.F. RR. / 1400ft SE of 195th Ave

Downstream Limit/Cross Section: 0.870

Upstream Limit/Cross Section: 0.875

2. Name of Structure: U.S.60 (Culvert)

Type (check one): ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure: U.S.60 / 1200ft SE of 195th Ave

Downstream Limit/Cross Section: 0.810

Upstream Limit/Cross Section: 0.850

3. Name of Structure:

Type (check one) ☐ Channelization ☐ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure:

Downstream Limit/Cross Section:

Upstream Limit/Cross Section:

NOTE: For more structures, attach additional pages as needed.

B. CHANNELIZATION

Flooding Source:

Name of Structure:

1. Accessory Structures

The channelization includes (check one):

- ☐ Levees [Attach Section E (Levee/Floodwall)]
- ☐ Superelevated sections
- ☐ Debris basin/detention basin
- ☐ Other (Describe):
- ☐ Drop structures
- ☐ Transitions in cross sectional geometry
- ☐ Energy dissipator

2. Drawing Checklist

Attach the plans of the channelization certified by a registered professional engineer, as described in the instructions.

3. Hydraulic Considerations

The channel was designed to carry (cfs) and/or the -year flood.

The design elevation in the channel is based on (check one):

☐ Subcritical flow ☐ Critical flow ☐ Supercritical flow ☐ Energy grade line

If there is the potential for a hydraulic jump at the following locations, check all that apply and attach an explanation of how the hydraulic jump is controlled without affecting the stability of the channel.

☐ Inlet to channel ☐ Outlet of channel ☐ At Drop Structures ☐ At Transitions
☐ Other locations (specify):

4. Sediment Transport Considerations

Was sediment transport considered? ☐ Yes ☐ No If Yes, then fill out Section F (Sediment Transport).
If No, then attach your explanation for why sediment transport was not considered.

C. BRIDGE/CULVERT

Flooding Source: Wash 1 East

Name of Structure: B.N.S.F. RR. (Bridge), U.S.60 (Culvert)

1. This revision reflects (check one):

- ☒ 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

2. Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8):
If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structures. Attach justification.

3. Attach plans of the structures certified by a registered professional engineer. The plan detail and information should include the following (check the information that has been provided):

- ☒ Dimensions (height, width, span, radius, length)
- ☒ Shape (culverts only)
- ☒ Material
- ☐ Beveling or Rounding
- ☒ Wing Wall Angle
- ☒ Skew Angle
- ☐ Distances Between Cross Sections
- ☐ Erosion Protection
- ☒ Low Chord Elevations – Upstream and Downstream
- ☒ Top of Road Elevations – Upstream and Downstream
- ☒ Structure Invert Elevations – Upstream and Downstream
- ☒ Stream Invert Elevations – Upstream and Downstream
- ☐ Cross-Section Locations

4. Sediment Transport Considerations

Was sediment transport considered? ☐ Yes ☒ No If yes, then fill out Section F (Sediment Transport).
If No, then attach your explanation for why sediment transport was not considered.

C. BRIDGE/CULVERT

2. **Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8): If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structures. Attach justification.**
   HEC-RAS with special bridge routine

3. **Attach plans of the structures certified by a registered professional engineer. The plan detail and information should include the following (check the information that has been provided):**
   Volume SR – Survey Report of "Wittmann Area Drainage Master Study Update"

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Flooding Source: Wash 2 East (South of CAP)
Note: Fill out one form for each flooding source studied

A. GENERAL

Complete the appropriate section(s) for each Structure listed below:

Channelization ..... complete Section B
Bridge/Culvert ..... complete Section C
Dam..... complete Section D
Levee/Floodwall ..... complete Section E
Sediment Transport..... complete Section F (if required)

Description Of Structure

1. Name of Structure: B.N.S.F. RR. (Bridge)

Type (check one): ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure: B.N.S.F. RR. / 1400ft NW of 187th Ave

Downstream Limit/Cross Section: 3.159

Upstream Limit/Cross Section: 3.163

2. Name of Structure: Jomax (Culvert)

Type (check one): ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure: Jomax / 800ft E of 189th Ave

Downstream Limit/Cross Section: 2.650

Upstream Limit/Cross Section: 2.634

3. Name of Structure: U.S.60 (Culvert)

Type (check one) ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure: U.S.60 / 1600ft NW of 187th Ave

Downstream Limit/Cross Section: 3.085

Upstream Limit/Cross Section: 3.097

NOTE: For more structures, attach additional pages as needed.

B. CHANNELIZATION

Flooding Source:

Name of Structure:

1. Accessory Structures

The channelization includes (check one):

- ☐ Levees [Attach Section E (Levee/Floodwall)]
- ☐ Superelevated sections
- ☐ Debris basin/detention basin
- ☐ Other (Describe):
- ☐ Drop structures
- ☐ Transitions in cross sectional geometry
- ☐ Energy dissipator

2. Drawing Checklist

Attach the plans of the channelization certified by a registered professional engineer, as described in the instructions.

3. Hydraulic Considerations

The channel was designed to carry (cfs) and/or the -year flood.

The design elevation in the channel is based on (check one):

☐ Subcritical flow ☐ Critical flow ☐ Supercritical flow ☐ Energy grade line

If there is the potential for a hydraulic jump at the following locations, check all that apply and attach an explanation of how the hydraulic jump is controlled without affecting the stability of the channel.

☐ Inlet to channel ☐ Outlet of channel ☐ At Drop Structures ☐ At Transitions
☐ Other locations (specify):

4. Sediment Transport Considerations

Was sediment transport considered? ☐ Yes ☐ No If Yes, then fill out Section F (Sediment Transport).
If No, then attach your explanation for why sediment transport was not considered.

C. BRIDGE/CULVERT

Flooding Source: Wash 2 East (South of CAP)

Name of Structure: B.N.S.F. RR. (Bridge), Jomax (Culvert), U.S.60 (Culvert)

1. This revision reflects (check one):

- ☒ 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

2. Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8):
If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structures. Attach justification.

3. Attach plans of the structures certified by a registered professional engineer. The plan detail and information should include the following (check the information that has been provided):

- ☒ Dimensions (height, width, span, radius, length)
- ☒ Shape (culverts only)
- ☒ Material
- ☐ Beveling or Rounding
- ☒ Wing Wall Angle
- ☒ Skew Angle
- ☐ Distances Between Cross Sections
- ☐ Erosion Protection
- ☒ Low Chord Elevations – Upstream and Downstream
- ☒ Top of Road Elevations – Upstream and Downstream
- ☒ Structure Invert Elevations – Upstream and Downstream
- ☒ Stream Invert Elevations – Upstream and Downstream
- ☐ Cross-Section Locations

4. Sediment Transport Considerations

Was sediment transport considered? ☐ Yes ☒ No If yes, then fill out Section F (Sediment Transport).
If No, then attach your explanation for why sediment transport was not considered.

C. BRIDGE/CULVERT

2. **Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8): If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structures. Attach justification.**
   HEC-RAS with special bridge routine

3. **Attach plans of the structures certified by a registered professional engineer. The plan detail and information should include the following (check the information that has been provided):**
   Volume SR – Survey Report of "Wittmann Area Drainage Master Study Update"

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Flooding Source: Wash 3 East
Note: Fill out one form for each flooding source studied

A. GENERAL

Complete the appropriate section(s) for each Structure listed below:

Channelization ..... complete Section B
Bridge/Culvert ..... complete Section C
Dam..... complete Section D
Levee/Floodwall ..... complete Section E
Sediment Transport..... complete Section F (if required)

Description Of Structure

1. Name of Structure: B.N.S.F. RR. (Bridge)

Type (check one): ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure: B.N.S.F. RR. / 200ft NW of 179th Ave

Downstream Limit/Cross Section: 3.170

Upstream Limit/Cross Section: 3.173

2. Name of Structure: Deer Valley (Culvert)

Type (check one): ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure: Deer Valley / 1000ft SW of U.S.60

Downstream Limit/Cross Section: 1.351

Upstream Limit/Cross Section: 1.381

3. Name of Structure: U.S.60 (Culvert)

Type (check one) ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure: U.S.60 / 400ft NW of 179th Ave

Downstream Limit/Cross Section: 3.109

Upstream Limit/Cross Section: 3.151

NOTE: For more structures, attach additional pages as needed.

B. CHANNELIZATION

Flooding Source:

Name of Structure:

1. Accessory Structures

The channelization includes (check one):

- ☐ Levees [Attach Section E (Levee/Floodwall)]
- ☐ Superelevated sections
- ☐ Debris basin/detention basin
- ☐ Other (Describe):
- ☐ Drop structures
- ☐ Transitions in cross sectional geometry
- ☐ Energy dissipator

2. Drawing Checklist

Attach the plans of the channelization certified by a registered professional engineer, as described in the instructions.

3. Hydraulic Considerations

The channel was designed to carry (cfs) and/or the -year flood.

The design elevation in the channel is based on (check one):

☐ Subcritical flow ☐ Critical flow ☐ Supercritical flow ☐ Energy grade line

If there is the potential for a hydraulic jump at the following locations, check all that apply and attach an explanation of how the hydraulic jump is controlled without affecting the stability of the channel.

☐ Inlet to channel ☐ Outlet of channel ☐ At Drop Structures ☐ At Transitions
☐ Other locations (specify):

4. Sediment Transport Considerations

Was sediment transport considered? ☐ Yes ☐ No If Yes, then fill out Section F (Sediment Transport).
If No, then attach your explanation for why sediment transport was not considered.

C. BRIDGE/CULVERT

Flooding Source: Wash 3 East

Name of Structure: B.N.S.F. RR. (Bridge), Deer Valley (Culvert), U.S.60 (Culvert)

1. This revision reflects (check one):

- ☒ 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

2. Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8):
If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structures. Attach justification.

3. Attach plans of the structures certified by a registered professional engineer. The plan detail and information should include the following (check the information that has been provided):

- ☒ Dimensions (height, width, span, radius, length)
- ☒ Shape (culverts only)
- ☒ Material
- ☐ Beveling or Rounding
- ☒ Wing Wall Angle
- ☒ Skew Angle
- ☐ Distances Between Cross Sections
- ☐ Erosion Protection
- ☒ Low Chord Elevations – Upstream and Downstream
- ☒ Top of Road Elevations – Upstream and Downstream
- ☒ Structure Invert Elevations – Upstream and Downstream
- ☒ Stream Invert Elevations – Upstream and Downstream
- ☐ Cross-Section Locations

4. Sediment Transport Considerations

Was sediment transport considered? ☐ Yes ☒ No If yes, then fill out Section F (Sediment Transport).
If No, then attach your explanation for why sediment transport was not considered.

C. BRIDGE/CULVERT

2. **Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8): If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structures. Attach justification.**
   HEC-RAS with special bridge routine

3. **Attach plans of the structures certified by a registered professional engineer. The plan detail and information should include the following (check the information that has been provided):**
   Volume SR – Survey Report of "Wittmann Area Drainage Master Study Update"

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Flooding Source: Wash 8 East
Note: Fill out one form for each flooding source studied

A. GENERAL

Complete the appropriate section(s) for each Structure listed below:

Channelization ..... complete Section B
Bridge/Culvert ..... complete Section C
Dam..... complete Section D
Levee/Floodwall ..... complete Section E
Sediment Transport..... complete Section F (if required)

Description Of Structure

1. Name of Structure: Jomax (Culvert)

Type (check one): ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure: 163rd Ave / Jomax Road

Downstream Limit/Cross Section: 0.426

Upstream Limit/Cross Section: 0.455

2. Name of Structure:

Type (check one): ☐ Channelization ☐ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure:

Downstream Limit/Cross Section:

Upstream Limit/Cross Section:

3. Name of Structure:

Type (check one) ☐ Channelization ☐ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure:

Downstream Limit/Cross Section:

Upstream Limit/Cross Section:

NOTE: For more structures, attach additional pages as needed.

B. CHANNELIZATION

Flooding Source:

Name of Structure:

1. Accessory Structures

The channelization includes (check one):

- ☐ Levees [Attach Section E (Levee/Floodwall)]
- ☐ Superelevated sections
- ☐ Debris basin/detention basin
- ☐ Other (Describe):
- ☐ Drop structures
- ☐ Transitions in cross sectional geometry
- ☐ Energy dissipator

2. Drawing Checklist

Attach the plans of the channelization certified by a registered professional engineer, as described in the instructions.

3. Hydraulic Considerations

The channel was designed to carry (cfs) and/or the -year flood.

The design elevation in the channel is based on (check one):

☐ Subcritical flow ☐ Critical flow ☐ Supercritical flow ☐ Energy grade line

If there is the potential for a hydraulic jump at the following locations, check all that apply and attach an explanation of how the hydraulic jump is controlled without affecting the stability of the channel.

☐ Inlet to channel ☐ Outlet of channel ☐ At Drop Structures ☐ At Transitions
☐ Other locations (specify):

4. Sediment Transport Considerations

Was sediment transport considered? ☐ Yes ☐ No If Yes, then fill out Section F (Sediment Transport).
If No, then attach your explanation for why sediment transport was not considered.

C. BRIDGE/CULVERT

Flooding Source: Wash 8 East

Name of Structure: Jomax (Culvert)

1. This revision reflects (check one):

- ☒ 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

2. Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8):
If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structures. Attach justification.

3. Attach plans of the structures certified by a registered professional engineer. The plan detail and information should include the following (check the information that has been provided):

- ☒ Dimensions (height, width, span, radius, length)
- ☒ Shape (culverts only)
- ☒ Material
- ☐ Beveling or Rounding
- ☒ Wing Wall Angle
- ☒ Skew Angle
- ☐ Distances Between Cross Sections
- ☐ Erosion Protection
- ☒ Low Chord Elevations – Upstream and Downstream
- ☒ Top of Road Elevations – Upstream and Downstream
- ☒ Structure Invert Elevations – Upstream and Downstream
- ☒ Stream Invert Elevations – Upstream and Downstream
- ☐ Cross-Section Locations

4. Sediment Transport Considerations

Was sediment transport considered? ☐ Yes ☒ No If yes, then fill out Section F (Sediment Transport).
If No, then attach your explanation for why sediment transport was not considered.

C. BRIDGE/CULVERT

2. **Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8): If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structures. Attach justification.**
   HEC-RAS with special bridge routine

3. **Attach plans of the structures certified by a registered professional engineer. The plan detail and information should include the following (check the information that has been provided):**
   Volume SR – Survey Report of "Wittmann Area Drainage Master Study Update"

SECTION 3: MAPPING AND SURVEY INFORMATION

3.1 Field Survey Information

Survey data, prepared for the District by DTM Inc., were provided to Entellus, Inc. in the following four Structure Survey Reports:

Wittmann ADMP State Route 74 Structure Surveys (**Reference 10**)

Wittmann ADMP Highway 60-Railroad Structure Surveys (**Reference 11**)

Wittmann ADMP Sun Valley Parkway Structure Surveys (**Reference 12**)

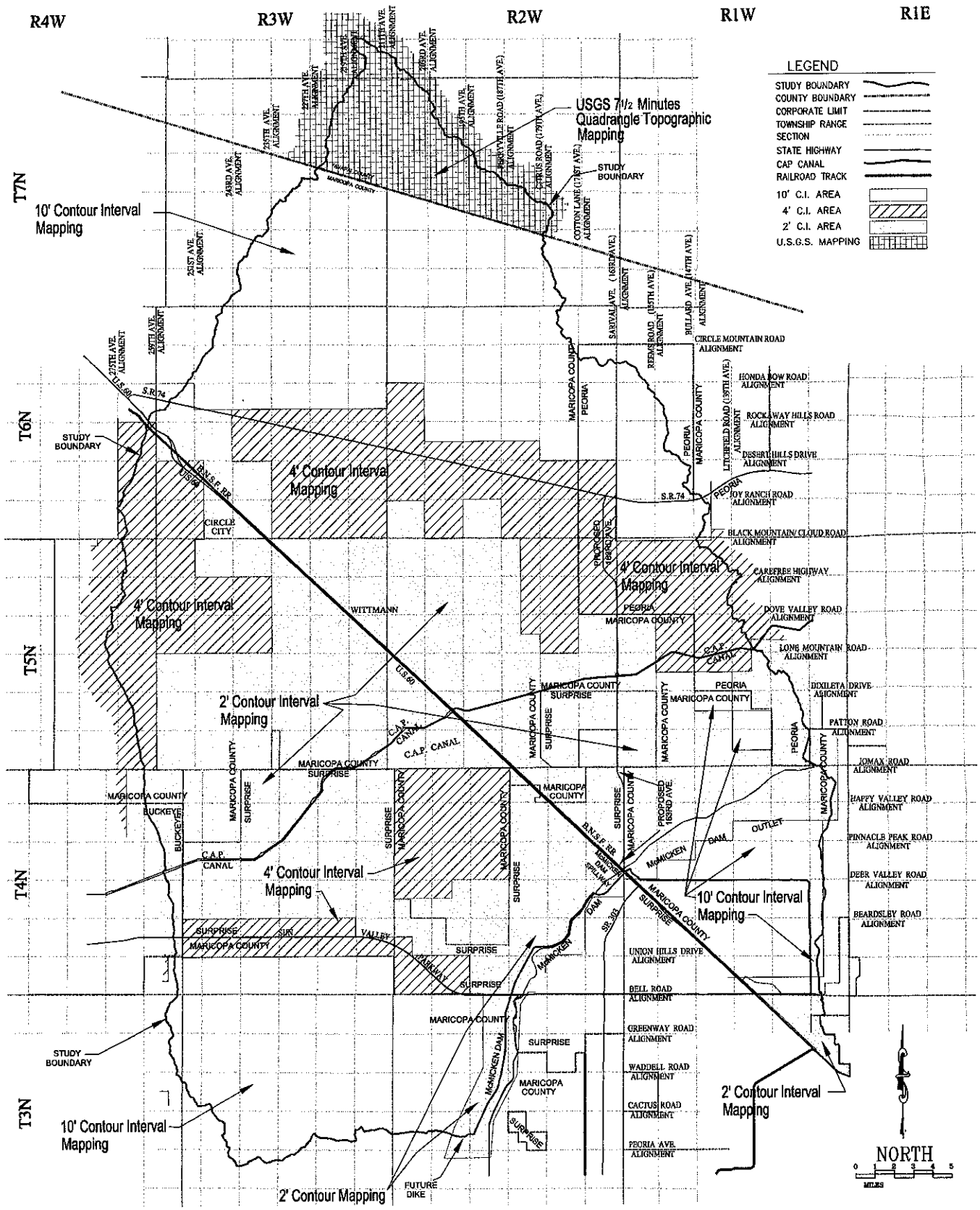
Wittmann ADMP CAP Canal Structure Surveys (**Reference 13**)

Additional survey was required for a number of structures outside of the area covered by the District's structure surveys. Survey also was required at the US 60 because roadway improvements were performed during the course of the project. Survey information was documented in the *Wittmann ADMP Survey Reports* (**References 10, 11, 12, 13**).

3.2 Mapping

Figure HD-3.1 shows the location of each type of mapping used. The base map used for this study was furnished by the District based on four different sources:

- USGS 7.5 minute quadrangle topographic mapping (**Reference 1**)
- 400-scale, 10-foot contour mapping (**Reference 2**)
- 200 scale, 4-foot contour mapping (**Reference 3**)
- 100 scale, 2-foot contour mapping (**Reference 4**)



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WITTMANN
AREA DRAINAGE MASTER STUDY UPDATE
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
CONTRACT FCD 2002C029

MAPPING COVERAGES

FIGURE HD-3.1

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3.2.1 Hydrology Mapping

A more general overview of the hydrologic analysis and its contents are located in: *Volume HY – ADMSU Hydrology* **(Section 3, Mapping and Survey Information)** of the "*Wittmann Area Drainage Master Study Update Report.*"

3.2.2 Hydraulic Mapping

The mapping used for the hydraulic portion of this project consists of both 100 scale with 2-foot contour interval, and 200 scale with 4-foot contour interval mapping. All mapping other than the USGS mapping was prepared by Stewart Geo Technologies for the District under a separate contract. The flight dates for the 1"=600' (1:7200) was (04/18/02), (04/19/02), and (04/23/02); the flight dates for the 1"=1200' (1:14400) was unknown. The vertical control was based on the North American Vertical Datum of 1988 (NAVD-88), and horizontal control was based on State Plane Coordinate System Arizona Central (1983 NAD). The District provided Entellus with a composite ASCII grid file developed from all four of these mapping sources.

SECTION 4: HYDROLOGY

The contents of this section are located in: *Volume HY – ADMSU Hydrology* of the "*Wittmann Area Drainage Master Study Update Report.*"

SECTION 5: HYDRAULICS

5.1 Method Description

The floodplains were analyzed using *BOSS RMS Version 2000 software* (**Reference 8**). RMS is an enhanced version of the U.S. *Army Corps of Engineers HEC-RAS program (Version 3.1.1, May 2003)* (**Reference 7**). This enhanced version was developed by the University of Brigham Young Computer Research Laboratory and is distributed by Boss International, Inc. It provides an interface between AutoCAD environment and HEC-RAS, and allows direct extraction of cross-section geometry from the terrain model to HEC-RAS. Additionally, RMS has utilities that allow automated plotting of water surface edges using the terrain model. The data obtained from RMS was exported to the HEC-RAS Version 3.1.1 and all final floodplain and floodway results were obtained by using this HEC-RAS Version 3.1.1.

Cross sections were extracted from the digital terrain model (DTM) generated as part of the mapping portion of this project. Ground elevations at some selected locations that required more detailed information were determined using field survey. Survey information was limited to structures survey and topographic survey near US 60 where recent improvements were completed after the project mapping was completed.

There are over seventy reaches being delineated as either: a Zone AE, a Zone A, a Zone AO, or a Zone AH as part of this study. The names of most of the reaches north and south of the CAP were obtained from the original nineteen washes in the 1989 *Wittmann Area Drainage Master Study* (**Reference 14**). For all other reaches, the washes were identified by township, range, and section number. The final name of each model corresponds to the wash name.

The downstream boundary condition varied depending on individual conditions for each wash. Reaches that were located at an impoundment area, such as the McMicken Dam, the Beardsley Canal, or the CAP Canal, had a downstream boundary condition set to a known water surface elevation. The known water surface elevation was generated using the level

pool routing as part of the detailed hydrology report (*Volume HY – ADMSU Hydrology*). The known water surface elevation corresponded to the 100-year pool elevation. For tributaries, the boundary condition was set to the slope-area method. The slope was measured at the downstream confluence of the wash. For small split flows which come back into the main wash a short distance at the downstream end, the boundary condition was set to a known water surface elevation at the confluence. For washes starting at effective Zone AE's the boundary condition was set to the elevation of the effective model downstream.

The average conveyance option of HEC-RAS was used for the calculation of the friction slope. Results of the HEC-RAS runs for all study reaches are presented in **Appendix E.6**. The flood profiles are included in **Section 7.4**

5.2 Work Study Maps

The work study maps generally consist of 2 and 4 foot contour intervals topographic mapping. At some locations, only 10 foot contours were available and are shown on the workmaps. Half and full size copies of the workmaps are include with this report.

5.3.1 Manning's "n" Value

5.3.1.1 Introduction

The Wittmann ADMSU Floodplain Delineation Study consists of approximately 120 linear miles of detailed delineation and approximately 30 linear miles of delineation under this project. Each wash was divided into several reaches of similar hydraulic characteristics, and Manning's "n" Values were assigned to these reaches based on their typical channel characteristics. Each reach was identified with an alphanumeric identifier, representing the name of the wash followed by the reach number. For example, 1W-1 represents Reach 1 of Wash 1 West, while 2E-2 represents Reach 2 of Wash 2 East. The reach number starts with "1" at the upstream end and increases in the downstream direction. The upstream end is

defined as the furthest upstream end of a wash north of the CAP, or the furthest upstream end just south of the CAP. The "n" Value location of photographs and limits of each reach are located in **Appendix E.1**. The following factors were considered while calculating the "n" Value for each reach:

Bed material particle size

Degree of irregularity of the bank slopes

Effect of obstruction

Degree of meandering

Vegetation

Variation in channel cross-section

The effect of vegetation cover in this particular area is one of the most important factors in the estimation of "n" Value. The density and type of vegetation have significant impact on the roughness coefficient ("n" Value). The vegetation within the floodplain was identified to include the following:

Creosote Brush

Ironwood

Mesquite

Saltbrush

Annual Grasses and Weeds

5.3.1.2 Methodology

Each reach was identified with the aid of aerial photographs. The discerning characteristics were channel size, vegetation density, bed materials, and development encroachment. Each reach was photographed at representative and accessible locations to document existing conditions. The photograph locations are presented on **Figures E.1,** in **Appendix E.1**.

Manning's roughness coefficients were determined in accordance with the methodology described in *Estimated Manning's Roughness Coefficient for Streams Channels and Floodplains in Maricopa County, Arizona* (**Reference 5**). The method described in this publication selects a base value for the roughness coefficient based exclusively on bed material. This base value is then adjusted to account for vegetation, irregularities, obstructions and channel cross-section variations. In addition, a multiplier was applied to the adjusted "n" Value when meandering of the reach was significant.

5.3.1.3 "n" Value Determination

The base roughness coefficient in this study was selected based on the average particle size observed in the field. The typical bed materials in the study area range from coarse sand to medium boulder and the typical values of the roughness coefficient range from 0.15 to 0.020. After these values were adjusted for the effects of vegetation, irregularities, etc. the final estimates of the roughness coefficients range from 0.035 in the smooth sections of the channel to .060 in heavily vegetated areas. Obstructions created by structures were ignored in the calculation of "n" Values because the cross-section excluded the structures from the flow area.

The base values, adjustments, and the adjusted values for Manning's roughness coefficient along with the photographic documentation are included in **Appendix E.1.**

5.3.1.4 Bank-Station Placement

Bank stations were placed based on contour mapping, cross-section plots, and aerial photography. Typically, heavy vegetation is located within the main channel and the overbanks are usually depleted of vegetation. This is typical of ephemeral washes in desert areas where the moisture required for plant growth is often restricted to the watercourses. As a result the main channel "n" values tend to be greater that the over-bank values.

5.3.2 Expansion and Contraction Coefficients

The expansion and contraction coefficients used in the HEC-RAS model were determined using the HEC-RAS *User's Manual* (**Reference 6**). For gradual transitions, which include most reaches in this study, the contraction and expansion coefficients were set as 0.1 and 0.3, respectively. At locations where the cross-sectional area and flow direction changed abruptly, values of 0.2 to 0.4 were used. At structure locations, values of 0.3 and 0.5 or higher were used based on the type and affect of the structure.

5.4 Cross-Section Description

The cross-sections used for the hydraulic modeling were based on DTM data provided by the District (**References 1-4**). Cross section plots for each wash are included in **Appendix E.2.**

5.4.1 Channels and Overbanks

Prior to extracting the cross sections from the DTM, the channel bank stations were determined with the aid of the topographic mapping and aerial photos. The plotted cross sections are presented in **Appendix E.2.**

5.4.2 Bridges and Constrictions

5.4.2.1 Minor Hydraulic Structures

There are several bridges and culverts throughout the study area. .Structures that could have a significant effect on the floodplain were modeled using the opening option of HEC-RAS. Other minor structures, including culverts less than 36" in diameter, were not modeled as culverts. Instead, it was assumed that these minor structures were completely clogged and modeled as obstructions using the geometry of the roadway.

5.4.2.2 Major Hydraulic Structures

There are two dams that are considered to be major hydraulic structures that affect washes delineated for this study: the McMicken Dam and the Lake Bonita Dam. A detailed analysis of the McMicken Dam was performed as part of the Wittmann ADMP. This analysis is documented in *Volume MDAA-McMicken Dam Alternative Analysis.*

A separate study conducted by the Arizona Department of Water Resources (ADWR) concluded that Lake Bonita Dam was an unsafe dam. Subsequently, they prepared and constructed a breach in the embankment of the dam. The breach section through the dam was modeled in the delineation of Wash 11 East (Padelford Wash) breach plans and survey provided by the District are included in **Appendix E.4.**

There are several cross-drainage structures along the CAP Canal with a significant amount of storage behind the canals embankment. These structures were analyzed using level pool routing during the hydrology portion of the Wittmann ADMP. For more details on this analysis please refer to *Volume HY-Wittmann ADMP Hydrology Report.*

Other major hydraulic structures include: the Beardsley Canal, the McMicken Dam Outlet Channel, the US 60. These modeling issues associated with these structures are discussed in **Section 5.5.8**, on a wash-by-wash basis.

5.5 Modeling Considerations

5.5.1 Hydraulic Jumps and Drop Analysis

Several locations are prone to hydraulic jumps. The majority of these locations are near structures. Wherever these conditions were encountered, the spacing of the cross sections was reduced to minimize computational inaccuracies.

5.5.2 Bridges and Culverts

Several bridges and culverts were modeled as part of this study. These structures were modeled using the HEC-RAS bridge routine. The majority of the structures modeled were located along Grand Avenue and the BNSF Railroad. Approximately 30 bridges and culverts were modeled. The structures were modeled using the data included in *Volume SR Survey Report.*

5.5.3 Levees and Dikes

There were several locations where non-certified levees or dikes were encountered. These structures were modeled assuming the worse case conditions upstream and downstream from the structure. The modeling upstream from non-certified levees or dikes assumed the obstruction was in place in order to account for backwater effects. Downstream from the structure the modeling assumed the structure was breached.

5.5.4 Islands and Flow Splits

There are many locations within the washes showing divided flow conditions. For most of these locations, the elevation differences between the island and the surrounding water surface are within the accuracy limits of the mapping (within 1

foot). Therefore, it was assumed that they would be inundated and were kept in the floodplain for the 1% event.

5.5.5 Ineffective Flow Areas

After the preliminary flooding boundaries were plotted, the wash cross-sections were checked to insure that each reflected the actual flow area. Several cross-sections were modified to exclude tributaries and non-effective areas. The ineffective flow area stations were estimated based on topographic mapping. The criteria of 1:1 contraction and 4:1 expansion rates were used for determining the ineffective flow areas upstream and downstream of expansion and contractions.

5.5.6 Supercritical Flow

Potential supercritical flow areas were reported by HEC-RAS at several locations. These locations were examined to insure there were no model instabilities and the water surface was set to critical depth.

5.5.7 Blocked Obstructions

Various delineated washes are affected by one or more livestock tanks. Livestock tanks are large pits along a watercourse that divert runoff for various purposes. The tanks often included a berm or dike to divert runoff from the wash into the tank. Since these features usually obstruct the main path of flow, they were modeled as ineffective or blocked. The blocked conveyance option of HEC-RAS was used to model excavated areas where the cross sections were lower than the loswest downstream elevation.

5.5.8 Special Modeling Considerations South of the CAP

5.5.8.1 Wash 1 East

There are several divided flows located within this reach. Most of the divided flows are negligible since the divided flows are not carried more than 1000 feet, and/or they are less than 1 foot in depth, which is less than the accuracy of the topographic mapping.

A cross section is called out in the CHECK-RAS output as not being contained. This cross section was considered ineffective on the left side of the channel, where a high point divides the flow; therefore, this warning was ignored.

One or more locations in this reach have the potential for supercritical flow. An explanation of the action taken at these locations is documented on the CHECK-RAS output located in **Appendix E.7**.

There are two modeled structures in this reach. The first structure is a 3-10' x 5' CBC, *located at US 60. The second structure is a bridge,* located at the BNSF Railroad. In between these two structures, supercritical occurs due to a hydraulic jump that occurs inside the culvert. See **Volume SR** for Survey Report data information.

5.5.8.2 Wash 2 East

There are several divided flows located within this reach. Most of the divided flows are negligible since the divided flows are not carried more than 1000 feet, and/or they are less than 1 foot in depth, which is less than the accuracy of the topographic mapping.

One or more locations in this reach have the potential for supercritical flow. An explanation of the action taken at these locations is documented on the CHECK-RAS output located in **Appendix E.7**.

A cross section is called out in the CHECK-RAS output as not being contained. This cross section was considered ineffective on the right side of the channel, where a high point divides the flow, therefore, this warning was ignored.

There are three modeled structures in this reach. The first structure is a 3-10' x 4' CBC located at Jomax Road. The second structure is a 2-10' x 5' CBC located at US 60. The third structure is a bridge, located

at the BNSF Railroad. In between the US60 and BNSF Railroad structures, supercritical flow conditions occur due to a hydraulic jump that occurs inside the culvert. See **Volume SR** for Survey Report data information.

Two separate models were created to model the failure of two dikes. The first is located at Norwich Drive and Citrus Road, immediately north of Norwich Drive. The dike is adjacent to Norwich Drive and cross sections were cut perpendicular to the flow path likely if the dike were to fail. The second location of the dike failure is at Happy Valley Road, and east of 187th Avenue. The dike is located along the south side of Happy Valley Road. Cross sections were cut perpendicular to the assumed dike failure flow. Floodway limits were not a part of these models, since it was accounted for in the main model. The same orientation was used for all cross sections in both models. In the main model (no failure) the area downstream of the dike was assumed ineffective, while in the failure model the entire area was assumed to be effective.

There are several divided flows located within this reach. Most of the divided flows are negligible since the divided flows are not carried more than 1000 feet, and/or they are less than 1 foot in depth, which is less than the accuracy of the topographic mapping.

There is approximately 3600 linear feet of Zone A in this reach. The downstream location of the Zone A begins at 187th Avenue and Happy Valley Road, and ends just south of Jomax Road. The Zone A is located between two detailed study portions. Basic normal depth was used to interpolate the inundation limits in the locations of the Zone A flood limits. This area was delineated as a Zone A because only 4' mapping was available.

5.5.8.3 Wash 3 East

The boundary condition for both floodplain and floodway profiles used elevation 1348.50 ft. The McMicken Dam Principal Spillway - Elevation is from the Principal Outlet rating curve for the 100-year event. The rating curve is included in *Volume MD McMicken Dam Hydrology*.

There are several divided flows located within this reach. Most of the divided flows are negligible since the divided flows are not carried more than 1000 feet, and/or they are less than 1 foot in depth, which is less than the accuracy of the topographic mapping.

One or more locations in this reach have the potential for supercritical flow. An explanation of the action taken at these locations is documented on the CHECK-RAS output located in **Appendix E.7**.

There are three modeled structures in this reach. The first structure is a 3-10' x 3' CBC located at Deer Valley Road. The second structure is a 4-12.5' x 45' CBC located at US 60. The third structure, a bridge is located at the BNSF Railroad. The first and second structures are both overtopped, thus creating hydraulic jumps, but the third structure has adequate capacity. See **Volume SR** for Survey Report data information.

5.5.8.4 Wash 3 East (Zone A)

The detailed delineation of Wash 3 East resulted in a constricted floodplain upstream from the McMicken Dam Emergency Spillway. The area outside of the constricted portion of the detailed floodplain was outside of the detailed limit of study for this project but still appears to be flood prone. Therefore the area was delineated as a Zone A, using normal depth. It was estimated that the area would convey half of the flow from the constricted section. The Zone A limits were

determined using a cross section cut using half of the flow from the detailed delineation.

5.5.8.5 Wash 4 East

Several cross sections use contraction and expansion coefficients of 0.2 and 0.4, respectively. In these areas, the channel is well defined and meanders frequently.

A cross section is called out in the CHECK-RAS output as not being contained. This cross section was considered ineffective on the left side of the channel, where a high point divides the flow, therefore, this warning was ignored.

There are several divided flows located within this reach. Most of the divided flows are negligible since the divided flows are not carried more than 1000 feet, and/or they are less than 1 foot in depth, which is less than the accuracy of the topographic mapping.

A separate model was created to account for failure of the dike located at 179th Avenue. The dike runs adjacent to 179th Avenue on the east side. Cross sections were cut perpendicular to the direction of flow likely if the dike were to fail. The cross sections were copied from the main model and included the full flow without ineffective limits. These cross sections were used to delineate the Zone AE inundation limits on the farthest east side of the floodplain for the model. Floodway limits were not a part of this model, since it was accounted for in the main model. There are several divided flows located within both of these reaches, but they are negligible since the models were basically used to interpolate the inundation limits of the dike failure.

5.5.8.6 Wash 5 East

There are several divided flows located within this reach. Most of the divided flows are negligible since the divided flows are not carried

more than 1000 feet, and/or they are less than 1 foot in depth, which is less than the accuracy of the topographic mapping.

One or more locations in this reach have the potential for supercritical flow. An explanation of the action taken at these locations is documented on the CHECK-RAS output located in **Appendix E.7**.

At RM – 3.853 and RM – 1.298 there is a slight hydraulic jump due to potential superficial flows. Within these cross sections, the model was examined for potential instability.

There is one cross section modeled using the blocked obstruction option in HEC-RAS. It is located approximately 250 feet south of Dale Lane where the embankment of a livestock tank obstructs the main channel. This structure effectively obstructs the flow and creates a backwater effect that propagates upstream. To model the effects of the embankment, a blocked obstruction was placed along the entire width of the embankment near the structure and to the cross sections upstream and downstream that may be affected by the embankment.

Approximately 2200 feet north of Jomax Road, a combined flow from from Wash 5 East and 6 East was used because the floodplain in this area was assumed to have mixed flow. The cross sections were cut to interpolate the Zone AE inundation limits for both washes without including any ineffective limits. In order to remain conservative, the Base Flow Elevations (BFE's) on the flood maps show the higher water surface elevations between the two combined flow cross sections. Separate floodways were mapped out using the independent flow from the individual washes, as shown on the flood maps.

5.5.8.7 Wash 5 East (Zone AO)

Within this reach, a dike directs flows into a livestock tank. This dike runs perpendicular to the direction of flow for almost a mile. Upstream

from the dike there is a below grade channel with varying capacity that directs flows to the Wash 5 East thalweg. This dike does not meet the FEMA criteria and the area below the dike was modeled as a Zone AO using normal depth.

A separate model was created to account for the failure of a training dike that is intended to direct flows to a cross drainage structure on the Beardsley Canal. The cross section from the main model was used with the ineffective limits removed in order to make the whole section available for conveyance. Upstream from the dike, the main model (no failure) was used to delineate the floodplain while downstream the failure model was used.

5.5.8.8 Wash 6 East

There is a split flow located at C612_1, where most of the flow moves southerly towards Basin CPI621, and the remaining flow moves towards the main wash. This split is just downstream of the confluence with Wash 8 East. The split significantly reduces the amount of flow in the wash. Wash 6 East was split at the confluence with Wash 8 East in order to model the north portion as a tributary to the south portion. The southern portion was named Wash 6 East South, and the northern portion retained the name Wash 6 East. Normal depth boundary conditions were used for Wash 6 East. The split flow estimates are included in *Volume HY ADMSU Hydrology.*

There are several divided flows located within this reach. Most of the divided flows are negligible since the divided flows are not carried more than 1000 feet, and/or they are less than 1 foot in depth, which is less than the accuracy of the topographic mapping.

One or more locations in this reach have the potential for supercritical flow. An explanation of the action taken at these locations is documented on the CHECK-RAS output located in **Appendix E.7**.

Approximately 2200 feet north of Jomax Road, a combination of flow was used from Wash 5 East and 6 East. This condition was discussed in the section for wash 5 East, **Section 5.5.8.6**.

5.5.8.9 Wash 6 East-South

This reach is actually the portion of Wash 6 East that is downstream from its confluence with Wash 8 East. The reason for splitting up Wash 6 East is that Wash 8 East is really the main wash, and the reach of Wash 6 East upstream from the confluence is the tributary. This is evident from the size of the washes and the flows. Therefore, the upstream portion of Wash 6 East was treated as the tributary.

There are several divided flows located within this reach. Most of the divided flows are negligible since the divided flows are not carried more than 1000 feet, and/or they are less than 1 foot in depth, which is less than the accuracy of the topographic mapping.

One or more locations in this reach have the potential for supercritical flow. An explanation of the action taken at these locations is documented on the CHECK-RAS output located in **Appendix E.7**.

5.5.8.10 Wash 6 East (Zone A)

A cross section was cut to estimate the floodplain limits for a Zone A to tie the Zone AE limits together. Basic normal depth was used, with a known flow (flow was obtained from the hydrology CPI618 for the 6 hour storm) and slope (obtained from the topographic mapping). A known water surface elevation was calculated based upon these parameters, and the floodway limits were drawn according to the

output from normal depth. Cross section geometries and normal depth calculations are included in **Appendix D**.

5.5.8.11 Wash 7 East (East Split)

There are several divided flows located within this reach. Most of the divided flows are negligible since the divided flows are not carried more than 1000 feet, and/or they are less than 1 foot in depth, which is less than the accuracy of the topographic mapping.

5.5.8.12 Wash 7 East (West Split)

One or more locations in this reach have the potential for supercritical flow. An explanation of the action taken at these locations is documented on the CHECK-RAS output located in **Appendix E.7**.

There are several divided flows located within this reach. Most of the divided flows are negligible since the divided flows are not carried more than 1000 feet, and/or they are less than 1 foot in depth, which is less than the accuracy of the topographic mapping.

5.5.8.13 Wash 8 East

A separate HEC-1 model was developed for this wash. The modified model is included in **Appendix E.5**.

There are several divided flows located within this reach. Most of the divided flows are negligible since the divided flows are not carried more than 1000 feet, and/or they are less than 1 foot in depth, which is less than the accuracy of the topographic mapping.

One or more locations in this reach have the potential for supercritical flow. An explanation of the action taken at these locations is documented on the CHECK-RAS output located in **Appendix E.7**.

There is one modeled structure in this reach. The structure is a five opening 7' x 3' CBC located at Jomax Road and Sarival Avenue (163rd Ave.). The structure is being overtopped, which creates a hydraulic jump downstream, due to the overtopping of the structure. The structure was modeled as partially filled as revealed by the survey data. See *Volume SR Survey Report* for geometry and configuration of these structures.

5.5.8.14 Wash 7 East and 8 East (Zone A)

A cross section was cut to estimate floodplain limits for a Zone A to tie the effective floodplain downstream Zone AE limits together. Basic normal depth was used with a known flow (flow was obtained from the hydrology for Wash 7 East-East Split) and slope (obtained from the topographic mapping). This Zone A is located approximately 800 feet southeast of the intersection of 168th Avenue and Dale Lane. Cross section geometry and normal depth calculations are included in **Appendix E**.

5.5.8.15 Wash 9 East

Approximately 2000 feet of the southeast corner of Patton Road and 163rd Ave. there is a significant split flow. Using the split flow optimization option in HEC-RAS, the split flow was determined to be a 70-30 split. The model used in the optimization is included in the CD included in this report. There are other smaller split flows in this area but they were ignored because they are minor or they return to the main wash shortly.

There are several divided flows located within this reach. Most of the divided flows are negligible since the divided flows are not carried more than 1000 feet, and/or they are less than 1 foot in depth, which is less than the accuracy of the topographic mapping.

One or more locations in this reach have the potential for supercritical flow. An explanation of the action taken at these locations is documented on the CHECK-RAS output located in **Appendix E.7**.

5.5.8.16 Wash 9 East-Split

See Wash 9 East for a discussion on a split flow located within this reach.

The boundary conditions in this reach for both the floodplain and floodway profiles use a known water surface elevation. The elevation was obtained from the main model of Wash 9 East, since this is where the split converges back into the main wash. At the upstream divergence of the split, the output from HEC-RAS shows a slight different in water surface elevation from that of Wash 9 East. These differences are small and caused by variation in cross section geometry rounded flow valves, and differences in velocity heads. The highest water surface elevation reported by either of the models was used to delineate the Floodplain and to develop the BFE's.

There are several divided flows located within this reach. Most of the divided flows are negligible since the divided flows are not carried more than 1000 feet, and/or they are less than 1 foot in depth, which is less than the accuracy of the topographic mapping.

5.5.8.17 Wash 10 East

There are two split flow locations along this wash. The first location is approximately ~900 feet north of Dixileta Drive (at C606A-14); this split flow was modified in the hydrology to account for flow towards Wash 10 East (East Split-1). A spreadsheet is included in **Appendix D** that shows the analysis of the split flow. The second location is just south of Patton Road (at C606A); a separate HEC-1 model was

developed for this wash. The modified model is included in **Appendix D**.

There are several divided flows located within this reach. Most of the divided flows are negligible since the divided flows are not carried more than 1000 feet, and/or they are less than 1 foot in depth, which is less than the accuracy of the topographic mapping.

One or more locations in this reach have the potential for supercritical flow. An explanation of the action taken at these locations is documented on the CHECK-RAS output located in **Appendix E.7**.

5.5.8.18 Wash 10 East (East Split-1)

See Wash 10 East for a discussion on a split flow located within this reach.

There are several divided flows located within this reach. Most of the divided flows are negligible since the divided flows are not carried more than 1000 feet, and/or they are less than 1 foot in depth, which is less than the accuracy of the topographic mapping.

One or more locations in this reach have the potential for supercritical flow. An explanation of the action taken at these locations is documented on the CHECK-RAS output located in **Appendix E.7**.

5.5.8.19 Wash 10 East (East Split-2)

See Wash 10 East for a discussion on a split flow located within this reach.

The downstream portion of this wash ties into an existing Zone A floodzone. The two furthest downstream cross sections were assigned known water surface elevations that were estimated using normal depth. Therefore, the downstream boundary condition for this wash

was entered as a known water surface elevation that was estimated using normal depth.

A cross section is called out in the CHECK-RAS output as not being contained. This cross section was considered ineffective on the right side of the channel, where a high point divides the flow, therefore, this warning was ignored.

There are several divided flows located within this reach. Most of the divided flows are negligible since the divided flows are not carried more than 1000 feet, and/or they are less than 1 foot in depth, which is less than the accuracy of the topographic mapping.

One or more locations in this reach have the potential for supercritical flow. An explanation of the action taken at these locations is documented on the CHECK-RAS output located in **Appendix E.7**.

5.5.8.20 Wash 11 East

The concentration point developed in the hydrology did not have the specific combination of flows needed to obtain delineation flows for this wash. Concentration point C11E was generated (modified) to provide flow before the storage at Beardsley Canal. These modifications are included in **Appendix E**.

The downstream boundary condition is a known water surface elevation for both the floodplain and floodway profiles, which is the 100-year pool deviation upstream of the Beardsley Canal (1346 ft).

Several cross sections are called out in the CHECK-RAS output as not being contained at the downstream end of the reach. These cross sections are within the 100-year pool of the Beardsley Canal and the cross sections would have to extend for miles to provide containment.

Approximately at the northwest corner of Dixileta Drive and 155th Avenue, there is a significant split flow that was accounted for in the model. The spreadsheet used to calculate the split flow is included in **Appendix D.**

There are several divided flows located within this reach. Most of the divided flows are negligible since the divided flows are not carried more than 1000 feet, and/or they are less than 1 foot in depth, which is less than the accuracy of the topographic mapping.

At Bonita Dam, the dam was breached on the south side by a concrete trapezoidal breach section approximately ~350 feet in length. The breached area was surveyed and cross sections were cut according to the surveyed data. The mapping shown on the flood maps doesn't represent the breach that was completed after the mapping was flown. The survey data was provided by the Flood Control District of Maricopa County and is included in *Volume SR Survey Report.*

5.5.8.21 Wash 11 East Failure (At Beardsley Canal)

A separate model was created to account for failure of the dike located just north of Beardsley Canal. Immediately north of Beardsley Canal, there is a training dike that runs diagonally on the east side of the wash. Cross sections were copied from the Wash 11 East model and considered the entire reach effective. These cross sections were used to estimate inundation limits on the downstream side of the dike. Floodway limits were not a part of this model, since it was accounted for in the main model. There are several divided flows located within both of these reaches, but they are negligible since the models were basically used to interpolate the inundation limits of the dike failure.

A cross section is called out in the CHECK-RAS output as not being contained at the downstream end of the reach. This cross section is

within the 100-year pool of the Beardsley Canal and would have to be extended for several miles to contain the flow. Since the uncontained flow is ineffective and within a flood zone this warning was ignored.

5.5.8.22 Bonita Dike Channel

This wash connects Wash 14 East to Wash 13 East, where flow splits from Wash 14 East, and moves towards Wash 13 East. There is no floodway analysis for this wash, since the floodplain doesn't have a significant impact on the area, and there is not a well defined channel.

Along Patton Road (Alignment) about halfway between 147th Avenue and 139th Avenue, a split flow was modeled to obtain the flow moving towards Bonita Dike Channel. Using the split flow optimization option in HEC-RAS, the split flow was determined to be approximately 90 to 14 East and 10 toward Bonita Dike Channel. The split moving towards Bonita Dike Channel was used in the Bonita Dike delineation. However, for Wash 14 East, the assumption of 10 percent of the flow leaving the wash towards the Bonita Dike Channel was ignored because of the uncertainty of this estimate. The HEC-RAS optimization model is included in the CD in this report.

One or more locations in this reach have the potential for supercritical flow. An explanation of the action taken at these locations is documented on the CHECK-RAS output located in **Appendix E.7**.

5.5.8.23 Wash 12 East

Approximately at the intersection of Dixileta Drive and 155th Avenue, a split flow was encountered. Using the split flow optimization option in HEC-RAS, the split flow was determined to be a 80-20 split. Other split flows were ignored, since they were negligible in this reach. The optimization model is included in the CD in this report. The flow

downstream was reduced based upon the flow estimates provided by the optimization model and the split was modeled as well.

There are several divided flows located within this reach. Most of the divided flows are negligible since the divided flows are not carried more than 1000 feet, and/or they are less than 1 foot in depth, which is less than the accuracy of the topographic mapping.

One or more locations in this reach have the potential for supercritical flow. An explanation of the action taken at these locations is documented on the CHECK-RAS output located in **Appendix E.7**.

5.5.8.24 Wash 12 East Split

See Wash 12 East for a discussion on a split flow located within this reach. The downstream boundary condition used for this wash was a known water surface elevation of the main wash, since the flow comes back into the main wash a short distance downstream.

There are several divided flows located within this reach. Most of the divided flows are negligible since the divided flows are not carried more than 1000 feet, and/or they are less than 1 foot in depth, which is less than the accuracy of the topographic mapping.

One or more locations in this reach have the potential for supercritical flow. An explanation of the action taken at these locations is documented on the CHECK-RAS output located in **Appendix E.7**.

Floodway analysis was not performed for this channel because there is not a well-defined channel through this reach.

5.5.8.25 Wash 13 East

There are several divided flows located within this reach. Most of the divided flows are negligible since the divided flows are not carried

more than 1000 feet, and/or they are less than 1 foot in depth, which is less than the accuracy of the topographic mapping.

One or more locations in this reach have the potential for supercritical flow. An explanation of the action taken at these locations is documented on the CHECK-RAS output located in **Appendix E.7**.

In order to tie to the effective model upstream, a short Zone A was delineated between the effective floodplain and the new floodplain. Cross section geometry and water surface elevations estimates are included in **Appendix E.**

5.5.8.26 Wash 14 East

Special modifications were made to the HEC 1 model in order to obtain accurate delineation flows. The modified model is included in **Appendix E.5.**

One or more locations in this reach have the potential for supercritical flow. An explanation of the action taken at these locations is documented on the CHECK-RAS output located in **Appendix E.7**.

The upstream cross sections of this wash are considered a Zone A that ties into the effective wash. In order to tie to the effective model upstream, a short Zone A was delineated between the effective floodplain and the new floodplain. Cross section geometry and water surface elevations estimates are included in **Appendix E.**

5.5.8.27 Wash 1 West

Special modifications were made to the HEC 1 model in order to obtain accurate delineation flows for this wash. The modified model is included in **Appendix D**. There is a split flow located at C508* where most of the flow moves towards the main wash, and the remaining

flow moves southerly towards Basin WI500. See modified model for more details.

There are several divided flows located within this reach. Most of the divided flows are negligible since the divided flows are not carried more than 1000 feet, and/or they are less than 1 foot in depth, which is less than the accuracy of the topographic mapping.

One or more locations in this reach have the potential for supercritical flow. An explanation of the action taken at these locations is documented on the CHECK-RAS output located in **Appendix E.7**.

There is a modeled structure in this reach. The structure is a bridge and is located at Deer Valley Road. See **Volume SR** for Survey Report data information.

In this model, a Zone A is included within the detailed model. There is approximately 6600 linear feet of Zone A delineations in this wash. It is bounded by Happy Valley Road at the south end, and Jomax Road at the north end. This area was delineated as a Zone A because only 4 foot mapping was available. The water surface elevations were obtained by using normal depth calculations. The slope was obtained from an initial HEC-RAS run and the output table provided slope information. The slope from this table was used, along with a known flow to calculate the water surface elevation.

5.5.8.28 Wash 2 West

The ADMP HEC 1 does not directly provide flows adequate to delineate this reach. The HEC model was modified to provide these flows. A separate HEC-1 model was developed for this wash. The modified model is included in **Appendix E.5**.

There are several divided flows located within this reach. Most of the divided flows are negligible since the divided flows are not carried more than 1000 feet, and/or they are less than 1 foot in depth, which is less than the accuracy of the topographic mapping.

One or more locations in this reach have the potential for supercritical flow. An explanation of the action taken at these locations is documented on the CHECK-RAS output located in **Appendix E.7**.

There are several cross sections that contain a blocked obstruction. These cross sections are located just northeast of the intersection of Beardsley Road (Alignment) and 187th Avenue. The obstruction was added to simulate ineffective area of the pit in the channel, since there is no conveyance in this pit area. Blocked obstruction elevations were set at the overflow elevation of the pit.

There is a modeled structure in this reach. The structure is modeled as a bridge and is located at Deer Valley Road. See **Volume SR** for Survey Report data information.

In this model, a Zone A is included within the detailed model. There is approximately 4 linear miles of Zone A delineations in this wash. It is bounded by Deer Valley Road at the south end, and 211th Avenue at the north end. This Zone A was delineated as such because only 4-foot mapping was available. The water surface elevations were obtained by using normal depth calculations. The slope was obtained from an initial HEC-RAS run and the output table provided slope information. The slope from this table was used, along with a known flow to calculate the water surface elevation. .

5.5.8.29 Iona East

The ADMP hydrology model did not provide adequate flow information to delineate all reaches of this wash. Some modifications

were required to obtain delineation flows. The modified model is included in **Appendix D**. There is a split flow located at C300_11 where most of the flow moves towards the Iona East, and the remaining flow moves southerly towards Iona West. Using the split flow optimization option in HEC-RAS the split flow was determined to be a 75-25 split, see **Appendix D** for the output.

There are several divided flows located within this reach. Most of the divided flows are negligible since the divided flows are not carried more than 1000 feet, and/or they are less than 1 foot in depth, which is less than the accuracy of the topographic mapping.

One or more locations in this reach have the potential for supercritical flow. An explanation of the action taken at these locations is documented on the CHECK-RAS output located in **Appendix E.7**.

At the downstream end of the wash, the Zone AE and floodway limits were tied into the effective Trilby Wash. The effective models were not available. However, Iona Wash is a tributary and does not have to match elevation at the confluence. Therefore, the model was extended downstream into Trilby Wash and normal depth used as the boundary condition.

5.5.8.30 Iona West

The ADMP hydrology model did not provide adequate flow information to delineate all reaches of this wash. Some modifications were required to obtain delineation flows. The modified model is included in **Appendix D**. There is a split flow located at C300_11 where most of the flow moves towards the Iona East, and the remaining flow moves southerly towards Iona West. Using the split flow optimization option in HEC-RAS the split flow was determined to be a 75-25 split, see **Appendix D** for the output.

There are several divided flows located within this reach. Most of the divided flows are negligible since the divided flows are not carried more than 1000 feet, and/or they are less than 1 foot in depth, which is less than the accuracy of the topographic mapping.

One or more locations in this reach have the potential for supercritical flow. An explanation of the action taken at these locations is documented on the CHECK-RAS output located in **Appendix E.7**.

There is a stock pond located within the wash approximately 1400 feet northwest of the intersection of Deer Valley Road and 219th Avenue. Ineffective areas and cross section geometry were used to model the effect of the obstruction created by this structure.

At the downstream end of the wash, the Zone AE and floodway limits were tied into the effective Trilby Wash. The effective models were not available. However Iona West is a tributary and does not have to match elevations at the confluence. This wash was treated as a tributary by extending the cross sections into Trilby Wash and using normal depth.

5.5.8.31 Iona East Split-1

The ADMSU HEC 1 model was modified to obtain delineation flow of certain location. The modified model is included in **Appendix D**. There are two split flows that occurre in this reach. The first split flow is located at CIW363, which was accounted for in the ADMP hydrology. The second split flow is located at CIW351, which was also modeled in the detailed hydrology.

There are several divided flows located within this reach. Most of the divided flows are negligible since the divided flows are not carried more than 1000 feet, and/or they are less than 1 foot in depth, which is less than the accuracy of the topographic mapping.

One or more locations in this reach have the potential for supercritical flow. An explanation of the action taken at these locations is documented on the CHECK-RAS output located in **Appendix E.7**.

There is a stock pond located approximately 300 feet upstream of the confluence with the Trilby Wash. The stock pond is entirely located within the floodway limits.

Portions of this wash were delineated as a Zone A. There is approximately 2.5 linear miles of Zone A delineations in this wash. The Zone A is bounded by Lone Mountain Road at the south end and Carefree Highway (Alignment) at the north end. This area was delineated as a Zone A because only 4-foot mapping was available. The inundation limits were estimated using normal depth calculations. The slope was obtained from an initial HEC-RAS run and the output table provided slope information. The slope from this table was used, along with a known flow to calculate the water surface elevation. The output from normal depth calculations was used in these cross sections to set a known water surface elevation.

At the downstream end of the wash, the Zone AE and floodway limits tied into the effective Trilby Wash. The effective model was not available. However, Iona East Split-1 is a tributary and was tied into the effective floodplain and roadway by stopping the delineation at the effective boundary.

5.5.8.32 Iona East Split-2

The ADMSU HEC-1 model was modified to obtain delineation flows at certain locations. The modified model is included in **Appendix D**. There is a split flow located near CIW322, which was not modeled in the detailed hydrology. Using the split flow optimization option in HEC-RAS the split flow was determined to be a 60-40 split, see

Appendix D for the output. Most of the flow moves southeasterly towards Iona East Split-2 and the remaining flow moves southwesterly towards Iona Wash.

The downstream boundary condition was set to the known water surface elevation of the CAP 100-year pool.

There are several divided flows located within this reach. Most of the divided flows are negligible since the divided flows are not carried more than 1000 feet, and/or they are less than 1 foot in depth, which is less than the accuracy of the topographic mapping.

One or more locations in this reach have the potential for supercritical flow. An explanation of the action taken at these locations is documented on the CHECK-RAS output located in **Appendix E.7**.

5.5.8.33 Iona Wash North

The ADMSU HEC-1 model was modified to obtain delineation flows at certain locations. A separate HEC-1 model was developed for this wash. The modified model is included in **Appendix E.5**. There are several split flows that occur in this reach. The first split flow is located at C388_18, which was modified in the hydrology to account for this spit flow. Using the split flow optimization option in HEC-RAS the split flow was determined to be a 70-30 split, see **Appendix D** for the split flow calculations. The second split flow is located at CIW357, which was modeled in the detailed hydrology. The third split flow is located at CIW363, which was modeled in the detailed hydrology.

There are several divided flows located within this reach. Most of the divided flows are negligible since the divided flows are not carried more than 1000 feet, and/or they are less than 1 foot in depth, which is less than the accuracy of the topographic mapping.

One or more locations in this reach have the potential for supercritical flow. An explanation of the action taken at these locations is documented on the CHECK-RAS output located in **Appendix E.7**.

There are three modeled structures in this reach. The first structure is a bridge located on the eastbound US 60 lanes (farthest downstream end). The second structure is a bridge located on the westbound US 60 lanes (farthest upstream side). The third structure is a bridge located at the BNSF Railroad. None of the structures are overtopped by the 100-year storm events. See **Volume SR** for structure survey data information.

Approximately 1300 feet north of Black Mountain Road there is a stock pond. Also, just south of Black Mountain Road there is another stock pond. The first mentioned stock pond is not in the direct flow path of the wash, and has little influence on the hydraulics at this location and only captures flows from tributary areas. The second stock pond is located within the main channel. The embankment of this stock pond has significant effects on the upstream water surface and was modeled using a blocked obstruction, ineffective area and including the embankment in the geometry.

At the downstream end of the wash, the Zone AE and floodway limits were tied into the effective Iona Wash. The effective models were not available. Iona Wash North is a tributary of Trilby Wash. Therefore, tie-in was done by stopping the new delineation at the main wash effective boundary.

5.5.8.34 Iona North West Split-1

There is a split flow that occurs in this reach. The split flow is located at C388_18, which was modified in the hydrology to account for this spit flow. Using the split flow optimization option in HEC-RAS the

split flow was determined to be a 70-30 split. The split flow calculations (HEC-RAS output) are included in **Appendix D**.

The downstream boundary condition for this wash was a known water surface elevation in the main wash, since this is a relatively short split and re-combined flow reach wihout significant contributing areas or tributaries into the reach.

There are several divided flows located within this reach. Most of the divided flows are negligible since the divided flows are not carried more than 1000 feet, and/or they are less than 1 foot in depth, which is less than the accuracy of the topographic mapping.

One or more locations in this reach have the potential for supercritical flow. An explanation of the action taken at these locations is documented on the CHECK-RAS output located in **Appendix E.7**.

5.5.8.35 Iona Wash

The ADMSU HEC-1 model was modified to better describe the flows in Iona Wash. The modified model is included in **Appendix E.5**. There is a split flow located near CIW322, which was not modeled in the ADMSU hydrology. Using the split flow optimization option in HEC-RAS, the split flow was determined to be a 60-40 split, see **Appendix D** for the output. Most of the flow moves southeasterly towards Iona East Split-2 and the remaining flow moves southwesterly towards Iona Wash. .

The downstream boundary condition was set to a known water surface elevation corresponding to the 100-year pool elevation at the CAP Canal.

A cross section is called out in the CHECK-RAS output as not being contained. This cross section is located in the ponding area north of

the CAP Canal. This cross section is within a Zone AH, and would have to be extended for several miles to get containment.

One or more locations in this reach have the potential for supercritical flow. An explanation of the action taken at these locations is documented on the CHECK-RAS output located in **Appendix E.7**.

At the upstream end of the wash, the Zone AE and floodway limits were tied into the effective Iona Wash. The effective models were not available, and tie-in was based on the effective profiles and floodway tables provided in the Flood Insurance Study.

Even though the 6-hour storm resulted in a slightly higher peak flow, the 24-hour storm was used for delineation. The difference in flows between the two storms was insignificant and the 24-hour peak flows were considered adequate.

5.5.8.36 Iona Zone AO

This floodzone limit was added to join the shallow flooding area between the two washes Iona North and Iona East Split-1 together. Floodplain limits were estimated using normal depth at six cross section spaced through the delineated area.

The flow was estimated by utilizing DO351 and adding the local area flow from IW346.

5.5.8.37 Iona Tributary

The entire reach was modeled as a Zone A. The water surface elevations were obtained by using normal depth calculations. The slope was obtained from an initial HEC-RAS run, and the output table

provided slope information. The slope from this table was used, along with a known flow to estimate the inundation limits.

At the downstream end of the wash, the Zone A limits were tied into the effective Iona Wash. The effective models were not available; therefore, using topographic mapping the floodplain was tied to the effective delineation.

Even though the 6-hour storm resulted in a slightly higher peak flow, the 24-hour storm was used for delineation. The difference in flows between the two storms was insignificant and the 24-hour peak flows were considered adequate.

5.5.8.38 Wittmann Wash

The ADMSU HEC-1 model was modified to better describe the flows in portions of Wittmann Wash. There is a split flow that occurs in this reach, it is located at CTW485_2. The assumption was that this is a 50-50 split since both downstream reaches are very similar. The location of this split is in the Town of Wittmann, just north of Center Street. There is another split flow location at CWI584, which was accounted for in the ADMSU hydrology, see **Appendix D**. Most of the flow moves towards the main wash, while the remaining flow went towards the Wittmann Wash (South Split).

There are several divided flows located within this reach. Most of the divided flows are negligible since the divided flows are not carried more than 1000 feet, and/or they are less than 1 foot in depth, which is less than the accuracy of the topographic mapping.

One or more locations in this reach have the potential for supercritical flow. An explanation of the action taken at these locations is documented on the CHECK-RAS output located in **Appendix E.7**.

There are four modeled structures in this reach. The first structure consisted of six 24" concrete pipe culverts, and is located at Center Street in the Town of Wittmann. Backwater flow from this structure causes the wash to overtop its bank, and combine with the Wittmann Wash. The structures in both of these washes were modeled as a single multiple openings for the combined flow. The second structure is a bridge and is located at BNSF Railroad. The third and fourth structures are bridges located at US 60. The first structure overtops, but the second, third, and fourth structures can handle the 100-year flow without overtopping. See *Volume SR – Survey Report* for Structure Survey data information.

5.5.8.39 Wittmann Wash (North Split)

This wash is formed by a split flow from Wittmann Wash at CTW485_2. The assumption was that this is a 50-50 split since both downstream reaches are very similar.

The downstream boundary condition for this wash was set to a known water surface elevation. This is a relatively short reach in which the flow split and re-enters the wash a short distance downstream.

There are several divided flows located within this reach. Most of the divided flows are negligible since the divided flows are not carried more than 1000 feet, and/or they are less than 1 foot in depth, which is less than the accuracy of the topographic mapping.

One or more locations in this reach have the potential for supercritical flow. An explanation of the action taken at these locations is documented on the CHECK-RAS output located in **Appendix E.7**.

There is one modeled structure in this reach. The structure is six 24" concrete pipe culverts, and is located at Center Street in the Town of Wittmann. This structure was modeled together with the structure on Wittmann Wash as discussed in previous sections. See *Volume RS – Survey report* for Structure Survey data information.

5.5.8.40 Wittmann Wash (South Split)

This reach is created by split flows from Wittmann Wash at CWI584. See *Volume HY – ADMSU hydrology* for more details.

There are several divided flows located within this reach. Most of the divided flows are negligible since the divided flows are not carried more than 1000 feet, and/or they are less than 1 foot in depth, which is less than the accuracy of the topographic mapping.

One or more locations in this reach have the potential for supercritical flow. An explanation of the action taken at these locations is documented on the CHECK-RAS output located in **Appendix E.7**.

5.5.8.41 Wittmann Tributary Wash

There are several divided flows located within this reach. Most of the divided flows are negligible since the divided flows are not carried more than 1000 feet, and/or they are less than 1 foot in depth, which is less than the accuracy of the topographic mapping.

One or more locations in this reach have the potential for supercritical flow. An explanation of the action taken at these locations is documented on the CHECK-RAS output located in **Appendix E.7**.

In two general areas of the wash, the floodplain and/or floodway limits combined with other washes. There are several different combinations with different washes at some locations. For the combination of Wittmann Tributary, T5N-R2W-S07 wash, T5N-R3W-S24E wash, the

combined flow used was 3020 cfs. For the combination of Wittmann Tributary and T5N-R2W-S07 wash, the combined flow used was 1010 cfs. Each one of the models includes water surface elevation for the common cross section. Ideally, the water surfaces in all models should match. However, there are small variations between the models. These differences are minor and were considered within the accuracy of the model. In the work maps and tables, the highest floodplain elevation was used. Floodways for these combined areas were modeled as separate for each model unless the channel combined.

5.5.8.42 Wash 7 East Tributary

There are several divided flows located within this reach. Most of the divided flows are negligible since the divided flows are not carried more than 1000 feet, and/or they are less than 1 foot in depth, which is less than the accuracy of the topographic mapping.

One or more locations in this reach have the potential for supercritical flow. An explanation of the action taken at these locations is documented on the CHECK-RAS output located in **Appendix E.7**.

In this model, a Zone A is included within the detailed model. There is approximately 1000 linear feet of Zone A delineated in this wash. The Zone A is bounded by Dove Valley Road at the south end. The inundation limits were obtained by using normal depth calculations. The slope was obtained from an initial HEC-RAS run, and the output table provided slope information. The slope from this table was used, along with a known flow to calculate the water surface elevation. The output from normal depth calculations was used in these cross sections to set a known water surface elevation.

5.5.8.43 Wash 7 East

The ADMSU HEC-1 model was modified in order to obtain better delineation flows for some of the reaches in this wash. The modified model is included in **Appendix E.5**.

A cross section is called out in the CHECK-RAS output as not being contained. This cross section is located in the ponding area north of the CAP Canal. This is within a Zone AH, and it is downstream from where the delineation started.

There are several divided flows located within this reach. Most of the divided flows are negligible since the divided flows are not carried more than 1000 feet, and/or they are less than 1 foot in depth, which is less than the accuracy of the topographic mapping.

One or more locations in this reach have the potential for supercritical flow. An explanation of the action taken at these locations is documented on the CHECK-RAS output located in **Appendix E.7**.

In this model, cross sections used to delineate the Zone A are included in the detailed model. There is approximately 5200 linear feet of Zone A delineated in this wash located north of Lone Mountain Road.

The water surface elevations were obtained by using normal depth calculations. The slope was obtained from an initial HEC-RAS run, and the output table provided slope information. The slope from this table was used, along with a known flow to calculate the water surface elevation. The output from normal depth calculations was used in these cross sections to set a known water surface elevation.

5.5.8.44 Wash 2 East (North of CAP)

The ADMSU HEC-1 model was modified in order to obtain better delineation flows for some of the reached in this wash. The modified model is included in **Appendix E.5**.

There are several divided flows located within this reach. Most of the divided flows are negligible since the divided flows are not carried more than 1000 feet, and/or they are less than 1 foot in depth, which is less than the accuracy of the topographic mapping.

One or more locations in this reach have the potential for supercritical flow. An explanation of the action taken at these locations is documented on the CHECK-RAS output located in **Appendix E.7**.

5.5.8.45 Wash 2 East Tributary (North of CAP)

The ADMSU HEC-1 model was modified in, or to obtain better delineation flows for some of the reaches in this wash. The modified model is included in **Appendix E.5**.

There are several divided flows located within this reach. Most of the divided flows are negligible since the divided flows are not carried more than 1000 feet, and/or they are less than 1 foot in depth, which is less than the accuracy of the topographic mapping.

One or more locations in this reach have the potential for supercritical flow. An explanation of the action taken at these locations is documented on the CHECK-RAS output located in **Appendix E.7**.

5.5.8.46 Wash T5N-R2W-S19E

The ADMSU HEC-1 model was modified in order to obtain better delineation flows for some of the reaches in this wash. The modified model is included in **Appendix D**. There are a couple of split flows located in this reach. This wash is feed by split flows from wash T5N-

R2W-S19W at two different locations. The spreadsheet found in **Appendix D** was utilized to calculate the flow at both of the split flow locations.

There are several divided flows located within this reach. Most of the divided flows are negligible since the divided flows are not carried more than 1000 feet, and/or they are less than 1 foot in depth, which is less than the accuracy of the topographic mapping.

One or more locations in this reach have the potential for supercritical flow. An explanation of the action taken at these locations is documented on the CHECK-RAS output located in **Appendix E.7**.

5.5.8.47 Wash T5N-R2W-S19W

The ADMSU HEC-1 model was modified in order to obtain better delineation flows for some of the reaches in this wash. The modified model is included in **Appendix D.** There are several split flows that occur in this reach. The first split flow is located at C554_13**. Modifications were made to the ADMSU hydrology to account for this spit flow. The second split flow is located at C554_12**. Modifications were made to the hydrology to account for this spit flow.

There are several divided flows located within this reach. Most of the divided flows are negligible since the divided flows are not carried more than 1000 feet, and/or they are less than 1 foot in depth, which is less than the accuracy of the topographic mapping.

One or more locations in this reach have the potential for supercritical flow. An explanation of the action taken at these locations is documented on the CHECK-RAS output located in **Appendix E.7**.

In one general area of the wash, the floodplain and/or floodway limits combine with another wash, thus increasing flow in this area. Where T5N-R2W-S19W and T5N-R2W-S07 washes combines, a 2380 cfs combined flow was used. Since this combined flow was modeled, in more than one model, small differences in water surface elevation were encountered between the two models in the combined area. The highest water surface elevation was used in the works maps and tables to develop base flood elevation.

5.5.8.48 Wash T5N-R3W-S24E

The ADMSU HEC-1 model was modified in order to obtain better delineation flows for some of the reaches in this wash. The modified model is included in **Appendix E.5.**

There are several divided flows located within this reach. Most of the divided flows are negligible since the divided flows are not carried more than 1000 feet, and/or they are less than 1 foot in depth, which is less than the accuracy of the topographic mapping.

One or more locations in this reach have the potential for supercritical flow. An explanation of the action taken at these locations is documented on the CHECK-RAS output located in **Appendix E.7**.

In one general area of the wash, the floodplain and/or floodway limits combine with another wash, thus increasing flow in this area. A flow of 3020 cfs was used as the combined flow for T5N-R3W-S24E, T5N-R2wS07 and Wittmann Tributary. Since this combined flow was modeled in more than one model, small differences in water surface elevation were encountered between the two models in the combined area. The highest water surface elevation was used in the works maps and tables and to develop base flood elevation.

There are two modeled structures in this reach. The first structure is a bridge and is located at BNSF Railroad. The second structure is a 3-10' x 5' CBC located at the US 60. Structures are not being overtopped. See *Volume SR – Survey Report* for structure survey data information.

5.5.8.49 Wash T5N-R3W-S01S

The ADMSU HEC-1 model was modified in order to obtain better delineation flows for some of the reaches in this wash. The modified model is included in **Appendix E.5.**

There are several divided flows located within this reach. Most of the divided flows are negligible since the divided flows are not carried more than 1000 feet, and/or they are less than 1 foot in depth, which is less than the accuracy of the topographic mapping.

One or more locations in this reach have the potential for supercritical flow. An explanation of the action taken at these locations is documented on the CHECK-RAS output located in **Appendix E.7**.

5.5.8.50 Wash T5N-R2W-S07

The ADMSU HEC-1 model was modified in order to obtain better delineation flows for some of the reaches in this wash. The modified model is included in **Appendix D.** There is a split flow that occurs in this reach. The split flow is located at C576_6, and the ADMSU hydrology was modified to account for this spit flow.

There are several divided flows located within this reach. Most of the divided flows are negligible since the divided flows are not carried more than 1000 feet, and/or they are less than 1 foot in depth, which is less than the accuracy of the topographic mapping.

One or more locations in this reach have the potential for supercritical flow. An explanation of the action taken at these locations is documented on the CHECK-RAS output located in **Appendix E.7**.

In two general areas of the wash, the floodplain and/or floodway limits combine with other washes, thus increasing flow in these areas. In the area where Wittmann Tributary T5N-R2W-S07 and T5N-R3W-S24E combine, a combined flow of 3020 cfs was used. In the other area where Wittmann Tributary and T5N-R2W-S07 combine, the flow used was 1010 cfs. Since this combined flow was modeled in more than one model, small differences in water surface elevation were encountered between the two models in the combined area. The highest water surface elevation was used in the works maps and tables to develop base flood elevation.

5.5.8.51 Trilby Wash

The downstream boundary condition for this wash was set to known water surface elevation obtained from the effective Flood Insurance Study. The effective HEC-2 model was provided by the District. This model was imported into HEC-RAS 3.1.1 and all elevations adjusted by +2 feet for the vertical datum differences. The effective model used a flow of Q=2670 cfs, therefore, this flow was used to tie into the effective model downstream. Only one cross section was kept from the effective model (cross section 18.481), since the model converged at this location. Therefore everything downstream of this cross section was deleted from the effective model.

There are several divided flows located within this reach. Most of the divided flows are negligible since the divided flows are not carried more than 1000 feet, and/or they are less than 1 foot in depth, which is less than the accuracy of the topographic mapping.

One or more locations in this reach have the potential for supercritical flow. An explanation of the action taken at these locations is documented on the CHECK-RAS output located in **Appendix E.7**.

In this model, a Zone A is included within the detailed model. There is approximately 5300 linear feet of Zone A delineated in this wash. North of Desert Hill Drive (Alignment) the inundation limits were obtained by using normal depth calculations. The slope was obtained from an initial HEC-RAS run, and the output table provided slope information. The slope from this table was used along with a known flow to calculate the water surface elevation. The output from normal depth calculations was used in these cross sections to set a known water surface elevation.

5.5.8.52 Circle City Area Wash-1

Only 4-foot mapping was available at the downstream end of this wash. A short Zone A was used to connect the effective floodplain to the detailed new delineations through the 4-foot mapping area. Normal depth was used to estimate flow conditions in this area. The first cross section in this model has the normal depth water surface elevation used in the Zone A.

There are several divided flows located within this reach. Most of the divided flows are negligible since the divided flows are not carried more than 1000 feet, and/or they are less than 1 foot in depth, which is less than the accuracy of the topographic mapping.

One or more locations in this reach have the potential for supercritical flow. An explanation of the action taken at these locations is documented on the CHECK-RAS output located in **Appendix E.7**.

At the upstream end of the wash, the Zone AE and floodway limits were tied into the effective Circle City Area Wash-1. The effective

models were not available; therefore, tie-in was based on the profiles on tables found in the effective Flood Insurance Study.

5.5.8.53 Wash 2 West (North of CAP)

The ADMSU HEC-1 model was modified in order to obtain better delineation flows for some of the reaches in this wash. The modified model is included in **Appendix E.5.**

The downstream boundary condition was set to 1551.76 feet known water surface elevation for both the floodplain and floodway profiles. The elevation corresponds to the 100-year storage pool elevation north of the CAP Canal.

There were a couple of cross sections called out in the CHECK-RAS output as not being contained. These cross sections are located in the ponding area north of the CAP Canal. This area is within an AH zone, and this cross section was not used in the delineation.

There are several divided flows located within this reach. Most of the divided flows are negligible since the divided flows are not carried more than 1000 feet, and/or they are less than 1 foot in depth, which is less than the accuracy of the topographic mapping.

One or more locations in this reach have the potential for supercritical flow. An explanation of the action taken at these locations is documented on the CHECK-RAS output located in **Appendix E.7**.

There is a modeled structure in this reach. The structure is modeled as four CMP culverts;are 4 – 60" and located at 219th Avenue. The structure at this location shows overtopping during a 100-year event. See *Volume SR - Survey Report* for survey report data information.

There was a cross section that contained a blocked obstruction. This cross section is located at 219th Avenue. Scour at the culvert outlet

formed a drop that was simulated, using a blocked conveyance obstruction below the culvert outlet.

5.5.8.54 Wash 2 West Tributary-1

The ADMSU HEC-1 model was modified in order to obtain better delineation flows for some of the reaches in this wash. The modified model is included in **Appendix D.** There is a split flow that occurs in this reach. The split flow is located at C434_4, which was modified in the hydrology to account for this spit flow.

There are several divided flows located within this reach. Most of the divided flows are negligible since the divided flows are not carried more than 1000 feet, and/or they are less than 1 foot in depth, which is less than the accuracy of the topographic mapping.

One or more locations in this reach have the potential for supercritical flow. An explanation of the action taken at these locations is documented on the CHECK-RAS output located in **Appendix E.7**.

Where this reach crosses Lone Mountain Road, the HEC-RAS option for multiple openings was used. The first structure includes 6 – 8' x 6' CBC, and is located on the far east side of the structure cross sections. The second structure consists of 3- 48" CMP's, and is located near the inverts of the structure cross sections. The structures at this location are not being overtopped at the roadway. See *Volume SR –Survey Report* for survey data information.

In The areas where 2 West Tributary-1 and 2 West Tributary-2 combine, the combined flow of 5080 cfs was used. Since this combined flow was modeled in more than one model, small differences in water surface elevation were encountered between the

two models in the combined area. The highest water surface elevation was used in the works maps and tables to develop base flood elevation.

5.5.8.55 Wash 2 West Tributary-2

The ADMSU HEC-1 model was modified in order to obtain better delineation flows for some of the reaches in this wash. The modified model is included in **Appendix E.5.**

The downstream boundary condition was set to known water surface elevation of 1551.8 for both the floodplain and floodway profiles. This elevation corresponds to the 100-year storage pool elevation north of the CAP within an AH Floodzone, and downstream from where the delineation began.

There were a couple of cross sections called out in the CHECK-RAS output as not being contained. These cross sections are located in the ponding area north of the CAP Canal, within a Zone AH floodzone and downstream of were the delineation begins, therefore this warning was ignored.

There are several divided flows located within this reach. Most of the divided flows are negligible since the divided flows are not carried more than 1000 feet, and/or they are less than 1 foot in depth, which is less than the accuracy of the topographic mapping.

One or more locations in this reach have the potential for supercritical flow. An explanation of the action taken at these locations is documented on the CHECK-RAS output located in **Appendix E.7**.

In one general area of the wash, the floodplain and/or floodway limits combine with another wash, thus increasing flow in this area. In areas where 2 West Tributary-1 and 2 West Tributary-2 combine, the combined flow of 5080 cfs was used. Since this combined flow was

modeled in more than one model, small differences in water surface elevation were encountered between the two models in the combined area. The highest water surface elevation was used in the works maps and tables and to develop base flood elevation.

5.5.8.56 Wash 3 West

The ADMSU HEC-1 model was modified in order to obtain better delineation flows for some of the reaches in this wash. The modified model is included in **Appendix E.5.**

The downstream boundary condition was set at known water surface elevation of 1545.1 for both the floodplain and floodway profiles. This elevation corresponds to the 100-year storage pool north of the CAP.

There were a couple of cross sections called out in the CHECK-RAS output as not being contained. These cross sections are located in the ponding area north of the CAP Canal within a Zone AH, and downstream from where the delineation was started.

There are several divided flows located within this reach. Most of the divided flows are negligible since the divided flows are not carried more than 1000 feet, and/or they are less than 1 foot in depth, which is less than the accuracy of the topographic mapping.

In this model, a Zone A is included within the detailed model. There is approximately 5 linear miles of Zone A delineations in this wash upstream of 243rd Avenue (Alignment). The water surface elevations were obtained by using normal depth calculations. The slope was obtained from an initial HEC-RAS run, and the output table provided slope information. The slope from this table was used, along with a known flow to calculate the water surface elevation. The output from

normal depth calculations was used in these cross sections to set a known water surface elevation.

5.5.8.57 Wash T4N-R3W-S08E

The ADMSU HEC-1 model was modified in order to obtain better delineation flows for some of the reaches in this wash. The modified model is included in **Appendix E.5.**

There are several divided flows located within this reach. Most of the divided flows are negligible since the divided flows are not carried more than 1000 feet, and/or they are less than 1 foot in depth, which is less than the accuracy of the topographic mapping.

One or more locations in this reach have the potential for supercritical flow. An explanation of the action taken at these locations is documented on the CHECK-RAS output located in **Appendix E.7.**

There was a cross section that contained a blocked obstruction. This cross section is located approximately 1500 feet northwest of the intersection of Jomax Road and 243rd Avenue. The blocked obstruction was added to ignore the area downstream of the stock pond that created a low spot. The low spot created a non-conveyance area, therefore, this obstruction was added using the option of blocked obstruction from HEC-RAS.

In one general area of the wash, the floodplain and/or floodway limits combine with another wash, thus increasing flow in this area. In the area where washed combined, a combined flow of 1500 cfs was used. Since this combined flow was modeled in more than one model small differences in water surface elevation were encountered between the two models in the combined area. The highest water surface elevation was used in the works maps and tables and to develop base flood elevation.

In this model, a Zone A is included within the detailed model. The very upstream cross section is a Zone A. This area was delineated as a Zone A because only 4-foot mapping was available. The water surface elevations were obtained by using normal depth calculations. The slope was obtained from an initial HEC-RAS run, and the output table provided slope information. The slope from this table was used, along with a known flow to calculate the water surface elevation. The output from normal depth calculations were used in these cross sections to set a known water surface elevation

5.5.8.58 Wash T5N-R3W-S19

There are several divided flows located within this reach. Most of the divided flows are negligible since the divided flows are not carried more than 1000 feet, and/or they are less than 1 foot in depth, which is less than the accuracy of the topographic mapping.

One or more locations in this reach have the potential for supercritical flow. An explanation of the action taken at these locations is documented on the CHECK-RAS output located in **Appendix E.7**.

In one general area of the wash, the floodplain and/or floodway limits combine with another wash, thus increasing flow in this area. In the area, where T5N-R3W-S19 and T4N-R3W-S08E combined, a combined flow of 1500 cfs was used. Since this combined flow was modeled in more than one model, small differences in water surface elevation were encountered between the two models in the combined area. The highest water surface elevation was used in the works maps and tables and to develop base flood elevation.

5.5.8.59 T5N-R2W-S14N

The ADMSU HEC-1 model was modified in order to obtain better delineation flows for some of the reaches in this wash. The modified model is included in **Appendix E.5.**

In this model, the entire reach is modeled as a Zone A. The water surface elevations were obtained by using normal depth calculations. The slope was obtained from an initial HEC-RAS run, and the output table provided slope information. The slope from this table was used, along with a known flow to calculate the water surface elevation. The output from normal depth calculations was used in these cross sections to set a known water surface elevation. Floodway analysis is not a part of this analysis.

5.5.8.60 T5N-R2W-S14S

The ADMSU HEC-1 model was modified in order to obtain better delineation flows for some of the reaches in this wash. The modified model is included in **Appendix E.5.**

In this model, the entire reach is modeled as a Zone A. The water surface elevations were obtained by using normal depth calculations. The slope was obtained from an initial HEC-RAS run, and the output table provided slope information. The slope from this table was used, along with a known flow to calculate the water surface elevation. The output from normal depth calculations was used in these cross sections to set a known water surface elevation. Floodway analysis is not a part of this analysis.

5.5.8.61 T5N-R2W-S14W

The ADMSU HEC-1 model was modified in order to obtain better delineation flows for some of the reaches in this wash. The modified model is included in **Appendix E.5.**

In this model, the entire reach is modeled as a Zone A. The water surface elevations were obtained by using normal depth calculations. The slope was obtained from an initial HEC-RAS run, and the output table provided slope information. The slope from this table was used, along with a known flow to calculate the water surface elevation. The output from normal depth calculations was used in these cross sections to set a known water surface elevation. Floodway analysis is not a part of this analysis.

5.5.8.62 T5N-R2W-S11

In this model, the entire reach is modeled as a Zone A. The water surface elevations were obtained by using normal depth calculations. The slope was obtained from an initial HEC-RAS run, and the output table provided slope information. The slope from this table was used, along with a known flow to calculate the water surface elevation. The output from normal depth calculations was used in these cross sections to set a known water surface elevation. Floodway analysis is not a part of this analysis.

5.6 Floodway Modeling

The floodway limits were defined by initially using Method 4 with a surcharge of 1.0 ft, and then running the model. Modifications were made as needed to insure the surcharge did not exceed 1.0 ft, and velocities did not significantly increase. After these modifications were made, Method 1 was used with the known encroachment stations obtained from Method 4.

The output was checked again and the floodway inundation limits were defined based on these new encroachment boundaries.

5.7 Problems Encountered During Modeling

5.7.1 Special Problems and Solutions

Various problems are discussed for each wash in **Section 5.5**.

5.7.2 Modeling Warning and Errors

See **Appendix E**, for the Check-RAS Output for each of the washes.

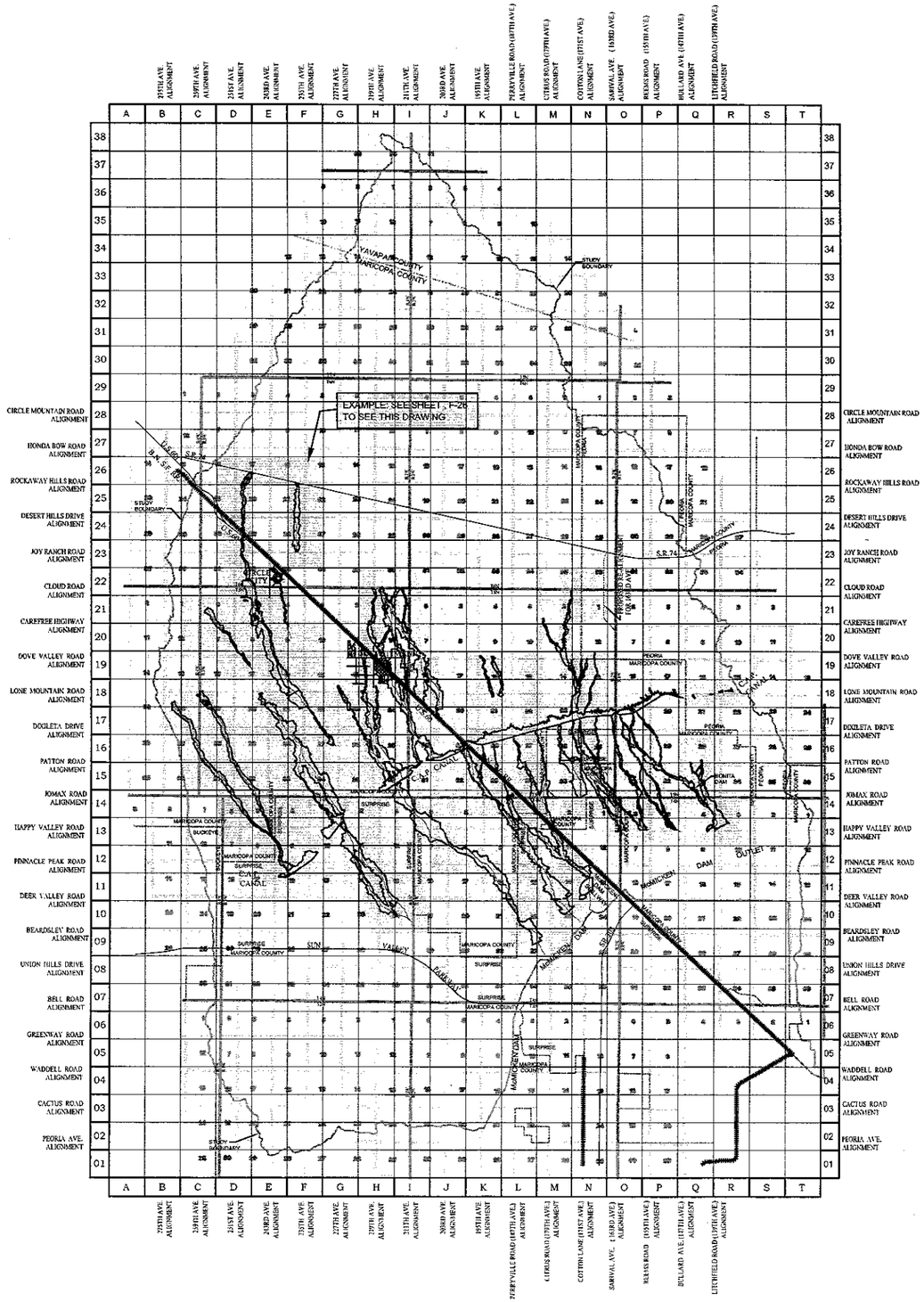
5.8 Calibration

Since gaging records in the study area are not used for this project, the results of the HEC-RAS model could not be calibrated. However, the results were carefully examined and found to be reasonable.

5.9 Final Results

5.9.1 Hydraulic Analysis Results

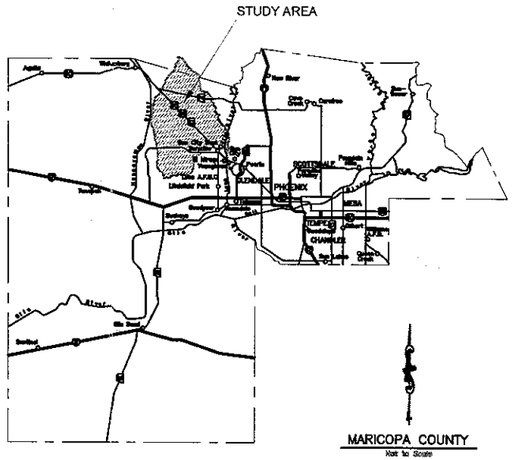
The Floodplain Maps, as well as their index are presented in the following **Exhibits 001 through 151** in reduced scale. Full size copies are bound separately from this report.



FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT F.C.D. 2002C029



LOCATION MAP

AERIAL MAPPING
NOT A PART OF THIS CONTRACT.
SUPPLIED BY THE FLOOD CONTROL DISTRICT.

HYDROLOGY
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2255 North 44th Street, Suite 125
Phoenix, Az. 85008-3279

HYDRAULICS
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Phoenix, Az. 85008-3279

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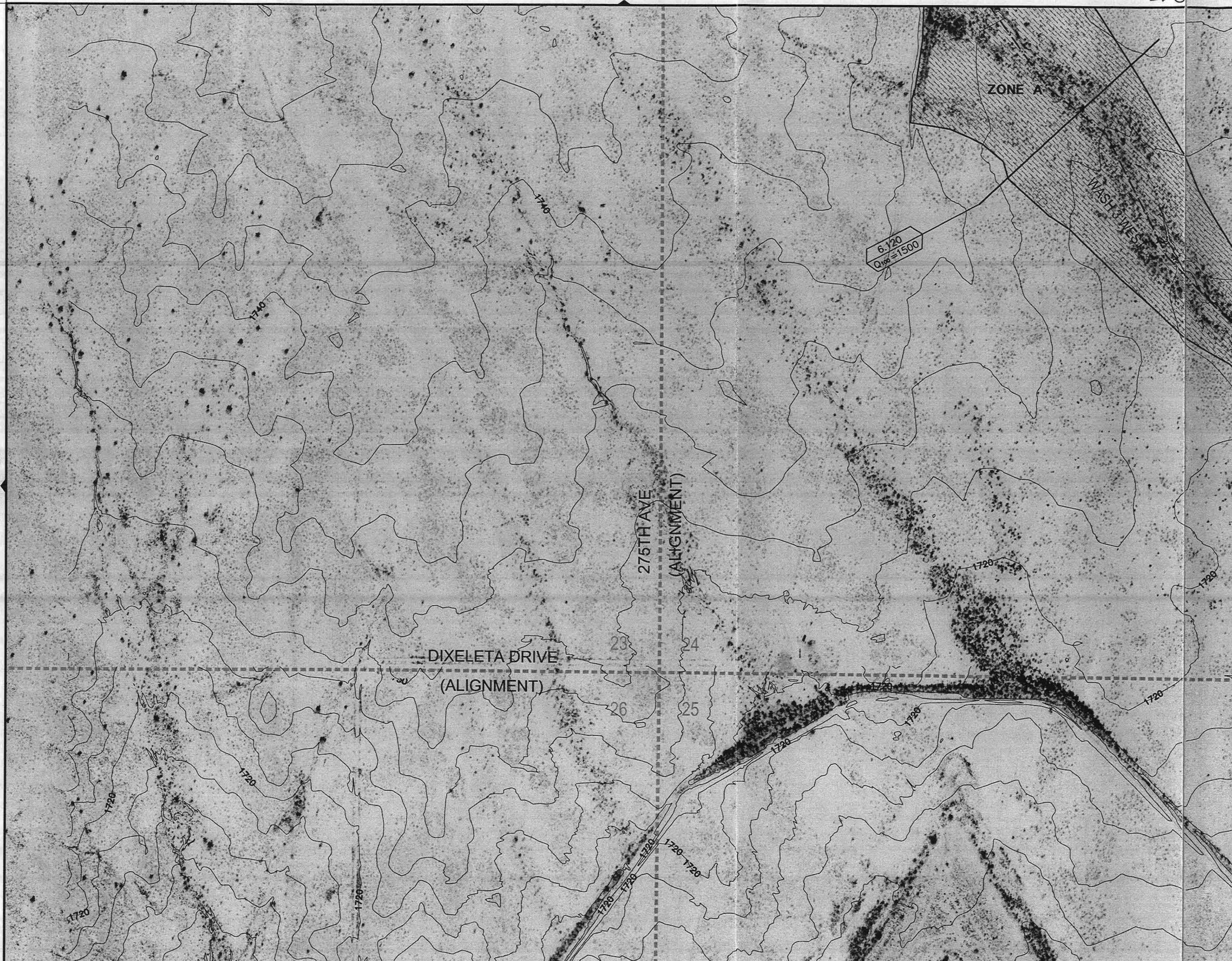
PLANS	KAB	07/2005	RECOMMENDED BY: DATE
PLANS CHK.	HAA/AMB	07/2005	APPROVED BY: DATE
SUBMITTED BY: DATE:			CHIEF ENGINEER AND GENERAL MANAGER

SHEET 1 OF 153

SEE SHEET B-18



SEE SHEET A-17

SEE SHEET C-17

SEE SHEET B-16

FILE: P:300\310\310032 (Wittmann ADMSU)\Task\hydraulics\FP-B_17.dwg DATE: 07/26/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A			ZONE A
EFFECTIVE ZONE AE			ZONE AH
EFFECTIVE ZONE AH			ZONE AE
EFFECTIVE FLOODWAY			FLOODWAY (FW)
			ZONE AO

HYDRAULIC BASE LINE	3.1
ZONE DESIGNATION	ZONE A
WASH I.D. LABEL	WASH 9 EAST
ELEVATION REFERENCE MARK	ERM AJ3866
CROSS SECTION	2.199 / Q100 =1270 FP=1400.55 FW=1400.56
BASE FLOOD ELEVATION	1320
DIKE / LEVEE	DIKE
COUNTY BOUNDARY	
CORPORATE LIMIT	
LIMIT OF STUDY	
LIMIT OF DETAILED STUDY	
TOWNSHIP/RANGE LINE	
SECTION LINE	
SECTION NUMBER	29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

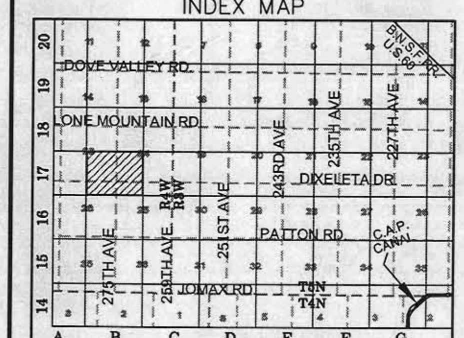
I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3873		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 2.00 FEET = NAVD 88.

Registered Professional Engineer Certificate No. 28737 HERNAN A. ARISTIZABAL Date Signed 7/27/05 ARIZONA, U.S.A.

INDEX MAP



200' 0' 200' 400'

SCALE: 1"= 200'

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DESIGN CHK.	HAA	07/2005	
PLANS	KAB	07/2005	RECOMMENDED BY: DATE
PLANS CHK.	AMG/HAA	07/2005	APPROVED BY: DATE CHIEF ENGINEER AND GENERAL MANAGER
SUBMITTED BY: DATE:			SHEET B-17 OF FLOODPLAIN DELINEATION

SEE SHEET B-19

ERM AJ3877

1760

1760

1760

1760

1760

1760

1760

1760

275TH AVE (ALIGNMENT)

14

13

23

24

LONE MOUNTAIN ROAD (ALIGNMENT)

6,370
Q_{100}=1350

LIMIT OF STUDY

ZONE A

SEE SHEET A-18

SEE SHEET C-18

SEE SHEET B-17

FILE: P:\300\310\310032 (Wittmann ADMS)\Task\Hydraulics\FP-B_18.dwg DATE: 07/26/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

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LEGEND

EFFECTIVE ZONE A — ZONE A
EFFECTIVE ZONE AE — ZONE AH
EFFECTIVE ZONE AH — ZONE AE
EFFECTIVE FLOODWAY — FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 / Q_{100}=1270 / FP=1400.55 / FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

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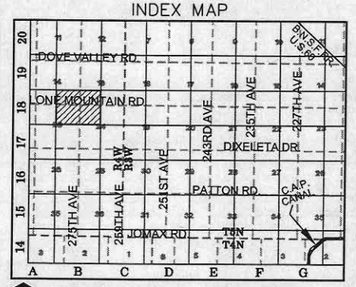
NOTE:

1. NGVD 29 + 2.00 FEET = NAVD 88.

HERMAN A. ARISTIZABAL — 22737 — REGISTERED PROFESSIONAL ENGINEER — ARIZONA, U.S.A.

INDEX MAP



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SCALE: 1"= 200'

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PLANS CHK.	AMG/HAA	07/2005

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APPROVED BY: DATE

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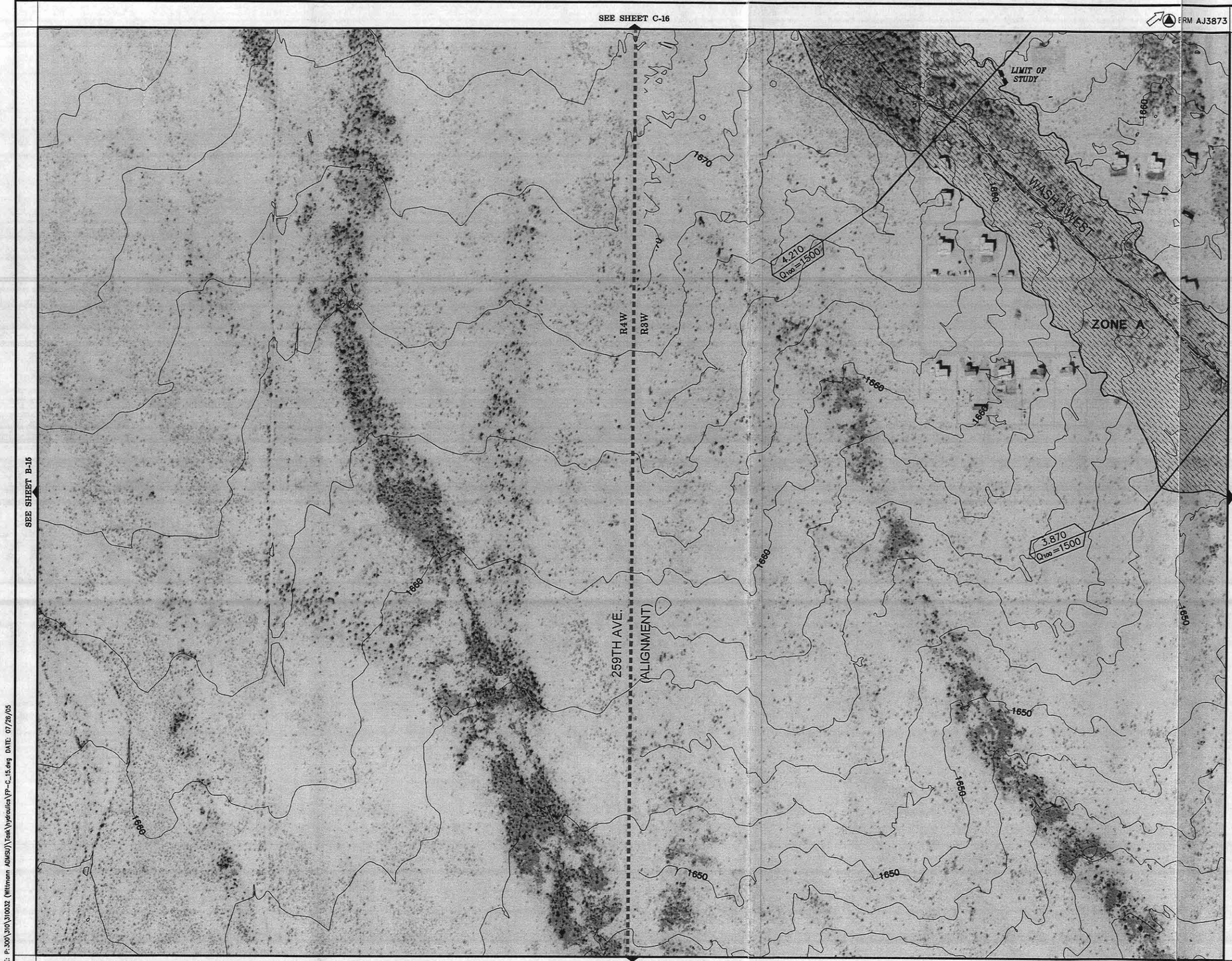
SHEET B-18 OF FLOODPLAIN DELINEATION



FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A — ZONE A
EFFECTIVE ZONE AE — ZONE AH
EFFECTIVE ZONE AH — ZONE AE
EFFECTIVE FLOODWAY — FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 / Q_{100}=1270 — FP=1400.55 / FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

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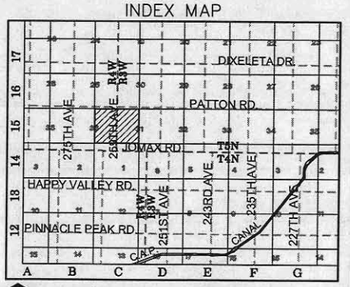
AJ3873		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:
1. NGVD 29 + 1.90 FEET = NAVD 88.

29737 HERMAN A. ARISTIZABAL Date Signed 7/7/05 ARIZONA, U.S.A.

INDEX MAP



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SCALE: 1"= 200'

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PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005

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SHEET C-15 OF FLOODPLAIN DELINEATION

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FILE: P:\301\310\310032 (Wittmann ADMSU)\Task\hydraulics\FP-C_15.dwg DATE: 07/26/05

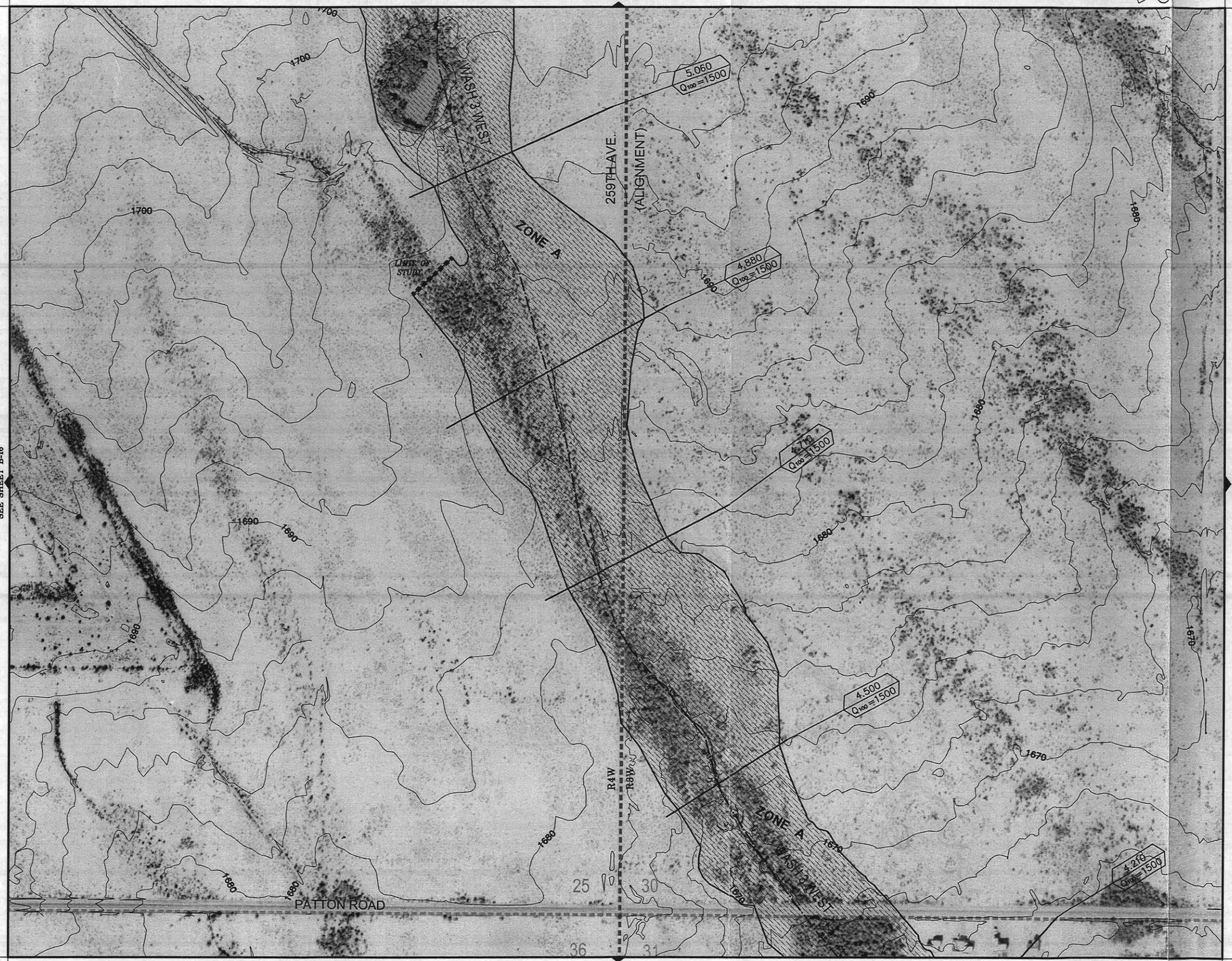
SEE SHEET C-17

ERM AJ3873

SEE SHEET B-16

SEE SHEET D-16

SEE SHEET C-15



FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY
ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 / Q100=1270 — FP=1400.55 / FW=1400.56
BASE FLOOD ELEVATION — 1329
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

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NOTE:

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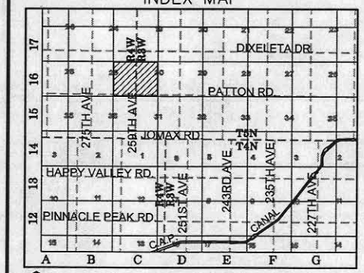
DALE LN.

INDEX MAP



200' 0' 200' 400'

SCALE: 1"= 200'

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Fax 602.344.3947
WEB www.entellus.com

	BY	DATE
DESIGN	AMG/RAS	07/2005
DESIGN CHK.	HAA	07/2005
PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

SUBMITTED BY: DATE:

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET C-16 OF FLOODPLAIN DELINEATION

FILE: P:\300\310\310032 (Wittmann ADMS)\Task\hydraulics\FP-C_16.dwg DATE: 07/26/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

SEE SHEET C-18

ERM AJ3873

T5N-R3W-S19

T4N-R3W-S08E

4.493 FP=1713.71
Q_{100}=430 FW=1713.71

0.078 T5N-R3W-S19
Q_{100}=1500

4.417 FP=1711.33
Q_{100}=1500 FW=1711.45

0.000 T5N-R3W-S19
Q_{100}=1500

4.336 FP=1708.34
Q_{100}=1500 FW=1708.70

4.256 FP=1705.59
Q_{100}=2100 FW=1706.38

4.178 FP=1702.96
Q_{100}=2100 FW=1703.80

4.102 FP=1700.27
Q_{100}=2100 FW=1701.14

4.014 FP=1697.65
Q_{100}=2100 FW=1698.56

3.937 FP=1695.72
Q_{100}=2100 FW=1696.80

5.730
Q_{100}=1500

5.410
Q_{100}=1500

5.240
Q_{100}=1500

ZONE AE

ZONE A

LIMIT OF STUDY

WASH 3 WEST

DIXELETA DR.
(ALIGNMENT)

259TH AVE
(ALIGNMENT)

R4W R3W

24 19 25 30

1720 1710 1700 1690 1712 1708 1716 1718 1698

SEE SHEET B-17

SEE SHEET D-17

SEE SHEET C-16

FILE: P:\300\310\10032 (Wittmann ADMSU)\Task\hydraulics\FP-C_18.dwg DATE: 07/26/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A — ZONE A
EFFECTIVE ZONE AE — ZONE AH
EFFECTIVE ZONE AH — ZONE AE
EFFECTIVE FLOODWAY — FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 Q_{100}=1270 FP=1400.55 FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

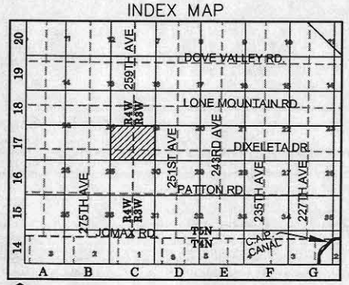
NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3873		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 2.00 FEET = NAVD 88.

INDEX MAP



N

200' 0' 200' 400'

SCALE: 1" = 200'

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DESIGN	AMG/RAS	07/2005
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PLANS CHK.	AMG/HAA	07/2005
SUBMITTED BY:		DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET C-17 OF FLOODPLAIN DELINEATION

SEE SHEET C-19

ERM AJ3873

SEE SHEET B-18

SEE SHEET D-18

SEE SHEET C-17

259TH AVE (ALIGNMENT)

LONE MOUNTAIN ROAD (ALIGNMENT)

R4W R3W

13 18 24 19

T4N-R3W-S08E

T5N-R3W-S19

LIMIT OF DETAILED STUDY

LIMIT OF STUDY

ZONE A

ZONE AE

1740 1720 1716 1712 1710 1708

FP=1728.23 FW=1729.19 0.580 Q100=660

FP=1725.09 FW=1725.50 0.510 Q100=1500

FP=1723.10 FW=1723.36 0.413 Q100=1500

FP=1720.47 FW=1721.19 0.358 Q100=1070

FP=1717.84 FW=1718.63 0.263 Q100=1070

FP=1715.22 FW=1715.77 0.185 Q100=1070

FP=1713.11 FW=1713.71 0.493 Q100=1430

FP=1711.33 FW=1711.45 0.078 Q100=1500

FP=1709.10 FW=1709.37 0.417 Q100=1500

FP=1708.37 FW=1708.70 0.336 Q100=1500

4.891 Q100=710

4.817 Q100=1500 FP=1725.09 FW=1725.40

4.752 Q100=1500 FP=1723.10 FW=1723.72

4.652 Q100=430 FP=1719.64 FW=1719.87

4.585 Q100=430 FP=1717.56 FW=1717.99

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A — ZONE A
EFFECTIVE ZONE AE — ZONE AH
EFFECTIVE ZONE AH — ZONE AE
EFFECTIVE FLOODWAY — FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 Q100=1270 FP=1400.55 FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

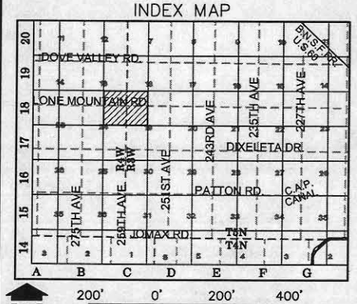
I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3873		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 2.00 FEET = NAVD 88.

Registered Professional Engineer — 28737 — HERMAN A. ARISTIZABAL — Date Signed 7/7/05 — ARIZONA, U.S.A.

INDEX MAP



N

200' 0' 200' 400'

SCALE: 1" = 200'

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PLANS CHK.	AMG/HAA	07/2005

SUBMITTED BY: DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET C-18 OF FLOODPLAIN DELINEATION

FILE: P:\305\310\310323 (Wittmann ADMS)\Task\Hydraulics\FP-C_18.dwg DATE: 07/28/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

SEE SHEET C-21

ERM AJ3877

1.920
Q_{100}=4500

LONA TRIBUTARY

ZONE A

R4W

R3W

259TH AVE
(ALIGNMENT)

SEE SHEET B-20

SEE SHEET D-20

SEE SHEET C-19

FILE: P:\300\310\310032 (Wittmann ADMS)\Task\Hydraulics\FP-C_20.dwg DATE: 07/21/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY

ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 FP=1400.55 / Q_{100}=1270 FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

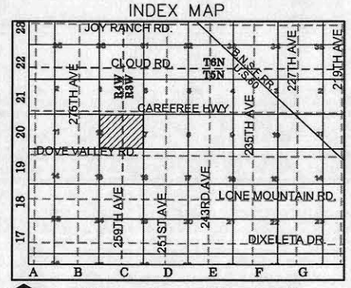
I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3877		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 2.00 FEET = NAVD 88.

Registered Professional Engineer — Certificate No. 39737 — HERNAN A. ARISTIZABAL — Date Signed — ARIZONA, U.S.A.

INDEX MAP



200' 0' 200' 400'

SCALE: 1"= 200'

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PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005
SUBMITTED BY:		DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET C-20 OF FLOODPLAIN DELINEATION

SEE SHEET C-22

ERM AJ3877

SEE SHEET B-21

SEE SHEET D-21

SEE SHEET C-20

1820

1820

1820

1800

1800

2.420
Q_{100}=4500

2.280
Q_{100}=4500

1.920
Q_{100}=4500

2.050
Q_{100}=4500

259TH AVE (ALIGNMENT)

CAREFREE HWY. (ALIGNMENT)

LIMIT OF STUDY

LIMIT OF STUDY

LIMIT OF STUDY

IONA TRIBUTARY

IONA TRIBUTARY

ZONE A

R4W R3W

1 6

12

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

- EFFECTIVE ZONE A / ZONE A
- EFFECTIVE ZONE AE / ZONE AH
- EFFECTIVE ZONE AH / ZONE AE
- EFFECTIVE FLOODWAY / FLOODWAY (FW)
- ZONE AO
- HYDRAULIC BASE LINE
- ZONE DESIGNATION: ZONE A
- WASH I.D. LABEL: WASH 9 EAST
- ELEVATION REFERENCE MARK: ERM AJ3866
- CROSS SECTION: 2.199 / Q_{100}=1270 / FP=1400.55 / FW=1400.56
- BASE FLOOD ELEVATION: 1320
- DIKE / LEVEE: DIKE
- COUNTY BOUNDARY
- CORPORATE LIMIT
- LIMIT OF STUDY
- LIMIT OF DETAILED STUDY
- TOWNSHIP/RANGE LINE
- SECTION LINE / SECTION NUMBER: 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

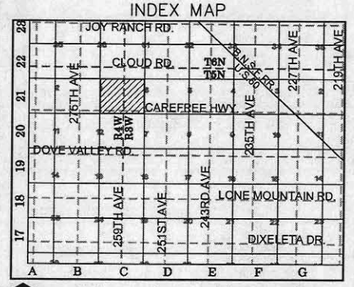
I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3877		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 2.00 FEET = NAVD 88.

HERMAN A. ARISTIZABAL 29737 REGISTERED ENGINEER ARIZONA, U.S.A.

INDEX MAP



200' 0' 200' 400'

SCALE: 1"= 200'

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PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005
SUBMITTED BY:		DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

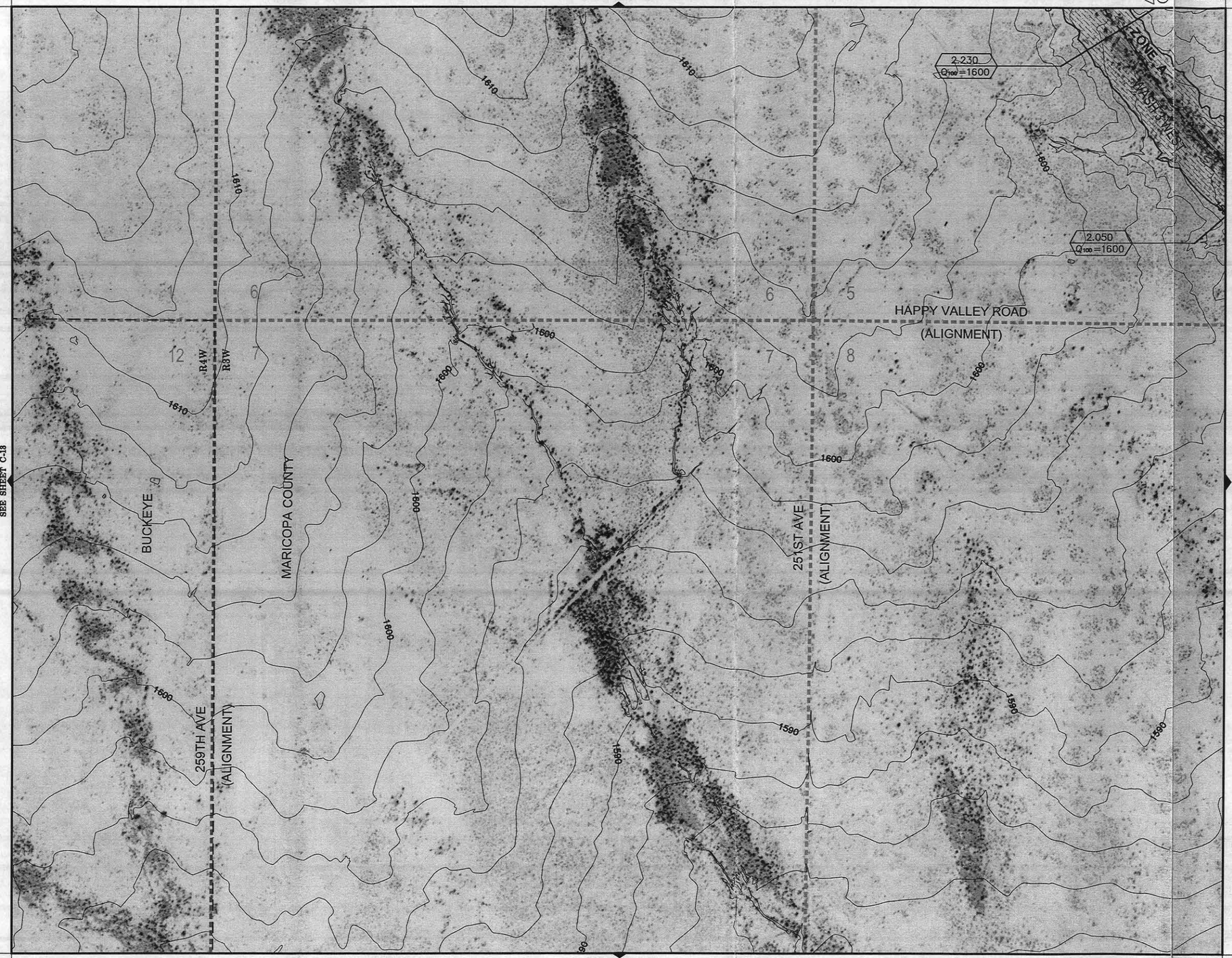
SHEET C-21 OF FLOODPLAIN DELINEATION

FILE: P:\300\310\310032 (Wittmann ADMS)\Task\hydraulics\FP-C_21.dwg DATE: 07/26/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

SEE SHEET D-14

ERM AJ3861



SEE SHEET C-18

SEE SHEET E-18

SEE SHEET D-12

FILE: P:\300\310\310032 (Wittmann ADMS)\Task\Hydraulics\FP-D_13.dwg DATE: 07/26/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY
ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 / Q100=1270 — FP=1400.55 / FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

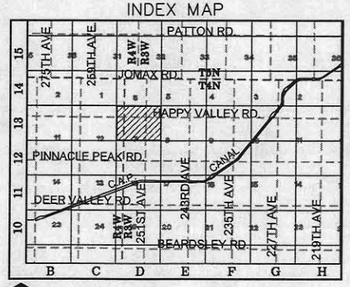
I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3861		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 1.90 FEET = NAVD 88.

REGISTERED PROFESSIONAL ENGINEER — 39737 — HERNAN A. ARISTIZABAL — ARIZONA, U.S.A.

INDEX MAP



N

200' 0' 200' 400'

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SUBMITTED BY:		DATE:

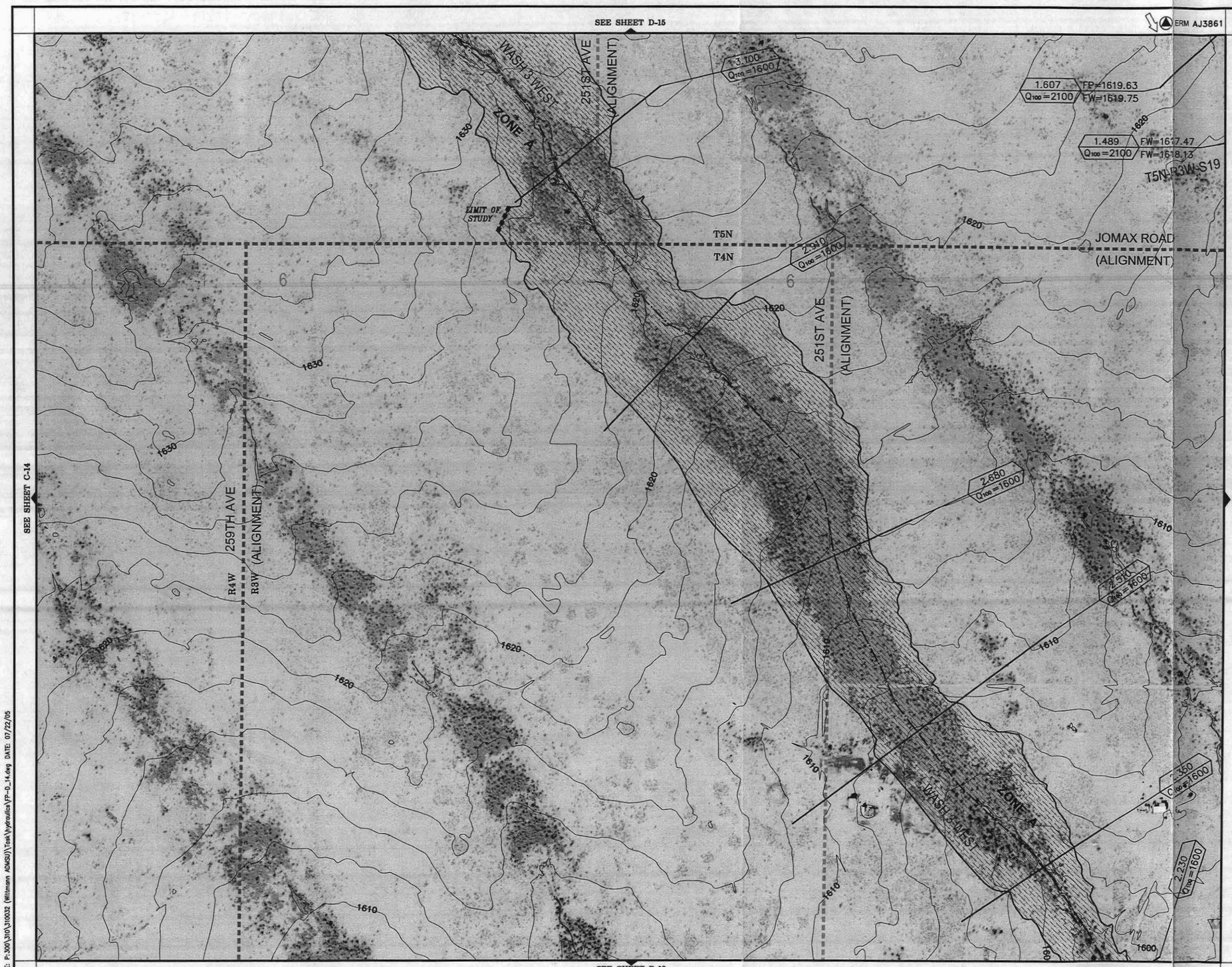
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE:

APPROVED BY: DATE:

CHIEF ENGINEER AND GENERAL MANAGER

SHEET D-13 OF FLOODPLAIN DELINEATION



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1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY
ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 / Q100=1270 — FP=1400.55 / FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

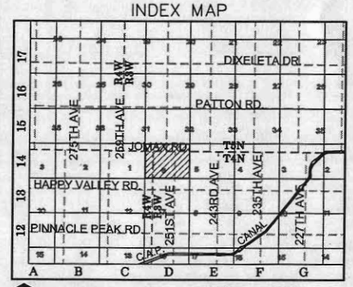
NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3861	-	NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:
1. NGVD 29 + 1.90 FEET = NAVD 88.

Registered Professional Engineer — 39737 — HERNAN A. ARISTIZABAL — Date Signed 7/7/05 — ARIZONA, U.S.A.

INDEX MAP



N

200' 0' 200' 400'

SCALE: 1"= 200'

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FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET D-14 OF FLOODPLAIN DELINEATION

SEE SHEET D-16

ERM AJ3873

LIMIT OF DETAILED STUDY

2.527 FP=1649.75
Q_{100}=2100 FW=1650.82

2.440 FP=1647.18
Q_{100}=2100 FW=1648.03

3.870
Q_{100}=1500

2.343 FR=1644.45
Q_{100}=2100 FW=1645.41

2.359 FR=1641.77
Q_{100}=2100 FW=1642.64

3.640
Q_{100}=1600

2.156 FP=1637.99
Q_{100}=2100 FW=1638.93

2.073 FP=1635.27
Q_{100}=2100 FW=1636.12

3.370
Q_{100}=1600

1.986 FP=1632.09
Q_{100}=2100 FW=1632.99

1.900 FP=1628.97
Q_{100}=2100 FW=1629.87

1.817 FP=1626.43
Q_{100}=2100 FW=1627.33

1.737 FP=1623.86
Q_{100}=2100 FW=1624.67

1.666 FP=1621.96
Q_{100}=2100 FW=1622.31

252ND AVE.

251ST AVE (ALIGNMENT)

T4N-R3W-S08E

FW

ZONE AE

ZONE A

WASH 3 WEST

LIMIT OF STUDY

LIMIT OF DETAILED STUDY

SEE SHEET C-15

SEE SHEET E-15

SEE SHEET D-14

FILE: P:\300\310\310032 (Wittmann ADMSJ)\Task\hydraulics\FP-D_15.dwg DATE: 07/26/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
WITTMANN AREA DRAINAGE MASTER STUDY UPDATE
CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A — ZONE A
EFFECTIVE ZONE AE — ZONE AH
EFFECTIVE ZONE AH — ZONE AE
EFFECTIVE FLOODWAY — FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 FP=1400.55 / Q_{100}=1270 FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

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I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
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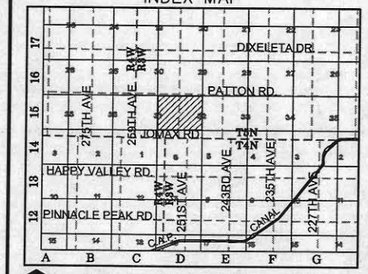
HERMAN A. ARISTIZABAL — 35737 — REGISTERED PROFESSIONAL ENGINEER — ARIZONA, U.S.A.

INDEX MAP



200' 0' 200' 400'
SCALE: 1"= 200'

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	BY	DATE
DESIGN	AMG/RAS	07/2005
DESIGN CHK.	HAA	07/2005
PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005
SUBMITTED BY:		DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET D-15 OF FLOODPLAIN DELINEATION

SEE SHEET D-17

ERM AJ3873

FP=1677.18 FW=1677.80 3.363 Q_{100}=2100

FP=1679.32 FW=1679.88 3.439 Q_{100}=2100

FP=1674.05 FW=1674.31 3.288 Q_{100}=2100

FP=1671.33 FW=1671.73 3.213 Q_{100}=2100

FP=1668.52 FW=1668.91 3.115 Q_{100}=2100

FP=1665.47 FW=1666.01 3.028 Q_{100}=2100

FP=1663.68 FW=1664.56 2.980 Q_{100}=2100

FP=1660.40 FW=1660.78 2.864 Q_{100}=2100

FP=1657.82 FW=1658.77 2.778 Q_{100}=2100

FP=1654.88 FW=1655.58 2.599 Q_{100}=2100

FP=1652.46 FW=1653.39 2.625 Q_{100}=2100

FP=1649.75 FW=1650.62 2.527 Q_{100}=2100

ZONE AE

FW

T4N-R3W-S08E

T4N-R3W-S08E

DALE LN.

251ST AVE (ALIGNMENT)

PATTON ROAD

LIMIT OF DETAILED STUDY

SEE SHEET C-16

SEE SHEET B-16

SEE SHEET D-15

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A — ZONE A

EFFECTIVE ZONE AE — ZONE AH

EFFECTIVE ZONE AH — ZONE AE

EFFECTIVE FLOODWAY — FLOODWAY (FW)

ZONE AO

HYDRAULIC BASE LINE

ZONE DESIGNATION — ZONE A

WASH I.D. LABEL — WASH 9 EAST

ELEVATION REFERENCE MARK — ERM AJ3866

CROSS SECTION — 2.199 Q_{100}=1270 FP=1400.55 FW=1400.56

BASE FLOOD ELEVATION — 1320

DIKE / LEVEE — DIKE

COUNTY BOUNDARY

CORPORATE LIMIT

LIMIT OF STUDY

LIMIT OF DETAILED STUDY

TOWNSHIP/RANGE LINE

SECTION LINE

SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

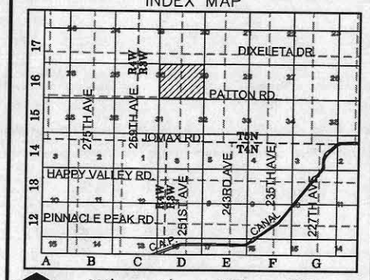
I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3873		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 1.90 FEET = NAVD 88.

HERMAN A. ARISTIZABAL 20737 REGISTERED PROFESSIONAL ENGINEER STATE OF ARIZONA, U.S.A.

INDEX MAP



N

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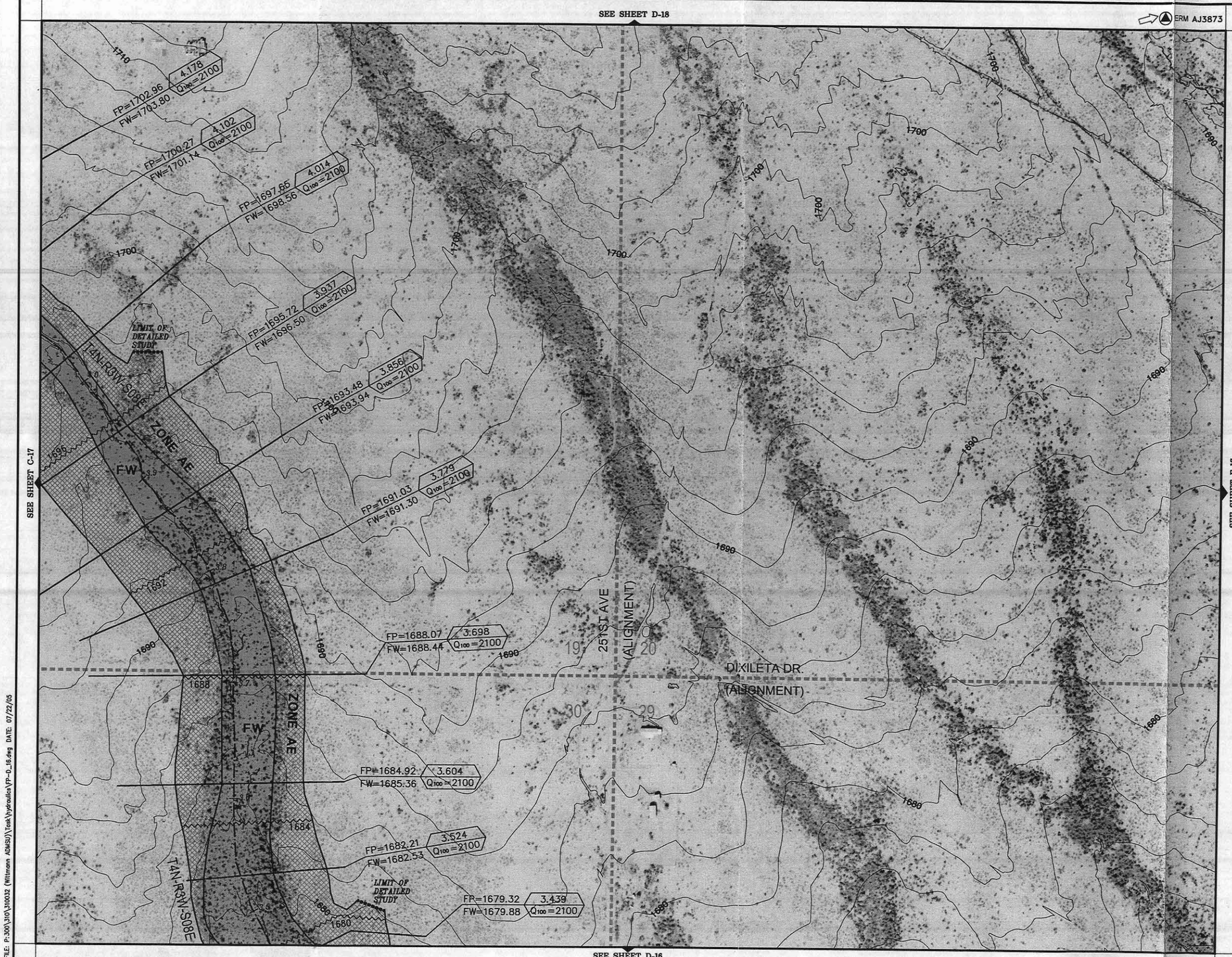
APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET D-16 OF FLOODPLAIN DELINEATION

FILE: P:\00\310\310032 (Wittmann ADMSU)\Task\Hydraulics\FP-D_16.dwg DATE: 07/27/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES



FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A — ZONE A

EFFECTIVE ZONE AE — ZONE AH

EFFECTIVE ZONE AH — ZONE AE

EFFECTIVE FLOODWAY — FLOODWAY (FW)

ZONE AO

HYDRAULIC BASE LINE

ZONE DESIGNATION: ZONE A

WASH I.D. LABEL: WASH 9 EAST

ELEVATION REFERENCE MARK: ERM AJ3866

CROSS SECTION: 2.199 / Q_{100}=1270 — FP=1400.55 / FW=1400.56

BASE FLOOD ELEVATION: 1320

DIKE / LEVEE: DIKE

COUNTY BOUNDARY

CORPORATE LIMIT

LIMIT OF STUDY

LIMIT OF DETAILED STUDY

TOWNSHIP/RANGE LINE

SECTION LINE / SECTION NUMBER: 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

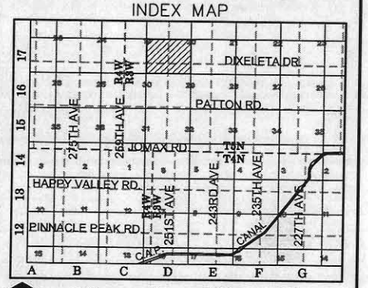
I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3873		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 1.90 FEET = NAVD 88.

Registered Professional Engineer — 39737 — HERMAN A. ARISTIZABAL — Date Signed 7/14/05 — ARIZONA, U.S.A.

INDEX MAP



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PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005

SUBMITTED BY: DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET D-17 OF FLOODPLAIN DELINEATION

FILE: P:\00\310\310032 (Wittmann ADMSU)\Task\Hydraulics\FP-D_16.dwg DATE: 07/22/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

SEE SHEET D-20

ERM AJ3873

IONA TRIBUTARY

LIMIT OF STUDY

ZONE A

1760

1740

DOVE VALLEY RD.
(ALIGNMENT)

Q 620
Q_{100}=4500

0.480
Q_{100}=4500

0.270
Q_{100}=4500

0.000
Q_{100}=4500

1720

251ST AVE
(ALIGNMENT)

EFFECTIVE
IONA WASH
ZONE AE & FW

1700

SEE SHEET C-19

SEE SHEET B-19

SEE SHEET D-18

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A — ZONE A
EFFECTIVE ZONE AE — ZONE AH
EFFECTIVE ZONE AH — ZONE AE
EFFECTIVE FLOODWAY — FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 / Q_{100}=1270 — FP=1400.55 / FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

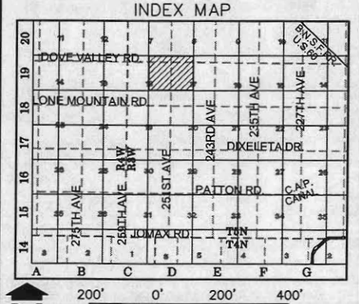
NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3873		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:
1. NGVD 29 + 2.00 FEET = NAVD 88.

CERTIFICATE NO. 39737 — HERNAN A. ARISTIZABAL — Date 7/19/05 — REGISTERED PROFESSIONAL ENGINEER — ARIZONA, U.S.A.

INDEX MAP



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SCALE: 1"= 200'

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PLANS CHK.	AMG/HAA	07/2005
SUBMITTED BY:		DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET D-19 OF FLOODPLAIN DELINEATION

FILE: P:\001\310\310023 (Wittmann ADMSU)\Task\Hydraulics\FP-D_19.dwg DATE: 07/21/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

SEE SHEET D-21

ERM AJ3877

LIMIT OF STUDY

ZONE A

1,670
Q_{100}=4500

LIMIT OF STUDY

LIMIT OF STUDY

1,450
Q_{100}=4500

IONA TRIBUTARY

1,220
Q_{100}=4500

ZONE A

251ST AVE (ALIGNMENT)

LIMIT OF STUDY

1,060
Q_{100}=4500

0,850
Q_{100}=4500

SEE SHEET C-20

SEE SHEET E-20

SEE SHEET D-19

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY
ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 / Q_{100}=1270 — FP=1400.55 / FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

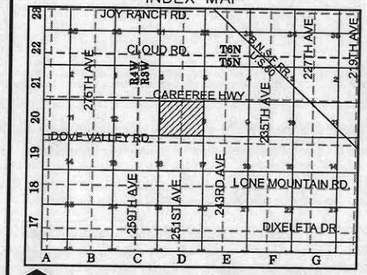
I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3877		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 2.00 FEET = NAVD 88.

HERNAN A. ARRIETA
22737
REGISTERED LAND SURVEYOR
ARIZONA, U.S.A.

INDEX MAP



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200' 0' 200' 400'

SCALE: 1" = 200'

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PLANS CHK.	AMG/HAA	07/2005

SUBMITTED BY: _____ DATE: _____

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: _____ DATE

APPROVED BY: _____ DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET D-20 OF FLOODPLAIN DELINEATION

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FILE: P:\200\310\J10032 (Wittmann ADMS)\Task\Hydraulics\FP-D_20.dwg DATE: 07/21/05

SEE SHEET D-22

ERM AJ3877

0.991 FP=IONA ES-1 IONA WASH NORTH
Q_{100}=4550 FW=IONA ES-1

5.261 FP=1823.91 IONA WASH EAST SPLIT-1
Q_{100}=4550 FW=1824.28

ZONE AE

LIMIT OF DETAILED STUDY

IONA WASH NORTH

0.905 FP=1818.21 IONA WASH NORTH
Q_{100}=1330 FW=1818.34

5.172 FP=1819.03 IONA WASH EAST SPLIT-1
Q_{100}=700 FW=1819.46

0.833 FP=1814.53
Q_{100}=1330 FW=1815.49

0.765 FP=1812.11
Q_{100}=1330 FW=1812.92

0.682 FP=1808.70
Q_{100}=1330 FW=1809.42

0.656 FP=1807.32
Q_{100}=1330 FW=1807.99

0.569 FP=1803.64
Q_{100}=1330 FW=1804.55

0.492 FP=1800.15
Q_{100}=1330 FW=1800.98

0.396 FP=1796.48
Q_{100}=1330 FW=1797.46

0.305 FP=1792.40
Q_{100}=1330 FW=1793.22

0.219 FP=1788.22
Q_{100}=1330 FW=1789.01

1.920
Q_{100}=4500

LIMIT OF STUDY

IONA TRIBUTARY

ZONE A

251ST AVE (ALIGNMENT)

CAREFREE HWY (ALIGNMENT)

IONA WASH NORTH

ZONE AE

LIMIT OF DETAILED STUDY

1820 1810 1800 1790

SEE SHEET C-21

SEE SHEET E-21

SEE SHEET D-20

FILE: P:\300\310\310032 (Wittmann ADMS)\Tools\hydraulics\VP-D_21.dwg DATE: 07/27/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A — ZONE A
EFFECTIVE ZONE AE — ZONE AH
EFFECTIVE ZONE AH — ZONE AE
EFFECTIVE FLOODWAY — FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 FP=1400.55 / Q_{100}=1270 FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
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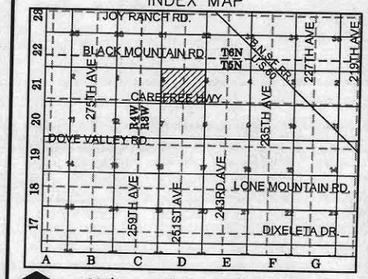
Registered Professional Engineer — 28737 — HERNAN A. ARISTIZABAL — Date Signed 7/27/05 — ARIZONA, U.S.A.

INDEX MAP



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FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

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CHIEF ENGINEER AND GENERAL MANAGER

SHEET D-21 OF FLOODPLAIN DELINEATION

SEE SHEET D-23

ERM AJ3877

1.925 FP=1868.34
Q100=3580 FW=1869.32

1.830 FP=1863.17
Q100=3580 FW=1863.83

1.758 FP=1859.94
Q100=3580 FW=1859.96

1.683 FP=1856.06
Q100=3580 FW=1856.06

1.603 FP=1852.64
Q100=3580 FW=1852.70

1.578 FP=1850.93
Q100=3580 FW=1851.09

1.595 FP=1844.46
Q100=3580 FW=1845.41

1.400 FP=1841.65
Q100=3710 FW=1842.59

1.293 FP=1840.69
Q100=4550 FW=1841.55

1.219 FP=1835.72
Q100=4550 FW=1836.11

1.147 FP=1831.32
Q100=4550 FW=1832.29

1.074 FP=1827.91
Q100=4550 FW=1828.90

IOWA WASH NORTH

ZONE AE

FW

LIMIT OF DETAILED STUDY

LIMIT OF STUDY

EFFECTIVE ZONE A

ZONE A

1866 1862 1858 1854 1850 1846 1842 1838 1834 1830 1826

1860 1840

251ST AVE (ALIGNMENT)

BLACK MOUNTAIN RD. (ALIGNMENT)

T6N
T5N

SEE SHEET C-22

SEE SHEET E-22

SEE SHEET D-21

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FILE: P:\300\310\310032 (Wittmann ADMS0)\Task\Hydraulics\FP-D_22.dwg DATE: 07/27/05

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY
ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 FP=1400.55 / Q100=1270 FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

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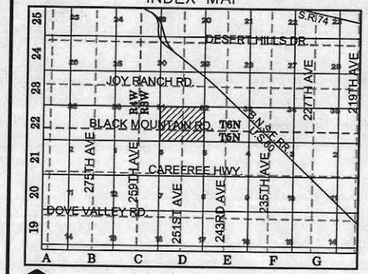

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CHIEF ENGINEER AND GENERAL MANAGER

SHEET D-22 OF FLOODPLAIN DELINEATION

SEE SHEET D-24

ERM DV0929

2.791 FP=1913.59
Q100=3540 FW=1913.67

2.678 FP=1908.26
Q100=3540 FW=1909.16

2.599 FP=1903.91
Q100=3580 FW=1904.43

2.526 FP=1900.15
Q100=3580 FW=1900.78

2.436 FP=1895.60
Q100=3580 FW=1895.60

2.324 FP=1889.61
Q100=3580 FW=1889.95

2.227 FP=1884.83
Q100=3580 FW=1885.11

2.149 FP=1880.45
Q100=3580 FW=1880.53

2.080 FP=1875.73
Q100=3580 FW=1876.66

2.000 FP=1872.42
Q100=3580 FW=1873.20

1.925 FP=1868.34
Q100=3580 FW=1869.32

LIMIT OF DETAILED STUDY

LIMIT OF DETAILED STUDY

LIMIT OF DETAILED STUDY

LIMIT OF DETAILED STUDY

B.N.S.F.R.R.

U.S. 60

EFFECTIVE ZONE A

ZONE AE

ZONE AE

ZONE AE

FW

FW

FW

EFFECTIVE ZONE A

JOY RANCH RD (ALIGNMENT)

251ST AVE (ALIGNMENT)

IORA WASH NORTH

1912
1908
1904
1900
1896
1892
1888
1884
1880
1878
1874
1870

SEE SHEET C-23

SEE SHEET E-23

SEE SHEET D-22

FILE: P:\300\310\310032 (Wittmann ADMS0)\Task\Hydraulics\FP-D_23.dwg DATE: 07/27/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY
ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 FP=1400.55 / Q100=1270 FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

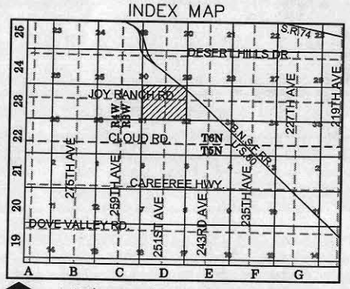
NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
DV0929		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 2.00 FEET = NAVD 88.

INDEX MAP



200' 0' 200' 400'

SCALE: 1"= 200'

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DESIGN CHK.	HAA	07/2005
PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005
SUBMITTED BY:		DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET D-23 OF FLOODPLAIN DELINEATION

SEE SHEET D-25

ERM DV0929

SEE SHEET C-24

SEE SHEET E-24

SEE SHEET D-23

DESERT HILLS DR. (ALIGNMENT)

LIMIT OF DETAILED STUDY

IONA WASH NORTH

ZONE AE

FW

U.S. 60 GRAND AVE.

B.N.S.F. RR.

251ST AVE (ALIGNMENT)

FP=1955.12 / 3.602
FW=1955.77 / Q_{100}=3460

FP=1951.62 / 3.523
FW=1952.55 / Q_{100}=3460

FP=1946.18 / 3.422
FW=1947.11 / Q_{100}=3460

FP=1943.08 / 3.349
FW=1943.94 / Q_{100}=3460

FP=1938.34 / 3.257
FW=1938.56 / Q_{100}=3460

FP=1933.88 / 3.180
FW=1935.56 / Q_{100}=3460

FP=1929.36 / 3.087
FW=1929.86 / Q_{100}=3460

FP=1927.60 / 3.043
FW=1927.60 / Q_{100}=3540

FP=1926.08 / 3.046
FW=1926.18 / Q_{100}=3540

FP=1925.78 / 3.007
FW=1925.81 / Q_{100}=3540

FP=1924.49 / 2.959
FW=1924.49 / Q_{100}=3540

FP=1923.69 / 2.945
FW=1923.69 / Q_{100}=3540

2.952 / Q_{100}=3540 / FP=1923.92 / FW=1923.92

2.939 / Q_{100}=3540 / FP=1923.64 / FW=1923.64

2.932 / Q_{100}=3540 / FP=1921.26 / FW=1924.28

2.919 / Q_{100}=3540 / FP=1920.57 / FW=1920.99

2.850 / Q_{100}=3540 / FP=1916.55 / FW=1916.77

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY
ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 / Q_{100}=1270 / FP=1400.55 / FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
DV0929		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:
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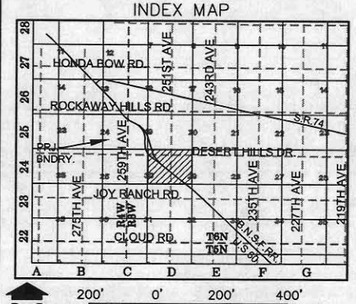
HERMAN A. ARISTIZABAL 20737 REGISTERED PROFESSIONAL ENGINEER ARIZONA, U.S.A.

INDEX MAP



200' 0' 200' 400'

SCALE: 1"= 200'

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PLANS CHK.	AMG/HAA	07/2005
SUBMITTED BY:		DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET D-24 OF FLOODPLAIN DELINEATION

FILE: P:\301\310\310032 (Wittmann ADMSU)\Task\hydraulics\FP-D_24.dwg DATE: 07/27/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

SEE SHEET D-26

ERM DV0929

0.156 Q100=1520 FP=2008.85 FW=2009.20

0.100 Q100=1520 FP=2006.57 FW=2007.47

IONA NORTH WEST SPLIT-1

0.000 Q100=3210 FP=2000.82 IONA NORTH WEST SPLIT-1 FW=2001.75

251ST AVE (ALIGNMENT)

FP=2012.90 4.584 FW=2013.06 Q100=2170

IONA WASH NORTH

FP=2006.76 4.486 FW=2007.59 Q100=2170

ZONE AE

IONA NORTH FP=2000.82 4.396 FW=2007.75 Q100=3210

FP=1995.58 4.312 FW=1995.95 Q100=2180

FP=1991.86 4.247 FW=1991.97 Q100=3460

LIMIT OF DETAILED STUDY

FP=1987.62 4.164 FW=1988.14 Q100=3460

FP=1983.72 4.092 FW=1984.21 Q100=3460

FW

FP=1980.93 4.038 FW=1981.33 Q100=3460

IONA WASH NORTH

ZONE AE

FP=1975.63 3.948 FW=1976.34 Q100=3460

FP=1972.16 3.879 FW=1972.85 Q100=3410

FP=1966.72 3.796 FW=1967.21 Q100=3460

FP=1960.27 3.689 FW=1960.40 Q100=3460

FW

ZONE AE

EFFECTIVE ZONE A

U.S. 60 GRAND AVE.

B.N.S.F. RR.

SEE SHEET C-25

SEE SHEET E-25

SEE SHEET D-24

FILE: P:\301\310\310032 (Wittmann ADMSJ)\Task\Hydraulics\FP-D_25.dwg DATE: 07/27/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A — ZONE A

EFFECTIVE ZONE AE — ZONE AH

EFFECTIVE ZONE AH — ZONE AE

EFFECTIVE FLOODWAY — FLOODWAY (FW)

ZONE AO

HYDRAULIC BASE LINE

ZONE DESIGNATION — ZONE A

WASH I.D. LABEL — WASH 9 EAST

ELEVATION REFERENCE MARK — ERM AJ3866

CROSS SECTION — 2.199 Q100=1270 FP=1400.55 FW=1400.56

BASE FLOOD ELEVATION — 1320

DIKE / LEVEE — DIKE

COUNTY BOUNDARY

CORPORATE LIMIT

LIMIT OF STUDY

LIMIT OF DETAILED STUDY

TOWNSHIP/RANGE LINE

SECTION LINE

SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

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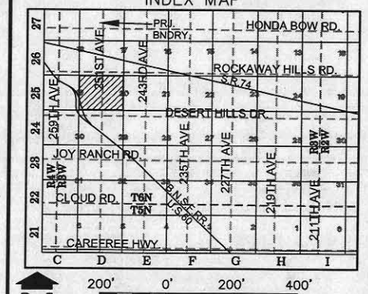
NOTE:

1. NGVD 29 + 2.05 FEET = NAVD 88.

29737 HERMAN A. ARISTIZABAL

INDEX MAP



200' 0' 200' 400'

SCALE: 1"= 200'

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PLANS CHK.	AMG/HAA	07/2005

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RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET D-25 OF FLOODPLAIN DELINEATION

SEE SHEET D-27

ERM AJ3887

EFFECTIVE ZONE A

EFFECTIVE ZONE A

S.R.74

2050

5.018 FP=2038.86
Q100=3100 FW=2039.49

4.925 FP=2032.56
Q100=3100 FW=2033.47

0.549 FP=2032.50
Q100=3100 FW=2033.47

IONA NORTH WEST SPLIT-1

4.828 FP=2026.07
Q100=2170 FW=2026.84

0.450 FP=2026.70
Q100=1520 FW=2027.55

IONA WASH NORTH

ZONE AE

4.755 FP=2022.28
Q100=2170 FW=2023.10

LIMIT OF DETAILED STUDY

0.388 FP=2023.61
Q100=1520 FW=2024.50

0.318 FP=2018.70
Q100=1520 FW=2018.87

IONA NORTH WEST SPLIT-1

IONA WASH NORTH

ZONE AE

0.224 FP=2013.60
Q100=1520 FW=2014.06

FP=2017.39 4.664
FW=2018.36 Q100=2170

FP=2012.50 4.584
FW=2013.06 Q100=2170

0.156 FP=2008.85
Q100=1520 FW=2009.20

25151 AVE (ALIGNMENT)

ROCKAWAY HILLS RD (ALIGNMENT)

SEE SHEET C-26

SEE SHEET E-26

SEE SHEET D-25

FILE: P:\300\310\310032 (Wittmann ADMS)\Task\Hydraulics\FP-D_26.dwg DATE: 07/27/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY
ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 / Q_{100}=1270 — FP=1400.55 / FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

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I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
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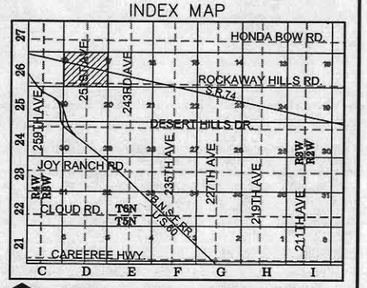
29737 HERNAN A. ARISTIZABAL Date Signed 7/27/05 ARIZONA, U.S.A.

INDEX MAP



N

200' 0' 200' 400'

SCALE: 1"= 200'

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FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

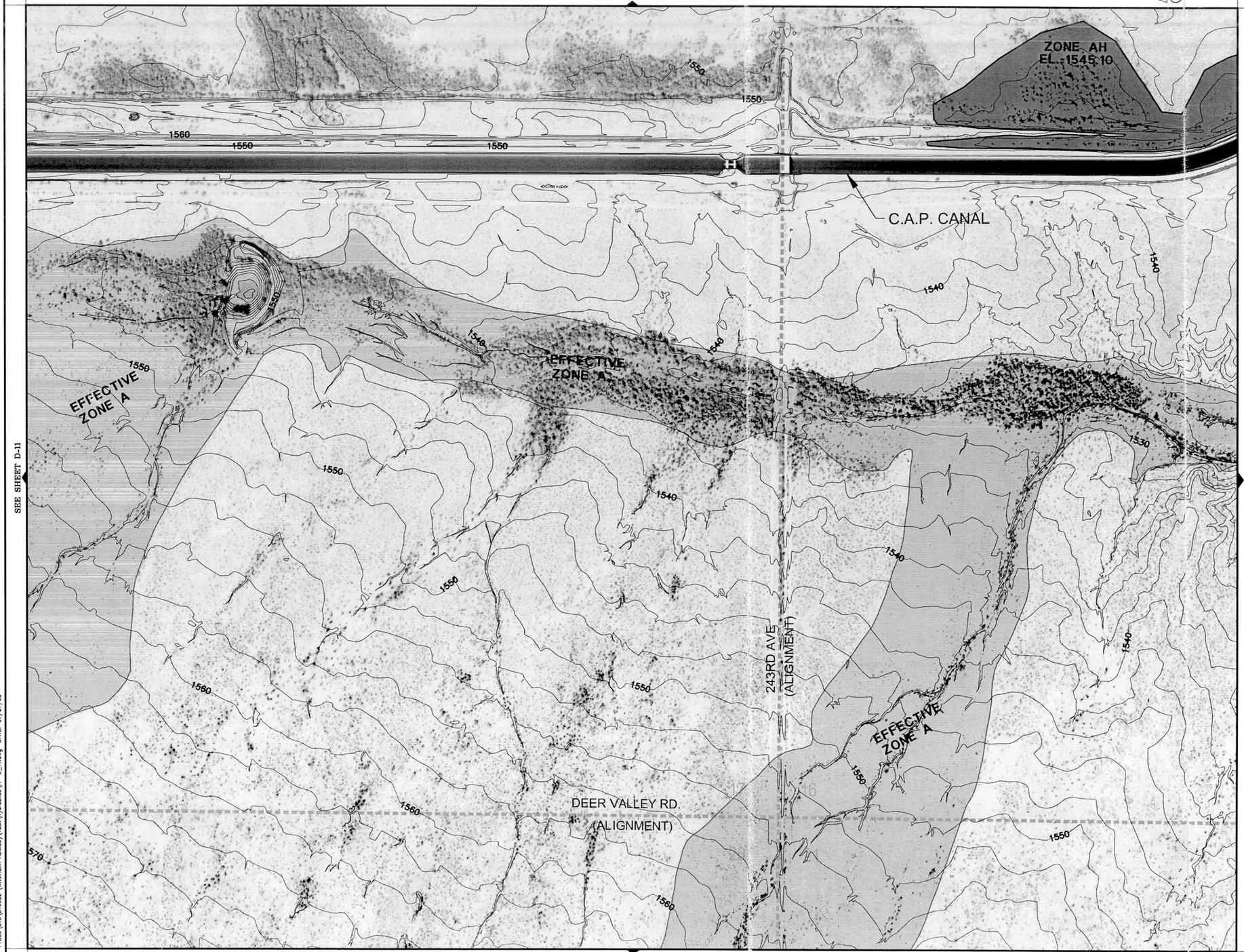
APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET D-26 OF FLOODPLAIN DELINEATION

SEE SHEET E-12

ERM AJ3861



SEE SHEET D-11

SEE SHEET F-11

SEE SHEET E-10

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FILE: P:\001\310\310032 (Wittmann ADMSU)\Task\hydraulics\FP-E_11.dwg DATE: 07/27/05

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A — ZONE A
EFFECTIVE ZONE AE — ZONE AH
EFFECTIVE ZONE AH — ZONE AE
EFFECTIVE FLOODWAY — FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 / Q_{100}=1270 — FP=1400.55 / FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

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NOTE:

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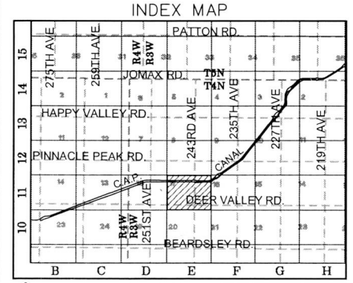
CERTIFICATE NO. 29737 HERNAN A. ARISTIZABAL, RPLS — Not Valid Without Signature — ARIZONA, U.S.A.

INDEX MAP



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SCALE: 1"= 200'

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SUBMITTED BY: DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET E-11 OF FLOODPLAIN DELINEATION

SEE SHEET E-13

ERM AJ3861

SEE SHEET D-12

SEE SHEET F-12

SEE SHEET E-11

1.049 / Q_{100}=4250 FP=1558.40 FW=1559.30

FP=1556.77 FW=1556.60 0.948 Q_{100}=4250

FP=1553.62 FW=1554.62 0.860 Q_{100}=4250

FP=1551.84 FW=1552.75 0.781 Q_{100}=4250

FP=1550.05 FW=1551.04 0.701 Q_{100}=4250

FP=1547.94 FW=1548.73 0.618 Q_{100}=4250

FP=1546.64 FW=1547.64 0.544 Q_{100}=4250

FP=1545.38 FW=1547.10 0.483 Q_{100}=4250

0.403 Q_{100}=4250 FP=1546.08 FW=1546.61

0.356 Q_{100}=4250 FP=1546.05 FW=1546.50

0.277 Q_{100}=4250 FP=1546.01 FW=1546.35

0.207 Q_{100}=4250 FP=1545.98 FW=1546.28

0.129 Q_{100}=4250

MARICOPA COUNTY

PINNACLE PEAK RD.
(ALIGNMENT)

SURPRISE

243RD AVE
(ALIGNMENT)

WASH 3 WEST

WASH 9 WEST

ZONE AE

FW

ZONE AH

LIMIT OF DETAILED STUDY

1570 1580 1560 1550 1552 1548 1540

8 17 16

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A / ZONE A
EFFECTIVE ZONE AE / ZONE AH
EFFECTIVE ZONE AH / ZONE AE
EFFECTIVE FLOODWAY / FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE

ZONE DESIGNATION — ZONE A

WASH I.D. LABEL — WASH 9 EAST

ELEVATION REFERENCE MARK — ERM AJ3866

CROSS SECTION — 2.199 / Q_{100}=1270 FP=1400.55 FW=1400.56

BASE FLOOD ELEVATION — 1320

DIKE / LEVEE — DIKE

COUNTY BOUNDARY

CORPORATE LIMIT

LIMIT OF STUDY

LIMIT OF DETAILED STUDY

TOWNSHIP/RANGE LINE

SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

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Certificate No. 29737 — HERNAN A. ARISTIZABAL — Date Signed 7/13/05 — ARIZONA, U.S.A.

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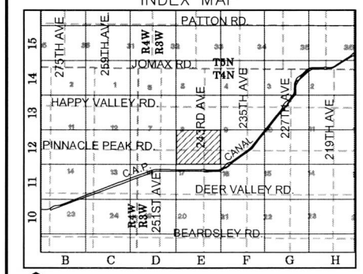

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FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

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APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET E-12 OF FLOODPLAIN DELINEATION

FILE: P:\300\310\310032 (Wittmann ADMS)\Task\Hydraulics\FP-E_12.dwg DATE: 07/22/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

SEE SHEET E-14

SEE SHEET D-13

SEE SHEET F-13

SEE SHEET E-12

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY
ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
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HERNAN A. ARISTIZABAL 29737 ARIZONA, U.S.A.

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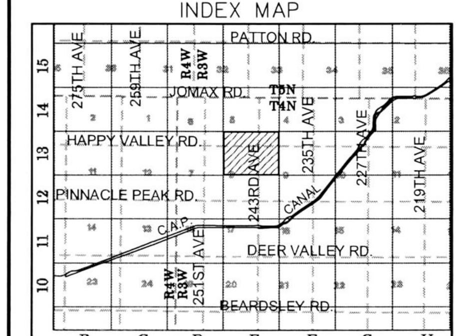

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APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET E-13 OF FLOODPLAIN DELINEATION

FILE: P:\300\310\310032 (Wittmann ADMSU)\Task\hydraulics\FP-E_13.dwg DATE: 07/22/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

SEE SHEET E-15

ERM AJ3861

FP=1617.47 1.489
FW=1618.13 Q100=2100

FP=1614.53 1.412
FW=1614.83 Q100=2100

FP=1612.21 1.353
FW=1612.88 Q100=2100

FP=1609.84 1.274
FW=1610.46 Q100=2100

FP=1606.30 1.184
FW=1606.75 Q100=2100

FP=1603.08 1.090
FW=1603.70 Q100=2100

FP=1600.29 1.005
FW=1601.18 Q100=2100

FP=1596.99 0.921
FW=1597.72 Q100=2100

FP=1592.80 0.831
FW=1593.30 Q100=2100

FP=1588.50 0.734
FW=1589.06 Q100=2100

FP=1585.52 0.641
FW=1586.11 Q100=2100

FP=1618.36 1.539 FW=1618.98
Q100=2100

ZONE AE

FW

LIMIT OF DETAILED STUDY

T4N-R3W-S08E

T4N-R3W-S08E

243RD AVE ALIGNMENT

243RD AVE (ALIGNMENT)

MARICOPA COUNTY

JOMAX RD. (ALIGNMENT)

SURPRISE

T5N

T4N

32

33

1

4

1610

1612

1608

1604

1600

1592

1590

SEE SHEET D-14

SEE SHEET F-14

SEE SHEET E-13

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A — ZONE A
EFFECTIVE ZONE AE — ZONE AH
EFFECTIVE ZONE AH — ZONE AE
EFFECTIVE FLOODWAY — FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 Q100=1270 FP=1400.55 FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

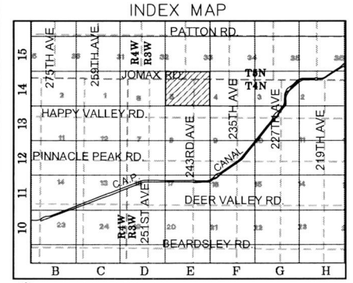
NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3861		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:
1. NGVD 29 + 1.90 FEET = NAVD 88.

CERTIFICATE NO. 29737 HERNAN A. ARISTIZABAL Date Signed 1/31/08 ARIZONA, U.S.A.

INDEX MAP



200' 0' 200' 400'
SCALE: 1"= 200'

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	BY	DATE
DESIGN	AMG/RAS	07/2005
DESIGN CHK.	HAA	07/2005
PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005
SUBMITTED BY:		DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET E-14 OF FLOODPLAIN DELINEATION

FILE: P:\300\310\310032 (Wittmann ADMSU)\Task\Hydraulics\FP-E_14.dwg DATE: 07/27/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

SEE SHEET E-16

SEE SHEET D-15

SEE SHEET F-15

SEE SHEET E-14

ERM AJ3873

32 33 1

1640 1640 1630 1630 1630 1630 1630 1620 1620 1620 1620 1620 1610 1610

OBERLIN WY

243RD AVE (ALIGNMENT)

239TH AVE.

PINNACLE VISTA DR.

FP=1623.86 FW=1624.67 1.737 Q_{100}=2100

FP=1621.96 FW=1622.31 1.666 Q_{100}=2100

FP=1619.63 FW=1619.75 1.607 Q_{100}=2100

T4N-R3W-S08E

FP=1618.36 FW=1618.98 1.539 Q_{100}=2100

1620 1620 FW 1.6 ZONE AE

FP=1617.47 FW=1618.13 1.489 Q_{100}=2100

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY
ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 / Q_{100}=1270 — FP=1400.55 / FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

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NOTE:

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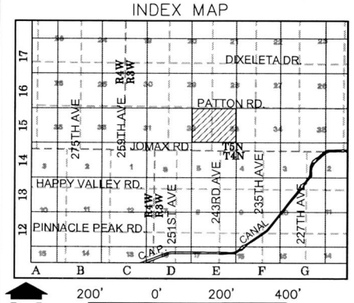
Professional Engineering Certificate No. 29737 HERNAN A. ARISTIZABAL Date Signed 1/1/06 ARIZONA, U.S.A.

INDEX MAP



N

200' 0' 200' 400'

SCALE: 1"= 200'

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	BY	DATE
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PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005

SUBMITTED BY: DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET E-15 OF FLOODPLAIN DELINEATION

FILE: P:\300\310\310032 (Wittmann ADMSU)\Task\hydraulics\FP-E_15.dwg DATE: 07/22/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

SEE SHEET E-17

ERM AJ3873

SEE SHEET D-16

SEE SHEET F-16

SEE SHEET E-15

FILE: P:\300\310\310032 (Wittmann ADMS)\Task\hydraulics\FP-E_16.dwg DATE: 07/27/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A — ZONE A
EFFECTIVE ZONE AE — ZONE AH
EFFECTIVE ZONE AH — ZONE AE
EFFECTIVE FLOODWAY — FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 / Q100=1270 — FP=1400.55 / FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

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I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
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NOTE:

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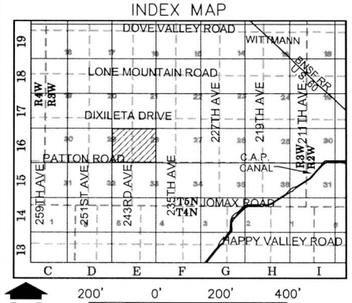
CERTIFICATE NO. 39737 HERMAN A. ARISTIZABAL — ARIZONA, U.S.A.

INDEX MAP



200' 0' 200' 400'

SCALE: 1" = 200'

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DESIGN	AMG/RAS	07/2005
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PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

SUBMITTED BY: DATE:

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET E-16 OF FLOODPLAIN DELINEATION

SEE SHEET E-18

SEE SHEET D-17

SEE SHEET F-17

SEE SHEET E-16

ERM AJ3873

4.413 / Q100=5650 FP=1682.40 FW=1683.11

4.314 / Q100=6610 FP=1679.28 FW=1679.70

4.243 / Q100=6610 FP=1677.06 FW=1677.75

4.161 / Q100=6610 FP=1674.73 FW=1675.38

4.071 / Q100=6610 FP=1671.92 FW=1672.13

3.990 / Q100=6610 FP=1669.34 FW=1669.60

3.889 / Q100=6610 FP=1666.49 FW=1666.59

3.818 / Q100=6610 FP=1663.72 FW=1664.31

3.736 / Q100=6610 FP=1660.77 FW=1661.71

3.648 / Q100=6610 FP=1658.11 FW=1658.94

3.528 / Q100=6610 FP=1653.93 FW=1654.79

3.415 / Q100=6610 FP=1650.23 FW=1650.95

IONA WASH

FW

ZONE AE

LIMIT OF DETAILED STUDY

DIXILETA DRIVE (ALIGNMENT)

243RD AVE (ALIGNMENT)

29

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY
ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
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CROSS SECTION — 2.199 / Q100=1270 FP=1400.55 FW=1400.56
BASE FLOOD ELEVATION 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER 29

ELEVATION REFERENCE MARKS

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NOTE:

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CERTIFICATE NO. 29737 HERNAN A. ARISTIZABAL — Date Signed 1/7/08 — ARIZONA, U.S.A.

INDEX MAP

DOVE VALLEY ROAD, WITTMANN, LONE MOUNTAIN ROAD, DIXILETA DRIVE, PATTON ROAD, C.A.P. CANAL, JOMAX ROAD, HAPPY VALLEY RD., 227TH AVE, 219TH AVE, 211TH AVE, 251ST AVE, 243RD AVE, 235TH AVE, T5N, T4N, R4W, R3W, R2W

C D E F G H I

200' 0' 200' 400'

SCALE: 1"= 200'

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FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET E-17 OF FLOODPLAIN DELINEATION

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FILE: P:\300\310\310032 (Wittmann ADMS)\Task\hydraulics\FP-E_17.dwg DATE: 07/27/05

SEE SHEET E-19

ERM AJ3873

EFFECTIVE IONA WASH ZONE AE & FW

20 Q100=300 (AO)

2.545 Q100=1000

1700

IONA EAST SPLIT-1

ZONE AO (DEPTH 1)

4.901 Q100=5650

FP=1696.69 FW=1697.44

243RD AVE (ALIGNMENT)

LONE MOUNTAIN ROAD (ALIGNMENT)

LIMIT OF STUDY

ZONE AE

LIMIT OF DETAILED STUDY

4.844 Q100=5650

FP=1695.44 FW=1696.42

FP=1693.59 FW=1693.75 4.772 Q100=5650

4.696 Q100=5650

FP=1691.08 FW=1691.57

4.629 Q100=5650

FP=1690.43 FW=1690.64

IONA WASH

FW

1690

1680

FP=1684.97 FW=1686.81 4.479 Q100=5650

FP=1682.40 FW=1683.11 4.413 Q100=5650

10 Q100=300 (AO)

2.054 Q100=1000 FP=1681.63 FW=1682.19

FP=1679.28 FW=1679.70 4.374 Q100=5650

4.547 Q100=5650 FP=1687.45 FW=1688.43

SEE SHEET D-18

SEE SHEET F-18

SEE SHEET E-17

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FILE: P:\300\310\310032 (Wittmann ADMSJ)\Task\hydraulics\FP-E_18.dwg DATE: 07/26/05

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

- EFFECTIVE ZONE A / ZONE A
- EFFECTIVE ZONE AE / ZONE AH
- EFFECTIVE ZONE AH / ZONE AE
- EFFECTIVE FLOODWAY / FLOODWAY (FW)
- ZONE AO
- HYDRAULIC BASE LINE
- ZONE DESIGNATION — ZONE A
- WASH I.D. LABEL — WASH 9 EAST
- ELEVATION REFERENCE MARK — ERM AJ3866
- CROSS SECTION — 2.199 Q100=1270 FP=1400.55 FW=1400.56
- BASE FLOOD ELEVATION — 1320
- DIKE / LEVEE — DIKE
- COUNTY BOUNDARY
- CORPORATE LIMIT
- LIMIT OF STUDY
- LIMIT OF DETAILED STUDY
- TOWNSHIP/RANGE LINE
- SECTION LINE
- SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3873		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

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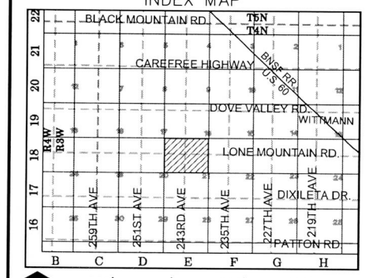
CERTIFICATE NO. 39737 HERNAN A. ARISTIZABAL Date Signed 7/27/05 ARIZONA, U.S.A.

INDEX MAP



200' 0' 200' 400'

SCALE: 1" = 200'

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PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005

SUBMITTED BY: DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET E-18 OF FLOODPLAIN DELINEATION

SEE SHEET E-20

ERM AJ3873

SEE SHEET D-19

SEE SHEET F-19

SEE SHEET E-18

ZONE A

1740

3.419
Q_{100}=290

LIMIT OF DETAILED STUDY

ZONE AO
(DEPTH 1)

DOVE VALLEY RD
(ALIGNMENT)

LIMIT OF STUDY

IONA EAST SPLIT-1

3,130
Q_{100}=440

30
Q_{100}=300
(AO)

EFFECTIVE
IONA WASH
ZONE AE & FW

IONA TRIBUTARY

0.000
Q_{100}=4500

1720

1740

2.828
Q_{100}=1000

1720

LIMIT OF DETAILED STUDY

243RD AVE
(ALIGNMENT)

ZONE AO
(DEPTH 1)

2.545
Q_{100}=1000

ZONE A

20
Q_{100}=300
(AO)

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY

ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
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NOTE:

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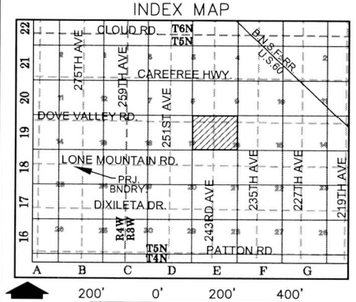
REGISTERED PROFESSIONAL ENGINEER
29737
HERNAN A. ARISTIZABAL
Date Signed 7/7/05
ARIZONA, U.S.A.

INDEX MAP



N

200' 0' 200' 400'

SCALE: 1" = 200'

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SUBMITTED BY:		DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET E-19 OF FLOODPLAIN DELINEATION

FILE: P-300\310\310032 (Wittmann ADMSU)\Task\hydraulics\FP-E_19.dwg DATE: 07/26/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

SEE SHEET E-21

SEE SHEET D-20

SEE SHEET F-20

SEE SHEET E-19

ERM AJ3873

IONA WASH NORTH
ZONE AE
LIMIT OF DETAILED STUDY
ZONE AO (DEPTH 1)
FP=1781.65
FW=1782.55
0.104
Q_{100}=1330
1780
ZONE AO (DEPTH 1)
0.000
Q_{100}=1330
50
(AO)
Q_{100}=730
EFFECTIVE IONA WASH ZONE AE & FW
4.349
Q_{100}=190
LIMIT OF STUDY
LIMIT OF STUDY
IONA EAST SPLIT-1
LIMIT OF STUDY
ZONE A
4.047
Q_{100}=290
ZONE AO (DEPTH 1)
243RD AVE (ALIGNMENT)
1760
ZONE AO (DEPTH 1)
40
(AO)
Q_{100}=730
ZONE A
0.493
Q_{100}=660
0.401
Q_{100}=660
LIMIT OF STUDY
1780
1780
CIRCLE CITY AREA WASH-1
1790
EFFECTIVE CIRCLE CITY AREA WASH-1 ZONE AE
1760
3.759
Q_{100}=290
IONA EAST SPLIT-1
1760

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY
ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199, Q_{100}=1270, FP=1400.55, FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
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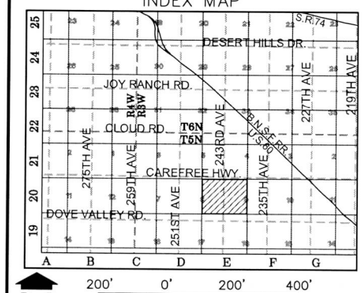
CERTIFICATE No. 29737 HERNAN A. ARISTIZABAL Date Signed 7/27/05 ARIZONA U.S.A.

INDEX MAP



200' 0' 200' 400'
SCALE: 1"= 200'

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	BY	DATE
DESIGN	AMG/RAS	07/2005
DESIGN CHK.	HAA	07/2005
PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005
SUBMITTED BY:		DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET E-20 of FLOODPLAIN DELINEATION

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FILE: P:\300\310\310032 (Wittmann ADMSU)\Task\Hydraulics\FP-E_20.dwg DATE: 07/27/05

SEE SHEET E-22

ERM AJ3873

IONA WASH NORTH FP=1823.74 FW=1823.98 0.991 Q100=4550

IONA EAST SPLIT-1 FP=1823.91 FW=1824.28 5.261 Q100=4550

IONA WASH NORTH FP=1818.21 FW=1818.34 0.905 Q100=1330

IONA E.S.-1 FP=1820.25 FW=1820.41 3.172 Q100=700

IONA E.S.-1 FP=1816.27 FW=1816.53 5.108 Q100=700

IONA WASH NORTH FP=1814.53 FW=1815.49 0.833 Q100=1330

FP=1813.12 FW=1814.00 5.056 Q100=700

FP=1812.11 FW=1812.92 0.765 Q100=1330

FP=1809.66 FW=1809.96 4.977 Q100=700

FP=1808.70 FW=1809.42 0.682 Q100=1330

FP=1807.32 FW=1807.89 0.656 Q100=1330

FP=1806.16 FW=1806.26 4.895 Q100=700

FP=1803.64 FW=1804.55 0.569 Q100=1330

FP=1802.82 FW=1803.60 4.808 Q100=700

FP=1803.64 FW=1804.55 0.569 Q100=1330

FP=1798.80 FW=1799.63 4.732 Q100=700

FP=1800.15 FW=1800.98 0.492 Q100=1330

FP=1795.43 FW=1796.16 4.638 Q100=700

FP=1796.48 FW=1797.46 0.396 Q100=1330

FP=1792.40 FW=1793.22 0.305 Q100=1331

FP=1791.23 FW=1792.23 4.539 Q100=700

FP=1788.05 FW=1788.76 4.460 Q100=190

0.219 Q100=1330 FP=1788.22 FW=1789.01

60 Q100=730

1.464 Q100=520 FP=1829.16 FW=1829.93

1.373 Q100=520 FP=1824.22 FW=1824.24

1.281 Q100=620 FP=1817.80 FW=1818.09

1.208 Q100=660 FP=1814.10 FW=1814.95

1.121 Q100=660 FP=1810.36 FW=1810.39

1.030 Q100=660 FP=1805.73 FW=1805.73

0.977 Q100=660 FP=1803.02 FW=1802.99

0.894 Q100=660 FP=1798.39 FW=1799.15

0.829 Q100=660 FP=1794.37 FW=1795.30

0.707 Q100=660 FP=1789.87 FW=1790.17

0.629 Q100=660 FP=1785.93 FW=1786.62

0.555 Q100=660 FP=1781.73 FW=1781.74

0.493 Q100=660

ZONE AE

ZONE A

ZONE AO (DEPTH 1)

FW

LIMIT OF DETAILED STUDY

IONA WASH NORTH

IONA EAST SPLIT-1

CIRCLE CITY AREA WASH-1

243RD AVE (ALIGNMENT)

CAREFREE RD. (ALIGNMENT)

SEE SHEET D-21

SEE SHEET F-21

SEE SHEET E-20

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A — ZONE A
EFFECTIVE ZONE AE — ZONE AH
EFFECTIVE ZONE AH — ZONE AE
EFFECTIVE FLOODWAY — FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 Q100=1270 FP=1400.55 FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3873		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:
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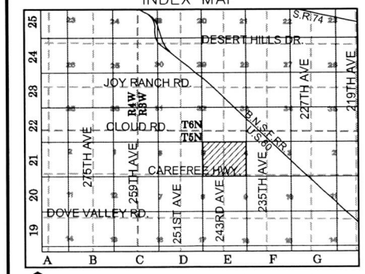
CERTIFICATE OF SURVEY — 29737 HERMAN A. ARISTIZABAL — ARIZONA, U.S.A.

INDEX MAP



N

200' 0' 200' 400'

SCALE: 1"= 200'

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PLANS CHK.	AMG/HAA	07/2005
SUBMITTED BY:		DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET E-21 OF FLOODPLAIN DELINEATION

FILE: P-300\310\310032 (Wittmann ADMS)\Task\hydraulics\FP-E_21.dwg DATE: 07/27/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

SEE SHEET E-23

ERM DV0929

EFFECTIVE CIRCLE CITY AREA WASH 7 ZONE AE & FW

EFFECTIVE CIRCLE CITY AREA WASH 6 ZONE AE & FW

EFFECTIVE ZONE A

B.N.S.F.RR.

U.S.60 (GRAND AVE.)

EFFECTIVE TRILBY WASH ZONE AE & FW

243RD AVE (ALIGNMENT)

LIMIT OF STUDY

FP=1841.65 FW=1842.59 1.406 Q_{100}=3710

ZONE AE

LIMIT OF DETAILED STUDY

FP=1840.69 FW=1841.55 1.293 Q_{100}=4550

BLACK MOUNTAIN RD. / CLOUD RD. (ALIGNMENT)

T5N

T6N

FP=1835.72 FW=1836.11 1.219 Q_{100}=4550

FW

FP=1831.32 FW=1832.29 1.147 Q_{100}=4550

IONA WASH NORTH

ZONE AE

FP=1827.91 FW=1828.90 1.074 Q_{100}=4550

LIMIT OF DETAILED STUDY

FP=1846.31 FW=1846.27 1.738 Q_{100}=520

FP=1843.34 FW=1843.65 1.687 Q_{100}=520

FP=1838.65 FW=1839.22 1.610 Q_{100}=520

C.C. AREA WASH-1

FP=1833.96 FW=1834.03 1.539 Q_{100}=520

FP=1829.16 FW=1829.93 1.454 Q_{100}=520

SEE SHEET E-21

SEE SHEET D-22

SEE SHEET F-22

FILE: P:\300\310\310032 (Wittmann ADMS)\Task\Hydraulics\FP-E_22.dwg DATE: 07/27/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A — ZONE A
EFFECTIVE ZONE AE — ZONE AH
EFFECTIVE ZONE AH — ZONE AE
EFFECTIVE FLOODWAY — FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 / Q_{100}=1270 — FP=1400.55 / FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

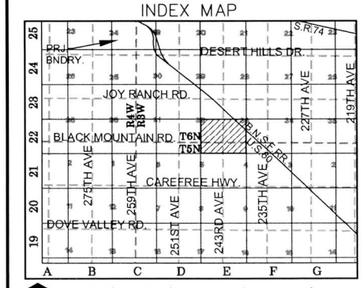
I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
DV0929		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 2.00 FEET = NAVD 88.

CERTIFICATE NO. 29757 HERNAN A. ARISTIZABAL ARIZONA, U.S.A.

INDEX MAP



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200' 0' 200' 400'

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PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

SUBMITTED BY: DATE:

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET E-22 OF FLOODPLAIN DELINEATION

SEE SHEET E-27

ERM AJ3887

EFFECTIVE ZONE A

EFFECTIVE ZONE A

EFFECTIVE ZONE A

EFFECTIVE ZONE A

FP=2038.86 5.018
FW=2039.49 Q_{100}=3100

LIMIT OF DETAILED STUDY

S.R.74

IONA WASH NORTH

243RD AVE (ALIGNMENT)

ROCKAWAY HILLS RD. (ALIGNMENT)

2120

2100

2080

2080

SEE SHEET D-26

SEE SHEET F-26

SEE SHEET E-25

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY
ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 / Q_{100}=1270 — FP=1400.55 / FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

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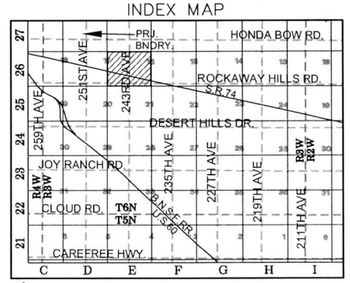
NOTE:

1. NGVD 29 + 2.05 FEET = NAVD 88.

CERTIFICATE NO. 29737 HERNAN A. ARISTIZABAL Date Signed 7/7/05 ARIZONA, U.S.A.

INDEX MAP



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SCALE: 1"= 200'

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PLANS CHK.	AMG/HAA	07/2005

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

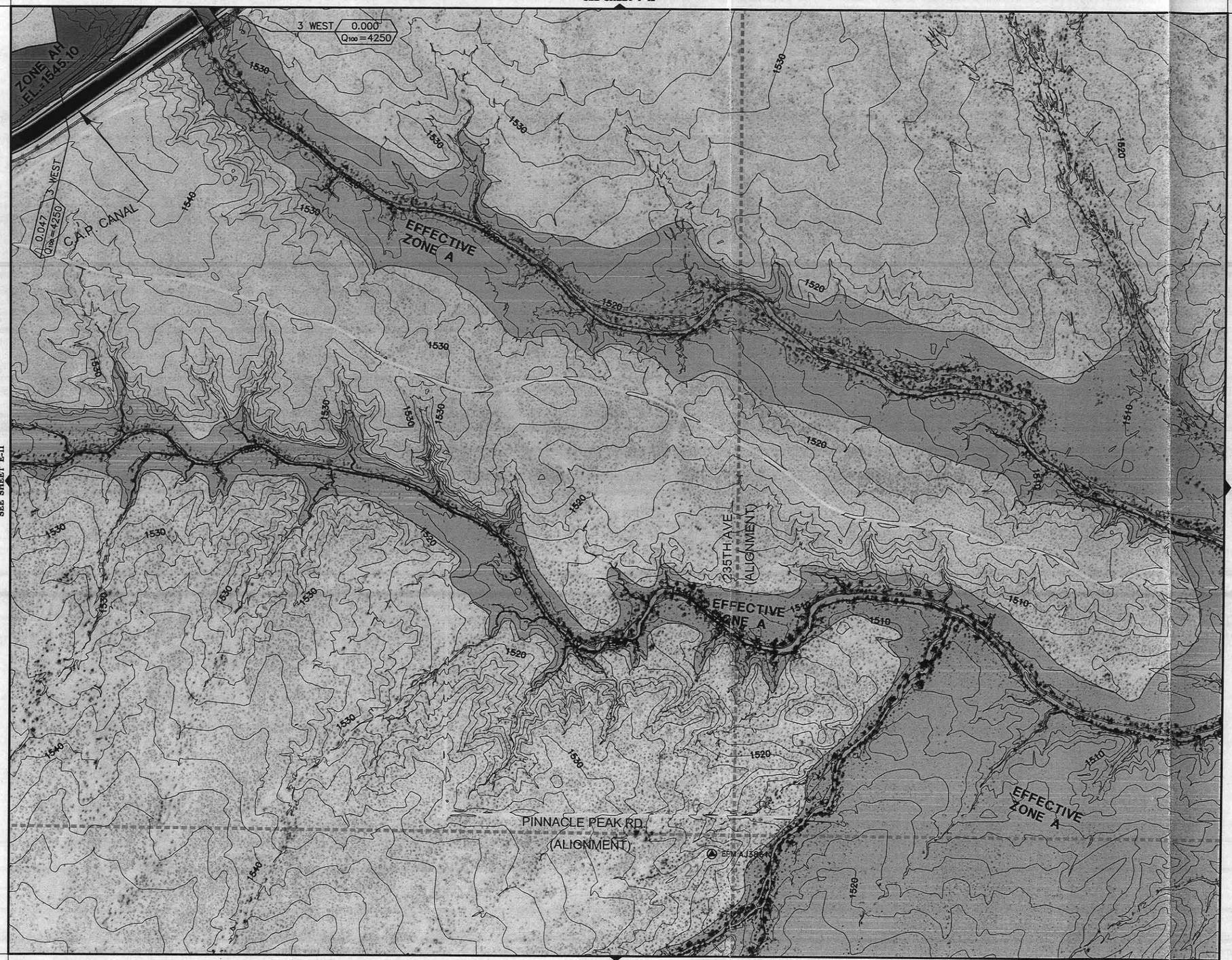
SUBMITTED BY: DATE:

SHEET E-26 OF FLOODPLAIN DELINEATION

FILE: P:\300\310\310032 (Wittmann ADMS)\Task\Hydraulics\FP-E_26.dwg DATE: 07/27/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

SEE SHEET F-12



SEE SHEET E-11

SEE SHEET G-11

SEE SHEET F-10

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A — ZONE A
EFFECTIVE ZONE AE — ZONE AH
EFFECTIVE ZONE AH — ZONE AE
EFFECTIVE FLOODWAY — FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 Q100=1270 FP=1400.55 FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

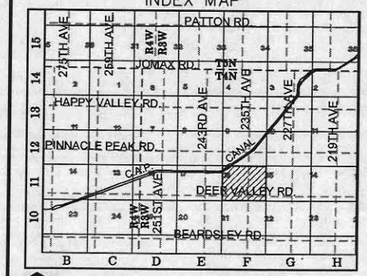
NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3861		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 1.90 FEET = NAVD 88.

INDEX MAP



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FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

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APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET F-11 OF FLOODPLAIN DELINEATION

FILE: P:\301\301\10032 (Wittmann ADMS)\Task\Hydraulics\FP-F_11.dwg DATE: 07/22/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

SEE SHEET F-13

ERM AJ3861

SEE SHEET E-12

SEE SHEET G-12

SEE SHEET F-11

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FILE: P:\300\310\310032 (Wittmann ADMS)\Task\hydraulics\FP-F_12.dwg DATE: 07/22/05

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY
ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 / Q100=1270 — FP=1400.55 / FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
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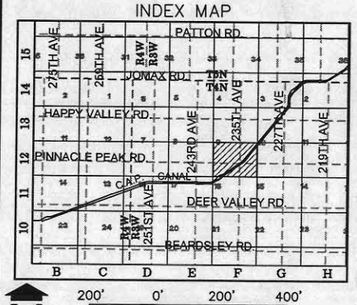
NOTE:

1. NGVD 29 + 1.90 FEET = NAVD 88.

Registered Professional Engineer — 29737 — HERNAN A. ARISTIZABAL — Date Signed 7/21/05 — ARIZONA, U.S.A.

INDEX MAP



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FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET F-12 OF FLOODPLAIN DELINEATION

SEE SHEET F-14

ERM AJ3861

HAPPY VALLEY RD.
(ALIGNMENT)

235TH AVE
(ALIGNMENT)

C.A.P. CANAL

ZONE AH
EL.=1553.48

1580
1570
1560
1550

4
3
9
10

SEE SHEET E-18

SEE SHEET G-18

SEE SHEET F-12

FILE: P:\300\310\310032 (Wittmann ADMS)\Task\hydraulics\FP-F_13.dwg DATE: 07/26/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY
ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
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DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

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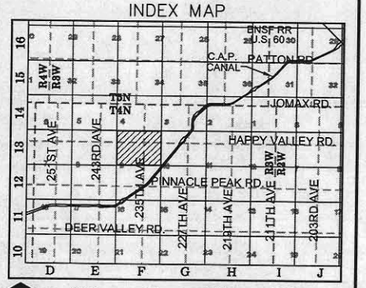
NOTE:
1. NGVD 29 + 1.90 FEET = NAVD 88.

Registered Professional Engineer — 21757 — HERMAN A. ARISTIZABAL — Date Signed 7/26/05 — ARIZONA, U.S.A.

INDEX MAP



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RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET F-13 OF FLOODPLAIN DELINEATION

SEE SHEET F-15

ERM AJ3866

SEE SHEET E-14

SEE SHEET G-14

SEE SHEET F-13

MARICOPA COUNTY

SURPRISE

235TH AVE (ALIGNMENT)

JOMAX ROAD (ALIGNMENT)

T5N
T4N

33
34

IONA WASH EAST SPLIT-2

IONA WASH

ZONE AE

ZONE A

LIMIT OF DETAILED STUDY

1.404 Q100=2960 FP=1583.78 FW=1564.15

1.322 Q100=2960 FP=1581.81 FW=1582.35

1.186 Q100=2960 FP=1574.49 FW=1575.23

1.143 Q100=4090 FP=1581.30

1.264 Q100=2960 FP=1577.92 FW=1578.27

1.109 Q100=2960 FP=1573.53 FW=1574.27

1.015 Q100=2960 FP=1563.25 FW=1569.67

0.914 Q100=2960 FP=1567.68 FW=1568.27

0.821 Q100=3010 FP=1566.22 FW=1566.28

0.726 Q100=3010 FP=1563.74 FW=1563.89

1600, 1590, 1580, 1570, 1584

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY
ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 Q100=1270 FP=1400.55 FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

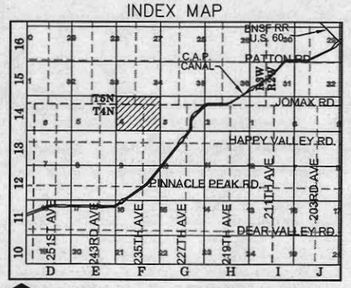
I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3866		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 1.90 FEET = NAVD 88.

HERMAN A. ARISTIZABAL 37737 — Registered Professional Engineer — Arizona, U.S.A.

INDEX MAP



N

200' 0' 200' 400'

SCALE: 1"= 200'

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DESIGN CHK.	HAA	07/2005
PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005
SUBMITTED BY:		DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET F-14 OF FLOODPLAIN DELINEATION

FILE: P:\300\310\310032 (Wittmann ADMSU)\Task\Hydrology\FP-0_14.dwg DATE: 07/27/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

SEE SHEET F-16

ERM AJ3873

SEE SHEET E-15

SEE SHEET G-15

SEE SHEET F-14

FILE: P:\300\310\310032 (Wittmann ADMSU)\Task\hydrolics\FP-F_15.dwg DATE: 07/27/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

2.151 Q100=7020 FP=1615.22 IONA (ES-2)
2.293 Q100=7020 FP=1615.22 FW=1615.48
2.237 Q100=1780 FP=1612.73 FW=1612.73
2.137 Q100=1780 FP=1609.98 FW=1610.11
2.060 Q100=1780 FP=1608.37 FW=1608.37
1.985 Q100=1780 FP=1605.01 FW=1605.54
1.907 Q100=1780 FP=1602.51 FW=1602.63
1.847 Q100=1780 FP=1600.76 FW=1600.82
1.762 Q100=1780 FP=1595.61 FW=1595.65
1.671 Q100=1780 FP=1592.04 FW=1592.18
1.587 Q100=1780 FP=1589.30 FW=1589.63
1.496 Q100=1780 FP=1585.42 FW=1586.38

FP=1612.57 2.051 Q100=4090
FP=1609.78 1.970 Q100=4090
FP=1606.54 1.868 Q100=4090
FP=1604.21 1.798 Q100=4090
FP=1602.39 1.729 Q100=4090
FP=1600.55 1.674 Q100=4090
1.601 Q100=4090 FP=1597.78
1.482 Q100=4090 FP=1593.88
1.404 Q100=2960 FP=1563.78 FW=1594.15
1.407 Q100=4090 FP=1590.33
1.344 Q100=4090 FP=1588.07
1.224 Q100=4090 FP=1584.07

ZONE AE
FW
IONA WASH
IONA WASH EAST SPLIT 2
235TH AVE (ALIGNMENT)
237TH AVE
LIMIT OF DETAILED STUDY
Pinnacle Vista Dr.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A — ZONE A
EFFECTIVE ZONE AE — ZONE AH
EFFECTIVE ZONE AH — ZONE AE
EFFECTIVE FLOODWAY — FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 Q100=1270 FP=1400.55 FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

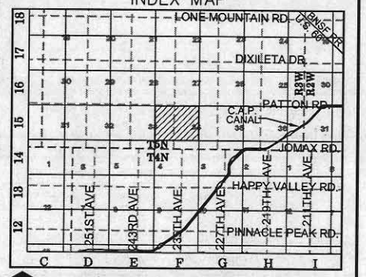
NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3873		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:
1. NGVD 29 + 1.90 FEET = NAVD 88.

HERMAN A. ARBITZABAL 28737 REGISTERED PROFESSIONAL ENGINEER ARIZONA, U.S.A.

INDEX MAP



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PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005
SUBMITTED BY:		DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET F-15 OF FLOODPLAIN DELINEATION

SEE SHEET F-17

SEE SHEET E-16

SEE SHEET G-16

SEE SHEET F-15

ERM AJ3873

FP=1644.45 / FW=1645.28 — 3.250 — Q_{100}=6610

FP=1639.99 / FW=1640.45 — 3.154 — Q_{100}=6610

FP=1637.61 / FW=1637.90 — 3.056 — Q_{100}=6610

FP=1636.10 / FW=1635.65 — 2.980 — Q_{100}=6610

FP=1633.43 / FW=1634.21 — 2.944 — Q_{100}=6610

FP=1632.36 / FW=1633.17 — 2.882 — Q_{100}=6610

FP=1628.67 / FW=1629.27 — 2.759 — Q_{100}=7020

FP=1625.47 / FW=1626.07 — 2.644 — Q_{100}=7020

FP=1621.73 / FW=1621.99 — 2.507 — Q_{100}=7020

FP=1619.12 / FW=1619.60 — 2.433 — Q_{100}=7020

FP=1617.56 / FW=1618.53 — 2.396 — Q_{100}=7020

FP=1615.22 / FW=1615.48 — 2.295 — Q_{100}=7020

FP=1615.22 — 2.151 — IONA (ES-2) Q_{300}=7020

FP=1647.05 / FW=1647.80 — 3.335 — Q_{100}=6610

ZONE AE

FW

LIMIT OF DETAILED STUDY

IONA WASH

IONA WASH EAST SPLIT

235TH AVE

231ST AVE

PATTON ROAD

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY
ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 / Q_{100}=1270 — FP=1400.55 / FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

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NOTE:

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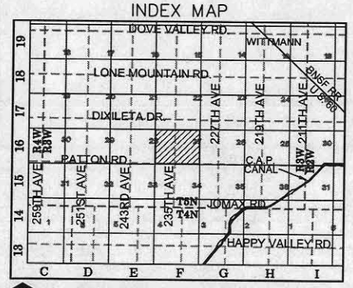
HERMAN A. ARISTIZABAL — 17737 — REGISTERED PROFESSIONAL ENGINEER — CERTIFICATE EXPIRES 12/31/06 — ARIZONA, U.S.A.

INDEX MAP



200' 0' 200' 400'

SCALE: 1"= 200'

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PLANS CHK.	AMG/HAA	07/2005
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FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE:

APPROVED BY: DATE:

CHIEF ENGINEER AND GENERAL MANAGER

SHEET F-16 OF FLOODPLAIN DELINEATION

FILE: P:\300\310\310032 (Wittmann ADMS)\Task\Hydraulics\FP--F_16.dwg DATE: 07/23/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A — ZONE A
EFFECTIVE ZONE AE — ZONE AH
EFFECTIVE ZONE AH — ZONE AE
EFFECTIVE FLOODWAY — FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 / Q100=1270 / FP=1400.55 / FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3873		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:
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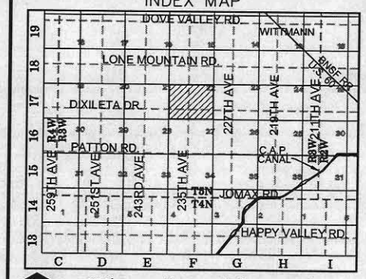
HERMAN A. ARISTIZABAL — 20737 — REGISTERED PROFESSIONAL ENGINEER — ARIZONA, U.S.A.

INDEX MAP



200' 0' 200' 400'
SCALE: 1"= 200'

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PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005

SUBMITTED BY: DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET F-17 OF FLOODPLAIN DELINEATION

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FILE: P:\300\310\310032 (Wittmann ADMS)\Task\Hydraulics\FP-F_17.dwg DATE: 07/28/05

SEE SHEET F-19

SEE SHEET E-18

SEE SHEET G-18

SEE SHEET F-17

ZONE A

ZONE AO (DEPTH 1)

ZONE AE

FW

LIMIT OF STUDY

LIMIT OF DETAILED STUDY

IONA WASH EAST SPLIT-1

235TH AVE

LONE MOUNTAIN RD.

2.266 Q100=1000

1.10 Q100=300

2.054 Q100=1000 FP=1681.66 FW=1682.39

1.949 Q100=1410 FP=1678.77 FW=1679.76

1.834 Q100=1410 FP=1674.45 FW=1675.42

1.722 Q100=1410 FP=1670.25 FW=1671.24

1.628 Q100=1410 FP=1666.34 FW=1667.29

1.547 Q100=1410 FP=1662.30 FW=1663.21

1.480 Q100=1410 FP=1658.45 FW=1658.66

ERM AJ3873

1680 1690 1670 1660 1650

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A — ZONE A

EFFECTIVE ZONE AE — ZONE AH

EFFECTIVE ZONE AH — ZONE AE

EFFECTIVE FLOODWAY — FLOODWAY (FW)

ZONE AO

HYDRAULIC BASE LINE

ZONE DESIGNATION — ZONE A

WASH I.D. LABEL — WASH 9 EAST

ELEVATION REFERENCE MARK — ERM AJ3866

CROSS SECTION — 2.199 Q100=1270 FP=1400.55 FW=1400.56

BASE FLOOD ELEVATION — 1320

DIKE / LEVEE — DIKE

COUNTY BOUNDARY

CORPORATE LIMIT

LIMIT OF STUDY

LIMIT OF DETAILED STUDY

TOWNSHIP/RANGE LINE

SECTION LINE

SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
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NOTE:

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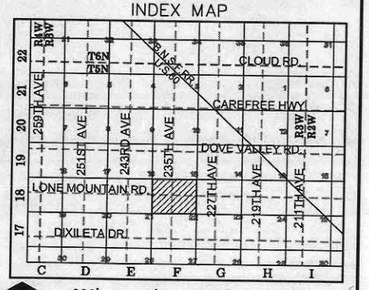
HERNAN A. ARISTIZABAL 39737 REGISTERED PROFESSIONAL ENGINEER ARIZONA U.S.A.

INDEX MAP



200' 0' 200' 400'

SCALE: 1"= 200'

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PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005
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FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

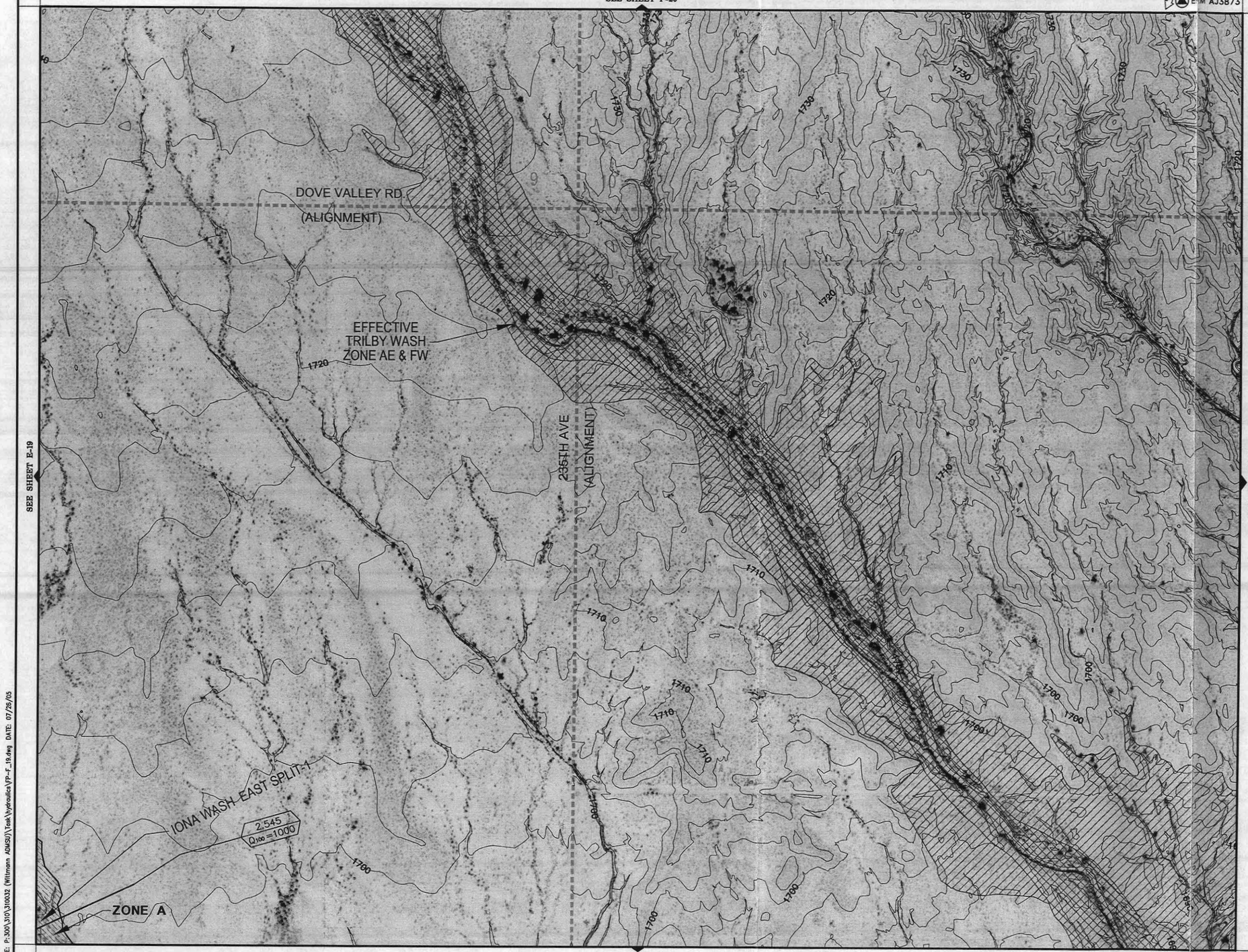
APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET F-18 OF FLOODPLAIN DELINEATION

FILE: P:\301\310\310032 (Wittmann ADMS)\Task\Hydraulics\FP-F_18.dwg DATE: 07/26/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES



FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY
ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 / Q_{100}=1270 — FP=1400.55 / FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

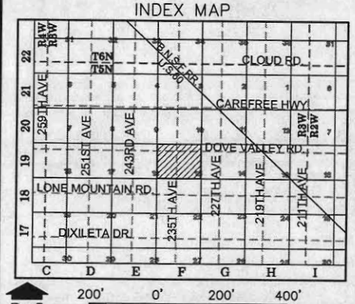
NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3873		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 2.00 FEET = NAVD 88.

INDEX MAP



200' 0' 200' 400'

SCALE: 1"= 200'

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SUBMITTED BY:		DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

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CHIEF ENGINEER AND GENERAL MANAGER

SHEET F-19 OF FLOODPLAIN DELINEATION

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FILE: P:\300\310\310032 (Wittmann ADMSU)\Task\Hydraulics\FP-F_19.dwg DATE: 07/26/05

SEE SHEET F-21

ERM AJ3873

LIMIT OF STUDY

0.49
Q100=660

CIRCLE CITY AREA WASH-1

236TH AVE ALIGNMENT

EFFECTIVE TRILBY WASH ZONE AE & FW

SEE SHEET E-20

SEE SHEET G-20

SEE SHEET F-19

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FILE: P:\300\310\310032 (Wittmann ADMSU)\Task\hydraulics\FP-F_20.dwg DATE: 07/26/05

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A — ZONE A
EFFECTIVE ZONE AE — ZONE AH
EFFECTIVE ZONE AH — ZONE AE
EFFECTIVE FLOODWAY — FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 / Q100=1270 — FP=1400.55 / FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
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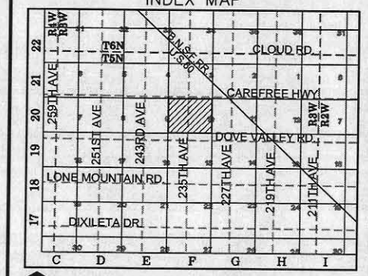
NOTE:
1. NGVD 29 + 2.00 FEET = NAVD 88.

HERMAN A. ARISTIZABAL 19737 REGISTERED PROFESSIONAL ENGINEER ARIZONA, U.S.A.

INDEX MAP



N

200' 0' 200' 400'

SCALE: 1"= 200'

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PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005
SUBMITTED BY:		DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET F-20 of FLOODPLAIN DELINEATION

SEE SHEET F-24

ERM AJ3887

FP=1943.45 | 18.789 | FW=1943.90 | Q_{100}=5900

FP=1938.09 | 18.210 | FW=1938.66 | Q_{100}=5900

FP=1931.61 | 18.615 | FW=1932.10 | Q_{100}=5900

FP=1926.02 | 18.537 | FW=1926.65 | Q_{100}=2670

FP=1920.60 | 18.484 | FW=1920.90 | Q_{100}=2670

ZONE AE

ZONE A

TRILBY WASH

FW

LIMIT OF DETAILED STUDY

JOY RANCH RD. (ALIGNMENT)

238TH AVE

EFFECTIVE CIRCLE CITY AREA WASH 1 ZONE AE & FW

EFFECTIVE TRILBY WASH (WEST SPLIT) ZONE AE

EFFECTIVE TRILBY WASH ZONE AE & FW

1940 1938 1936 1934 1932 1930 1928 1926 1924 1922 1920 1918 1916 1914 1912 1910 1908 1906 1904 1902 1900

SEE SHEET E-28

SEE SHEET G-28

SEE SHEET F-22

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FILE: P:\301\310\310032 (Wittmann ADMS0)\Tools\hydraulics\FP-F_23.dwg DATE: 08/31/05

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A — ZONE A

EFFECTIVE ZONE AE — ZONE AH

EFFECTIVE ZONE AH — ZONE AE

EFFECTIVE FLOODWAY — FLOODWAY (FW)

ZONE AO

HYDRAULIC BASE LINE

ZONE DESIGNATION — ZONE A

WASH I.D. LABEL — WASH 9 EAST

ELEVATION REFERENCE MARK — ERM AJ3866

CROSS SECTION — 2.199 | Q_{100}=1270 | FP=1400.55 | FW=1400.56

BASE FLOOD ELEVATION — 1320

DIKE / LEVEE — DIKE

COUNTY BOUNDARY

CORPORATE LIMIT

LIMIT OF STUDY

LIMIT OF DETAILED STUDY

TOWNSHIP/RANGE LINE

SECTION LINE

SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

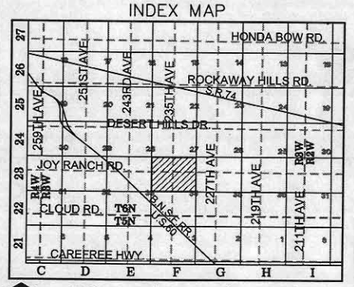
I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3887		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 2.05 FEET = NAVD 88.

Registered Professional Engineer — 39737 — HERMAN A. ARISTIZABAL — Date Signed — ARIZONA, U.S.A.

INDEX MAP



N

200' 0' 200' 400'

SCALE: 1"= 200'

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DESIGN	AMG/RAS	07/2005
DESIGN CHK.	HAA	07/2005
PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005

SUBMITTED BY: DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET F-23 OF FLOODPLAIN DELINEATION

SEE SHEET F-25

ERM AJ3887

ZONE A

TRILBY WASH

LIMIT OF DETAILED STUDY

235TH AVE

DESERT HILLS DR (ALIGNMENT)

FP=1993.46 FW=1994.43 — 19.493 — Q_{100}=5900

FP=1989.74 FW=1990.41 — 19.439 — Q_{100}=5900

FP=1983.47 FW=1984.42 — 19.352 — Q_{100}=5900

FP=1979.88 FW=1980.01 — 19.298 — Q_{100}=5900

FP=1976.53 FW=1977.52 — 19.240 — Q_{100}=5900

FP=1970.30 FW=1971.23 — 19.158 — Q_{100}=5900

FP=1966.37 FW=1967.35 — 19.104 — Q_{100}=5900

FP=1959.87 FW=1960.24 — 19.018 — Q_{100}=5900

FP=1954.25 FW=1954.99 — 18.927 — Q_{100}=5900

FP=1948.69 FW=1949.66 — 18.854 — Q_{100}=5900

FW

ZONE AE

LIMIT OF DETAILED STUDY

SEE SHEET E-24

SEE SHEET G-24

SEE SHEET F-23

FILE: P:\300\310\310032 (Wittmann ADMSU)\Task\Hydraulics\FP-F_24.dwg DATE: 07/27/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A — ZONE A

EFFECTIVE ZONE AE — ZONE AH

EFFECTIVE ZONE AH — ZONE AE

EFFECTIVE FLOODWAY — FLOODWAY (FW)

ZONE AO

HYDRAULIC BASE LINE

ZONE DESIGNATION — ZONE A

WASH I.D. LABEL — WASH 9 EAST

ELEVATION REFERENCE MARK — ERM AJ3866

CROSS SECTION — 2.199 / Q_{100}=1270 — FP=1400.55 / FW=1400.56

BASE FLOOD ELEVATION — 1320

DIKE / LEVEE — DIKE

COUNTY BOUNDARY

CORPORATE LIMIT

LIMIT OF STUDY

LIMIT OF DETAILED STUDY

TOWNSHIP/RANGE LINE

SECTION LINE

SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

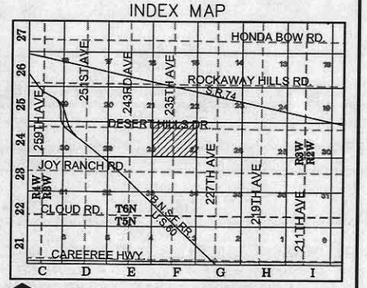
I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3887		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 2.05 FEET = NAVD 88.

Registered Professional Engineer — 29757 — HERMAN A. ARISTIZABAL — Date Signed 7/27/05 — ARIZONA, U.S.A.

INDEX MAP



200' 0' 200' 400'

SCALE: 1" = 200'

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PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005

SUBMITTED BY: DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

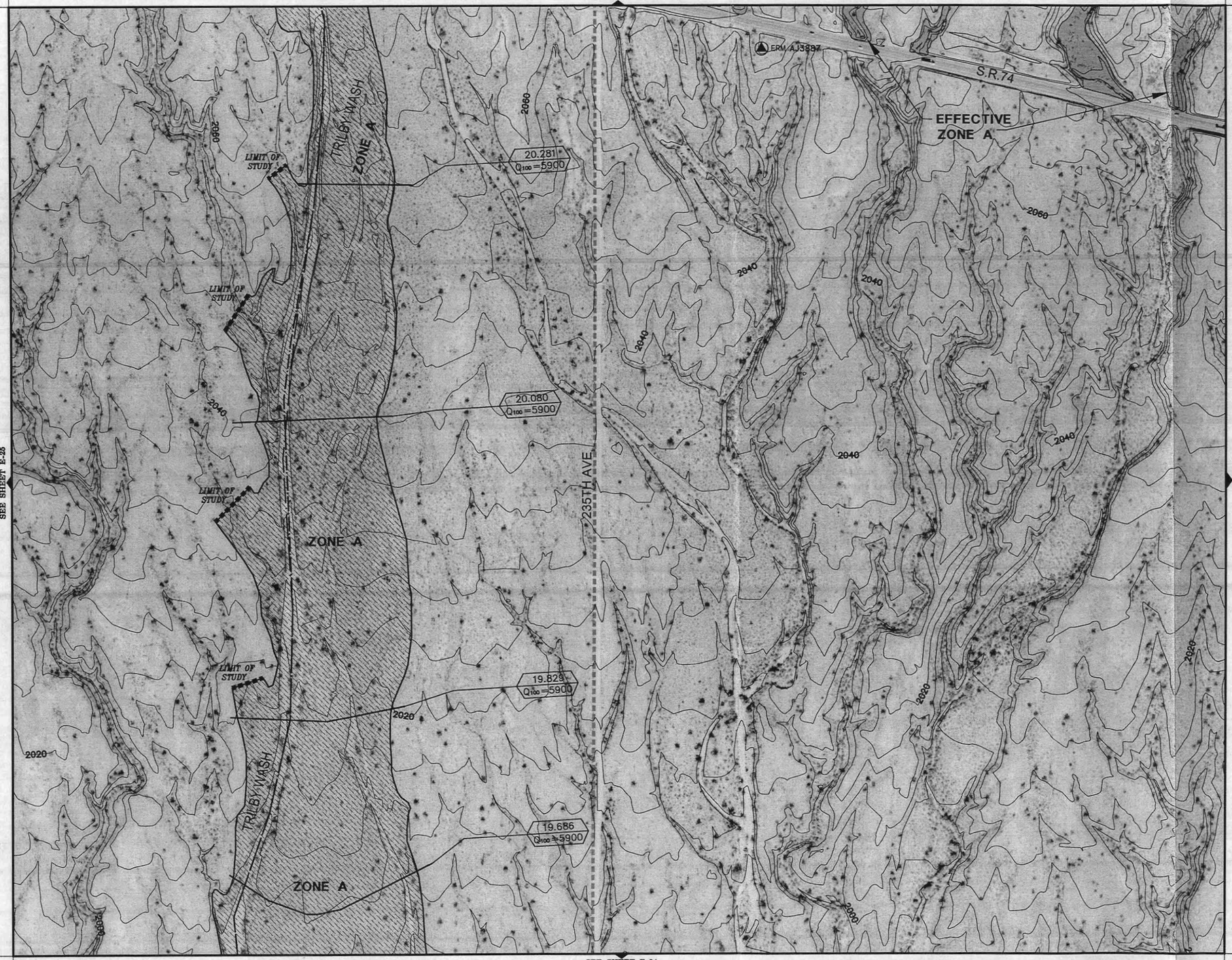
RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET F-24 OF FLOODPLAIN DELINEATION

SEE SHEET F-26



SEE SHEET E-25

SEE SHEET G-25

SEE SHEET F-24

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FILE: P:\80\10\10032 (Wittmann ADMS)\Task\hydraulics\FP-F_25.dwg DATE: 07/27/05

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY
ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 / Q100 =1270 — FP=1400.55 / FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

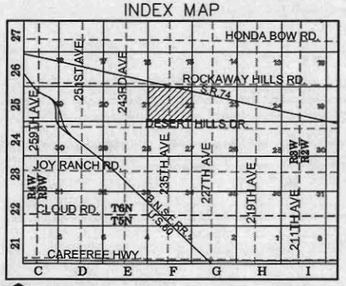
ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3887		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:
1. NGVD 29 + 2.05 FEET = NAVD 88.

INDEX MAP



N

200' 0' 200' 400'

SCALE: 1"= 200'

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DESIGN	AMG/RAS	07/2005
DESIGN CHK.	HAA	07/2005
PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005

SUBMITTED BY: DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET F-25 OF FLOODPLAIN DELINEATION

SEE SHEET F-27

ERM AJ3887

SEE SHEET E-26

SEE SHEET G-26

2100

2100

2100

2100

2100

2100

2100

2080

2080

2080

EFFECTIVE ZONE A

235TH AVE (ALIGNMENT)

EFFECTIVE ZONE A

S.R.74

TRILBY WASH

LIMIT OF STUDY

ZONE A

20.434
Q_{100}=5900

16

ROCKAWAY HILLS ROAD (ALIGNMENT)

SEE SHEET F-25

FILE: P:\300\310\310032 (Wittmann ADMS)\Task\Hydraulics\FP-F_26.dwg DATE: 07/27/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A — ZONE A

EFFECTIVE ZONE AE — ZONE AH

EFFECTIVE ZONE AH — ZONE AE

EFFECTIVE FLOODWAY — FLOODWAY (FW)

ZONE AO

HYDRAULIC BASE LINE

ZONE DESIGNATION — ZONE A

WASH I.D. LABEL — WASH 9 EAST

ELEVATION REFERENCE MARK — ERM AJ3866

CROSS SECTION — 2.199 / Q_{100}=1270 / FP=1400.55 / FW=1400.56

BASE FLOOD ELEVATION — 1320

DIKE / LEVEE — DIKE

COUNTY BOUNDARY

CORPORATE LIMIT

LIMIT OF STUDY

LIMIT OF DETAILED STUDY

TOWNSHIP/RANGE LINE

SECTION LINE

SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

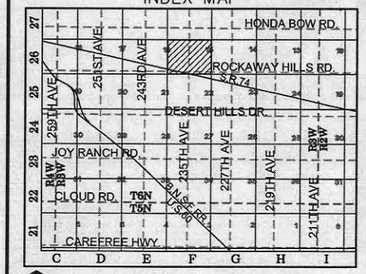
I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3887		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 2.05 FEET = NAVD 88.

Registered Professional Engineer — 28737 — HERMAN A. ARISTIZABAL — Date Signed 7/27/05 — ARIZONA, U.S.A.

INDEX MAP



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200' 0' 200' 400'

SCALE: 1"= 200'

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PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005

SUBMITTED BY: DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET F-26 OF FLOODPLAIN DELINEATION

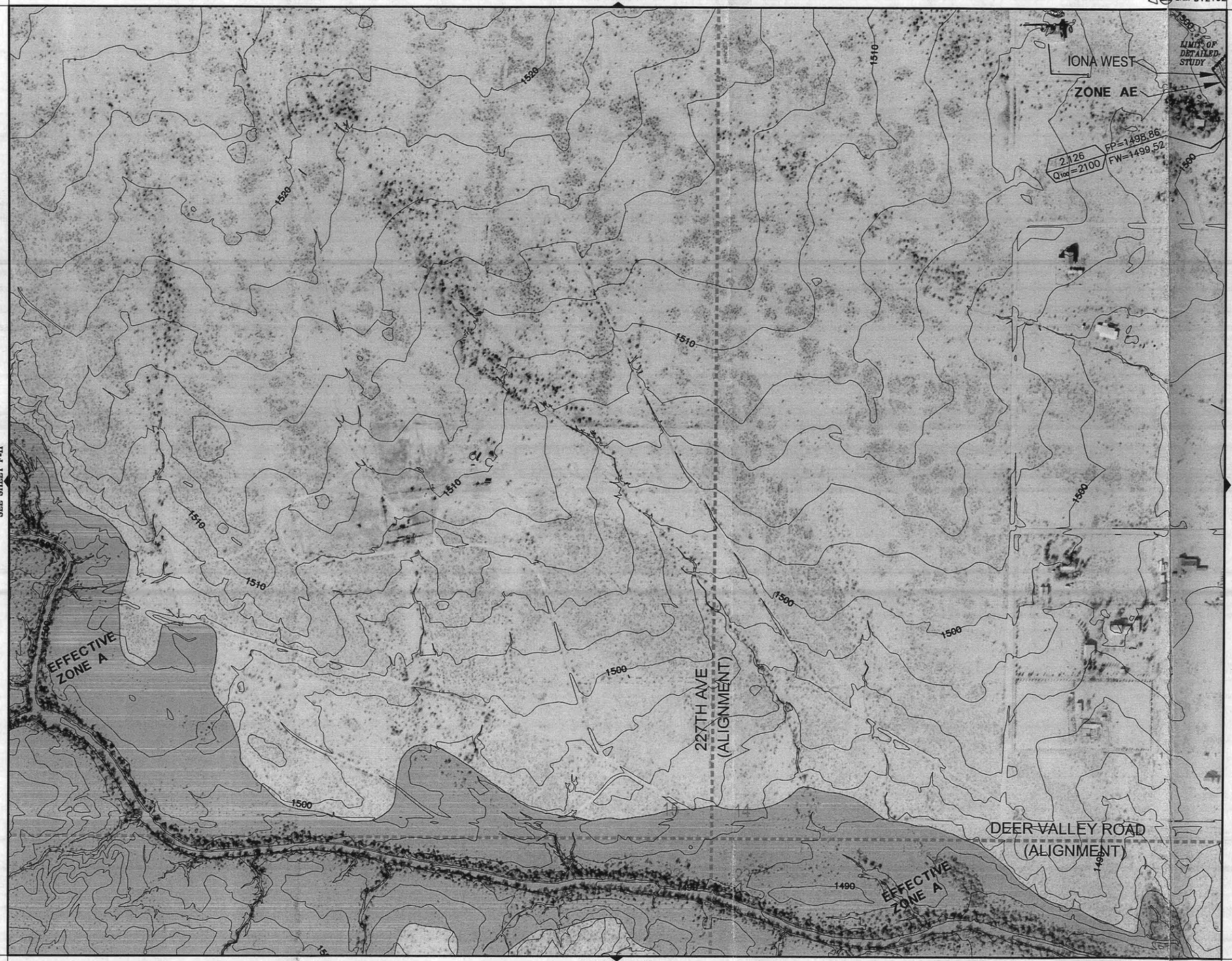
SEE SHEET G-12

ERM DV2192

SEE SHEET F-11

SEE SHEET H-11

SEE SHEET G-10



FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A — ZONE A
EFFECTIVE ZONE AE — ZONE AH
EFFECTIVE ZONE AH — ZONE AE
EFFECTIVE FLOODWAY — FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 / Q100=1270 — FP=1400.55 / FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

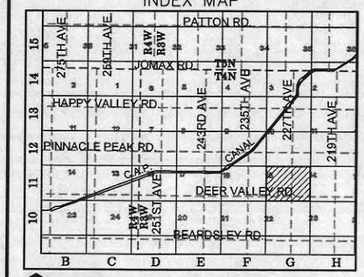
I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
DV2192		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 1.90 FEET = NAVD 88.

Registered Professional Engineer — 29737 — HERNAN A. ARISTIZABAL — ARIZONA, U.S.A.

INDEX MAP



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200' 0' 200' 400'

SCALE: 1" = 200'

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PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005
SUBMITTED BY:		DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

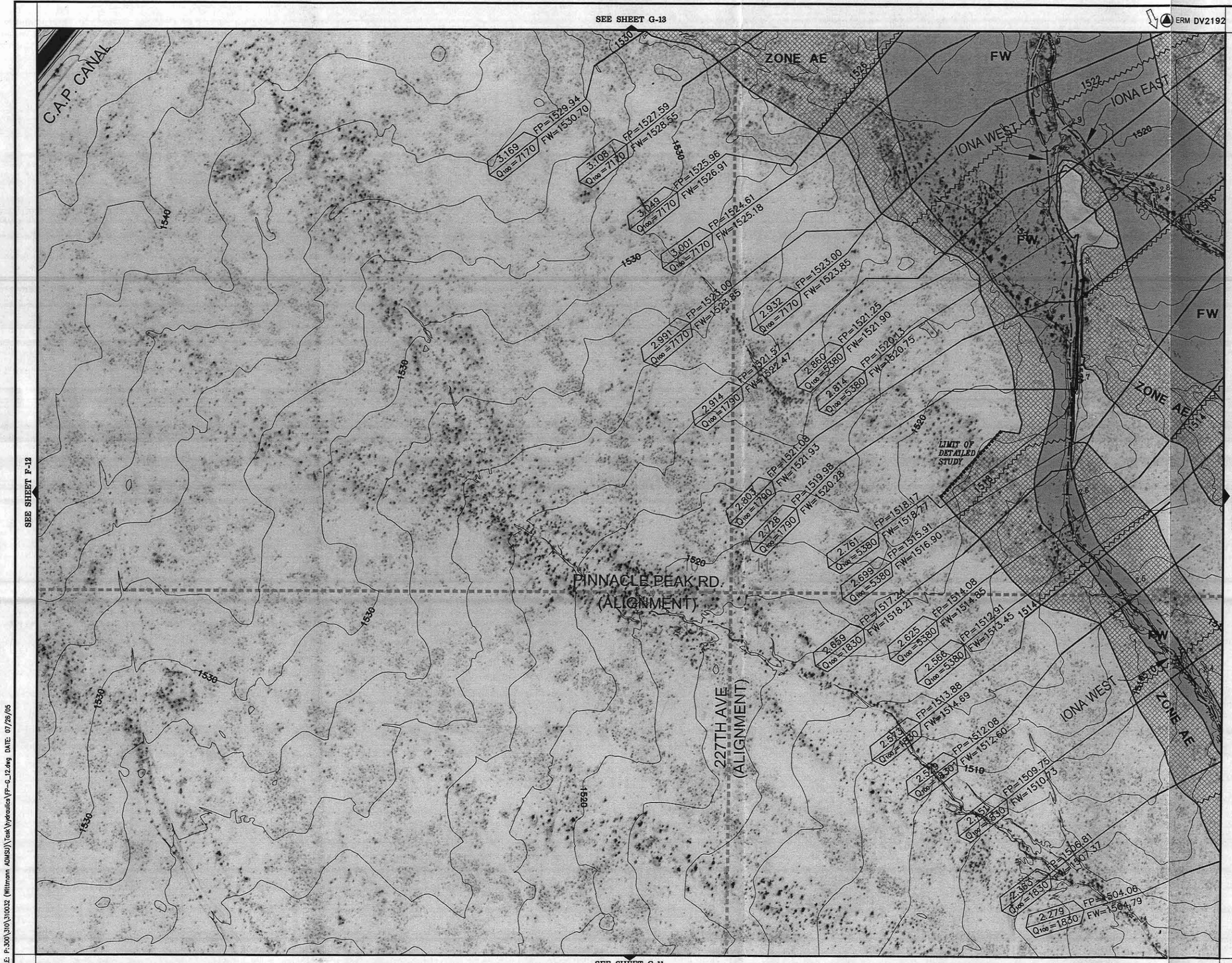
APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET G-11 OF FLOODPLAIN DELINEATION

FILE: P:\30\310\310032 (Wittmann ADMS)\Task\Hydraulics\FP-G_11.dwg DATE: 07/25/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES



FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
WITTMANN AREA DRAINAGE MASTER STUDY UPDATE
CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY
ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 Q100=1270 FP=1400.55 FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

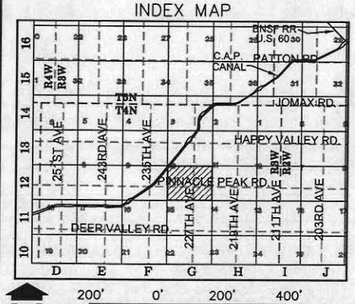
NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
DV2192		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:
1. NGVD 29 + 1.90 FEET = NAVD 88.

Registered Professional Engineer — 28737 — HERMAN A. ARISTIZABAL — Date Signed 7/7/05 — ARIZONA, U.S.A.

INDEX MAP



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SCALE: 1" = 200'

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SUBMITTED BY: DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET G-12 OF FLOODPLAIN DELINEATION

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FILE: P:\300\310\310032 (Wittmann ADMS)\Teak\hydraulics\FP-G_12.dwg DATE: 07/26/05

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE
CONTRACT FCD 2002C029

LEGEND

- EFFECTIVE ZONE A / ZONE A
- EFFECTIVE ZONE AE / ZONE AH
- EFFECTIVE ZONE AH / ZONE AE
- EFFECTIVE FLOODWAY / FLOODWAY (FW)
- ZONE AO
- HYDRAULIC BASE LINE
- ZONE DESIGNATION: ZONE A
- WASH I.D. LABEL: WASH 9 EAST
- ELEVATION REFERENCE MARK: ERM AJ3866
- CROSS SECTION: 2.199 Q100=1270 FP=1400.55 FW=1400.56
- BASE FLOOD ELEVATION: 1320
- DIKE / LEVEE: DIKE
- COUNTY BOUNDARY
- CORPORATE LIMIT
- LIMIT OF STUDY
- LIMIT OF DETAILED STUDY
- TOWNSHIP/RANGE LINE
- SECTION LINE
- SECTION NUMBER: 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3866		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

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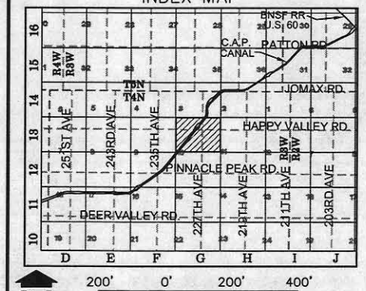
HERNAN A. ARISTIZABAL 29737 ARIZONA U.S.A.

INDEX MAP



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SUBMITTED BY:		DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

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CHIEF ENGINEER AND GENERAL MANAGER

SHEET G-13 OF FLOODPLAIN DELINEATION

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FILE: P:\300\340\310032 (Wittmann ADMSU)\Task\hydraulics\FP-G_13.dwg DATE: 07/18/05

SEE SHEET G-15

ERM AJ3866

ZONE AE

FP=1581.30
1.143
Q_{100}=4090

229TH AVE

FP=1578.49
1.044
Q_{100}=4090

FP=1576.18
0.982
Q_{100}=4090

FP=1574.07
0.904
Q_{100}=4090

EFFECTIVE TRILBY WASH ZONE AE & FW

FP=1570.05
0.778
Q_{100}=4090

MARICOPA COUNTY

JOMAX ROAD (ALIGNMENT)

CITY OF SURPRISE

FP=1567.17
0.684
Q_{100}=4090

ZONE AE

LIMIT OF DETAILED STUDY

FP=1564.41
0.609
Q_{100}=4090

C.A.P. CANAL

OVERCHUTE STRUCTURE

IONA WASH EAST SPLIT-2

FP=1565.74
FW=1563.89
0.726
Q_{100}=3010

FP=1560.13
FW=1560.42
0.623
Q_{100}=3010

FP=1557.93
FW=1558.98
0.531
Q_{100}=3010

FP=1561.56
0.425
Q_{100}=4090

227TH AVE (ALIGNMENT)

FP=1558.27
0.427
Q_{100}=4090

FP=1556.75
0.379
Q_{100}=4090

EFFECTIVE TRILBY WASH ZONE AE & FW

IONA WASH

ZONE AE

ZONE AH
EL.=1553.48

0.333
Q_{100}=3010

0.233
Q_{100}=3010

0.314
Q_{100}=4090

IONA WASH EAST SPLIT-2
0.203
Q_{100}=7100

IONA WASH
0.118
Q_{100}=7100

0.439
Q_{100}=3010
FP=1555.52
FW=1555.57

SEE SHEET F-14

SEE SHEET H-14

SEE SHEET G-13

FILE: P-300\310\310332 (Wittmann ADMS0)\Task\Hydraulics\FP-G_14.dwg DATE: 07/27/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY
ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 / Q_{100}=1270 — FP=1400.55 / FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

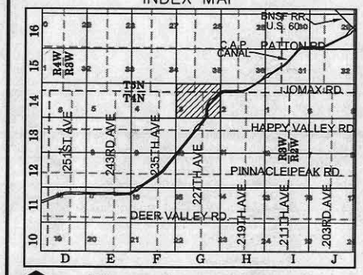
NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3866		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:
1. NGVD 29 + 1.90 FEET = NAVD 88.

39737 HERMAN A. ARISTIZABAL REGISTERED PROFESSIONAL ENGINEER ARIZONA, U.S.A.

INDEX MAP



N

200' 0' 200' 400'

SCALE: 1"= 200'

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	BY	DATE
DESIGN	AMG/RAS	07/2005
DESIGN CHK.	HAA	07/2005
PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005

SUBMITTED BY: DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET G-14 OF FLOODPLAIN DELINEATION

SEE SHEET G-16

ERM AJ3866

SEE SHEET F-15

SEE SHEET H-15

SEE SHEET G-14

LIMIT OF DETAILED STUDY

ZONE AE

LIMIT OF DETAILED STUDY

ZONE AE

LIMIT OF DETAILED STUDY

ZONE AE

227TH AVE (ALIGNMENT)

229TH AVE

225TH AVE

223RD AVE

IONA WASH EAST SPLIT-2

EFFECTIVE TRILBY WASH ZONE AE & FW

FP=1597.78 1.601 Q_{100}=4090

FP=1593.89 1.482 Q_{100}=4090

FP=1590.35 1.407 Q_{100}=4090

FP=1588.07 1.344 Q_{100}=4090

FP=1584.97 1.224 Q_{100}=4090

FP=1581.30 1.143 Q_{100}=4090

1600 1590 1580 1570

FILE: P:\300\310\310032 (Wittmann ADMS)\Task\Hydraulics\FP-G_15.dwg DATE: 07/27/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY
ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 / Q_{100}=1270 — FP=1400.55 / FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

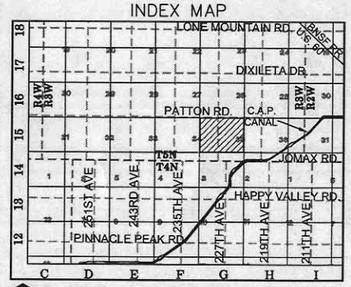
I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3866		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 1.90 FEET = NAVD 88.

Professional Engineer — 29737 — HERMAN A. ARISTIZABAL — Date Signed 7-27-05 — ARIZONA, U.S.A.

INDEX MAP



200' 0' 200' 400'

SCALE: 1" = 200'

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PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005

SUBMITTED BY: DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

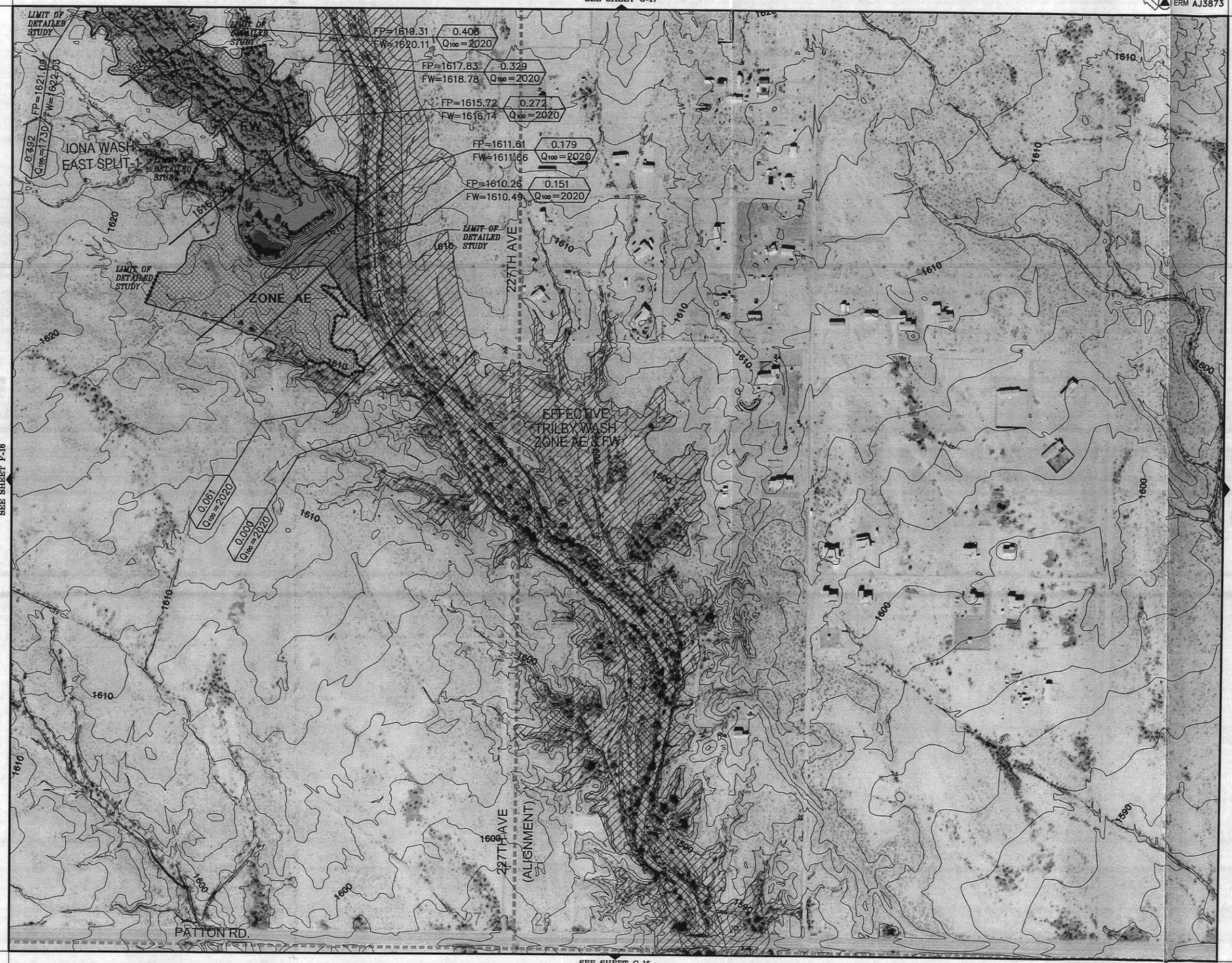
RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SEE SHEET G-17

ERM AJ3873



SEE SHEET F-16

SEE SHEET H-16

SEE SHEET G-15

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY
ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 / Q_{100}=1270 / FP=1400.55 / FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

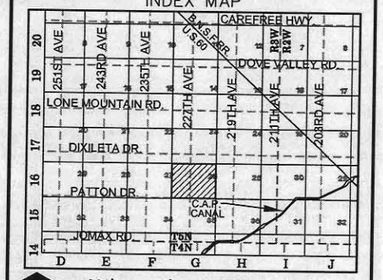
I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3873		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 1.90 FEET = NAVD 88.

29737 HERMAN A. ARISTIZABAL — Registered Professional Engineer — ARIZONA, U.S.A.

INDEX MAP



200' 0' 200' 400'

SCALE: 1" = 200'

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PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005

SUBMITTED BY: DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET G-16 OF FLOODPLAIN DELINEATION

FILE: P:\300\310\310032 (Wittmann AOMSU)\Task\Hydraulics\FP-G_16.dwg DATE: 07/26/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

SEE SHEET G-18

ERM AJ3873

SEE SHEET F-17

SEE SHEET H-17

SEE SHEET G-16

ZONE AE

FW

WASH 2 WEST

227TH AVE

2.794 FP=1642.87 Q100=1040 FW=1643.25

2.718 FP=1641.63 Q100=1040 FW=1642.15

2.565 FP=1635.24 Q100=1040 FW=1636.96

2.478 FP=1632.78 Q100=1040 FW=1633.78

2.426 FP=1629.69 Q100=1040 FW=1630.17

2.369 FP=1626.96 Q100=1040 FW=1627.46

2.303 FP=1623.88 Q100=1040 FW=1624.14

2.215 FP=1618.53 Q100=1040 FW=1619.07

2.134 FP=1616.50 Q100=1040 FW=1617.22

FP=1640.21 2.667 FW=1640.56 Q100=1040

FP=1637.69 2.622 FW=1637.69 Q100=1040

LIMIT OF DETAILED STUDY

EFFECTIVE TRILBY WASH ZONE AE & FW

227TH AVE (ALIGNMENT)

DIXILETA DR. (ALIGNMENT)

FW FP=1624.83 0.654 FW=1625.68 Q100=1730

FP=1623.06 0.579 FW=1623.89 Q100=1730

IONA WASH EAST SPLIT-1

FP=1621.09 0.492 FW=1622.03 Q100=1730

ZONE AE

LIMIT OF DETAILED STUDY

LIMIT OF DETAILED STUDY

LIMIT OF DETAILED STUDY

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A — ZONE A

EFFECTIVE ZONE AE — ZONE AH

EFFECTIVE ZONE AH — ZONE AE

EFFECTIVE FLOODWAY — FLOODWAY (FW)

ZONE AO

HYDRAULIC BASE LINE

ZONE DESIGNATION — ZONE A

WASH I.D. LABEL — WASH 9 EAST

ELEVATION REFERENCE MARK — ERM AJ3866

CROSS SECTION — 2.199 Q100=1270 FP=1400.55 FW=1400.56

BASE FLOOD ELEVATION — 1320

DIKE / LEVEE — DIKE

COUNTY BOUNDARY

CORPORATE LIMIT

LIMIT OF STUDY

LIMIT OF DETAILED STUDY

TOWNSHIP/RANGE LINE

SECTION LINE

SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

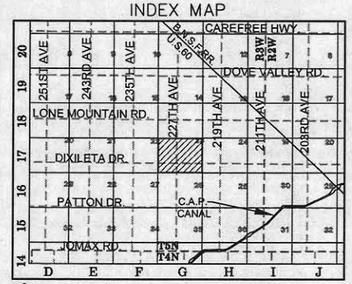
NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3873		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 1.90 FEET = NAVD 88.

INDEX MAP



200' 0' 200' 400'

SCALE: 1"= 200'

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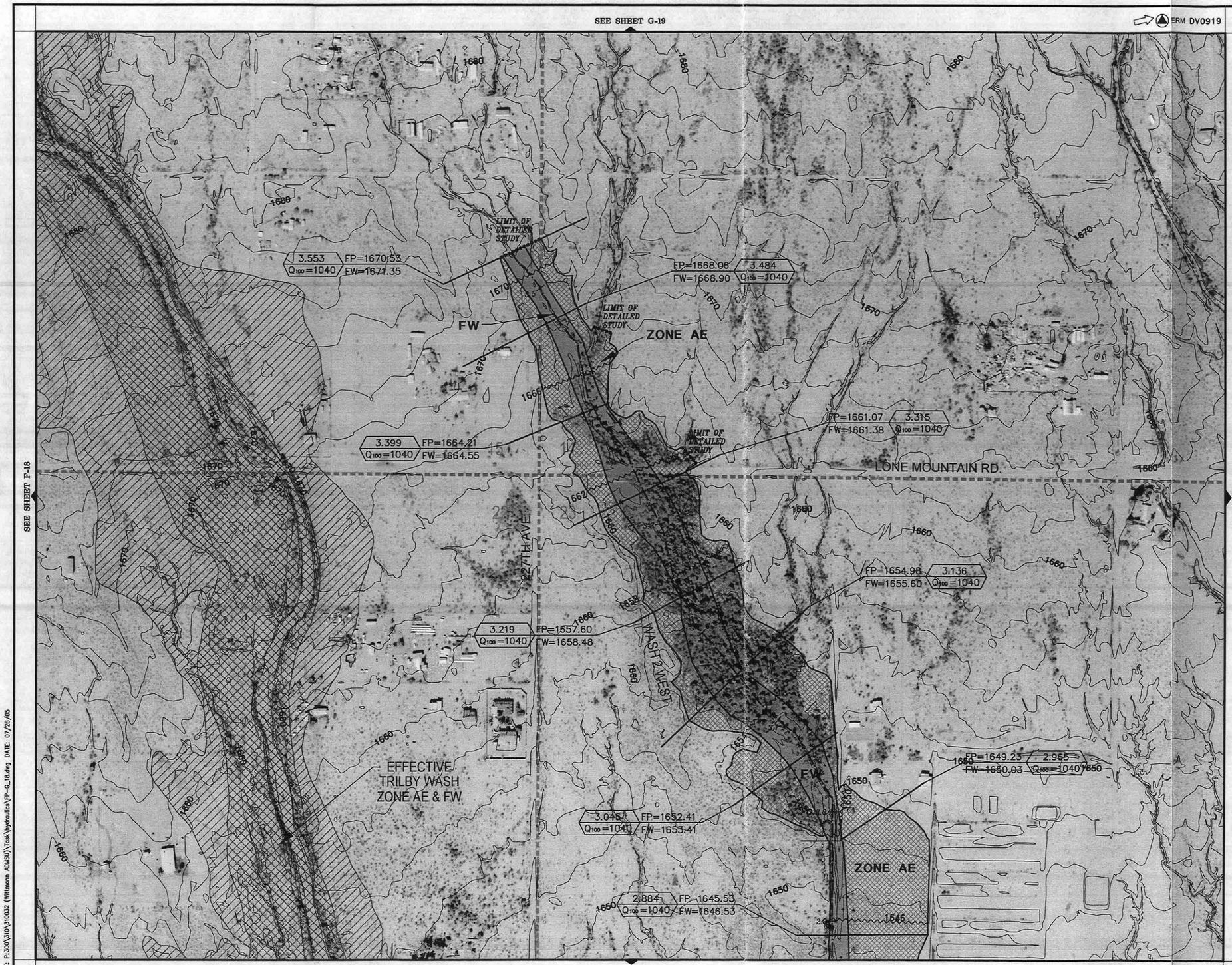
	BY	DATE	
DESIGN	AMG/RAS	07/2005	FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
DESIGN CHK.	HAA	07/2005	RECOMMENDED BY: DATE
PLANS	KAB	07/2005	APPROVED BY: DATE
PLANS CHK.	AMG/HAA	07/2005	CHIEF ENGINEER AND GENERAL MANAGER
SUBMITTED BY: DATE:			SHEET G-17 OF FLOODPLAIN DELINEATION

FILE: P:\300\310\310032 (Wittmann ADMS)\Task\Hydraulics\FP-G_17.dwg DATE: 07/28/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES



FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE
CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY
ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 Q100=1270 FP=1400.55 FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

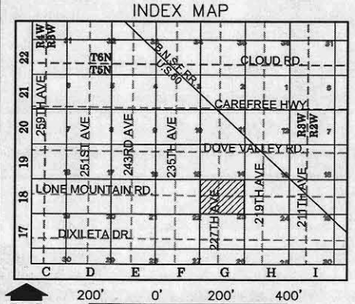
NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
DV0919		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:
1. NGVD 29 + 1.90 FEET = NAVD 88.

Professional Engineer — 28737 — HERNAN A. ARISTIZABAL — ARIZONA, U.S.A.

INDEX MAP



200' 0' 200' 400'
SCALE: 1" = 200'

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DESIGN CHK.	HAA	07/2005
PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE
APPROVED BY: DATE
CHIEF ENGINEER AND GENERAL MANAGER
SUBMITTED BY: DATE:

SHEET G-18 OF FLOODPLAIN DELINEATION

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FILE: P-300\H0\H0032 (Wittmann ADMS)\Task\Hydraulics\FP-G_18.dwg DATE: 07/26/05

SEE SHEET H-11

ERM DV2192

SEE SHEET G-10

SEE SHEET I-10

SEE SHEET H-09

EFFECTIVE ZONE A

EFFECTIVE ZONE A

EXISTING ZONE A

ZONE AE

ZONE AE

ZONE AE

IONA WEST

IONA WEST

IONA EAST

IONA WASH EFFECTIVE ZONE AE

FW

FW

FW

1.291 Q100=2100 FP=1473.29 FW=1474.05

1.337 Q100=2100 FP=1472.15 FW=1473.04

1.156 Q100=2100 FP=1470.77 FW=1471.67

1.097 Q100=2100 FP=1469.36 FW=1470.88

0.683 Q100=5540 FP=1459.61 FW=1470.88

0.855 Q100=5540 FP=1455.77 FW=1466.18

0.808 Q100=5540 FP=1464.02 FW=1464.51

0.741 Q100=5540 FP=1461.83 FW=1462.26

0.398 Q100=2100 FP=1466.49 FW=1466.66

0.946 Q100=2100 FP=1462.32 FW=1464.10

0.879 Q100=2100 FP=1464.78 FW=1464.78

0.615 Q100=2100 FP=1462.64 FW=1462.64

0.722 Q100=2100 FP=EFF. IONA WASH FW=1459.54

0.651 Q100=2100 FP=EFF. IONA WASH FW=1457.87

0.572 Q100=2100 FP=EFF. IONA WASH FW=1457.87

0.521 Q100=2100 SEE EFFECTIVE IONA WASH MODEL

LIMIT OF DETAILED STUDY

LIMIT OF DETAILED STUDY

LIMIT OF DETAILED STUDY

219TH AVE

IONA WASH

1480 1490 1500 1510 1520 1530 1540 1550 1560

1460 1470 1480 1490

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY

ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 Q100=1270 FP=1400.55 FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

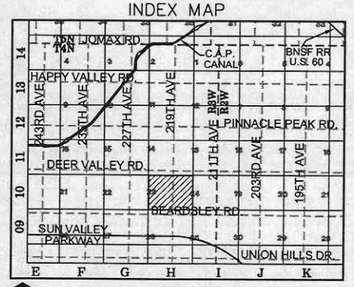
I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
DV2192		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 1.80 FEET = NAVD 88.

ARIZONA REGISTERED PROFESSIONAL ENGINEER 39737 HERMAN A. ARISTIZABAL

INDEX MAP



200' 0' 200' 400'

SCALE: 1"= 200'

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DESIGN CHK.	HAA	07/2005
PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005
SUBMITTED BY:		DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET H-10 OF FLOODPLAIN DELINEATION

FILE: P:\301\310\310032 (Wittmann ADMSJ)\Task\Hydraulics\FP-H_10.dwg DATE: 07/26/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

SEE SHEET H-12

SEE SHEET G-11

SEE SHEET I-11

SEE SHEET H-10

FILE: P:\300\310\10032 (Wittmann ADMS)\Task\hydraulics\FP-HL11.dwg DATE: 07/18/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY
ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 Q100=1270 FP=1400.55 FW=1400.56
BASE FLOOD ELEVATION 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

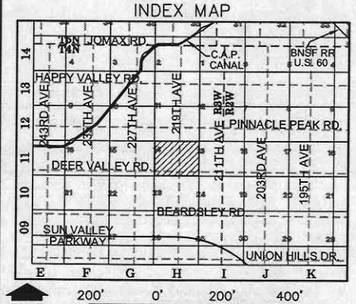
I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
DV2192		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV
DV2194		

NOTE:

1. NGVD 29 + 1.80 FEET = NAVD 88.

Certificate Expires 9/30/06 — 29737 HERMAN A. ARISTIZABAL — Registered Professional Engineer — ARIZONA, U.S.A.

INDEX MAP



N

200' 0' 200' 400'

SCALE: 1" = 200'

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DESIGN CHK.	HAA	07/2005
PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005

SUBMITTED BY: DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET H-11 OF FLOODPLAIN DELINEATION

SEE SHEET H-13

ERM DV2192

FP=1521.25 2.860 FW=1521.90 Q100=5380

FP=1520.13 2.814 FW=1520.75 Q100=5380

FP=1518.17 2.761 FW=1518.77 Q100=5380

FP=1515.91 2.699 FW=1516.90 Q100=5380

FP=1514.08 2.625 FW=1514.85 Q100=5380

FP=1512.91 2.566 FW=1513.45 Q100=5380

FP=1510.84 2.471 FW=1511.47 Q100=5460

FP=1508.98 2.385 FW=1509.52 Q100=5460

FP=1505.99 2.317 FW=1506.97 Q100=5460

FP=1504.38 2.244 FW=1505.33 Q100=5460

FP=1501.95 2.189 FW=1502.51 Q100=5460

FP=1500.13 2.106 FW=1500.87 Q100=5460

FP=1499.11 2.050 FW=1499.77 Q100=5460

FP=1497.15 1.986 FW=1497.93 Q100=5460

FP=1494.26 1.899 FW=1494.81 Q100=5460

FP=1492.91 1.845 FW=1493.33 Q100=5460

FP=1491.40 1.775 FW=1491.55 Q100=5540

FP=1490.01 1.730 FW=1490.58 Q100=5540

FP=1506.75 2.437 FW=1510.73 Q100=1830

FP=1505.57 2.363 FW=1507.37 Q100=1830

FP=1504.06 2.279 FW=1504.79 Q100=1830

FP=1501.33 2.203 FW=1502.32 Q100=1830

ZONE AE

FW

IONA EAST

IONA WEST

219TH AVE

TRILBY WASH

EFFECTIVE TRILBY WASH ZONE AE & FW

LIMIT OF DETAILED STUDY

RINNACLE PEAK RD.

SEE SHEET G-12

SEE SHEET I-12

SEE SHEET H-11

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FILE: P:\300_310\10032 (Wittmann ADMSJ)\Tetak Hydraulics\FP-H_12.dwg DATE: 07/26/05

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A — ZONE A

EFFECTIVE ZONE AE — ZONE AH

EFFECTIVE ZONE AH — ZONE AE

EFFECTIVE FLOODWAY — FLOODWAY (FW)

ZONE AO

HYDRAULIC BASE LINE

ZONE DESIGNATION — ZONE A

WASH I.D. LABEL — WASH 9 EAST

ELEVATION REFERENCE MARK — ERM AJ3866

CROSS SECTION — 2.199 Q100=1270 FP=1400.55 FW=1400.56

BASE FLOOD ELEVATION — 1320

DIKE / LEVEE — DIKE

COUNTY BOUNDARY

CORPORATE LIMIT

LIMIT OF STUDY

LIMIT OF DETAILED STUDY

TOWNSHIP/RANGE LINE

SECTION LINE

SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

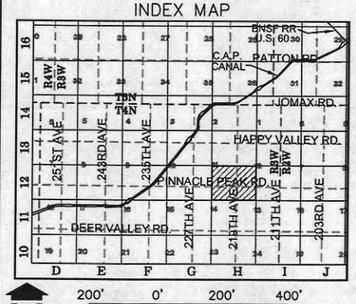
I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
DV2192		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 1.80 FEET = NAVD 88.

CERTIFICATE NO. 28757 HERNAN A. ARISTIZABAL ARIZONA, U.S.A.

INDEX MAP



200' 0' 200' 400'

SCALE: 1" = 200'

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	BY	DATE
DESIGN	AMG/RAS	07/2005
DESIGN CHK.	HAA	07/2005
PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

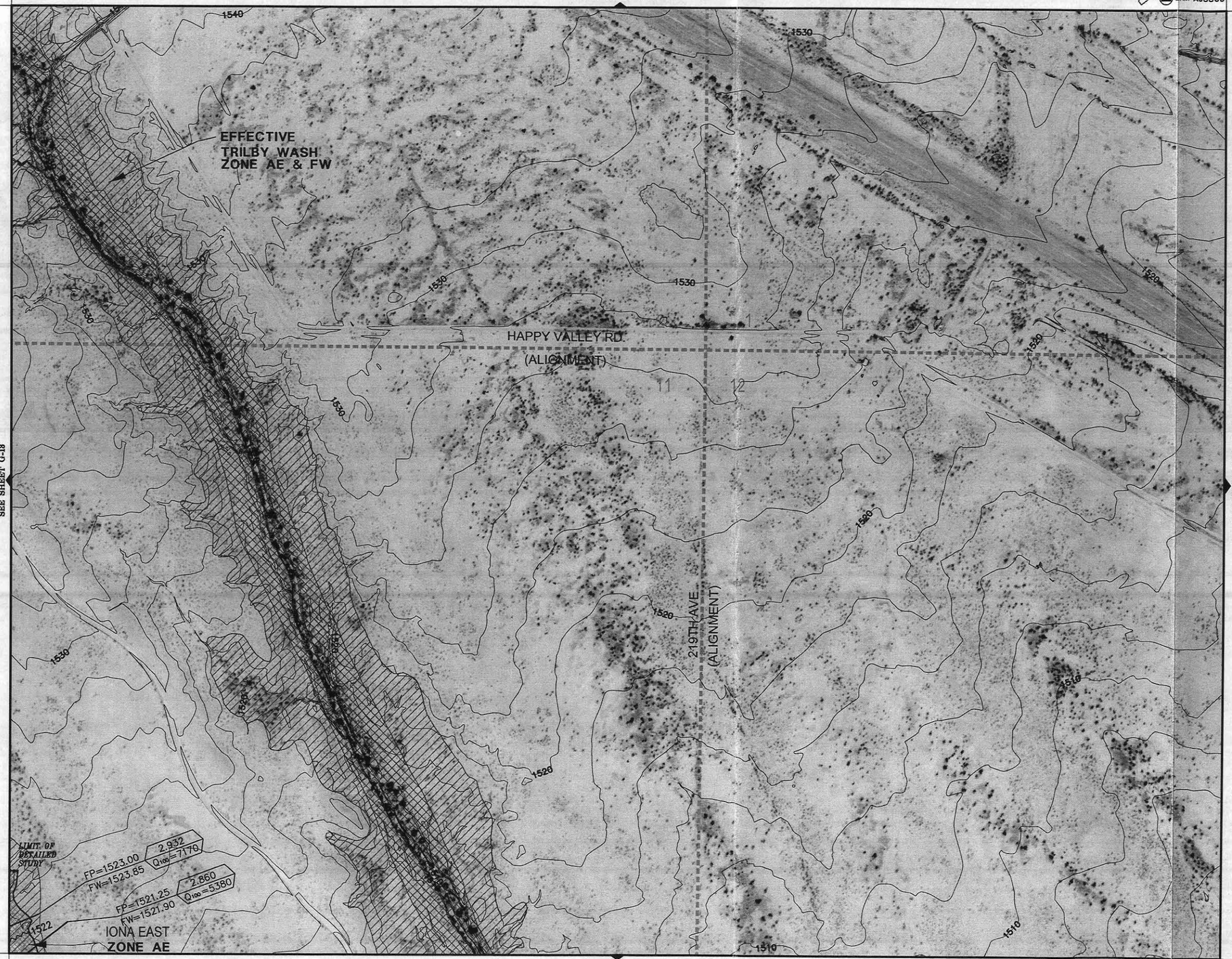
CHIEF ENGINEER AND GENERAL MANAGER

SUBMITTED BY: DATE:

SHEET H-12 OF FLOODPLAIN DELINEATION

SEE SHEET H-14

ERM AJ3866



SEE SHEET G-18

SEE SHEET I-13

SEE SHEET H-12

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FILE: P:\300\J10\J10032 (Wittmann ADMSJ)\Task 9\exhibits\FP-H_13.dwg DATE: 07/28/05

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY
ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 / Q_{100}=1270 — FP=1400.55 / FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

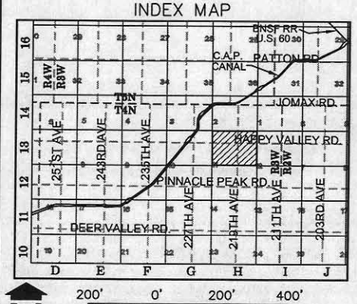
I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3866		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 1.90 FEET = NAVD 88.

Registered Professional Engineer — DATE OF SIGNATURE — 29737 — HERNAN A. ARISTIZABAL — 7/7/05 — ARIZONA, U.S.A.

INDEX MAP



200' 0' 200' 400'

SCALE: 1" = 200'

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DESIGN CHK.	HAA	07/2005
PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005
SUBMITTED BY:		DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE:

APPROVED BY: DATE:

CHIEF ENGINEER AND GENERAL MANAGER

SHEET H-13 OF FLOODPLAIN DELINEATION

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY
ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 / Q100=1270 — FP=1400.55 / FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

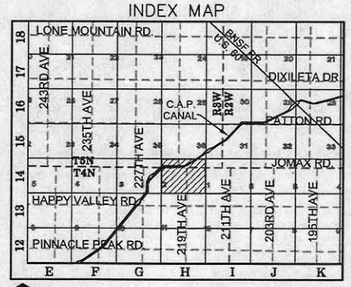
I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3866		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 1.90 FEET = NAVD 88.

CERTIFICATE — 29737 — HERNAN A. ARISTIZABAL — Date Signed 7/7/05 — ARIZONA, U.S.A.

INDEX MAP



200' 0' 200' 400'

SCALE: 1"= 200'

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PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005
SUBMITTED BY:		DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET H-14 OF FLOODPLAIN DELINEATION

FILE: P:\301\310\310032 (Wittmann ADMSU)\Task\hydraulics\FP-H_14.dwg DATE: 07/27/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY
ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 FP=1400.55 / Q100=1270 FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

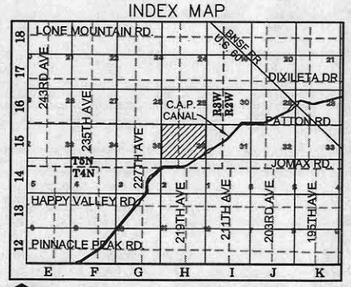
I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3866		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 1.90 FEET = NAVD 88.

HERMAN A. ARISTIZABAL 20737 REGISTERED ARIZONA U.S.A.

INDEX MAP



200' 0' 200' 400'
SCALE: 1"= 200'

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PLANS CHK.	AMG/HAA	07/2005

SUBMITTED BY: DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET H-15 OF FLOODPLAIN DELINEATION

FILE: P:\301\310\310032 (Wittmann ADMS)\Task\hydraulics\FP-H_15.dwg DATE: 07/28/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

SEE SHEET H-17

ERM DV0916

SEE SHEET G-16

SEE SHEET I-16

SEE SHEET H-15

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FILE: P:\300\310\316032 (Wittmann ADMS)\Task\Hydraulics\FP-H_16.dwg DATE: 07/26/05

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A — ZONE A
EFFECTIVE ZONE AE — ZONE AH
EFFECTIVE ZONE AH — ZONE AE
EFFECTIVE FLOODWAY — FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 Q100=1270 FP=1400.55 FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

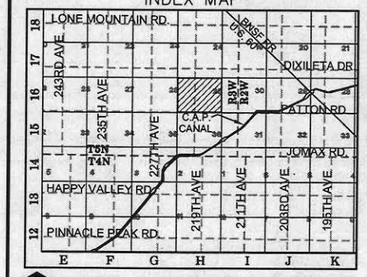
I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
DV0916		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 1.90 FEET = NAVD 88.

Certificate Number 29737 — Norman A. Aristizabal — Date Signed 7/26/05 — Arizona, U.S.A.

INDEX MAP



200' 0' 200' 400'
SCALE: 1" = 200'

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DESIGN CHK.	HAA	07/2005
PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005

SUBMITTED BY: DATE:

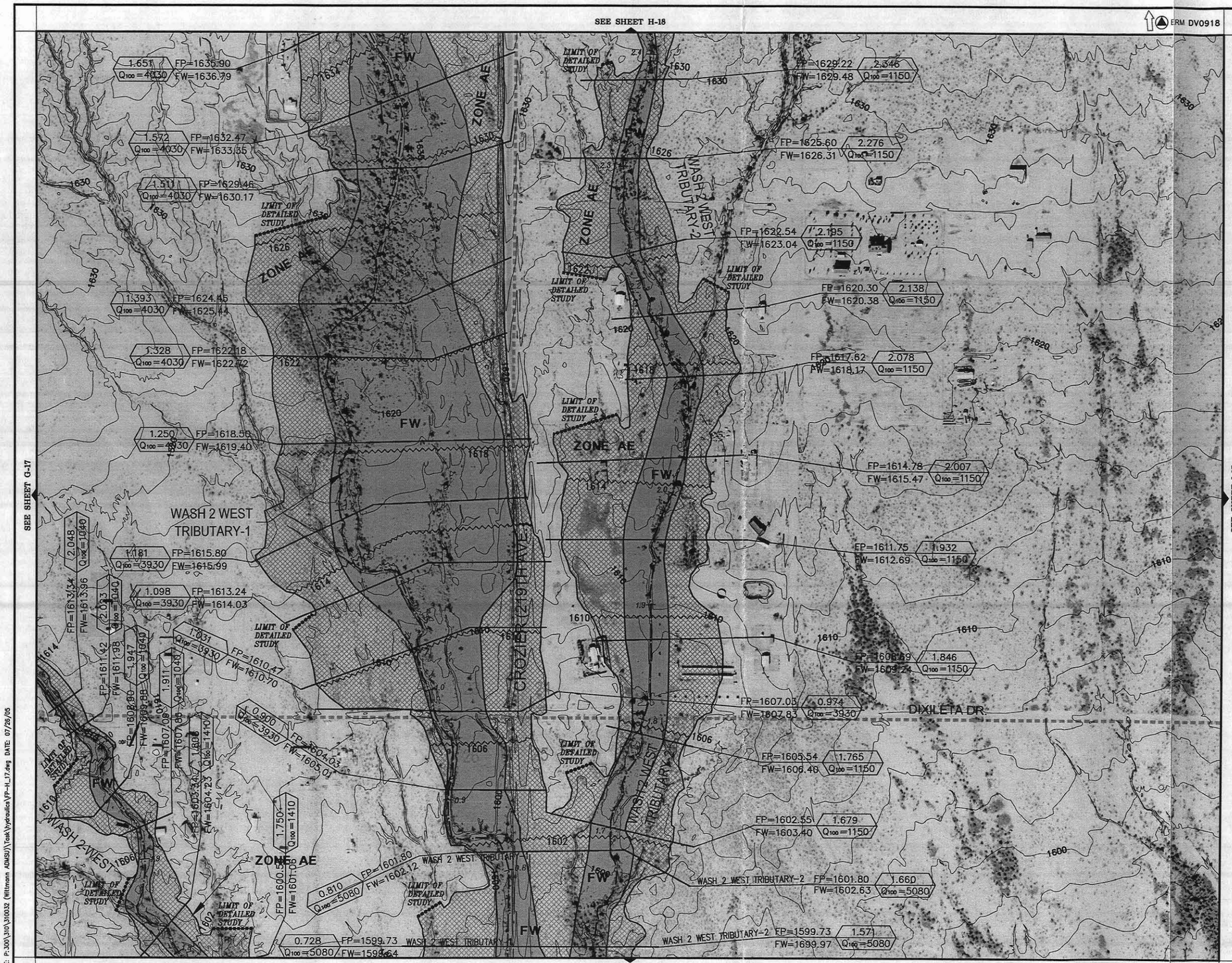
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET H-16 OF FLOODPLAIN DELINEATION



FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY
ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
ZONE AO

HYDRAUUC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 Q100=1270 FP=1400.55 FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

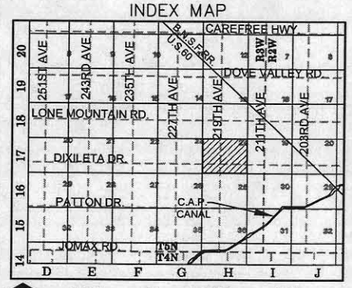
ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
DV0918		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:
1. NGVD 29 + 1.90 FEET = NAVD 88.

INDEX MAP



N
200' 0' 200' 400'
SCALE: 1"= 200'

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DESIGN CHK.	HAA	07/2005
PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005
SUBMITTED BY:		DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET H-17 OF FLOODPLAIN DELINEATION

FILE: P:\30\310\H0032 (Wittmann ADMS)\Task\Hydraulics\FP-H_17.dwg DATE: 07/26/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FILE: P:\80\310\310032 (Wittmann ADMS)\Task\hydraulics\FP-H_18.dwg DATE: 07/26/05

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY
ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 Q100=1270 FP=1400.55 FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

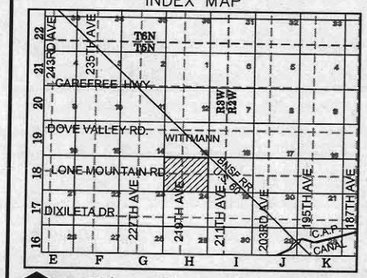
I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
DV0918		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 1.90 FEET = NAVD 88.

HERNAN A. ARISTIZABAL 38737 REGISTERED PROFESSIONAL ENGINEER CERTIFICATE NO. ARIZONA, U.S.A.

INDEX MAP



N

200' 0' 200' 400'

SCALE: 1"= 200'

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DESIGN CHK.	HAA	07/2005
PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SUBMITTED BY: DATE:

SHEET H-18 OF FLOODPLAIN DELINEATION

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY
ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 Q100=1270 FP=1400.55 FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

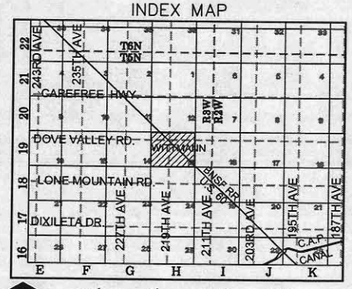
NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
DV0919		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV
DV0918		

NOTE:

1. NGVD 29 + 1.90 FEET = NAVD 88.

INDEX MAP



N

200' 0' 200' 400'

SCALE: 1"= 200'

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DESIGN CHK.	HAA	07/2005
PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005
SUBMITTED BY:		DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET H-19 OF FLOODPLAIN DELINEATION

FILE: P:\300\310\310032 (Wittmann ADMSU)\Task\Vydroulics\FP-H_19.dwg DATE: 07/26/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

SEE SHEET H-21

ERM DV0919

SEE SHEET G-20

SEE SHEET I-20

SEE SHEET H-19

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

- EFFECTIVE ZONE A / ZONE A
- EFFECTIVE ZONE AE / ZONE AH
- EFFECTIVE ZONE AH / ZONE AE
- EFFECTIVE FLOODWAY / FLOODWAY (FW)
- ZONE AO
- HYDRAULIC BASE LINE
- ZONE DESIGNATION: ZONE A
- WASH I.D. LABEL: WASH 9 EAST
- ELEVATION REFERENCE MARK: ERM AJ3866
- CROSS SECTION: 2.199 Q100=1270 FP=1400.55 FW=1400.56
- BASE FLOOD ELEVATION: 1320
- DIKE / LEVEE: DIKE
- COUNTY BOUNDARY
- CORPORATE LIMIT
- LIMIT OF STUDY
- LIMIT OF DETAILED STUDY
- TOWNSHIP/RANGE LINE
- SECTION LINE / SECTION NUMBER: 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

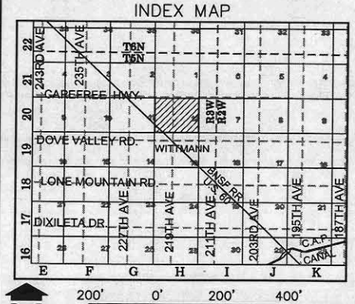
I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
DV0919		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 2.00 FEET = NAVD 88.

HERMAN A. ARISTIZABAL 20737 REGISTERED ENGINEER ARIZONA, U.S.A.

INDEX MAP



200' 0' 200' 400'

SCALE: 1"= 200'

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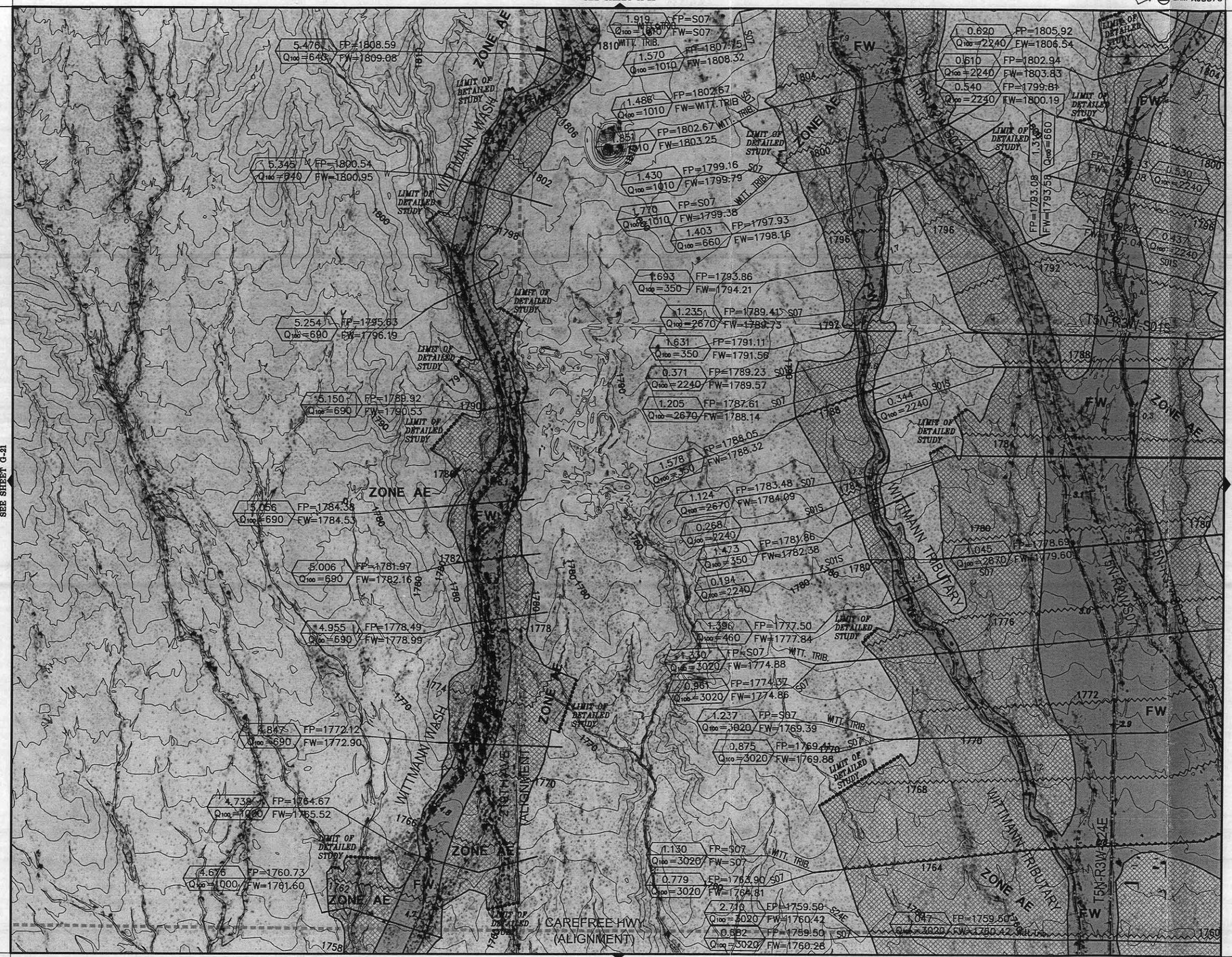
DESIGN CHK.	HAA	07/2005	
PLANS	KAB	07/2005	RECOMMENDED BY: DATE
PLANS CHK.	AMG/HAA	07/2005	APPROVED BY: DATE
SUBMITTED BY: DATE:			CHIEF ENGINEER AND GENERAL MANAGER

SHEET H-20 OF FLOODPLAIN DELINEATION

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FILE: P:\300\310\310032 (Wittmann ADMSJ)\Tasks\hydraulics\FP-H_20.dwg DATE: 07/26/05



FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY
ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 Q100=1270 FP=1400.55 FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

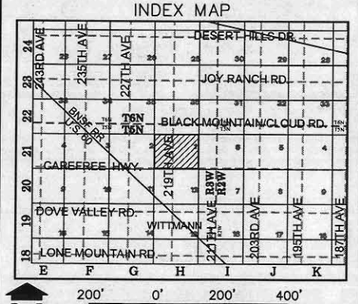
NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3878		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:
1. NGVD 29 + 2.00 FEET = NAVD 88.

Registered Professional Engineer — 38737 — HERMAN A. ARISTIZABAL — ARIZONA, U.S.A.

INDEX MAP



N
200' 0' 200' 400'
SCALE: 1" = 200'

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	BY	DATE
DESIGN	AMG/RAS	07/2005
DESIGN CHK.	HAA	07/2005
PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005
SUBMITTED BY:		DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET H-21 OF FLOODPLAIN DELINEATION

FILE: P:\300\310\310032 (Wittmann ADMS)\Task\Hydraulics\FP-H_21.dwg DATE: 07/26/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

SEE SHEET H-23

ERM AJ3878

SEE SHEET G-22

SEE SHEET I-22

SEE SHEET H-21

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FILE: P:\300\310\310032 (Wittmann ADMSU)\Task\hydraulics\FP-H_22.dwg DATE: 07/26/05

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY
ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 / Q100=1270 / FP=1400.55 / FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

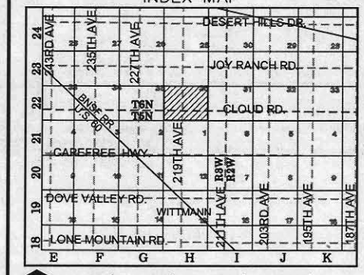
I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3878		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 2.00 FEET = NAVD 88.

HERMAN A. ARISTIZABAL 28737 — Registered Professional Engineer — State of Arizona, U.S.A.

INDEX MAP



200' 0' 200' 400'

SCALE: 1"= 200'

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DESIGN	AMG/RAS	07/2005
DESIGN CHK.	HAA	07/2005
PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005
SUBMITTED BY:		DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET H-22 OF FLOODPLAIN DELINEATION

SEE SHEET I-11

ERM DV2192

SEE SHEET H-10

SEE SHEET J-10

SEE SHEET I-09

IONA EAST

IONA WEST

SURPRISE

MARICOPA COUNTY

MARICOPA COUNTY

SURPRISE

R3W

R2W

211TH AVE (ALIGNMENT)

LIMIT OF DETAILED STUDY

EFFECTIVE IONA WASH ZONE AE & FW

FP=1464.02 / Q=808
W=1464.51 / Q=5310

SEE EFFECTIVE IONA WASH MODEL Q100=5340

0.741

0.572
FP=EFF. IONA WASH
FW=1457.97
Q100=2100

SEE EFFECTIVE IONA WASH MODEL Q100=2100

0.447
Q100=2100

0.378
Q100=2100

0.289
Q100=2100

0.139
Q100=2100

SEE EFFECTIVE IONA WASH MODEL

1460

1450

1440

1430

FW

0.2

0.3

0.4

0.5

0.6

0.7

0.8

1.0

1.5

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A — ZONE A
EFFECTIVE ZONE AE — ZONE AH
EFFECTIVE ZONE AH — ZONE AE
EFFECTIVE FLOODWAY — FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
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LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

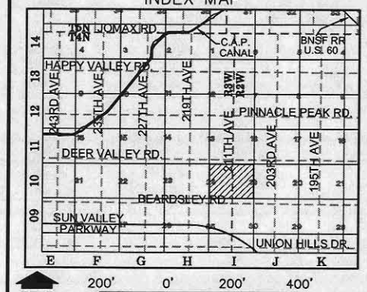
I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
DV2192		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 1.80 FEET = NAVD 88.

39737 HERNAN A. ARISTIZABAL — REGISTERED PROFESSIONAL ENGINEER — ARIZONA, U.S.A.

INDEX MAP



N

200' 0' 200' 400'

SCALE: 1" = 200'

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PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005

SUBMITTED BY: DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET I-10 OF FLOODPLAIN DELINEATION

FILE: P:\301\310\310032 (Wittmann ADMS)\Task\Hydraulics\FP-I_10.dwg DATE: 07/25/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

SEE SHEET I-12

ERM DV2192

SEE SHEET H-11

SEE SHEET J-11

1480

1480

1460

1460

1470

1470

1470

1470

1470

1470

1470

1460

R3W

R2W

EFFECTIVE TRILBY WASH ZONE AE & FW

TRILBY WASH

FP=1465.77
FW=1466.18

0.855
Q_{100}=5540

FP=1464.02
FW=1464.51

0.808
Q_{100}=5540

MARICOPA COUNTY

SURPRISE

211TH AVE (ALIGNMENT)

DEER VALLEY RD. (ALIGNMENT)

3

18

24

19

SEE EFFECTIVE / EFFECTIVE JONAH WASH MODEL Q_{100}=5540

ZONE AE

LIMIT OF DETAILED STUDY

JONAH EAST

SEE SHEET I-10

FILE: P:\301\310\310032 (Wittmann ADMS)\Task\Hydraulics\FP-I_11.dwg DATE: 07/28/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY

ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
ZONE AO

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DIKE / LEVEE — DIKE
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TOWNSHIP/RANGE LINE
SECTION LINE
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ELEVATION REFERENCE MARKS

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NOTE:

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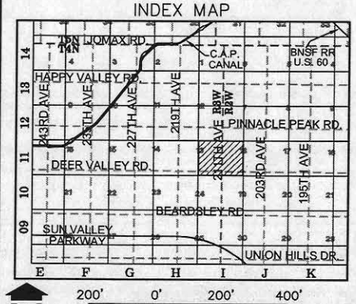
Registered Professional Engineer — 29737 — HERNAN A. ARISTIZABAL — Date Signed 7/28/05 — ARIZONA, U.S.A.

INDEX MAP



200' 0' 200' 400'

SCALE: 1"= 200'

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FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

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CHIEF ENGINEER AND GENERAL MANAGER

SHEET I-11 OF FLOODPLAIN DELINEATION

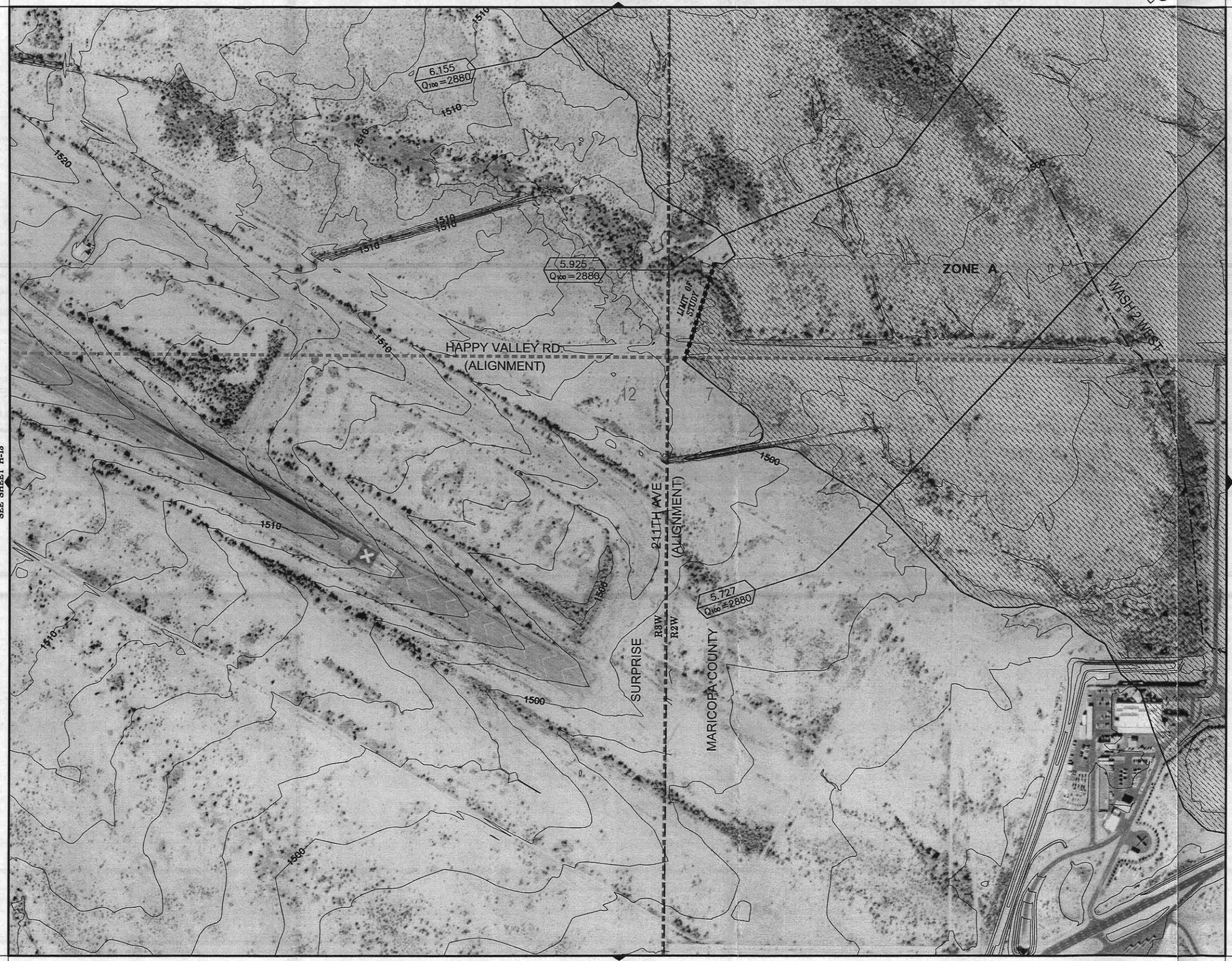
SEE SHEET I-14

ERM AJ3866

SEE SHEET H-18

SEE SHEET J-18

SEE SHEET I-12



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FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE
MASTER STUDY UPDATE
CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A — ZONE A
EFFECTIVE ZONE AE — ZONE AH
EFFECTIVE ZONE AH — ZONE AE
EFFECTIVE FLOODWAY — FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
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ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 / Q100=1270 — FP=1400.55 / FW=1400.56
BASE FLOOD ELEVATION — 1320
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ELEVATION REFERENCE MARKS

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I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
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NOTE:

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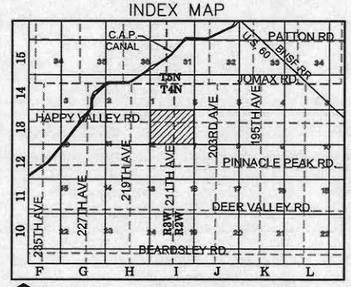
CERTIFICATE NO. 39737 — HERMAN A. ARISTIZABAL — REGISTERED PROFESSIONAL ENGINEER — ARIZONA, U.S.A.

INDEX MAP



N

200' 0' 200' 400'

SCALE: 1"= 200'

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PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005

SUBMITTED BY: DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET I-13 OF FLOODPLAIN DELINEATION

SEE SHEET I-15

SEE SHEET H-14

SEE SHEET J-14

SEE SHEET I-13

FP=1532.11 FW=1533.08 6.809 Q100=2880

FP=1530.23 FW=1531.07 6.844 Q100=2880

FP=1528.92 FW=1529.73 6.794 Q100=2880

FP=1526.38 FW=1527.29 6.720 Q100=2880

FP=1524.72 FW=1524.91 6.642 Q100=2880

FP=1522.17 FW=1522.81 6.509 Q100=2880

FP=1519.81 FW=1520.61 6.511 Q100=2880

FP=1517.26 FW=1518.20 6.414 Q100=2880

FP=1514.92 FW=1515.68 6.355 Q100=2880

6.155 Q100=2880

5.925 Q100=2880

FP=1538.64 FW=1539.44 1.102 Q100=2880

FP=1536.23 FW=1536.97 1.227 Q100=2880

6.936 Q100=2880

FP=1534.56 FW=1535.56 6.970 Q100=2880

FW

ZONE AE

WASH 2 WEST

211TH AVE

MARICOPA COUNTY

SURPRISE

JOMAX ROAD

ERM AJ3866

LIMIT OF DETAILED STUDY

ZONE A

LIMIT OF STUDY

211TH AVE (ALIGNMENT)

R3W R2W

1530 1528 1526 1524 1522 1520 1518 1516

FILE: P:\300\310\310032 (Wittmann ADMSJ)\Task\Hydraulics\FP-I_14.dwg DATE: 07/27/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A — ZONE A
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EFFECTIVE ZONE AH — ZONE AE
EFFECTIVE FLOODWAY — FLOODWAY (FW)
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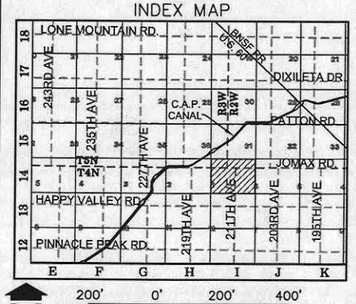
CERTIFICATE NO. 39737 HERMAN A. ARISTIZABAL REGISTERED PROFESSIONAL ENGINEER ARIZONA, U.S.A.

INDEX MAP



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FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET I-14 OF FLOODPLAIN DELINEATION

SEE SHEET I-16

ERM AJ3866

SEE SHEET H-16

SEE SHEET J-16

SEE SHEET I-14

FILE: P:\301\310\310032 (Wittmann ADMSU)\Task\hydrellas\FP-I_15.dwg DATE: 07/27/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A — ZONE A
EFFECTIVE ZONE AE — ZONE AH
EFFECTIVE ZONE AH — ZONE AE
EFFECTIVE FLOODWAY — FLOODWAY (FW)
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NOTE:
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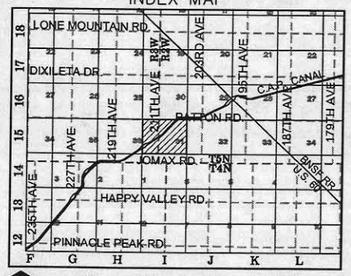
Registered Professional Engineer — 22737 — HERNAN A. ARRIETA — ARIZONA, U.S.A.

INDEX MAP



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SCALE: 1"= 200'

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SUBMITTED BY:		DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET I-15 OF FLOODPLAIN DELINEATION

SEE SHEET I-17

ERM DV0916

0.996 FP=1591.31 Q100=3070 FW=1591.43

0.916 FP=1588.21 WITTMANN WASH Q100=3070 FW=1588.93

0.807 FP=1588.21 WITTMANN WASH SOUTH SPLIT Q100=3070 FW=1588.93

0.855 FP=1586.72 WITTMANN WASH Q100=3070 FW=1586.23

0.746 FP=1586.72 WITTMANN WASH SOUTH SPLIT Q100=3070 FW=1585.74

0.684 FP=1581.74 Q100=420 FW=1582.61

0.593 FP=1577.83 Q100=420 FW=1578.47

0.509 FP=1574.00 Q100=420 FW=1574.20

0.458 FP=1572.09 Q100=420 FW=1572.18

0.415 FP=1568.99 Q100=420 FW=1570.23

0.328 FP=1566.06 Q100=420 FW=1566.71

0.278 FP=1564.18 Q100=420 FW=1564.48

0.169 FP=1559.54 Q100=420 FW=1560.19

0.090 FP=1555.94 Q100=420 FW=1556.26

0.834 FP=1576.10 Q100=2800 FW=1577.04

0.529 FP=1571.26 Q100=2800 FW=1572.09

FP=1583.36 FW=1584.02 0.308 Q100=2800

FP=1579.28 FW=1580.27 0.712 Q100=1800

0.438 FP=1568.56 Q100=2800 FW=1568.88

0.339 FP=1565.00 Q100=2800 FW=1565.85

0.246 FP=1561.83 Q100=2800 FW=1562.53

0.170 FP=1558.56 Q100=2800 FW=1559.52

0.082 FP=1555.23 Q100=2800 FW=1555.90

0.040 Q100=2800

0.016 FP=1550.68 Q100=420 FW=1550.69

0.019 Q100=2800

WITTMANN SOUTH SPLIT

WITTMANN WASH

211TH AVE

ZONE AE

ZONE A

ZONE AH EL. 553.36

FW

LIMIT OF DETAILED STUDY

SKINNER DR.

NICE RD.

PATTON RD.

C.A.P. CANAL

R3W R2W

SEE SHEET H-16

SEE SHEET J-16

SEE SHEET I-15

FILE: P:\300\310\310332 (Wittmann ADMS)\Task\hydraulics\FP-I_16.dwg DATE: 07/25/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY
ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 Q100=1270 FP=1400.55 FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
DV0916		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 1.90 FEET = NAVD 88.

Registered Professional Engineer — 29737 — HORHAN A. ARISTIZABAL — ARIZONA, U.S.A.

INDEX MAP

WITTMANN, DOVE VALLEY RD., LONE MOUNTAIN RD., DIXILETA DR., PATTON RD., JOMAX RD., HAPPY VALLEY RD., 235TH AVE, 227TH AVE, 219TH AVE, 211TH AVE, 203RD AVE, 195TH AVE, 187TH AVE, C.A.P. CANAL, R3W R2W, T5N T4N

200' 0' 200' 400'
SCALE: 1"= 200'

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	BY	DATE
DESIGN	AMG/RAS	07/2005
DESIGN CHK.	HAA	07/2005
PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005
SUBMITTED BY:		DATE:

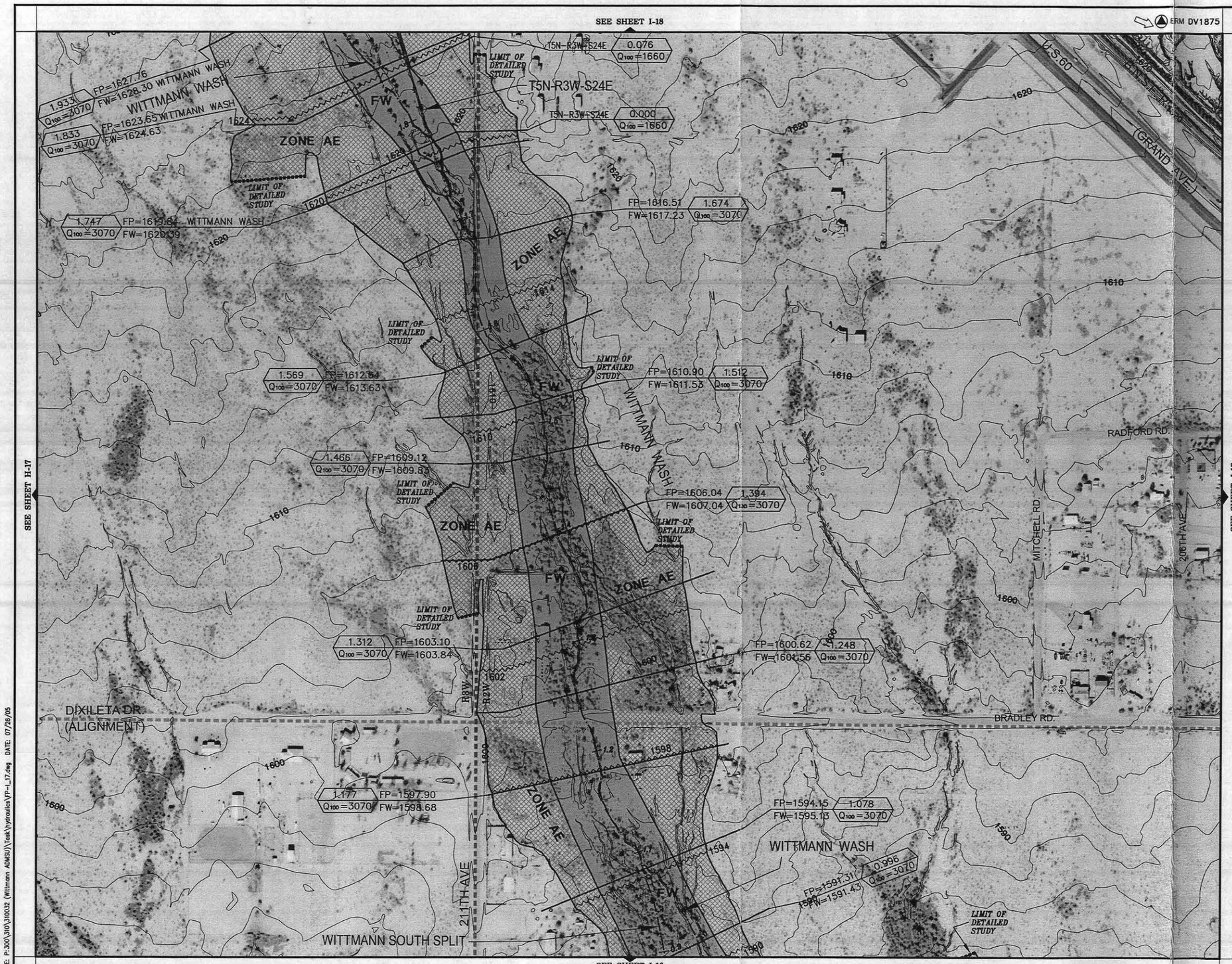
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET I-16 OF FLOODPLAIN DELINEATION



FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE
MASTER STUDY UPDATE
CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY
ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 / Q100=1270 — FP=1400.55 / FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

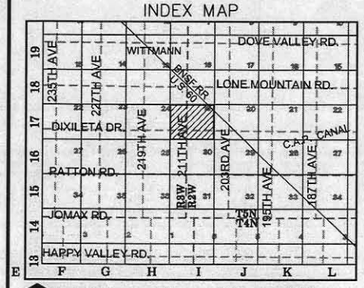
NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
DV1875		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:
1. NGVD 29 + 1.90 FEET = NAVD 88.

CERTIFICATE NO. 29737 — HERMAN A. ARISTIZABAL — REGISTERED PROFESSIONAL ENGINEER — STATE OF ARIZONA, U.S.A.

INDEX MAP



N
200' 0' 200' 400'
SCALE: 1"= 200'

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DESIGN CHK.	HAA	07/2005
PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005
SUBMITTED BY:		DATE:

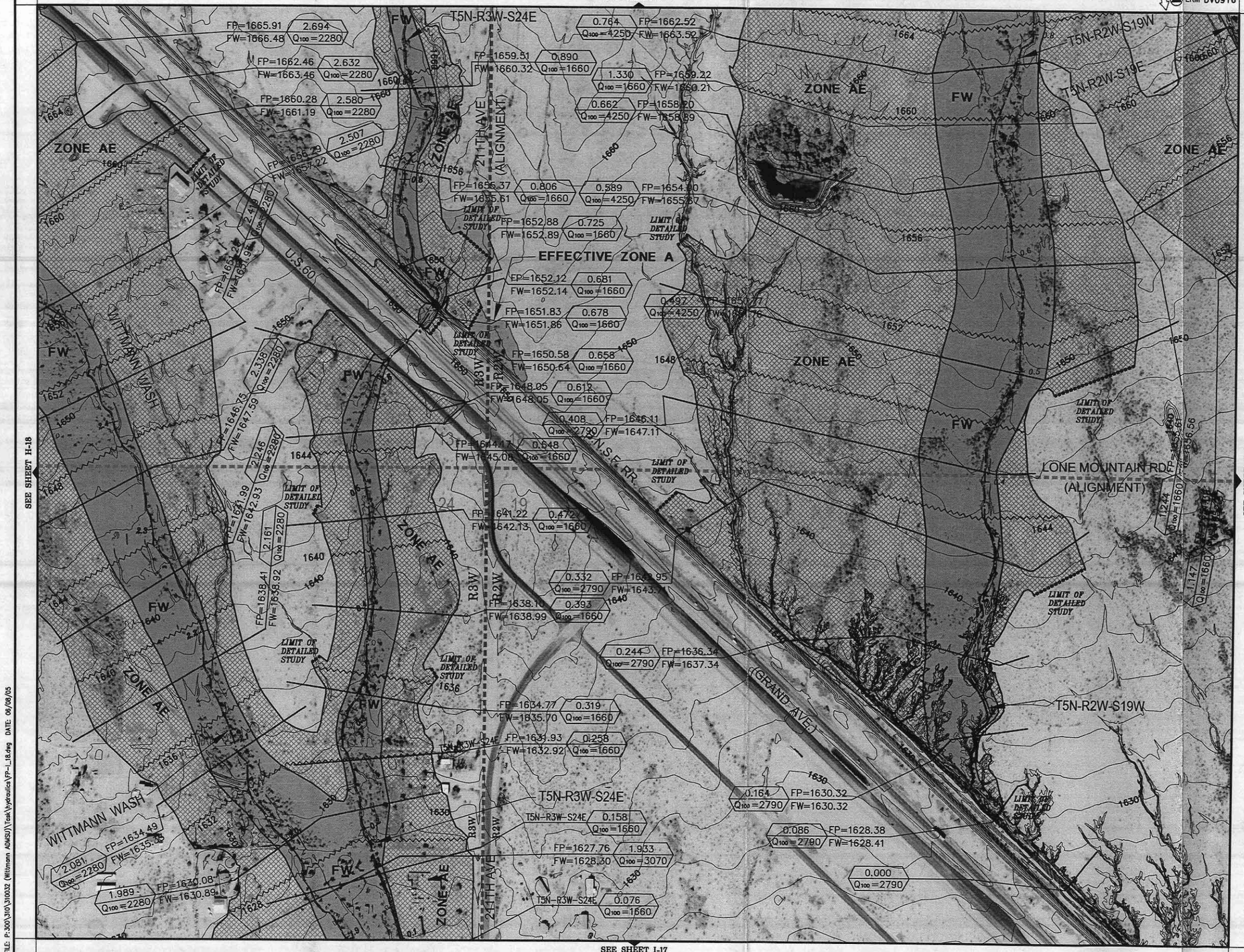
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE:
APPROVED BY: DATE:
CHIEF ENGINEER AND GENERAL MANAGER

SHEET I-17 OF FLOODPLAIN DELINEATION

FILE: P:\300\310\310032 (Wittmann ADMS)\Task\hydraulics\FP-I_17.dwg DATE: 07/28/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES



FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

- EFFECTIVE ZONE A / ZONE A
- EFFECTIVE ZONE AE / ZONE AH
- EFFECTIVE ZONE AH / ZONE AE
- EFFECTIVE FLOODWAY / FLOODWAY (FW)
- ZONE AO
- HYDRAULIC BASE LINE
- ZONE DESIGNATION: ZONE A
- WASH I.D. LABEL: WASH 9 EAST
- ELEVATION REFERENCE MARK: ERM AJ3866
- CROSS SECTION: 2.199 Q100=1270 FP=1400.55 FW=1400.56
- BASE FLOOD ELEVATION: 1320
- DIKE / LEVEE: DIKE
- COUNTY BOUNDARY
- CORPORATE LIMIT
- LIMIT OF STUDY
- LIMIT OF DETAILED STUDY
- TOWNSHIP/RANGE LINE
- SECTION LINE
- SECTION NUMBER: 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

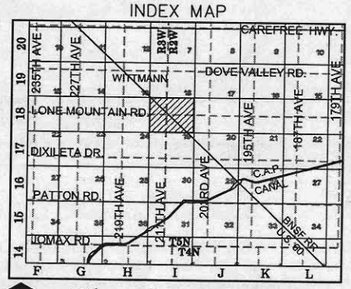
I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
DV0916		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 1.90 FEET = NAVD 88.

Registered Professional Engineer — 27737 — HERNAN A. ARISTIZABAL — ARIZONA, U.S.A.

INDEX MAP



200' 0' 200' 400'

SCALE: 1" = 200'

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	BY	DATE
DESIGN	AMG/RAS	07/2005
DESIGN CHK.	HAA	07/2005
PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: _____ DATE

APPROVED BY: _____ DATE

CHIEF ENGINEER AND GENERAL MANAGER

SUBMITTED BY: _____ DATE:

SHEET I-18 OF FLOODPLAIN DELINEATION

FILE: P:\00\310\310032 (Wittmann ADMSU)\Task\Hydraulics\FP-I_18.dwg DATE: 06/06/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

SEE SHEET I-20

ERM DV0918

SEE SHEET H-19

SEE SHEET J-19

SEE SHEET I-18

ZONE AE

FW

LIMIT OF DETAILED STUDY

DOVE VALLEY RD.

211TH AVE

CHRYSLER LOOP RD

T5N-R2W-S19W

T5N-R3W-S24E

T5N-R2W-S19E

R3W

R2W

WITTMANN WASH

U.S.60

BNSF R.R.

211TH AVE (ALIGNMENT)

1.801 FP=1708.60 Q100=1660 FW=1709.59

1.697 FP=1703.04 Q100=1660 FW=1703.97

1.704 FP=1706.76 Q100=2740 FW=1707.26

1.638 FP=1699.63 Q100=1660 FW=1700.32

1.538 FP=1697.62 Q100=5620 FW=1698.27

1.474 FP=1693.37 Q100=5620 FW=1694.33

1.623 FP=1698.70 Q100=1660 FW=1699.50

1.538 FP=1694.29 Q100=1660 FW=1695.29

1.462 FP=1690.17 Q100=1660 FW=1690.99

1.398 FP=1692.25 Q100=5620 FW=1693.19

1.315 FP=1688.28 Q100=5620 FW=1689.27

1.390 FP=1686.26 Q100=1660 FW=1687.15

1.225 FP=1684.78 Q100=5620 FW=1685.79

1.304 FP=1681.06 Q100=1660 FW=1681.59

1.213 FP=1676.11 Q100=1660 FW=1677.11

2.753 Q100=2280 FP=1669.42 FW=1670.16

1.104 FP=1670.08 Q100=1660 FW=1670.01

1.037 FP=1667.30 Q100=1660 FW=1668.13

0.972 FP=1663.63 Q100=1660 FW=1664.51

1.135 FP=1680.71 Q100=4250 FW=1681.69

1.079 FP=1678.01 Q100=4250 FW=1678.99

1.004 FP=1674.48 Q100=4250 FW=1675.34

0.926 FP=1671.02 Q100=4250 FW=1671.99

0.846 FP=1666.81 Q100=4250 FW=1667.66

1.632 FP=1702.48 Q100=2740 FW=1703.11

1.607 FP=1701.36 Q100=2740 FW=1702.12

2.054 Q100=2270 FP=1694.42 FW=1695.42

1.859 Q100=2270 FP=1689.85 FW=1689.66

1.741 Q100=2270 FP=1684.03 FW=1684.96

1.496 Q100=2270 FP=1679.77 FW=1680.66

1.853 Q100=1490 FP=1676.30 FW=1677.41

1.560 Q100=1490 FP=1672.19 FW=1672.60

1.497 FP=1668.80 Q100=1490 FW=1669.46

1.421 FP=1664.86 Q100=1490 FW=1665.78

FILE: P:\300\310\310332 (Wittmann ADMSU)\Task\hydrollics\FP-I_19.dwg DATE: 07/26/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY
ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 Q100=1270 FP=1400.55 FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

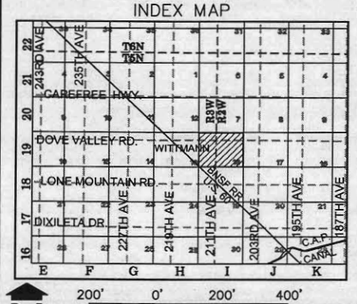
I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
DV0918		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 1.90 FEET = NAVD 88.

HERMAN A. ARISTIZABAL 39737 Registered Professional Engineer State of ARIZONA U.S.A.

INDEX MAP



N

200' 0' 200' 400'

SCALE: 1"= 200'

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DESIGN CHK.	HAA	07/2005
PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005
SUBMITTED BY:		DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET I-19 OF FLOODPLAIN DELINEATION

SEE SHEET I-21

ERM AJ3878

SEE SHEET H-20

SEE SHEET J-20

SEE SHEET I-19

ZONE AE

FW

LIMIT OF DETAILED STUDY

T5N-R2W-S07

T5N-R2W-S19W

T5N-R3W-S24E

CHRYSLER LOOP

211TH AVE ALIGNMENT

FP=1749.98 2.575 FW=1750.47 Q_{100}=800

FP=1745.92 2.493 FW=1746.76 Q_{100}=800

FP=1740.13 2.398 FW=1740.85 Q_{100}=800

FP=1747.87 0.474 FW=1748.19 Q_{100}=2700

FP=1743.65 0.390 FW=1743.92 Q_{100}=2700

FP=1738.87 0.305 FW=1739.48 Q_{100}=2700

FP=1736.36 2.543 FW=1737.14 Q_{100}=800

FP=1734.44 0.235 FW=1735.43 Q_{100}=2700

FP=1733.53 2.299 FW=1734.12 Q_{100}=800

FP=1731.16 2.265 FW=1731.77 Q_{100}=2380

FP=1727.48 2.187 FW=1727.74 Q_{100}=2380

FP=1724.32 2.124 FW=1725.21 Q_{100}=2380

FP=1718.86 1.990 FW=1719.54 Q_{100}=2740

FP=1714.44 1.902 FW=1715.40 Q_{100}=2740

FP=1712.91 1.866 FW=1713.63 Q_{100}=2740

FP=1709.65 1.787 FW=1710.45 Q_{100}=2740

FP=1706.76 1.704 FW=1707.26 Q_{100}=2740

FP=1718.64 1.976 FW=1719.63 Q_{100}=1660

FP=1715.39 1.906 FW=1716.06 Q_{100}=1660

2.617 Q_{100}=3020

0.588 Q_{100}=3020

FP=1749.85 2.525 FW=1750.44 Q_{100}=510

FP=1745.17 2.454 FW=1746.54 Q_{100}=510

FP=1742.90 2.404 FW=1743.32 Q_{100}=510

FP=1738.47 2.328 FW=1739.00 Q_{100}=510

FP=1734.14 2.243 FW=1734.96 Q_{100}=510

FP=1730.61 2.178 FW=1731.21 Q_{100}=510

FP=1724.87 2.071 FW=1724.95 Q_{100}=510

0.166 Q_{100}=1390

0.094 Q_{100}=1390

0.048 Q_{100}=1390

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY
ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 Q_{100}=1270 FP=1400.55 FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3878		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:
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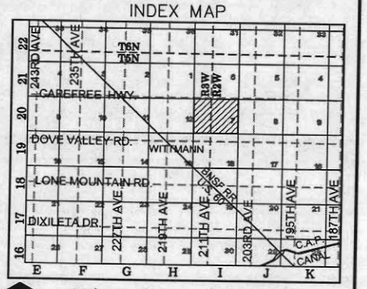
28737 HERMAN A. ARISTIZABAL Registered Professional Engineer ARIZONA, U.S.A.

INDEX MAP



SCALE: 1"= 200'

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PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005
SUBMITTED BY:		DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

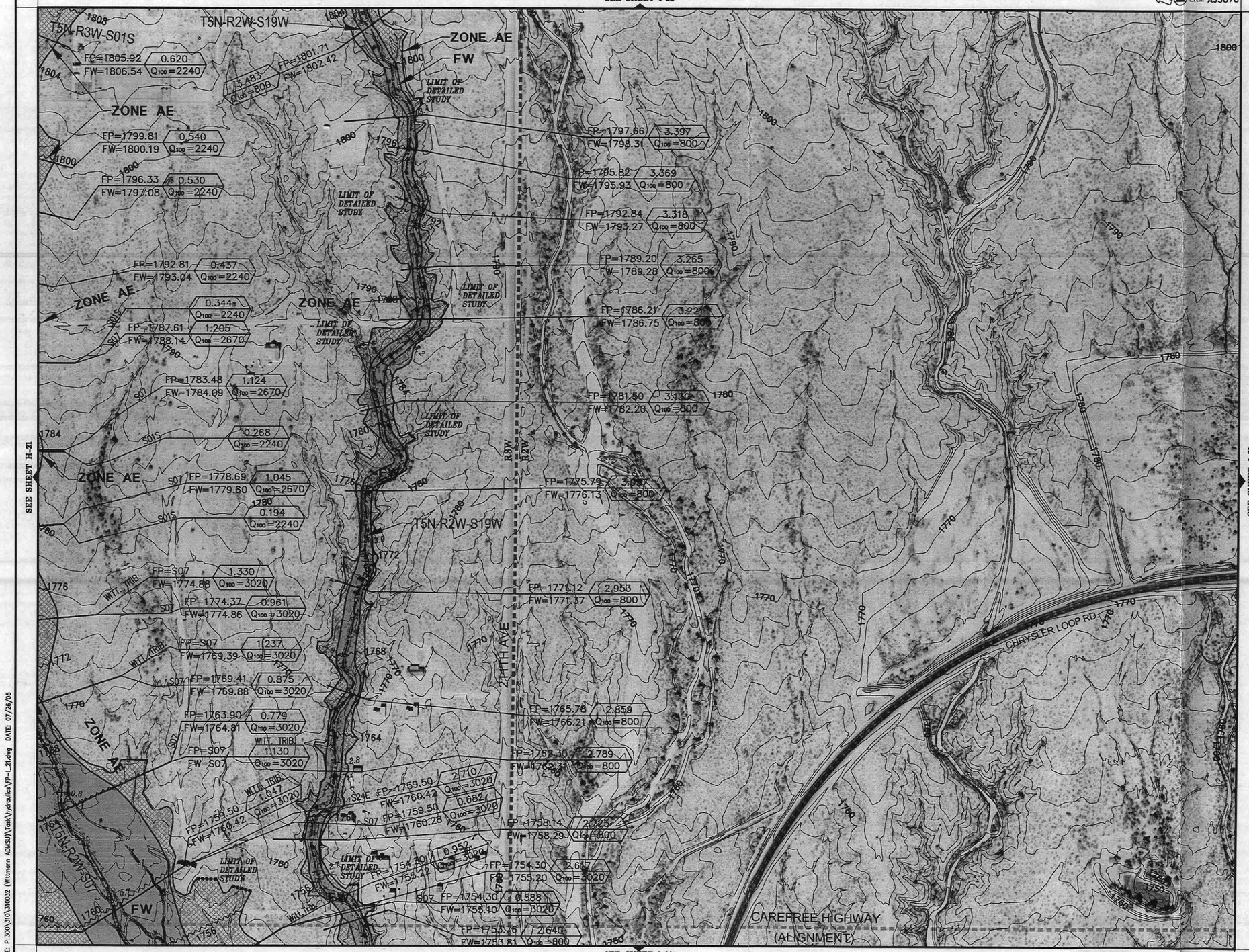
APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET I-20 OF FLOODPLAIN DELINEATION

FILE: P:\300\310\310032 (Wittmann ADMS)\Task\hydrodlea\FP-I_20.dwg DATE: 07/27/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES



FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY
ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 / Q_{100}=1270 — FP=1400.55 / FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
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NOTE:

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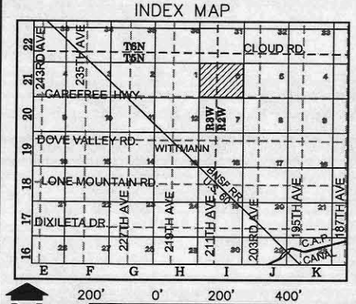
HERMAN A. ARISTIZABAL 39757 REGISTERED PROFESSIONAL ENGINEER ARIZONA, U.S.A.

INDEX MAP



N

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SCALE: 1"= 200'

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PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005
SUBMITTED BY:		DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

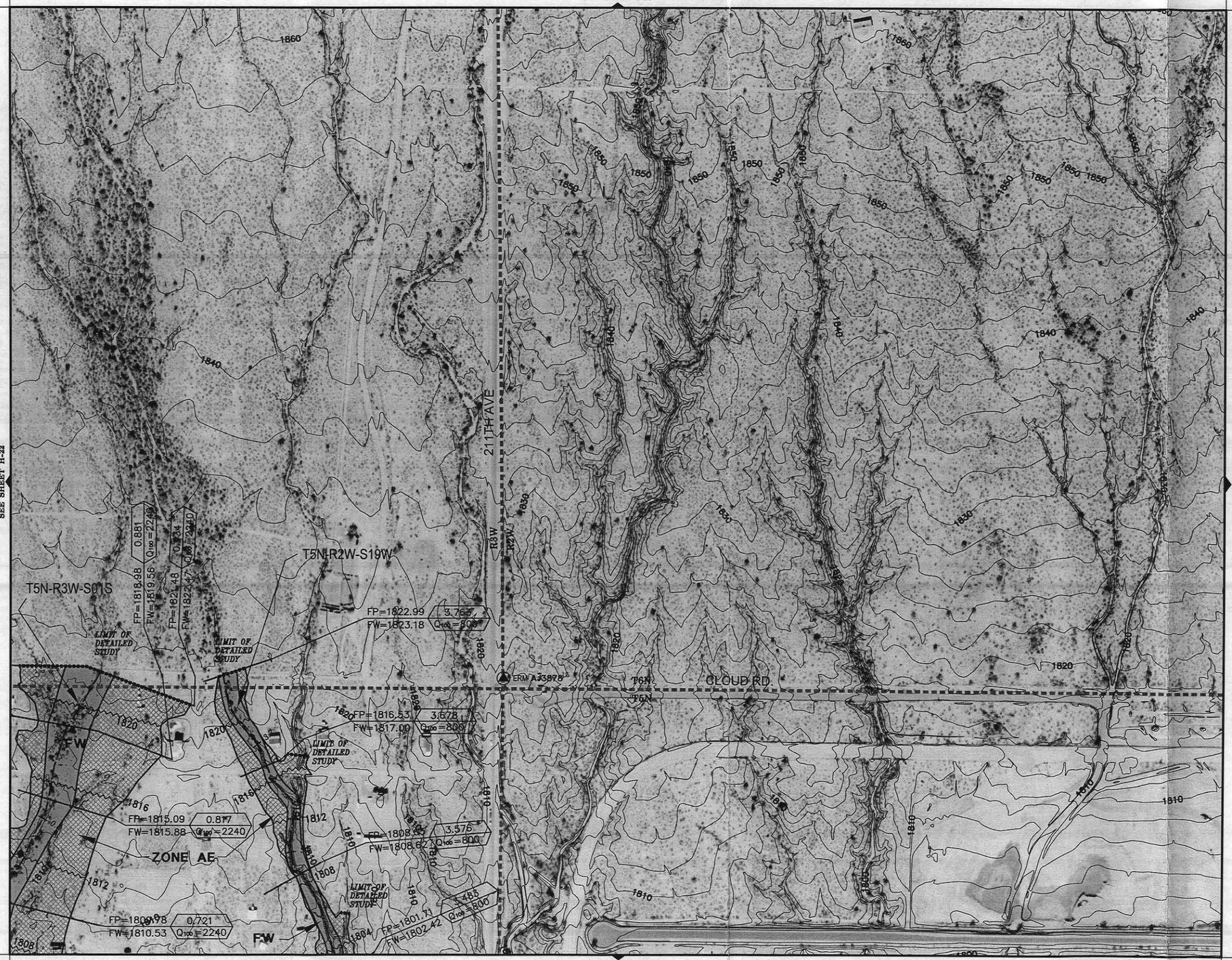
CHIEF ENGINEER AND GENERAL MANAGER

SHEET I-21 OF FLOODPLAIN DELINEATION

FILE: P:\300\310\310032 (Wittmann ADMS)\Task\hydraulics\FP-I_21.dwg DATE: 07/26/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

SEE SHEET I-23



SEE SHEET H-22

SEE SHEET J-22

SEE SHEET I-21

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A — ZONE A
EFFECTIVE ZONE AE — ZONE AH
EFFECTIVE ZONE AH — ZONE AE
EFFECTIVE FLOODWAY — FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 / Q_{100}=1270 — FP=1400.55 / FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

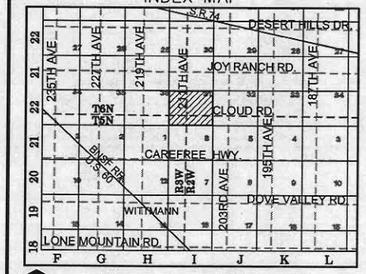
NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3878		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:
1. NGVD 29 + 2.00 FEET = NAVD 88.

Registered Professional Engineer — 29737 — HERMAN A. ARISTIZABAL — Date 7/7/05 — ARIZONA, U.S.A.

INDEX MAP



N

200' 0' 200' 400'

SCALE: 1"= 200'

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	BY	DATE
DESIGN	AMG/RAS	07/2005
DESIGN CHK.	HAA	07/2005
PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005
SUBMITTED BY:		DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET I-22 OF FLOODPLAIN DELINEATION

FILE: P:\300\310\310032 (Wittmann ADMS)\Task\Hydrotics\FP-I_22.dwg DATE: 07/28/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FILE: P:\300\310\310032 (Wittmann ADMS)\Task 1\Hydraulics\FP-J_12.dwg DATE: 07/27/05

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY
ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 / Q100 =1270 — FP=1400.55 / FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

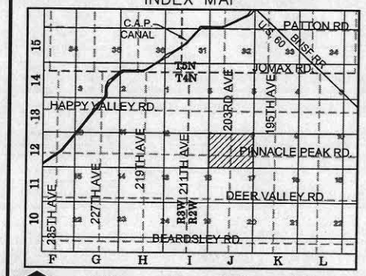
NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3860		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 1.80 FEET = NAVD 88.

INDEX MAP



200' 0' 200' 400'
SCALE: 1" = 200'

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DESIGN	AMG/RAS	07/2005
DESIGN CHK.	HAA	07/2005
PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005
SUBMITTED BY:		DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET J-12 OF FLOODPLAIN DELINEATION

SEE SHEET J-14

ERM AJ3866

5,727
Q_{100}=2880

LIMIT OF STUDY

203RD AVE (ALIGNMENT)

5,291
Q_{100}=2880

1480

HAPPY VALLEY RD.

3,865
Q_{100}=2880

4,862
Q_{100}=2880

4,650
Q_{100}=2880

ZONE A

WASH 2 WEST

CHRYSLER LOOP RD.

LIMIT OF STUDY

SEE SHEET I-18

SEE SHEET K-18

SEE SHEET J-12

FILE: P:\30\310\310032 (Wittmann ADMS)\Task\hydraulics\FP-_J13.dwg DATE: 07/27/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY
ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199, Q_{100}=1270, FP=1400.55, FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

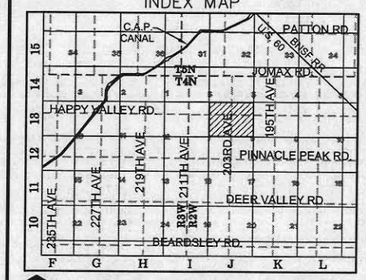
I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3866		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 1.80 FEET = NAVD 88.

HERMAN A. ARBITZABAL 29737 REGISTERED ENGINEER ARIZONA, U.S.A.

INDEX MAP



200' 0' 200' 400'
SCALE: 1"= 200'

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PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005
SUBMITTED BY:		DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

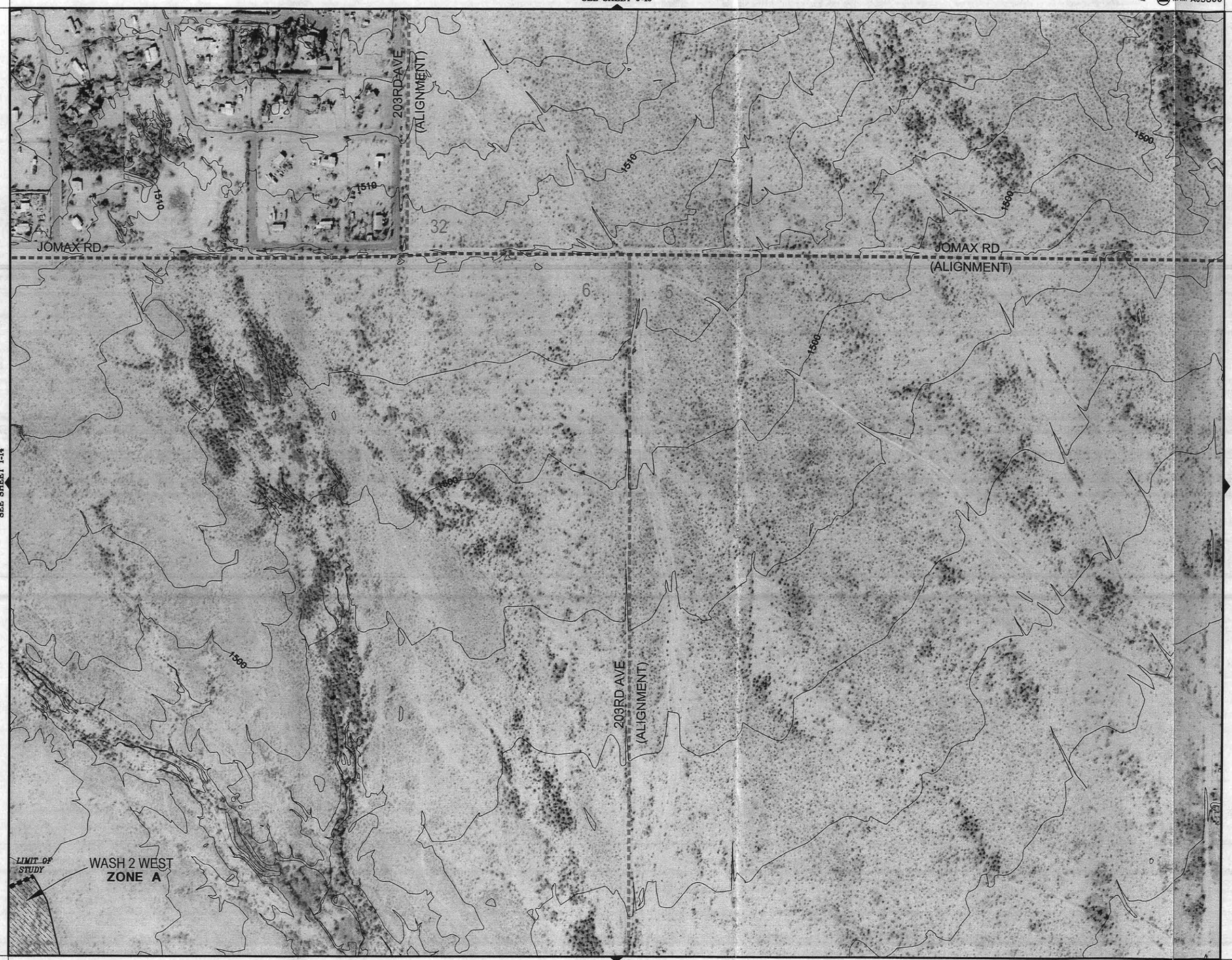
APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET J-13 OF FLOODPLAIN DELINEATION

SEE SHEET J-15

ERM AJ3866



SEE SHEET I-14

SEE SHEET K-14

SEE SHEET J-13

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE
CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A — ZONE A
EFFECTIVE ZONE AE — ZONE AH
EFFECTIVE ZONE AH — ZONE AE
EFFECTIVE FLOODWAY — FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 / Q_{100}=1270 — FP=1400.55 / FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

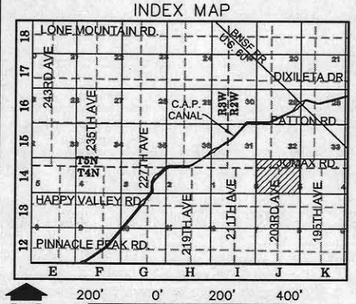
NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3866		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 1.90 FEET = NAVD 88.

INDEX MAP



N

200' 0' 200' 400'

SCALE: 1" = 200'

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DESIGN	AMG/RAS	07/2005
DESIGN CHK.	HAA	07/2005
PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: ____ DATE

APPROVED BY: ____ DATE

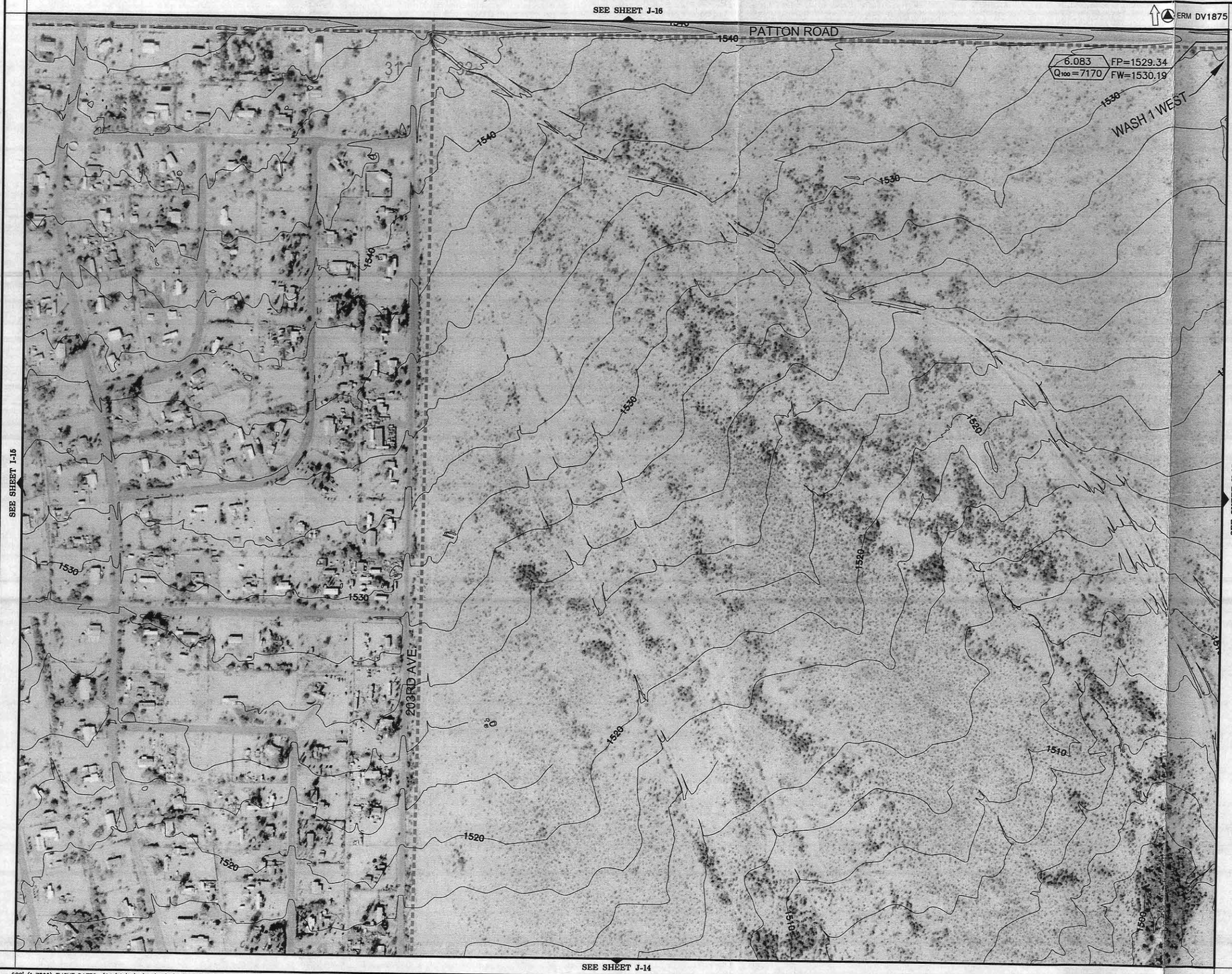
CHIEF ENGINEER AND GENERAL MANAGER

SUBMITTED BY: ____ DATE:

SHEET J-14 OF FLOODPLAIN DELINEATION

FILE: P:\309\310\310032 (Wittmann ADMS)\Task\Hydraulics\VP-J_14.dwg DATE: 07/28/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES



FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

- EFFECTIVE ZONE A
- EFFECTIVE ZONE AE
- EFFECTIVE ZONE AH
- EFFECTIVE FLOODWAY
- ZONE A
- ZONE AH
- ZONE AE
- FLOODWAY (FW)
- ZONE AO
- HYDRAULIC BASE LINE
- ZONE DESIGNATION: ZONE A
- WASH I.D. LABEL: WASH 9 EAST
- ELEVATION REFERENCE MARK: ERM AJ3866
- CROSS SECTION: 2.199 / Q100=1270 — FP=1400.55 / FW=1400.56
- BASE FLOOD ELEVATION: 1320
- DIKE / LEVEE: DIKE
- COUNTY BOUNDARY
- CORPORATE LIMIT
- LIMIT OF STUDY
- LIMIT OF DETAILED STUDY
- TOWNSHIP/RANGE LINE
- SECTION LINE
- SECTION NUMBER: 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

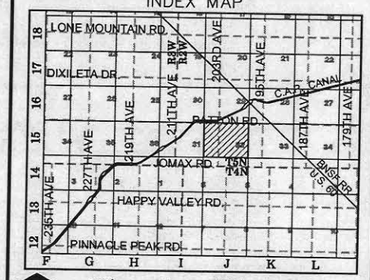
I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
DV1875		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 1.90 FEET = NAVD 88.

HERMAN A. ARISTIZABAL 29737 REGISTERED PROFESSIONAL ENGINEER ARIZONA, U.S.A.

INDEX MAP



N

200' 0' 200' 400'

SCALE: 1"= 200'

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DESIGN CHK.	HAA	07/2005
PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005
SUBMITTED BY:		DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET J-15 OF FLOODPLAIN DELINEATION

FILE: P:\300\310\310032 (Wittmann ADMS)\Task\hydraulics\FP-J_15.dwg DATE: 07/26/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

SEE SHEET J-17

ERM DV1875

SEE SHEET I-16

SEE SHEET K-16

SEE SHEET J-15

SKINNER DR.

JANICE RD.

203RD AVE

205TH AVE

WITTMANN WASH

203RD AVE BYPASS

PATTON RD. (ALIGNMENT)

U.S. 60 (GRAND AVE)

EASTBOUND

EXISTING ZONE A

C.A.P. CANAL OVERCHUTE STRUCTURE

C.A.P. CANAL

ZONE AH EL.=1553.36

WASH 1 WEST

FP=1565.00 / FW=1565.85 — 0.339 — Q_{100}=2800

FP=1561.83 / FW=1562.53 — 0.246 — Q_{100}=2800

FP=1558.56 / FW=1559.52 — 0.170 — Q_{100}=2800

FP=1555.23 / FW=1555.90 — 0.082 — Q_{100}=2800

0.040 — Q_{100}=2800

0.019 — Q_{100}=2800

6.497 — Q_{100}=7170 — FP=1551.75 / FW=1551.84

6.453 — Q_{100}=7170 — FP=1548.17 / FW=1548.72

6.390 — Q_{100}=7170 — FP=1543.15 / FW=1543.77

6.320 — Q_{100}=7170 — FP=1540.31 / FW=1541.07

6.230 — Q_{100}=7170 — FP=1536.72 / FW=1537.61

6.173 — Q_{100}=7170 — FP=1534.31 / FW=1535.23

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FILE: P:\300\310\310032 (Wittmann ADMSU)\Task\hydraulics\FP-J_16.dwg DATE: 07/26/05

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY

ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 / Q_{100}=1270 — FP=1400.55 / FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

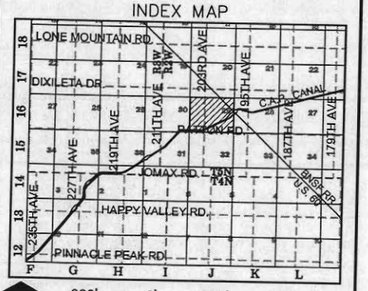
NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
DV1875		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:
1. NGVD 29 + 1.90 FEET = NAVD 88.

Registered Professional Engineer — 39737 — HERNAN A. ARISTIZABAL — ARIZONA, U.S.A.

INDEX MAP



200' 0' 200' 400'

SCALE: 1"= 200'

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PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005
SUBMITTED BY:		DATE:

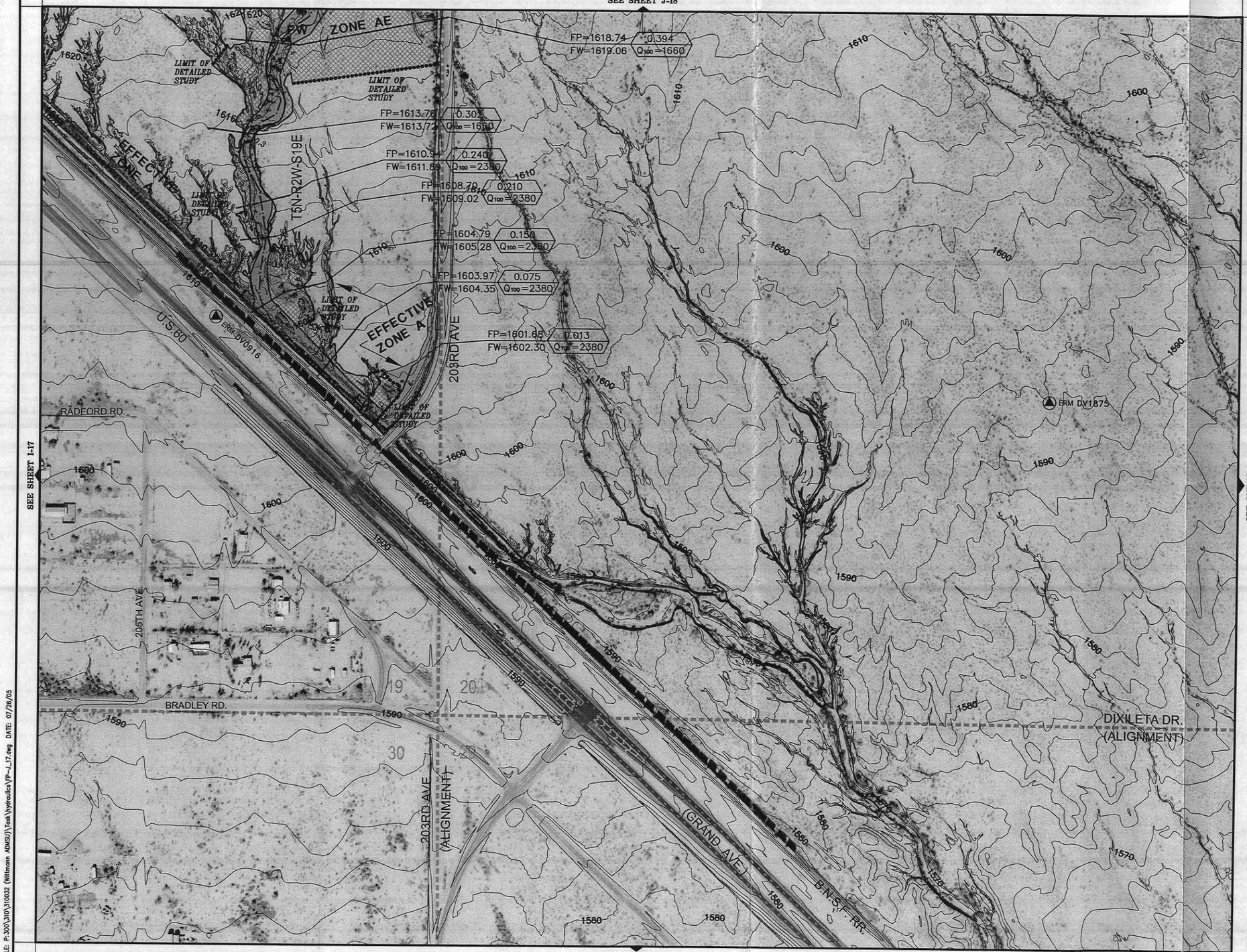
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET J-16 OF FLOODPLAIN DELINEATION



FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A — ZONE A
EFFECTIVE ZONE AE — ZONE AH
EFFECTIVE ZONE AH — ZONE AE
EFFECTIVE FLOODWAY — FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 / Q_{100}=1270 / FP=1400.55 / FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

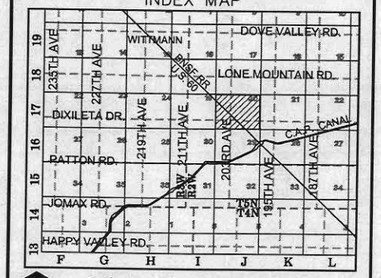
I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
DV0916		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE. WWW.NGS.NOAA.GOV
DV1875		

NOTE:

1. NGVD 29 + 1.90 FEET = NAVD 88.

HERNAN A. ARISTIZABAL — 20737 — ARIZONA, U.S.A.

INDEX MAP



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SCALE: 1"= 200'

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PLANS CHK.	AMG/HAA	07/2005

SUBMITTED BY: DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET J-17 OF FLOODPLAIN DELINEATION

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FILE: P:\301\310\310032 (Wittmann ADMSU)\Task\Hydraulics\FP-_L_17.dwg DATE: 07/26/05

SEE SHEET J-19

ERM DV0916

FP=1659.22 / FW=1660.21 / 1.330 / Q_{100}=1650

FP=1655.61 / FW=1656.56 / 1.244 / Q_{100}=1660

FP=1651.38 / FW=1652.37 / 1.147 / Q_{100}=1660

FP=1646.60 / FW=1647.27 / 1.042 / Q_{100}=1660

FP=1642.49 / FW=1643.49 / 0.954 / Q_{100}=1650

FP=1638.29 / FW=1639.27 / 0.855 / Q_{100}=1660

FP=1634.61 / FW=1635.62 / 0.778 / Q_{100}=1660

FP=1631.01 / FW=1631.74 / 0.695 / Q_{100}=1660

FP=1626.70 / FW=1627.69 / 0.586 / Q_{100}=1660

FP=1622.56 / FW=1623.47 / 0.503 / Q_{100}=1660

FW

ZONE AE

T5N-R2W-S19E

T5N-R2W-S19E

203RD AVE

LIMIT OF DETAILED STUDY

LIMIT OF DETAILED STUDY

LIMIT OF DETAILED STUDY

LONE MOUNTAIN RD. (ALIGNMENT)

SEE SHEET I-18

SEE SHEET K-18

SEE SHEET J-17

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FILE: P:\300\310\310032 (Wittmann ADMS0)\Task\hydraulics\FP-J_18.dwg DATE: 07/27/05

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY
ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
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CROSS SECTION — 2.199 / Q_{100}=1270 / FP=1400.55 / FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
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ELEVATION REFERENCE MARKS

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DV0916		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

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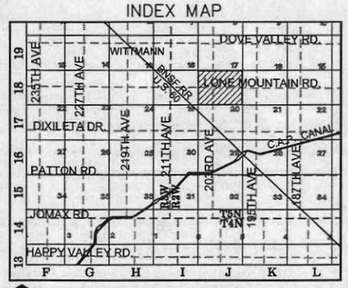
HERMAN A. ARISTIZABAL 29737 REGISTERED PROFESSIONAL ENGINEER ARIZONA, U.S.A.

INDEX MAP



200' 0' 200' 400'

SCALE: 1"= 200'

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DESIGN CHK.	HAA	07/2005
PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005

SUBMITTED BY: DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET J-18 OF FLOODPLAIN DELINEATION

SEE SHEET J-20

ERM AJ3872

SEE SHEET I-19

SEE SHEET K-19

SEE SHEET J-18

FILE: P:\300\310\310232 (Wittmann ADMS)\Task\Hydraulics\FP-J_19.dwg DATE: 07/26/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A — ZONE A
EFFECTIVE ZONE AE — ZONE AH
EFFECTIVE ZONE AH — ZONE AE
EFFECTIVE FLOODWAY — FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE — A3.1
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 / Q_{100}=1270 — FP=1400.55 / FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

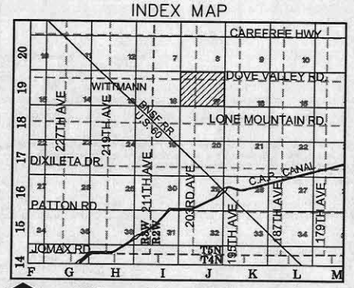
I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3872		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 1.90 FEET = NAVD 88.

HERMAN A. ARISTIZABAL — 39737 — REGISTERED PROFESSIONAL ENGINEER — ARIZONA, U.S.A.

INDEX MAP



200' 0' 200' 400'
SCALE: 1"= 200'

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PLANS CHK.	AMG/HAA	07/2005

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: _____ DATE

APPROVED BY: _____ DATE

CHIEF ENGINEER AND GENERAL MANAGER

SUBMITTED BY: _____ DATE:

SHEET J-19 OF FLOODPLAIN DELINEATION

SEE SHEET K-12

ERM AJ3860

SEE SHEET J-11

SEE SHEET L-11

SEE SHEET K-10

3.278
Q_{100}=2970

3.075
Q_{100}=2970

2.879
Q_{100}=2970

2.616
Q_{100}=2970

LIMIT OF STUDY

ZONE A

WASH 2 WEST

196TH AVE

DEER VALLEY RD.

LANDFILL

1420

1410

1400

1430

1440

16

20

21

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY
ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 / Q_{100}=1270 — FP=1400.55 / FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3860		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

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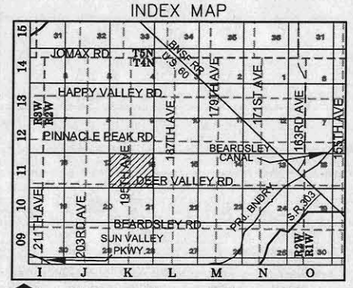
CERTIFICATE NO. 29737 — HERNAN A. ARISTIZABAL — 7/27/05 — ARIZONA, U.S.A.

INDEX MAP



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SCALE: 1"= 200'

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PLANS CHK.	AMG/HAA	07/2005
SUBMITTED BY:		DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET K-11 OF FLOODPLAIN DELINEATION

FILE: P:\300\310\310332 (Wittmann ADMS)\Task\hydraulics\FP-K_11.dwg DATE: 07/27/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

SEE SHEET K-13

ERM AJ3860

4.243
Q_{100}=2970

4.103
Q_{100}=2970

195TH AVE.

NORWICH DR.

193RD AVE.

191ST AVE.

LIMIT OF STUDY

3.924
Q_{100}=2970

1440

BELINDA AVE.

3.782
Q_{100}=2970

ZONE A

3.478
Q_{100}=2970

WASH 2 WEST

PINNACLE PEAK RD.

PINNACLE PEAK RD. ALIGNMENT

3.270
Q_{100}=2970

3.075
Q_{100}=2970

1420

SEE SHEET J-12

SEE SHEET L-12

SEE SHEET K-11

FILE: P:\501\310\310032 (Wittmann ADMS)\Task\hydraulics\FP-K_11.dwg DATE: 07/27/05

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FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY
ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 / Q_{100}=1270 / FP=1400.55 / FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

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I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
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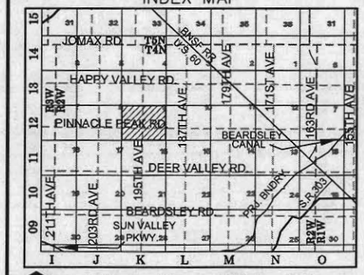
Registered Professional Engineer — 39737 — HERNAN A. ARISTIZABAL — ARIZONA, U.S.A.

INDEX MAP



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SCALE: 1"= 200'

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PLANS CHK.	AMG/HAA	07/2005

SUBMITTED BY: DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET K-12 OF FLOODPLAIN DELINEATION

SEE SHEET K-15

ERM DV0268

SEE SHEET J-14

SEE SHEET L-14

SEE SHEET K-13

5.069 Q100=7360 FP=1488.02 FW=1488.97

LIMIT OF DETAILED STUDY

ZONE AE

FW

WASH 1 WEST

4.874 Q100=7360 FP=1491.28 FW=1491.74

4.783 Q100=7360 FP=1479.21 FW=1476

4.741 Q100=7360 FP=1472.28 FW=1472.77

4.672 Q100=7360

5.008 Q100=7360 FP=1485.62 FW=1486.33

4.971 Q100=7360 FP=1484.45 FW=1485.32

4.929 Q100=7360 FP=1483.10 FW=1484.24

195TH AVE

193RD AVE

203RD AVE

JOMAX RD.

(ALIGNMENT)

JOMAX RD.

WASH 1 WEST

LIMIT OF STUDY

4.517 Q100=7360

4.356 Q100=7360

4.234 Q100=7360

ZONE A

195TH AVE

1480

1490

1500

1470

1460

32

33

5

4

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A — ZONE A

EFFECTIVE ZONE AE — ZONE AH

EFFECTIVE ZONE AH — ZONE AE

EFFECTIVE FLOODWAY — FLOODWAY (FW)

ZONE AO

HYDRAULIC BASE LINE

ZONE DESIGNATION — ZONE A

WASH I.D. LABEL — WASH 9 EAST

ELEVATION REFERENCE MARK — ERM AJ3866

CROSS SECTION — 2.199 Q100=1270 FP=1400.55 FW=1400.56

BASE FLOOD ELEVATION — 1320

DIKE / LEVEE — DIKE

COUNTY BOUNDARY

CORPORATE LIMIT

LIMIT OF STUDY

LIMIT OF DETAILED STUDY

TOWNSHIP/RANGE LINE

SECTION LINE

SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
DV0268		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

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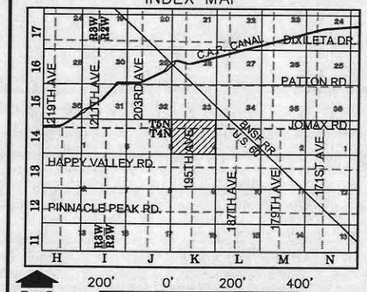
HERNAN A. ARISTIZABAL 20737 REGISTERED PROFESSIONAL ENGINEER ARIZONA, U.S.A.

INDEX MAP



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PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: _____ DATE

APPROVED BY: _____ DATE

CHIEF ENGINEER AND GENERAL MANAGER

SUBMITTED BY: _____ DATE:

SHEET K-14 OF FLOODPLAIN DELINEATION

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FILE: P:\300\310\310032 (Wittmann ADMSJ)\Task\Hydraulics\FP-K_14.dwg DATE: 07/28/05

SEE SHEET K-16

ERM DV0268

SEE SHEET J-16

SEE SHEET L-16

SEE SHEET K-14

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FILE: P:\300\310\310332 (Wittmann ADMS)\Task\Hydraulics\FP-K_15.dwg DATE: 07/27/05

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A — ZONE A

EFFECTIVE ZONE AE — ZONE AH

EFFECTIVE ZONE AH — ZONE AE

EFFECTIVE FLOODWAY — FLOODWAY (FW)

ZONE AO

HYDRAULIC BASE LINE

ZONE DESIGNATION — ZONE A

WASH I.D. LABEL — WASH 9 EAST

ELEVATION REFERENCE MARK — ERM AJ3866

CROSS SECTION — 2.199 Q100=1270 FP=1400.55 FW=1400.56

BASE FLOOD ELEVATION — 1320

DIKE / LEVEE — DIKE

COUNTY BOUNDARY

CORPORATE LIMIT

LIMIT OF STUDY

LIMIT OF DETAILED STUDY

TOWNSHIP/RANGE LINE

SECTION LINE

SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
DV0268		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

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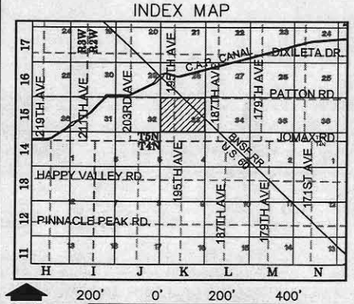
INDEX MAP



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FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

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CHIEF ENGINEER AND GENERAL MANAGER

SHEET K-15 OF FLOODPLAIN DELINEATION

SEE SHEET K-17

ERM DV1875

SEE SHEET J-16

SEE SHEET L-16

SEE SHEET K-15

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FILE: P:\300\310\310332 (Wittmann ADMSU)\Task\Hydraulics\FP-K_16.dwg DATE: 07/27/05

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY
ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 / Q_{100}=1270 — FP=1400.55 / FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

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I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
DV1875		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

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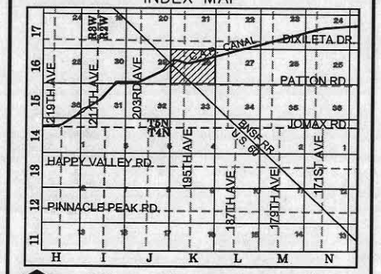
29737 HERMAN A. ARISTIZABAL

INDEX MAP



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FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

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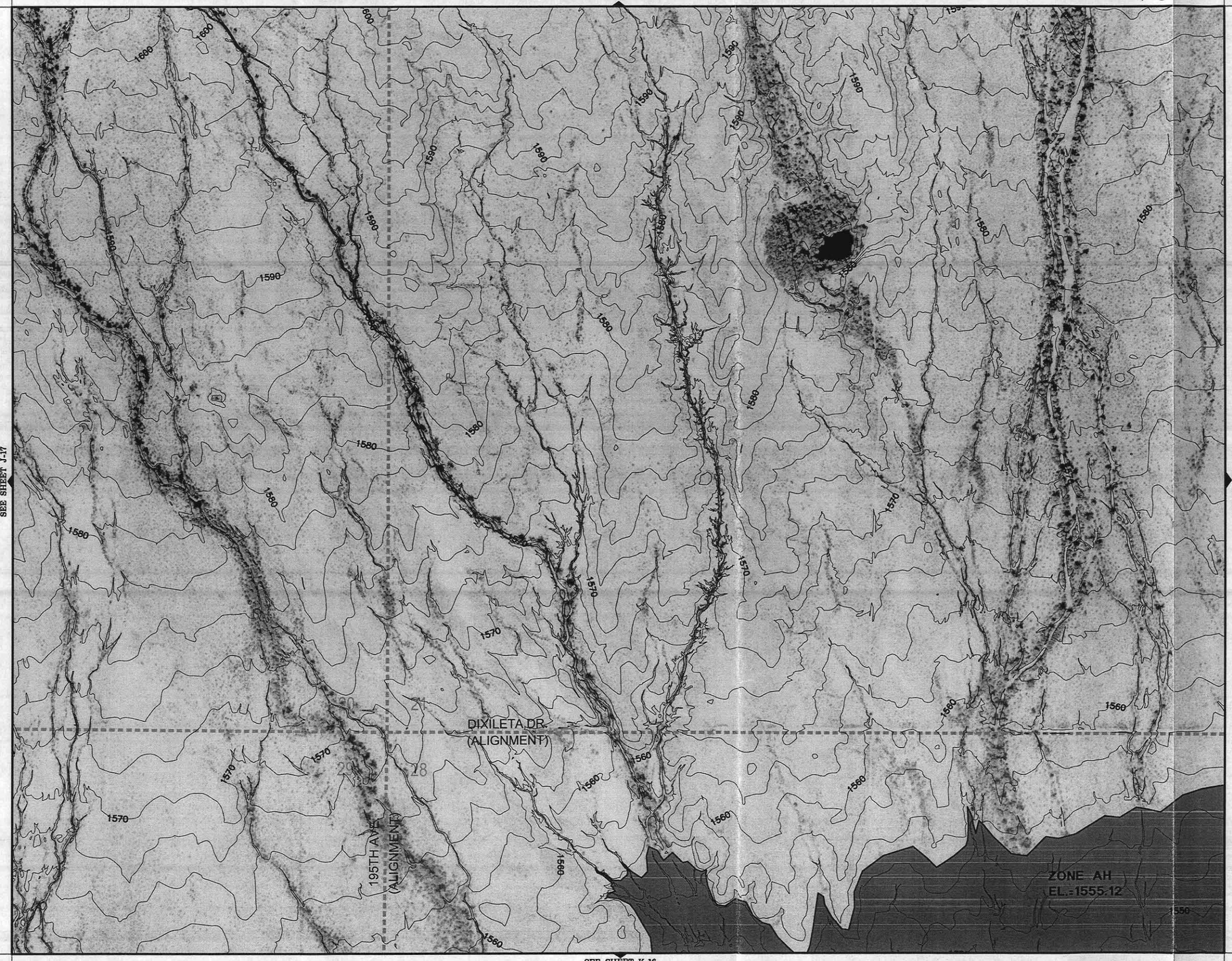
CHIEF ENGINEER AND GENERAL MANAGER

SHEET K-16 OF FLOODPLAIN DELINEATION

SEE SHEET K-18

ERM AJ3872



SEE SHEET J-17

SEE SHEET L-17

SEE SHEET K-16

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY
ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 / Q100=1270 — FP=1400.55 / FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
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LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

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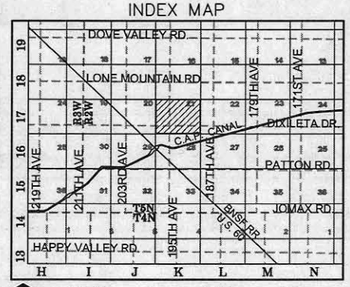

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CHIEF ENGINEER AND GENERAL MANAGER

SHEET K-17 OF FLOODPLAIN DELINEATION

FILE: P:\300_JHO\310032 (Wittmann ADMS)\Task\Hydraulics\FP-K_17.dwg DATE: 07/27/05

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ERM AJ3872

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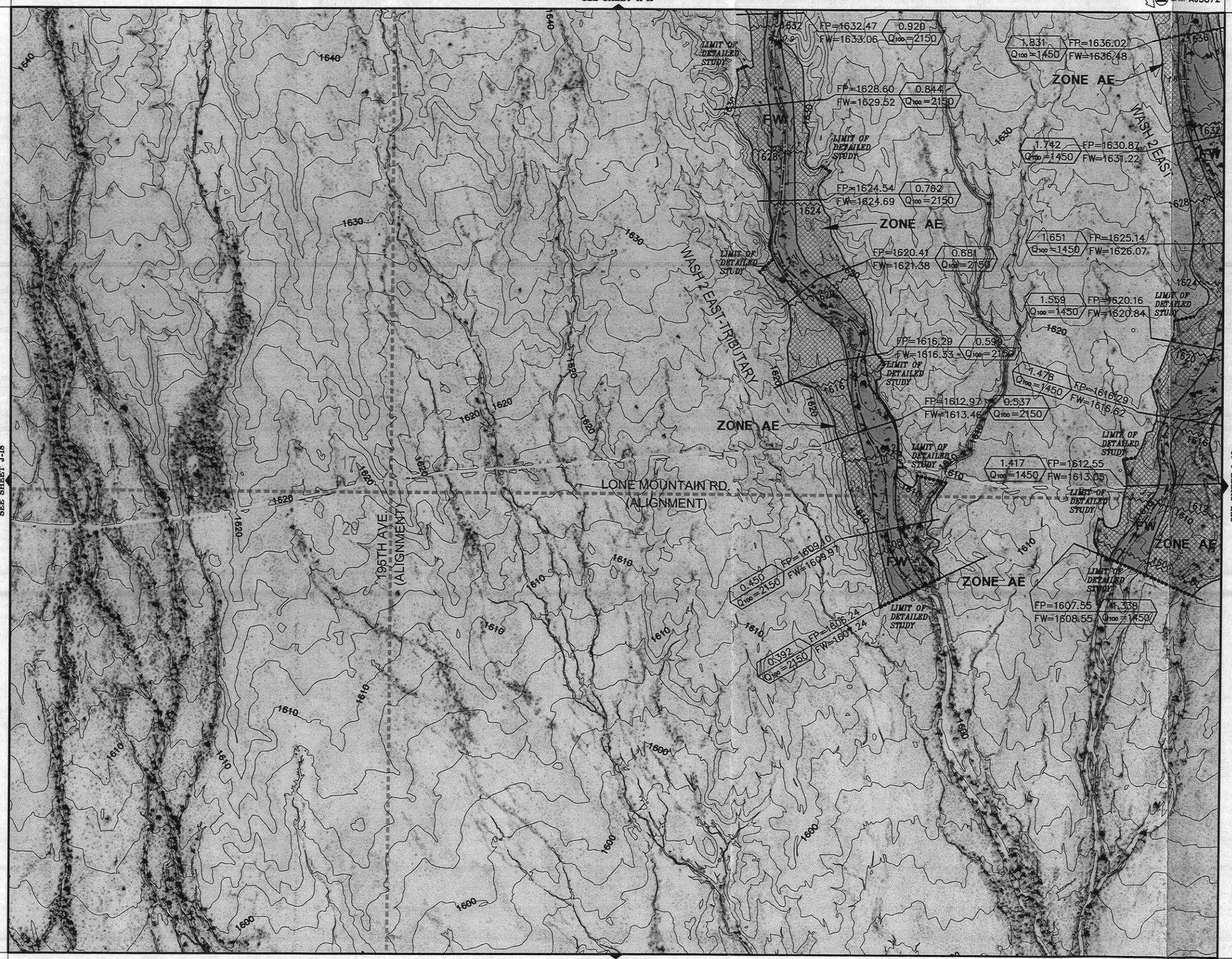

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

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EFFECTIVE ZONE AE — ZONE AH
EFFECTIVE ZONE AH — ZONE AE
EFFECTIVE FLOODWAY — FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
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ELEVATION REFERENCE MARK — ERM AJ3866
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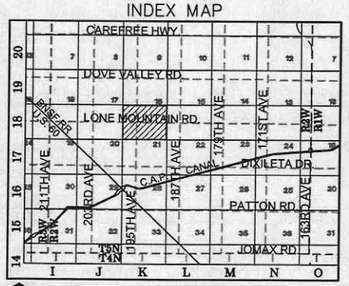
NOTE:

1. NGVD 29 + 1.90 FEET = NAVD 88.

HERMAN A. ARISTIZABAL 39737 REGISTERED PROFESSIONAL ENGINEER ARIZONA, U.S.A.

INDEX MAP



200' 0' 200' 400'

SCALE: 1"= 200'

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Fax 602.344.6947
WEB www.entellus.com

	BY	DATE
DESIGN	AMG/RAS	07/2005
DESIGN CHK.	HAA	07/2005
PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005

SUBMITTED BY: DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET K-18 OF FLOODPLAIN DELINEATION

FILE: P:\001\310\310032 (Wittmann ADMS0)\Task\hydraulics\FP-K_18.dwg DATE: 07/27/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

SEE SHEET K-20

ERM AJ3872

DOVE VALLEY RD

195TH AVE (ALIGNMENT)

WASH 2 EAST TRIBUTARY

WASH 2 EAST

ZONE AE

FW

LIMIT OF DETAILED STUDY

FP=1674.98 1,753 FW=1675.84 Q100=2150

FP=1673.15 1,696 FW=1673.24 Q100=2150

FP=1670.35 1,646 FW=1670.65 Q100=2150

FP=1666.62 1,578 FW=1666.25 Q100=2150

FP=1662.09 1,496 FW=1662.38 Q100=2150

FP=1657.70 1,416 FW=1657.89 Q100=2150

FP=1652.51 1,317 FW=1653.15 Q100=2150

FP=1647.97 1,233 FW=1648.43 Q100=2150

FP=1644.67 1,147 FW=1644.96 Q100=2150

FP=1640.83 1,078 FW=1641.30 Q100=2150

FP=1636.37 1,008 FW=1637.27 Q100=2150

FP=1678.87 2,598 FW=1678.97 Q100=890

FP=1677.56 2,571 FW=1677.73 Q100=890

FP=1676.13 2,542 FW=1676.32 Q100=890

FP=1673.68 2,501 FW=1674.09 Q100=890

FP=1668.39 2,412 FW=1668.93 Q100=890

FP=1664.79 2,347 FW=1663.73 Q100=890

FP=1660.49 2,276 FW=1660.73 Q100=890

FP=1656.67 2,196 FW=1656.63 Q100=890

2.120 FP=1652.16 Q100=1450 FW=1652.48

2.077 FP=1649.72 Q100=1450 FW=1650.18

1.991 FP=1644.89 Q100=1450 FW=1645.52

1.907 FP=1640.26 Q100=1450 FW=1640.90

SEE SHEET J-19

SEE SHEET L-19

SEE SHEET K-18

FILE: P:\300\310\10032 (Wittmann ADMSU)\Task\hydraulics\FP-K_19.dwg DATE: 07/26/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A — ZONE A

EFFECTIVE ZONE AE — ZONE AH

EFFECTIVE ZONE AH — ZONE AE

EFFECTIVE FLOODWAY — FLOODWAY (FW)

ZONE AO

HYDRAULIC BASE LINE

ZONE DESIGNATION — ZONE A

WASH I.D. LABEL — WASH 9 EAST

ELEVATION REFERENCE MARK — ERM AJ3866

CROSS SECTION — 2.199 / Q100=1270 — FP=1400.55 FW=1400.56

BASE FLOOD ELEVATION — 1320

DIKE / LEVEE — DIKE

COUNTY BOUNDARY

CORPORATE LIMIT

LIMIT OF STUDY

LIMIT OF DETAILED STUDY

TOWNSHIP/RANGE LINE

SECTION LINE

SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

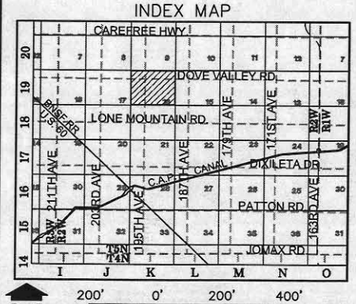
I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3872		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 1.90 FEET = NAVD 88.

HERNAN A. ARISTIZABAL — 39737 — REGISTERED ENGINEER — STATE OF ARIZONA, U.S.A.

INDEX MAP



200' 0' 200' 400'

SCALE: 1"= 200'

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	BY	DATE
DESIGN	AMG/RAS	07/2005
DESIGN CHK.	HAA	07/2005
PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005

SUBMITTED BY: DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET K-19 OF FLOODPLAIN DELINEATION

SEE SHEET L-10

ERM AJ3860

BEARDSLEY RD. (ALIGNMENT)

PERRYVILLE RD. (187TH AVE) (ALIGNMENT)

MARICOPA COUNTY / SURPRISE

WASH 2 WEST

ZONE AE

FW

ZONE AE

FW

EFFECTIVE TRILBY WASH ZONE AE & FW

EFFECTIVE ZONE A

LIMIT OF DETAILED STUDY

LIMIT OF DETAILED STUDY

1.204 Q100=3130 FP=1370.85 FW=1371.85

1.107 Q100=3130 FP=1367.46 FW=1368.20

1.041 Q100=3130 FP=1365.50 FW=1366.40

0.967 Q100=3130 FP=1363.43 FW=1364.39

0.877 Q100=3130 FP=1361.15 FW=1361.93

0.787 Q100=3130 FP=1359.80 FW=1359.80

0.708 Q100=3130 FP=1356.79 FW=1357.79

0.637 Q100=3130 FP=1354.64 FW=1355.64

0.579 Q100=3130 FP=1352.74 FW=1353.73

0.521 Q100=3130

0.451 Q100=3130

0.376 Q100=3130

0.303 Q100=3130

SEE SHEET K-09

SEE SHEET M-09

SEE SHEET L-08

FILE: P:\300\310\310332 (Wittmann ADMS)\Task\hydrodlls\VP-L_09.dwg DATE: 07/27/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A — ZONE A
EFFECTIVE ZONE AE — ZONE AH
EFFECTIVE ZONE AH — ZONE AE
EFFECTIVE FLOODWAY — FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 Q100=1270 FP=1400.55 FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

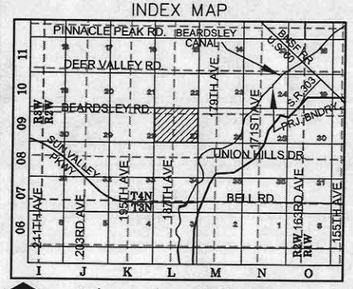
I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3860		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 1.80 FEET = NAVD 88.

Registered Professional Engineer — 28737 — HERNAN A. ARISTIZABAL — Date Signed 7/27/05 — ARIZONA, U.S.A.

INDEX MAP



200' 0' 200' 400'

SCALE: 1"= 200'

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	BY	DATE
DESIGN	AMG/RAS	07/2005
DESIGN CHK.	HAA	07/2005
PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: _____ DATE

APPROVED BY: _____ DATE

CHIEF ENGINEER AND GENERAL MANAGER

SUBMITTED BY: _____ DATE:

SHEET L-09 OF FLOODPLAIN DELINEATION

FILE: P:\300\310\310032 (Wittmann ADMS)\Task\Hydraulics\FP-L_10.dwg DATE: 07/27/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A — ZONE A
EFFECTIVE ZONE AE — ZONE AH
EFFECTIVE ZONE AH — ZONE AE
EFFECTIVE FLOODWAY — FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 / Q100=1270 — FP=1400.55 / FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

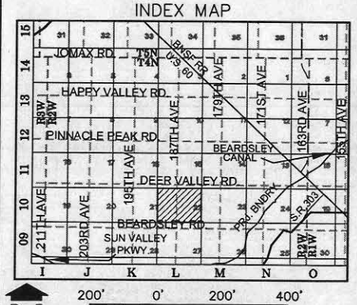
I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3860		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 1.80 FEET = NAVD 88.

Registered Professional Engineer — 29737 — HERMAN A. ARISTIZABAL — Date Signed 4/27/06 — ARIZONA, U.S.A.

INDEX MAP



200' 0' 200' 400'
SCALE: 1"= 200'

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	BY	DATE
DESIGN	AMG/RAS	07/2005
DESIGN CHK.	HAA	07/2005
PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005

SUBMITTED BY: DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

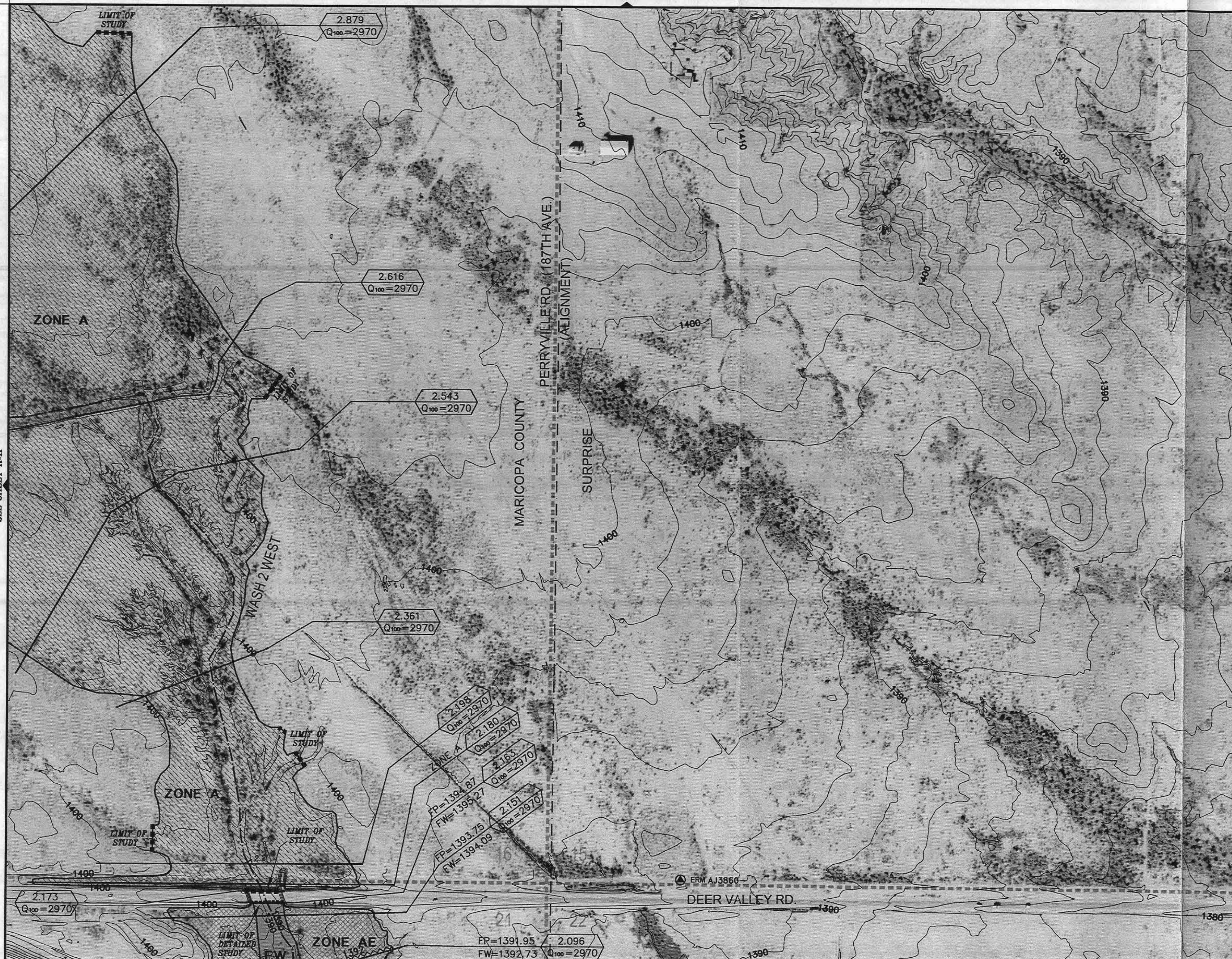
APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET L-10 OF FLOODPLAIN DELINEATION

SEE SHEET L-12

SEE SHEET K-11



SEE SHEET M-11

SEE SHEET L-10

FILE: P:300\310\310032 (Wittmann ADMSU)\Task\hydraulics\FP-L_11.dwg DATE: 07/27/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
WITTMANN AREA DRAINAGE MASTER STUDY UPDATE
CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A — ZONE A
EFFECTIVE ZONE AE — ZONE AH
EFFECTIVE ZONE AH — ZONE AE
EFFECTIVE FLOODWAY — FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 Q100=1270 FP=1400.55 FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

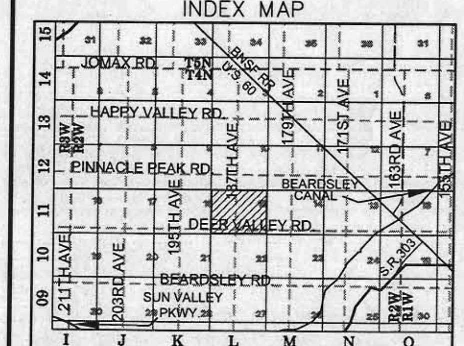
NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3860		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:
1. NGVD 29 + 1.80 FEET = NAVD 88.

Registered Professional Engineer Certificate No. 29737 HERNAN A. ARISTIZABAL Date Signed 7/27/05 ARIZONA, U.S.A.

INDEX MAP



200' 0' 200' 400'
SCALE: 1"= 200'

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	BY	DATE	FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
DESIGN	AMG/RAS	07/2005	RECOMMENDED BY: DATE
DESIGN CHK.	HAA	07/2005	APPROVED BY: DATE
PLANS	KAB	07/2005	CHIEF ENGINEER AND GENERAL MANAGER
PLANS CHK.	AMG/HAA	07/2005	SHEET L-11 OF FLOODPLAIN DELINEATION
SUBMITTED BY:		DATE:	

SEE SHEET L-13

ERM DV0268

SEE SHEET K-12

SEE SHEET M-12

SEE SHEET L-11

ZONE AE

FW

ZONE A

WASH 1 WEST

WASH 2 WEST

WASH 9 EAST

PERRYVILLE RD. (187TH AVE.) (ALIGNMENT)

PINNACLE PEAK RD.

MARICOPA COUNTY

SURPRISE

LIMIT OF DETAILED STUDY

3.057 Q100=7490 FP=1425.07 FW=1426.05

2.978 Q100=7490 FP=1423.01 FW=1423.96

2.897 Q100=7490 FP=1420.34 FW=1421.28

2.811 Q100=7490 FP=1418.31 FW=1418.75

2.725 Q100=7490 FP=1415.58 FW=1415.92

2.669 Q100=7490 FP=1413.60 FW=1414.30

2.593 Q100=7490 FP=1411.97 FW=1412.91

2.513 Q100=7490 FP=1410.16 FW=1411.07

2.453 Q100=7490 FP=1408.50 FW=1409.28

2.388 Q100=7490 FP=1405.60 FW=1406.12

2.340 Q100=7490 FP=1403.77 FW=1404.59

2.277 Q100=7490 FP=1402.26 FW=1402.98

3.075 Q100=2970

1420 1416 1412 1408 1404 1400

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A — ZONE A
EFFECTIVE ZONE AE — ZONE AH
EFFECTIVE ZONE AH — ZONE AE
EFFECTIVE FLOODWAY — FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 Q100=1270 FP=1400.55 FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

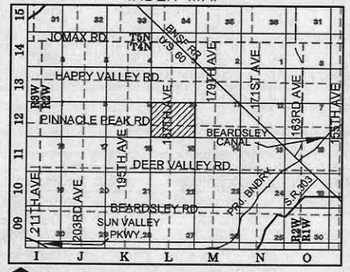
I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
DV0268		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 1.80 FEET = NAVD 88.

Certificate of Registration — 39737 — HERNAN A. ARISTIZABAL — ARIZONA, U.S.A.

INDEX MAP



N

200' 0' 200' 400'

SCALE: 1" = 200'

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	BY	DATE
DESIGN	AMG/RAS	07/2005
DESIGN CHK.	HAA	07/2005
PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005
SUBMITTED BY:		DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

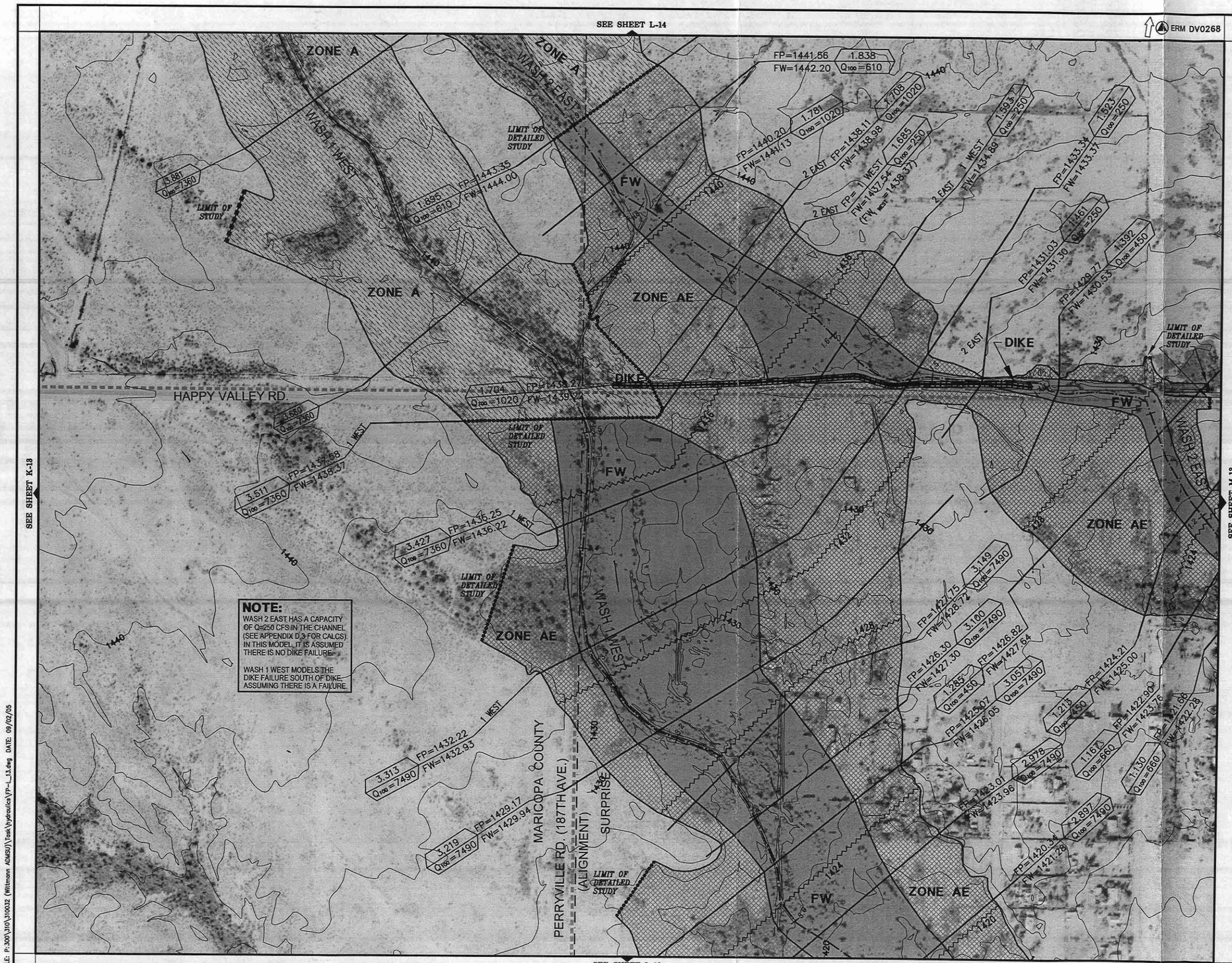
APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET L-12 OF FLOODPLAIN DELINEATION

FILE: P:\300\310\310032 (Wittmann ADMS)\Task\hydraulics\FP—L_12.dwg DATE: 07/27/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES



FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY
ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 / Q_{100}=1270 — FP=1400.55 / FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

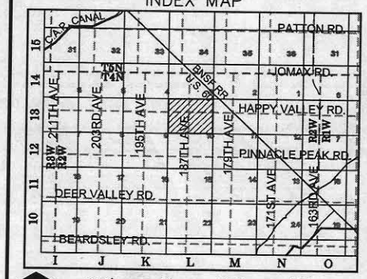
NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
DV0268		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 1.80 FEET = NAVD 88.

INDEX MAP



N

200' 0' 200' 400'

SCALE: 1"= 200'

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Phoenix, AZ 85008-3279
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WEB www.entellus.com

	BY	DATE
DESIGN	AMG/RAS	07/2005
DESIGN CHK.	HAA	07/2005
PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005
SUBMITTED BY:		DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET L-13 OF FLOODPLAIN DELINEATION

FILE: P:\300\310\310032 (Wittmann ADMSU)\Task\Hydraulics\FP-L_13.dwg DATE: 09/02/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FILE: P:\300\310\310232 (Wittmann ADMSD)\Task\Hydraulics\FP-L_14.dwg DATE: 07/24/05

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A — ZONE A
EFFECTIVE ZONE AE — ZONE AH
EFFECTIVE ZONE AH — ZONE AE
EFFECTIVE FLOODWAY — FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 Q100=1270 FP=1400.55 FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

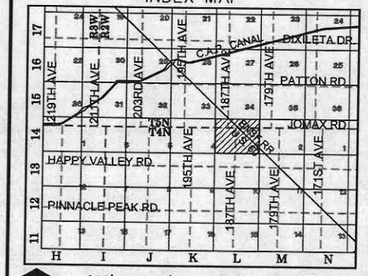
NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
DV0268		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV
DV2040		

NOTE:
1. NGVD 29 + 1.90 FEET = NAVD 88.

Registered Professional Engineer — 39737 — HERNAN A. ARISTIZABAL — Date Signed 7/27/05 — ARIZONA, U.S.A.

INDEX MAP



N

200' 0' 200' 400'

SCALE: 1"= 200'

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DESIGN	AMG/RAS	07/2005
DESIGN CHK.	HAA	07/2005
PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005
SUBMITTED BY:		DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET L-14 OF FLOODPLAIN DELINEATION

SEE SHEET L-16

ERM DV0268

PATTON RD. (ALIGNMENT)

PERRYVILLE RD (187TH AVE) (ALIGNMENT)

GRAVEL ROAD

B.N.S.F. RR.

US60

ZONE AE

FW

WASH 2 EAST

WASH 3 EAST

LIMIT OF DETAILED STUDY

5.291 Q100=440 FP=1507.89 FW=1508.43

5.203 Q100=780 FP=1504.05 FW=1505.04

5.140 Q100=780 FP=1501.85 FW=1502.21

5.071 Q100=780 FP=1499.16 FW=1499.43

4.997 Q100=780 FP=1495.80 FW=1495.80

4.919 Q100=780 FP=1492.27 FW=1492.71

4.865 Q100=780 FP=1489.84 FW=1490.59

4.811 Q100=780 FP=1487.42 FW=1487.83

4.744 Q100=780 FP=1484.90 FW=1485.19

4.675 Q100=780 FP=1481.97 FW=1482.50

4.595 Q100=780 FP=1478.86 FW=1479.46

4.521 Q100=780 FP=1475.66 FW=1476.13

4.454 Q100=780 FP=1472.69 FW=1473.56

4.349 Q100=780 FP=1467.70 FW=1468.67

3.277 Q100=470 FP=1496.67 FW=1496.98

3.196 Q100=470 FP=1493.73 FW=1493.74

3.166 Q100=470 FP=1492.79 FW=1492.79

3.163 Q100=470 FP=1492.22 FW=1492.23

3.159 Q100=470 FP=1491.72 FW=1491.74

3.141 Q100=470 FP=1491.67 FW=1491.69

3.134 Q100=470 FP=1491.62 FW=1491.63

3.097 Q100=470 FP=1491.40 FW=1491.39

3.085 Q100=470 FP=1489.01 FW=1489.01

3.078 Q100=470 FP=1487.72 FW=1487.72

3.059 Q100=470 FP=1487.30 FW=1487.30

3.036 Q100=470 FP=1486.71 FW=1486.71

2.997 Q100=470 FP=1485.10 FW=1485.10

2.972 Q100=470 FP=1484.64 FW=1484.64

2.931 Q100=470 FP=1482.46 FW=1482.46

2.900 Q100=470 FP=1481.85 FW=1481.85

SEE SHEET K-15

SEE SHEET M-15

SEE SHEET L-14

FILE: P:\300\310\310032 (Wittmann ADMSD)\Task\hydraulics\FP-L_15.dwg DATE: 07/24/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY
ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 Q100=1270 FP=1400.55 FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

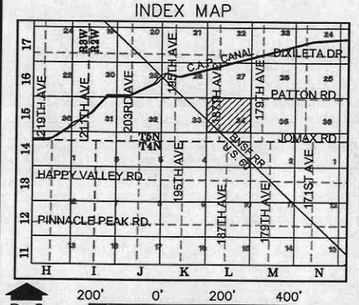
I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
DV0268		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 1.90 FEET = NAVD 88.

HERMAN A. ARISTIZABAL 17737 REGISTERED ENGINEER ARIZONA, U.S.A.

INDEX MAP



200' 0' 200' 400'

SCALE: 1"= 200'

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PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005
SUBMITTED BY:		DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET L-15 OF FLOODPLAIN DELINEATION

SEE SHEET L-17

ERM DV1875

ZONE AH
EL. 1555.12

C.A.P. CANAL

WASH 3 EAST

FW

ZONE AE

LIMIT OF DETAILED STUDY

PERRYVILLE RD (187TH AVE.) (ALIGNMENT)

WASH 3 EAST

6.085 Q100=440 FP=1542.14 FW=1542.34

6.024 Q100=440 FP=1536.85 FW=1537.22

FP=1537.77 6.062 FW=1537.95 Q100=440

FP=1536.14 5.983 FW=1536.57 Q100=440

FP=1534.52 5.941 FW=1534.66 Q100=440

FP=1531.25 5.874 FW=1531.67 Q100=440

FP=1528.84 5.806 FW=1529.67 Q100=440

FP=1526.77 5.737 FW=1527.58 Q100=440

FP=1523.44 5.662 FW=1524.38 Q100=440

5.584 Q100=440 FP=1520.16 FW=1521.06

5.519 Q100=440 FP=1518.20 FW=1519.01

5.435 Q100=440 FP=1513.88 FW=1514.06

5.361 Q100=440 FP=1510.94 FW=1511.52

FP=1507.89 5.291 FW=1508.43 Q100=440

2.305 Q100=530 FP=1536.07 FW=1536.18

SEE SHEET K-16

SEE SHEET M-16

SEE SHEET L-15

FILE: P:\300\310\310032 (Wittmann ADMS)\Task\Hydraulics\FP-L_16.dwg DATE: 07/24/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY
ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 Q100=1270 FP=1400.55 FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

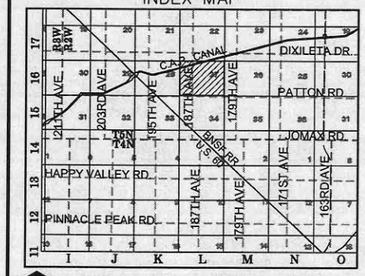
I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
DV1875		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 1.90 FEET = NAVD 88.

Certificate 29737 HERNAN A. ARISTIZABAL Date Signed 7/7/05 ARIZONA, U.S.A.

INDEX MAP



200' 0' 200' 400'

SCALE: 1"= 200'

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PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005

SUBMITTED BY: DATE:

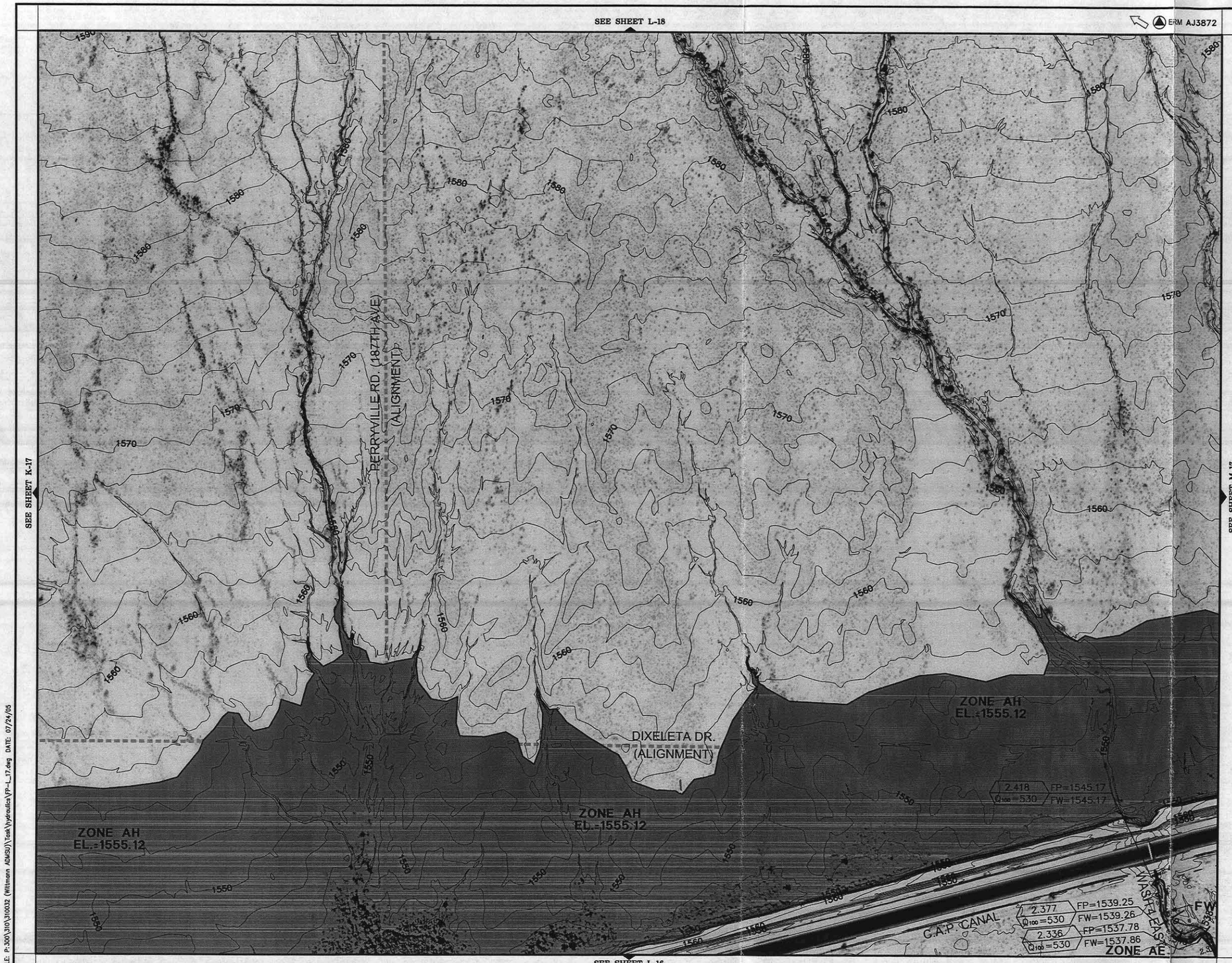
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET L-16 OF FLOODPLAIN DELINEATION



FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A	ZONE A
EFFECTIVE ZONE AE	ZONE AH
EFFECTIVE ZONE AH	ZONE AE
EFFECTIVE FLOODWAY	FLOODWAY (FW)
	ZONE AO
HYDRAULIC BASE LINE	1321
ZONE DESIGNATION	ZONE A
WASH I.D. LABEL	WASH 9 EAST
ELEVATION REFERENCE MARK	ERM AJ3866
CROSS SECTION	2.199 Q_{100}=1270 FP=1400.55 FW=1400.56
BASE FLOOD ELEVATION	1320
DIKE / LEVEE	DIKE
COUNTY BOUNDARY	
CORPORATE LIMIT	
LIMIT OF STUDY	
LIMIT OF DETAILED STUDY	
TOWNSHIP/RANGE LINE	
SECTION LINE / SECTION NUMBER	29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

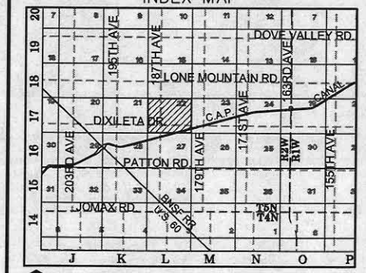
I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3872		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 1.90 FEET = NAVD 88.

CERTIFICATE NO. 28737 HERNAN A. ARISTIZABAL PHOENIX, ARIZONA, U.S.A.

INDEX MAP



200' 0' 200' 400'

SCALE: 1"= 200'

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PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005
SUBMITTED BY:		DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

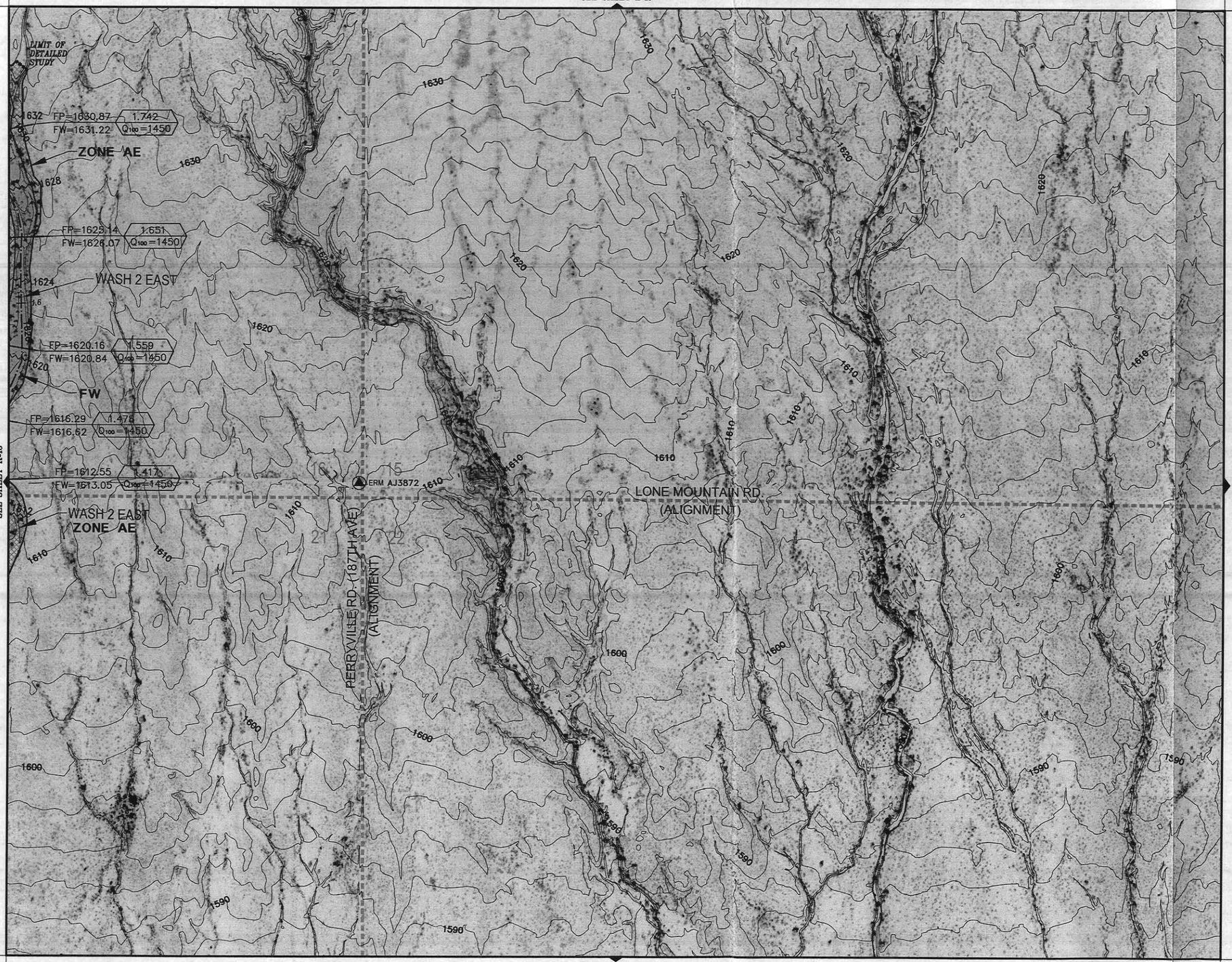
CHIEF ENGINEER AND GENERAL MANAGER

SHEET L-17 OF FLOODPLAIN DELINEATION

FILE: P:\300\30\30032 (Wittmann ADMS)\Task\hydraulics\FP-L_17.dwg DATE: 07/24/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

SEE SHEET L-19



SEE SHEET K-18

SEE SHEET M-18

SEE SHEET L-17

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FILE: P:\300\310\310332 (Wittmann ADMS)\Task\Hydraulics\FP-L_18.dwg DATE: 07/25/05

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY
ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 / Q100=1270 — FP=1400.55 / FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

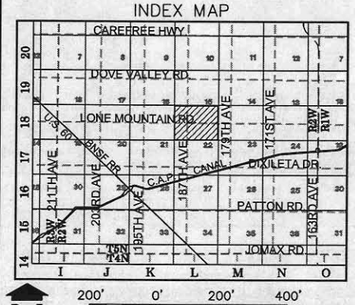
NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3872		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 1.90 FEET = NAVD 88.

INDEX MAP



N

200' 0' 200' 400'

SCALE: 1"= 200'

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PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005

SUBMITTED BY: DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

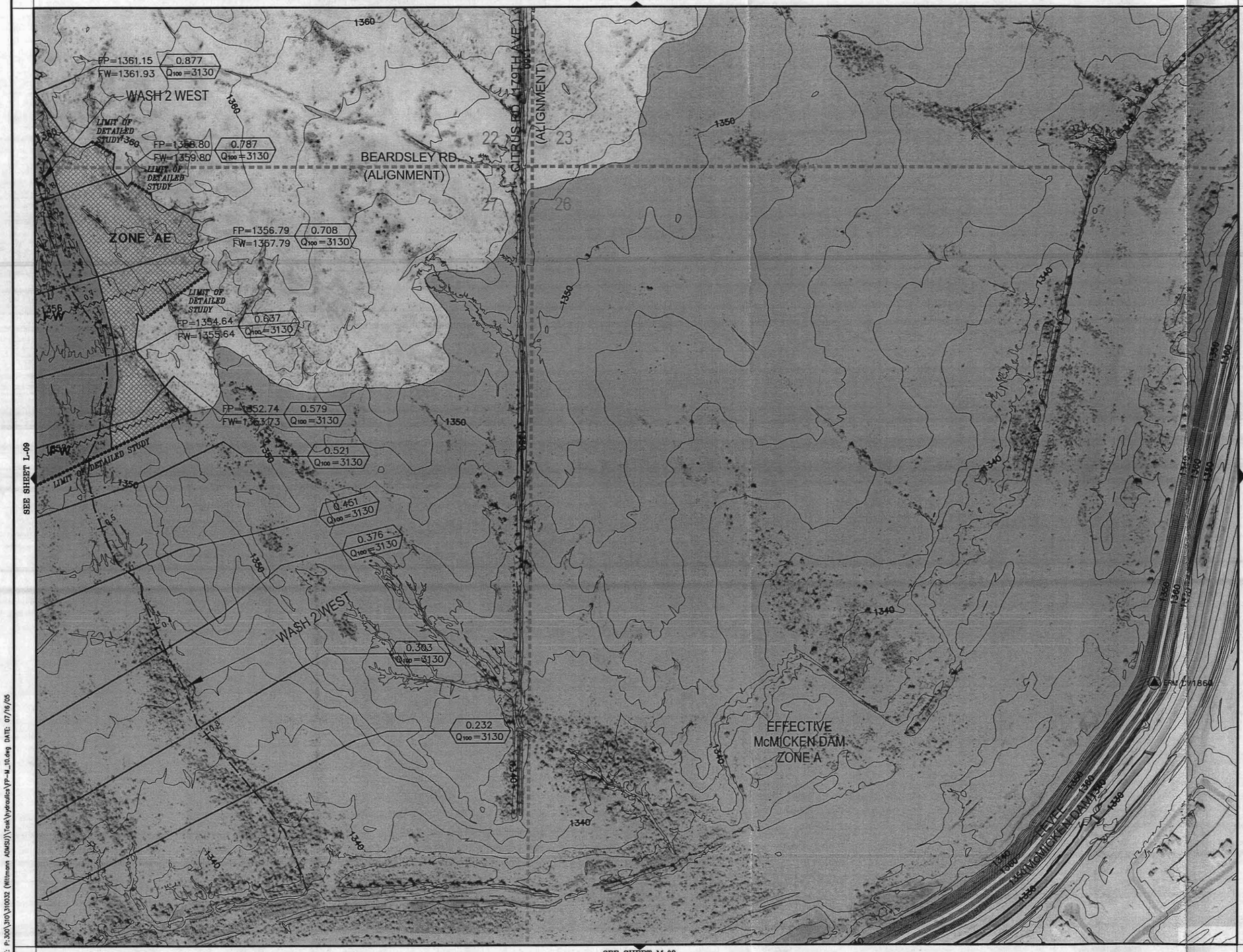
SHEET L-18 OF FLOODPLAIN DELINEATION

SEE SHEET M-10

SEE SHEET L-09

SEE SHEET N-09

SEE SHEET M-08



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1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY
ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 / Q100=1270 — FP=1400.55 / FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

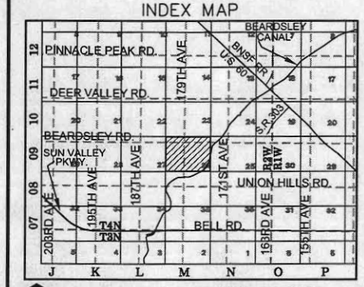
NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
DV1860		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 1.80 FEET = NAVD 88.

INDEX MAP



200' 0' 200' 400'

SCALE: 1"= 200'

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PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SUBMITTED BY: DATE:

SHEET M-09 OF FLOODPLAIN DELINEATION

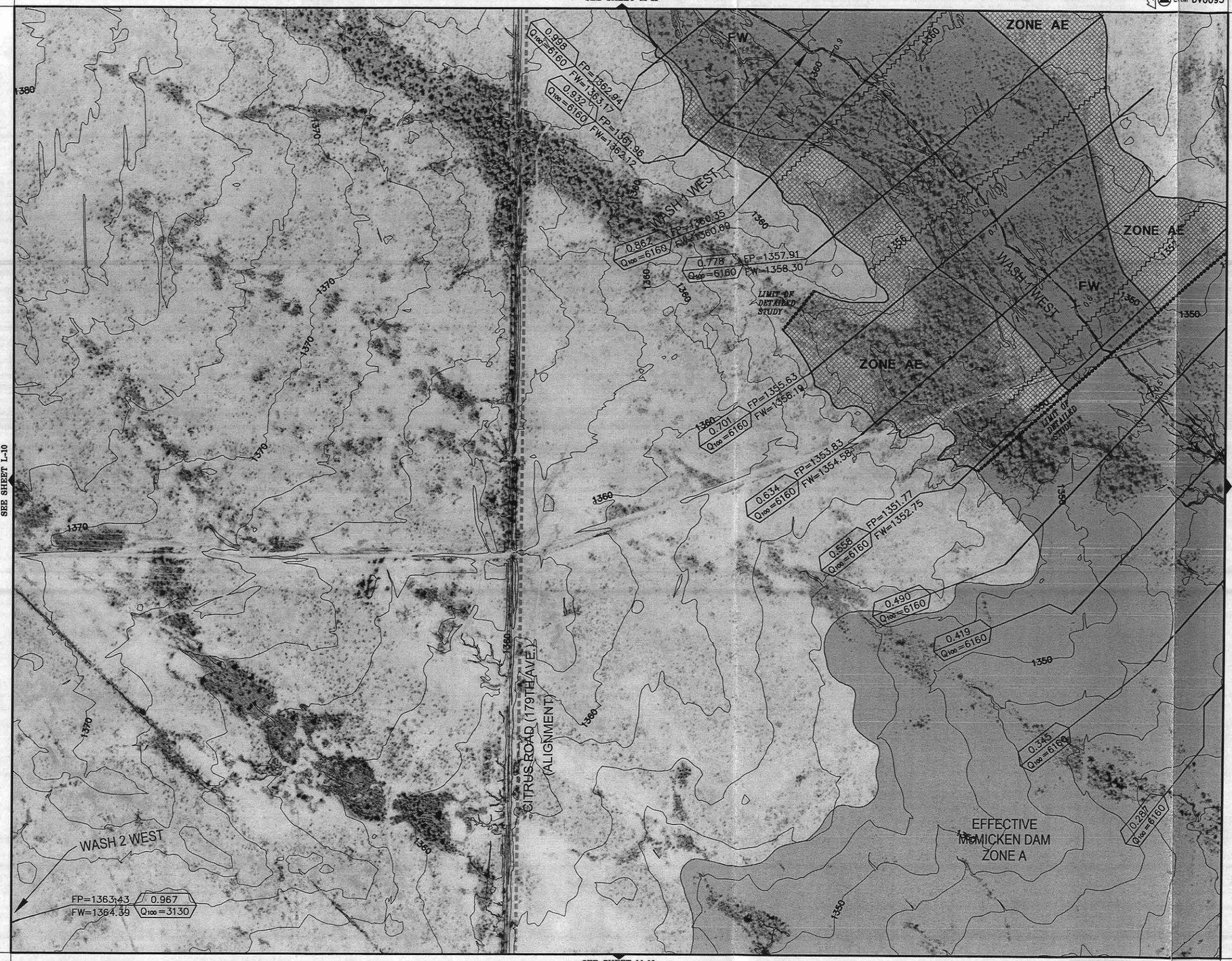
SEE SHEET M-11

ERM DV0095

SEE SHEET L-10

SEE SHEET N-10

SEE SHEET M-09



FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A — ZONE A
EFFECTIVE ZONE AE — ZONE AH
EFFECTIVE ZONE AH — ZONE AE
EFFECTIVE FLOODWAY — FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 / Q100=1270 — FP=1400.55 / FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

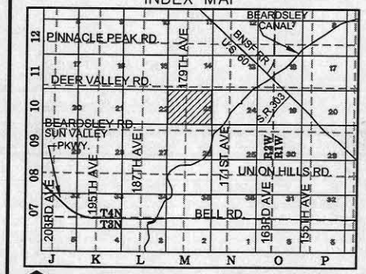
NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
DV0095		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 1.80 FEET = NAVD 88.

INDEX MAP



SCALE: 1" = 200'

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	BY	DATE
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DESIGN CHK.	HAA	07/2005
PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005
SUBMITTED BY:		DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

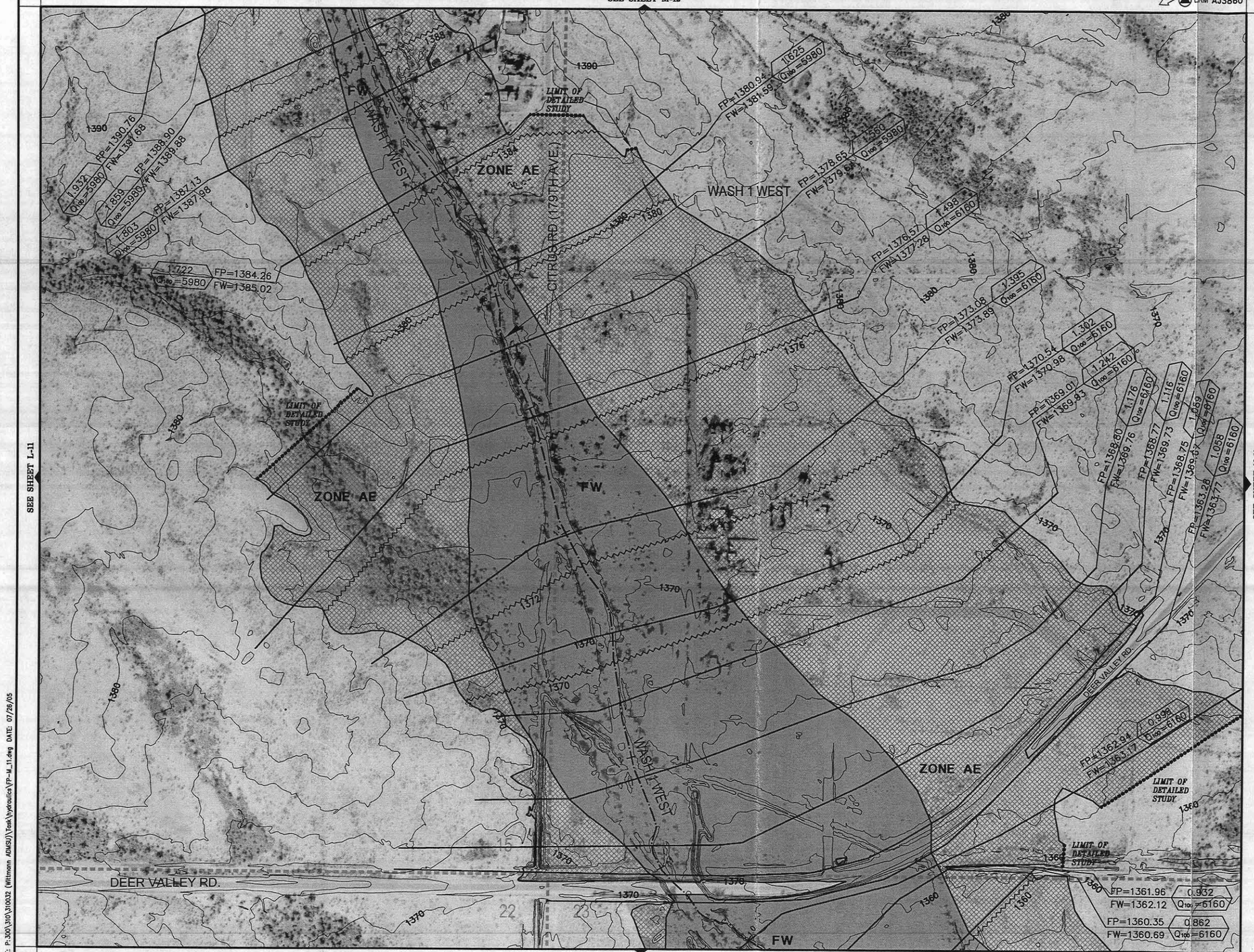
APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET M-10 OF FLOODPLAIN DELINEATION

FILE: P:\300\310\310032 (Wittmann ADMSU)\Task Hydraulics\FP-M_10.dwg DATE: 07/24/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES



FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A — ZONE A
EFFECTIVE ZONE AE — ZONE AH
EFFECTIVE ZONE AH — ZONE AE
EFFECTIVE FLOODWAY — FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 / Q100=1270 / FP=1400.55 / FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

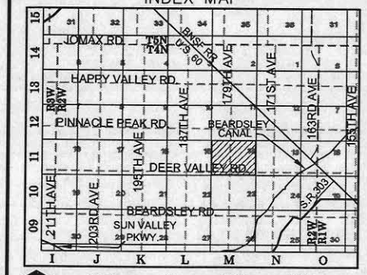
I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3860		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 1.80 FEET = NAVD 88.

Registered Professional Engineer — 39737 — HERMAN A. ARISTIZABAL — Date Signed 7/27/05 — ARIZONA, U.S.A.

INDEX MAP



N

200' 0' 200' 400'

SCALE: 1"= 200'

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	BY	DATE
DESIGN	AMG/RAS	07/2005
DESIGN CHK.	HAA	07/2005
PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005
SUBMITTED BY:		DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET M-11 OF FLOODPLAIN DELINEATION

FILE: P:\300\310\310032 (Wittmann ADMS0)\Task\hydraulics\FP-M_11.dwg DATE: 07/26/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

SEE SHEET M-13

ERM DV0091

SEE SHEET L-12

SEE SHEET N-12

SEE SHEET M-11

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A — ZONE A
EFFECTIVE ZONE AE — ZONE AH
EFFECTIVE ZONE AH — ZONE AE
EFFECTIVE FLOODWAY — FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 / Q100=1270 — FP=1400.55 / FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

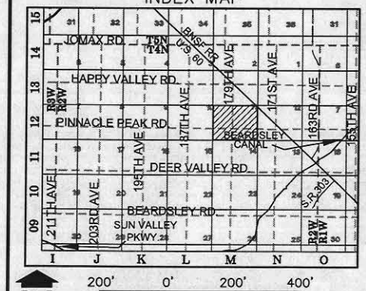
I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
DV0091		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 1.80 FEET = NAVD 88.

Registered Professional Engineer — Certificate No. 39737 — HERMAN A. ARISTIZABAL — State of ARIZONA, U.S.A.

INDEX MAP



N

200' 0' 200' 400'

SCALE: 1" = 200'

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	BY	DATE
DESIGN	AMG/RAS	07/2005
DESIGN CHK.	HAA	07/2005
PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

SUBMITTED BY: DATE:

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET M-12 OF FLOODPLAIN DELINEATION

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FILE: P:\301\310\310032 (Wittmann ADMS)\Task\hydraulics\FP-M_12.dwg DATE: 07/24/05

SEE SHEET M-14

ERM DV2040

SEE SHEET L-18

SEE SHEET N-18

SEE SHEET M-12

FILE: P:\30\10\310032 (Wittmann ADMSU)\Task\Hydraulics\FP-M_13.dwg DATE: 07/24/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY
ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 / Q100=1270 — FP=1400.55 / FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

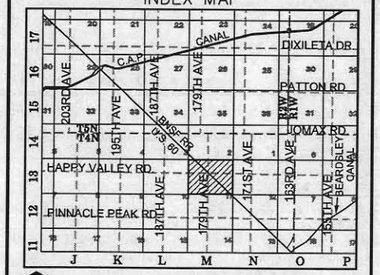
NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
DV2040		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:
1. NGVD 29 + 1.80 FEET = NAVD 88.

Registered Professional Engineer — 29737 — HERNAN A. ARISTIZABAL — ARIZONA, U.S.A.

INDEX MAP



N
200' 0' 200' 400'
SCALE: 1" = 200'

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	BY	DATE
DESIGN	AMG/RAS	07/2005
DESIGN CHK.	HAA	07/2005
PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005
SUBMITTED BY:		DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

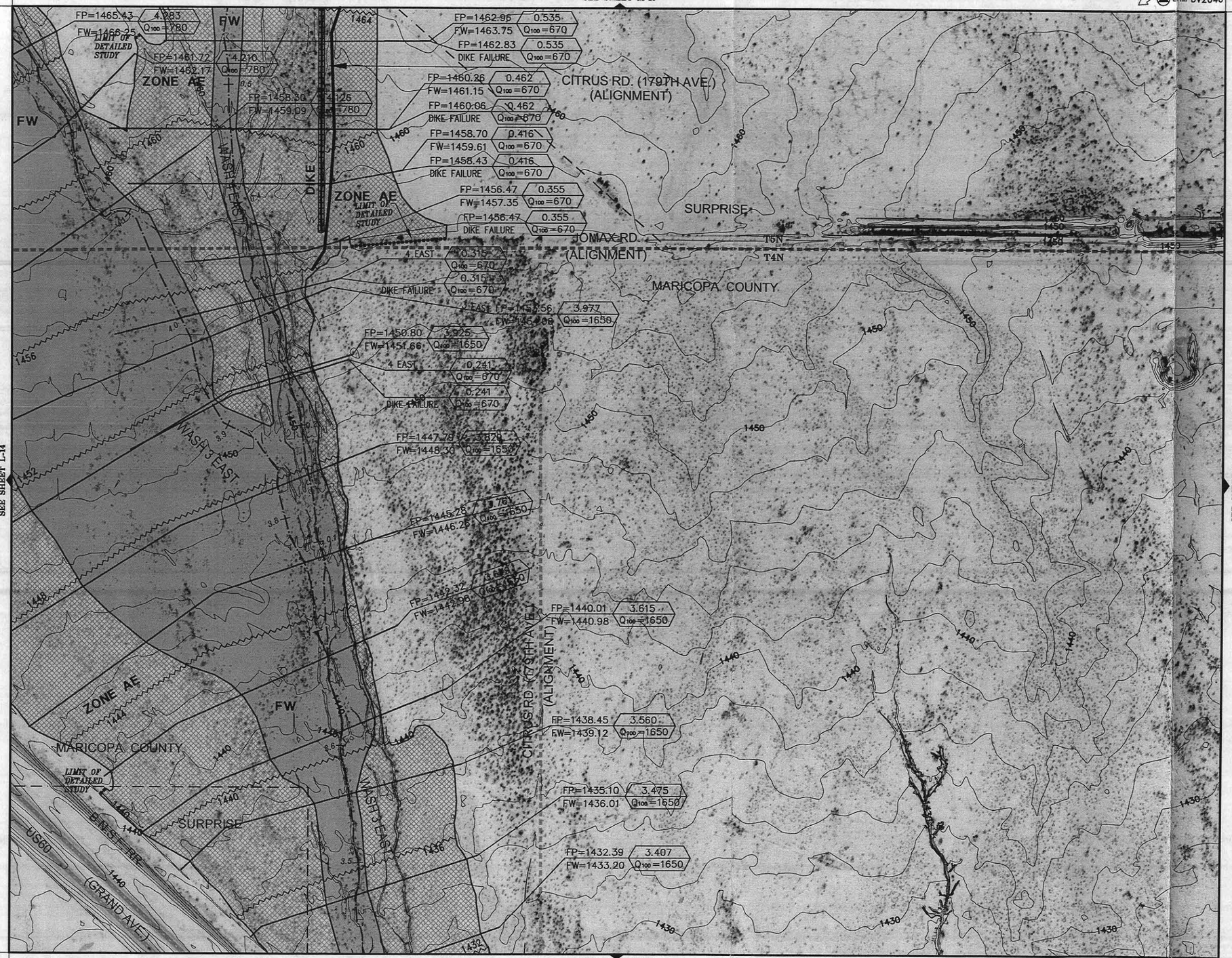
APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET M-13 OF FLOODPLAIN DELINEATION

SEE SHEET M-15

ERM DV2040



SEE SHEET L-14

SEE SHEET N-14

SEE SHEET M-13

FILE: P:\301\310\310032 (Wittmann ADMS0)\Task\hydraulics\FP-M_14.dwg DATE: 07/24/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY
ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 Q100=1270 FP=1400.55 FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

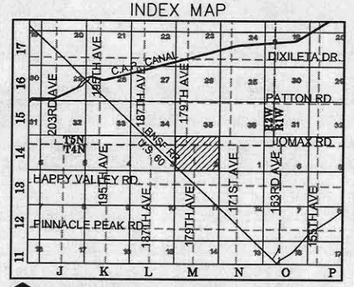
I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
DV2040		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 1.90 FEET = NAVD 88.

Registered Professional Engineer — 39737 — HERMAN A. ARISTIZABAL — Date Signed 7/27/05 — ARIZONA, U.S.A.

INDEX MAP



200' 0' 200' 400'

SCALE: 1"= 200'

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PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005

SUBMITTED BY: DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET M-14 OF FLOODPLAIN DELINEATION

SEE SHEET M-16

ERM DV0268

PATTON R.D (ALIGNMENT)

LIMIT OF DETAILED STUDY

1,382 FP=1496.92 Q100=670 FW=1497.31

1,336 FP=1494.65 Q100=670 FW=1494.64

1,269 FP=1491.18 Q100=670 FW=1491.19

1,227 FP=1489.30 Q100=670 FW=1489.31

1,176 FP=1487.42 Q100=670 FW=1487.41

1,113 FP=1485.31 Q100=670 FW=1485.41

CITRUS RD. (179TH AVE) (ALIGNMENT)

MARICOPA COUNTY

SURPRISE

WASH 4 EAST

WASH 6 EAST ZONE AE

DIKE

ZONE AO (DEPTH 1)

1.021

0.976

0.765

FP=1481.48 FW=1482.49 1.027 Q100=670

FP=1481.49 DIKE FAILURE 1.027 Q100=670

FP=1477.75 FW=1478.54 0.928 Q100=670

FP=1477.73 DIKE FAILURE 0.928 Q100=670

0.650

FP=1474.61 FW=1475.54 0.830 Q100=670

FP=1474.38 DIKE FAILURE 0.830 Q100=670

0.426

FP=1470.33 FW=1471.05 0.719 Q100=670

FP=1470.25 DIKE FAILURE 0.719 Q100=670

FP=1467.70 FW=1468.67 4.349 Q100=780

WASH 3 EAST

WASH 5 EAST ZONE AO (DEPTH 1)

FP=1466.26 FW=1467.00 0.624 Q100=670

FP=1466.13 DIKE FAILURE 0.624 Q100=670

ZONE AE

LIMIT OF STUDY

SEE SHEET L-15

SEE SHEET N-15

SEE SHEET M-14

FILE: P-300\310\31032 (Wittmann ADMS)\Task\Hydraulics\FP-M_15.dwg DATE: 07/24/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A — ZONE A
EFFECTIVE ZONE AE — ZONE AH
EFFECTIVE ZONE AH — ZONE AE
EFFECTIVE FLOODWAY — FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 Q100=1270 FP=1400.55 FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

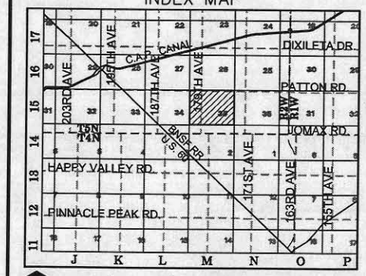
I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
DV0268		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 1.90 FEET = NAVD 88.

HERMAN A. ARISTIZABAL 28737 REGISTERED PROFESSIONAL ENGINEER ARIZONA, U.S.A.

INDEX MAP



200' 0' 200' 400'

SCALE: 1"= 200'

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DESIGN CHK.	HAA	07/2005
PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005

SUBMITTED BY: DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET M-15 OF FLOODPLAIN DELINEATION

SEE SHEET M-17

ERM AJ3867

SEE SHEET L-16

SEE SHEET N-16

SEE SHEET M-15

FP=1536.07 FW=1536.18 2.305 Q100=530

FP=1533.11 FW=1533.10 2.230 Q100=530

FP=1530.62 FW=1530.70 2.170 Q100=530

FP=1527.59 FW=1527.59 2.108 Q100=530

FP=1526.27 FW=1526.37 2.078 Q100=530

FP=1525.64 FW=1525.83 2.061 Q100=530

FP=1523.45 FW=1524.37 1.992 Q100=530

FP=1523.41 FW=1524.09 1.938 Q100=530

FP=1523.12 FW=1523.38 1.932 Q100=530

FP=1518.38 FW=1518.46 1.903 Q100=530

FP=1515.16 FW=1515.16 1.822 Q100=530

FP=1514.91 FW=1514.90 1.796 Q100=530

FP=1514.17 FW=1514.16 1.772 Q100=530

FP=1510.47 FW=1510.72 1.709 Q100=670

FP=1506.80 FW=1507.00 1.625 Q100=670

FP=1504.15 FW=1504.16 1.556 Q100=670

FP=1501.45 FW=1501.50 1.48 Q100=670

FP=1499.37 FW=1500.08 1.430 Q100=670

FP=1527.27 FW=1528.19 4.881 Q100=580

FP=1526.13 FW=1526.79 4.847 Q100=580

FP=1524.25 FW=1525.02 4.806 Q100=580

FP=1522.27 FW=1523.12 4.759 Q100=580

FP=1518.53 FW=1519.31 4.696 Q100=580

FP=1516.17 FW=1517.11 4.630 Q100=580

FP=1514.48 FW=1514.88 4.580 Q100=580

FP=1511.98 FW=1512.87 4.534 Q100=580

FP=1510.45 FW=1510.99 4.487 Q100=580

FP=1508.34 FW=1509.13 4.444 Q100=580

FP=1506.06 FW=1506.62 4.381 Q100=580

FP=1503.86 FW=1504.14 4.318 Q100=580

FP=1501.93 FW=1502.86 4.260 Q100=580

FP=1524.12 FW=1524.48 4.551 Q100=440

FP=1499.90 FW=1499.90 4.188 Q100=750

FP=1497.21 FW=1498.10 4.111 Q100=750

FP=1496.56 FW=1497.58 4.052 Q100=750

FP=1496.30 FW=1497.25 4.010 Q100=750

MARICOPA COUNTY

CITRUS ROAD (179TH AVE.)

(ALIGNMENT)

SURPRISE

WASH 5 EAST

WASH 6 EAST

WASH 4 EAST

Dale Ln.

ZONE AE

ZONE AO (DEPTH 1) DIKE

DIKE

FW

LIMIT OF DETAILED STUDY

1534 1532 1530 1528 1526 1524 1522 1520 1518 1516 1514 1512 1510 1508 1506 1504 1502 1500

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A — ZONE A

EFFECTIVE ZONE AE — ZONE AH

EFFECTIVE ZONE AH — ZONE AE

EFFECTIVE FLOODWAY — FLOODWAY (FW)

ZONE AO

HYDRAULIC BASE LINE

ZONE DESIGNATION — ZONE A

WASH I.D. LABEL — WASH 9 EAST

ELEVATION REFERENCE MARK — ERM AJ3866

CROSS SECTION — 2.199 Q100=1270 FP=1400.55 FW=1400.56

BASE FLOOD ELEVATION — 1320

DIKE / LEVEE — DIKE

COUNTY BOUNDARY

CORPORATE LIMIT

LIMIT OF STUDY

LIMIT OF DETAILED STUDY

TOWNSHIP/RANGE LINE

SECTION LINE

SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3867		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

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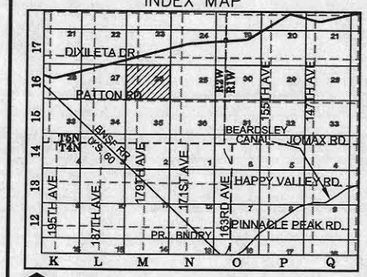
Registered Professional Engineer — 28737 HERNAN A. ARISTIZABAL — Date Signed — ARIZONA, U.S.A.

INDEX MAP



N

200' 0' 200' 400'

SCALE: 1" = 200'

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DESIGN CHK.	HAA	07/2005
PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005

SUBMITTED BY: DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET M-16 OF FLOODPLAIN DELINEATION

FILE: P:\301\01\10032 (Wittmann ADMS)\Task1\hydraulics\FP-M_16.dwg DATE: 05/02/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

SEE SHEET M-18

ERM AJ3872

WASH 7 EAST
ZONE AH
0.287 FP=1560.79
Q_{100}=3930 FW=1561.73

LIMIT OF DETAILED STUDY

0.200 FP=1556.27
Q_{100}=3930 FW=1557.02

0.127
Q_{100}=3930

ZONE AH
EL= 1555.12

CITRUS RD. (179TH AVE) (ALIGNMENT)

ZONE AH
EL= 1555.12

C.A.P. CANAL

FP=1543.18 5.146
FW=1543.20 Q_{100}=420

FP=1540.66 5.120
FW=1541.21 Q_{100}=580

MARICOPA COUNTY

4.772 FP=1535.02
Q_{100}=440 FW=1535.09

FP=1537.12 5.064
FW=1537.87 Q_{100}=580

4.728 FP=1532.56
Q_{100}=440 FW=1532.94

DIXILETA DR (ALIGNMENT)

ZONE AE

LIMIT OF DETAILED STUDY

FP=1534.05 5.016
FW=1534.93 Q_{100}=580

SURPRISE

WASH 5 EAST

WASH 6 EAST

FP=1530.20 4.953
FW=1530.92 Q_{100}=580

4.630 FP=1526.28
Q_{100}=440 FW=1528.37

FP=1527.27 4.881
FW=1528.19 Q_{100}=580

WASH 4 EAST

FW FP=1536.07 2.305
FW=1536.18 Q_{100}=530

SEE SHEET L-17

SEE SHEET N-17

SEE SHEET M-16

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FILE: P:\300\310\310032 (Wittmann ADMS)\Tools\hydraulics\FP-M_17.dwg DATE: 07/24/05

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY
ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 FP=1400.55 / Q_{100}=1270 FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

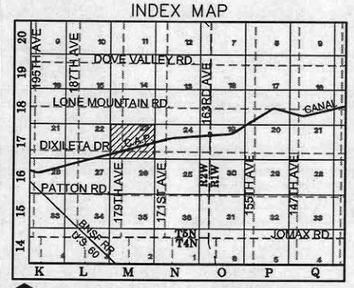
I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3872		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 1.90 FEET = NAVD 88.

39737 HERMAN A. ARISTIZABAL ARIZONA, U.S.A.

INDEX MAP



SCALE: 1"= 200'

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PLANS	KAB	07/2005
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SUBMITTED BY:		DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET M-17 OF FLOODPLAIN DELINEATION

SEE SHEET M-19

ERM AJ3872

CITRUS RD. (179TH AVE.)
(ALIGNMENT)

LONE MOUNTAIN RD.
(ALIGNMENT)

SEE SHEET L-18

SEE SHEET N-18

SEE SHEET M-17

0.637 FP=1577.56
Q100=3930 FW=1577.93

0.561 FP=1573.39
Q100=3930 FW=1573.73

LIMIT OF DETAILED STUDY

0.487 FP=1569.36
Q100=3930 FW=1569.78

WASH 7 EAST
ZONE AE

0.385 FP=1565.15
Q100=3930 FW=1565.65

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE
MASTER STUDY UPDATE
CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A — ZONE A
EFFECTIVE ZONE AE — ZONE AH
EFFECTIVE ZONE AH — ZONE AE
EFFECTIVE FLOODWAY — FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 / Q100=1270 — FP=1400.55 / FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

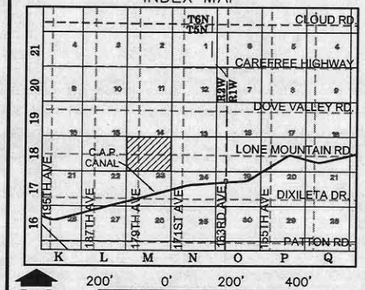
NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3872		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:
1. NGVD 29 + 1.90 FEET = NAVD 88.

CERTIFICATE NO. 29737
HERNAN A. ARISTIZABAL
REGISTERED PROFESSIONAL ENGINEER
ARIZONA, U.S.A.

INDEX MAP



200' 0' 200' 400'
SCALE: 1"= 200'

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	BY	DATE
DESIGN	AMG/RAS	07/2005
DESIGN CHK.	HAA	07/2005
PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SUBMITTED BY: DATE:

SHEET M-18 OF FLOODPLAIN DELINEATION

FILE: P:\300\310\310032 (Wittmann ADMS)\Task\hydraulics\FP-4_18.dwg DATE: 07/21/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

SEE SHEET M-20

ERM AJ3872

LIMIT OF STUDY

ZONE A

T5N-R2W-S14N

1680

1660

DOVE VALLEY RD.
(ALIGNMENT)

0.580
Q_{100}=2930

1.070
Q_{100}=2680

0.920
Q_{100}=2680

1640

0.380
Q_{100}=2930

CITRUS RD. (179TH AVE.)
(ALIGNMENT)

ZONE A

0.120
Q_{100}=2930

0.000
Q_{100}=3000

1620

SEE SHEET L-19

SEE SHEET N-19

SEE SHEET M-18

FILE: P:\30\310\310032 (Wittmann ADMSD)\Task\hydraulics\VP-M_19.dwg DATE: 07/21/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY
ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 / Q_{100}=1270 — FP=1400.55 / FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

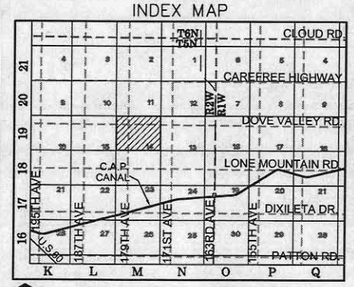
I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3872		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 2.00 FEET = NAVD 88.

CERTIFICATE NO. 28737 HERNAN A. ARISTIZABAL DATE 7/19/05 REGISTERED PROFESSIONAL ENGINEER STATE OF ARIZONA, U.S.A.

INDEX MAP



200' 0' 200' 400'

SCALE: 1" = 200'

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DESIGN CHK.	HAA	07/2005
PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SUBMITTED BY: DATE:

SHEET M-19 OF FLOODPLAIN DELINEATION

SEE SHEET M-21

ERM AJ3879

CAREFREE HIGHWAY (ALIGNMENT)

LIMIT OF STUDY

ZONE A

1720

1700

T5N-R2W-S11

T5N-R2W-S14N

0.955
Q_{100}=2700

0.735
Q_{100}=2700

1.440
Q_{100}=3590

1.140
Q_{100}=3590

1.010
Q_{100}=3590

0.780
Q_{100}=3590

0.475
Q_{100}=2700

0.253
Q_{100}=2700

0.066
Q_{100}=2700

1680

CITRUS RD (174TH AVE.) (ALIGNMENT)

T5N-R2W-S1

SEE SHEET L-20

SEE SHEET N-20

SEE SHEET M-19

FILE: P:\300\310\310032 (Wittmann ADMS0)\Task\hydraulics\FP-M_20.dwg DATE: 07/21/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY
ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199, Q_{100}=1270, FP=1400.55, FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

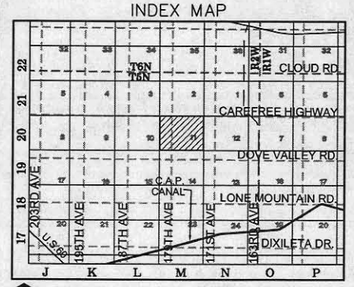
I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3879		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 2.00 FEET = NAVD 88.

CERTIFICATE No. 29737 — HERNAN A. ARISTIZABAL — ARIZONA, U.S.A.

INDEX MAP



N

200' 0' 200' 400'

SCALE: 1"= 200'

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PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SUBMITTED BY: DATE:

SHEET M-20 OF FLOODPLAIN DELINEATION

SEE SHEET M-22

ERM AJ3879

SEE SHEET L-21

SEE SHEET N-21

SEE SHEET M-20

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
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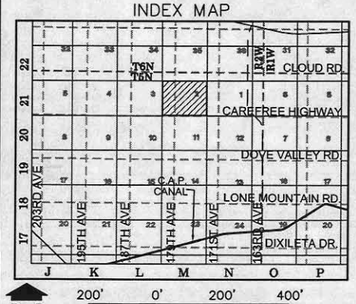
I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3879		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 2.00 FEET = NAVD 88.

Certificate No. 39737 — HERNAN A. ARISTIZABAL — Date Signed 10-7-05 — ARIZONA, U.S.A.

INDEX MAP



200' 0' 200' 400'

SCALE: 1" = 200'

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PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005
SUBMITTED BY:		DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

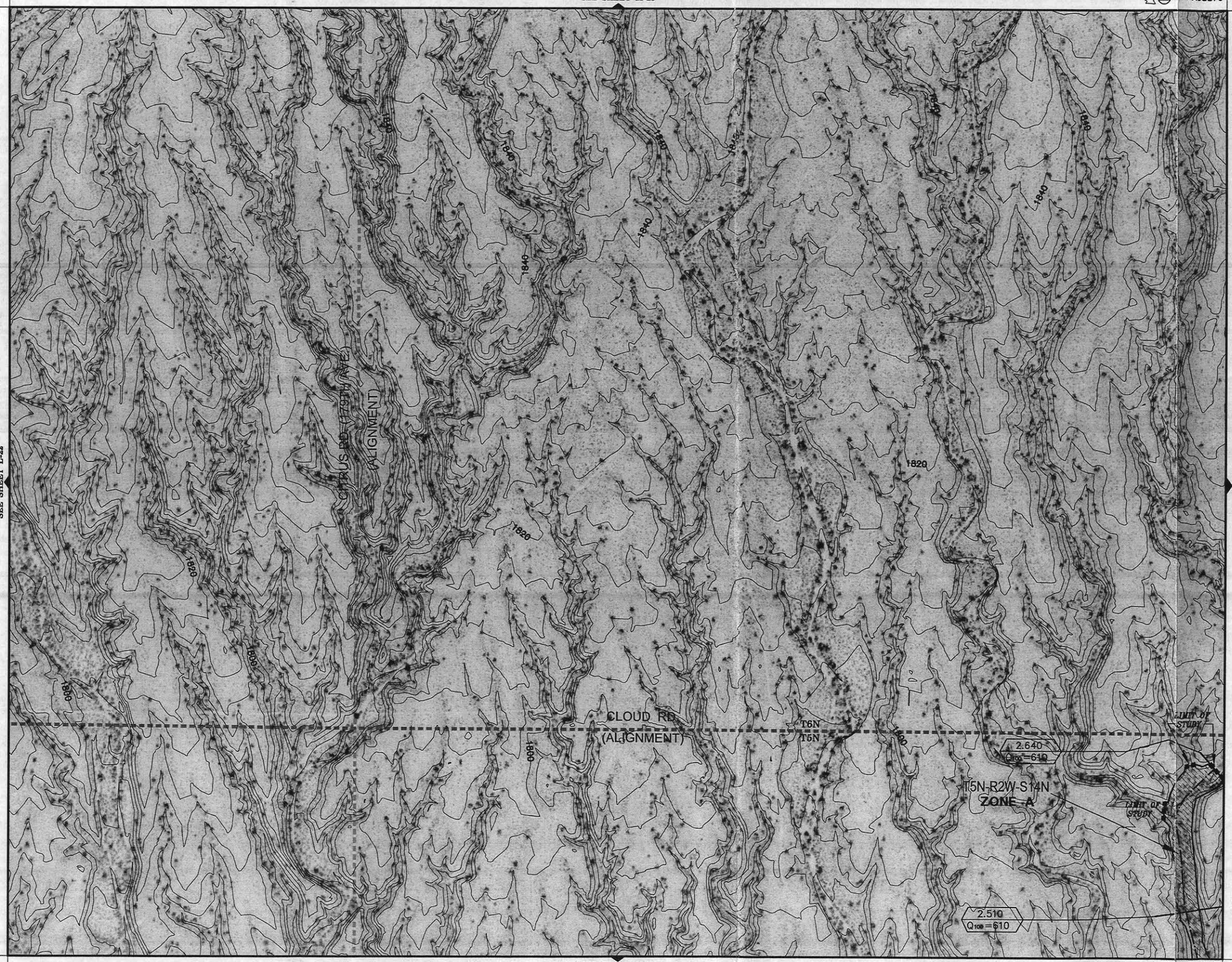
SHEET M-21 OF FLOODPLAIN DELINEATION

FILE: P-300\310\310032 (Wittmann ADMS)\Task\Hydraulics\FP-M_21.dwg DATE: 07/21/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

SEE SHEET M-23

ERM AJ3879



SEE SHEET L-22

SEE SHEET N-22

SEE SHEET M-21

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FILE: P:\300\310\310032 (Wittmann ADMSU)\Task\hydrollics\FP-L_22.dwg DATE: 07/21/05

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY
ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 / Q100=1270 — FP=1400.55 / FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

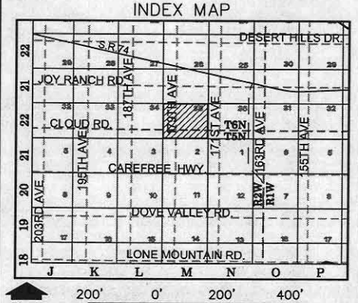
NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3879		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:
1. NGVD 29 + 2.00 FEET = NAVD 88.

HERNAN A. ARISTIZABAL, 39737, REGISTERED PROFESSIONAL ENGINEER, STATE OF ARIZONA, U.S.A.

INDEX MAP



200' 0' 200' 400'
SCALE: 1"= 200'

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PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005
SUBMITTED BY:		DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET M-22 OF FLOODPLAIN DELINEATION

FILE: P:\300\310\310032 (Wittmann ADMSU)\Task\hydraulics\FP-N_10.dwg DATE: 07/23/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A — ZONE A
EFFECTIVE ZONE AE — ZONE AH
EFFECTIVE ZONE AH — ZONE AE
EFFECTIVE FLOODWAY — FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 / Q100=1270 — FP=1400.55 / FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

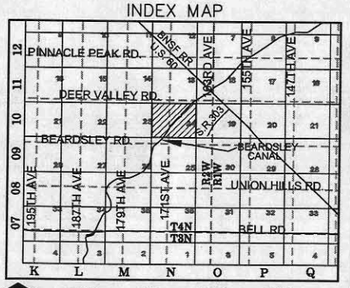
NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
DV0095		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 1.80 FEET = NAVD 88.

INDEX MAP



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SCALE: 1"= 200'

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DESIGN CHK.	HAA	07/2005
PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005
SUBMITTED BY:		DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET N-10 OF FLOODPLAIN DELINEATION

SEE SHEET N-12

ERM DV0089

SEE SHEET M-11

SEE SHEET O-11

SEE SHEET N-10

1.398 FP=1366.20 Q100=2460 FW=1366.54

1.381 FP=1365.89 Q100=2460 FW=1366.12

1.351 FP=1363.77 Q100=2460 FW=1364.10

1.284 FP=1363.25 Q100=2460 FW=1363.77

1.233 FP=1362.57 Q100=2460 FW=1363.26

FP=1360.44 1.156 FW=1360.73 Q100=2460

FP=1356.50 1.132 FW=1357.11 Q100=2460

FP=1356.14 1.122 FW=1356.80 Q100=2460

FP=1354.55 1.039 FW=1355.26 Q100=2460

FP=1354.20 0.942 FW=1355.01 Q100=2460

FP=1353.86 0.831 FW=1354.71 Q100=2520

0.699 Q100=2520

0.587 Q100=2520

0.522 Q100=2520

FP=1362.94 0.998 FW=1363.17 Q100=6160

1.0 Q100=1260

ZONE AE

ZONE A

EFFECTIVE ZONE A

EFFECTIVE McMICKEN DAM ZONE A

WASH 3 EAST

WASH 9 EAST

WASH 1 WEST

WASH 1 EAST (ZONE A)

DEER VALLEY RD

DEER VALLEY RD (ALIGNMENT)

COTTON LANE (174TH AVE) (ALIGNMENT)

BASELINE RD

McMICKEN DAM EMERGENCY SPILLWAY

LEVEE

BEARDSLEY CANAL

LIMIT OF DETAILED STUDY

LIMIT OF STUDY

FW

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY
ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 FP=1400.55 Q100=1270 FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

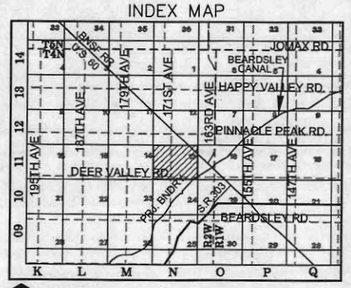
I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
DV0089		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 1.80 FEET = NAVD 88.

29737 HERMAN A. ARISTIZABAL 7/1/05 ARIZONA, U.S.A.

INDEX MAP



200' 0' 200' 400'

SCALE: 1"= 200'

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DESIGN CHK.	HAA	07/2005
PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005

SUBMITTED BY: DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET N-11 OF FLOODPLAIN DELINEATION

FILE: P:\300\310\310032 (Wittmann ADMSU)\Task\Hydraulics\FP-N_11.dwg DATE: 08/31/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

SEE SHEET N-13

ERM DV0091

EFFECTIVE ZONE A

COTTON LANE (171ST AVE.) (ALIGNMENT)

EFFECTIVE ZONE A

LIMIT OF DETAILED STUDY

ZONE AE

FW

WASH 3 EAST

ZONE AE

FW

ZONE AE

LIMIT OF DETAILED STUDY

LIMIT OF DETAILED STUDY

B.N.S.F.R.R.

US60

PINNACLE PEAK RD. (ALIGNMENT)

DEER VALLEY RD.

POWER FACILITY

(GRAND AVE.)

LIMIT OF DETAILED STUDY

SEE SHEET M-12

SEE SHEET O-12

SEE SHEET N-11

FILE: P:\30\310\310032 (Wittmann ADMSI)\Task\hydraulics\FP-N_12.dwg DATE: 07/23/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY
ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
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ELEVATION REFERENCE MARKS

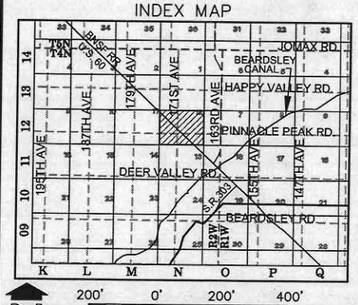
NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
DV0091		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:
1. NGVD 29 + 1.80 FEET = NAVD 88.

CERTIFICATE NO. 30737 — HERMAN A. ARISTIZABAL — REGISTERED PROFESSIONAL ENGINEER — ARIZONA, U.S.A.

INDEX MAP



200' 0' 200' 400'
SCALE: 1"= 200'

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DESIGN	AMG/RAS	07/2005
DESIGN CHK.	HAA	07/2005
PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005
SUBMITTED BY:		DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: _____ DATE

APPROVED BY: _____ DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET N-12 OF FLOODPLAIN DELINEATION

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE
CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A — ZONE A
EFFECTIVE ZONE AE — ZONE AH
EFFECTIVE ZONE AH — ZONE AE
EFFECTIVE FLOODWAY — FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 Q100=1270 FP=1400.55 FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

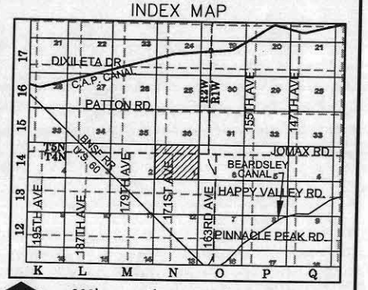
ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3867		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:
1. NGVD 29 + 1.90 FEET = NAVD 88.

INDEX MAP



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PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005

SUBMITTED BY: DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE
APPROVED BY: DATE
CHIEF ENGINEER AND GENERAL MANAGER

SHEET N-14 OF FLOODPLAIN DELINEATION

FILE: P:\300\310\310032 (Wittmann ADMSU)\Task\Hydraulics\FP-N_14.dwg DATE: 07/23/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

SEE SHEET N-16

ERM AJ3867

SEE SHEET M-15

SEE SHEET O-15

SEE SHEET N-14

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A — ZONE A
EFFECTIVE ZONE AE — ZONE AH
EFFECTIVE ZONE AH — ZONE AE
EFFECTIVE FLOODWAY — FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 / Q100=1270 — FP=1400.55 / FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

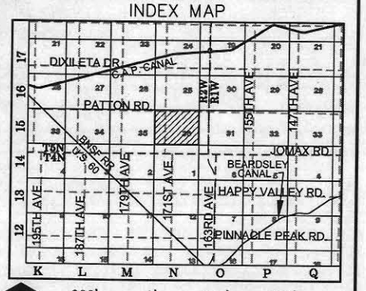
I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3867		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 1.90 FEET = NAVD 88.

Certificate No. 28737 HERNAN A. ARISTIZABAL Date Signed 7/1/2005 ARIZONA, U.S.A.

INDEX MAP



SCALE: 1" = 200'

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	BY	DATE
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DESIGN CHK.	HAA	07/2005
PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005
SUBMITTED BY:		DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

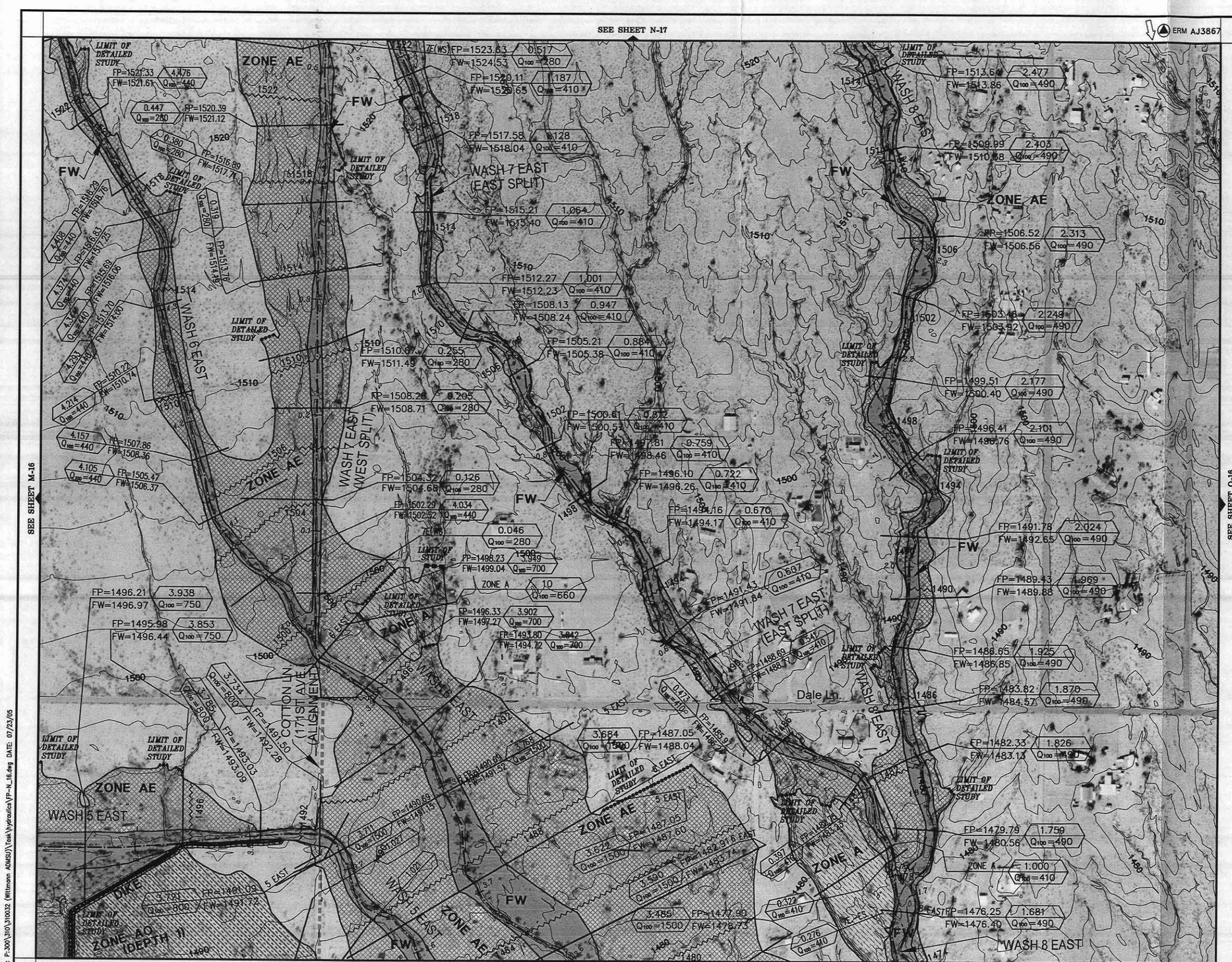
APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET N-15 OF FLOODPLAIN DELINEATION

FILE: P:\300\310\310032 (Wittmann ADMS)\Task\Hydraulics\FP-N_15.dwg DATE: 07/23/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES



FILE: P:\300\310\310032 (Wittmann ADMS0)\Task\hydraulics\FP-N_16.dwg DATE: 07/23/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A — ZONE A

EFFECTIVE ZONE AE — ZONE AH

EFFECTIVE ZONE AH — ZONE AE

EFFECTIVE FLOODWAY — FLOODWAY (FW)

ZONE AO

HYDRAULIC BASE LINE

ZONE DESIGNATION — ZONE A

WASH I.D. LABEL — WASH 9 EAST

ELEVATION REFERENCE MARK — ERM AJ3866

CROSS SECTION — 2.199 Q100=1270 FP=1400.55 FW=1400.56

BASE FLOOD ELEVATION — 1320

DIKE / LEVEE — DIKE

COUNTY BOUNDARY

CORPORATE LIMIT

LIMIT OF STUDY

LIMIT OF DETAILED STUDY

TOWNSHIP/RANGE LINE

SECTION LINE

SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

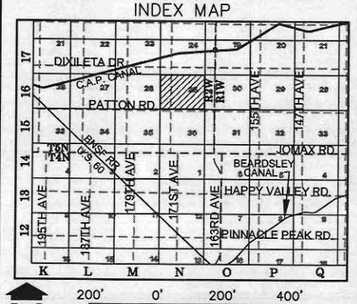
I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3867		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 1.90 FEET = NAVD 88.

Registered Professional Engineer — 39737 — HERMAN A. ARISTIZABAL — ARIZONA, U.S.A.

INDEX MAP



200' 0' 200' 400'

SCALE: 1"= 200'

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DESIGN CHK.	HAA	07/2005
PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005
SUBMITTED BY:		DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET N-16 OF FLOODPLAIN DELINEATION

SEE SHEET N-18

ERM AJ3872

EXISTING ZONE A

EXISTING ZONE AE

FP=1560.79 0.287
FW=1561.79 Q100=3930

WASH 7 EAST

FP=1556.27 0.200
FW=1557.02 Q100=3930

0.127
Q100=3930

ZONE AH
EL.= 1555.12

ZONE AE

FW

C.A.P. CANAL

FP=1542.04 3.029
FW=1542.01 Q100=490

FP=1536.37 2.953
FW=1536.51 Q100=490

FP=1542.80 0.951
FW=1542.78 Q100=470

FP=1543.58 4.966
FW=1543.74 Q100=440

FP=1538.49 0.900
FW=1538.45 Q100=410

LIMIT OF DETAILED STUDY

WASH 7 EAST (WEST SPLIT)

COTTON LN. (57TH AVE.) (ALIGNMENT)

FP=1540.62 4.896
FW=1540.70 Q100=440

FP=1535.28 0.815
FW=1535.40 Q100=410

FP=1538.22 4.832
FW=1538.26 Q100=440

0.750 FP=1532.57
Q100=410 FW=1532.69

FP=1532.67 1.458
FW=1532.69 Q100=410

FP=1535.02 4.772
FW=1535.09 Q100=440

0.696 FP=1530.75
Q100=280 FW=1530.91

FP=1529.75 1.395
FW=1529.92 Q100=410

FP=1532.56 4.728
FW=1532.94 Q100=440

MARICOPA COUNTY

DIXELETA DR. (ALIGNMENT)

SURPRISE ZONE AE

WASH 8 EAST

WASH 6 EAST

WASH 7 EAST (EAST SPLIT)

FP=1528.28 4.630
FW=1528.37 Q100=440

0.582 FP=1526.42
Q100=280 FW=1526.88

FP=1525.50 1.308
FW=1525.76 Q100=410

FP=1524.12 4.551
FW=1524.48 Q100=440

0.517 FP=1523.63
Q100=280 FW=1524.53

FP=1522.82 1.242
FW=1523.18 Q100=410

FP=1534.47 2.898
FW=1534.50 Q100=490

FP=1528.68 2.799
FW=1528.79 Q100=490

FP=1524.89 2.711
FW=1525.07 Q100=490

FP=1524.08 2.081
FW=1524.19 Q100=490

FP=1521.47 2.637
FW=1521.50 Q100=490

FP=1519.03 2.583
FW=1519.00 Q100=490

FP=1515.90 2.530
FW=1516.26 Q100=490

SEE SHEET M-17

SEE SHEET O-17

SEE SHEET N-16

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FILE: P:\300\310\310032 (Wittmann ADMSU)\Task\Hydraulics\FP-N_17.dwg DATE: 08/30/05

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY
ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
ZONE AO

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ELEVATION REFERENCE MARKS

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I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
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NOTE:

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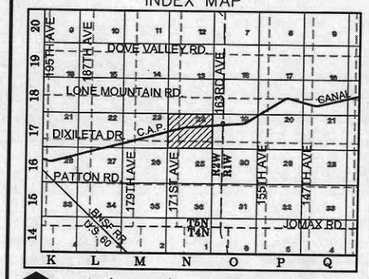
Registered Professional Engineer — 29737 — HERMAN A. ARISTIZABAL — Date Signed 1-23-06 — ARIZONA, U.S.A.

INDEX MAP



200' 0' 200' 400'
SCALE: 1"= 200'

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PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005
SUBMITTED BY:		DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET N-17 OF FLOODPLAIN DELINEATION

SEE SHEET N-19

ERM AJ3872

SEE SHEET M-18

SEE SHEET O-18

SEE SHEET N-17

LIMIT OF STUDY

ZONE A

15M-R2W-S14W

WASH 7 EAST

COTTON LANE (171ST AVE.) (ALIGNMENT)

1.122 Q100=1290

0.290 Q100=3040

7 EAST 0.697 Q100=3930

0.100 Q100=3040

LIMIT OF DETAILED STUDY

FW

ZONE AE

FP=1586.00 0.811
FW=1586.84 Q100=3930

LONE MOUNTAIN ROAD (ALIGNMENT)

FP=1581.57 0.724
FW=1581.97 Q100=3930

FP=1577.56 0.637
FW=1577.93 Q100=3930

FP=1573.39 0.561
FW=1573.73 Q100=3930

FP=1569.36 0.467
FW=1569.78 Q100=3930

FP=1565.15 0.385
FW=1565.65 Q100=3930

0.347 Q100=510 FP=1563.14 FW=1563.72

WASH 7 EAST TRIBUTARY

FP=1605.03 1.187
FW=1605.47 Q100=510

FP=1600.68 1.105
FW=1601.08 Q100=510

FP=1596.14 1.031
FW=1596.47 Q100=510

FW

FP=1591.47 0.940
FW=1591.54 Q100=510

FP=1587.85 0.857
FW=1587.77 Q100=510

FP=1584.11 0.778
FW=1584.79 Q100=510

WHITE WING ROAD

FP=1581.74 0.722
FW=1582.14 Q100=510

FP=1578.78 0.666
FW=1579.60 Q100=510

FP=1574.20 0.567
FW=1575.01 Q100=510

FP=1570.13 0.488
FW=1570.52 Q100=510

FP=1566.84 0.418
FW=1567.45 Q100=510

EFFECTIVE PADELFORD ZONE AE & FW

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A — ZONE A
EFFECTIVE ZONE AE — ZONE AH
EFFECTIVE ZONE AH — ZONE AE
EFFECTIVE FLOODWAY — FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 Q100=1270 FP=1400.55 FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
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CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

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AJ3872		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:
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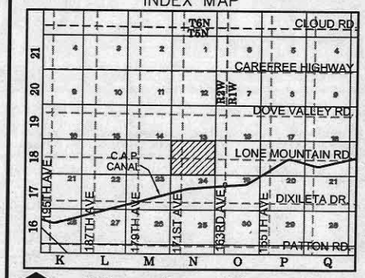
CERTIFICATE NO. 30737 HERMAN A. ARISTIZABAL Date Signed 10-31-05 ARIZONA, U.S.A.

INDEX MAP



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PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

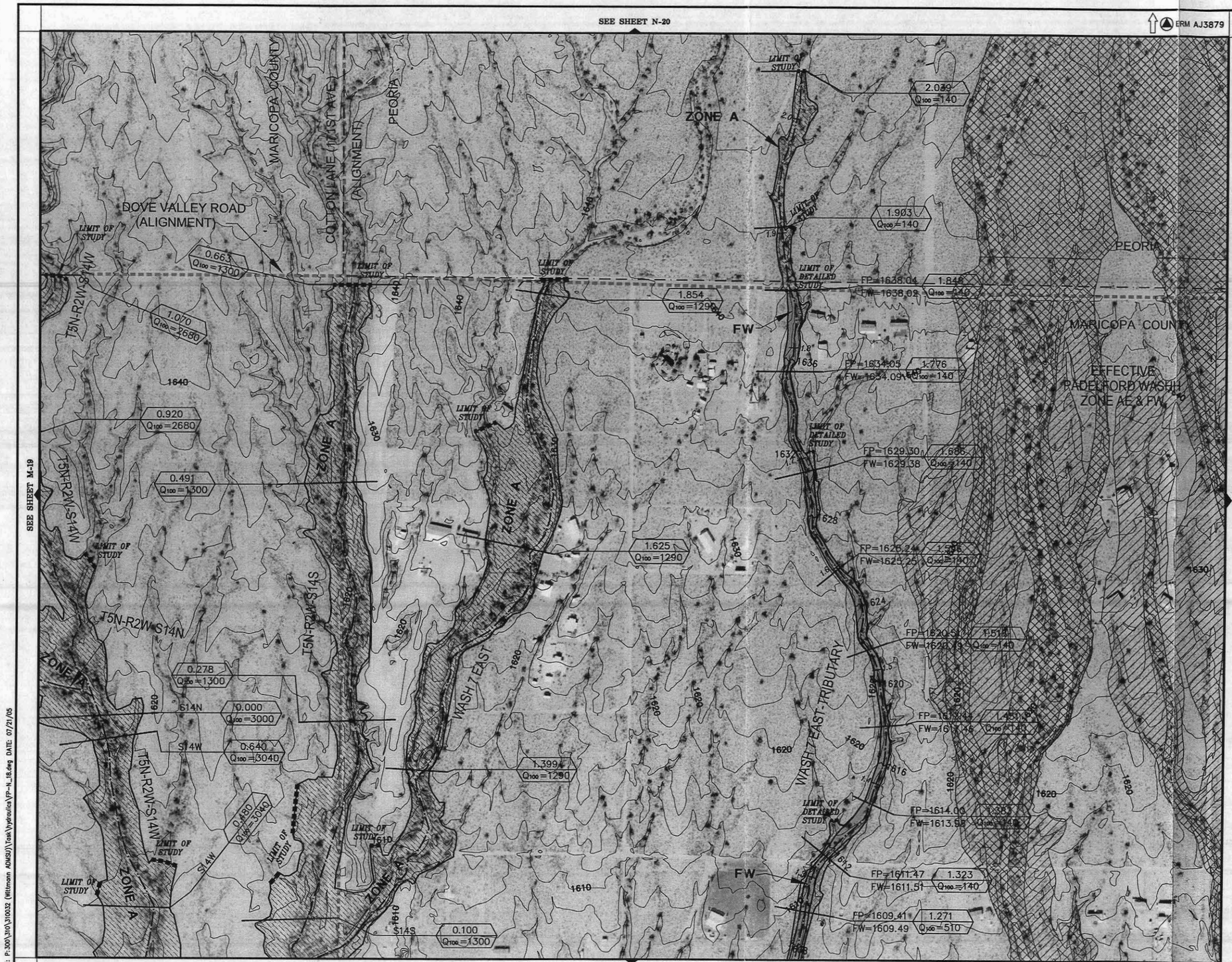
CHIEF ENGINEER AND GENERAL MANAGER

SUBMITTED BY: DATE:

SHEET N-18 OF FLOODPLAIN DELINEATION

FILE: P:\300\310\310032 (Wittmann ADMS)\Task\Hydraulics\FP-N_18.dwg DATE: 07/21/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES



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FILE: P:\300\310\310032 (Wittmann ADMS0)\Task\hydraulics\FP-N_18.dwg DATE: 07/21/05

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A — ZONE A
EFFECTIVE ZONE AE — ZONE AH
EFFECTIVE ZONE AH — ZONE AE
EFFECTIVE FLOODWAY — FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 Q100=1270 FP=1400.55 FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

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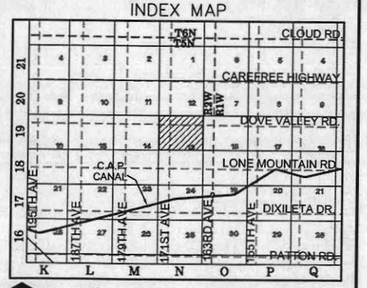
HERNAN A. ARISTIZABAL — 39737 — Registered Professional Engineer — State of Arizona — U.S.A.

INDEX MAP



N
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SUBMITTED BY:		DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

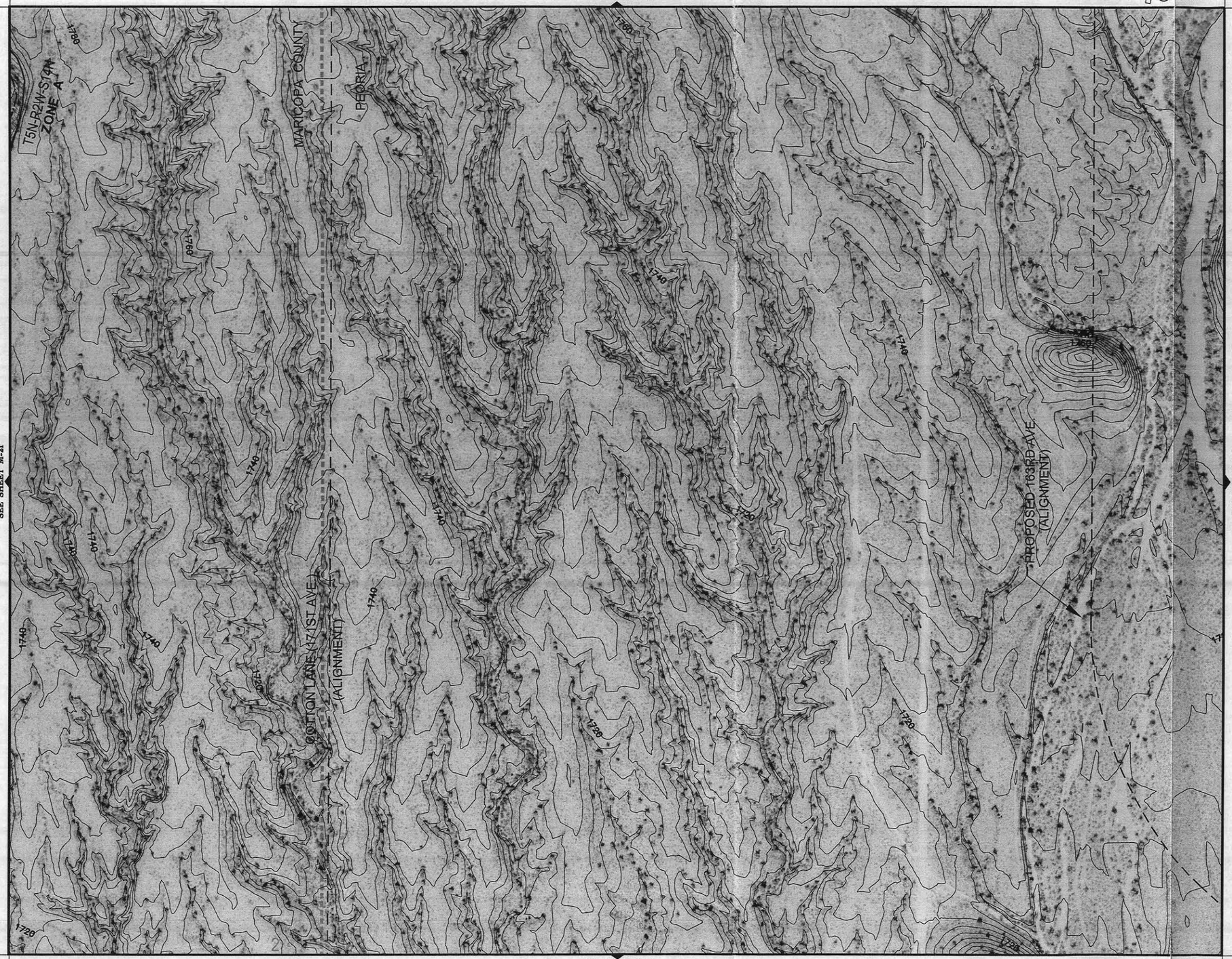
APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET N-19 OF FLOODPLAIN DELINEATION

SEE SHEET N-22

ERM AJ3879



SEE SHEET M-21

SEE SHEET O-21

SEE SHEET N-20

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FILE: P:\300\310\310032 (Wittmann ADMS)\Task Hydraulics\FP-N_21.dwg DATE: 05/02/05

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A		ZONE A
EFFECTIVE ZONE AE		ZONE AH
EFFECTIVE ZONE AH		ZONE AE
EFFECTIVE FLOODWAY		FLOODWAY (FW)
		ZONE AO

HYDRAULIC BASE LINE

ZONE DESIGNATION — ZONE A

WASH I.D. LABEL — WASH 9 EAST

ELEVATION REFERENCE MARK — ERM AJ3866

CROSS SECTION — 2.199 / Q_{100}=1270 — FP=1400.55 / FW=1400.56

BASE FLOOD ELEVATION — 1320

DIKE / LEVEE — DIKE

COUNTY BOUNDARY

CORPORATE LIMIT

LIMIT OF STUDY

LIMIT OF DETAILED STUDY

TOWNSHIP/RANGE LINE

SECTION LINE

SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

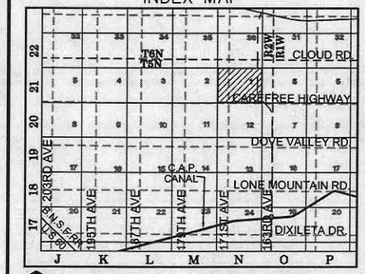
I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3879		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 2.00 FEET = NAVD 88.

Registered Professional Engineer — HERMAN A. ARISTIZABAL — 39737 — Date Signed 4/7/05 — ARIZONA, U.S.A.

INDEX MAP



200' 0' 200' 400'

SCALE: 1"= 200'

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DESIGN CHK.	HAA	07/2005
PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005
SUBMITTED BY:		DATE:

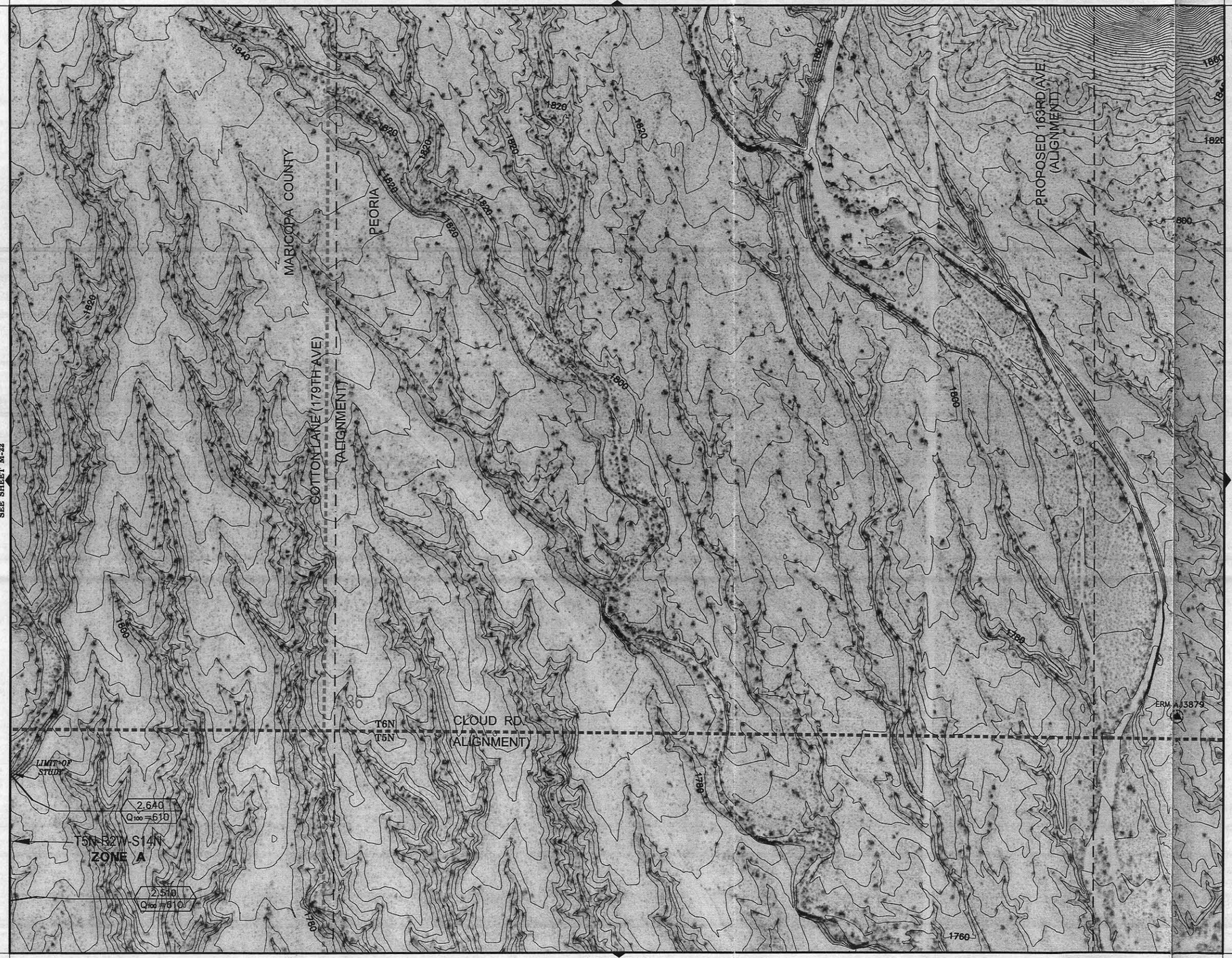
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET N-21 OF FLOODPLAIN DELINEATION



FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A — ZONE A
EFFECTIVE ZONE AE — ZONE AH
EFFECTIVE ZONE AH — ZONE AE
EFFECTIVE FLOODWAY — FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 / Q_{100}=1270 — FP=1400.55 / FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

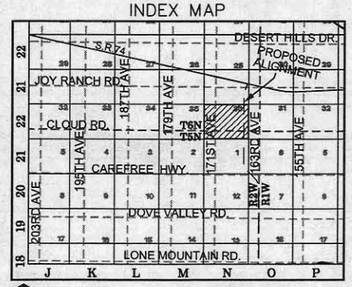
NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3879		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:
1. NGVD 29 + 2.00 FEET = NAVD 88.

Registered Professional Engineer — 39757 — HERNAN A. ARISTIZABAL — ARIZONA, U.S.A.

INDEX MAP



200' 0' 200' 400'
SCALE: 1"= 200'

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PLANS CHK.	AMG/HAA	07/2005
SUBMITTED BY:		DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE
APPROVED BY: DATE
CHIEF ENGINEER AND GENERAL MANAGER

SHEET N-22 OF FLOODPLAIN DELINEATION

FILE: P:\300\310\310032 (Wittmann ADMS)\Task Hydraulics\FP-N_22.dwg DATE: 07/21/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY
ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 Q100=1270 FP=1400.55 FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

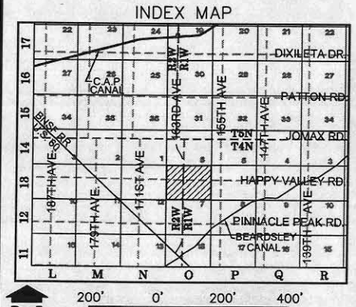
I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3867		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 1.90 FEET = NAVD 88.

HERMAN A. ARISTIZABAL 39737 — Registered Professional Engineer — ARIZONA, U.S.A.

INDEX MAP



N

200' 0' 200' 400'

SCALE: 1" = 200'

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PLANS CHK.	AMG/HAA	07/2005
SUBMITTED BY:		DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET O-13 OF FLOODPLAIN DELINEATION

FILE: P:\300\310\310032 (Wittmann ADMS0)\Task\hydraulics\FP-O_13.dwg DATE: 07/23/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

SEE SHEET O-15

SEE SHEET N-14

SEE SHEET P-14

SEE SHEET O-13

FILE: P:\001\310\10032 (Wittmann ADMS)\Tech\Hydraulics\FP-O_14.dwg DATE: 07/23/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY
ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 Q100=1270 FP=1400.55 FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

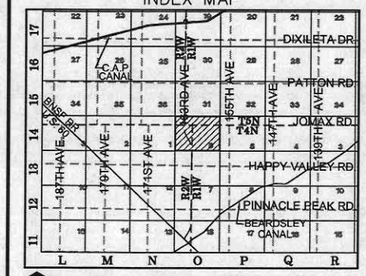
I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3867		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 1.90 FEET = NAVD 88.

Certificate Number 39737 HERNAN A. ARISTIZABAL Date Expires 3/31/07 ARIZONA, U.S.A.

INDEX MAP



200' 0' 200' 400'

SCALE: 1"= 200'

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PLANS CHK.	AMG/HAA	07/2005

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FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET O-14 OF FLOODPLAIN DELINEATION

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

- EFFECTIVE ZONE A / ZONE A
- EFFECTIVE ZONE AE / ZONE AH
- EFFECTIVE ZONE AH / ZONE AE
- EFFECTIVE FLOODWAY / FLOODWAY (FW)
- ZONE AO
- HYDRAULIC BASE LINE
- ZONE DESIGNATION: ZONE A
- WASH I.D. LABEL: WASH 9 EAST
- ELEVATION REFERENCE MARK: ERM AJ3866
- CROSS SECTION: 2.199 Q100=1270 FP=1400.55 FW=1400.56
- BASE FLOOD ELEVATION: 1320
- DIKE / LEVEE: DIKE
- COUNTY BOUNDARY
- CORPORATE LIMIT
- LIMIT OF STUDY
- LIMIT OF DETAILED STUDY
- TOWNSHIP/RANGE LINE
- SECTION LINE
- SECTION NUMBER: 29

ELEVATION REFERENCE MARKS

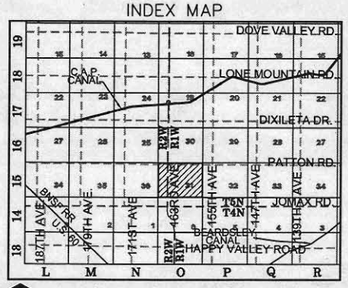
NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
DV2039		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 1.90 FEET = NAVD 88.

INDEX MAP



N

200' 0' 200' 400'

SCALE: 1" = 200'

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PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005

SUBMITTED BY: DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

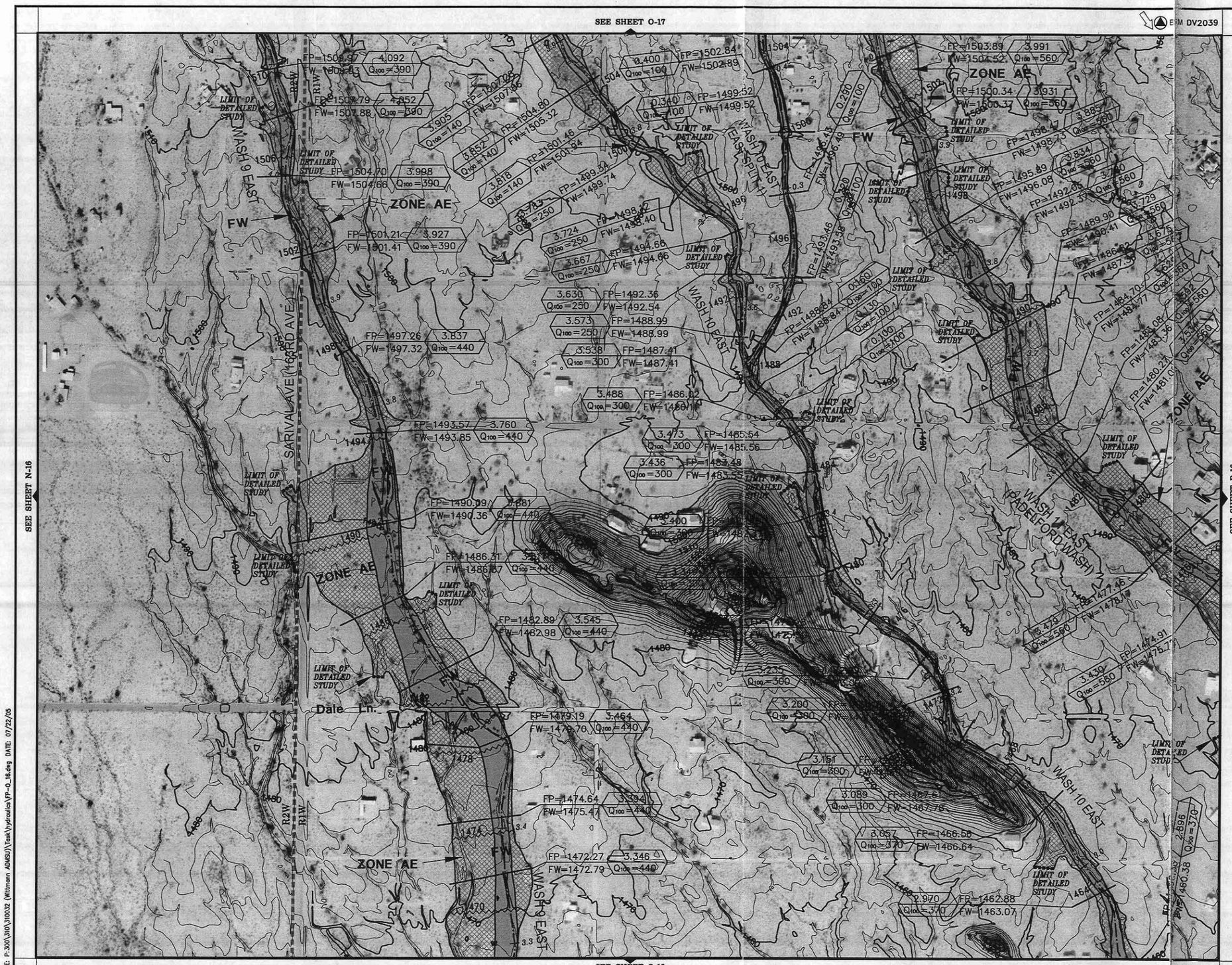
APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET O-15 OF FLOODPLAIN DELINEATION

FILE: P:\300\310\310032 (Wittmann ADMS)\Task\Hydraulics\FP-O_15.dwg DATE: 07/22/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES



FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A — ZONE A
EFFECTIVE ZONE AE — ZONE AH
EFFECTIVE ZONE AH — ZONE AE
EFFECTIVE FLOODWAY — FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 / Q_{100}=1270 — FP=1400.55 / FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

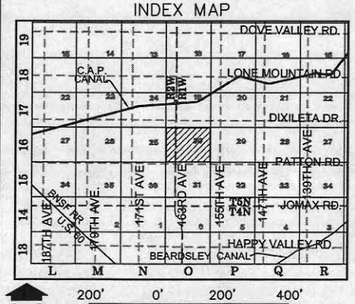
NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
DV2039		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:
1. NGVD 29 + 1.90 FEET = NAVD 88.

Registered Professional Engineer — 39737 — HERNAN A. ARISTIZABAL — ARIZONA, U.S.A.

INDEX MAP



SCALE: 1" = 200'

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PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005

SUBMITTED BY: DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET O-16 OF FLOODPLAIN DELINEATION

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FILE: P:\300\310\310032 (Wittmann ADMSU)\Task\Hydraulics\FP-O_16.dwg DATE: 07/22/05

SEE SHEET O-18

ERM DV2039

SEE SHEET N-17

SEE SHEET P-17

SEE SHEET O-16

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FILE: P:\300\310\310032 (Wittmann ADMSU)\Task\hydraulics\FP-0_17.dwg DATE: 08/30/05

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY
ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 / Q_{100}=1270 — FP=1400.55 / FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

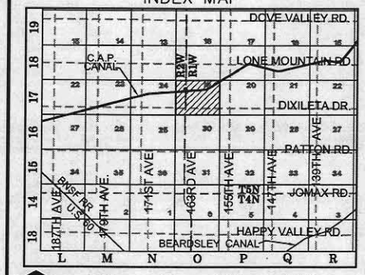
NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
DV2039		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:
1. NGVD 29 + 1.90 FEET = NAVD 88.

39737 HERNAN A. ARISTIZABAL Registered Professional Engineer CERTIFICATE NO. 39737 STATE OF ARIZONA, U.S.A.

INDEX MAP



N
200' 0' 200' 400'
SCALE: 1"= 200'

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PLANS CHK.	AMG/HAA	07/2005
SUBMITTED BY:		DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET O-17 OF FLOODPLAIN DELINEATION

SEE SHEET O-19

ERM DV2039

EFFECTIVE RADELFORD WASH ZONE AE & FW

EFFECTIVE RADELFORD WASH ZONE AE & FW

EFFECTIVE RADELFORD WASH ZONE AE & FW

EFFECTIVE RADELFORD WASH ZONE AE & FW

EFFECTIVE RADELFORD WASH ZONE AE & FW

EFFECTIVE RADELFORD WASH ZONE AE & FW

EFFECTIVE RADELFORD WASH ZONE AE & FW

ZONE AH EL.= 1550.12

ZONE AH EL.= 1550.12

LONE MOUNTAIN RD. (ALIGNMENT)

SOUTHWEST GAS EASEMENT

CAP

RAW

SEE SHEET N-18

SEE SHEET P-18

SEE SHEET O-17

FILE: P:\300\310\310032 (Wittmann ADMSU)\Task\hydraulics\FP-O_18.dwg DATE: 08/30/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A — ZONE A

EFFECTIVE ZONE AE — ZONE AH

EFFECTIVE ZONE AH — ZONE AE

EFFECTIVE FLOODWAY — FLOODWAY (FW)

ZONE AO

HYDRAULIC BASE LINE

ZONE DESIGNATION — ZONE A

WASH I.D. LABEL — WASH 9 EAST

ELEVATION REFERENCE MARK — ERM AJ3866

CROSS SECTION — 2.199 / Q_{100}=1270 — FP=1400.55 / FW=1400.56

BASE FLOOD ELEVATION — 1320

DIKE / LEVEE — DIKE

COUNTY BOUNDARY

CORPORATE LIMIT

LIMIT OF STUDY

LIMIT OF DETAILED STUDY

TOWNSHIP/RANGE LINE

SECTION LINE

SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

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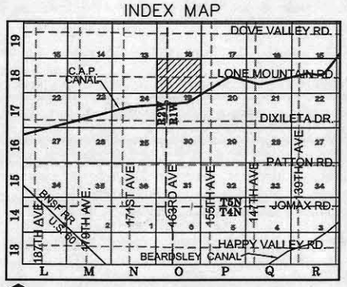
INDEX MAP



200' 0' 200' 400'

SCALE: 1"= 200'

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PLANS CHK.	AMG/HAA	07/2005

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

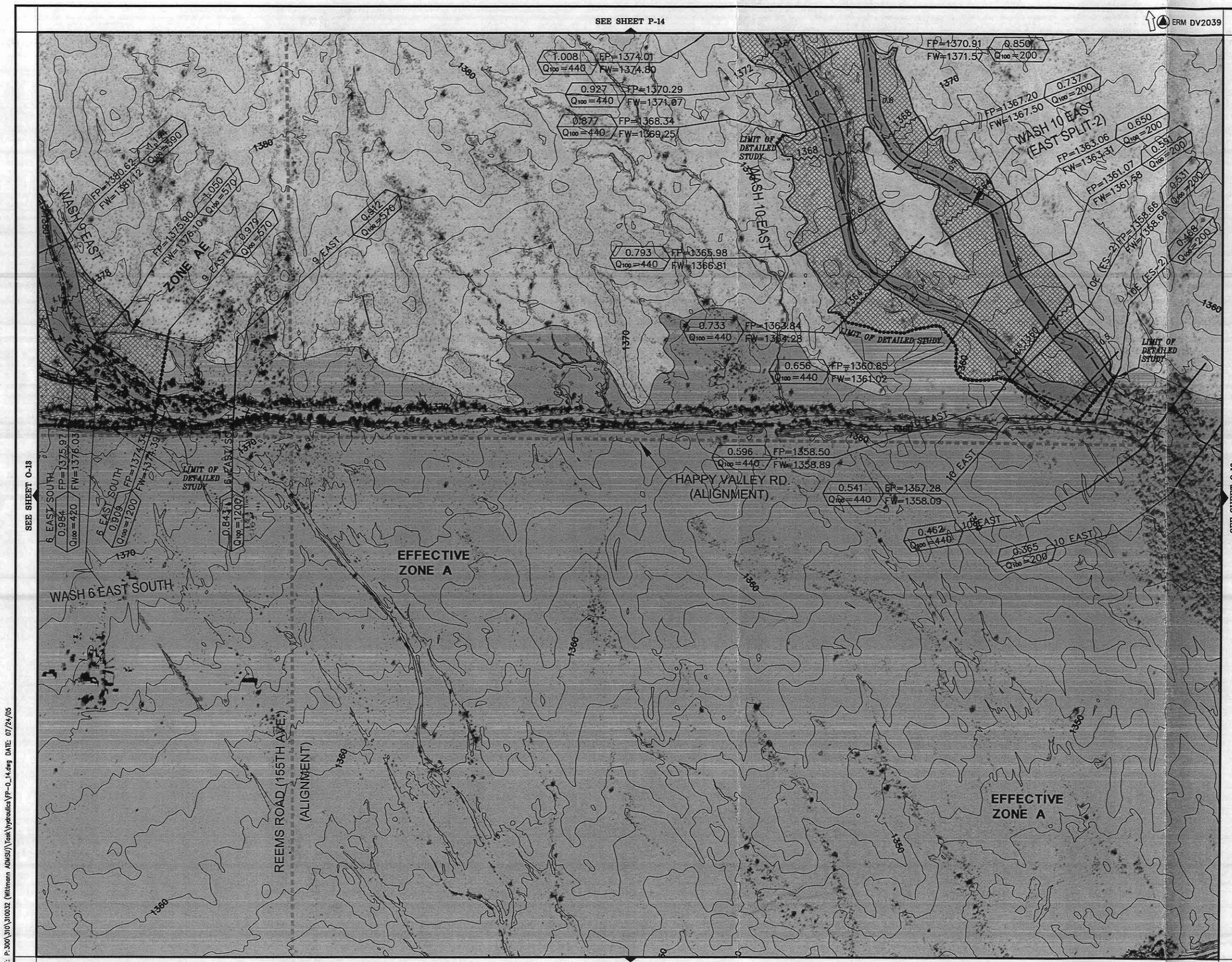
SUBMITTED BY: DATE:

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET O-18 OF FLOODPLAIN DELINEATION



FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A — ZONE A
EFFECTIVE ZONE AE — ZONE AH
EFFECTIVE ZONE AH — ZONE AE
EFFECTIVE FLOODWAY — FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 Q100=1270 FP=1400.55 FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

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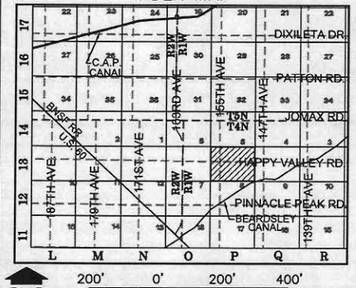
NOTE:
1. NGVD 29 + 1.90 FEET = NAVD 88.

39737 HERMAN A. ARISTIZABAL ARIZONA, U.S.A.

INDEX MAP



200' 0' 200' 400'
SCALE: 1"= 200'

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PLANS CHK.	AMG/HAA	07/2005

SUBMITTED BY: DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET P-13 OF FLOODPLAIN DELINEATION

FILE: P:\300\310\310032 (Wittmann ADMS)\Task\hydraulics\FP-0_14.dwg DATE: 07/24/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

SEE SHEET P-15

ERM DV2039

SEE SHEET O-14

SEE SHEET Q-14

SEE SHEET P-13

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A — ZONE A
EFFECTIVE ZONE AE — ZONE AH
EFFECTIVE ZONE AH — ZONE AE
EFFECTIVE FLOODWAY — FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 Q100=1270 FP=1400.55 FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

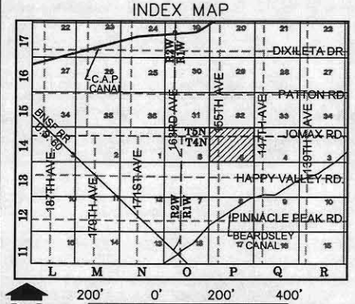
I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
DV2039		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 1.90 FEET = NAVD 88.

Certificate Number 39737 HERMAN A. ARISTIZABAL 07/27/05 ARIZONA, U.S.A.

INDEX MAP



200' 0' 200' 400'
SCALE: 1"= 200'

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DESIGN	AMG/RAS	07/2005
DESIGN CHK.	HAA	07/2005
PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005
SUBMITTED BY:		DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET P-14 OF FLOODPLAIN DELINEATION

FILE: P:\300\310\310032 (Wittmann ADMS)\Task Hydraulics\P-O_14.dwg DATE: 07/27/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE
CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A	ZONE A
EFFECTIVE ZONE AE	ZONE AH
EFFECTIVE ZONE AH	ZONE AE
EFFECTIVE FLOODWAY	FLOODWAY (FW)
	ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 / Q_{100}=1270 — FP=1400.55 / FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

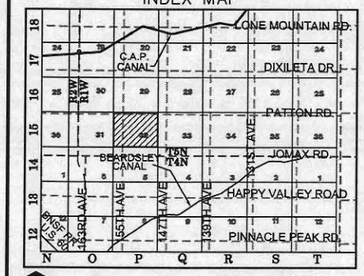
NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
DV2039		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:
1. NGVD 29 + 1.90 FEET = NAVD 88.

39737 HERMAN A. ARISTIZABAL — REGISTERED PROFESSIONAL ENGINEER — ARIZONA, U.S.A.

INDEX MAP



N
200' 0' 200' 400'
SCALE: 1"= 200'

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DESIGN	AMG/RAS	07/2005
DESIGN CHK.	HAA	07/2005
PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005
SUBMITTED BY:		DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
RECOMMENDED BY: DATE
APPROVED BY: DATE
CHIEF ENGINEER AND GENERAL MANAGER

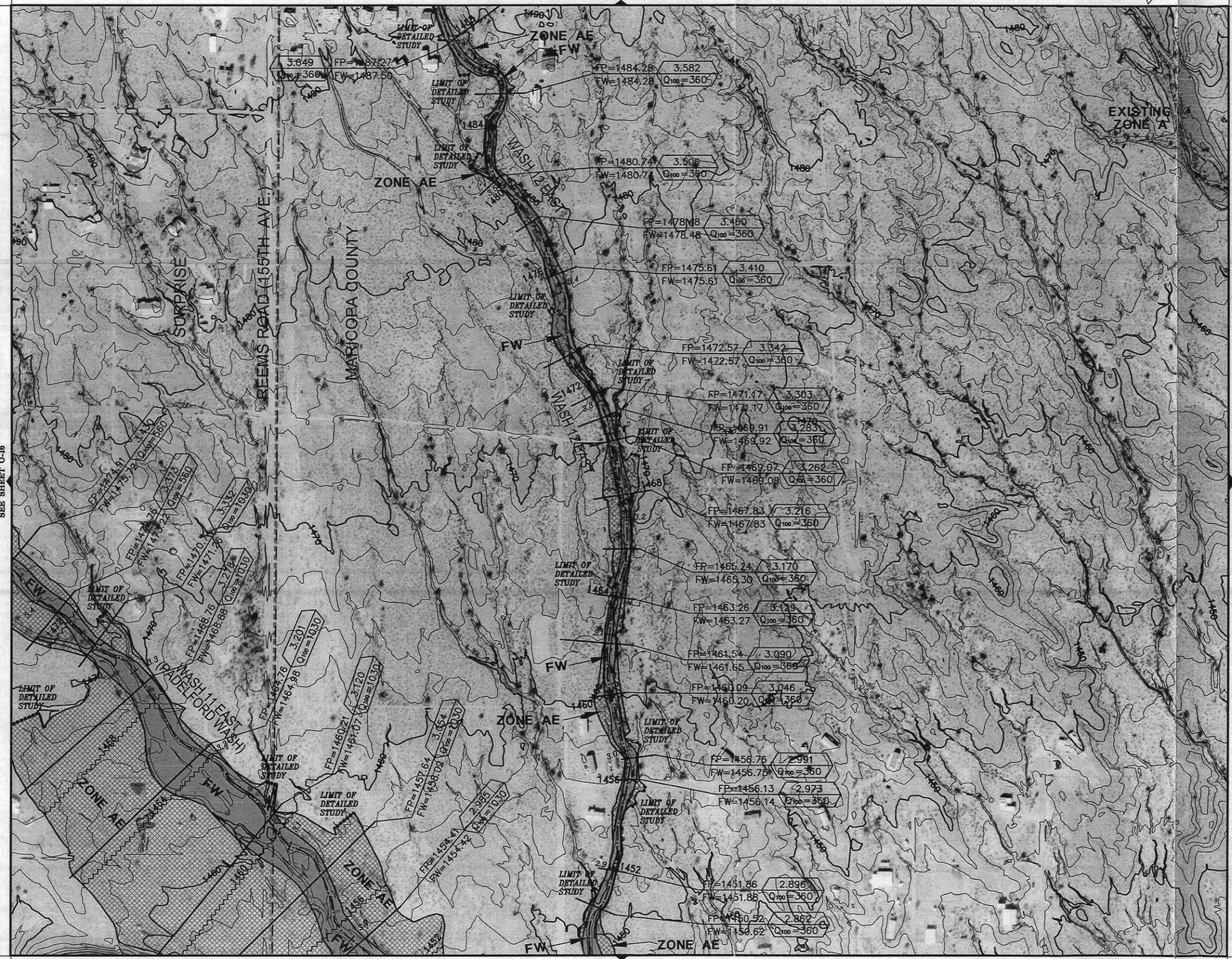
SHEET P-15 OF FLOODPLAIN DELINEATION

FILE: P:\300\310\310032 (Wittmann ADMS)\Task\Hydraulics\FP-P_15.dwg DATE: 07/27/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

SEE SHEET P-17

ERM DV2039



SEE SHEET O-16

SEE SHEET Q-16

SEE SHEET P-15

FILE: P:\300\310\310032 (Wittmann ADMS)\Task\hydraulics\FP-P_16.dwg DATE: 07/27/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A — ZONE A

EFFECTIVE ZONE AE — ZONE AH

EFFECTIVE ZONE AH — ZONE AE

EFFECTIVE FLOODWAY — FLOODWAY (FW)

ZONE AO

HYDRAULIC BASE LINE

ZONE DESIGNATION — ZONE A

WASH I.D. LABEL — WASH 9 EAST

ELEVATION REFERENCE MARK — ERM AJ3866

CROSS SECTION — 2.199 Q100=1270 FP=1400.55 FW=1400.56

BASE FLOOD ELEVATION — 1320

DIKE / LEVEE — DIKE

COUNTY BOUNDARY

CORPORATE LIMIT

LIMIT OF STUDY

LIMIT OF DETAILED STUDY

TOWNSHIP/RANGE LINE

SECTION LINE

SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

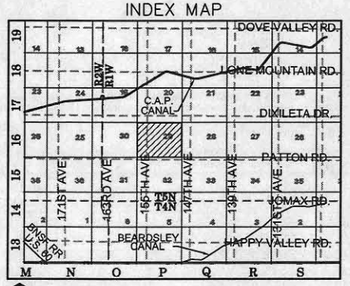
I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
DV2039		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 1.90 FEET = NAVD 88.

Registered Professional Engineer — 29737 — HERMAN A. ARISTIZABAL — Date Signed 7/27/05 — ARIZONA, U.S.A.

INDEX MAP



200' 0' 200' 400'

SCALE: 1" = 200'

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PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005

SUBMITTED BY: DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET P-16 OF FLOODPLAIN DELINEATION

SEE SHEET P-18

ERM DV2039

C.A.P. CANAL

REEMS ROAD (155TH AVE.) (ALIGNMENT)

EFFECTIVE ZONE A

EFFECTIVE ZONE A

EFFECTIVE ZONE A

WASH 12 EAST SPLIT

WASH 12 EAST

MARICOPA COUNTY

DIXILETA DR. (ALIGNMENT)

SURPRISE

ZONE AE

ZONE AE

ZONE AE

EFFECTIVE ZONE A

LIMIT OF DETAILED STUDY

FP=1522.53 | 4.299
FW=1522.60 | Q_{100}=360

FP=1519.29 | 4.139
FW=1519.75 | Q_{100}=360

FP=1516.36 | 4.166
FW=1516.83 | Q_{100}=360

FP=1514.26 | 4.127
FW=1514.33 | Q_{100}=360

FP=1511.76 | 4.088
FW=1511.88 | Q_{100}=290

FP=1508.51 | 4.021
FW=1509.20 | Q_{100}=290

FP=1504.05 | 3.951
FW=1504.46 | Q_{100}=290

FP=1501.48 | 3.902
FW=1502.03 | Q_{100}=290

FP=1499.67 | 3.867
FW=1500.41 | Q_{100}=290

FP=1496.32 | 3.804
FW=1496.28 | Q_{100}=290

FP=1490.95 | 3.716
FW=1491.21 | Q_{100}=360

FP=1487.27 | 3.649
FW=1487.50 | Q_{100}=360

FP=1514.28 | 4.09 | Q_{100}=360

3.997 | FP=1506.96 | Q_{100}=70

3.933 | FP=1503.01 | Q_{100}=70

3.854 | FP=1498.01 | Q_{100}=70

4.070 | Q_{100}=70

3.795 | FP=1495.64 | Q_{100}=70

3.716 | FP=1490.95 | Q_{100}=360

FW

SEE SHEET O-17

SEE SHEET Q-17

SEE SHEET P-16

FILE: P:\300\310\310032 (Wittmann ADMSD)\Task\hydraulics\FP-P_17.dwg DATE: 07/27/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY
ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 | Q_{100}=1270 | FP=1400.55 | FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

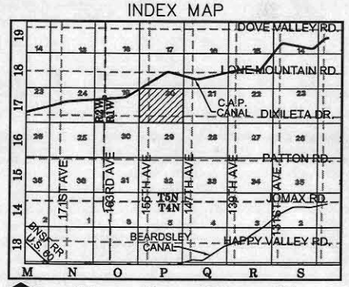
I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
DV2039		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 2.00 FEET = NAVD 88.

Registered Professional Engineer — Certificate No. 39737 — HERNAN A. ARISTIZABAL — Date Signed — ARIZONA, U.S.A.

INDEX MAP



N

200' 0' 200' 400'

SCALE: 1"= 200'

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PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005

SUBMITTED BY: DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET P-17 OF FLOODPLAIN DELINEATION

SEE SHEET P-19

ERM DV2039

SEE SHEET O-18

SEE SHEET Q-18

SEE SHEET P-17

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY
ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 / Q_{100}=1270 — FP=1400.55 / FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

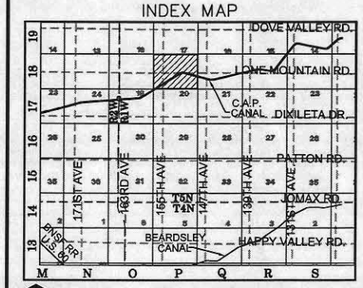
NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
DV2039		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:
1. NGVD 29 + 2.00 FEET = NAVD 88.

CERTIFICATE NO. 29737 — HERNAN A. ARISTIZABAL — REGISTERED PROFESSIONAL ENGINEER — ARIZONA, U.S.A.

INDEX MAP



N

200' 0' 200' 400'

SCALE: 1"= 200'

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DESIGN	AMG/RAS	07/2005	FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
DESIGN CHK.	HAA	07/2005	RECOMMENDED BY: DATE
PLANS	KAB	07/2005	APPROVED BY: DATE
PLANS CHK.	AMG/HAA	07/2005	CHIEF ENGINEER AND GENERAL MANAGER
SUBMITTED BY: DATE:			SHEET P-18 OF FLOODPLAIN DELINEATION

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FILE: P:\300\310\310032 (Wittmann ADMSU)\Task\hydraulics\FP-P_18.dwg DATE: 08/30/05

SEE SHEET Q-14

ERM DV0083

SEE SHEET P-13

SEE SHEET R-13

SEE SHEET Q-12

0.337 FP=1354.12 Q100=3000 FW=1355.01

0.337 FP=1353.59 Q100=3000 FW=1354.47

WASH 9 EAST (PADELFORD WASH) ZONE AE

0.270 FP=1351.74 Q100=3000 FW=1352.67

0.217 FP=1350.41 Q100=3000 FW=1351.24

0.189 FP=1349.09 Q100=3000 FW=1349.75

LIMIT OF DETAILED STUDY

ZONE AE

FW

0.140 FP=1348.05 Q100=3000 FW=1348.35

0.064 Q100=3000

11 EAST

0.000 Q100=3000

0.365 Q100=200

0.300 Q100=200

10 EAST

HAPPY VALLEY RD (ALIGNMENT)

BULLARD AVE (147TH AVE.) (ALIGNMENT)

BEARDSLEY CANAL

EFFECTIVE ZONE A

EFFECTIVE ZONE A

1360

1350

1340

1330

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A — ZONE A

EFFECTIVE ZONE AE — ZONE AH

EFFECTIVE ZONE AH — ZONE AE

EFFECTIVE FLOODWAY — FLOODWAY (FW)

ZONE AO

HYDRAULIC BASE LINE

ZONE DESIGNATION — ZONE A

WASH I.D. LABEL — WASH 9 EAST

ELEVATION REFERENCE MARK — ERM AJ3866

CROSS SECTION — 2.199 Q100=1270 FP=1400.55 FW=1400.56

BASE FLOOD ELEVATION — 1320

DIKE / LEVEE — DIKE

COUNTY BOUNDARY

CORPORATE LIMIT

LIMIT OF STUDY

LIMIT OF DETAILED STUDY

TOWNSHIP/RANGE LINE

SECTION LINE

SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

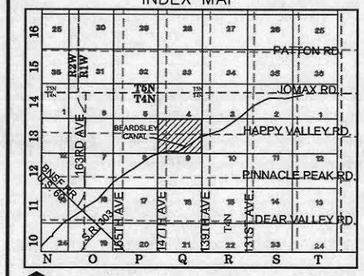
I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
DV0083		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 1.90 FEET = NAVD 88.

Registered Professional Engineer — 28737 — HERNAN A. ARMISTEAD — Date Signed 7/11/06 — ARIZONA, U.S.A.

INDEX MAP



N

200' 0' 200' 400'

SCALE: 1"= 200'

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PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005

SUBMITTED BY: DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET Q-13 OF FLOODPLAIN DELINEATION

FILE: P:\300\310\310032 (Wittmann ADMS0)\Task\hydraulics\FP--Q_13.dwg DATE: 06/06/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

SEE SHEET Q-15

ERM DV2039

1.482 Q100=1310 FP=1396.60 FW=1397.45

1.397 Q100=1310 FP=1393.61 FW=1394.10

1.350 Q100=1310 FP=1391.87 FW=1392.23

1.294 Q100=1310 FP=1389.85 FW=1390.44

1.255 Q100=1310 FP=1388.10 FW=1388.53

1.189 Q100=1310 FP=1385.22 FW=1386.01

1.137 Q100=1310 FP=1383.07 FW=1383.70

1.099 Q100=1310 FP=1381.25 FW=1382.02

0.999 Q100=1310 FP=1377.88 FW=1378.73

0.920 Q100=1310 FP=1374.35 FW=1374.71

0.848 Q100=2950 FP=1371.74 FW=1372.26

0.848 Q100=1830 FP=1371.43 FW=1371.81

0.765 Q100=2950 FP=1368.68 FW=1369.60

0.677 Q100=2950 FP=1365.40 FW=1366.27

0.613 Q100=2950 FP=1363.36 FW=1364.32

0.536 Q100=2950 FP=1360.57 FW=1361.55

0.469 Q100=3000 FP=1358.07 FW=1358.98

FP=1388.26 FW=1389.28 1.284 Q100=1830

FP=1384.72 FW=1385.43 1.189 Q100=1830

FP=1380.99 FW=1381.55 1.090 Q100=1830

0.995 Q100=1830

0.947 Q100=1830

FP=1376.56 FW=1376.21

FP=1374.52 FW=1374.92

ZONE AE

FW

WASH 9 EAST

WASH 11 EAST (PADELFORD WASH)

WASH 13 EAST

LIMIT OF DETAILED STUDY

JOMAX RD.

T5N

T4N

BULLARD AVE. (147TH AVE.) (ALIGNMENT)

SEE SHEET P-14

SEE SHEET R-14

SEE SHEET Q-13

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FILE: P:\30\310\310032 (Wittmann ADMSJ)\Task\hydrollica\FP-Q_14.dwg DATE: 07/12/05

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A — ZONE A

EFFECTIVE ZONE AE — ZONE AH

EFFECTIVE ZONE AH — ZONE AE

EFFECTIVE FLOODWAY — FLOODWAY (FW)

ZONE AO

HYDRAULIC BASE LINE

ZONE DESIGNATION — ZONE A

WASH I.D. LABEL — WASH 9 EAST

ELEVATION REFERENCE MARK — ERM AJ3866

CROSS SECTION — 2.199 Q100=1270 FP=1400.55 FW=1400.56

BASE FLOOD ELEVATION — 1320

DIKE / LEVEE — DIKE

COUNTY BOUNDARY

CORPORATE LIMIT

LIMIT OF STUDY

LIMIT OF DETAILED STUDY

TOWNSHIP/RANGE LINE

SECTION LINE

SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

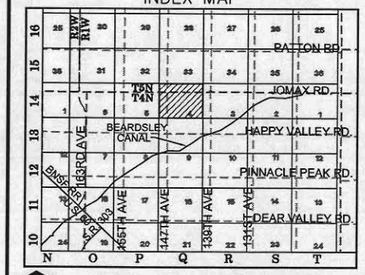
I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
DV2039		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 1.90 FEET = NAVD 88.

Registered Professional Engineer — 38737 — HERMAN A. ARISTIZABAL — Date Signed 7/14/05 — ARIZONA, U.S.A.

INDEX MAP



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DESIGN CHK.	HAA	07/2005
PLANS	KAB	07/2005
PLANS CHK.	AMG/HAA	07/2005

SUBMITTED BY: DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET Q-14 OF FLOODPLAIN DELINEATION

FILE: P:\300\310\310032 (Wittmann ADMS)\Tech\Hydraulics\FP-Q_15.dwg DATE: 07/12/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A / ZONE A
EFFECTIVE ZONE AE / ZONE AH
EFFECTIVE ZONE AH / ZONE AE
EFFECTIVE FLOODWAY / FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 / Q100=1270 — FP=1400.55 / FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

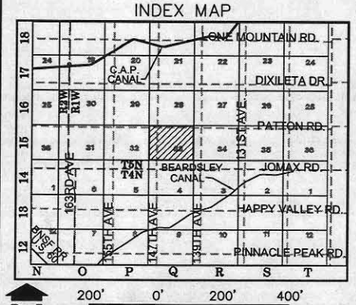
I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
DV2039		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 1.90 FEET = NAVD 88.

Registered Professional Engineer — 39737 — HERMAN A. ARISTIZABAL — Date Signed — ARIZONA, U.S.A.

INDEX MAP



N

200' 0' 200' 400'

SCALE: 1" = 200'

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PLANS CHK.	AMG/HAA	07/2005
SUBMITTED BY:		DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

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APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET Q-15 OF FLOODPLAIN DELINEATION

SEE SHEET Q-17

ERM DV2039

EFFECTIVE ZONE A

EFFECTIVE ZONE A

SEE SHEET P-16

SEE SHEET R-16

1450

BULLARD AVE. (147TH AVE.) (ALIGNMENT)

EFFECTIVE ZONE A

WASH 14 EAST ZONE A

LIMIT OF STUDY

ZONE A 2,244 Q_{100}=1380

WASH 13 EAST ZONE A

LIMIT OF STUDY

ZONE A 2,294 Q_{100}=460

SEE SHEET Q-15

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FILE: P:\300\310\310032 (Wittmann ADMS)\Task\hydraulics\FP-Q_16.dwg DATE: 07/12/05

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A — ZONE A
EFFECTIVE ZONE AE — ZONE AH
EFFECTIVE ZONE AH — ZONE AE
EFFECTIVE FLOODWAY — FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 / Q_{100}=1270 — FP=1400.55 / FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

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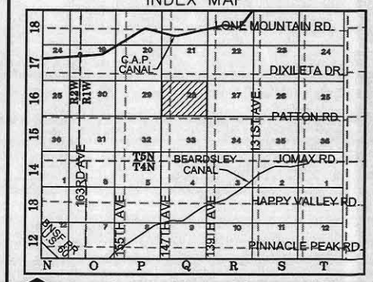
DV2039		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 2.00 FEET = NAVD 88.

CERTIFICATE NO. 29737 HERNAN A. ARISTIZABAL Date Signed 7/12/05 ARIZONA, U.S.A.

INDEX MAP



200' 0' 200' 400'

SCALE: 1"= 200'

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PLANS CHK.	AMG/HAA	07/2005
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FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET Q-16 OF FLOODPLAIN DELINEATION

SEE SHEET Q-19

ERM DV2039

SEE SHEET P-18

SEE SHEET R-18

MARICOPA COUNTY

PEORIA

BULLARD AVENUE (147TH AVE.) (ALIGNMENT)

LONE MOUNTAIN ROAD (ALIGNMENT)

ZONE AH
EL.= 1532.00

ZONE AH
EL.= 1532.00

EFFECTIVE ZONE A

EFFECTIVE ZONE A

C.A.P. CANAL

C.A.P. CANAL

ZONE AH
EL.= 1530.60

EFFECTIVE ZONE A

1540

1528

1520

1500

SEE SHEET Q-17

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FILE: P:\300\310\310032 (Wittmann ADMS0)\Task\hydraulics\FP-Q_18.dwg DATE: 07/22/05

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A — ZONE A
EFFECTIVE ZONE AE — ZONE AH
EFFECTIVE ZONE AH — ZONE AE
EFFECTIVE FLOODWAY — FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
CROSS SECTION — 2.199 / Q_{100}=1270 — FP=1400.55 / FW=1400.56
BASE FLOOD ELEVATION — 1320
DIKE / LEVEE — DIKE
COUNTY BOUNDARY
CORPORATE LIMIT
LIMIT OF STUDY
LIMIT OF DETAILED STUDY
TOWNSHIP/RANGE LINE
SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

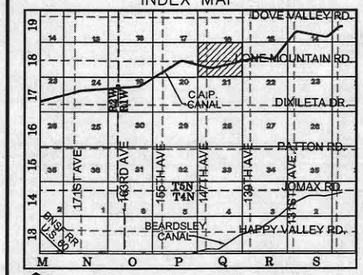
I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
DV2039		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 2.00 FEET = NAVD 88.

HERMAN A. ARISTIZABAL 29737 ARIZONA U.S.A.

INDEX MAP



200' 0' 200' 400'
SCALE: 1"= 200'

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PLANS CHK.	AMG/HAA	07/2005
SUBMITTED BY:		DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

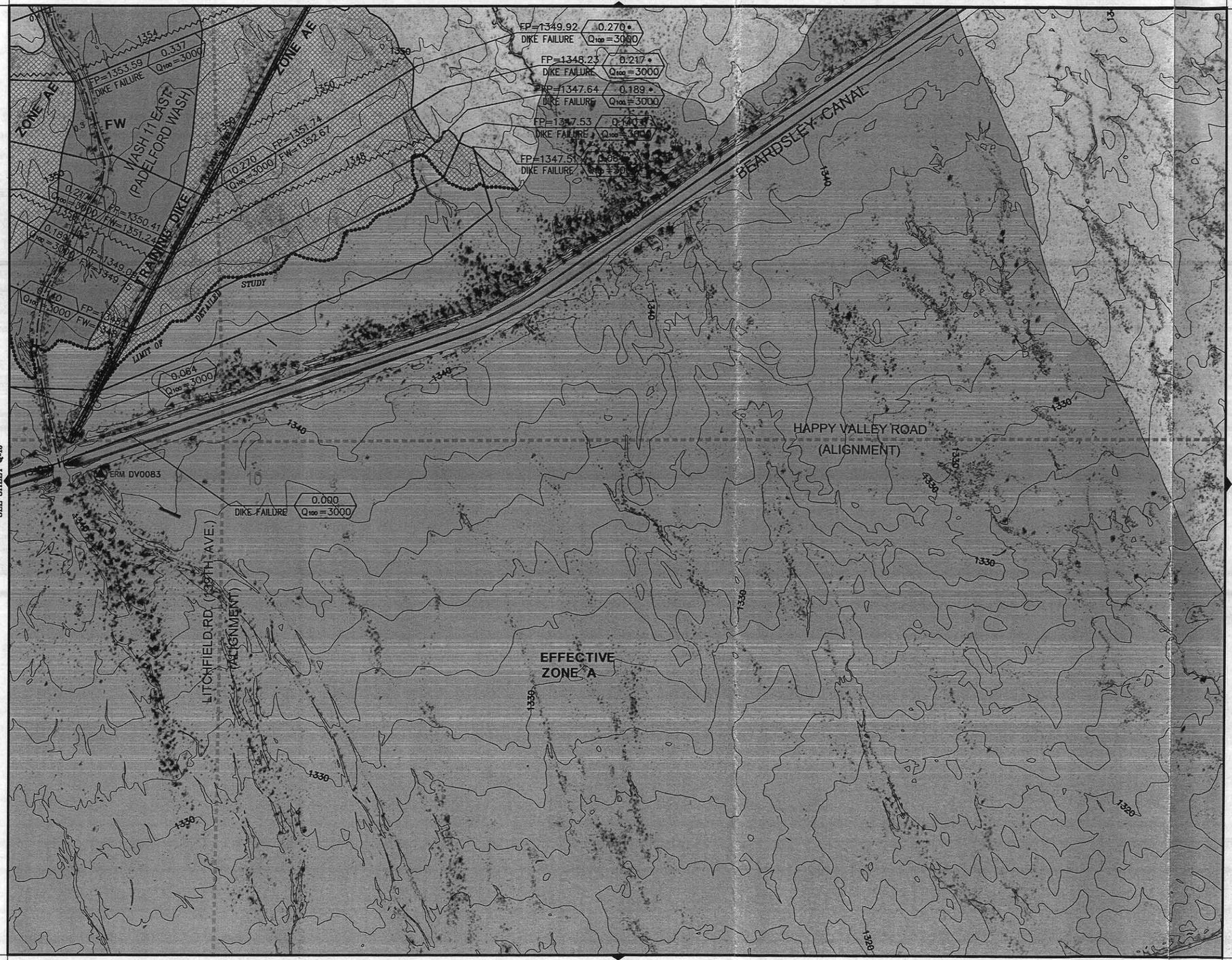
RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET Q-18 OF FLOODPLAIN DELINEATION

SEE SHEET R-14



SEE SHEET Q-18

SEE SHEET S-18

SEE SHEET R-12

FILE: P:\30\310\310032 (Wittmann ADMSD)\Task\Hydraulics\FP-R_13.dwg DATE: 07/12/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A — ZONE A
EFFECTIVE ZONE AE — ZONE AH
EFFECTIVE ZONE AH — ZONE AE
EFFECTIVE FLOODWAY — FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE
ZONE DESIGNATION — ZONE A
WASH I.D. LABEL — WASH 9 EAST
ELEVATION REFERENCE MARK — ERM AJ3866
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BASE FLOOD ELEVATION — 1320
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SECTION LINE
SECTION NUMBER — 29

ELEVATION REFERENCE MARKS

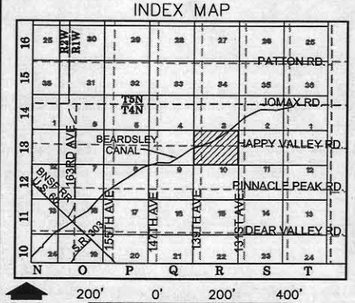
NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
DV0083		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:

1. NGVD 29 + 1.90 FEET = NAVD 88.

INDEX MAP



200' 0' 200' 400'

SCALE: 1"= 200'

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PLANS CHK.	AMG/HAA	07/2005

SUBMITTED BY: DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

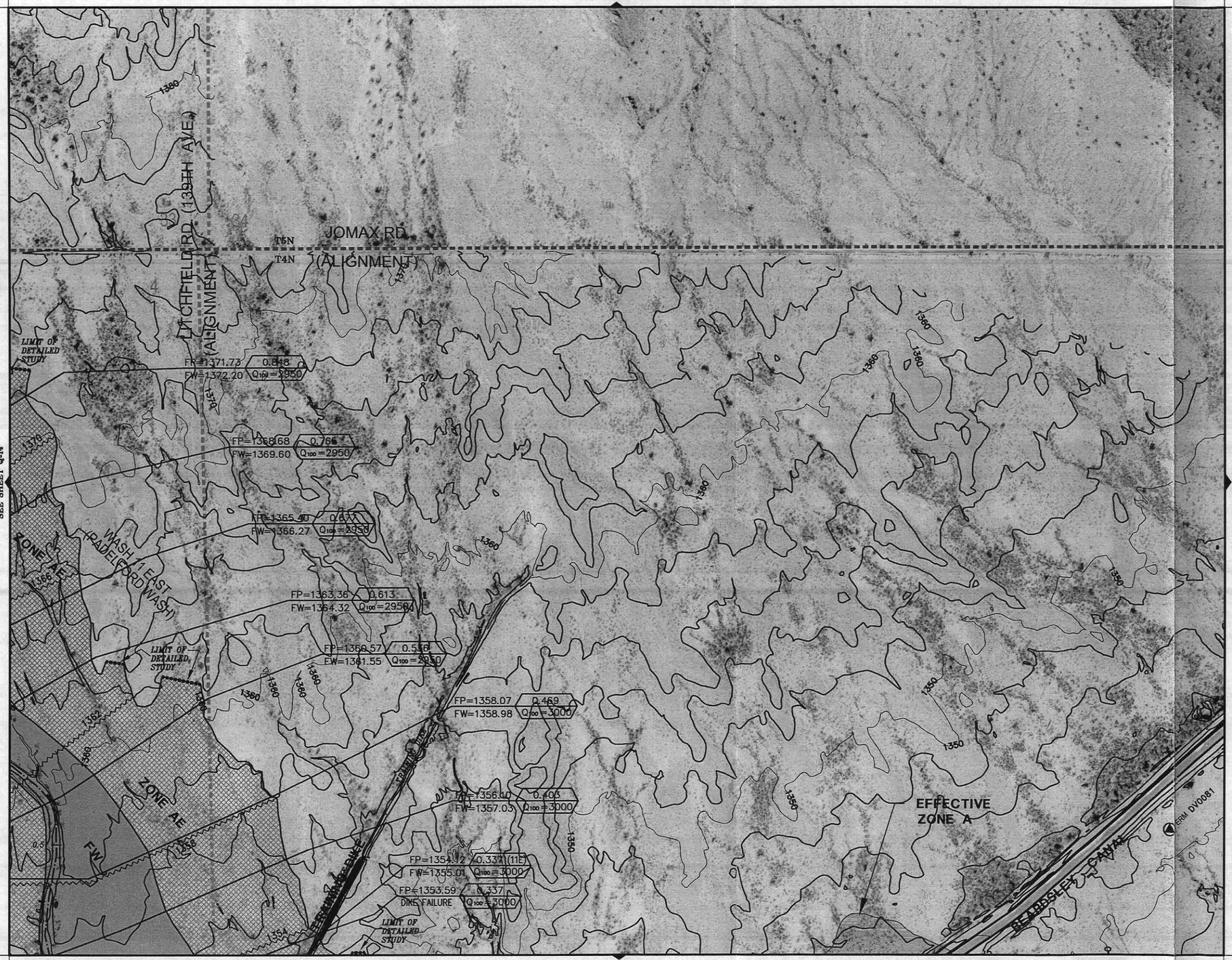
RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET R-13 OF FLOODPLAIN DELINEATION

SEE SHEET R-15



SEE SHEET Q-14

SEE SHEET S-14

SEE SHEET R-13

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE
MASTER STUDY UPDATE
CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY
ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
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NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

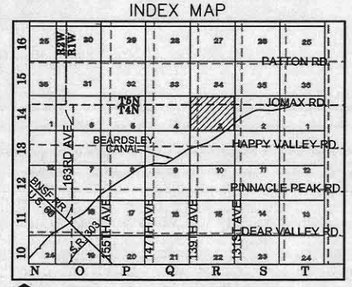
I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
DV0081		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

NOTE:
1. NGVD 29 + 1.90 FEET = NAVD 88.

* : SECTION ASSUMING TRAINING DIKE HAS FAILED.

Registered Professional Engineer — 39757 — HERNAN A. ARISTIZABAL — Date Signed 7/7/05 — ARIZONA, U.S.A.

INDEX MAP



200' 0' 200' 400'
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CHIEF ENGINEER AND GENERAL MANAGER

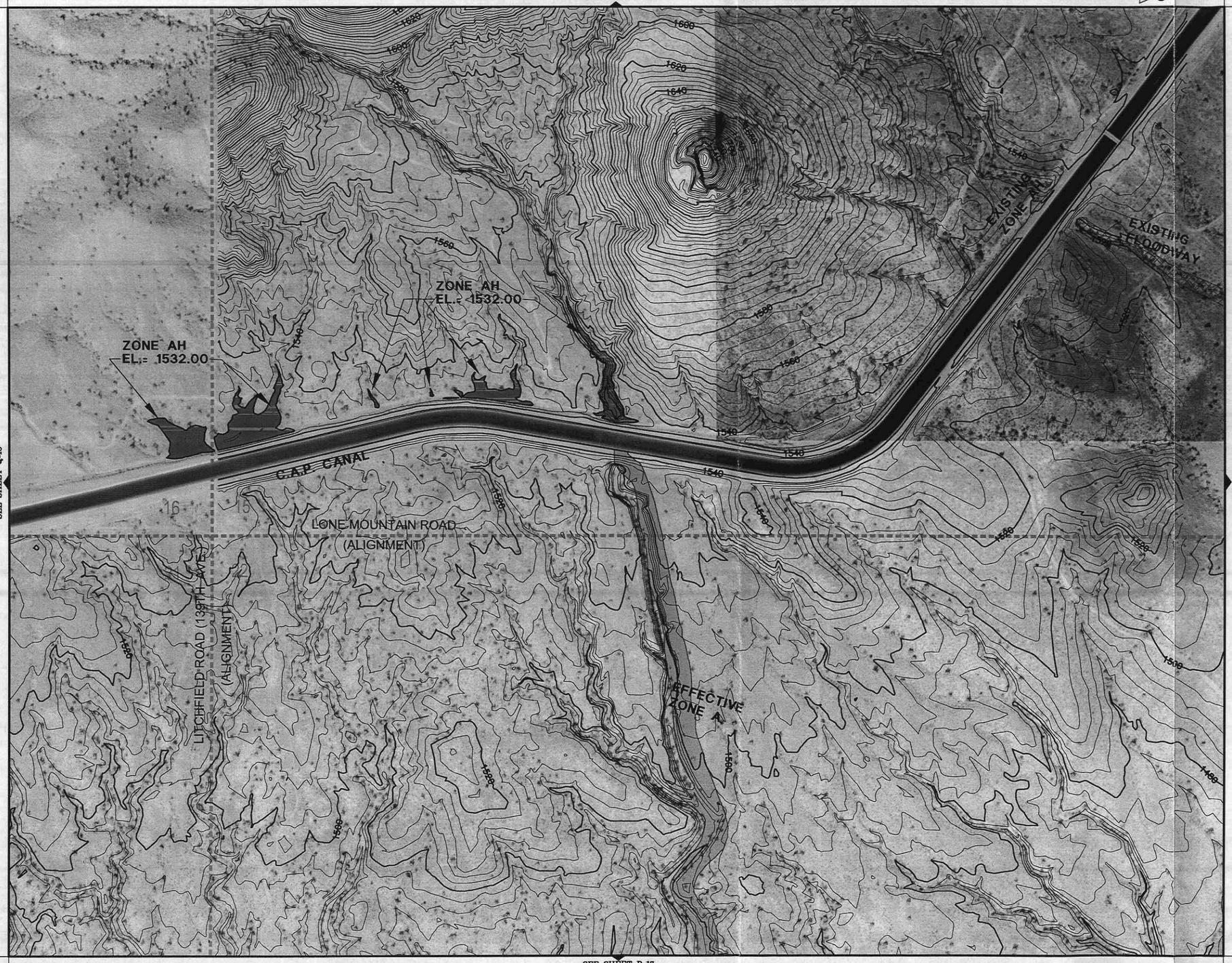
SHEET R-14 OF FLOODPLAIN DELINEATION

FILE: P:\300\310\10032 (Wittmann ADMS)\Task Hydraulics\FP-R_14.dwg DATE: 07/12/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

SEE SHEET R-19

ERM DV2039



SEE SHEET Q-18

SEE SHEET S-18

SEE SHEET R-17

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT FCD 2002C029

LEGEND

EFFECTIVE ZONE A
EFFECTIVE ZONE AE
EFFECTIVE ZONE AH
EFFECTIVE FLOODWAY
ZONE A
ZONE AH
ZONE AE
FLOODWAY (FW)
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NOTE:

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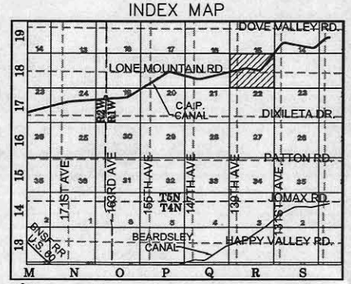
Certificate No. 38737 HERNAN A. ARISTIZABAL Registered Professional Engineer ARIZONA, U.S.A.

INDEX MAP



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CHIEF ENGINEER AND GENERAL MANAGER

SHEET R-18 OF FLOODPLAIN DELINEATION

FILE: P:\300\310\310032 (Wittmann ADMS)\Task\hydraulics\FP-R_18.dwg DATE: 07/22/05

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

SECTION 6: EROSION AND SEDIMENT TRANSPORT

The contents of this section are located in: *Volume GR – Geomorphology* of the "*Wittmann Area Drainage Master Study Update Report.*"