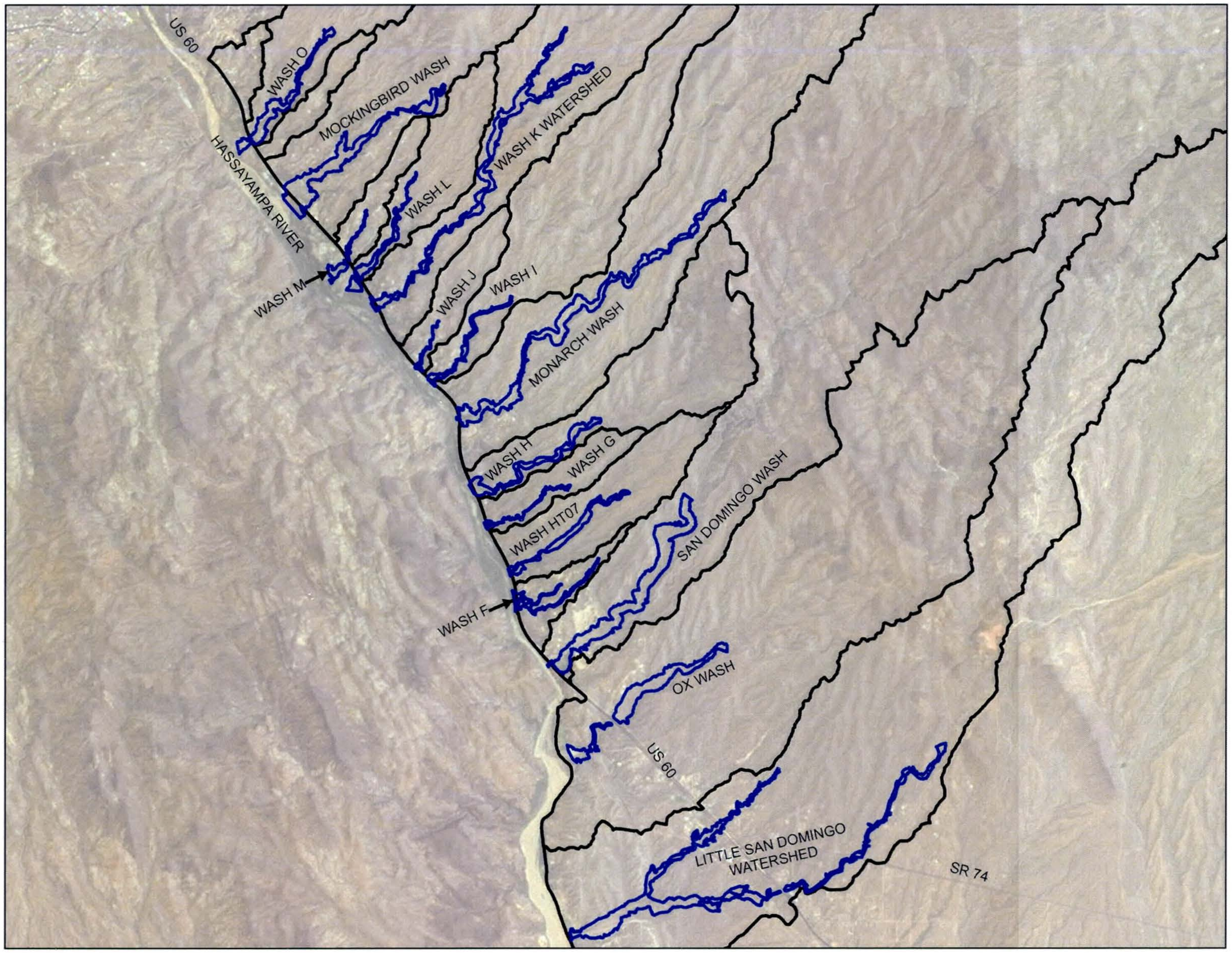
Wickenburg Area Drainage Master Study/Plan

FCD 2009C030 - PHASE 3 TECHNICAL DATA NOTEBOOK

January 2014

Revised October 2014



Prepared for:
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, AZ 85009
(602) 506.1501

Prepared by:

Hoskin • Ryan Consultants, Inc.
creative engineering solutions

Wickenburg Area Drainage Master Study/Plan

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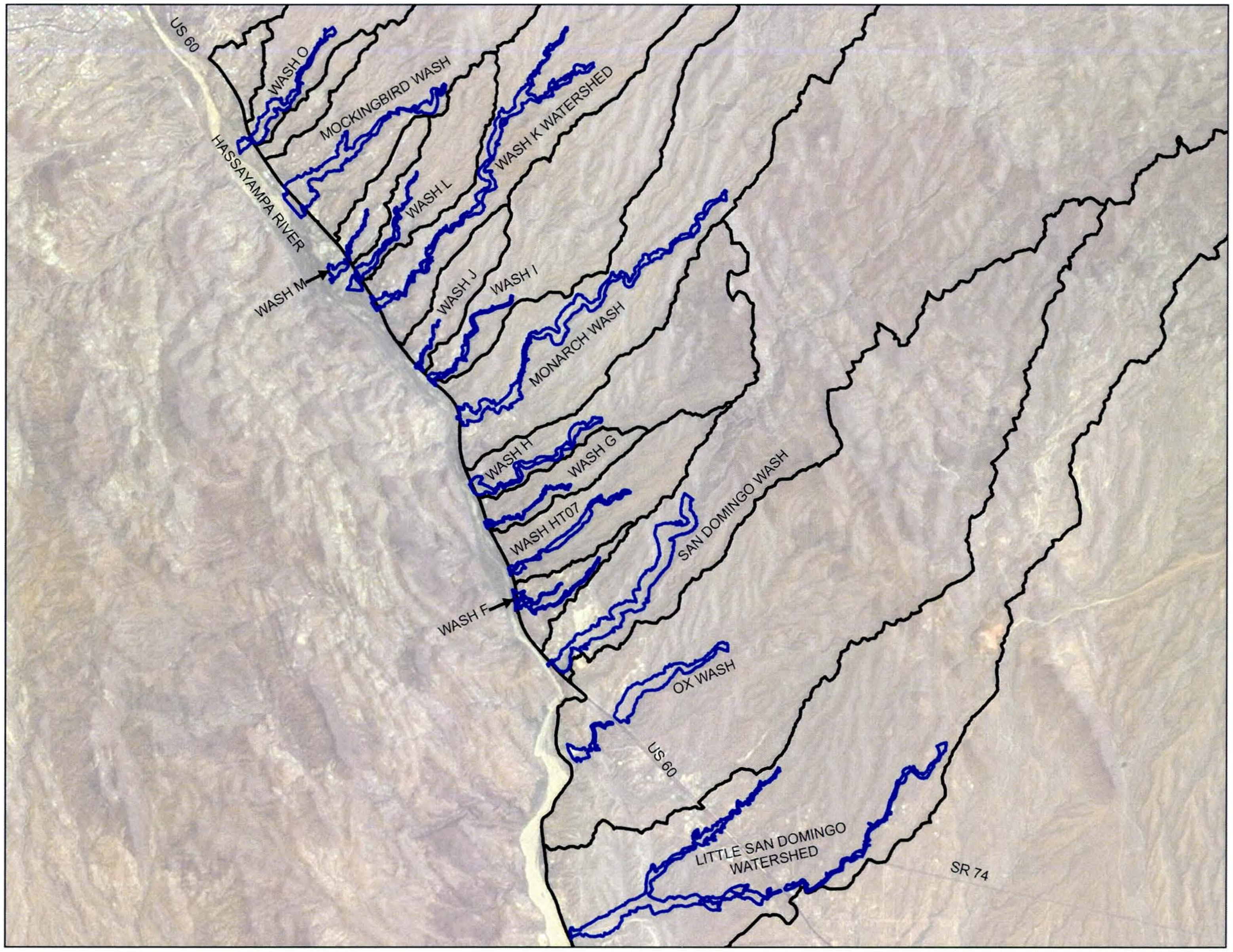

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Hoskin • Ryan Consultants, Inc.
creative engineering solutions

WICKENBURG
AREA DRAINAGE MASTER STUDY/PLAN
(FCD 2009C030)

PHASE 3 TRIBUTARY WASHES
TECHNICAL DATA NOTEBOOK

January 21, 2014
Revised October 2014

Registered Professional Engineer (Civil)
CERTIFICATE NO.
41454
RICARDO E.
AGUIRRE
Date Signed 10-23-2014
ARIZONA, U.S.A.
Expires 9-30-2016

Prepared for:
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, AZ 85009
(602) 506-1501

Registered Professional Engineer (Civil)
CERTIFICATE NO.
53281
TED W.
CASSIDY
Date Signed 10/23/14
ARIZONA U.S.A.
Expire 6/30/2015

Prepared by:
Hoskin-Ryan Consultants, Inc.
6245 N. 24th Parkway, Suite 100
Phoenix, AZ 85016
(602) 252-8384

REGISTERED PROFESSIONAL ENGINEER (CIVIL)
CERTIFICATE NO.
19690
PAUL W.R.
HOSKIN
Date Signed 10/23/14
ARIZONA, U.S.A.
EXPIRES 3/31/2015

in association with :

Coe & Van Loo Consultants, Inc.
4550 N. 12th Street
Phoenix, AZ 85014
(602) 264-6831

Dewberry & Davis, LLC
7204 N. 16th Street, Suite 108
Phoenix, AZ 85020
(602) 943-1585

WICKENBURG AREA DRAINAGE MASTER STUDY/PLAN
(FCD 2009C030)

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TECHNICAL DATA NOTEBOOK
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Registered Professional Engineer (Civil) CERTIFICATE NO. 53281 TED W. CASSIDY Date Signed 10/23/14 ARIZONA U.S.A.

6/30/2015

REGISTERED PROFESSIONAL ENGINEER (CIVIL) CERTIFICATE NO. 19690 PAUL W.R. HOSKIN Date Signed 10/23/14 ARIZONA, U.S.A.

EXPIRES 3/31/2015

Registered Professional Engineer (Civil) CERTIFICATE NO. 41454 RICARDO E. AGUIRRE Date Signed 10-23-2014 ARIZONA, U.S.A. Expires 9-30-2016

1 Introduction

Hoskin•Ryan Consultants, Inc. (HRC), has been contracted by the Flood Control District of Maricopa County (District) to prepare the Wickenburg Area Drainage Master Study (WADMS). (Figure 1). The study is an update of the Wickenburg Area Drainage Master Study (WADMS-94), completed in 1994. Since the WADMS-94, there have been advancements in the technology used to identify flood hazards, precipitation data has changed, and more recent and accurate digital topography is available. Growth, development, and other factors have resulted in changes to drainage patterns in some areas, causing potential changes to the flood hazards.

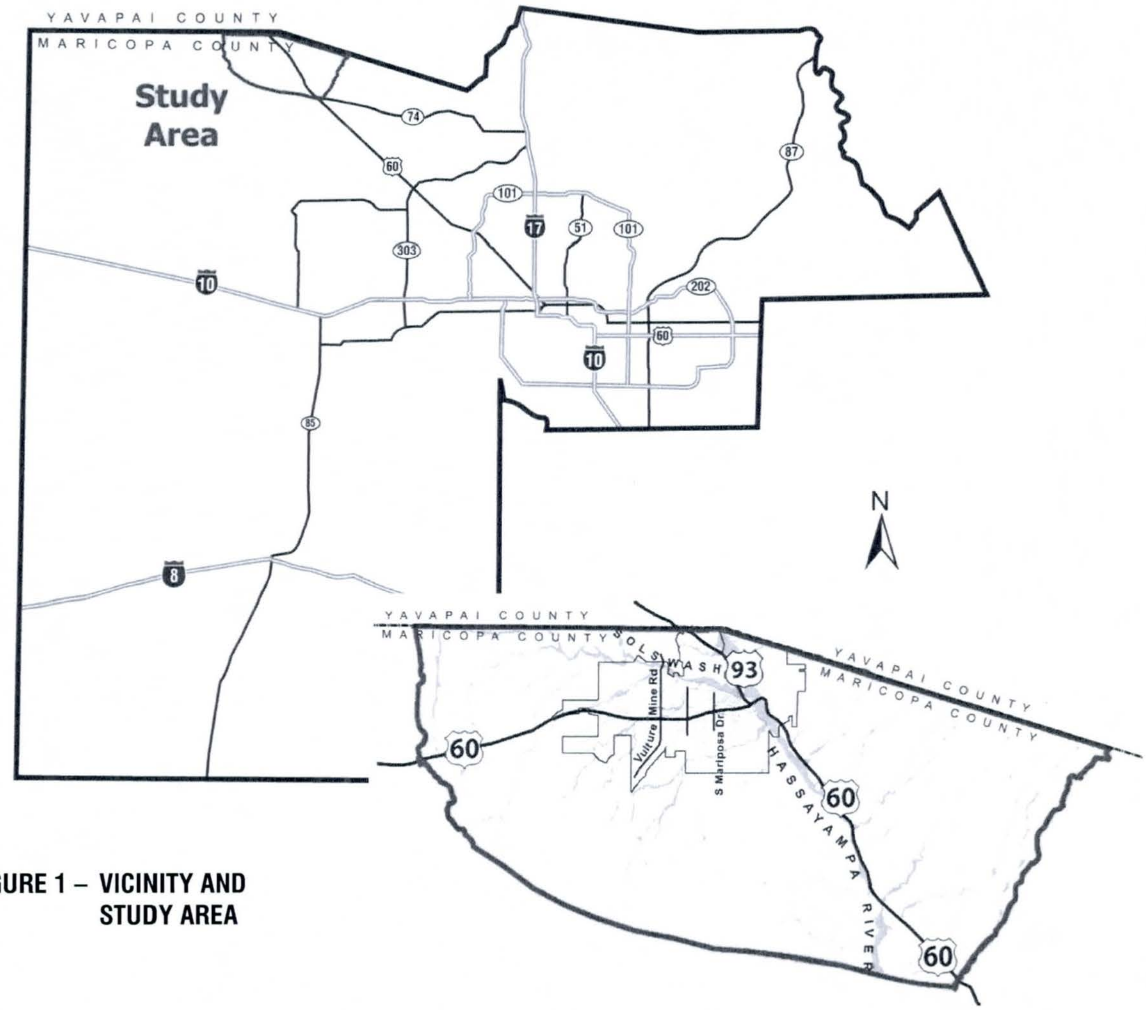

FIGURE 1 – VICINITY AND STUDY AREA

The study was performed in three phases, (Figure 2) with submittals to FEMA as either Letters of Map Revision (LOMRs) or Physical Map Revisions (PMRs). The study delineates floodplains for tributary washes of Sols Wash and the Hassayampa River within the Town of Wickenburg corporate limits and surrounding area.

The first phase identifies the current floodplain and flood hazards for Sunset Wash and Sunnycove Wash and is documented in the Phase 1 TDN (Ref. 24). The second phase delineates the floodplains for Sols Wash and Hassayampa River tributary washes that occur within, or in close proximity to, the Town limits and is documented in the Phase 2 East TDN (Ref. 25) and the Phase 2 West TDN (Ref. 26). The third phase (or current phase) includes floodplain delineations for select washes outside the Town's jurisdictional limits and east of the Hassayampa River.

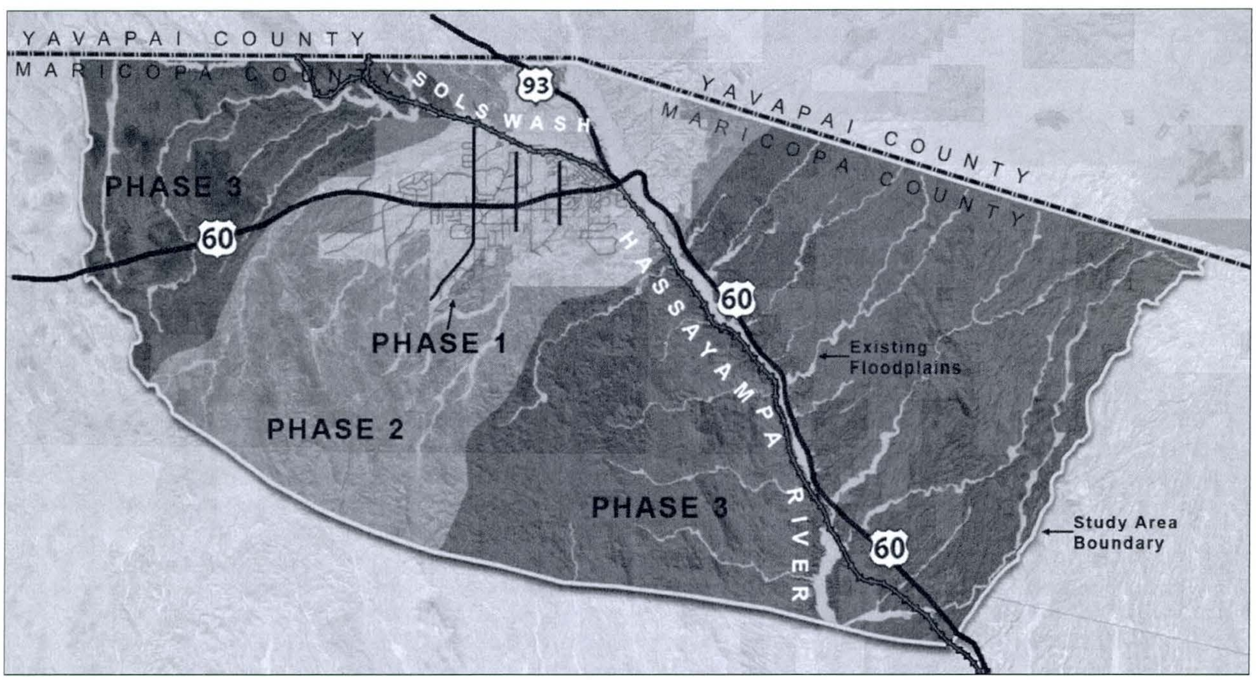

FIGURE 2 – STUDY PHASES

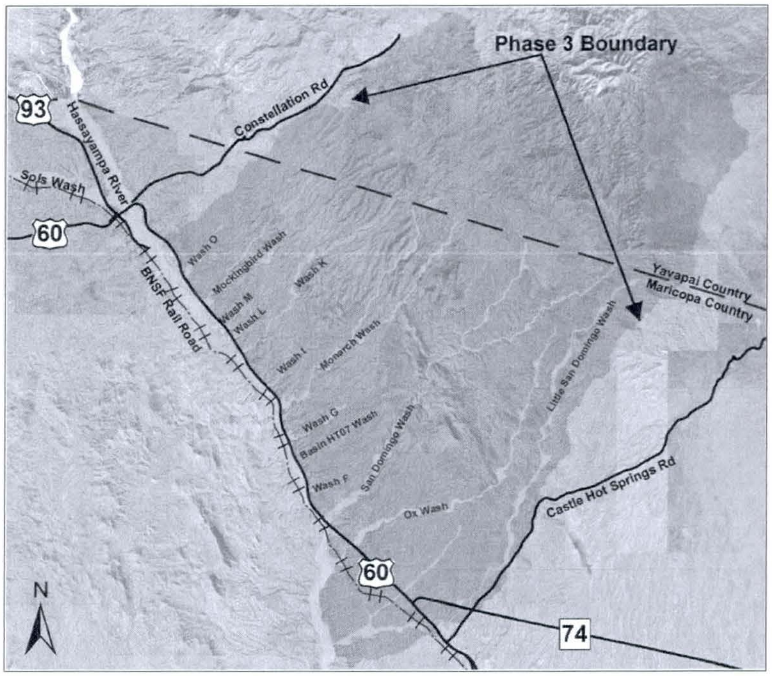

FIGURE 3 – PHASE 3 WATERSHED

The Phase 3 study area includes tributaries on the east side of the Hassayampa, generally outside of the Town limits. The purpose of this TDN is a technical submittal of new hydrologic and hydraulic analysis to FEMA. The new hydrologic and hydraulic analysis are based on recent NOAA rainfall data and topographic mapping.

1.1 Authority for Study

The study is a joint effort between the District and the Town. The District's contract number is FCD 2009C030. The official Notice to Proceed date is July 12, 2010. The District Project Manager is Gregory L. Jones, PE, AICP.

1.2 Location of Study

The Phase 3 study area encompasses approximately 70 square miles within Maricopa County to the east of the Town. The watershed area is located within Townships 6, 7 and 8 North, and Ranges 3 & 4 West, of the Gila and Salt River Meridian. Washes included in this TDN are tributaries to the Hassayampa River. See the Work Maps Index Map, included with this report, for wash locations. These washes include:

• Wash O	Tributary to the Hassayampa River
• Mockingbird Wash	Tributary to the Hassayampa River
• Wash M	Tributary to the Hassayampa River
• Wash L	Tributary to the Hassayampa River
• Wash K	Tributary to the Hassayampa River
• Wash K-1	Tributary to Wash K
• Wash J	Tributary to the Hassayampa River
• Wash I	Tributary to the Hassayampa River
• Monarch Wash	Tributary to the Hassayampa River
• Wash H	Tributary to the Hassayampa River
• Wash G	Tributary to the Hassayampa River
• Wash HT07	Tributary to the Hassayampa River
• Wash F	Tributary to the Hassayampa River
• Wash F Tributary 1	Tributary to Wash F
• San Domingo Wash	Tributary to the Hassayampa River
• Ox Wash	Tributary to the Hassayampa River
• Little San Domingo Wash	Tributary to the Hassayampa River
• Little San Domingo Wash Tributary 1	Tributary to Little San Domingo Wash
• Wash S2	Tributary to Little San Domingo Wash

1.3 Methodology Summary

Hydrologic Modeling

Hydrology for the contributing watersheds of the Phase 3 Tributaries was developed using the U.S. Army Corps of Engineers *HEC-1, Version 4.1, Flood Hydrograph Package* (Ref. 35). Hydrologic models prepared as part of the WADMS include the following:

- 500-year; 6-hour and 24-hour Existing Condition
- 100-year; 6-hour and 24-hour Existing Condition
- 50-year; 6-hour and 24-hour Existing Condition
- 10-year; 6-hour and 24-hour Existing Condition

The models were developed following the procedures recommended in the District's *Drainage Design Manual for Maricopa County, Volume I, Hydrology* (Ref. 17). Watersheds were divided into major watersheds contributing to each Hassayampa River tributary wash. Each major watershed was then further divided into sub-basins based on topographic mapping and field observations.

The District's *Drainage Design Management System Version 4.6.0* software (DDMSW), dated August 2010 (Ref. 15), was used to generate the sub-basin HEC-1 data. Sub-basin parameters were gathered from a combination of field observation and existing land use and soils maps. Soil losses were estimated using the Green & Ampt method and excess rainfall runoff was generated for the sub-basins using the Phoenix Mountain and the Desert Rangeland S-graphs as appropriate per the terrain in the sub-basin. Recent changes in development within the watershed areas are reflected in this study. *NOAA Atlas 14, Precipitation-Frequency Atlas of the United States, Volume 1, Arizona* (Ref. 31) was used as the point precipitation rainfall data source for the project.

Refer to Section 4 of this report for a detailed description of the hydrologic modeling methods.

<u>Hydraulic Modeling</u>

The effective Zone "AE" floodplains were previously delineated in the WADMS-94 using the HEC-2 hydraulic model (the effective model). However, HEC-RAS Version 4.1 (Ref. 37) was used to analyze the 100-year floodplains for this study.

HEC-RAS cross-section geometry was obtained from the 2004 two-foot contour interval (Ref. 43) and 2013 two-foot contour interval (Ref. 44) topographic mapping provided by the District and was supplemented by survey where the 2004 and 2013 data was not available (See Section 3: Survey and Mapping Information). Elevations for the study are on the NAVD88 vertical datum. Cross-sections were created at the same locations as the effective model wherever practical and supplemented with cross-sections at additional locations, including new culverts. Supplemental ground survey was conducted at drainage structures.

Encroachment Method #4 was used for the first iteration of floodway modeling followed by Method #1. Encroachment limits were modified as necessary to optimize the floodway water surface elevation (WSEL). Refer to Section 5 of this report for a detailed description of the hydraulic modeling methods.

1.4 Acknowledgements

This study was performed under the authority of the District, in cooperation with the Town. HRC was the Prime Consultant responsible for all aspects of the study; Dewberry, and Coe and Van Loo Consultants, Inc., assisted with data collection, hydrology, hydraulics, and floodplain delineation. Environmental Planning Group assisted with data collection and existing conditions analysis. Bender Consulting Services assisted with Public Involvement. Cooper Aerial Surveys Co. performed flown topographic survey. Geological Consultants, Inc., provided soils and bedrock analysis, and Alpha Geotechnical provided soils sampling and testing.

1.5 Summary of Study Results

The HEC-1 output for each hydrologic model is included in Appendix D.6. The USGS data for Arizona and the regional regression equations were used to verify the peak discharges. Refer to Section 4.5 for the hydrologic results.

The 100-year, 6-hour and the 100-year, 24-hour storm were compared to determine the highest peak discharge for each wash to use in the floodplain and floodway delineations. All washes were delineated to the extents of detailed study in the WADMS-94 with the addition of Wash HT07. Refer to the Floodplain Work Maps located at the back of this report for the wash locations.

2 Study Documentation Abstract and FEMA Forms

2.1: Study Documentation Abstract for FEMA Submittals		Initial Study		Restudy	X	CLOMR		LOMR	X	Other	
2.1.1	Date Study Accepted										
2.1.2	Study Contractor	Hoskin-Ryan Consultants, Inc.									
	Contact(s)	Paul W.R. Hoskin, PE / Douglas Both, CFM / Peng Zhang, PE, CFM									
	Address	6245 N. 24th Parkway, Suite 100 Phoenix, AZ 85016									
	Phone	(602) 252-8384									
	Internal Ref. No.	HRC 10-003-01									
	Subcontractors w/ Phone	Coe & Van Loo Consultants, Inc. – (602) 264-6831 Dewberry & Davis, LLC – (602) 943-1585									
2.1.3	FEMA Technical Review Contractor										
	Contact(s)										
	Address										
	Phone										
	Internal Ref. No.										
2.1.4	FEMA Regional Reviewer										
	Phone										
2.1.5	State Technical Reviewer										
	Phone										
2.1.6	Local Technical Reviewer	Greg Jones, PE, AICP – Flood Control District of Maricopa County Kathryn Gross, CFM, MA – Flood Control District of Maricopa County									
	Phone	Greg Jones (602) 506-5537 Kathryn Gross (602) 506-4837									
	Internal Ref. No.	FCD 2009C030									
2.1.7	Reach Description	Wash O between headwaters and confluence with the Hassayampa River. Mockingbird Wash between headwaters and confluence with the Hassayampa River. Wash M between headwaters and confluence with the Hassayampa River. Wash L between headwaters and confluence with the Hassayampa River. Wash K between headwaters and confluence with the Hassayampa River. Wash K-1 between headwaters and confluence with Wash K. Wash J between headwaters and confluence with the Hassayampa River. Wash I between headwaters and confluence with the Hassayampa River. Monarch Wash between headwaters and confluence with the Hassayampa River. Wash H between headwaters and confluence with the Hassayampa River. Wash G between headwaters and confluence with the Hassayampa River. Wash HT07 between headwaters and confluence with the Hassayampa River. Wash F between headwaters and confluence with the Hassayampa River. Wash F Tributary 1 between headwaters and confluence with Wash F. San Domingo Wash between headwaters and confluence with the Hassayampa River. Ox Wash between headwaters and confluence with the Hassayampa River. Little San Domingo Wash between headwaters and confluence with the Hassayampa River. Little San Domingo Wash Tributary 1 between headwaters and confluence with the Little San Domingo Wash. Wash S2 between headwaters and confluence with the Little San Domingo									

		Wash. FIRM 04013C0755L, 04013C0345L, 04013C0340L, 04013C0365L, 04013C0335L, 04013C0329L and 04013C0735L
2.1.8	USGS Quad Sheet(s) with original photo date & latest photo revision date	7.5-Minute Topographic Quadrangle Map Series: Vulture Peak, Arizona, provisional editing 1990. Wickenburg, Arizona, 1964, photo inspected 1978.
2.1.9	Unique Conditions and Problems	N/A
2.1.10	Coordination of Discharges (Agency, Date, Comments)	Peak flows to be generated as part of the study. Review and approval of peak flows to be completed by the Flood Control District of Maricopa County.

Study Documentation Abstract for Local Government and ADWR Submittals		
2.1: General Information		
2.1.1	Community	Wickenburg, Town of
2.1.2	Community Number	040056
2.1.3	County	Maricopa County
2.1.4	State	Arizona
2.1.5	Date Study Accepted	
2.1.6	Study Contractor	Hoskin-Ryan Consultants, Inc.
	Contact(s)	Paul W.R. Hoskin, PE / Douglas Both, CFM / Peng Zhang, PE, CFM
	Address	6245 N. 24th Parkway, Suite 100 Phoenix, AZ 85016
	Phone	(602) 252-8384
	Internal Ref. No.	HRC 10-003-01
2.1.7	State Technical Reviewer	
	Phone	
2.1.8	Local Technical Reviewer	Greg Jones, PE, AICP – Flood Control District of Maricopa County Kathryn Gross, CFM, MA – Flood Control District of Maricopa County
	Phone	Greg Jones (602) 506-5537 Kathryn Gross (602) 506-4837
	Internal Ref. No.	FCD 2009C030
2.1.9	River or Stream Name	Wash O, Mockingbird Wash, Wash M, Wash L, Wash K, Wash J, Wash I, Monarch Wash, Wash H, Wash G, Wash HT07, Wash F, San Domingo Wash, Ox Wash, Little San Domingo Wash.
2.1.10	Reach Description	Wash O between headwaters and confluence with the Hassayampa River. Mockingbird Wash between headwaters and confluence with the Hassayampa River. Wash M between headwaters and confluence with the Hassayampa River. Wash L between headwaters and confluence with the Hassayampa River. Wash K between headwaters and confluence with the Hassayampa River. Wash K-1 between headwaters and confluence with Wash K. Wash J between headwaters and confluence with the Hassayampa River. Wash I between headwaters and confluence with the Hassayampa River. Monarch Wash between headwaters and confluence with the Hassayampa River. Wash H between headwaters and confluence with the Hassayampa River. Wash G between headwaters and confluence with the Hassayampa River. Wash HT07 between headwaters and confluence with the Hassayampa River. Wash F between headwaters and confluence with the Hassayampa River. Wash F Tributary 1 between headwaters and confluence with Wash F. San Domingo Wash between headwaters and confluence with the Hassayampa River. Ox Wash between headwaters and confluence with the Hassayampa River. Little San Domingo Wash between headwaters and confluence with the Hassayampa River. Little San Domingo Wash Tributary 1 between headwaters and confluence with the Little San Domingo Wash. Wash S2 between headwaters and confluence with the Little San Domingo Wash.
2.1.11	Study Type (riverine, alluvial, fan, etc.)	Riverine
Section 2.2: Mapping Information		
2.2.1	USGS Quad Sheet(s) with original photo date & latest	7.5-Minute Topographic Quadrangle Map Series: Vulture Peak, Arizona, provisional editing 1990.

	photo revision date	Wickenburg, Arizona, 1964, photo inspected 1978.
2.2.2	Mapping for Hydrologic Study, Type/Source, Scale, Date	2-foot contour interval topographic mapping from the Flood Control District of Maricopa County, dated 7/7/2004 for study area within Maricopa County, USGS 10-ft raster data downloaded on 8/22/2013
2.2.3	Mapping for Hydraulic Study, Type/Source, Scale, Date, Subcontractor, Date of Aerial Mapping	2-foot contour interval topographic mapping from the Flood Control District of Maricopa County, dated 7/2004 and 1/2013
Section 2.3: Hydrology		
2.3.1	Model or Method Used (incl. vendor and version)	*HEC-1 Flood Hydrograph Package, Version 4.1*, U.S. Army Corps of Engineers, Hydrologic Engineering Center, June 1998
		Drainage Design Management System, Version 4.6.0, KVL Consultants, Inc., for Flood Control District of Maricopa County, 8/12/2010
2.3.2	Storm Duration	6-hour and 24-hour
2.3.3	Hydrograph Type	Flood Control District of Maricopa County 6-hour distribution for 6-hour modeling; SCS Type II distribution for 24-hour modeling
2.3.4	Frequencies Determined	10-year,6-hour and 24-hour, 50-year, 6-hour and 24-hour, 100-year, 6- and 24-hour and 500-year, 6-hour and 24-hour
2.3.5	List of Gages Used in Frequency Analysis or Calibration	Frequency analysis and calibration not completed for this study.
2.3.6	Rainfall Amounts and Reference	Isopluvials for Maricopa County, Arizona, from the Flood Control District of Maricopa County's *Drainage Design Manual for Maricopa County, Arizona, Volume I-Hydrology*, June 14, 2010 10-year, 6-hour Precipitation = 2.22 inches 10-year, 24-hour Precipitation = 3.02 inches 50-year, 6-hour Precipitation = 3.05 inches 50-year, 24-hour Precipitation = 4.12 inches 100-year, 6-hour Precipitation = 3.43 inches 100-year, 24-hour Precipitation = 4.62 inches 500-year, 6-hour precipitation = 4.33 inches 500-year, 24-hour precipitation = 5.80 inches
2.3.7	Unique Conditions and Problems	
2.3.8	Coordination of Discharges (agency, date, comments)	Peak flows generated as part of the study. Review and approval of peak flows to be completed by the Flood Control District of Maricopa County.
Section 2.4: Hydraulics		
2.4.1	Model or Method Used (incl. vendor and version)	*HEC-RAS River Analysis System, Version 4.1*, U.S. Army Corps of Engineers, Hydrologic Engineering Center, March 2008.
		HEC-GeoRAS, Version 4.2.93, U.S. Army Corps of Engineers, September 2009.
2.4.2	Regime	Subcritical
2.4.3	Frequencies for which Profiles Were Computed	10-year, 50-year, 100-year and 500-year
2.4.4	Method of Floodway Calculation	HEC-RAS Floodway Modeling Method 1
2.4.5	Unique Conditions and Problems	
Section 2.5: Additional Information		
Item		Description / Discussion

U.S. DEPARTMENT OF HOMELAND SECURITY
FEDERAL EMERGENCY MANAGEMENT AGENCY

OVERVIEW & CONCURRENCE FORM

O.M.B No. 1660-0016
Expires February 28, 2014

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 1 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 it displays a valid OMB control number. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Department of Homeland Security, Federal Emergency Management Agency, 1800 South Bell Street, Arlington, VA 20958-3005, Paperwork Reduction Project (1660-0016). 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.**

PRIVACY ACT STATEMENT

AUTHORITY: The National Flood Insurance Act of 1968, Public Law 90-448, as amended by the Flood Disaster Protection Act of 1973, Public Law 93-234.

PRINCIPAL PURPOSE(S): This information is being collected for the purpose of determining an applicant's eligibility to request changes to National Flood Insurance Program (NFIP) Flood Insurance Rate Maps (FIRM).

ROUTINE USE(S): The information on this form may be disclosed as generally permitted under 5 U.S.C § 552a(b) of the Privacy Act of 1974, as amended. This includes using this information as necessary and authorized by the routine uses published in DHS/FEMA/NFIP/LOMA-1 National Flood Insurance Program (NFIP); Letter of Map Amendment (LOMA) February 15, 2006, 71 FR 7990.

DISCLOSURE: The disclosure of information on this form is voluntary; however, failure to provide the information requested may delay or prevent FEMA from processing a determination regarding a requested change to a (NFIP) Flood Insurance Rate Maps (FIRM).

A. REQUESTED RESPONSE FROM DHS-FEMA

This request is for a (check one):

☐ CLOMR: A letter from DHS-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 DHS-FEMA officially revising the current NFIP map to show the changes to floodplains, regulatory floodway or flood elevations. (See 44 CFR Ch. 1, Parts 60, 65 & 72)

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
Example: 480301 480287	City of Katy Harris County	TX TX	48473C 48201C	0005D 0220G	02/08/83 09/28/90
040037	Maricopa County	AZ	04013C	0735L	10/16/13
	See attached sheet for additional affected Panels				

2. a. Flooding Source: See attached sheet for names of Flooding Sources.

   b. Types of Flooding: ☒ Riverine ☐ Coastal ☒ Shallow Flooding (e.g., Zones AO and AH)

   ☐ Alluvial fan ☐ Lakes ☐ Other (Attach Description)

3. Project Name/Identifier: WICKENBURG AREA DRAINAGE MASTER STUDY/PLANNING

4. FEMA zone designations affected: A, AE (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 ☐ Base Map Changes

   ☐ Coastal Analysis ☒ Hydraulic Analysis ☒ Hydrologic Analysis ☐ Corrections

   ☐ Weir-Dam Changes ☐ Levee Certification ☐ Alluvial Fan Analysis ☐ Natural Changes

   ☒ New Topographic Data ☐ 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 structures (check all that apply)

Structures: ☐ Channelization ☐ Levee/Floodwall ☒ Bridge/Culvert

☐ Dam ☐ Fill ☐ Other (Attach Description)

6. ☐ Documentation of ESA compliance is submitted (required to initiate CLOMR review). Please refer to the instructions for more information.

C. REVIEW FEE

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

☐ No, Attach Explanation

Please see the DHS-FEMA Web site at http://www.fema.gov/plan/prevent/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: KATHRYN GROSS, CFM	Company: FLOOD CONTROL DISTRICT, MARICOPA COUNTY	
Mailing Address: 2801 W. DURANGO STREET PHOENIX, AZ, 85006	Daytime Telephone No.: (602) 506-4837	Fax No.: (602) 506-4601
	E-Mail Address: kag@mail.maricopa.gov	
Signature of Requester (required):	Date: 3/3/2014	

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 requirements for when fill is 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. For Conditional LOMR requests, the applicant has documented Endangered Species Act (ESA) compliance to FEMA prior to FEMA's review of the Conditional LOMR application. For LOMR requests, I acknowledge that compliance with Sections 9 and 10 of the ESA has been achieved independently of FEMA's process. For actions authorized, funded, or being carried out by Federal or State agencies, documentation from the agency showing its compliance with Section 7(a)(2) of the ESA will be submitted. 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	Community Name: MARICOPA COUNTY	
Mailing Address: 2801 W. DURANGO STREET PHOENIX, AZ, 85006	Daytime Telephone No.: (602) 506-1501	Fax No.: (602) 506-4601
	E-Mail Address: tsp@mail.maricopa.gov	
Community Official's Signature (required):	Date: 4/2/14	

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 data, hydrologic and hydraulic analysis, and any other supporting information as per NFIP regulations paragraph 65.2(b) and as described in the MT-2 Forms Instructions. 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: PAUL W.R. HOSKIN, P.E.	License No.: AZ 19690	Expiration Date: 3/31/2015
Company Name: HOSKIN RYAN CONSULTANTS, INC	Telephone No.: (602) 252-8384	Fax No.: (602) 252-8385
Signature:	Date:	E-Mail Address: paulh@hoskinryan.com

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

Registered Professional Engineer (Civil)
CERTIFICATE NO.
19880
PAUL W. R. HOSKIN
Date Signed 1/27/14
ARIZONA U.S.A.
Seal (Optional)

Additional Information for MT2 Form 1:

Section B1 (Maricopa County):

Community No.	Community Name	State	Map No.	Panel No.	Effective Date
040037	Maricopa County	AZ	04013C	0755L	10/16/2013
040037	Maricopa County	AZ	04013C	0345L	10/16/2013
040037	Maricopa County	AZ	04013C	0340L	10/16/2013
040037	Maricopa County	AZ	04013C	0365L	10/16/2013
040037	Maricopa County	AZ	04013C	0335L	10/16/2013
040037	Maricopa County	AZ	04013C	0329L	10/16/2013

Section B2:

Flooding Sources: Wash O, Mockingbird Wash, Mockingbird Wash Tributary 1, Wash M, Wash L, Wash K, Wash K-1, Wash J, Wash I, Monarch Wash, Wash H, Wash G, Wash HT07, Wash F, Wash F Tributary 1, San Domingo Wash, Ox Wash, Little San Domingo Wash and Little San Domingo Wash Tributary 1.

U.S. DEPARTMENT OF HOMELAND SECURITY
FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 1660-0016
Expires February 28, 2014

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PRIVACY ACT STATEMENT

AUTHORITY: The National Flood Insurance Act of 1968, Public Law 90-448, as amended by the Flood Disaster Protection Act of 1973, Public Law 93-234.

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DISCLOSURE: The disclosure of information on this form is voluntary; however, failure to provide the information requested may delay or prevent FEMA from processing a determination regarding a requested change to a NFIP Flood Insurance Rate Maps (FIRM).

Flooding Source: Wash O

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 B) ☐ 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.)	Effective/FIS (cfs)	Revised (cfs)
At Hassayampa River	2.94	1,995	2412

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

☐ Statistical Analysis of Gage Records ☒ Precipitation/Runoff Model → Specify Model: HEC-1
☐ 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.

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

Is the hydrology for the revised flooding source(s) affected by sediment transport? ☐ Yes ☒ No

If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation..

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit*	Confluence with Hassayampa River	0.123	2005.6 (NAVD88)	2005.11 (NAVD88)
Upstream Limit*	Upstream XS of Wash	1.559	2191.0 (NAVD88)	2185.70 (NAVD88)

*Proposed/Revised elevations must tie-into the Effective elevations within 0.5 foot at the downstream and upstream limits of revision.

2. Hydraulic Method/Model Used: HEC-RAS VERSION 4.1

3. Pre-Submittal Review of Hydraulic Models*

DHS-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. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS.

4.

Models Submitted	**Natural Run** File Name:	Plan Name:	**Floodway Run** File Name:	Plan Name:	**Datum**
Duplicate Effective Model*					
Corrected Effective Model*					
Existing or Pre-Project Conditions Model					
Revised or Post-Project Conditions Model	O_MB_L.prj	O_MB_L.p03	O_MB_L.prj	O_MB_L.p03	NAVD88
Other - (attach description)					

* For details, refer to the corresponding section of the instructions.

☒ Digital Models Submitted? (Required)

C. MAPPING REQUIREMENTS

A **certified topographic work 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.).

☒ Digital Mapping (GIS/CADD) Data Submitted (preferred)

Topographic Information: 2' contour interval mapping (NAVD88)

Source: Flood Control District of Maricopa County   Date: July 7th, 2004

Accuracy: +/- 1' interval mapping

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**, at the same scale as the original, 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 on revision.

☒ Annotated FIRM and/or FBFM (Required)

D. COMMON REGULATORY REQUIREMENTS*

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

   a. 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 compared to pre-project conditions.
   - The proposed project encroaches upon a SFHA with or without BFEs established and would result in increases above 1.00 foot compared to pre-project conditions.

   b. Does this LOMR request cause increase in the BFE and/or SFHA compared with the effective BFEs and/or SFHA? ☒ Yes ☐ No
   If Yes, please attach **proof of property owner notification and acceptance (if available)**. Elements of and examples of property owner notifications can be found in the MT-2 Form 2 Instructions.

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 established. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For CLOMR requests, please submit documentation to FEMA and the community to show that you have complied with Sections 9 and 10 of the Endangered Species Act (ESA).

For actions authorized, funded, or being carried out by Federal or State agencies, please submit documentation from the agency showing its compliance with Section 7(a)(2) of the ESA. Please see the MT-2 instructions for more detail.

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FEDERAL EMERGENCY MANAGEMENT AGENCY

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DISCLOSURE: The disclosure of information on this form is voluntary; however, failure to provide the information requested may delay or prevent FEMA from processing a determination regarding a requested change to a NFIP Flood Insurance Rate Maps (FIRM).

Flooding Source: Mockingbird 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 B) ☐ 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.)	Effective/FIS (cfs)	Revised (cfs)
At Hassayampa River	6.5	3459	5482
At upstream of Trib 1	5.14	2167	4735

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

☐ Statistical Analysis of Gage Records ☒ Precipitation/Runoff Model → Specify Model: HEC-1
☐ 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.

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

Is the hydrology for the revised flooding source(s) affected by sediment transport? ☐ Yes ☒ No

If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation..

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit*	Confluence with Hassayampa River	0.236	1992.8 (NAVD88)	1987.81 (NAVD88)
Upstream Limit*	Upstream XS of Wash	2.280	2257.0 (NAVD88)	2257.11 (NAVD88)

*Proposed/Revised elevations must tie-into the Effective elevations within 0.5 foot at the downstream and upstream limits of revision.

2. Hydraulic Method/Model Used: HEC-RAS VERSION 4.1

3. Pre-Submittal Review of Hydraulic Models*

DHS-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. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS.

4.

Models Submitted	**Natural Run** File Name:	Plan Name:	**Floodway Run** File Name:	Plan Name:	**Datum**
Duplicate Effective Model*	File Name:	Plan Name:	File Name:	Plan Name:	
Corrected Effective Model*	File Name:	Plan Name:	File Name:	Plan Name:	
Existing or Pre-Project Conditions Model	File Name:	Plan Name:	File Name:	Plan Name:	
Revised or Post-Project Conditions Model	File Name: O_MB_L.prj	Plan Name: O_MB_L.p03	File Name: O_MB_L.prj	Plan Name: O_MB_L.p03	NAVD88
Other - (attach description)	File Name:	Plan Name:	File Name:	Plan Name:	

* For details, refer to the corresponding section of the instructions.

☒ Digital Models Submitted? (Required)

C. MAPPING REQUIREMENTS

A **certified topographic work 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.).

☒ Digital Mapping (GIS/CADD) Data Submitted (preferred)

Topographic Information: 2' contour interval mapping (NAVD88)

Source: Flood Control District of Maricopa County   Date: July 7th, 2004

Accuracy: +/- 1' interval mapping

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**, at the same scale as the original, 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 on revision.

☒ Annotated FIRM and/or FBFM (Required)

D. COMMON REGULATORY REQUIREMENTS*

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

   a. 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 compared to pre-project conditions.
   - The proposed project encroaches upon a SFHA with or without BFEs established and would result in increases above 1.00 foot compared to pre-project conditions.

   b. Does this LOMR request cause increase in the BFE and/or SFHA compared with the effective BFEs and/or SFHA? ☒ Yes ☐ No
   If Yes, please attach **proof of property owner notification and acceptance (if available)**. Elements of and examples of property owner notifications can be found in the MT-2 Form 2 Instructions.

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 established. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For CLOMR requests, please submit documentation to FEMA and the community to show that you have complied with Sections 9 and 10 of the Endangered Species Act (ESA).

For actions authorized, funded, or being carried out by Federal or State agencies, please submit documentation from the agency showing its compliance with Section 7(a)(2) of the ESA. Please see the MT-2 instructions for more detail.

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Flooding Source: Mockingbird Tributary 1 (formally Wash E2)

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 B) ☐ 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.)	Effective/FIS (cfs)	Revised (cfs)
At Mockingbird Wash	1.26	1,056	1492
0.385 miles upstream	0.92	711	1052

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

☐ Statistical Analysis of Gage Records ☒ Precipitation/Runoff Model → Specify Model: HEC-1
☐ 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.

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

Is the hydrology for the revised flooding source(s) affected by sediment transport? ☐ Yes ☒ No

If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation..

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit*	Confluence with Mockingbird Wash River	0.243	2064.3 (NAVD88)	2065.37 (NAVD88)
Upstream Limit*	Upstream XS of wash	0.385	2087.7 (NAVD88)	2083.37 (NAVD88)

*Proposed/Revised elevations must tie-into the Effective elevations within 0.5 foot at the downstream and upstream limits of revision.

2. Hydraulic Method/Model Used: HEC-RAS VERSION 4.1

3. Pre-Submittal Review of Hydraulic Models*

DHS-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. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS.

4.

Models Submitted	**Natural Run** File Name:	Plan Name:	**Floodway Run** File Name:	Plan Name:	**Datum**
Duplicate Effective Model*	File Name:	Plan Name:	File Name:	Plan Name:	
Corrected Effective Model*	File Name:	Plan Name:	File Name:	Plan Name:	
Existing or Pre-Project Conditions Model	File Name:	Plan Name:	File Name:	Plan Name:	
Revised or Post-Project Conditions Model	File Name: O_MB_L.prj	Plan Name: O_MB_L.p03	File Name: O_MB_L.prj	Plan Name: O_MB_L.p03	NAVD88
Other - (attach description)	File Name:	Plan Name:	File Name:	Plan Name:	

* For details, refer to the corresponding section of the instructions.

☒ Digital Models Submitted? (Required)

C. MAPPING REQUIREMENTS

A **certified topographic work 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.).

☒ Digital Mapping (GIS/CADD) Data Submitted (preferred)

Topographic Information: 2' contour interval mapping (NAVD88)

Source: Flood Control District of Maricopa County   Date: July 7th, 2004

Accuracy: +/- 1' interval mapping

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**, at the same scale as the original, 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 on revision.

☒ Annotated FIRM and/or FBFM (Required)

D. COMMON REGULATORY REQUIREMENTS*

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

   a. 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 compared to pre-project conditions.
   - The proposed project encroaches upon a SFHA with or without BFEs established and would result in increases above 1.00 foot compared to pre-project conditions.

   b. Does this LOMR request cause increase in the BFE and/or SFHA compared with the effective BFEs and/or SFHA? ☒ Yes ☐ No
   If Yes, please attach **proof of property owner notification and acceptance (if available)**. Elements of and examples of property owner notifications can be found in the MT-2 Form 2 Instructions.

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 established. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

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Flooding Source: Wash M

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 B) ☐ 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.)	Effective/FIS (cfs)	Revised (cfs)
At Downstream Limit/ US60	0.32	390	679

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

   ☐ Statistical Analysis of Gage Records ☒ Precipitation/Runoff Model → Specify Model: HEC-1
   ☐ 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.

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

   Is the hydrology for the revised flooding source(s) affected by sediment transport? ☐ Yes ☒ No

   If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation..

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit*	Confluence with Hassayampa River	0.255	N/A	1965.81 (NAVD88)
Upstream Limit*	Upstream XS of Wash	1.039	N/A	2067.02 (NAVD88)

*Proposed/Revised elevations must tie-into the Effective elevations within 0.5 foot at the downstream and upstream limits of revision.

2. Hydraulic Method/Model Used: HEC-RAS Version 4.1.0

3. Pre-Submittal Review of Hydraulic Models*

DHS-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. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS.

4.

Models Submitted	**Natural Run** File Name:	Plan Name:	**Floodway Run** File Name:	Plan Name:	**Datum**
Duplicate Effective Model*					
Corrected Effective Model*					
Existing or Pre-Project Conditions Model					
Revised or Post-Project Conditions Model	MON_M_J_H.prj	MON_M_J_H.p01	MON_M_J_H.prj	MON_M_J_H.p01	_NAVD88___
Other - (attach description)					

* For details, refer to the corresponding section of the instructions.

☒ Digital Models Submitted? (Required)

C. MAPPING REQUIREMENTS

A **certified topographic work 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.).

☒ Digital Mapping (GIS/CADD) Data Submitted (preferred)

Topographic Information: 2' contour interval mapping (NAVD88)

Source: Flood Control District of Maricopa County Date: July 7th, 2004

Accuracy: +/- 1' interval mapping

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**, at the same scale as the original, 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 on revision.

☒ Annotated FIRM and/or FBFM (Required)

D. COMMON REGULATORY REQUIREMENTS*

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

   a. 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 compared to pre-project conditions.
   - The proposed project encroaches upon a SFHA with or without BFEs established and would result in increases above 1.00 foot compared to pre-project conditions.

   b. Does this LOMR request cause increase in the BFE and/or SFHA compared with the effective BFEs and/or SFHA? ☒ Yes ☐ No
   If Yes, please attach **proof of property owner notification and acceptance (if available)**. Elements of and examples of property owner notifications can be found in the MT-2 Form 2 Instructions.

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 established. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For CLOMR requests, please submit documentation to FEMA and the community to show that you have complied with Sections 9 and 10 of the Endangered Species Act (ESA).

For actions authorized, funded, or being carried out by Federal or State agencies, please submit documentation from the agency showing its compliance with Section 7(a)(2) of the ESA. Please see the MT-2 instructions for more detail.

* Not inclusive of all applicable regulatory requirements. For details, see 44 CFR parts 60 and 65.

U.S. DEPARTMENT OF HOMELAND SECURITY
FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 1660-0016
Expires February 28, 2014

PAPERWORK BURDEN DISCLOSURE NOTICE

PRIVACY ACT STATEMENT

AUTHORITY: The National Flood Insurance Act of 1968, Public Law 90-448, as amended by the Flood Disaster Protection Act of 1973, Public Law 93-234.

PRINCIPAL PURPOSE(S): This information is being collected for the purpose of determining an applicant's eligibility to request changes to National Flood Insurance Program (NFIP) Flood Insurance Rate Maps (FIRM).

ROUTINE USE(S): The information on this form may be disclosed as generally permitted under 5 U.S.C § 552a(b) of the Privacy Act of 1974, as amended. This includes using this information as necessary and authorized by the routine uses published in DHS/FEMA/NFIP/LOMA-1 National Flood Insurance Program (NFIP); Letter of Map Amendment (LOMA) February 15, 2006, 71 FR 7990.

DISCLOSURE: The disclosure of information on this form is voluntary; however, failure to provide the information requested may delay or prevent FEMA from processing a determination regarding a requested change to a NFIP Flood Insurance Rate Maps (FIRM).

Flooding Source: Wash L

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 B) ☐ 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.)	Effective/FIS (cfs)	Revised (cfs)
At Hassayampa River	0.80	802	1072

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

☐ Statistical Analysis of Gage Records ☒ Precipitation/Runoff Model → Specify Model: HEC-1
☐ 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.

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

Is the hydrology for the revised flooding source(s) affected by sediment transport? ☐ Yes ☒ No

If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation..

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit*	Confluence with Hassayampa River	0.309	1958.9 (NAVD88)	1960.01 (NAVD88)
Upstream Limit*	Upstream XS of Wash	1.658	2154.4 (NAVD88)	2154.35 (NAVD88)

*Proposed/Revised elevations must tie-into the Effective elevations within 0.5 foot at the downstream and upstream limits of revision.

2. Hydraulic Method/Model Used: HEC-RAS VERSION 4.1

3. Pre-Submittal Review of Hydraulic Models*

DHS-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. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS.

4.

Models Submitted	**Natural Run**		**Floodway Run**		**Datum**
Duplicate Effective Model*	File Name:	Plan Name:	File Name:	Plan Name:	
Corrected Effective Model*	File Name:	Plan Name:	File Name:	Plan Name:	
Existing or Pre-Project Conditions Model	File Name:	Plan Name:	File Name:	Plan Name:	
Revised or Post-Project Conditions Model	File Name: O_MB_L.prj	Plan Name: O_MB_L.p03	File Name: O_MB_L.prj	Plan Name: O_MB_L.p03	NAVD88
Other - (attach description)	File Name:	Plan Name:	File Name:	Plan Name:	

* For details, refer to the corresponding section of the instructions.

☒ Digital Models Submitted? (Required)

C. MAPPING REQUIREMENTS

A **certified topographic work 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.).

☒ Digital Mapping (GIS/CADD) Data Submitted (preferred)

Topographic Information: 2' contour interval mapping (NAVD88)

Source: Flood Control District of Maricopa County Date: July 7th, 2004

Accuracy: +/- 1' interval mapping

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**, at the same scale as the original, 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 on revision.

☒ Annotated FIRM and/or FBFM (Required)

D. COMMON REGULATORY REQUIREMENTS*

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

   a. 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 compared to pre-project conditions.
   - The proposed project encroaches upon a SFHA with or without BFEs established and would result in increases above 1.00 foot compared to pre-project conditions.

   b. Does this LOMR request cause increase in the BFE and/or SFHA compared with the effective BFEs and/or SFHA? ☒ Yes ☐ No
   If Yes, please attach **proof of property owner notification and acceptance (if available)**. Elements of and examples of property owner notifications can be found in the MT-2 Form 2 Instructions.

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 established. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For CLOMR requests, please submit documentation to FEMA and the community to show that you have complied with Sections 9 and 10 of the Endangered Species Act (ESA).

For actions authorized, funded, or being carried out by Federal or State agencies, please submit documentation from the agency showing its compliance with Section 7(a)(2) of the ESA. Please see the MT-2 instructions for more detail.

* Not inclusive of all applicable regulatory requirements. For details, see 44 CFR parts 60 and 65.

U.S. DEPARTMENT OF HOMELAND SECURITY
FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 1660-0016
Expires February 28, 2014

PAPERWORK BURDEN DISCLOSURE NOTICE

PRIVACY ACT STATEMENT

AUTHORITY: The National Flood Insurance Act of 1968, Public Law 90-448, as amended by the Flood Disaster Protection Act of 1973, Public Law 93-234.

PRINCIPAL PURPOSE(S): This information is being collected for the purpose of determining an applicant's eligibility to request changes to National Flood Insurance Program (NFIP) Flood Insurance Rate Maps (FIRM).

ROUTINE USE(S): The information on this form may be disclosed as generally permitted under 5 U.S.C § 552a(b) of the Privacy Act of 1974, as amended. This includes using this information as necessary and authorized by the routine uses published in DHS/FEMA/NFIP/LOMA-1 National Flood Insurance Program (NFIP); Letter of Map Amendment (LOMA) February 15, 2006, 71 FR 7990.

DISCLOSURE: The disclosure of information on this form is voluntary; however, failure to provide the information requested may delay or prevent FEMA from processing a determination regarding a requested change to a NFIP Flood Insurance Rate Maps (FIRM).

Flooding Source: Wash K

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 B) ☐ 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.)	Effective/FIS (cfs)	Revised (cfs)
US of conf w/ Wash K-1	1.03	955	1432
At conf. with Hassayampa	3.08	2508	2988

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

☐ Statistical Analysis of Gage Records ☒ Precipitation/Runoff Model → Specify Model: HEC-1
☐ 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.

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

Is the hydrology for the revised flooding source(s) affected by sediment transport? ☐ Yes ☒ No

If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation..

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit*	Confluence of Hassayampa River	0.097	1951.5 (NAVD88)	1952.33 (NAVD88)
Upstream Limit*	Upstream XS of Wash	3.757	2396.8 (NAVD88)	2398.54 (NAVD88)

*Proposed/Revised elevations must tie-into the Effective elevations within 0.5 foot at the downstream and upstream limits of revision.

2. Hydraulic Method/Model Used**:** HEC-RAS 4.1.0

3. Pre-Submittal Review of Hydraulic Models*

DHS-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. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS.

4.

Models Submitted	**Natural Run** File Name:	Plan Name:	**Floodway Run** File Name:	Plan Name:	**Datum**
Duplicate Effective Model*	File Name:	Plan Name:	File Name:	Plan Name:	
Corrected Effective Model*	File Name:	Plan Name:	File Name:	Plan Name:	
Existing or Pre-Project Conditions Model	File Name:	Plan Name:	File Name:	Plan Name:	
Revised or Post-Project Conditions Model	File Name: I_K.prj	Plan Name: I_K.p01	File Name: I_K.prj	Plan Name: I_K.p01	NAVD88
Other - (attach description)	File Name:	Plan Name:	File Name:	Plan Name:	

* For details, refer to the corresponding section of the instructions.

☒ Digital Models Submitted? (Required)

C. MAPPING REQUIREMENTS

A **certified topographic work 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.).

☒ Digital Mapping (GIS/CADD) Data Submitted (preferred)

Topographic Information**:** GIS format.

Source**:** FCDMC Date**:** 7/7/04

Accuracy**:** 2ft. contours

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**, at the same scale as the original, 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 on revision.

☒ Annotated FIRM and/or FBFM (Required)

D. COMMON REGULATORY REQUIREMENTS*

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

   a. 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 compared to pre-project conditions.
   - The proposed project encroaches upon a SFHA with or without BFEs established and would result in increases above 1.00 foot compared to pre-project conditions.

   b. Does this LOMR request cause increase in the BFE and/or SFHA compared with the effective BFEs and/or SFHA? ☒ Yes ☐ No
   If Yes, please attach **proof of property owner notification and acceptance (if available)**. Elements of and examples of property owner notifications can be found in the MT-2 Form 2 Instructions.

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 established. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For CLOMR requests, please submit documentation to FEMA and the community to show that you have complied with Sections 9 and 10 of the Endangered Species Act (ESA).

For actions authorized, funded, or being carried out by Federal or State agencies, please submit documentation from the agency showing its compliance with Section 7(a)(2) of the ESA. Please see the MT-2 instructions for more detail.

* Not inclusive of all applicable regulatory requirements. For details, see 44 CFR parts 60 and 65.

U.S. DEPARTMENT OF HOMELAND SECURITY
FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 1660-0016
Expires February 28, 2014

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 3.5 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, 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, Department of Homeland Security, Federal Emergency Management Agency, 1800 South Bell Street, Arlington VA 20958-3005, Paperwork Reduction Project (1660-0016). 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.**

PRIVACY ACT STATEMENT

AUTHORITY: The National Flood Insurance Act of 1968, Public Law 90-448, as amended by the Flood Disaster Protection Act of 1973, Public Law 93-234.

PRINCIPAL PURPOSE(S): This information is being collected for the purpose of determining an applicant's eligibility to request changes to National Flood Insurance Program (NFIP) Flood Insurance Rate Maps (FIRM).

ROUTINE USE(S): The information on this form may be disclosed as generally permitted under 5 U.S.C § 552a(b) of the Privacy Act of 1974, as amended. This includes using this information as necessary and authorized by the routine uses published in DHS/FEMA/NFIP/LOMA-1 National Flood Insurance Program (NFIP); Letter of Map Amendment (LOMA) February 15, 2006, 71 FR 7990.

DISCLOSURE: The disclosure of information on this form is voluntary; however, failure to provide the information requested may delay or prevent FEMA from processing a determination regarding a requested change to a NFIP Flood Insurance Rate Maps (FIRM).

Flooding Source: Wash K-1 (Formally Wash K1)

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 B) ☐ 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.)	Effective/FIS (cfs)	Revised (cfs)
At Conf w/Wash K	0.78	848	1139

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

☐ Statistical Analysis of Gage Records ☒ Precipitation/Runoff Model → Specify Model: HEC-1
☐ 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.

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

Is the hydrology for the revised flooding source(s) affected by sediment transport? ☐ Yes ☒ No

If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation..

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit*	Confluence of Wash K	0.073	2305.2 (NAVD88)	2303.63 (NAVD88)
Upstream Limit*	Upstream XS of Wash	0.821	2398.2 (NAVD88)	2399.35 (NAVD88)

*Proposed/Revised elevations must tie-into the Effective elevations within 0.5 foot at the downstream and upstream limits of revision.

2. Hydraulic Method/Model Used: HEC-RAS 4.1

3. Pre-Submittal Review of Hydraulic Models*

DHS-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. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS.

4.

Models Submitted	**Natural Run** File Name:	Plan Name:	**Floodway Run** File Name:	Plan Name:	**Datum**
Duplicate Effective Model*					
Corrected Effective Model*					
Existing or Pre-Project Conditions Model					
Revised or Post-Project Conditions Model	I_K.prj	I_K.p01	I_K.prj	I_K.p01	NAVD88
Other - (attach description)					

* For details, refer to the corresponding section of the instructions.

☒ Digital Models Submitted? (Required)

C. MAPPING REQUIREMENTS

A **certified topographic work 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.).

☒ Digital Mapping (GIS/CADD) Data Submitted (preferred)

Topographic Information: GIS format.

Source: FCDMC   Date: 7/7/04

Accuracy: 2ft. contours

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**, at the same scale as the original, 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 on revision.

☒ Annotated FIRM and/or FBFM (Required)

D. COMMON REGULATORY REQUIREMENTS*

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

   a. 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 compared to pre-project conditions.
      - The proposed project encroaches upon a SFHA with or without BFEs established and would result in increases above 1.00 foot compared to pre-project conditions.

   b. Does this LOMR request cause increase in the BFE and/or SFHA compared with the effective BFEs and/or SFHA? ☒ Yes ☐ No
   If Yes, please attach **proof of property owner notification and acceptance (if available)**. Elements of and examples of property owner notifications can be found in the MT-2 Form 2 Instructions.

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 established. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For CLOMR requests, please submit documentation to FEMA and the community to show that you have complied with Sections 9 and 10 of the Endangered Species Act (ESA).

For actions authorized, funded, or being carried out by Federal or State agencies, please submit documentation from the agency showing its compliance with Section 7(a)(2) of the ESA. Please see the MT-2 instructions for more detail.

* Not inclusive of all applicable regulatory requirements. For details, see 44 CFR parts 60 and 65.

U.S. DEPARTMENT OF HOMELAND SECURITY
FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 1660-0016
Expires February 28, 2014

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 3.5 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, 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, Department of Homeland Security, Federal Emergency Management Agency, 1800 South Bell Street, Arlington VA 20958-3005, Paperwork Reduction Project (1660-0016). 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.**

PRIVACY ACT STATEMENT

AUTHORITY: The National Flood Insurance Act of 1968, Public Law 90-448, as amended by the Flood Disaster Protection Act of 1973, Public Law 93-234.

PRINCIPAL PURPOSE(S): This information is being collected for the purpose of determining an applicant's eligibility to request changes to National Flood Insurance Program (NFIP) Flood Insurance Rate Maps (FIRM).

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DISCLOSURE: The disclosure of information on this form is voluntary; however, failure to provide the information requested may delay or prevent FEMA from processing a determination regarding a requested change to a NFIP Flood Insurance Rate Maps (FIRM).

Flooding Source: Wash J

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 B) ☐ 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.)	Effective/FIS (cfs)	Revised (cfs)
At Downstream Limit/ US60	0.41	488	721

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

☐ Statistical Analysis of Gage Records ☒ Precipitation/Runoff Model → Specify Model: HEC-1
☐ 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.

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

Is the hydrology for the revised flooding source(s) affected by sediment transport? ☐ Yes ☒ No

If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation..

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit*	Confluence with Hassayampa River	0.11	N/A	1931.19 (NAVD88)
Upstream Limit*	Upstream XS of Wash	0.676	N/A	2032.88 (NAVD88)

*Proposed/Revised elevations must tie-into the Effective elevations within 0.5 foot at the downstream and upstream limits of revision.

2. Hydraulic Method/Model Used: HEC-RAS Version 4.1.0

3. Pre-Submittal Review of Hydraulic Models*

DHS-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. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS.

4.

Models Submitted	**Natural Run** File Name:	**Natural Run** Plan Name:	**Floodway Run** File Name:	**Floodway Run** Plan Name:	**Datum**
Duplicate Effective Model*					
Corrected Effective Model*					
Existing or Pre-Project Conditions Model					
Revised or Post-Project Conditions Model	MON_M_J_H.prj	MON_M_J_H.p01	MON_M_J_H.prj	MON_M_J_H.p01	NAVD88
Other - (attach description)					

* For details, refer to the corresponding section of the instructions.

☒ Digital Models Submitted? (Required)

C. MAPPING REQUIREMENTS

A **certified topographic work 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.).

☒ Digital Mapping (GIS/CADD) Data Submitted (preferred)

Topographic Information: 2' contour interval mapping (NAVD88)

Source: Flood Control District of Maricopa County   Date: July 7th, 2004

Accuracy: +/- 1' interval mapping

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**, at the same scale as the original, 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 on revision.

☒ Annotated FIRM and/or FBFM (Required)

D. COMMON REGULATORY REQUIREMENTS*

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

   a. 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 compared to pre-project conditions.
      - The proposed project encroaches upon a SFHA with or without BFEs established and would result in increases above 1.00 foot compared to pre-project conditions.

   b. Does this LOMR request cause increase in the BFE and/or SFHA compared with the effective BFEs and/or SFHA? ☒ Yes ☐ No
      If Yes, please attach **proof of property owner notification and acceptance (if available)**. Elements of and examples of property owner notifications can be found in the MT-2 Form 2 Instructions.

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 established. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For CLOMR requests, please submit documentation to FEMA and the community to show that you have complied with Sections 9 and 10 of the Endangered Species Act (ESA).

For actions authorized, funded, or being carried out by Federal or State agencies, please submit documentation from the agency showing its compliance with Section 7(a)(2) of the ESA. Please see the MT-2 instructions for more detail.

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U.S. DEPARTMENT OF HOMELAND SECURITY
FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 1660-0016
Expires February 28, 2014

PAPERWORK BURDEN DISCLOSURE NOTICE

PRIVACY ACT STATEMENT

AUTHORITY: The National Flood Insurance Act of 1968, Public Law 90-448, as amended by the Flood Disaster Protection Act of 1973, Public Law 93-234.

PRINCIPAL PURPOSE(S): This information is being collected for the purpose of determining an applicant's eligibility to request changes to National Flood Insurance Program (NFIP) Flood Insurance Rate Maps (FIRM).

ROUTINE USE(S): The information on this form may be disclosed as generally permitted under 5 U.S.C § 552a(b) of the Privacy Act of 1974, as amended. This includes using this information as necessary and authorized by the routine uses published in DHS/FEMA/NFIP/LOMA-1 National Flood Insurance Program (NFIP); Letter of Map Amendment (LOMA) February 15, 2006, 71 FR 7990.

DISCLOSURE: The disclosure of information on this form is voluntary; however, failure to provide the information requested may delay or prevent FEMA from processing a determination regarding a requested change to a NFIP Flood Insurance Rate Maps (FIRM).

Flooding Source: Wash I

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 B) ☐ 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.)	Effective/FIS (cfs)	Revised (cfs)
At Hassayampa River	2.31	1795	2139

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

☐ Statistical Analysis of Gage Records ☒ Precipitation/Runoff Model → Specify Model: HEC-1
☐ 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.

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

Is the hydrology for the revised flooding source(s) affected by sediment transport? ☐ Yes ☒ No

If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation..

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit*	Confluence of Hassayampa River	0.106	1929.8 (NAVD88)	1930.28 (NAVD88)
Upstream Limit*	Upstream XS of Wash	1.34	2072.5 (NAVD88)	2074.52 (NAVD88)

*Proposed/Revised elevations must tie-into the Effective elevations within 0.5 foot at the downstream and upstream limits of revision.

2. Hydraulic Method/Model Used: HEC-RAS 4.1.0

3. Pre-Submittal Review of Hydraulic Models*

DHS-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. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS.

4.

Models Submitted	Natural Run File Name	Natural Run Plan Name	Floodway Run File Name	Floodway Run Plan Name	Datum
Duplicate Effective Model*	File Name:	Plan Name:	File Name:	Plan Name:	
Corrected Effective Model*	File Name:	Plan Name:	File Name:	Plan Name:	
Existing or Pre-Project Conditions Model	File Name:	Plan Name:	File Name:	Plan Name:	
Revised or Post-Project Conditions Model	File Name: I_K.prj	Plan Name: I_K.p01	File Name: I_K.prj	Plan Name: I_K.p01	NAVD88
Other - (attach description)	File Name:	Plan Name:	File Name:	Plan Name:	

* For details, refer to the corresponding section of the instructions.

☒ Digital Models Submitted? (Required)

C. MAPPING REQUIREMENTS

A **certified topographic work 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.).

☒ Digital Mapping (GIS/CADD) Data Submitted (preferred)

Topographic Information: GIS format.

Source: FCDMC   Date: 7/7/04

Accuracy: 2ft. contours

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**, at the same scale as the original, 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 on revision.

☒ Annotated FIRM and/or FBFM (Required)

D. COMMON REGULATORY REQUIREMENTS*

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

   a. 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 compared to pre-project conditions.
   - The proposed project encroaches upon a SFHA with or without BFEs established and would result in increases above 1.00 foot compared to pre-project conditions.

   b. Does this LOMR request cause increase in the BFE and/or SFHA compared with the effective BFEs and/or SFHA? ☒ Yes ☐ No

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

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 established. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For CLOMR requests, please submit documentation to FEMA and the community to show that you have complied with Sections 9 and 10 of the Endangered Species Act (ESA).

For actions authorized, funded, or being carried out by Federal or State agencies, please submit documentation from the agency showing its compliance with Section 7(a)(2) of the ESA. Please see the MT-2 instructions for more detail.

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PRIVACY ACT STATEMENT

AUTHORITY: The National Flood Insurance Act of 1968, Public Law 90-448, as amended by the Flood Disaster Protection Act of 1973, Public Law 93-234.

PRINCIPAL PURPOSE(S): This information is being collected for the purpose of determining an applicant's eligibility to request changes to National Flood Insurance Program (NFIP) Flood Insurance Rate Maps (FIRM).

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DISCLOSURE: The disclosure of information on this form is voluntary; however, failure to provide the information requested may delay or prevent FEMA from processing a determination regarding a requested change to a NFIP Flood Insurance Rate Maps (FIRM).

Flooding Source: Monarch 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 B) ☐ 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.)	Effective/FIS (cfs)	Revised (cfs)
At Downstream Limit/ US60	10.65	3832	5357

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

☐ Statistical Analysis of Gage Records ☒ Precipitation/Runoff Model → Specify Model: HEC-1
☐ 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.

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

Is the hydrology for the revised flooding source(s) affected by sediment transport? ☐ Yes ☒ No

If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation..

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit*	Confluence with Hassayampa River	0.042	1912.27(NAVD88	1910.83 (NAVD88)
Upstream Limit*	Upstream XS of Wash	3.984	2370.2 (NAVD88)	2374.04 (NAVD88)

*Proposed/Revised elevations must tie-into the Effective elevations within 0.5 foot at the downstream and upstream limits of revision.

2. Hydraulic Method/Model Used: HEC-RAS Version 4.1.0

3. Pre-Submittal Review of Hydraulic Models*

DHS-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. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS.

4.

Models Submitted	**Natural Run** File Name:	Plan Name:	**Floodway Run** File Name:	Plan Name:	**Datum**
Duplicate Effective Model*	File Name:	Plan Name:	File Name:	Plan Name:	
Corrected Effective Model*	File Name:	Plan Name:	File Name:	Plan Name:	
Existing or Pre-Project Conditions Model	File Name:	Plan Name:	File Name:	Plan Name:	
Revised or Post-Project Conditions Model	File Name: MON_M_J_H.prj	Plan Name: MON_M_J_H.p01	File Name: MON_M_J_H.prj	Plan Name: MON_M_J_H.p01	_NAVD88___
Other - (attach description)	File Name:	Plan Name:	File Name:	Plan Name:	

* For details, refer to the corresponding section of the instructions.

☒ Digital Models Submitted? (Required)

C. MAPPING REQUIREMENTS

A **certified topographic work 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.).

☒ Digital Mapping (GIS/CADD) Data Submitted (preferred)

Topographic Information: 2' contour interval mapping (NAVD88)

Source: Flood Control District of Maricopa County Date: July 7th, 2004

Accuracy: +/- 1' interval mapping

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**, at the same scale as the original, 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 on revision.

☒ Annotated FIRM and/or FBFM (Required)

D. COMMON REGULATORY REQUIREMENTS*

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

   a. 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 compared to pre-project conditions.
      - The proposed project encroaches upon a SFHA with or without BFEs established and would result in increases above 1.00 foot compared to pre-project conditions.

   b. Does this LOMR request cause increase in the BFE and/or SFHA compared with the effective BFEs and/or SFHA? ☒ Yes ☐ No
   If Yes, please attach **proof of property owner notification and acceptance (if available)**. Elements of and examples of property owner notifications can be found in the MT-2 Form 2 Instructions.

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 established. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For CLOMR requests, please submit documentation to FEMA and the community to show that you have complied with Sections 9 and 10 of the Endangered Species Act (ESA).

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AUTHORITY: The National Flood Insurance Act of 1968, Public Law 90-448, as amended by the Flood Disaster Protection Act of 1973, Public Law 93-234.

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DISCLOSURE: The disclosure of information on this form is voluntary; however, failure to provide the information requested may delay or prevent FEMA from processing a determination regarding a requested change to a NFIP Flood Insurance Rate Maps (FIRM).

Flooding Source: Wash H

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 B) ☐ 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.)	Effective/FIS (cfs)	Revised (cfs)
At Downstream Limit/ US60	1.76	1631	1480

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

☐ Statistical Analysis of Gage Records ☒ Precipitation/Runoff Model → Specify Model: HEC-1
☐ 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.

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

Is the hydrology for the revised flooding source(s) affected by sediment transport? ☐ Yes ☒ No

If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation..

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit*	Confluence with Hassayampa River	0.117	1893.7 (NAVD88)	1891.78 (NAVD88)
Upstream Limit*	Upstream XS of Wash	1.915	2054.2 (NAVD88)	2054.42 (NAVD88)

*Proposed/Revised elevations must tie-into the Effective elevations within 0.5 foot at the downstream and upstream limits of revision.

2. Hydraulic Method/Model Used: HEC-RAS Version 4.1.0

3. Pre-Submittal Review of Hydraulic Models*

DHS-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. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS.

4.

Models Submitted	Natural Run File Name	Natural Run Plan Name	Floodway Run File Name	Floodway Run Plan Name	Datum
Duplicate Effective Model*	File Name:	Plan Name:	File Name:	Plan Name:	
Corrected Effective Model*	File Name:	Plan Name:	File Name:	Plan Name:	
Existing or Pre-Project Conditions Model	File Name:	Plan Name:	File Name:	Plan Name:	
Revised or Post-Project Conditions Model	File Name: MON_M_J_H.prj	Plan Name: MON_M_J_H.p01	File Name: MON_M_J_H.prj	Plan Name: MON_M_J_H.p01	NAVD88
Other - (attach description)	File Name:	Plan Name:	File Name:	Plan Name:	

* For details, refer to the corresponding section of the instructions.

☒ Digital Models Submitted? (Required)

C. MAPPING REQUIREMENTS

A **certified topographic work 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.).

☒ Digital Mapping (GIS/CADD) Data Submitted (preferred)

Topographic Information: 2' contour interval mapping (NAVD88)

Source: Flood Control District of Maricopa County Date: July 7th, 2004

Accuracy: +/- 1' interval mapping

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**, at the same scale as the original, 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 on revision.

☒ Annotated FIRM and/or FBFM (Required)

D. COMMON REGULATORY REQUIREMENTS*

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

   a. 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 compared to pre-project conditions.
   - The proposed project encroaches upon a SFHA with or without BFEs established and would result in increases above 1.00 foot compared to pre-project conditions.

   b. Does this LOMR request cause increase in the BFE and/or SFHA compared with the effective BFEs and/or SFHA? ☒ Yes ☐ No
   If Yes, please attach **proof of property owner notification and acceptance (if available)**. Elements of and examples of property owner notifications can be found in the MT-2 Form 2 Instructions.

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 established. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For CLOMR requests, please submit documentation to FEMA and the community to show that you have complied with Sections 9 and 10 of the Endangered Species Act (ESA).

For actions authorized, funded, or being carried out by Federal or State agencies, please submit documentation from the agency showing its compliance with Section 7(a)(2) of the ESA. Please see the MT-2 instructions for more detail.

* Not inclusive of all applicable regulatory requirements. For details, see 44 CFR parts 60 and 65.

U.S. DEPARTMENT OF HOMELAND SECURITY
FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 1660-0016
Expires February 28, 2014

PAPERWORK BURDEN DISCLOSURE NOTICE

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PRIVACY ACT STATEMENT

AUTHORITY: The National Flood Insurance Act of 1968, Public Law 90-448, as amended by the Flood Disaster Protection Act of 1973, Public Law 93-234.

PRINCIPAL PURPOSE(S): This information is being collected for the purpose of determining an applicant's eligibility to request changes to National Flood Insurance Program (NFIP) Flood Insurance Rate Maps (FIRM).

ROUTINE USE(S): The information on this form may be disclosed as generally permitted under 5 U.S.C § 552a(b) of the Privacy Act of 1974, as amended. This includes using this information as necessary and authorized by the routine uses published in DHS/FEMA/NFIP/LOMA-1 National Flood Insurance Program (NFIP); Letter of Map Amendment (LOMA) February 15, 2006, 71 FR 7990.

DISCLOSURE: The disclosure of information on this form is voluntary; however, failure to provide the information requested may delay or prevent FEMA from processing a determination regarding a requested change to a NFIP Flood Insurance Rate Maps (FIRM).

Flooding Source: Wash G

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 B) ☐ 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.)	Effective/FIS (cfs)	Revised (cfs)
At Downstream Limit/ US60	0.41	528	620

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

☐ Statistical Analysis of Gage Records ☒ Precipitation/Runoff Model → Specify Model: HEC-1
☐ 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.

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

Is the hydrology for the revised flooding source(s) affected by sediment transport? ☐ Yes ☒ No

If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation..

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit*	Confluence with Hassayampa River	0.151	1885.0 (NAVD88)	1881.25 (NAVD88)
Upstream Limit*	Upstream XS of Wash	1.233	2024.1 (NAVD88)	2023.57 (NAVD88)

*Proposed/Revised elevations must tie-into the Effective elevations within 0.5 foot at the downstream and upstream limits of revision.

2. Hydraulic Method/Model Used: HEC-RAS Version 4.1.0

3. Pre-Submittal Review of Hydraulic Models*

DHS-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. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS.

4.

Models Submitted	**Natural Run** File Name:	Plan Name:	**Floodway Run** File Name:	Plan Name:	**Datum**
Duplicate Effective Model*					
Corrected Effective Model*					
Existing or Pre-Project Conditions Model					
Revised or Post-Project Conditions Model	G_HT_F_SD.prj	G_HT_F_SD.p03	G_HT_F_SD.prj	G_HT_F_SD.p03	NAVD88
Other - (attach description)					

* For details, refer to the corresponding section of the instructions.

☒ Digital Models Submitted? (Required)

C. MAPPING REQUIREMENTS

A **certified topographic work 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.).

☒ Digital Mapping (GIS/CADD) Data Submitted (preferred)

Topographic Information: 2' contour interval mapping (NAVD88)

Source: Flood Control District of Maricopa County Date: July 7th, 2004

Accuracy: +/- 1' interval mapping

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**, at the same scale as the original, 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 on revision.

☒ Annotated FIRM and/or FBFM (Required)

D. COMMON REGULATORY REQUIREMENTS*

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

   a. 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 compared to pre-project conditions.
   - The proposed project encroaches upon a SFHA with or without BFEs established and would result in increases above 1.00 foot compared to pre-project conditions.

   b. Does this LOMR request cause increase in the BFE and/or SFHA compared with the effective BFEs and/or SFHA? ☒ Yes ☐ No
   If Yes, please attach **proof of property owner notification and acceptance (if available)**. Elements of and examples of property owner notifications can be found in the MT-2 Form 2 Instructions.

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 established. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For CLOMR requests, please submit documentation to FEMA and the community to show that you have complied with Sections 9 and 10 of the Endangered Species Act (ESA).

For actions authorized, funded, or being carried out by Federal or State agencies, please submit documentation from the agency showing its compliance with Section 7(a)(2) of the ESA. Please see the MT-2 instructions for more detail.

* Not inclusive of all applicable regulatory requirements. For details, see 44 CFR parts 60 and 65.

U.S. DEPARTMENT OF HOMELAND SECURITY
FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 1660-0016
Expires February 28, 2014

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PRIVACY ACT STATEMENT

AUTHORITY: The National Flood Insurance Act of 1968, Public Law 90-448, as amended by the Flood Disaster Protection Act of 1973, Public Law 93-234.

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DISCLOSURE: The disclosure of information on this form is voluntary; however, failure to provide the information requested may delay or prevent FEMA from processing a determination regarding a requested change to a NFIP Flood Insurance Rate Maps (FIRM).

Flooding Source: Wash HT07

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 B) ☒ 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.)	Effective/FIS (cfs)	Revised (cfs)
At Downstream Limit/ US60	0.89	N/A	1063

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

☐ Statistical Analysis of Gage Records ☒ Precipitation/Runoff Model → Specify Model: HEC-1
☐ 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.

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

Is the hydrology for the revised flooding source(s) affected by sediment transport? ☐ Yes ☒ No

If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation..

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit*	Confluence with Hassayampa River	0.058	N/A	1867.30 (NAVD88)
Upstream Limit*	Upstream XS of Wash	1.499	N/A	2072.69 (NAVD88)

*Proposed/Revised elevations must tie-into the Effective elevations within 0.5 foot at the downstream and upstream limits of revision.

2. Hydraulic Method/Model Used: HEC-RAS Version 4.1.0

3. Pre-Submittal Review of Hydraulic Models*

DHS-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. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS.

4.

Models Submitted	Natural Run		Floodway Run		Datum
Duplicate Effective Model*	File Name:	Plan Name:	File Name:	Plan Name:	
Corrected Effective Model*	File Name:	Plan Name:	File Name:	Plan Name:	
Existing or Pre-Project Conditions Model	File Name:	Plan Name:	File Name:	Plan Name:	
Revised or Post-Project Conditions Model	File Name: G_HT_F_SD_OX.prj	Plan Name: G_HT_F_SD_OX.p01	File Name: N/A	Plan Name: N/A	_NAVD88___
Other - (attach description)	File Name:	Plan Name:	File Name:	Plan Name:	

* For details, refer to the corresponding section of the instructions.

☒ Digital Models Submitted? (Required)

C. MAPPING REQUIREMENTS

A **certified topographic work 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.).

☒ Digital Mapping (GIS/CADD) Data Submitted (preferred)

Topographic Information: 2' contour interval mapping (NAVD88)

Source: Flood Control District of Maricopa County   Date: July 7th, 2004

Accuracy: +/- 1' interval mapping

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**, at the same scale as the original, 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 on revision.

☒ Annotated FIRM and/or FBFM (Required)

D. COMMON REGULATORY REQUIREMENTS*

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

   a. 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 compared to pre-project conditions.
      - The proposed project encroaches upon a SFHA with or without BFEs established and would result in increases above 1.00 foot compared to pre-project conditions.

   b. Does this LOMR request cause increase in the BFE and/or SFHA compared with the effective BFEs and/or SFHA? ☒ Yes ☐ No

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

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 established. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

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U.S. DEPARTMENT OF HOMELAND SECURITY
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DISCLOSURE: The disclosure of information on this form is voluntary; however, failure to provide the information requested may delay or prevent FEMA from processing a determination regarding a requested change to a NFIP Flood Insurance Rate Maps (FIRM).

Flooding Source: Wash F

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 B) ☐ 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.)	Effective/FIS (cfs)	Revised (cfs)
At Downstream Limit/ US60	0.26	350	577

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

☐ Statistical Analysis of Gage Records ☒ Precipitation/Runoff Model → Specify Model: HEC-1
☐ 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.

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

Is the hydrology for the revised flooding source(s) affected by sediment transport? ☐ Yes ☒ No

If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation..

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit*	Confluence with Hassayampa River	0.065	1868.5 (NAVD88)	1864.29 (NAVD88)
Upstream Limit*	Upstream XS of Wash	1.094	2030.2 (NAVD88)	2030.14 (NAVD88)

*Proposed/Revised elevations must tie-into the Effective elevations within 0.5 foot at the downstream and upstream limits of revision.

2. Hydraulic Method/Model Used: HEC-RAS Version 4.1.0

3. Pre-Submittal Review of Hydraulic Models*

DHS-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. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS.

4.

Models Submitted	**Natural Run**		**Floodway Run**		**Datum**
Duplicate Effective Model*	File Name:	Plan Name:	File Name:	Plan Name:	
Corrected Effective Model*	File Name:	Plan Name:	File Name:	Plan Name:	
Existing or Pre-Project Conditions Model	File Name:	Plan Name:	File Name:	Plan Name:	
Revised or Post-Project Conditions Model	File Name: G_HT_F_SD_OX.prj	Plan Name: G_HT_F_SD_OX.p01	File Name: G_HT_F_SD_OX.prj	Plan Name: G_HT_F_SD_OX.p01	_NAVD88___
Other - (attach description)	File Name:	Plan Name:	File Name:	Plan Name:	

* For details, refer to the corresponding section of the instructions.

☒ Digital Models Submitted? (Required)

C. MAPPING REQUIREMENTS

A **certified topographic work 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.).

☒ Digital Mapping (GIS/CADD) Data Submitted (preferred)

Topographic Information: 2' contour interval mapping (NAVD88)

Source: Flood Control District of Maricopa County Date: July 7th, 2004

Accuracy: +/- 1' interval mapping

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**, at the same scale as the original, 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 on revision.

☒ Annotated FIRM and/or FBFM (Required)

D. COMMON REGULATORY REQUIREMENTS*

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

   a. 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 compared to pre-project conditions.
   - The proposed project encroaches upon a SFHA with or without BFEs established and would result in increases above 1.00 foot compared to pre-project conditions.

   b. Does this LOMR request cause increase in the BFE and/or SFHA compared with the effective BFEs and/or SFHA? ☒ Yes ☐ No
   If Yes, please attach **proof of property owner notification and acceptance (if available)**. Elements of and examples of property owner notifications can be found in the MT-2 Form 2 Instructions.

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 established. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For CLOMR requests, please submit documentation to FEMA and the community to show that you have complied with Sections 9 and 10 of the Endangered Species Act (ESA).

For actions authorized, funded, or being carried out by Federal or State agencies, please submit documentation from the agency showing its compliance with Section 7(a)(2) of the ESA. Please see the MT-2 instructions for more detail.

* Not inclusive of all applicable regulatory requirements. For details, see 44 CFR parts 60 and 65.

U.S. DEPARTMENT OF HOMELAND SECURITY
FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 1660-0016
Expires February 28, 2014

PAPERWORK BURDEN DISCLOSURE NOTICE

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PRIVACY ACT STATEMENT

AUTHORITY: The National Flood Insurance Act of 1968, Public Law 90-448, as amended by the Flood Disaster Protection Act of 1973, Public Law 93-234.

PRINCIPAL PURPOSE(S): This information is being collected for the purpose of determining an applicant's eligibility to request changes to National Flood Insurance Program (NFIP) Flood Insurance Rate Maps (FIRM).

ROUTINE USE(S): The information on this form may be disclosed as generally permitted under 5 U.S.C § 552a(b) of the Privacy Act of 1974, as amended. This includes using this information as necessary and authorized by the routine uses published in DHS/FEMA/NFIP/LOMA-1 National Flood Insurance Program (NFIP); Letter of Map Amendment (LOMA) February 15, 2006, 71 FR 7990.

DISCLOSURE: The disclosure of information on this form is voluntary; however, failure to provide the information requested may delay or prevent FEMA from processing a determination regarding a requested change to a NFIP Flood Insurance Rate Maps (FIRM).

Flooding Source: Wash F Tributary 1 (formally Wash F2)

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 B)
☐ 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.)	Effective/FIS (cfs)	Revised (cfs)
At Downstream Limit/ US60	0.10	170	218

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

☐ Statistical Analysis of Gage Records
☒ Precipitation/Runoff Model → Specify Model: HEC-1
☐ 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.

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

Is the hydrology for the revised flooding source(s) affected by sediment transport? ☐ Yes ☒ No

If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation..

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit*	Confluence with Wash F	0.047	1876.1(NAVD88)	1879.54 (NAVD88)
Upstream Limit*	Upstream XS of Wash	0.406	1954.9 (NAVD88)	1954.45 (NAVD88)

*Proposed/Revised elevations must tie-into the Effective elevations within 0.5 foot at the downstream and upstream limits of revision.

2. Hydraulic Method/Model Used: HEC-RAS Version 4.1.0

3. Pre-Submittal Review of Hydraulic Models*

DHS-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. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS.

4.

Models Submitted	**Natural Run**		**Floodway Run**		**Datum**
	File Name	Plan Name	File Name	Plan Name	
Duplicate Effective Model*	File Name:	Plan Name:	File Name:	Plan Name:	
Corrected Effective Model*	File Name:	Plan Name:	File Name:	Plan Name:	
Existing or Pre-Project Conditions Model	File Name:	Plan Name:	File Name:	Plan Name:	
Revised or Post-Project Conditions Model	File Name: G_HT_F_SD_OX.prj	Plan Name: G_HT_F_SD_OX.p01	File Name: G_HT_F_SD_OX.prj	Plan Name: G_HT_F_SD_OX.p01	_NAVD88___
Other - (attach description)	File Name:	Plan Name:	File Name:	Plan Name:	

* For details, refer to the corresponding section of the instructions.

☒ Digital Models Submitted? (Required)

C. MAPPING REQUIREMENTS

A **certified topographic work 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.).

☒ Digital Mapping (GIS/CADD) Data Submitted (preferred)

Topographic Information: 2' contour interval mapping (NAVD88)

Source: Flood Control District of Maricopa County   Date: July 7th, 2004

Accuracy: +/- 1' interval mapping

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**, at the same scale as the original, 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 on revision.

☒ Annotated FIRM and/or FBFM (Required)

D. COMMON REGULATORY REQUIREMENTS*

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

   a. 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 compared to pre-project conditions.
   - The proposed project encroaches upon a SFHA with or without BFEs established and would result in increases above 1.00 foot compared to pre-project conditions.

   b. Does this LOMR request cause increase in the BFE and/or SFHA compared with the effective BFEs and/or SFHA? ☒ Yes ☐ No
   If Yes, please attach **proof of property owner notification and acceptance (if available)**. Elements of and examples of property owner notifications can be found in the MT-2 Form 2 Instructions.

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 established. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For CLOMR requests, please submit documentation to FEMA and the community to show that you have complied with Sections 9 and 10 of the Endangered Species Act (ESA).

For actions authorized, funded, or being carried out by Federal or State agencies, please submit documentation from the agency showing its compliance with Section 7(a)(2) of the ESA. Please see the MT-2 instructions for more detail.

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PRIVACY ACT STATEMENT

AUTHORITY: The National Flood Insurance Act of 1968, Public Law 90-448, as amended by the Flood Disaster Protection Act of 1973, Public Law 93-234.

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DISCLOSURE: The disclosure of information on this form is voluntary; however, failure to provide the information requested may delay or prevent FEMA from processing a determination regarding a requested change to a NFIP Flood Insurance Rate Maps (FIRM).

Flooding Source: San Domingo 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 B) ☐ 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.)	Effective/FIS (cfs)	Revised (cfs)
At Downstream Limit/ US60	20.49	12,760	12,949

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

☐ Statistical Analysis of Gage Records ☒ Precipitation/Runoff Model → Specify Model: HEC-1
☐ 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.

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

Is the hydrology for the revised flooding source(s) affected by sediment transport? ☐ Yes ☒ No

If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation..

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit*	Confluence withHassayampa River	0.042	1866.5 (NAVD88)	1860.91 (NAVD88)
Upstream Limit*	Upstream XS of Wash	2.328	2024.0 (NAVD88)	2024.81 (NAVD88)

*Proposed/Revised elevations must tie-into the Effective elevations within 0.5 foot at the downstream and upstream limits of revision.

2. Hydraulic Method/Model Used: HEC-RAS Version 4.1.0

3. Pre-Submittal Review of Hydraulic Models*

DHS-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. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS.

4.

Models Submitted	**Natural Run** File Name:	Plan Name:	**Floodway Run** File Name:	Plan Name:	**Datum**
Duplicate Effective Model*	File Name:	Plan Name:	File Name:	Plan Name:	
Corrected Effective Model*	File Name:	Plan Name:	File Name:	Plan Name:	
Existing or Pre-Project Conditions Model	File Name:	Plan Name:	File Name:	Plan Name:	
Revised or Post-Project Conditions Model	File Name: G_HT_F_SD_OX.prj	Plan Name: G_HT_F_SD_OX.p01	File Name: G_HT_F_SD_OX.prj	Plan Name: G_HT_F_SD_OX.p01	NAVD88
Other - (attach description)	File Name:	Plan Name:	File Name:	Plan Name:	

* For details, refer to the corresponding section of the instructions.

☒ Digital Models Submitted? (Required)

C. MAPPING REQUIREMENTS

A **certified topographic work 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.).

☒ Digital Mapping (GIS/CADD) Data Submitted (preferred)

Topographic Information: 2' contour interval mapping (NAVD88)

Source: Flood Control District of Maricopa County   Date: July 7th, 2004

Accuracy: +/- 1' interval mapping

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**, at the same scale as the original, 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 on revision.

☒ Annotated FIRM and/or FBFM (Required)

D. COMMON REGULATORY REQUIREMENTS*

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

   a. 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 compared to pre-project conditions.
   - The proposed project encroaches upon a SFHA with or without BFEs established and would result in increases above 1.00 foot compared to pre-project conditions.

   b. Does this LOMR request cause increase in the BFE and/or SFHA compared with the effective BFEs and/or SFHA? ☒ Yes ☐ No
   If Yes, please attach **proof of property owner notification and acceptance (if available)**. Elements of and examples of property owner notifications can be found in the MT-2 Form 2 Instructions.

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 established. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For CLOMR requests, please submit documentation to FEMA and the community to show that you have complied with Sections 9 and 10 of the Endangered Species Act (ESA).

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DISCLOSURE: The disclosure of information on this form is voluntary; however, failure to provide the information requested may delay or prevent FEMA from processing a determination regarding a requested change to a NFIP Flood Insurance Rate Maps (FIRM).

Flooding Source: Ox 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 B) ☐ 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.)	Effective/FIS (cfs)	Revised (cfs)
At Downstream Limit/ US60	8.47	4,447	5,734

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

☐ Statistical Analysis of Gage Records ☒ Precipitation/Runoff Model → Specify Model: HEC-1
☐ 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.

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

Is the hydrology for the revised flooding source(s) affected by sediment transport? ☐ Yes ☒ No

If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation..

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit*	Confluence withHassayampa River	0.248	1834.8 (NAVD88)	1836.18 (NAVD88)
Upstream Limit*	Upstream XS of Wash	2.186	1985.4 (NAVD88)	1985.26 (NAVD88)

*Proposed/Revised elevations must tie-into the Effective elevations within 0.5 foot at the downstream and upstream limits of revision.

2. Hydraulic Method/Model Used: HEC-RAS Version 4.1.0

3. Pre-Submittal Review of Hydraulic Models*

DHS-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. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS.

4.

Models Submitted	**Natural Run** File Name:	Plan Name:	**Floodway Run** File Name:	Plan Name:	**Datum**
Duplicate Effective Model*	File Name:	Plan Name:	File Name:	Plan Name:	
Corrected Effective Model*	File Name:	Plan Name:	File Name:	Plan Name:	
Existing or Pre-Project Conditions Model	File Name:	Plan Name:	File Name:	Plan Name:	
Revised or Post-Project Conditions Model	File Name: G_HT_F_SD_OX.prj	Plan Name: G_HT_F_SD_OX.p01	File Name: G_HT_F_SD_OX.prj	Plan Name: G_HT_F_SD_OX.p01	NAVD88
Other - (attach description)	File Name:	Plan Name:	File Name:	Plan Name:	

* For details, refer to the corresponding section of the instructions.

☒ Digital Models Submitted? (Required)

C. MAPPING REQUIREMENTS

A **certified topographic work 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.).

☒ Digital Mapping (GIS/CADD) Data Submitted (preferred)

Topographic Information: 2' contour interval mapping (NAVD88)

Source: Flood Control District of Maricopa County   Date: July 7th, 2004

Accuracy: +/- 1' interval mapping

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**, at the same scale as the original, 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 on revision.

☒ Annotated FIRM and/or FBFM (Required)

D. COMMON REGULATORY REQUIREMENTS*

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

   a. For CLOMR requests, if either of the following is true, please submit **evidence of compliance with Section 65.12 of the NFIP regulations**:

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      - The proposed project encroaches upon a SFHA with or without BFEs established and would result in increases above 1.00 foot compared to pre-project conditions.

   b. Does this LOMR request cause increase in the BFE and/or SFHA compared with the effective BFEs and/or SFHA? ☒ Yes ☐ No
   If Yes, please attach **proof of property owner notification and acceptance (if available)**. Elements of and examples of property owner notifications can be found in the MT-2 Form 2 Instructions.

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

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Flooding Source: Little San Domingo 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 B) ☐ 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.)	Effective/FIS (cfs)	Revised (cfs)
At Downstream Limit/ US60	8.76	3,403	4,456

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

☐ Statistical Analysis of Gage Records ☒ Precipitation/Runoff Model → Specify Model: HEC-1
☐ 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.

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

Is the hydrology for the revised flooding source(s) affected by sediment transport? ☐ Yes ☒ No

If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation..

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit*	Confluence withHassayampa River	0.145	1788.1 (NAVD88)	1790.75 (NAVD88)
Upstream Limit*	Upstream XS of Wash	4.599	N/A	2105.57 (NAVD88)

*Proposed/Revised elevations must tie-into the Effective elevations within 0.5 foot at the downstream and upstream limits of revision.

2. Hydraulic Method/Model Used: HEC-RAS Version 4.1.0

3. Pre-Submittal Review of Hydraulic Models*

DHS-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. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS.

4.

Models Submitted	**Natural Run** File Name:	Plan Name:	**Floodway Run** File Name:	Plan Name:	**Datum**
Duplicate Effective Model*					
Corrected Effective Model*					
Existing or Pre-Project Conditions Model					
Revised or Post-Project Conditions Model	LSD.prj	LSD.p01	LSD.prj	LSD.p01	_NAVD88___
Other - (attach description)	LSD_Optimized.prj	LSD_Optimized.prj	N/A	N/A	_NAVD88

* For details, refer to the corresponding section of the instructions.

☒ Digital Models Submitted? (Required)

C. MAPPING REQUIREMENTS

A **certified topographic work 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.).

☒ Digital Mapping (GIS/CADD) Data Submitted (preferred)

Topographic Information: 2' contour interval mapping (NAVD88)

Source: Flood Control District of Maricopa County Date: July 7, 2004 & January 29, 2013

Accuracy: +/- 1' interval mapping

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**, at the same scale as the original, 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 on revision.

☒ Annotated FIRM and/or FBFM (Required)

D. COMMON REGULATORY REQUIREMENTS*

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

   a. 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 compared to pre-project conditions.
      - The proposed project encroaches upon a SFHA with or without BFEs established and would result in increases above 1.00 foot compared to pre-project conditions.

   b. Does this LOMR request cause increase in the BFE and/or SFHA compared with the effective BFEs and/or SFHA? ☒ Yes ☐ No

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

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 established. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For CLOMR requests, please submit documentation to FEMA and the community to show that you have complied with Sections 9 and 10 of the Endangered Species Act (ESA).

For actions authorized, funded, or being carried out by Federal or State agencies, please submit documentation from the agency showing its compliance with Section 7(a)(2) of the ESA. Please see the MT-2 instructions for more detail.

* Not inclusive of all applicable regulatory requirements. For details, see 44 CFR parts 60 and 65.

U.S. DEPARTMENT OF HOMELAND SECURITY
FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 1660-0016
Expires February 28, 2014

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 3.5 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, 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, Department of Homeland Security, Federal Emergency Management Agency, 1800 South Bell Street, Arlington VA 20958-3005, Paperwork Reduction Project (1660-0016). 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.**

PRIVACY ACT STATEMENT

AUTHORITY: The National Flood Insurance Act of 1968, Public Law 90-448, as amended by the Flood Disaster Protection Act of 1973, Public Law 93-234.

PRINCIPAL PURPOSE(S): This information is being collected for the purpose of determining an applicant's eligibility to request changes to National Flood Insurance Program (NFIP) Flood Insurance Rate Maps (FIRM).

ROUTINE USE(S): The information on this form may be disclosed as generally permitted under 5 U.S.C § 552a(b) of the Privacy Act of 1974, as amended. This includes using this information as necessary and authorized by the routine uses published in DHS/FEMA/NFIP/LOMA-1 National Flood Insurance Program (NFIP); Letter of Map Amendment (LOMA) February 15, 2006, 71 FR 7990.

DISCLOSURE: The disclosure of information on this form is voluntary; however, failure to provide the information requested may delay or prevent FEMA from processing a determination regarding a requested change to a NFIP Flood Insurance Rate Maps (FIRM).

Flooding Source: Little San Domingo Wash 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 B) ☐ 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.)	Effective/FIS (cfs)	Revised (cfs)
At Confluence w/ Little San Domingo Wash	0.84	821	999

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

☐ Statistical Analysis of Gage Records ☒ Precipitation/Runoff Model → Specify Model: HEC-1
☐ 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.

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

Is the hydrology for the revised flooding source(s) affected by sediment transport? ☐ Yes ☒ No

If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation..

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit*	Confluence w/ Little San Domingo Wash	0.206	N/A	1845.51 (NAVD88)
Upstream Limit*	Upstream XS of Wash	2.131	N/A	2018.12 (NAVD88)

*Proposed/Revised elevations must tie-into the Effective elevations within 0.5 foot at the downstream and upstream limits of revision.

2. Hydraulic Method/Model Used: HEC-RAS Version 4.1.0

3. Pre-Submittal Review of Hydraulic Models*

DHS-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. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS.

4.

Models Submitted	**Natural Run** File Name:	Plan Name:	**Floodway Run** File Name:	Plan Name:	**Datum**
Duplicate Effective Model*	File Name:	Plan Name:	File Name:	Plan Name:	
Corrected Effective Model*	File Name:	Plan Name:	File Name:	Plan Name:	
Existing or Pre-Project Conditions Model	File Name:	Plan Name:	File Name:	Plan Name:	
Revised or Post-Project Conditions Model	File Name: LSD.prj	Plan Name: LSD.p01	File Name: N/A	Plan Name: N/A	NAVD88
Other - (attach description)	File Name:	Plan Name:	File Name:	Plan Name:	

* For details, refer to the corresponding section of the instructions.

☒ Digital Models Submitted? (Required)

C. MAPPING REQUIREMENTS

A **certified topographic work 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.).

☒ Digital Mapping (GIS/CADD) Data Submitted (preferred)

Topographic Information: 2' contour interval mapping (NAVD88)

Source: Flood Control District of Maricopa County

Date: July 7, 2004 & January 29, 2013

Accuracy: +/- 1' interval mapping

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**, at the same scale as the original, 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 on revision.

☒ Annotated FIRM and/or FBFM (Required)

D. COMMON REGULATORY REQUIREMENTS*

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

   a. 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 compared to pre-project conditions.
      - The proposed project encroaches upon a SFHA with or without BFEs established and would result in increases above 1.00 foot compared to pre-project conditions.

   b. Does this LOMR request cause increase in the BFE and/or SFHA compared with the effective BFEs and/or SFHA? ☒ Yes ☐ No
   If Yes, please attach **proof of property owner notification and acceptance (if available)**. Elements of and examples of property owner notifications can be found in the MT-2 Form 2 Instructions.

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 established. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For CLOMR requests, please submit documentation to FEMA and the community to show that you have complied with Sections 9 and 10 of the Endangered Species Act (ESA).

For actions authorized, funded, or being carried out by Federal or State agencies, please submit documentation from the agency showing its compliance with Section 7(a)(2) of the ESA. Please see the MT-2 instructions for more detail.

* Not inclusive of all applicable regulatory requirements. For details, see 44 CFR parts 60 and 65.

U.S. DEPARTMENT OF HOMELAND SECURITY
FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 1660-0016
Expires February 28, 2014

Flooding Source: Wash S2

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 B)   ☐ 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.)	Effective/FIS (cfs)	Revised (cfs)
At Downstream Limit	0.295	420	450

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

☐ Statistical Analysis of Gage Records   ☒ Precipitation/Runoff Model → Specify Model: HEC-1
☐ 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.

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

Is the hydrology for the revised flooding source(s) affected by sediment transport? ☐ Yes ☒ No

If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation..

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit*	Confluence with Little San Domingo Wash	0.219	N/A	1831.81 (NAVD88)
Upstream Limit*	Upstream XS of Wash	0.514	1856.1 (NAVD88)	1854.21 (NAVD88)

*Proposed/Revised elevations must tie-into the Effective elevations within 0.5 foot at the downstream and upstream limits of revision.

2. Hydraulic Method/Model Used: HEC-RAS Version 4.1.0

3. Pre-Submittal Review of Hydraulic Models*

DHS-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. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS.

4.

Models Submitted	**Natural Run**		**Floodway Run**		**Datum**
Duplicate Effective Model*	File Name:	Plan Name:	File Name:	Plan Name:	
Corrected Effective Model*	File Name:	Plan Name:	File Name:	Plan Name:	
Existing or Pre-Project Conditions Model	File Name:	Plan Name:	File Name:	Plan Name:	
Revised or Post-Project Conditions Model	File Name: LSD.prj	Plan Name: LSD.p01	File Name: N/A	Plan Name: N/A	NAVD88
Other - (attach description)	File Name:	Plan Name:	File Name:	Plan Name:	

* For details, refer to the corresponding section of the instructions.

☒ Digital Models Submitted? (Required)

C. MAPPING REQUIREMENTS

A **certified topographic work 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.).

☒ Digital Mapping (GIS/CADD) Data Submitted (preferred)

Topographic Information: 2' contour interval mapping (NAVD88)

Source: Flood Control District of Maricopa County　　Date: July 7th, 2004

Accuracy: +/- 1' interval mapping

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**, at the same scale as the original, 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 on revision.

☒ Annotated FIRM and/or FBFM (Required)

D. COMMON REGULATORY REQUIREMENTS*

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

   a. 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 compared to pre-project conditions.
   - The proposed project encroaches upon a SFHA with or without BFEs established and would result in increases above 1.00 foot compared to pre-project conditions.

   b. Does this LOMR request cause increase in the BFE and/or SFHA compared with the effective BFEs and/or SFHA? ☒ Yes ☐ No
   If Yes, please attach **proof of property owner notification and acceptance (if available)**. Elements of and examples of property owner notifications can be found in the MT-2 Form 2 Instructions.

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 established. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For CLOMR requests, please submit documentation to FEMA and the community to show that you have complied with Sections 9 and 10 of the Endangered Species Act (ESA).

For actions authorized, funded, or being carried out by Federal or State agencies, please submit documentation from the agency showing its compliance with Section 7(a)(2) of the ESA. Please see the MT-2 instructions for more detail.

* Not inclusive of all applicable regulatory requirements. For details, see 44 CFR parts 60 and 65.

B. Hydraulics

4.

Models Submitted	**Natural Run**		**Floodway Run**	
	File Name:	Plan Name:	File Name:	Plan Name:
Other- Optimization Model	LSD_Optimized.prj	LSD_Optimized.p01	N/A	N/A

LSD_Optimized.prj

Model used to determine the amount of flow overtopping the natural berm upstream of the confluence between Little San Domingo Wash Reach 1 and Wash S2 crossing. Flow optimized in the Steady Flow Analysis at the lateral structure. Flow path of overtopping flows were mapped as Zone A in the Work Maps. Model not used for floodplain or floodway mapping.

DEPARTMENT OF HOMELAND SECURITY
FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE STRUCTURES FORM

O.M.B. NO. 1660-0016
Expires February 28, 2014

PAPERWORK BURDEN DISCLOSURE NOTICE

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PRIVACY ACT STATEMENT

AUTHORITY: The National Flood Insurance Act of 1968, Public Law 90-448, as amended by the Flood Disaster Protection Act of 1973, Public Law 93-234.

PRINCIPAL PURPOSE(S): This information is being collected for the purpose of determining an applicant's eligibility to request changes to National Flood Insurance Program (NFIP) Flood Insurance Rate Maps (FIRM).

ROUTINE USE(S): The information on this form may be disclosed as generally permitted under 5 U.S.C § 552a(b) of the Privacy Act of 1974, as amended. This includes using this information as necessary and authorized by the routine uses published in DHS/FEMA/NFIP/LOMA-1 National Flood Insurance Program; Letter of Map Amendment (LOMA) February 15, 2006, 71 FR 7990.

DISCLOSURE: The disclosure of information on this form is voluntary; however, failure to provide the information requested may delay or prevent FEMA from processing a determination regarding a requested change to a NFIP Flood Insurance Rate Maps (FIRM).

Flooding Source: Wash O

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 Modeled Structure

1. Name of Structure: WAO-100 - 3-10"x8' Concrete Box Culvert

   Type (check one): ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

   Location of Structure: Between RS 0.205 and RS 0.235 at the US-60 crossing.

   Downstream Limit/Cross Section: 0.205

   Upstream Limit/Cross Section: 0.235

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. 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): _____

2. Channel Design Plans

Attach the plans of the channelization certified by a registered professional engineer, as described in the instructions.

3. Accessory Structures

The channelization includes (check one):

☐ Levees [Attach Section E (Levee/Floodwall)] ☐ Drop structures ☐ Superelevated sections

☐ Transitions in cross sectional geometry ☐ Debris basin/detention basin [Attach Section D (Dam/Basin)] ☐ Energy dissipator

☐ Weir ☐ Other (Describe):

4. Sediment Transport Considerations

Are the hydraulics of the channel affected by sediment transport? ☐ 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.

C. BRIDGE/CULVERT

Flooding Source: Wash O

Name of Structure: WAO-100

1. This revision reflects (check one):

☐ Bridge/culvert not modeled in the FIS

☐ Modified bridge/culvert previously modeled in the FIS

☒ Revised 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): HEC-RAS
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

Are the hydraulics of the structure affected by sediment transport? ☐ Yes ☒ No

If Yes, then fill out Section F (Sediment Transport) of Form 3. If no, then attach an explanation.

DEPARTMENT OF HOMELAND SECURITY
FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE STRUCTURES FORM

O.M.B. NO. 1660-0016
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AUTHORITY: The National Flood Insurance Act of 1968, Public Law 90-448, as amended by the Flood Disaster Protection Act of 1973, Public Law 93-234.

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DISCLOSURE: The disclosure of information on this form is voluntary; however, failure to provide the information requested may delay or prevent FEMA from processing a determination regarding a requested change to a NFIP Flood Insurance Rate Maps (FIRM).

Flooding Source: Mockingbird 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 Modeled Structure

1. Name of Structure: MOC 100- 2-4'x20' concrete bridge

   Type (check one): ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

   Location of Structure: At crossing of US60/Wickenburg Way

   Downstream Limit/Cross Section: 0.272

   Upstream Limit/Cross Section: 0.310

2. Name of Structure: MOC 200- 4-10'x4' concrete bridge

   Type (check one): ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

   Location of Structure: At crossing of US60/Wickenburg Way

   Downstream Limit/Cross Section: 0.272

   Upstream Limit/Cross Section: 0.310

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. 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): _____

2. Channel Design Plans

Attach the plans of the channelization certified by a registered professional engineer, as described in the instructions.

3. Accessory Structures

The channelization includes (check one):

☐ Levees [Attach Section E (Levee/Floodwall)] ☐ Drop structures ☐ Superelevated sections

☐ Transitions in cross sectional geometry ☐ Debris basin/detention basin [Attach Section D (Dam/Basin)] ☐ Energy dissipator

☐ Weir ☐ Other (Describe):

4. Sediment Transport Considerations

Are the hydraulics of the channel affected by sediment transport? ☐ 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.

C. BRIDGE/CULVERT

Flooding Source: Mockingbird Wash

Name of Structure: MOC_100 & MOC_200

1. This revision reflects (check one):

☐ Bridge/culvert not modeled in the FIS

☐ Modified bridge/culvert previously modeled in the FIS

☒ Revised 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): HEC-RAS
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

Are the hydraulics of the structure affected by sediment transport? ☐ Yes ☒ No

If Yes, then fill out Section F (Sediment Transport) of Form 3. If no, then attach an explanation.

DEPARTMENT OF HOMELAND SECURITY
FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE STRUCTURES FORM

O.M.B. NO. 1660-0016
Expires February 28, 2014

PAPERWORK BURDEN DISCLOSURE NOTICE

PRIVACY ACT STATEMENT

Flooding Source: Wash M

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 Modeled Structure

1. Name of Structure: M 100 - 1-8'x7' Concrete Box Culvert

   Type (check one): ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

   Location of Structure: At crossing of US60/Wickenbug Way

   Downstream Limit/Cross Section: 0.448

   Upstream Limit/Cross Section: 0.494

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. 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): _____

2. Channel Design Plans

Attach the plans of the channelization certified by a registered professional engineer, as described in the instructions.

3. Accessory Structures

The channelization includes (check one):

☐ Levees [Attach Section E (Levee/Floodwall)] ☐ Drop structures ☐ Superelevated sections

☐ Transitions in cross sectional geometry ☐ Debris basin/detention basin [Attach Section D (Dam/Basin)] ☐ Energy dissipator

☐ Weir ☐ Other (Describe):

4. Sediment Transport Considerations

Are the hydraulics of the channel affected by sediment transport? ☐ 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.

C. BRIDGE/CULVERT

Flooding Source: Wash M

Name of Structure: M_100

1. This revision reflects (check one):

☐ Bridge/culvert not modeled in the FIS

☐ Modified bridge/culvert previously modeled in the FIS

☒ Revised 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): HEC-RAS
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

Are the hydraulics of the structure affected by sediment transport? ☐ Yes ☒ No

If Yes, then fill out Section F (Sediment Transport) of Form 3. If no, then attach an explanation.

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PRIVACY ACT STATEMENT

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Flooding Source: Wash L

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 Modeled Structure

1. Name of Structure: L-100 - 2-8'x6' CBC

   Type (check one): ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

   Location of Structure: At crossing of US60/Wickenburg Way

   Downstream Limit/Cross Section: 0.375

   Upstream Limit/Cross Section: 0.426

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. 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): _____

2. Channel Design Plans

Attach the plans of the channelization certified by a registered professional engineer, as described in the instructions.

3. Accessory Structures

The channelization includes (check one):

☐ Levees [Attach Section E (Levee/Floodwall)] ☐ Drop structures ☐ Superelevated sections

☐ Transitions in cross sectional geometry ☐ Debris basin/detention basin [Attach Section D (Dam/Basin)] ☐ Energy dissipator

☐ Weir ☐ Other (Describe):

4. Sediment Transport Considerations

Are the hydraulics of the channel affected by sediment transport? ☐ 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.

C. BRIDGE/CULVERT

Flooding Source: Wash L

Name of Structure: L 100

1. This revision reflects (check one):

☐ Bridge/culvert not modeled in the FIS

☐ Modified bridge/culvert previously modeled in the FIS

☒ Revised 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): HEC-RAS
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

Are the hydraulics of the structure affected by sediment transport? ☐ Yes ☒ No

If Yes, then fill out Section F (Sediment Transport) of Form 3. If no, then attach an explanation.

DEPARTMENT OF HOMELAND SECURITY
FEDERAL EMERGENCY MANAGEMENT AGENCY

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Flooding Source: Wash K

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 Modeled Structure

1. Name of Structure: K 100 3-10'x2.5' Concrete Bridge

   Type (check one): ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

   Location of Structure: At crossing of US60/Wickenburg Way

   Downstream Limit/Cross Section: 0.119

   Upstream Limit/Cross Section: 0.138

2. Name of Structure: K 200 3-10'x2.5' Concrete Bridge

   Type (check one): ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

   Location of Structure: At crossing of US60/Wickenburg Way

   Downstream Limit/Cross Section: 0.100

   Upstream Limit/Cross Section: 0.117

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. 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): _____

2. Channel Design Plans

Attach the plans of the channelization certified by a registered professional engineer, as described in the instructions.

3. Accessory Structures

The channelization includes (check one):

☐ Levees [Attach Section E (Levee/Floodwall)] ☐ Drop structures ☐ Superelevated sections
☐ Transitions in cross sectional geometry ☐ Debris basin/detention basin [Attach Section D (Dam/Basin)] ☐ Energy dissipator

☐ Weir ☐ Other (Describe):

4. Sediment Transport Considerations

Are the hydraulics of the channel affected by sediment transport? ☐ 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.

C. BRIDGE/CULVERT

Flooding Source: Wash K

Name of Structure: K 100 & K 200

1. This revision reflects (check one):

☐ Bridge/culvert not modeled in the FIS

☐ Modified bridge/culvert previously modeled in the FIS

☒ Revised 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): HEC - RAS
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

Are the hydraulics of the structure affected by sediment transport? ☐ Yes ☒ No

If Yes, then fill out Section F (Sediment Transport) of Form 3. If no, then attach an explanation.

DEPARTMENT OF HOMELAND SECURITY
FEDERAL EMERGENCY MANAGEMENT AGENCY

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Flooding Source: Wash J

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 Modeled Structure

1. Name of Structure: J 100 - 1-8'x7' Concrete Box Culvert

   Type (check one): ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

   Location of Structure: At crossing of US60/Wickenburg Way

   Downstream Limit/Cross Section: 0.11

   Upstream Limit/Cross Section: 0.138

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. 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): _____

2. Channel Design Plans

Attach the plans of the channelization certified by a registered professional engineer, as described in the instructions.

3. Accessory Structures

The channelization includes (check one):

☐ Levees [Attach Section E (Levee/Floodwall)] ☐ Drop structures ☐ Superelevated sections
☐ Transitions in cross sectional geometry ☐ Debris basin/detention basin [Attach Section D (Dam/Basin)] ☐ Energy dissipator

☐ Weir ☐ Other (Describe):

4. Sediment Transport Considerations

Are the hydraulics of the channel affected by sediment transport? ☐ 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.

C. BRIDGE/CULVERT

Flooding Source: Wash J

Name of Structure: J 100

1. This revision reflects (check one):

☐ Bridge/culvert not modeled in the FIS

☐ Modified bridge/culvert previously modeled in the FIS

☒ Revised 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): HEC-RAS
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

Are the hydraulics of the structure affected by sediment transport? ☐ Yes ☒ No

If Yes, then fill out Section F (Sediment Transport) of Form 3. If no, then attach an explanation.

DEPARTMENT OF HOMELAND SECURITY
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Flooding Source: Wash I

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 Modeled Structure

1. Name of Structure: I 100 3-10'x3' Concrete Bridge

   Type (check one): ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

   Location of Structure: At crossing of US60/Wickenburg Way

   Downstream Limit/Cross Section: 0.106

   Upstream Limit/Cross Section: 0.129

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. 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): _____

2. Channel Design Plans

Attach the plans of the channelization certified by a registered professional engineer, as described in the instructions.

3. Accessory Structures

The channelization includes (check one):

☐ Levees [Attach Section E (Levee/Floodwall)] ☐ Drop structures ☐ Superelevated sections

☐ Transitions in cross sectional geometry ☐ Debris basin/detention basin [Attach Section D (Dam/Basin)] ☐ Energy dissipator

☐ Weir ☐ Other (Describe):

4. Sediment Transport Considerations

Are the hydraulics of the channel affected by sediment transport? ☐ 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.

C. BRIDGE/CULVERT

Flooding Source: Wash I

Name of Structure: I 100

1. This revision reflects (check one):

☐ Bridge/culvert not modeled in the FIS

☐ Modified bridge/culvert previously modeled in the FIS

☒ Revised 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): HEC - RAS
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

Are the hydraulics of the structure affected by sediment transport? ☐ Yes ☒ No

If Yes, then fill out Section F (Sediment Transport) of Form 3. If no, then attach an explanation.

DEPARTMENT OF HOMELAND SECURITY
FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE STRUCTURES FORM

O.M.B. NO. 1660-0016
Expires February 28, 2014

PAPERWORK BURDEN DISCLOSURE NOTICE

PRIVACY ACT STATEMENT

AUTHORITY: The National Flood Insurance Act of 1968, Public Law 90-448, as amended by the Flood Disaster Protection Act of 1973, Public Law 93-234.

PRINCIPAL PURPOSE(S): This information is being collected for the purpose of determining an applicant's eligibility to request changes to National Flood Insurance Program (NFIP) Flood Insurance Rate Maps (FIRM).

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DISCLOSURE: The disclosure of information on this form is voluntary; however, failure to provide the information requested may delay or prevent FEMA from processing a determination regarding a requested change to a NFIP Flood Insurance Rate Maps (FIRM).

Flooding Source: Monarch 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 Modeled Structure

1. Name of Structure: MON_100 - 1-Concrete Bridge

   Type (check one): ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

   Location of Structure: At crossing of US60/Wickenbug Way West Bound Lane

   Downstream Limit/Cross Section: 0.065

   Upstream Limit/Cross Section: 0.076

2. Name of Structure: MON_200 - 1-Concrete Bridge

   Type (check one): ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

   Location of Structure: At crossing of US60/Wickenbug Way East Bound Lane

   Downstream Limit/Cross Section: 0.042

   Upstream Limit/Cross Section: 0.055

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. 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): _____

2. Channel Design Plans

Attach the plans of the channelization certified by a registered professional engineer, as described in the instructions.

3. Accessory Structures

The channelization includes (check one):

☐ Levees [Attach Section E (Levee/Floodwall)] ☐ Drop structures ☐ Superelevated sections

☐ Transitions in cross sectional geometry ☐ Debris basin/detention basin [Attach Section D (Dam/Basin)] ☐ Energy dissipator

☐ Weir ☐ Other (Describe):

4. Sediment Transport Considerations

Are the hydraulics of the channel affected by sediment transport? ☐ 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.

C. BRIDGE/CULVERT

Flooding Source: Monarch Wash

Name of Structure: MON_100 & MON_200

1. This revision reflects (check one):

☐ Bridge/culvert not modeled in the FIS

☐ Modified bridge/culvert previously modeled in the FIS

☒ Revised 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): HEC-RAS
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

Are the hydraulics of the structure affected by sediment transport? ☐ Yes ☒ No

If Yes, then fill out Section F (Sediment Transport) of Form 3. If no, then attach an explanation.

RIVERINE STRUCTURES FORM

O.M.B. NO. 1660-0016
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Flooding Source: Wash H

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 Modeled Structure

1. Name of Structure: H 100 - 3-10'x5'

   Type (check one): ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

   Location of Structure: At crossing of US60/Wickenburg Way

   Downstream Limit/Cross Section: 0.117

   Upstream Limit/Cross Section: 0.143

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. 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): _____

2. Channel Design Plans

Attach the plans of the channelization certified by a registered professional engineer, as described in the instructions.

3. Accessory Structures

The channelization includes (check one):

☐ Levees [Attach Section E (Levee/Floodwall)] ☐ Drop structures ☐ Superelevated sections
☐ Transitions in cross sectional geometry ☐ Debris basin/detention basin [Attach Section D (Dam/Basin)] ☐ Energy dissipator

☐ Weir ☐ Other (Describe):

4. Sediment Transport Considerations

Are the hydraulics of the channel affected by sediment transport? ☐ 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.

C. BRIDGE/CULVERT

Flooding Source: Wash H

Name of Structure: H_100

1. This revision reflects (check one):

☐ Bridge/culvert not modeled in the FIS

☐ Modified bridge/culvert previously modeled in the FIS

☒ Revised 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): HEC-RAS
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

Are the hydraulics of the structure affected by sediment transport? ☐ Yes ☒ No

If Yes, then fill out Section F (Sediment Transport) of Form 3. If no, then attach an explanation.

DEPARTMENT OF HOMELAND SECURITY
FEDERAL EMERGENCY MANAGEMENT AGENCY

O.M.B. NO. 1660-0016
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RIVERINE STRUCTURES FORM

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DISCLOSURE: The disclosure of information on this form is voluntary; however, failure to provide the information requested may delay or prevent FEMA from processing a determination regarding a requested change to a NFIP Flood Insurance Rate Maps (FIRM).

Flooding Source: Wash G

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 Modeled Structure

1. Name of Structure: G_100 - 1-6'x1.66'

   Type (check one): ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

   Location of Structure: At crossing of US60/Wickenburg Way

   Downstream Limit/Cross Section: 0.151

   Upstream Limit/Cross Section: 0.184

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. 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): _____

2. Channel Design Plans

Attach the plans of the channelization certified by a registered professional engineer, as described in the instructions.

3. Accessory Structures

The channelization includes (check one):

☐ Levees [Attach Section E (Levee/Floodwall)] ☐ Drop structures ☐ Superelevated sections

☐ Transitions in cross sectional geometry ☐ Debris basin/detention basin [Attach Section D (Dam/Basin)] ☐ Energy dissipator

☐ Weir ☐ Other (Describe):

4. Sediment Transport Considerations

Are the hydraulics of the channel affected by sediment transport? ☐ 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.

C. BRIDGE/CULVERT

Flooding Source: Wash G

Name of Structure: G_100

1. This revision reflects (check one):

☐ Bridge/culvert not modeled in the FIS

☐ Modified bridge/culvert previously modeled in the FIS

☒ Revised 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): HEC-RAS
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

Are the hydraulics of the structure affected by sediment transport? ☐ Yes ☒ No

If Yes, then fill out Section F (Sediment Transport) of Form 3. If no, then attach an explanation.

DEPARTMENT OF HOMELAND SECURITY
FEDERAL EMERGENCY MANAGEMENT AGENCY

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RIVERINE STRUCTURES FORM

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Flooding Source: Wash HT07

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 Modeled Structure

1. Name of Structure: HT07 100 - 2-10'x6'

   Type (check one): ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

   Location of Structure: At crossing of US60/Wickenburg Way

   Downstream Limit/Cross Section: 0.058

   Upstream Limit/Cross Section: 0.082

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. 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): _____

2. Channel Design Plans

Attach the plans of the channelization certified by a registered professional engineer, as described in the instructions.

3. Accessory Structures

The channelization includes (check one):

☐ Levees [Attach Section E (Levee/Floodwall)] ☐ Drop structures ☐ Superelevated sections

☐ Transitions in cross sectional geometry ☐ Debris basin/detention basin [Attach Section D (Dam/Basin)] ☐ Energy dissipator

☐ Weir ☐ Other (Describe):

4. Sediment Transport Considerations

Are the hydraulics of the channel affected by sediment transport? ☐ 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.

C. BRIDGE/CULVERT

Flooding Source: Wash HT07

Name of Structure: HT07_100

1. This revision reflects (check one):

☒ Bridge/culvert not modeled in the FIS

☐ Modified bridge/culvert previously modeled in the FIS

☐ Revised 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): HEC-RAS
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

Are the hydraulics of the structure affected by sediment transport? ☐ Yes ☒ No

If Yes, then fill out Section F (Sediment Transport) of Form 3. If no, then attach an explanation.

DEPARTMENT OF HOMELAND SECURITY
FEDERAL EMERGENCY MANAGEMENT AGENCY

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Flooding Source: Wash F

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 Modeled Structure

1. Name of Structure: F 100 - 1-6'x6'

   Type (check one): ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

   Location of Structure: At crossing of US60/Wickenburg Way

   Downstream Limit/Cross Section: 0.065

   Upstream Limit/Cross Section: 0.095

2. Name of Structure: F 200 - 1-3' Diameter

   Type (check one): ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

   Location of Structure: Crossing of Private Driveway

   Downstream Limit/Cross Section: 0.9101

   Upstream Limit/Cross Section: 0.92

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. 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): _____

2. Channel Design Plans

Attach the plans of the channelization certified by a registered professional engineer, as described in the instructions.

3. Accessory Structures

The channelization includes (check one):

☐ Levees [Attach Section E (Levee/Floodwall)] ☐ Drop structures ☐ Superelevated sections
☐ Transitions in cross sectional geometry ☐ Debris basin/detention basin [Attach Section D (Dam/Basin)] ☐ Energy dissipator

☐ Weir ☐ Other (Describe):

4. Sediment Transport Considerations

Are the hydraulics of the channel affected by sediment transport? ☐ 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.

C. BRIDGE/CULVERT

Flooding Source: Wash F

Name of Structure: F 100

1. This revision reflects (check one):

☐ Bridge/culvert not modeled in the FIS

☐ Modified bridge/culvert previously modeled in the FIS

☒ Revised 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): HEC-RAS
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

Are the hydraulics of the structure affected by sediment transport? ☐ Yes ☒ No

If Yes, then fill out Section F (Sediment Transport) of Form 3. If no, then attach an explanation.

B. CHANNELIZATION

Flooding Source:

Name of Structure: _____

1. 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): _____

2. Channel Design Plans

Attach the plans of the channelization certified by a registered professional engineer, as described in the instructions.

3. Accessory Structures

The channelization includes (check one):

☐ Levees [Attach Section E (Levee/Floodwall)] ☐ Drop structures ☐ Superelevated sections

☐ Transitions in cross sectional geometry ☐ Debris basin/detention basin [Attach Section D (Dam/Basin)] ☐ Energy dissipator

☐ Weir ☐ Other (Describe):

4. Sediment Transport Considerations

Are the hydraulics of the channel affected by sediment transport? ☐ 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.

C. BRIDGE/CULVERT

Flooding Source: Wash F

Name of Structure: F 200

1. This revision reflects (check one):

☒ Bridge/culvert not modeled in the FIS

☐ Modified bridge/culvert previously modeled in the FIS

☐ Revised 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): HEC-RAS
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

Are the hydraulics of the structure affected by sediment transport? ☐ Yes ☒ No

If Yes, then fill out Section F (Sediment Transport) of Form 3. If no, then attach an explanation.

DEPARTMENT OF HOMELAND SECURITY
FEDERAL EMERGENCY MANAGEMENT AGENCY

O.M.B. NO. 1660-0016
Expires February 28, 2014

RIVERINE STRUCTURES FORM

PAPERWORK BURDEN DISCLOSURE NOTICE

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PRIVACY ACT STATEMENT

AUTHORITY: The National Flood Insurance Act of 1968, Public Law 90-448, as amended by the Flood Disaster Protection Act of 1973, Public Law 93-234.

PRINCIPAL PURPOSE(S): This information is being collected for the purpose of determining an applicant's eligibility to request changes to National Flood Insurance Program (NFIP) Flood Insurance Rate Maps (FIRM).

ROUTINE USE(S): The information on this form may be disclosed as generally permitted under 5 U.S.C § 552a(b) of the Privacy Act of 1974, as amended. This includes using this information as necessary and authorized by the routine uses published in DHS/FEMA/NFIP/LOMA-1 National Flood Insurance Program; Letter of Map Amendment (LOMA) February 15, 2006, 71 FR 7990.

DISCLOSURE: The disclosure of information on this form is voluntary; however, failure to provide the information requested may delay or prevent FEMA from processing a determination regarding a requested change to a NFIP Flood Insurance Rate Maps (FIRM).

Flooding Source: San Domingo 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 Modeled Structure

1. Name of Structure: SAN 100 -87' wide Bridge

   Type (check one): ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

   Location of Structure: At crossing of Wickenburg Way/US60

   Downstream Limit/Cross Section: 0.057

   Upstream Limit/Cross Section: 0.078

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. 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): _____

2. Channel Design Plans

Attach the plans of the channelization certified by a registered professional engineer, as described in the instructions.

3. Accessory Structures

The channelization includes (check one):

☐ Levees [Attach Section E (Levee/Floodwall)] ☐ Drop structures ☐ Superelevated sections

☐ Transitions in cross sectional geometry ☐ Debris basin/detention basin [Attach Section D (Dam/Basin)] ☐ Energy dissipator

☐ Weir ☐ Other (Describe):

4. Sediment Transport Considerations

Are the hydraulics of the channel affected by sediment transport? ☐ 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.

C. BRIDGE/CULVERT

Flooding Source: San Domingo Wash

Name of Structure: SAN_100

1. This revision reflects (check one):

☐ Bridge/culvert not modeled in the FIS

☐ Modified bridge/culvert previously modeled in the FIS

☒ Revised 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): HEC-RAS
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

Are the hydraulics of the structure affected by sediment transport? ☐ Yes ☒ No

If Yes, then fill out Section F (Sediment Transport) of Form 3. If no, then attach an explanation.

DEPARTMENT OF HOMELAND SECURITY
FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE STRUCTURES FORM

O.M.B. NO. 1660-0016
Expires February 28, 2014

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Flooding Source: Ox 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 Modeled Structure

1. Name of Structure: OX 100 -15' Wide Bridge

   Type (check one): ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

   Location of Structure: At crossing of Railroad

   Downstream Limit/Cross Section: 0.368

   Upstream Limit/Cross Section: 0.373

2. Name of Structure: OX_200 - 3-10'x10' CBC

   Type (check one): ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

   Location of Structure: At crossing of Wickenburg Way/US 60

   Downstream Limit/Cross Section: 0.812

   Upstream Limit/Cross Section: 0.872

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. 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): _____

2. Channel Design Plans

Attach the plans of the channelization certified by a registered professional engineer, as described in the instructions.

3. Accessory Structures

The channelization includes (check one):

☐ Levees [Attach Section E (Levee/Floodwall)] ☐ Drop structures ☐ Superelevated sections
☐ Transitions in cross sectional geometry ☐ Debris basin/detention basin [Attach Section D (Dam/Basin)] ☐ Energy dissipator

☐ Weir ☐ Other (Describe):

4. Sediment Transport Considerations

Are the hydraulics of the channel affected by sediment transport? ☐ 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.

C. BRIDGE/CULVERT

Flooding Source: Ox Wash

Name of Structure: OX_100, OX_200

1. This revision reflects (check one):

☐ Bridge/culvert not modeled in the FIS

☐ Modified bridge/culvert previously modeled in the FIS

☒ Revised 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): HEC-RAS
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

Are the hydraulics of the structure affected by sediment transport? ☐ Yes ☒ No

If Yes, then fill out Section F (Sediment Transport) of Form 3. If no, then attach an explanation.

DEPARTMENT OF HOMELAND SECURITY
FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE STRUCTURES FORM

O.M.B. NO. 1660-0016
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DISCLOSURE: The disclosure of information on this form is voluntary; however, failure to provide the information requested may delay or prevent FEMA from processing a determination regarding a requested change to a NFIP Flood Insurance Rate Maps (FIRM).

Flooding Source: Little San Domingo 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 Modeled Structure

1. Name of Structure: LIT 100 -20' wide wooden bridge

   Type (check one): ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

   Location of Structure: At crossing of Railroad

   Downstream Limit/Cross Section: 2.047

   Upstream Limit/Cross Section: 2.051

2. Name of Structure: LIT 200 - 4-10'x8' CBC

   Type (check one): ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

   Location of Structure: At crossing of Wickenburg Way/US 60

   Downstream Limit/Cross Section: 2.161

   Upstream Limit/Cross Section: 2.208

3. Name of Structure: LIT 300 - 4-10'x8' CBC

   Type (check one) ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

   Location of Structure: At crossing with State Road 74

   Downstream Limit/Cross Section: 3.069

   Upstream Limit/Cross Section: 3.093

NOTE: FOR MORE STRUCTURES, ATTACH ADDITIONAL PAGES AS NEEDED.

B. CHANNELIZATION

Flooding Source:

Name of Structure: _____

1. 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): _____

2. Channel Design Plans

Attach the plans of the channelization certified by a registered professional engineer, as described in the instructions.

3. Accessory Structures

The channelization includes (check one):

☐ Levees [Attach Section E (Levee/Floodwall)] ☐ Drop structures ☐ Superelevated sections
☐ Transitions in cross sectional geometry ☐ Debris basin/detention basin [Attach Section D (Dam/Basin)] ☐ Energy dissipator

☐ Weir ☐ Other (Describe):

4. Sediment Transport Considerations

Are the hydraulics of the channel affected by sediment transport? ☐ 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.

C. BRIDGE/CULVERT

Flooding Source: LIttle San Domingo Wash

Name of Structure: LIT 100, LIT 200, LIT 300

1. This revision reflects (check one):

☐ Bridge/culvert not modeled in the FIS

☐ Modified bridge/culvert previously modeled in the FIS

☒ Revised 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): HEC-RAS
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

Are the hydraulics of the structure affected by sediment transport? ☐ Yes ☒ No

If Yes, then fill out Section F (Sediment Transport) of Form 3. If no, then attach an explanation.

DEPARTMENT OF HOMELAND SECURITY
FEDERAL EMERGENCY MANAGEMENT AGENCY

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RIVERINE STRUCTURES FORM

PAPERWORK BURDEN DISCLOSURE NOTICE

PRIVACY ACT STATEMENT

Flooding Source: Little San Domingo Wash 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 Modeled Structure

1. Name of Structure: LIT 400 -3'x3.6' Concrete Arch

   Type (check one): ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

   Location of Structure: At crossing of Railroad

   Downstream Limit/Cross Section: 0.902

   Upstream Limit/Cross Section: 0.924

2. Name of Structure: LIT 500 - 1-6'x5' CBC

   Type (check one): ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

   Location of Structure: At crossing of Wickenburg Way/US 60

   Downstream Limit/Cross Section: 1.163

   Upstream Limit/Cross Section: 1.205

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. 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): _____

2. Channel Design Plans

Attach the plans of the channelization certified by a registered professional engineer, as described in the instructions.

3. Accessory Structures

The channelization includes (check one):

☐ Levees [Attach Section E (Levee/Floodwall)] ☐ Drop structures ☐ Superelevated sections

☐ Transitions in cross sectional geometry ☐ Debris basin/detention basin [Attach Section D (Dam/Basin)] ☐ Energy dissipator

☐ Weir ☐ Other (Describe):

4. Sediment Transport Considerations

Are the hydraulics of the channel affected by sediment transport? ☐ 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.

C. BRIDGE/CULVERT

Flooding Source: LIttle San Domingo Wash Tributary 1

Name of Structure: LIT_400, LIT_500

1. This revision reflects (check one):

☐ Bridge/culvert not modeled in the FIS

☐ Modified bridge/culvert previously modeled in the FIS

☒ Revised 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): HEC-RAS
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

Are the hydraulics of the structure affected by sediment transport? ☐ Yes ☒ No

If Yes, then fill out Section F (Sediment Transport) of Form 3. If no, then attach an explanation.

D. DAM/BASIN

Flooding Source: _____
Name of Structure: _____

1. This request is for (check one): ☐ Existing dam/basin ☐ New dam/basin ☐ Modification of existing dam/basin

2. The dam/basin was designed by (check one): ☐ Federal agency ☐ State agency ☐ Private organization ☐ Local government agency

   Name of the agency or organization: _____

3. The Dam was permitted as (check one): ☐ Federal Dam ☐ State Dam

   Provide the permit or identification number (ID) for the dam and the appropriate permitting agency or organization

   Permit or ID number _________________ Permitting Agency or Organization ___________________________

   a. ☐ Local Government Dam ☐ Private Dam

   Provided related drawings, specification and supporting design information.

4. Does the project involve revised hydrology? ☐ Yes ☐ No

   If Yes, complete the Riverine Hydrology & Hydraulics Form (Form 2).

   Was the dam/basin designed using critical duration storm? (must account for the maximum volume of runoff)

   ☐ Yes, provide supporting documentation with your completed Form 2.

   ☐ No, provide a written explanation and justification for not using the critical duration storm.

5. Does the submittal include debris/sediment yield analysis? ☐ Yes ☐ No

   If Yes, then fill out Section F (Sediment Transport). If No, then attach your explanation for why debris/sediment analysis was not considered?

6. Does the Base Flood Elevation behind the dam/basin or downstream of the dam/basin change? ☐ Yes ☐ No

   If Yes, complete the Riverine Hydrology & Hydraulics Form (Form 2) and complete the table below.

	Stillwater Elevation Behind the Dam/Basin	
FREQUENCY (% annual chance)	FIS	REVISED
10-year (10%)	_____	_____
50-year (2%)	_____	_____
100-year (1%)	_____	_____
500-year (0.2%)	_____	_____
Normal Pool Elevation	_____	_____

7. Please attach a copy of the formal Operation and Maintenance Plan

E. LEVEE/FLOODWALL

1. System Elements

   a. This Levee/Floodwall analysis is based on (check one): ☐ upgrading of an existing levee/floodwall system ☐ a newly constructed levee/floodwall system ☐ reanalysis of an existing levee/floodwall system

   b. Levee elements and locations are (check one):

   ☐ earthen embankment, dike, berm, etc. Station _____ to _____
   ☐ structural floodwall Station _____ to _____
   ☐ Other (describe): Station _____ to _____

   c. Structural Type (check one): ☐ monolithic cast-in place reinforced concrete ☐ reinforced concrete masonry block ☐ sheet piling ☐ Other (describe): _____

   d. Has this levee/floodwall system been certified by a Federal agency to provide protection from the base flood?

   ☐ Yes ☐ No

   If Yes, by which agency? _____

e. Attach certified drawings containing the following information (indicate drawing sheet numbers):

1. Plan of the levee embankment and floodwall structures. Sheet Numbers: _____
2. A profile of the levee/floodwall system showing the Base Flood Elevation (BFE), levee and/or wall crest and foundation, and closure locations for the total levee system. Sheet Numbers: _____
3. A profile of the BFE, closure opening outlet and inlet invert elevations, type and size of opening, and kind of closure. Sheet Numbers: _____
4. A layout detail for the embankment protection measures. Sheet Numbers: _____
5. Location, layout, and size and shape of the levee embankment features, foundation treatment, Floodwall structure, closure structures, and pump stations. Sheet Numbers: _____

2. Freeboard

a. The minimum freeboard provided above the BFE is:

Riverine

3.0 feet or more at the downstream end and throughout ☐ Yes ☐ No

3.5 feet or more at the upstream end ☐ Yes ☐ No

4.0 feet within 100 feet upstream of all structures and/or constrictions ☐ Yes ☐ No

Coastal

1.0 foot above the height of the one percent wave associated with the 1%-annual-chance stillwater surge elevation or maximum wave runup (whichever is greater). ☐ Yes ☐ No

2.0 feet above the 1%-annual-chance stillwater surge elevation ☐ Yes ☐ No

Please note, occasionally exceptions are made to the minimum freeboard requirement. If an exception is requested, attach documentation addressing Paragraph 65.10(b)(1)(ii) of the NFIP Regulations.

If No is answered to any of the above, please attach an explanation.

b. Is there an indication from historical records that ice-jamming can affect the BFE? ☐ Yes ☐ No

If Yes, provide ice-jam analysis profile and evidence that the minimum freeboard discussed above still exists.

3. Closures

a. Openings through the levee system (check one): ☐ exists ☐ does not exist

If opening exists, list all closures:

Channel Station	Left or Right Bank	Opening Type	Highest Elevation for Opening Invert	Type of Closure Device

(Extend table on an added sheet as needed and reference)

Note: Geotechnical and geologic data

In addition to the required detailed analysis reports, data obtained during field and laboratory investigations and used in the design analysis for the following system features should be submitted in a tabulated summary form. (Reference U.S. Army Corps of Engineers [USACE] EM-1110-2-1906 Form 2086.)

4. Embankment Protection

a. The maximum levee slope land side is: _____

b. The maximum levee slope flood side is: _____

c. The range of velocities along the levee during the base flood is: _____ (min.) to _____ (max.)

d. Embankment material is protected by (describe what kind): _____

e. Riprap Design Parameters (check one): ☐ Velocity ☐ Tractive stress
Attach references

Reach		Sideslope	Flow Depth	Velocity	Curve or Straight	Stone Riprap			Depth of Toedown
						D_{100}	D_{50}	Thickness	
Sta	to								
Sta	to								
Sta	to								
Sta	to								
Sta	to								
Sta	to								

(Extend table on an added sheet as needed and reference each entry)

f. Is a bedding/filter analysis and design attached? ☐ Yes ☐ No

g. Describe the analysis used for other kinds of protection used (include copies of the design analysis):

Attach engineering analysis to support construction plans.

5. Embankment And Foundation Stability

a. Identify locations and describe the basis for selection of critical location for analysis:

_____

☐ Overall height: Sta.: _____, height _____ ft.

☐ Limiting foundation soil strength:

Strength ϕ = _____ degrees, c = _____ psf

Slope: SS = _____ (h) to _____ (v)

(Repeat as needed on an added sheet for additional locations)

b. Specify the embankment stability analysis methodology used (e.g., circular arc, sliding block, infinite slope, etc.):

_____

c. Summary of stability analysis results:

E. LEVEE/FLOODWALL (CONTINUED)

5. Embankment And Foundation Stability (continued)

Case	Loading Conditions	Critical Safety Factor	Criteria (Min.)
I	End of construction		1.3
II	Sudden drawdown		1.0
III	Critical flood stage		1.4
IV	Steady seepage at flood stage		1.4
VI	Earthquake (Case I)		1.0

(Reference: USACE EM-1110-2-1913 Table 6-1)

d. Was a seepage analysis for the embankment performed? ☐ Yes ☐ No

If Yes, describe methodology used:

e. Was a seepage analysis for the foundation performed? ☐ Yes ☐ No

f. Were uplift pressures at the embankment landside toe checked? ☐ Yes ☐ No

g. Were seepage exit gradients checked for piping potential? ☐ Yes ☐ No

h. The duration of the base flood hydrograph against the embankment is _____ hours.

Attach engineering analysis to support construction plans.

6. Floodwall And Foundation Stability

a. Describe analysis submittal based on Code (check one): ☐ UBC (1988) ☐ Other (specify): _____

b. Stability analysis submitted provides for: ☐ Overturning ☐ Sliding If not, explain: _____

c. Loading included in the analyses were: ☐ Lateral earth @ P_A = _____ psf; P_p = _____ psf

☐ Surcharge-Slope @ _____, ☐ surface _____ psf

☐ Wind @ P_w = _____ psf

☐ Seepage (Uplift); _____ ☐ Earthquake @ P_{eq} = _____ %g

☐ 1%-annual-chance significant wave height: _____ ft.

☐ 1%-annual-chance significant wave period: _____ sec.

d. Summary of Stability Analysis Results: Factors of Safety.
Itemize for each range in site layout dimension and loading condition limitation for each respective reach.

Loading Condition	Criteria (Min)		Sta	To	Sta	To
	Overturn	Sliding	Overturn	Sliding	Overturn	Sliding
Dead & Wind	1.5	1.5				
Dead & Soil	1.5	1.5				
Dead, Soil, Flood, & Impact	1.5	1.5				
Dead, Soil, & Seismic	1.3	1.3				

(Ref: FEMA 114 Sept 1986; USACE EM 1110-2-2502)
Note: (Extend table on an added sheet as needed and reference)

E. LEVEE/FLOODWALL (CONTINUED)

6. Floodwall And Foundation Stability (continued)

   e. Foundation bearing strength for each soil type:

Bearing Pressure	Sustained Load (psf)	Short Term Load (psf)
Computed design maximum		
Maximum allowable		

   f. Foundation scour protection ☐ is, ☐ is not provided. If provided, attach explanation and supporting documentation:

   Attach engineering analysis to support construction plans.

7. Settlement

   a. Has anticipated potential settlement been determined and incorporated into the specified construction elevations to maintain the established freeboard margin? ☐ Yes ☐ No

   b. The computed range of settlement is _____ ft. to _____ ft.

   c. Settlement of the levee crest is determined to be primarily from : ☐ Foundation consolidation ☐ Embankment compression ☐ Other (Describe): _____

   d. Differential settlement of floodwalls ☐ has ☐ has not been accommodated in the structural design and construction.

   Attach engineering analysis to support construction plans.

8. Interior Drainage

   a. Specify size of each interior watershed:

   Draining to pressure conduit: _____ acres
   Draining to ponding area: _____ acres

   b. Relationships Established

   Ponding elevation vs. storage ☐ Yes ☐ No
   Ponding elevation vs. gravity flow ☐ Yes ☐ No
   Differential head vs. gravity flow ☐ Yes ☐ No

   c. The river flow duration curve is enclosed: ☐ Yes ☐ No

   d. Specify the discharge capacity of the head pressure conduit: _____ cfs

   e. Which flooding conditions were analyzed?

   - Gravity flow (Interior Watershed) ☐ Yes ☐ No
   - Common storm (River Watershed) ☐ Yes ☐ No
   - Historical ponding probability ☐ Yes ☐ No
   - Coastal wave overtopping ☐ Yes ☐ No

   If No for any of the above, attach explanation.

   e. Interior drainage has been analyzed based on joint probability of interior and exterior flooding and the capacities of pumping and outlet facilities to provide the established level of flood protection. ☐ Yes ☐ No If No, attach explanation.

   g. The rate of seepage through the levee system for the base flood is _____ cfs

   h. The length of levee system used to drive this seepage rate in item g: _____ ft.

E. LEVEE/FLOODWALL (CONTINUED)

8. Interior Drainage (continued)

i. Will pumping plants be used for interior drainage? ☐ Yes ☐ No

If Yes, include the number of pumping plants: _____ For each pumping plant, list:

	Plant #1	Plant #2
The number of pumps		
The ponding storage capacity		
The maximum pumping rate		
The maximum pumping head		
The pumping starting elevation		
The pumping stopping elevation		
Is the discharge facility protected?		
Is there a flood warning plan?		
How much time is available between warning and flooding?		

Will the operation be automatic? ☐ Yes ☐ No

If the pumps are electric, are there backup power sources? ☐ Yes ☐ No

(Reference: USACE EM-1110-2-3101, 3102, 3103, 3104, and 3105)

Include a copy of supporting documentation of data and analysis. Provide a map showing the flooded area and maximum ponding elevations for all interior watersheds that result in flooding.

9. Other Design Criteria

a. The following items have been addressed as stated:

Liquefaction ☐ is ☐ is not a problem
Hydrocompaction ☐ is ☐ is not a problem
Heave differential movement due to soils of high shrink/swell ☐ is ☐ is not a problem

b. For each of these problems, state the basic facts and corrective action taken:

Attach supporting documentation

c. If the levee/floodwall is new or enlarged, will the structure adversely impact flood levels and/or flow velocities floodside of the structure?
☐ Yes ☐ No Attach supporting documentation

d. 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.

10. Operational Plan And Criteria

a. Are the planned/installed works in full compliance with Part 65.10 of the NFIP Regulations? ☐ Yes ☐ No

b. Does the operation plan incorporate all the provisions for closure devices as required in Paragraph 65.10(c)(1) of the NFIP regulations?
☐ Yes ☐ No

c. Does the operation plan incorporate all the provisions for interior drainage as required in Paragraph 65.10(c)(2) of the NFIP regulations?
☐ Yes ☐ No If the answer is No to any of the above, please attach supporting documentation.

E. LEVEE/FLOODWALL (CONTINUED)

11. Maintenance Plan
    Please attach a copy of the fomal maintenance plan for the levee/floodwall

12. Operations and Maintenance Plan

    Please attach a copy of the formal Operations and Maintenance Plan for the levee/floodwall.

CERTIFICATION OF THE LEVEE DOCUMENTION

This certification is to be signed and sealed by a licensed registered professional engineer authorized by law to certify elevation information data, hydrologic and hydraulic analysis, and any other supporting information as per NFIP regulations paragraph 65.10(e) and as described in the MT-2 Forms Instructions. 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: _____ License No.: _____ Expiration Date: _____

Company Name: _____ Telephone No.: _____ Fax No.: _____

Signature: _____ Date: _____ E-Mail Address: _____

F. SEDIMENT TRANSPORT

Flooding Source: _____

Name of Structure: _____

If there is any indication from historical records that sediment transport (including scour and deposition) can affect the Base Flood Elevation (BFE); and/or based on the stream morphology, vegetative cover, development of the watershed and bank conditions, there is a potential for debris and sediment transport (including scour and deposition) to affect the BFEs, then provide the following information along with the supporting documentation:

Sediment load associated with the base flood discharge: Volume _____ acre-feet

Debris load associated with the base flood discharge: Volume _____ acre-feet

Sediment transport rate _____ (percent concentration by volume)

Method used to estimate sediment transport: _____

Most sediment transport formulas are intended for a range of hydraulic conditions and sediment sizes; attach a detailed explanation for using the selected method.

Method used to estimate scour and/or deposition: _____

Method used to revise hydraulic or hydrologic analysis (model) to account for sediment transport: _____

Please note that bulked flows are used to evaluate the performance of a structure during the base flood; however, FEMA does not map BFEs based on bulked flows.

If a sediment analysis has not been performed, an explanation as to why sediment transport (including scour and deposition) will not affect the BFEs or structures must be provided.

3 Survey and Mapping Information

The *Phase 3 Survey Report* prepared by HRC (Ref. 28) is included as Appendix C. Information in this section is a summary of the detailed information found in the survey report.

3.1 Field Survey Information

3.1.1 Roadway Structures

Field survey of major existing roadway culvert structures was conducted on several trips between January 2013 and March 2013 to supplement the topographic mapping. All structures surveyed were documented in a manner consistent with the requirements in the *FEMA Guidelines and Specifications for Flood Hazard Mapping Partners* (Ref. 12), and are documented in Appendix C. Control Points were provided by the National Geodetic Survey, via the Maricopa County Department of Transportation (MCDOT) website.

3.1.2 Railroad Structures

A field survey of drainage structures crossing the Burlington Northern Santa Fe Railroad (Railroad) was conducted in February and March of 2013. Survey included top of rail, culvert and trestle dimensions and flow line elevations. Refer to Appendix C for survey field notes.

3.2 Mapping

Topographic mapping data from the Wickenburg Mapping Project (FCD 03-66), dated July 7th, 2004 (Ref. 43), was provided by the District and used to create 2-foot contour interval mapping for the majority of the study area. Additional topographic data was flown in January 2013 (Ref. 44) as a part of this project to update previous mapping around Little San Domingo Wash between US 60 and its confluence with the Hassayampa River. The vertical datum of the both sets of topographic data is NAVD88 and their geographic coordinate system is State Plane Arizona Central (NAD83).

The floodplain mapping along the upper extent of Little San Domingo extended beyond the extent of the 2004 and 2013 survey data. New field survey was included in this area, supplementing the 2004 and 2013 data. All survey data is included in the survey report in Appendix C.

4 Hydrology

4.1 Method Description

Hydrologic analyses were performed using the US Army Corps of Engineer's computer program HEC-1, Version 4.1, Flood Hydrograph Package in accordance with procedures and parameters recommended in the District's *Drainage Design Manual for Maricopa County, Volume I, Hydrology* (Ref. 17). Hydrologic Models for the Hassayampa Tributaries are as follows:

- 500-year; 6-hour and 24-hour Existing Condition
- 100-year; 6-hour and 24-hour Existing Condition
- 50-year; 6-hour and 24-hour Existing Condition
- 10-year; 6-hour and 24-hour Existing Condition

Each model uses the Green and Ampt methodology to estimate rainfall losses. Basins in the upper, mountainous reaches used the Phoenix Mountain S-graph for the unit hydrograph and those in the lower, flatter areas used the Desert/Rangeland S-graph. Flow is routed using the Normal Depth routing option. The watershed sub-basins and the flow routing schematic for the runoff model are shown on Exhibits 2.D1-2.E4.

The study identified the 100-year, 6-hour and 24-hour peak discharges and compared the discharges along each wash to determine which produced the higher discharge. The peak discharge from the 500-year storm event was also produced for the study.

4.2 Parameter Estimation

4.2.1 Drainage Area Boundaries

The watershed basin and sub-basin boundaries, along with a schematic of the HEC-1 sub-basins and routings are shown on Exhibits 1 & 2.D1-E4.

A terrain surface file was created in ArcGIS using the 2004 and 2013 topographic mapping and was used to delineate the watershed basin and sub-basin boundaries. If necessary, adjustments were made to the sub-basin boundaries based on visual assessments of the topography, aerial photography and field observations. Flow concentration points occur at the natural confluence of tributaries, split flow locations, and where manmade drainage facilities or structures affect flow characteristics.

4.2.2 Watershed Work Maps

The Work Maps for this study include land use, soils, and routing on GIS layers and mapping provided by the District. The parameters used in the models, and the basin and routing information, are depicted in Exhibits 1 through 5.E4.

All sub-basins are named after the main wash using five or six digit alphanumeric characters. The first two to three characters identify the wash and watershed that the sub-basin is located within (e.g. Basin MB01 is located within the Mockingbird Watershed). The remaining characters are numeric values that start at the upstream end of the sub-basin and increase in the downstream direction.

Channel routes are identified by an "R" followed by the wash name initials and the downstream operation.

4.2.3 Gage Data

There is one rainfall gage stations within the study area which has been in service since 1992, located near Little San Domingo Wash. The gage is maintained by the District. The precipitation gage of record and the data is available on the District's website. Calibration of hydrology models is not included in the scope of this study.

4.2.4 Statistical Parameters

The HEC-1 models were used to evaluate the hydrologic response of the study area to a range of precipitation events. A statistical analysis is not included in the scope of this study and thus is not included in this TDN. The runoff models were compared with the results from USGS and regional regression equations (see Section 4.5.2 and Appendix D.7)

4.2.5 Precipitation and Inflow Hydrographs

4.2.5.1 Precipitation

The District uses the Mean Partial Duration Time Series point precipitation values from NOAA Atlas 14 (Ref. 31). This results in a decrease in precipitation values for most of Maricopa County, however for the WADMS watershed, the precipitation values on average increased by approximately ten percent.

Isopluvial maps of rainfall intensities contained in the NOAA Atlas 14, Precipitation-Frequency Atlas of the United States, Volume 1, Arizona (Ref. 31) are used for this study. Rainfall data from the District's GIS shape files are embedded in the District's DDMSW program. DDMSW was used to develop hydrologic models for the 10, 50, and 100-year events. Precipitation for the 500-year event was read from the NOAA 14 table and graphs extracted from the NOAA website: (http://hdsc.nws.noaa.gov/hdsc/pfds/sa/az_pfds.html) based on the geographic coordinates of the centroid of the study area. The point values are summarized in Table 1, and precipitation tables and graphs are provided in Appendix D.1.

Table 1 –Point Precipitation Values

Watershed	Frequency and Duration	Point Precipitation (inches)
Phase 3 Hassayampa Tributaries	2-Year, 6-Hour	1.47
	2-Year, 24-Hour	2.01
	10-Year, 6-Hour	2.22
	10-Year, 24-Hour	3.02
	50-Year, 6-Hour	3.05
	50-Year, 24-Hour	4.12
	100-Year, 6-Hour	3.43
	100-Year, 24-Hour	4.62
	500-Year, 6-Hour	4.33
	500-Year, 24-Hour	5.80

4.2.5.2 Distribution Pattern

This study delivers HEC-1 modeling for the 6- and 24-hour storm distribution for the 10-, 50-, 100-, and 500-year storm events.

Typically, the 6-hour storm distribution is used for drainage areas of less than 20 square miles except for on-site storage facilities (Ref. 18). The 6-hour distribution may also be used for drainage areas between 20 square miles and 100 square miles to estimate the peak flood discharges that could be realized on watersheds due to the occurrence of a local storm critically centered over part or the entire watershed.

The Maricopa County 6-hour local storm distributions consist of five dimensionless storm patterns as shown in Table 2.4 of the *Hydrology Manual* (Ref. 17). Pattern 1 has the greatest rainfall intensities that can be expected in the eye of a local storm.

The 24-hour storm SCS Type II distribution is used for flood studies in Maricopa County for watershed areas between 20 and 500 square miles. This distribution is listed in Table 5 of the District's *Hydrology Manual* (Ref. 17).

Watersheds in the WADMS range in size from 0.2 to 20.5 square miles. Peak discharges from the 100-year 6-hour storm and the 100-year 24-hour storm were compared to determine whether a more localized or a general storm produces the greater discharge. In general, for smaller watersheds, the 100-year 6-hour storm produces a higher peak discharge than the 100-year 24-hour storm. For larger watersheds, the 100-year 24-hour storm generally produces a higher peak discharge than the 100-year 6-hour storm. The higher peak discharge was used for floodplain delineation.

4.2.5.3 Depth-Area Reduction

Depth-Area reduction was applied using the JD record option of HEC-1 and is based on the curves presented in Tables 2.1 and 2.2 of the *Hydrology Manual* (Ref. 17). The DDMSW program has these curves embedded in it.

4.2.6 Physical Parameters

4.2.6.1 Soils and Land Use

Detailed digital soil survey data from the Natural Resources Conservation Service (NRCS), as provided by the District, was used to develop the soils maps for the WADMS.

The existing 2010 land use dataset developed by MAG contains 94 different MAG land use categories that do not directly correlate to the 17 shown in Table 4.2 of the District's *Hydrology Manual* (Ref. 17). Since the

DDMSW program utilizes MAG land use categories, and provides Green and Ampt parameters for each category, the MAG land use categories was used in this study instead of Table 4.2 of the District's *Hydrology Manual* (Ref. 17).

The soil texture and land use data provide information regarding rainfall infiltration, which is discussed in the next section.

4.2.6.2 Rainfall Losses – Green-Ampt Infiltration

The Green-Ampt infiltration equation was selected to calculate the rainfall losses. Two phases are involved by using the Green-Ampt method. The first phase is surface retention loss, which is represented by a parameter called initial abstraction (IA) in HEC-1. The initial abstraction is a function of land use. The DDMSW program provides initial abstraction for each category of land use.

The second phase simulates the infiltration of rainfall into soil. The Green-Ampt equation, which is represented as follows, takes into account the soil suction head, porosity, hydraulic conductivity and time.

$$\mathrm{f} = \mathrm{XKSAT}\left(1 + \frac{\mathrm{PSIF} \cdot \mathrm{DTHETA}}{\mathrm{F}}\right)$$

$$\mathrm{f} = \frac{\mathrm{dF}}{\mathrm{dt}}$$

where f = infiltration rate (inches/hour)

XKSAT=saturated hydraulic conductivity (inches/hour)

PSIF=wetting front capillary suction (inches)

DTHETA=soil moisture deficit, pre-condition

F=accumulated infiltration depth (inches)

The saturated hydraulic conductivity (XKSAT) for bare ground conditions varies with soil texture and is provided by the DDMSW program. The DDMSW program adjusts the XKSAT values for vegetation cover and land use for each sub-basin. The wetting front capillary suction (PSIF) is also a function of soil texture and decreases with XKSAT. The DDMSW program calculates the PSIF from XKSAT based on the relationship depicted in Figure 4.3 of the District's *Hydrology Manual* (Ref. 17).

The soil moisture deficit (DTHETA) is a function of land use and is computed by the DDMSW program. Observation of the aerial photographs show that some land use types within the study area have different soil moisture deficits than their default values. Where necessary, adjustments were made by adding new land use categories with reasonable DTHETA values. These new categories are provided in Appendix D.2.

For impervious areas of a sub-basin, no infiltration occurs. A default percentage of impervious area (RTIMP) for each land use type is provided in the DDMSW program, however, some land use types exhibit different impervious percentages than their default values. Where necessary, adjustments were made by adding new land use categories with reasonable RTIMP values. These new categories can be found in Appendix D.2.

4.2.6.3 Unit Hydrograph

The four S-graphs appropriate for use within Maricopa County are Phoenix Mountain, Phoenix Valley, Desert/Rangeland, and Agricultural S-graphs. Given the terrain of the study area, the Phoenix Mountain S-graph was selected to generate the unit hydrographs for sub-basins within the upper, more mountainous regions. The Desert/Rangeland S-Graph was used for sub-basins in the lower, flatter regions.

The lag time is required to obtain the unit hydrograph from the S-graph. Per the District's *Hydrology Manual*, lag time is computed using the following equation:

$$Lag = 24K_n\left(\frac{L \cdot Lca}{S^{0.5}}\right)^{0.38}$$

Lag = basin lag in hours

K_n = mean Manning's n for channels within the basin

L = length of the longest watercourse in miles

Lca = length along the watercourse to a point opposite the centroid in miles

S = watercourse slope in feet per mile

The DDMSW program calculates the Kn for the drainage basins based on the land use types within the sub-basin. The Kn values for the land use types added to the DDMSW program were estimated based on the aerial and topography mapping.

The longest watercourses for each sub-basin were traced using the terrain model produced from the mapping. Lca values for all sub-basins were calculated by identifying their centroids. The watercourse slopes were calculated using ArcGIS tools.

4.2.7 Reach Routing

The Normal Depth Routing Method can be used for both natural and artificial channels in both urbanized and non-urbanized watersheds and was used for routing hydrographs within the WADMS. This method simulates attenuation due to overbank storage.

Longitudinal slopes and Manning's "n" values for the routing reaches were estimated based on the topographic mapping, aerial photographs, and field observations. Worksheets for "n" value calculations are located in the *Phase 3 Field Reconnaissance Report*, included as Appendix G (Ref. 27). These worksheets show tabulated reach routing parameters, cross-section sketches and "n" value estimations. Because the roughness for well-defined channels does not change appreciably with varying depths of flow, a single 'n' value was used for a routing reach.

A spreadsheet was created to verify the NSTPS time step values calculated using the DDMSW program (Appendix D.3). The NSTPS values were calculated for using the following equation:

$$NSTPS = \frac{Reach\ Length}{Celerity \times Time\ Step \times 60}$$

$NSTPS =$ time steps

$Reach\ Length =$ reach routing length

$Celerity = \partial Q/\partial A$, for a rectangular channel it is 5/3 of normal velocity. This ratio is also used to estimate the celerity in the spreadsheet.

$Time\ Step =$ 5 minutes for larger watersheds, 3 minutes for smaller.

Calculated NSTPS were used wherever possible; however in locations of low slopes and long reach routes, the calculated result caused more attenuation in the peak flow than was reasonable. In these cases, NSTPS were modified through trial and error and the resulting values are noted in the HEC-1 models and included in Appendix D.

4.2.8 Storage Routing

Typically, the capacity of existing roadway culverts in the area will be exceeded for events less than the 100-year. Typically these roadway crossings do not have much upstream storage capacity, and therefore do not have an effect on the peak flows downstream. Hence, roadway crossings are not modeled in the HEC-1 model, and flow is assumed to continue downstream unimpeded.

4.2.9 Flow Splits and Diversions

There were no splits or diversions used in the HEC-1 models developed for the Phase 3 Tributaries. These washes typically originate in the mountainous areas and have well defined routing reaches that were used in the hydrologic modeling.

4.3 Problems Encountered During the Study

No special problem was encountered. No warning or error messages occur in the models.

4.4 Calibration

A lack of accurate discharge data for all the washes prevented us from performing calibration on the hydrology models. No calibration was included with this study.

4.5 Final Results

4.5.1 Hydrologic Analysis Results

Hydrologic models were prepared for the 10-year, 6- and 24 hour, 50-year, 6- and 24 hour, 100-year, 6- and 24-hour and 500-year, 6- and 24 hour storm events for the existing condition using the NOAA 14. As seen below in Table 2- Controlling Storm Event, for smaller watersheds the 6-hour storm produces higher peak discharges than the 24-hour storm and it was therefore used for the floodplain delineations. For larger washes the 24-hour storm was used for floodplain delineation when it produced higher overall peak discharges. HEC-1 outputs for each model are included in Appendix D.6, and the peak flow rates used in the floodplain delineation are summarized in Tables 3-10. Refer to Exhibits 5.D1-5.E4 for the Flow Map.

Table 2 – Controlling Storm Event

Wash	Controlling Storm Event
Wash O	24-hour
Mockingbird Wash	24-hour
Wash M	6-hour
Wash L	6-hour
Wash K	24-hour
Wash J	6-hour
Wash I	24-hour
Monarch	24-hour
Wash H	6-hour
Wash G	6-hour
Wash F	6-hour
HT07	6-hour
San Domingo	24-hour
Ox Wash	24-hour
Little San Domingo Wash	24-hour

In general, the flows obtained are higher than the WADMS-94. This increase can be attributed to: (1) higher precipitation from NOAA 14 in comparison with NOAA 2; and (2) new developments in the area. Sub basin runoff and concentration points for 100-Year 6- and 24-hour flows are summarized in Tables 3-10.

Table 3 – 100-Year Hydrologic Results Summary for Wash O

HEC-1 I.D.	Contributing Drainage Area (sq. mi.)	100-Year 6-Hour Peak Discharge (cfs)	Time to Peak Discharge (hr)	100-Year 24-Hour Peak Discharge (cfs)	Time to Peak Discharge (hr)
O1	1.29	1257	4.58	1212	12.5
O2	0.93	1014	4.5	914	12.5
O3	0.72	1215	4.42	1038	12.42
CO2	2.22	1956	4.58	2118	12.5
CO3	2.94	2284	4.67	2412	12.67

Table 4 – 100-Year Hydrologic Results Summary Washes M, L, K, J and I

HEC-1 I.D.	Contributing Drainage Area (sq. mi.)	100-Year 6-Hour Peak Discharge (cfs)	Time to Peak Discharge (hr)	100-Year 24-Hour Peak Discharge (cfs)	Time to Peak Discharge (hr)
M01	0.32	679	4.33	545	12.25
L01	0.8	1072	4.5	931	12.5
K01	0.69	1152	4.25	1002	12.25
K02	0.78	1139	4.33	1013	12.33
K03	0.34	614	4.25	498	12.25
K04	1.27	1461	4.58	1344	12.58
J01	0.41	721	4.33	581	12.33
I01	1	1211	4.5	1113	12.42
I02	1.03	1313	4.5	1196	12.5
I03	0.28	615	4.25	492	12.25
CK02	1.81	2174	4.42	2291	12.33
CK03	1.03	1432	4.42	1327	12.42
CK04	3.08	2803	4.75	2988	12.75
CI02	2.03	2045	4.58	2096	12.58
CI03	2.31	2097	4.67	2139	12.67

Table 5 – 100-Year Hydrologic Results Summary for Mockingbird Wash

HEC-1 I.D.	Contributing Drainage Area (sq. mi.)	100-Year 6-Hour Peak Discharge (cfs)	Time to Peak Discharge (hr)	100-Year 24-Hour Peak Discharge (cfs)	Time to Peak Discharge (hr)
MB01	1.67	1766	4.33	1899	12.33
MB02	0.49	793	4.33	632	12.25
MB03	1.11	1359	4.33	1297	12.33
MB04	0.24	425	4.25	334	12.25
MB05	0.85	1189	4.33	1066	12.33
MB06	0.78	836	4.67	717	12.67
MB07	0.1	295	4.17	233	12.17
MB21	0.51	749	4.42	604	12.42
MB22	0.41	849	4.33	676	12.33
MB23	0.34	604	4.42	482	12.33
CMB02	2.15	2035	4.5	2233	12.42
CMB03	3.26	2841	4.42	3477	12.42
CMB04	3.51	2824	4.58	3585	12.5
CMB05	4.36	3393	4.58	4402	12.5
CMB06	5.14	3586	4.83	4735	12.75
CMB07	6.5	4286	4.92	5482	12.83
CMB22	0.92	1052	4.5	935	12.42
CMB23	1.26	1492	4.42	1412	12.42

Table 6 – 100-Year Hydrologic Results Summary for Monarch Wash

HEC-1 I.D.	Contributing Drainage Area (sq. mi.)	100-Year 6-Hour Peak Discharge (cfs)	Time to Peak Discharge (hr)	100-Year 24-Hour Peak Discharge (cfs)	Time to Peak Discharge (hr)
MW01	1.3	1323	4.42	1309	12.42
MW02	1	895	4.67	811	12.58
MW03	0.92	863	4.58	772	12.58
MW04	0.59	836	4.33	688	12.33
MW05	0.49	786	4.33	625	12.33
MW06	0.93	955	4.58	858	12.58
MW07	0.93	1176	4.42	1068	12.42
MW08	0.59	761	4.5	625	12.5
MW21	2.3	1286	4.92	1410	12.92
MW22	1.6	1228	4.83	1196	12.83
CMW02	2.3	1690	4.75	1797	12.75
CMW03	2	1532	4.67	1495	12.67
CMW04	1.51	1343	4.5	1312	12.5
CMW05	4.3	2793	4.75	3262	12.67
CMW06	9.13	4172	5	5230	12.92
CMW07	10.06	4150	5.33	5241	13.25
CMW08	10.65	4236	5.25	5357	13.17
CMW09	5.23	2945	4.92	3319	12.92
CMW22	3.9	1779	5.17	1936	12.92

Table 7 – 100-Year Hydrologic Results Summary for Washes H, G, HT07, F & Hassayampa East Trib.

HEC-1 I.D.	Contributing Drainage Area (sq. mi.)	100-Year 6-Hour Peak Discharge (cfs)	Time to Peak Discharge (hr)	100-Year 24-Hour Peak Discharge (cfs)	Time to Peak Discharge (hr)
H01	1.76	1480	4.92	1375	12.83
G01	0.41	620	4.42	493	12.42
HT07	0.89	1063	4.5	944	12.5
F01	0.26	577	4.25	460	12.25
HT01	0.14	449	4.17	359	12.17
HT02	0.27	549	4.33	440	12.33
HT03	0.15	452	4.17	360	12.17
HT04	0.23	503	4.25	404	12.25
HT06	0.16	361	4.17	289	12.17
HT08	0.08	233	4.17	185	12.17
HT310	0.16	459	4.17	364	12.17
HT319	0.21	532	4.17	421	12.17

Table 8 – 100-Year Hydrologic Results Summary for San Domingo Wash

HEC-1 I.D.	Contributing Drainage Area (sq. mi.)	100-Year 6-Hour Peak Discharge (cfs)	Time to Peak Discharge (hr)	100-Year 24-Hour Peak Discharge (cfs)	Time to Peak Discharge (hr)
SD01	0.87	821	4.5	742	12.5
SD02	0.78	1083	4.25	971	12.25
SD03	1.32	1224	4.5	1206	12.5
SD04	1.52	1561	4.42	1656	12.33
SD05	1.55	1425	4.42	1500	12.42
SD06	1.49	1861	4.33	1907	12.33
SD07	1.39	1489	4.5	1446	12.5
SD08	0.52	1289	4.17	1040	12.17
SD09	1.08	1352	4.58	1220	12.5
SD10	0.58	1164	4.25	952	12.25
SD11	0.73	1069	4.5	903	12.5
SD21	1.16	1054	4.5	1008	12.5
SD22	1.26	1217	4.42	1206	12.42
SD31	1.49	1729	4.33	1801	12.33
SD32	0.69	931	4.42	788	12.33
SD33	1.26	1263	4.58	1194	12.58
SD41	0.93	1111	4.5	995	12.42
SD42	0.55	868	4.33	713	12.33
SD43	1.32	1755	4.42	1675	12.42
CSD02	1.65	1410	4.33	1531	12.33
CSD03	4.49	3070	4.5	4164	12.42
CSD04	3.18	2314	4.5	2984	12.42
CSD05	8.46	4859	4.58	7137	12.5
CSD05A	6.04	3772	4.58	5247	12.5
CSD06	9.94	5304	4.67	8019	12.58
CSD07	14.78	7164	4.83	10719	12.75
CSD07A	11.34	5619	4.92	8512	12.83
CSD08	18.1	8743	4.83	12651	12.75
CSD08A	15.3	7261	4.83	10780	12.83
CSD09	19.18	8733	5.17	12689	13.08
CSD10	20.49	8993	5.25	12949	13.25
CSD11	19.91	8975	5.08	12961	13.08
CSD22	2.41	1724	4.58	1919	12.5
CSD33	3.44	2790	4.67	3408	12.58
CSD41	2.8	2667	4.5	2954	12.5
CSD42	1.48	1680	4.42	1681	12.42

Table 9 – 100-Year Hydrologic Results Summary for Ox Wash

HEC-1 I.D.	Contributing Drainage Area (sq. mi.)	100-Year 6-Hour Peak Discharge (cfs)	Time to Peak Discharge (hr)	100-Year 24-Hour Peak Discharge (cfs)	Time to Peak Discharge (hr)
OX1	1.64	1618	4.67	1583	12.58
OX2	1.62	1691	4.58	1649	12.58
OX3	0.7	747	4.75	633	12.75
OX4	1.82	1925	4.58	1908	12.58
OX5	1.03	1767	4.25	1677	12.25
OX6	0.12	360	4.08	290	12.08
OX7	0.08	273	4.08	218	12.08
OX21	1.0	1487	4.42	1361	12.42
OX22	0.46	904	4.33	728	12.25
COX1	3.97	3229	4.92	3319	12.92
COX2	3.26	2926	4.67	3220	12.58
COX4	5.79	4318	4.83	4624	12.83
COX5	6.81	4443	4.92	4722	12.92
COX6	6.93	4432	4.92	4726	12.92
COX7	8.47	5213	4.92	5734	12.92
COX21	1.46	1505	4.58	1521	12.58
COX22	8.39	5210	4.92	5742	12.83

Table 10 – 100-Year Hydrologic Results Summary for Little San Domingo Wash

HEC-1 I.D.	Contributing Drainage Area (sq. mi.)	100-Year 6-Hour Peak Discharge (cfs)	Time to Peak Discharge (hr)	100-Year 24-Hour Peak Discharge (cfs)	Time to Peak Discharge (hr)
LS01	1.23	1026	4.75	952	12.75
LS02	1.01	929	4.67	841	12.67
LS03	0.39	814	4.25	654	12.25
LS04	1.08	1486	4.42	1376	12.42
LS05	1.33	1429	4.67	1326	12.67
LS06	0.84	1149	4.5	1011	12.5
LS07	0.39	910	4.25	735	12.25
LS08	0.5	1050	4.25	852	12.25
LS09	0.76	1163	4.33	1021	12.33
LS11	0.26	486	4.33	395	12.33
LS12	0.13	378	4.17	305	12.17
LS21	0.51	791	4.42	644	12.42
LS22	0.33	787	4.25	632	12.25
CLS03	2.63	1791	4.75	1827	12.75
CLS04	3.71	2380	4.75	2395	12.5
CLS05	5.04	2819	5.17	2882	13.08
CLS06	5.88	3162	5.17	3281	13.08
CLS07	6.27	3178	5.17	3314	13.08
CLS08	6.77	3211	5.17	3360	13.08
CLS09	8.76	3943	4.75	4456	12.67
CLS10	7.16	3295	5.17	3466	13.17
CLS12	0.39	595	4.25	482	12.25
CLS22	8	3671	4.75	4089	12.58
CLS22A	0.84	999	4.33	891	12.25

4.5.2 Verification of Results

To verify the peak discharges comparisons were made with USGS data for Arizona, and with regional regression equations.

4.5.2.1 USGS Data for Arizona

The District has adopted a chart to describe the general relationship between peak discharges and watershed size for Maricopa County (Ref. 17).

This relationship is based on Log-Pearson Type 3 (LP3) regression curve analysis using USGS streamflow and statistical data taken from 314 continuous or partial-record gage stations throughout Arizona, and is a function of drainage area. The peak discharges from the HEC-1 output were plotted on the chart for comparison, as shown in Figure 4, and mostly lie within the 75th percentile confidence limits. Peak discharges that fall above the 75% confidence limit are from the downstream combination portions of San Domingo Wash, Mockingbird Wash and Monarch Wash. Detailed results are included in Appendix D.7.

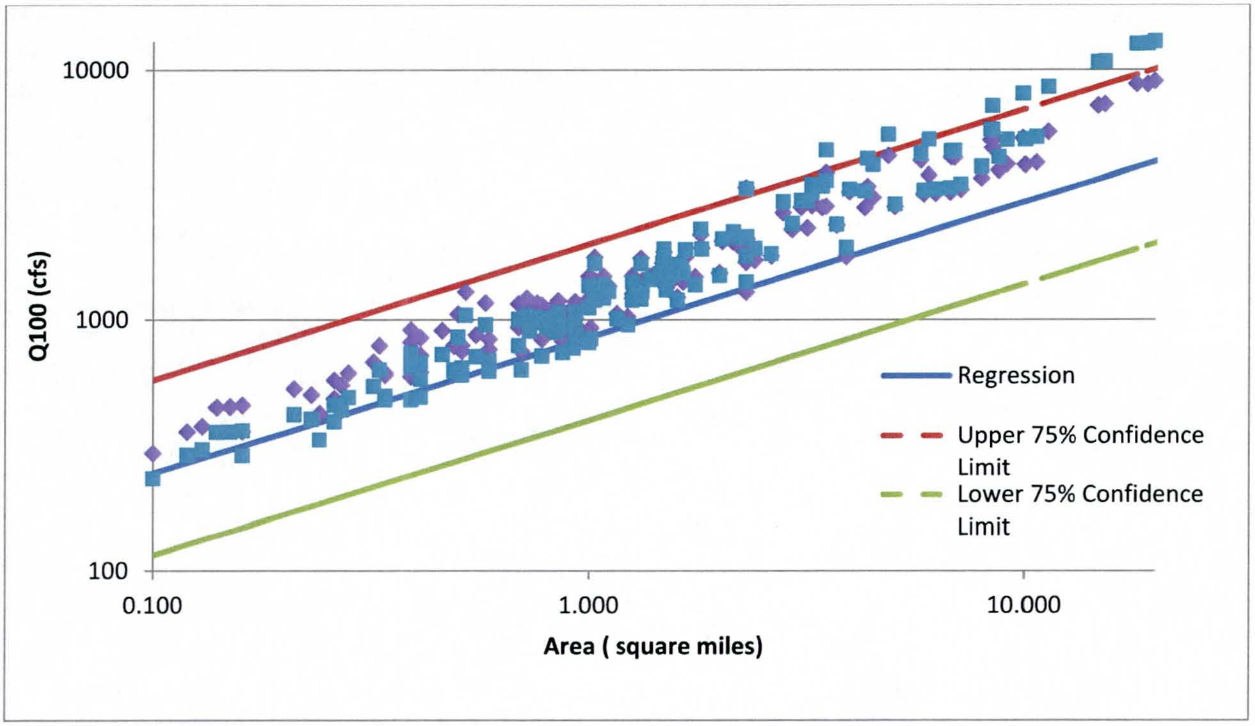


FIGURE 4 – COMPARISON OF 100-YR HEC-1 OUTPUT FOR PHASE 3 TRIBUTARIES WITH USGS DATA FOR ARIZONA

4.5.2.2 Regional Regression Equations

The USGS has developed regional regression equations for each region of the country. Within regional input variables are average watershed elevation and drainage area. Using detailed topographic mapping, the average elevation for the eastern tributaries is 2488.51 feet (NAVD88).

Figures 5, 6 & 7 show comparisons of the 10-Year, 50-Year, and 100-Year results, for the Phase 3 tributaries respectively. A review of the results indicates that the HEC-1 results tend to be higher than the regional regression results for the 10-year event, similar to the regional regression results for the 50-year event and lower than the regional regression results for the 100-year event. Detailed results are included in Appendix D.7.

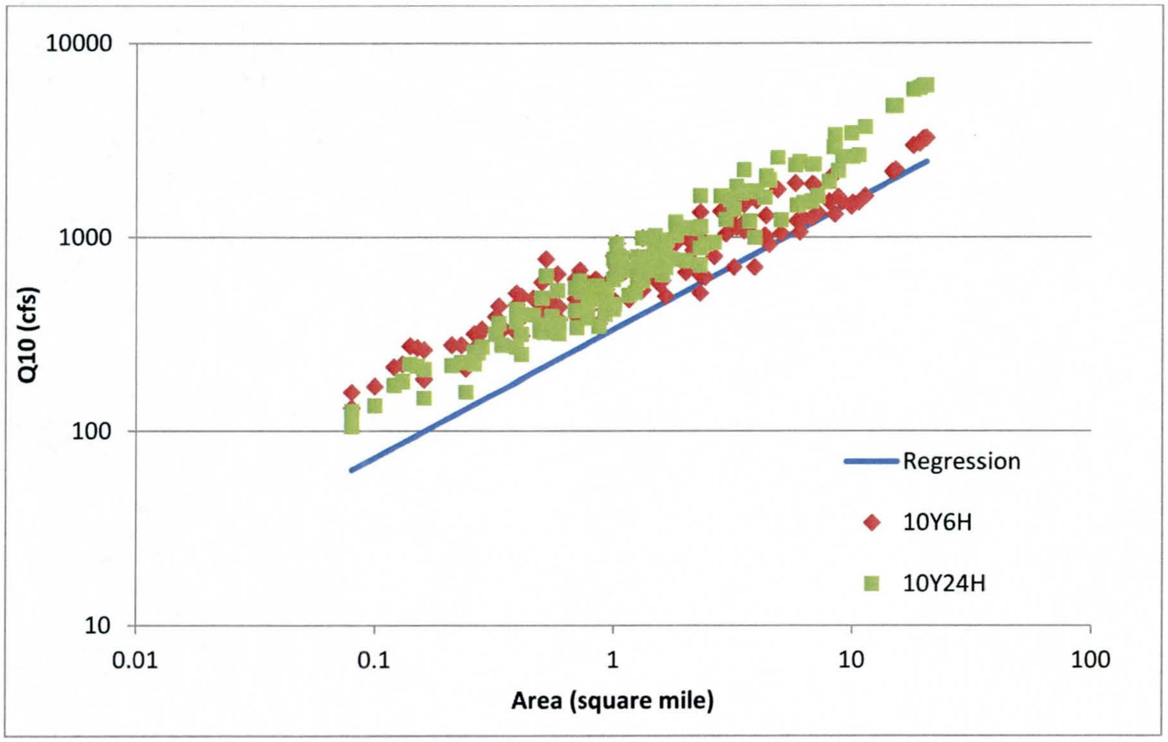


FIGURE 5 – COMPARISON OF 10-YR PHASE 3 TRIBUTARIES WATERSHEDS HEC-1 OUTPUT WITH USGS REGIONAL REGRESSION EQUATIONS

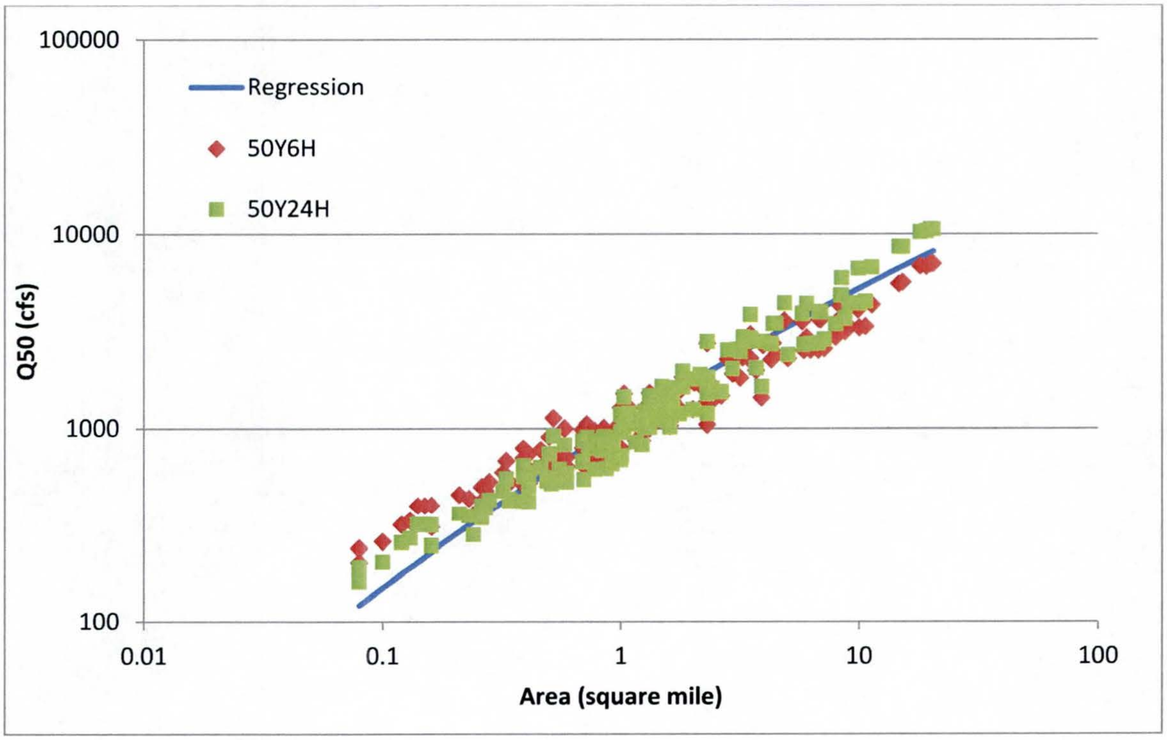


FIGURE 6 – COMPARISON OF 50-YR PHASE 3 TRIBUTARIES WATERSHED HEC-1 OUTPUT WITH USGS REGIONAL REGRESSION EQUATIONS

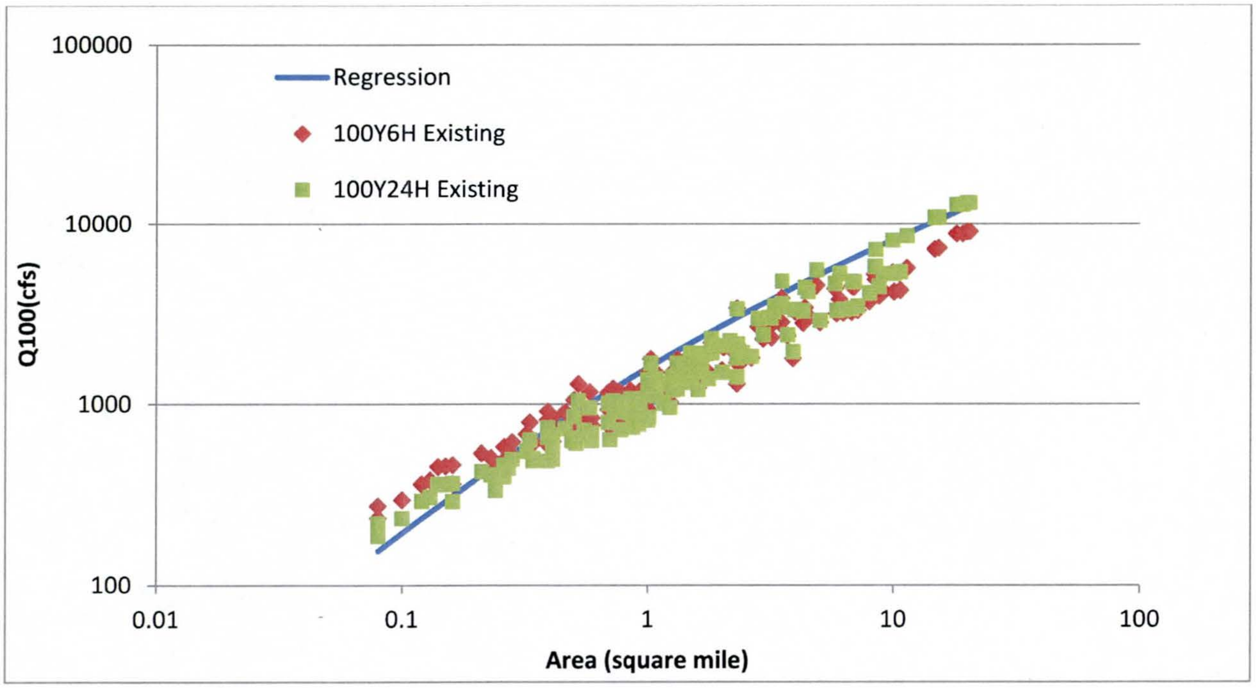


FIGURE 7 – COMPARISON OF 100-YR PHASE 3 TRIBUTARIES WATERSHED HEC-1 OUTPUT WITH USGS REGIONAL REGRESSION EQUATIONS

5 Hydraulics

5.1 Method Description

The effective Zone "AE" floodplain along the Phase 3 Tributaries was previously delineated in the WADMS-94 using HEC-2 hydraulic models. However, for this study, these existing condition wash delineations were updated using the US Army Corps of Engineers computer program, HEC-RAS version 4.1 (Ref. 37).

The downstream boundary conditions for Wash O, Mockingbird Wash, Wash M, Wash L, Wash K, Wash J, Wash I Monarch Wash, Wash H, Wash G, Wash HT07, Wash F, San Domingo Wash, Ox Wash and Little San Domingo Wash are summarized in Table 11 below.

Table 11 – Reach Boundary Conditions

Reach	Downstream Boundary Condition	Boundary Value	U.S. Joining Wash - D.S. Wash
Wash O	Normal Depth	S = 0.0198	N/A
Mockingbird Wash Reach 1	Junction	1	Mockingbird W R.1 - Mockingbird W Trib. 1
Mockingbird Wash Reach 2	Normal Depth	S = 0.0249	N/A
Mockingbird Wash Tributary 1	Junction	1	Mockingbird W R.1 - Mockingbird W R.2
Wash M Reach 1	Normal Depth	S = 0.05	N/A
Wash L Reach 1	Normal Depth	S = 0.034	N/A
Wash K Reach 1	Junction	1	Wash K R. 2 - Wash K Trib. 1
Wash K Reach 2	Normal Depth	S = 0.02	N/A
Wash K-1	Junction	1	Wash K R. 1 - Wash K R. 2
Wash J Reach 1	Normal Depth	S = 0.0195	N/A
Wash I Reach 1	Normal Depth	S = 0.0592	N/A
Monarch Wash Reach 1	Normal Depth	S = 0.0258	N/A
Wash H Reach 1	Normal Depth	S = 0.022	N/A
Wash G Reach 1	Normal Depth	S = 0.012	N/A
Wash HT07 Reach 1	Normal Depth	S = 0.022	N/A
Wash F Reach 1	Junction	8	Wash F R.2- Wash F Trib. 1
Wash F Reach 2	Normal Depth	S = 0.016	N/A
Wash F Tributary 1	Junction	8	N/A
San Domingo Wash Reach 1	Normal Depth	S = 0.015	N/A
Ox Wash Reach 1	Normal Depth	S = 0.006	N/A

Table 11 (Continued) – Reach Boundary Conditions

Reach	Downstream Boundary Condition	Boundary Value	U.S. Joining Wash - D.S. Wash
Little San Domingo Wash R. 1	Junction	21	L. San Domingo W. R.2 - L. San Domingo W.T.1
Little San Domingo Wash R. 2	Normal Depth	S = 0.0116	N/A
Little San Domingo Wash Trib. 1	Junction	21	L. San Domingo W. R.1 - L. San Domingo W.R.2
Wash S2	Junction	1	L. San Domingo W. R.2 - L. San Domingo W.R.3

5.2 Work Study Maps

Work study maps are prepared for the Phase 3 Tributaries washes at 1"=200-feet scale, and are included with this report.

5.3 Parameter Estimation

5.3.1 Roughness Coefficients

Manning's roughness coefficients ('n'-values) were chosen based on values presented in the Districts *Drainage Design Manual for Maricopa County, Volume II – Hydraulics* (Ref. 16) and the USGS *Selection of Manning's Roughness Coefficient for Natural and Constructed Vegetated and Non-Vegetated Channels* (Ref. 33). The range of 'n' values is summarized in Table 12. To give a representation of different segments of the study area, photographs and 'n'-value calculations are included in Appendix G.

Table 12 – HEC-RAS Manning's Roughness Coefficients

Location	Roughness Coefficient
Channel Banks	0.038-0.1
Channel Bottom	0.027-0.042
Concrete culverts	0.013
CMP culverts	0.019

5.3.2 Expansion and Contraction Coefficients

Expansion and contraction coefficients are based on values presented in the District's Hydraulics Drainage Design Manual (Ref. 16). Contraction and expansion values of 0.3 and 0.1 were used for cross-sections without dramatic differences. For cross-sections before and after culverts (Cross-Sections 2, 3 and 4), dramatic contraction and expansion cause a greater energy loss; therefore, 0.5 and 0.3 were used for the expansion and contraction coefficients, respectively.

5.3.3 Entrance Loss Coefficients

Culvert entrance loss coefficients were based on values presented in the HEC-RAS *Hydraulic Reference Manual*, dated March 2008 (Ref. 38). The coefficients chosen are summarized in Table 13.

Table 13 – Entrance Loss Coefficients

Culvert ID	Wash Name	River Station	Road Crossing	Material	Shape	Entrance Type	Entrance Loss Coefficient
O_100	Wash O	0.217	US 60	CBC	Box	Wingwalls flared (30-75 deg)	0.5
MOC_100	Mockingbird Wash	0.302	US 60	CBC	Box	Wingwalls flared (30-75 deg)	0.5
MOC_200	Mockingbird Wash	0.302	US 60	CBC	Box	Wingwalls flared (30-75 deg)	0.5
M_100	Wash M	0.473	US60	CBC	Box	Wingwalls flared (30-75 deg)	0.5
L_100	Wash L	0.414	US 60	CBC	Box	Wingwalls flared (30-75 deg)	0.5
K_100	Wash K	0.127	US 60	Bridge	Bridge	N/A	N/A
K_200		0.109	US 60	Bridge	Bridge	N/A	N/A
J_100	Wash J	0.123	US 60	CBC	Box	Wingwalls flared (30-75 deg)	0.4
I_100	Wash I	0.122	US 60	Bridge	Bridge	N/A	N/A
MON_100	Monarch Wash	0.065	US 60	Bridge	Bridge	N/A	N/A
MON_200		0.05	US 60	Bridge	Bridge	N/A	N/A
H_100	Wash H	0.13	US 60	CBC	Box	Wingwalls flared (30-75 deg)	0.5
G_100	Wash G	0.172	US 60	CBC	Box	Wingwalls flared (30-75 deg)	0.5
HT07_100	Wash HT07	0.071	US 60	CBC	Box	Wingwalls flared (30-75 deg)	0.2
F_100	Wash F	0.079	US 60	CBC	Box	Wingwalls flared (30-75 deg)	0.2
F_200		0.917	Driveway	CMP	Circular	Headwall	0.9
SAN_100	San Domingo Wash	0.067	US 60	Bridge	Bridge	N/A	N/A

Table 13 (Continued) – Entrance Loss Coefficients

Culvert ID	Wash Name	River Station	Road Crossing	Material	Shape	Entrance Type	Entrance Loss Coefficient
OX_100	Ox Wash	0.371	RR Bridge	Bridge	Bridge	N/A	N/A
OX_200		0.842	US 60	CBC	Box	Wingwalls flared (30-75 deg)	0.5
LIT_100	Little San Domingo Wash	2.049	RR Bridge	Bridge	Bridge	N/A	N/A
LIT_200		2.197	US 60	CBC	Box	Wingwalls flared (30-75 deg)	0.5
LIT_300		3.081	SR 74	CBC	Box	Wingwalls flared (30-75 deg)	0.5
LIT_400	Little San Domingo Wash Tributary 1	0.913	RR Bridge	Concrete	Arch	90 Degree Headwall	0.5
LIT_500		1.195	US 60	CBC	Box	Wingwalls flared (30-75 deg)	0.4

5.4 Cross-Section Description

HEC-RAS geometry data is obtained from the two-foot contour interval topographic mapping provided by the District, dated 2004 and 2013. HRC provided supplemental ground survey as documented in the *Phase 3 Survey Report* (Ref. 28). Elevations for the study are on the NAVD88 vertical datum.

Cross-sections were located along the washes such that the distance between two consecutive sections is approximately 500-feet. Cross-sections were placed perpendicular to the flow paths as much as possible. Additional cross-sections were provided upstream and downstream of culvert crossings, based on placement recommendations in the *HEC-RAS Hydraulic Reference Manual* (Ref. 38). HEC-RAS Cross-Section plots are located in Appendix E.5.4.

5.5 Modeling Considerations

5.5.1 Hydraulic Jump

All models were run with subcritical regime mode to obtain conservative WSELs. The locations of hydraulic jumps, if any, were not determined.

5.5.2 Culverts and Bridges

There are sixteen culverts and eight bridges within the Phase 3 Tributaries. The dimensions for these culverts were obtained from the field survey prepared by HRC. Many of these culverts were previously modeled in the WADMS-94. Refer to Table 14 for a summary of all structures included in the Phase 3 Tributaries HEC-RAS analysis. Also, refer to Appendix C for the field survey information.

Table 14 – Culvert Summary

Culvert ID	Wash Name	River Station	Road Crossing	Material	Shape	Size	Length
O_100	Wash O	0.217	US 60	CBC	Box	3-8' x 10'	154'
MOC_100	Mockingbird Wash	0.302	US 60	CBC	Box	2-4-5' x 20'	43'
MOC_100		0.302	US 60	CBC	Box	4-4-5' x 10.1'	56'
M_100	Wash M	0.473	US60	CBC	Box	1-7' x 8'	220'
L_100	Wash L	0.414	US 60	CBC	Box	2-6' x 8'	182'
K_100	Wash K	0.127	US 60	Bridge	Bridge	3-2.5' x 10'*	86'
K_200		0.109	US 60	Bridge	Bridge	3-2.5' x 10'*	78'
J_100	Wash J	0.123	US 60	CBC	Box	1-7' x 8'	127'
I_100	Wash I	0.122	US 60	Bridge	Bridge	3-3' x 10'*	116'
MON_100	Monarch Wash	0.065	US 60	Bridge	Bridge	6-Varied Size	37.5
MON_200		0.05	US 60	Bridge	Bridge	6-Varied Size	40.7
H_100	Wash H	0.13	US 60	CBC	Box	3-5' x 10'	116.1'
G_100	Wash G	0.172	US 60	CBC	Box	1-1.66' x 6'*	141'
HT07_100	Wash HT07	0.071	US 60	CBC	Box	2-6' x 10'	111'
F_100	Wash F	0.079	US 60	CBC	Box	1-6' x 6'	131.8'
F_200		0.917	Private Driveway	CMP	Circular	1-3' x 3'	52'
SAN_100	San Domingo Wash	0.067	US 60	Bridge	Bridge	1-41.09' x 96.5'	87'
OX_100	Ox Wash	0.371	RR Bridge	Bridge	Bridge	1-29.1' x 15'	15'
OX_200		0.842	US 60	CBC	Box	3-10' x 10'	282'
LIT_100	Little San Domingo Wash	2.049	RR Bridge	Bridge	Bridge	1-18.6' x 140'	20'
LIT_200		2.197	US 60	CBC	Box	4-8' x 10'	217'
LIT_300		3.081	SR 74	CBC	Box	4-8' x 10'	93.3'
LIT_400	Little San Domingo Wash Tributary 1	0.913	RR Bridge	Concrete	Arch	1-3.6' x 3'	92.7'
LIT_500		1.195	US 60	CBC	Box	1-5' x 6'	201'

Notes: *Culverts not modeled in WADMS-94 study
**Culvert heavily silted. Actual height of box unknown.

5.5.2.1 Mockingbird Bridge Analysis

MOC_100 and MOC_200 are the bridges for the north and south bound lanes of US60 crossing Mockingbird Wash respectively. The upstream structure (MOC_100) comprises of 2- 4.5-foot x 20-foot box culverts whereas the downstream structure (MOC_200) is made of 4-4.5-foot x 10-foot box culverts. Due to their close proximity and similar hydraulic capacities, the two structures were modeled as 2-4.5-foot x 10-foot boxes with a width spanning both bridges in the HEC-RAS model.

5.5.2.2 Little San Domingo Railroad Bridge Analysis

The Burlington Northern Santa Fe (BNSF) Railroad crossed the Little San Domingo Wash at bridge structure LIT_100. The BNSF railroad has designed a new bridge crossing to improve the hydraulic capacity of this crossing and was submitted and approved by FEMA for a CLOMR (No. 13-09-2632R, Ref. 5). The bridge data from the CLOMR was incorporated into the hydraulic model and is included in Appendix E.4.

5.5.3 Levees and Dikes

No levees or dikes were modeled as part of this study.

5.5.4 Islands and Flow Splits

The landform within the study area is generally mountainous and some of the washes do not have the capacity to convey the 100-year flow within the top of banks. As a result, it is possible for flow splits to occur causing islands to be formed within the floodplains.

5.5.4.1 Mockingbird Wash Outlet

Downstream of US 60, the main channel for Mockingbird Wash does not have the capacity to contain the 100 or 500–year flow causing the main channel banks to overtop with flows going into the low lying areas in the right and left overbank. These areas are significantly lower than the main wash. To keep smaller storms contained in the main wash, levee stations were used in the cross-sections downstream of US 60. These levee stations keep the 10 and 50-year flow within the main channel but allow the 100- and 500-year flows to overtop.

5.5.4.2 Little San Domingo / Wash S2 Flow Split

Upstream of its confluence with Little San Domingo Tributary 1, a portion of the flow within Little San Domingo Wash branches to the south, creating a braided distributary flow area. Most of this flow is contained and joins back with the main wash; however, some of the flow overtops a natural ridge and flows to Wash S2. The amount of flow overtopping the natural ridge was modeled by optimizing a lateral structure that follows the contours of the ridge. The overtopping flow was added to the flow in Wash S2.

5.5.5 Ineffective Flow Areas

Ineffective flow is modeled upstream and downstream of roadway culverts and Railroad crossings up to the elevation of the top of the roadway/Railroad. In some locations where the 100-year flow overtops the roadway, it was noted that the ineffective areas had an unreasonable impact on the energy grade lines of most or all of the flow profiles in the HEC-RAS model. At these locations, ineffective flow areas were removed or modified. Ineffective flow modeled upstream and downstream of the Railroad crossing, at culverts and at some other cross-sections is based upon recommended guidelines in the HEC-RAS Manual (Ref. 39).

5.5.6 Supercritical Flow

All models were run with subcritical regime mode to obtain conservative water surface elevations. No reaches of supercritical flow modeled as part of this study.

5.6 Floodway Modeling

Floodway modeling was performed on previously studied washes; including, Wash O, Mockingbird Wash Reaches 1-2, Mockingbird Wash Tributary 1, Wash L, Wash K Reaches 1-2, Wash K-1, Wash I, Monarch Wash, Wash H, Wash G, Wash F Reaches 1-2, Wash F Tributary 1, San Domingo Wash, Ox Wash, and Little San Domingo Wash Reach 2. The WADMS-94 included partial floodway modeling for Little San Domingo Wash Reach 1. Floodway calculations and delineations were only performed for the same extents as the WADMS-94. No floodway modeling was performed on Wash M, Wash J, Wash HT07, Little San Domingo Wash Tributary 1 or Wash S2.

With floodway encroachment stations limited to the bank stations Encroachment Method #4 was used first for floodway calculations, followed by Encroachment Method #1. Encroachment limits were then modified as necessary to optimize the floodway WSEL. Additional parameters on the encroachment stations include:

- Floodway WSEL is to be no greater than 1-foot above the floodplain WSEL.
- Floodway WSEL is to have no negative surcharge.
- The floodway delineation is to be generally smooth and consistent within segments of the wash.

5.7 Problems Encountered During the Study

5.7.1 Special Problems and Solutions

There are no problem areas found within the study area.

5.7.2 Modeling Warning and Error Messages

Though there are many modeling warning and error messages associated with HEC-RAS, these do not affect the accuracy of the results. Warnings and error messages include: Check-RAS NT, Check-RAS XS, Check-RAS Structures and Check-RAS Floodway. Refer to Appendix E.5.6 for the summary of the warning and error messages.

5.8 Calibration

No hydraulic modeling calibration was performed as part of this study.

5.9 Final Results

5.9.1 Hydraulic Analysis Results

Floodplains were delineated using the HEC-RAS 4.1 computer program (Ref. 37). Resulting floodplain delineations are shown on the Work Maps (included in this report).

The 100-year HEC-1 flows used in the HEC-RAS models are summarized in Table 15 with the full HEC-1 output located in Appendix D.6. The flows used for each reach are pro-rated or taken directly from selected concentration points in the HEC-1 model. Refer to Exhibits 6.D1-6.E4 for the locations of pro-rated flows and Appendix E for a full HEC-RAS flow summary table. The HEC-RAS results for the 100-year peak flows are summarized in Table 16. HEC-RAS output reports, tables, and cross-sections are included in Appendix E.5. Zone A transitions between detailed delineations and approximate were modified as necessary.

The 10-, 50-, 100- and the 500-year, flow summary table used in the HEC-RAS models are included in Appendix E.5.3.

Table 15 – 100-Year Flows Used for HEC-RAS Modeling

River / Reach Name	HEC-1 ID	100-Year Peak Discharge (cfs)
Wash O / Reach 1	C03	2412
Mockingbird Wash / Reach 1	CMB04	4735
	CMB07	5482
Mockingbird Wash / Reach 2	CMB07	5482
Mockingbird Wash Tributary 1 / Reach 1	CMB22	1052
	CMB23	1492
Wash M / Reach 1	M01	679
Wash L / Reach 1	L01	1072
Wash K / Reach 1	CK03	1432
Wash K / Reach 2	CK04 (pro-rated)	2664
	CK04	2988
Wash K-1/ Reach 1	K02	1139
Wash J / Reach 1	J01	721
Wash I / Reach 1	CI03	2139
Wash H / Reach 1	H01 (pro-rated)	1253
	H01	1480
Monarch Wash / Reach 1	CMW22 (pro-rated)	1782
	CMW22	1936
	CMW06	5230
	CMW07	5241
	CMW08	5357
Wash G / Reach 1	G01	620
Wash F- Reach 1	F01 (pro-rated)	287
Wash F- Reach 2	F01	577
Wash F Tributary / Reach 1	F01 (pro-rated)	218
Basin HT07 / Reach 1	HT07	1063
Ox Wash / Reach 1	COX1	3319
	COX5	4722
	COX6	4726
	COX7	5734
San Domingo Wash - Reach 1	CSD09	12689
	CSD10	12949
Little San Domingo - Reach 1	CLS05	2882
	CLS07 (pro-rated)	2986
	CLS07	3314
	CLS08	3360
	CLS10	3466

Table 15 (Continued)– 100-Year Flows Used for HEC-RAS Modeling

River / Reach Name	HEC-1 ID	100-Year Peak Discharge (cfs)
Little San Domingo - Reach 2	CLS09 (pro-rated)	4061
	CLS09	4456
Little San Domingo - Reach 3	CLS09	4456
Little San Domingo Tributary 1 - Reach 1	LS21	791
	CLS22a	999
Wash S2 - Reach 1	LS09 (pro-rated)	450
	LS09 (pro-rated+weir)	461

Note: Pro-rated flow (Refer to Exhibits 6.D1-6.E4)

Table 16 – HEC-RAS Results for 100-Year Event

Note: Elevations shown are on the NAVD88 Datum.

River Station (RS)	Water Surface Elevation (ft)	Peak Discharge (cfs)
Wash O - Reach 1		
1.559	2185.7	2412
1.45	2171.96	2412
1.349	2158.36	2412
1.255	2147.35	2412
1.151	2133.01	2412
1.061	2120	2412
0.968	2109.63	2412
0.868	2095.68	2412
0.783	2083.85	2412
0.719	2075.71	2412
0.686	2069.12	2412
0.653	2064.05	2412
0.584	2056.4	2412
0.505	2044.42	2412
0.411	2035.07	2412
0.339	2026.94	2412
0.283	2022.06	2412
0.235	2021.94	2412
0.217	Culvert	
0.205	2013.25	2412
0.159	2007.3	2412
0.123	2005.11	2412
Mockingbird Wash - Reach 1		
2.28	2257.11	4735
2.245	2250.67	4735
2.191	2242.41	4735
2.137	2235.8	4735
2.052	2227.21	4735
1.985	2216.22	4735
1.95	2211.4	4735
1.872	2199.07	4735
1.787	2189.61	4735
1.712	2181.67	4735
1.62	2170.73	4735
1.568	2162.67	4735
1.523	2159.16	4735
1.451	2142.57	4735
1.36	2126.99	4735
1.304	2118.52	4735

Table 16 (Continued) – HEC-RAS Results for 100-Year Event

Note: Elevations shown are on the NAVD88 Datum.

River Station (RS)	Water Surface Elevation (ft)	Peak Discharge (cfs)
Mockingbird Wash - Reach 1 (Continued)		
1.244	2109.81	4735
1.178	2103.05	4735
1.094	2089.74	4735
1.005	2077.22	4735
0.965	2071.39	4735
0.917	2065.68	4735
0.856	2056.17	5482
0.801	2049.06	5482
Mockingbird Wash - Reach 2		
0.713	2040.02	5482
0.609	2028.29	5482
0.561	2023.16	5482
0.504	2018.61	5482
0.416	2008.3	5482
0.369	2002.08	5482
0.324	1997.73	5482
0.31	1997.48	5482
0.302	Culvert	
0.272	1992.47	5482
0.236	1987.81	5482
Mockingbird Wash Tributary 1 - Reach 1		
0.385	2083.37	1052
0.287	2070.64	1052
0.243	2065.37	1492
Wash M - Reach 1		
1.039	2067.02	679
0.944	2050.69	679
0.872	2041.32	679
0.769	2030.63	679
0.67	2008.08	679
0.58	1996.88	679
0.494	1990.08	679
0.473	Culvert	
0.448	1977.85	679
0.354	1968.7	679
0.255	1965.81	679
Wash L - Reach 1		
1.658	2154.35	1072
1.618	2148.15	1072

Table 16 (Continued) – HEC-RAS Results for 100-Year Event

Note: Elevations shown are on the NAVD88 Datum.

River Station (RS)	Water Surface Elevation (ft)	Peak Discharge (cfs)
Wash L - Reach 1 (Continued)		
1.561	2135.81	1072
1.505	2126.92	1072
1.463	2120.08	1072
1.408	2111.97	1072
1.364	2105.5	1072
1.326	2099.75	1072
1.29	2097.2	1072
1.25	2080.69	1072
1.214	2070.85	1072
1.179	2066.94	1072
1.131	2061.31	1072
1.081	2054.05	1072
1.037	2050.07	1072
0.962	2041.75	1072
0.902	2034.49	1072
0.825	2025.83	1072
0.78	2020.7	1072
0.713	2012.7	1072
0.668	2007.21	1072
0.618	2001.45	1072
0.586	1997.77	1072
0.52	1991.34	1072
0.492	1987.69	1072
0.444	1985.24	1072
0.426	1985.24	1072
0.414	Culvert	
0.375	1972.87	1072
0.309	1960.02	1072
0.241	1946.74	1072
Wash K- Reach 1		
3.757	2398.54	1432
3.712	2394.11	1432
3.628	2385.55	1432
3.55	2377.31	1432
3.481	2370.01	1432
3.386	2358.16	1432
3.305	2349.33	1432
3.213	2338.2	1432
3.123	2326.46	1432

Table 16 (Continued) – HEC-RAS Results for 100-Year Event

Note: Elevations shown are on the NAVD88 Datum.

River Station (RS)	Water Surface Elevation (ft)	Peak Discharge (cfs)
Wash K- Reach 1 (Continued)		
3.076	2321.48	1432
3.02	2313.36	1432
2.964	2305.18	1432
Wash K- Reach 2		
2.895	2294.81	2664
2.803	2285.46	2664
2.707	2275.18	2664
2.619	2265.37	2664
2.533	2254.49	2664
2.475	2247.03	2664
2.404	2239.55	2664
2.329	2230.59	2664
2.235	2221.5	2664
2.141	2210.32	2664
2.046	2196.9	2664
1.976	2189.54	2664
1.902	2184.48	2664
1.843	2178.77	2664
1.754	2168.24	2664
1.709	2163.18	2664
1.642	2154.6	2664
1.561	2145.7	2988
1.487	2137.93	2988
1.387	2126.97	2988
1.317	2119.58	2988
1.227	2107.68	2988
1.144	2097.79	2988
1.047	2087.43	2988
0.951	2076.1	2988
0.851	2063.12	2988
0.759	2050.06	2988
0.693	2039.47	2988
0.644	2019.29	2988
0.567	2007.56	2988
0.501	2000.76	2988
0.434	1992.49	2988
0.379	1983.99	2988
0.288	1972.86	2988
0.192	1968.27	2988
0.157	1968.28	2988

Table 16 (Continued) – HEC-RAS Results for 100-Year Event

Note: Elevations shown are on the NAVD88 Datum.

River Station (RS)	Water Surface Elevation (ft)	Peak Discharge (cfs)
Wash K- Reach 2 (Continued)		
0.138	1968.28	2988
0.127	Bridge	
0.119	1963.5	2988
0.117	1963.49	2988
0.109	Bridge	
0.1	1954.33	2988
0.097	1952.33	2988
Wash K-1 - Reach 1		
0.821	2399.35	1139
0.742	2387.69	1139
0.633	2374.11	1139
0.546	2361.76	1139
0.464	2354.69	1139
0.382	2344.24	1139
0.292	2333.37	1139
0.249	2327.04	1139
0.223	2324.76	1139
0.175	2316.55	1139
0.144	2313.25	1139
0.073	2303.63	1139
Wash J - Reach 1		
0.676	2032.88	721
0.58	2014.31	721
0.488	1995.84	721
0.399	1970.16	721
0.297	1943.55	721
0.208	1939.1	721
0.138	1939.12	721
0.123	Culvert	
0.11	1931.19	721
Wash I - Reach 1		
1.34	2074.52	2139
1.237	2063.22	2139
1.142	2052.74	2139
1.044	2042.1	2139
0.939	2028.61	2139
0.839	2016.69	2139

Table 16 (Continued) – HEC-RAS Results for 100-Year Event

Note: Elevations shown are on the NAVD88 Datum.

River Station (RS)	Water Surface Elevation (ft)	Peak Discharge (cfs)
Wash I - Reach 1 (Continued)		
0.741	2003.33	2139
0.662	1994.25	2139
0.597	1984.91	2139
0.526	1978.62	2139
0.502	1976.06	2139
0.442	1969.15	2139
0.352	1957.21	2139
0.274	1948.29	2139
0.206	1940.49	2139
0.147	1939.2	2139
0.129	1939.01	2139
0.122	Bridge	
0.106	1930.28	2139
Monarch Wash - Reach 1		
3.984	2374.04	1782
3.874	2359.34	1782
3.774	2345.13	1782
3.661	2332.04	1782
3.56	2318.13	1782
3.451	2303.01	1782
3.347	2289.09	1782
3.239	2274.05	1936
3.13	2257.58	1936
3.024	2244.15	1936
2.908	2228.77	1936
2.806	2215.71	1936
2.695	2202.2	1936
2.592	2187.29	1936
2.486	2174.91	1936
2.382	2164.01	5230
2.301	2154.65	5241
2.205	2143.41	5241
2.093	2130.35	5241
1.973	2119	5241
1.88	2106.52	5241
1.763	2092.49	5241
1.66	2079.34	5241
1.554	2067.16	5241

Table 16 (Continued) – HEC-RAS Results for 100-Year Event

Note: Elevations shown are on the NAVD88 Datum.

River Station (RS)	Water Surface Elevation (ft)	Peak Discharge (cfs)
Monarch Wash - Reach 1 (Continued)		
1.431	2056.06	5241
1.327	2044.05	5241
1.24	2033.1	5241
1.131	2022.59	5241
1.035	2012.58	5241
0.928	2002.09	5241
0.831	1991.99	5241
0.739	1982.33	5241
0.658	1971.32	5241
0.556	1961.19	5357
0.444	1950.39	5357
0.361	1940.76	5357
0.286	1931.45	5357
0.192	1924.96	5357
0.076	1914.19	5357
0.065	Bridge	
0.06	1913.58	5357
0.055	1913.66	5357
0.05	Bridge	
0.042	1910.83	5357
Wash H - Reach 1		
1.915	2054.42	1253
1.792	2044.92	1253
1.686	2035.73	1253
1.556	2024.87	1253
1.449	2015.75	1253
1.313	2004.43	1253
1.209	1997.15	1253
1.11	1987.92	1253
1.006	1979.17	1480
0.899	1970.81	1480
0.796	1960.03	1480
0.702	1950.02	1480
0.603	1939.62	1480
0.521	1930.88	1480
0.418	1920.01	1480
0.318	1908.28	1480

Table 16 (Continued) – HEC-RAS Results for 100-Year Event

Note: Elevations shown are on the NAVD88 Datum.

River Station (RS)	Water Surface Elevation (ft)	Peak Discharge (cfs)
Wash H - Reach 1 (Continued)		
0.214	1898.96	1480
0.143	1895.26	1480
0.13	Culvert	
0.117	1891.78	1480
Wash G - Reach 1		
1.233	2023.57	620
1.149	2014.57	620
1.089	2008.38	620
1.011	1999.71	620
0.909	1990.57	620
0.823	1983.77	620
0.737	1972.26	620
0.643	1960.55	620
0.555	1948.11	620
0.477	1935.66	620
0.398	1922.25	620
0.316	1899.09	620
0.229	1895.18	620
0.184	1895.16	620
0.172	Culvert	
0.151	1881.25	620
Wash HT07- Reach 1		
1.499	2072.69	1063
1.419	2064.38	1063
1.332	2055.33	1063
1.226	2045.44	1063
1.125	2035.91	1063
1.041	2027.29	1063
0.945	2018.7	1063
0.865	2010.13	1063
0.78	2001.28	1063
0.698	1993.13	1063
0.619	1984.55	1063
0.547	1976.31	1063
0.468	1963.52	1063
0.381	1929.19	1063
0.293	1913.48	1063
0.207	1891.38	1063
0.154	1883.92	1063

Table 16 (Continued) – HEC-RAS Results for 100-Year Event

Note: Elevations shown are on the NAVD88 Datum.

River Station (RS)	Water Surface Elevation (ft)	Peak Discharge (cfs)
Wash HT07- Reach 1 (Continued)		
0.082	1878.57	1063
0.071	Culvert	
0.058	1867.29	1063
Wash F - Reach 1		
1.094	2030.14	287
1.021	2024.01	287
0.94	2018.81	287
0.92	2018.84	287
0.9165	Culvert	
0.9101	2014.07	287
0.895	2012.85	287
0.798	2006.05	287
0.754	2000.65	287
0.691	1996.06	287
0.597	1987.6	287
0.504	1979.19	287
0.396	1932.57	287
0.302	1888.6	287
0.213	1874.57	287
Wash F - Reach 2		
0.132	1874.82	577
0.095	1874.54	577
0.079	Culvert	
0.065	1864.29	577
Wash F Tributary 1 - Reach 1		
0.406	1954.45	218
0.3	1933.97	218
0.212	1914.57	218
0.134	1896.83	218
0.047	1879.54	218
San Domingo Wash - Reach 1		
2.328	2024.81	12689
2.185	2013.65	12689
2.059	2007.43	12689
1.951	1998.18	12689
1.834	1988.2	12689
1.719	1975.76	12689
1.582	1967.33	12689
1.455	1957.65	12689

Table 16 (Continued) – HEC-RAS Results for 100-Year Event

Note: Elevations shown are on the NAVD88 Datum.

River Station (RS)	Water Surface Elevation (ft)	Peak Discharge (cfs)
San Domingo Wash - Reach 1 (Continued)		
1.353	1949.14	12689
1.248	1941.25	12689
1.148	1933.28	12689
1.039	1924.05	12949
0.934	1915.23	12949
0.826	1906.9	12949
0.741	1898.8	12949
0.663	1890.41	12949
0.566	1880.75	12949
0.47	1875.03	12949
0.389	1873.31	12949
0.298	1869.84	12949
0.203	1870.87	12949
0.114	1870.01	12949
0.078	1863.79	12949
0.067	Bridge	
0.057	1860.48	12949
0.042	1860.91	12949
Ox Wash - Reach 1		
2.186	1985.26	3319
2.068	1975.85	3319
1.968	1969.59	3319
1.856	1963.01	3319
1.746	1954.74	4722
1.63	1945.89	4722
1.519	1937.28	4722
1.402	1928.46	4722
1.28	1920.88	4722
1.175	1911.68	4722
1.073	1903.36	4722
0.979	1900.71	4722
0.872	1900.19	4722
0.842	Culvert	
0.812	1879.84	4726
0.757	1876.88	4726
0.669	1869.21	4726
0.576	1858.89	4726
0.496	1852.55	4726

Table 16 (Continued) – HEC-RAS Results for 100-Year Event

Note: Elevations shown are on the NAVD88 Datum.

River Station (RS)	Water Surface Elevation (ft)	Peak Discharge (cfs)
Ox Wash - Reach 1 (Continued)		
0.413	1847.66	4726
0.373	1846.11	4726
0.371	Bridge	
0.368	1844.41	5734
0.335	1841.73	5734
0.248	1836.18	5734
Little San Domingo Wash - Reach 1		
4.599	2105.57	2882
4.496	2098.26	2882
4.387	2088.34	2882
4.281	2082.91	2882
4.17	2075.35	2882
4.066	2069.42	2882
3.972	2064.54	2882
3.867	2057.93	2882
3.753	2051.98	2882
3.623	2044.09	2882
3.497	2036.58	2882
3.381	2029.76	2882
3.268	2024.72	2882
3.15	2018.82	2882
3.093	2019.28	2882
3.081	Culvert	
3.069	2008.32	2882
3.022	2006.45	2986
2.923	2001.18	2986
2.817	1994.07	2986
2.7	1986.63	2986
2.594	1981.42	2986
2.477	1975.33	3314
2.374	1969	3314
2.256	1963.77	3314
2.208	1963.43	3314
2.197	Culvert	
2.161	1948.13	3360
2.083	1944.06	3360
2.051	1941.39	3360
2.0488	Bridge	

Table 16 (Continued) – HEC-RAS Results for 100-Year Event

Note: Elevations shown are on the NAVD88 Datum.

River Station (RS)	Water Surface Elevation (ft)	Peak Discharge (cfs)
Little San Domingo Wash - Reach 1 (Continued)		
2.047	1940	3360
2.0451	1939.82	3360
2.045	1939.19	3360
2.044	1938.89	3360
2.043	1937.89	3360
2.039	1936.33	3360
2.037	1935.16	3360
2.004	1932.57	3360
1.928	1926.28	3360
1.782	1916.05	3360
1.669	1906.53	3360
1.564	1897.65	3360
1.441	1888.07	3360
1.321	1876.65	3360
1.211	1868.27	3466
1.085	1858.81	3466
0.978	1851.57	3466
0.9779	Lateral Structure	
0.896	1846.8	3466
Little San Domingo Wash - Reach 2		
0.687	1830.04	4061
0.597	1822.8	4456
Little San Domingo Wash - Reach 3		
0.476	1814.21	4456
0.368	1806.03	4456
0.253	1798.1	4456
0.145	1790.75	4456
Little San Domingo Wash Tributary 1 - Reach 1		
2.131	2018.12	791
2.031	2011.3	791
1.918	2004.08	791
1.801	1995.7	791
1.682	1986.97	791
1.561	1978.38	791
1.444	1966.67	791
1.319	1956.98	791
1.225	1957.09	791
1.205	1957.09	791

Table 16 (Continued) – HEC-RAS Results for 100-Year Event

Note: Elevations shown are on the NAVD88 Datum.

River Station (RS)	Water Surface Elevation (ft)	Peak Discharge (cfs)
Little San Domingo Wash Tributary 1 - Reach 1 (Continued)		
1.195	Culvert	
1.163	1944.2	999
1.113	1944.18	999
1.008	1944.18	999
0.933	1944.18	999
0.924	1944.18	999
0.913	Culvert	
0.902	1915.29	999
0.884	1910.91	999
0.794	1903.29	999
0.674	1888.88	999
0.555	1877.14	999
0.439	1865.21	999
0.314	1853.89	999
0.206	1845.51	999
Wash S2 - Reach 1		
0.514	1854.21	450
0.427	1848.53	461
0.319	1840.54	461
0.219	1831.81	461

5.9.2 Verification of Results

The majority of the proposed floodplain delineations are similar to the effective FEMA delineation. However, variations are due to the increase in the 100-year flow rates, updated topography, revised 'n' values, land use changes and updated modeling techniques.

6 Erosion and Sediment Transport

Erosion and Sediment Transport are not covered under the Scope of this study.

7 Draft FIS Report Data

7.1 Summary of Discharges

The draft summary of discharges is provided in Table 17.

Table 17 – Summary of Discharges

Flooding Source and Location	Drainage Area (Square Miles)	Peak Discharges (cfs)			
		10-Year	50-Year	100-Year	500-Year
Wash O					
US 60 Crossing / at Hassaympa River	2.94	1236	2018	2412	3625
Mockingbird Wash					
Upstream of Confluence with Mockingbird Wash Tributary 1	5.14	2222	3813	4735	6748
US 60 Crossing / at Hassaympa River	6.5	2572	4382	5482	7840
Mockingbird Wash Tributary 1					
At Confluence with Mockingbird Wash	1.26	791	1268	1492	2096
Wash M					
US 60 Crossing / at Hassaympa River	0.32	387	588	679	890
Wash L					
US 60 Crossing / at Hassaympa River	0.8	553	909	1072	1452
Wash K					
At confluence with Wash K-1	1.03	698	1210	1432	1947
US 60 Crossing / at Hassaympa River	3.08	1567	2545	2988	4220
Wash K-1					
At Confluence with Wash K	0.78	577	963	1139	1548
Wash J					
US 60 Crossing / at Hassaympa River	0.41	380	614	721	969
Wash I					
US 60 Crossing / at Hassaympa River	2.31	1136	1823	2139	2884

Table 17 (Continued) – Summary of Discharges

Flooding Source and Location	Drainage Area (Square Miles)	Peak Discharges (cfs)			
		10-Year	50-Year	100-Year	500-Year
Monarch Wash					
US 60 Crossing / at Hassaympa River	10.65	2663	4473	5357	7957
Wash H					
US 60 Crossing / at Hassaympa River	1.76	766	1253	1480	2018
Wash G					
US 60 Crossing / at Hassaympa River	0.41	308	518	620	856
Wash HT07					
US 60 Crossing / at Hassaympa River	0.89	504	885	1063	1478
Wash F					
Upstream of confluence with Wash F Tributary 1	0.13	157	246	287	382
US 60 Crossing / at Hassaympa River	0.26	315	494	577	768
Wash F Tributary 1					
At Confluence with Wash F	0.1	119	186	218	290
San Domingo Wash					
US 60 Crossing / at Hassaympa River	20.49	6044	10611	12949	19326
Ox Wash					
At US 60 Crossing	6.81	2372	3958	4722	6663
At Railroad Crossing	6.93	2385	3957	4726	6692
At Hassayampa River	8.47	2932	4824	5734	8092
Little San Domingo Wash					
At SR 74 crossing	5.04	1228	2387	2882	4060
At US 60 crossing	6.27	1510	2709	3314	4722
At BNSF Railroad Crossing	6.77	1535	2733	3360	4840
Upstream of confluence with Little San Domingo Wash Tributary 1	7.16	1631	2865	3466	5036
At Hassayampa River	8.76	2200	3667	4456	6278

Table 17 (Continued) – Summary of Discharges

Flooding Source and Location	Drainage Area (Square Miles)	Peak Discharges (cfs)			
		10-Year	50-Year	100-Year	500-Year
Little San Domingo Wash Tributary 1					
At US 60 Crossing	0.51	419	674	791	1062
At Confluence with Little San Domingo Wash	0.84	512	843	999	1366
Wash S2					
At Confluence with Little San Domingo Wash	0.3	224	382	461	786

7.2 Floodway Data

The floodway data results are summarized in Table 18.

Table 18 – Floodway Data Summary

Cross-Section	Distance[1]	Floodway Width (feet)	Floodway Section Area (square feet)	Floodway Mean Velocity (feet per second)	Base Flood Water Surface Elevation Regulatory (Feet NAVD88)	Without Floodway (Feet NAVD88)	With Floodway (Feet NAVD88)	Increase (Feet NAVD88)
Wash O / Reach 1								
1.559	1.559	98	269.84	8.9	2185.7	2185.7	2186.59	0.9
1.450	1.450	55.00	222.73	10.8	2171.96	2171.96	2172.86	0.90
1.349	1.349	45.00	207.40	11.6	2158.36	2158.36	2159.29	0.93
1.255	1.255	35.84	187.26	12.9	2147.35	2147.35	2148.23	0.88
1.151	1.151	56.14	220.93	10.9	2133.01	2133.01	2133.79	0.78
1.061	1.061	62.00	227.58	10.6	2120.00	2120.00	2120.90	0.91
0.968	0.968	48.56	211.01	11.4	2109.63	2109.63	2110.46	0.83
0.868	0.868	97.30	259.16	9.3	2095.68	2095.68	2095.85	0.17
0.783	0.783	104.18	272.55	8.9	2083.85	2083.85	2084.71	0.86
0.719	0.719	89.75	276.65	8.7	2075.71	2075.71	2076.68	0.97
0.686	0.686	116.68	318.18	7.6	2069.12	2069.12	2070.10	0.98
0.653	0.653	177.00	382.20	6.3	2064.05	2064.05	2065.00	0.95
0.584	0.584	84.15	250.16	9.6	2056.40	2056.40	2057.25	0.85
0.505	0.505	160.11	301.70	8.0	2044.42	2044.42	2045.41	0.98
0.411	0.411	132.35	286.64	8.4	2035.07	2035.07	2035.18	0.11
0.339	0.339	165.05	360.72	6.7	2026.94	2026.94	2027.93	0.98
0.283	0.283	233.01	625.19	3.9	2022.06	2022.06	2022.07	0.01
0.235	0.235	129.94	880.49	2.7	2021.94	2021.94	2021.94	0.00
0.217	0.217	Culvert						
0.205	0.205	49.68	213.11	11.3	2013.25	2013.25	2013.25	0.00
0.159	0.159	91.82	279.30	8.6	2007.30	2007.30	2008.10	0.80
0.123	0.123	75.21	271.43	8.9	2005.11	2005.11	2005.48	0.37
Outlet - Hassayampa River								
Mockingbird Wash / Reach 1								
2.280	2.280	60.32	361.65	14.7	2257.11	2257.11	2258.07	0.96
2.245	2.245	88.42	414.73	14.3	2250.67	2250.67	2251.64	0.97
2.191	2.191	80.32	395.15	14.0	2242.41	2242.41	2243.34	0.93
2.137	2.137	53.38	334.17	14.2	2235.80	2235.80	2236.33	0.53
2.052	2.052	56.00	352.53	15.4	2227.21	2227.21	2228.12	0.91
1.985	1.985	120.00	479.34	13.8	2216.22	2216.22	2217.20	0.98
1.950	1.950	103.00	452.56	14.3	2211.40	2211.40	2212.27	0.88
1.872	1.872	218.49	560.54	12.0	2199.07	2199.07	2200.03	0.96
1.787	1.787	45.00	322.18	16.2	2189.61	2189.61	2190.49	0.88

Table 18 (Continued) – Floodway Data Summary

Cross-Section	Distance[1]	Floodway Width (feet)	Floodway Section Area (square feet)	Floodway Mean Velocity (feet per second)	Base Flood Water Surface Elevation Regulatory (Feet NAVD88)	Without Floodway (Feet NAVD88)	With Floodway (Feet NAVD88)	Increase (Feet NAVD88)
Mockingbird Wash / Reach 1 *(Continued)*								
1.712	1.712	27.00	274.96	19.9	2181.67	2181.67	2182.62	0.94
1.620	1.620	20.00	249.39	20.7	2170.73	2170.73	2171.63	0.90
1.568	1.568	22.00	257.74	20.2	2162.67	2162.67	2163.39	0.71
1.523	1.523	20.00	263.44	22.7	2159.16	2159.16	2159.36	0.20
1.451	1.451	37.76	306.55	17.1	2142.57	2142.57	2143.27	0.70
1.360	1.360	73.79	391.87	14.3	2126.99	2126.99	2127.89	0.90
1.304	1.304	117.56	447.42	11.9	2118.52	2118.52	2119.35	0.83
1.244	1.244	152.00	478.49	11.5	2109.81	2109.81	2110.75	0.94
1.178	1.178	90.00	403.86	12.4	2103.05	2103.05	2103.90	0.84
1.094	1.094	150.00	490.36	11.4	2089.74	2089.74	2090.69	0.95
1.005	1.005	150.99	494.88	11.5	2077.22	2077.22	2078.20	0.98
0.965	0.965	240.00	556.65	10.6	2071.39	2071.39	2072.33	0.94
0.917	0.917	213.00	574.19	10.6	2065.68	2065.68	2066.67	0.99
0.856	0.856	372.34	702.75	7.4	2056.17	2056.17	2056.22	0.05
0.801	0.801	321.08	670.21	8.6	2049.06	2049.06	2049.50	0.44
Mockingbird Wash / Reach 2								
0.713	0.713	191.26	736.92	13.0	2040.02	2040.02	2040.97	0.95
0.609	0.609	173.36	698.77	13.7	2028.29	2028.29	2029.18	0.88
0.561	0.561	140.00	648.39	14.5	2023.16	2023.16	2023.76	0.60
0.504	0.504	183.00	804.87	15.1	2018.61	2018.61	2018.61	0.00
0.416	0.416	123.00	638.53	15.2	2008.30	2008.30	2009.28	0.98
0.369	0.369	200.00	873.32	14.3	2002.08	2002.08	2003.08	1.00
0.324	0.324	85.00	556.27	15.3	1997.73	1997.73	1998.64	0.91
0.310	0.310	108.00	650.13	17.2	1997.48	1997.48	1998.28	0.80
0.302	0.302	Culvert						
0.272	0.272	57.00	377.03	14.5	1992.47	1992.47	1992.59	0.12
0.236	0.236	73.61	445.23	15.2	1987.81	1987.81	1988.21	0.41
Outlet – Hassayampa River								
Mockingbird Wash Tributary 1/ Reach 1								
0.385	0.385	37.13	112.01	10.9	2083.37	2083.37	2084.14	0.77
0.287	0.287	95.00	159.76	8.8	2070.64	2070.64	2071.55	0.91
0.243	0.243	105.00	197.91	8.4	2065.37	2065.37	2066.37	1.00
Outlet – Mockingbird Wash								

Table 18 (Continued) – Floodway Data Summary

Cross-Section	Distance[1]	Floodway Width (feet)	Floodway Section Area (square feet)	Floodway Mean Velocity (feet per second)	Base Flood Water Surface Elevation Regulatory (Feet NAVD88)	Without Floodway (Feet NAVD88)	With Floodway (Feet NAVD88)	Increase (Feet NAVD88)
Wash L / Reach 1								
1.658	1.658	21.00	91.26	11.8	2154.35	2154.35	2154.63	0.27
1.618	1.618	14.82	80.94	13.2	2148.15	2148.15	2148.54	0.38
1.561	1.561	16.00	83.17	12.9	2135.81	2135.81	2135.94	0.13
1.505	1.505	19.00	88.14	12.2	2126.92	2126.92	2127.27	0.36
1.463	1.463	18.00	85.90	12.5	2120.08	2120.08	2120.28	0.20
1.408	1.408	16.05	83.22	12.9	2111.97	2111.97	2112.04	0.07
1.364	1.364	20.26	89.80	11.9	2105.50	2105.50	2105.60	0.10
1.326	1.326	38.00	147.46	7.3	2099.75	2099.75	2100.65	0.90
1.290	1.290	18.35	89.45	12.0	2097.20	2097.20	2097.31	0.11
1.250	1.250	20.00	91.01	11.8	2080.69	2080.69	2080.69	0.00
1.214	1.214	26.00	101.74	10.5	2070.85	2070.85	2071.73	0.88
1.179	1.179	45.00	120.13	8.9	2066.94	2066.94	2067.73	0.79
1.131	1.131	45.00	116.60	9.2	2061.31	2061.31	2061.57	0.26
1.081	1.081	78.99	162.11	6.6	2054.05	2054.05	2054.89	0.84
1.037	1.037	52.84	124.99	8.6	2050.07	2050.07	2050.97	0.91
0.962	0.962	44.45	116.33	9.2	2041.75	2041.75	2042.36	0.61
0.902	0.902	39.98	112.29	9.6	2034.49	2034.49	2035.33	0.84
0.825	0.825	31.00	110.50	9.7	2025.83	2025.83	2026.70	0.87
0.780	0.780	52.47	122.67	8.7	2020.70	2020.70	2021.10	0.40
0.713	0.713	49.08	120.52	8.9	2012.70	2012.70	2013.53	0.83
0.668	0.668	55.00	136.10	7.9	2007.21	2007.21	2008.17	0.96
0.618	0.618	85.00	168.28	6.4	2001.45	2001.45	2002.37	0.92
0.586	0.586	77.84	139.39	7.7	1997.77	1997.77	1998.20	0.43
0.520	0.520	37.24	112.24	9.6	1991.34	1991.34	1991.68	0.33
0.492	0.492	41.69	113.63	9.4	1987.69	1987.69	1988.51	0.83
0.444	0.444	96.00	459.79	2.3	1985.24	1985.24	1985.24	0.01
0.426	0.426	75.00	565.11	1.9	1985.24	1985.24	1985.24	0.00
0.414	0.414	Culvert						
0.375	0.375	38.00	114.55	9.4	1972.87	1972.87	1972.86	0.00
0.309	0.309	119.93	161.72	6.6	1960.02	1960.02	1960.23	0.21
0.241	0.241	73.71	137.67	7.8	1946.74	1946.74	1946.85	0.11
Outlet - Hassayampa River								
Wash K / Reach 1								
3.757	3.757	65.10	165.95	8.6	2398.54	2398.54	2399.36	0.81

Table 18 (Continued) – Floodway Data Summary

Cross-Section	Distance[1]	Floodway Width (feet)	Floodway Section Area (square feet)	Floodway Mean Velocity (feet per second)	Base Flood Water Surface Elevation Regulatory (Feet NAVD88)	Without Floodway (Feet NAVD88)	With Floodway (Feet NAVD88)	Increase (Feet NAVD88)
Wash K / Reach 1 *(Continued)*								
3.712	3.712	66.55	171.28	8.4	2394.11	2394.11	2394.77	0.66
3.628	3.628	77.21	175.70	8.2	2385.55	2385.55	2386.17	0.62
3.55	3.55	51.06	150.86	9.5	2377.31	2377.31	2377.38	0.06
3.481	3.481	69.70	175.67	8.2	2370.01	2370.01	2370.03	0.02
3.386	3.386	130.38	220.17	6.5	2358.16	2358.16	2359.02	0.86
3.305	3.305	59.04	166.33	8.6	2349.33	2349.33	2349.99	0.66
3.213	3.213	52.33	152.37	9.4	2338.20	2338.20	2338.39	0.20
3.123	3.123	66.41	167.78	8.5	2326.46	2326.46	2326.49	0.03
3.076	3.076	64.08	179.59	8.0	2321.48	2321.48	2321.52	0.04
3.020	3.020	60.06	156.81	9.1	2313.36	2313.36	2314.22	0.87
2.964	2.964	183.77	226.46	6.3	2305.18	2305.18	2305.19	0.00
Wash K / Reach 2								
2.895	2.895	237.51	408.81	6.5	2294.81	2294.81	2295.61	0.79
2.803	2.803	137.74	371.33	7.2	2285.46	2285.46	2285.50	0.04
2.707	2.707	70.90	273.24	9.8	2275.18	2275.18	2275.19	0.02
2.619	2.619	102.18	302.78	8.8	2265.37	2265.37	2266.23	0.86
2.533	2.533	97.70	291.49	9.1	2254.49	2254.49	2255.21	0.72
2.475	2.475	122.22	316.20	8.4	2247.03	2247.03	2247.80	0.77
2.404	2.404	121.87	333.89	8.0	2239.55	2239.55	2240.24	0.69
2.329	2.329	165.04	362.42	7.4	2230.59	2230.59	2231.58	0.99
2.235	2.235	74.97	277.81	9.6	2221.50	2221.50	2221.90	0.40
2.141	2.141	84.32	270.86	9.8	2210.32	2210.32	2210.33	0.01
2.046	2.046	160.49	349.29	7.6	2196.90	2196.90	2197.87	0.97
1.976	1.976	120.00	324.44	8.2	2189.54	2189.54	2190.49	0.96
1.902	1.902	97.85	327.72	8.1	2184.48	2184.48	2184.99	0.51
1.843	1.843	63.27	243.36	11.0	2178.77	2178.77	2178.84	0.07
1.754	1.754	178.34	388.45	6.9	2168.24	2168.24	2168.35	0.11
1.709	1.709	69.44	259.07	10.3	2163.18	2163.18	2164.11	0.93
1.642	1.642	159.72	332.89	8.0	2154.60	2154.60	2155.58	0.98
1.561	1.561	170.95	370.28	8.1	2145.70	2145.70	2145.72	0.02
1.487	1.487	87.06	294.43	10.2	2137.93	2137.93	2138.06	0.13
1.387	1.387	110.33	311.24	9.6	2126.97	2126.97	2126.97	0.00
1.317	1.317	82.33	286.76	10.4	2119.58	2119.58	2119.99	0.40
1.227	1.227	115.43	323.49	9.2	2107.68	2107.68	2107.70	0.02

Table 18 (Continued) – Floodway Data Summary

Cross-Section	Distance[1]	Floodway Width (feet)	Floodway Section Area (square feet)	Floodway Mean Velocity (feet per second)	Base Flood Water Surface Elevation Regulatory (Feet NAVD88)	Without Floodway (Feet NAVD88)	With Floodway (Feet NAVD88)	Increase (Feet NAVD88)
Wash K / Reach 2 *(Continued)*								
1.144	1.144	90.32	293.12	10.2	2097.79	2097.79	2097.80	0.01
1.047	1.047	57.13	253.02	11.8	2087.43	2087.43	2087.74	0.31
0.951	0.951	76.72	285.89	10.5	2076.10	2076.10	2076.23	0.13
0.851	0.851	77.25	298.55	10.0	2063.12	2063.12	2063.14	0.02
0.759	0.759	83.30	331.77	9.0	2050.06	2050.06	2050.16	0.10
0.693	0.693	32.07	224.34	13.3	2039.47	2039.47	2039.58	0.12
0.644	0.644	51.87	245.77	12.2	2019.29	2019.29	2019.90	0.62
0.567	0.567	64.07	260.80	11.5	2007.56	2007.56	2007.97	0.41
0.501	0.501	49.03	253.10	11.8	2000.76	2000.76	2000.83	0.07
0.434	0.434	73.50	291.01	10.3	1992.49	1992.49	1992.56	0.07
0.379	0.379	66.13	285.23	10.5	1983.99	1983.99	1984.94	0.95
0.288	0.288	73.55	281.04	10.6	1972.86	1972.86	1973.16	0.30
0.192	0.192	176.09	1490.10	2.0	1968.27	1968.27	1968.98	0.72
0.157	0.157	210.00	2585.03	1.2	1968.28	1968.28	1969.01	0.72
0.138	0.138	235.71	3299.82	0.9	1968.28	1968.28	1969.01	0.73
0.127	0.127	Bridge						
0.119	0.119	270.00	1931.76	1.6	1963.50	1963.50	1964.15	0.65
0.117	0.117	270.00	1894.14	1.6	1963.49	1963.49	1964.15	0.66
0.109	0.109	Bridge						
0.100	0.100	100.78	778.67	9.2	1954.33	1954.33	1954.35	0.02
0.097	0.097	237.58	1491.73	5.9	1952.33	1952.33	1952.33	0.00
Outlet – Hassayampa River								
Wash K-1/ Reach 1								
0.821	0.821	86.27	153.03	7.4	2399.35	2399.35	2399.37	0.02
0.742	0.742	56.35	140.65	8.1	2387.69	2387.69	2388.50	0.80
0.633	0.633	72.63	147.11	7.7	2374.11	2374.11	2375.00	0.89
0.546	0.546	57.38	133.27	8.6	2361.76	2361.76	2361.99	0.23
0.464	0.464	33.70	117.25	9.7	2354.69	2354.69	2354.76	0.06
0.382	0.382	43.81	121.53	9.4	2344.24	2344.24	2344.76	0.53
0.292	0.292	39.39	122.24	9.3	2333.37	2333.37	2333.68	0.31
0.249	0.249	42.00	120.16	9.5	2327.04	2327.04	2327.23	0.19
0.223	0.223	39.62	120.47	9.5	2324.76	2324.76	2324.79	0.04
0.175	0.175	67.53	149.67	7.6	2316.55	2316.55	2317.41	0.85
0.144	0.144	44.40	121.71	9.4	2313.25	2313.25	2314.10	0.85

Table 18 (Continued) – Floodway Data Summary

Cross-Section	Distance[1]	Floodway Width (feet)	Floodway Section Area (square feet)	Floodway Mean Velocity (feet per second)	Base Flood Water Surface Elevation Regulatory (Feet NAVD88)	Without Floodway (Feet NAVD88)	With Floodway (Feet NAVD88)	Increase (Feet NAVD88)
Wash K-1/ Reach 1 *(Continued)*								
0.073	0.073	98.75	175.39	6.5	2303.63	2303.63	2304.44	0.81
Outlet – Wash K								
Wash I / Reach 1								
1.340	1.340	84.04	240.67	8.9	2074.52	2074.52	2074.57	0.05
1.237	1.237	73.37	225.57	9.5	2063.22	2063.22	2063.28	0.06
1.142	1.142	75.11	224.62	9.5	2052.74	2052.74	2052.78	0.04
1.044	1.044	48.40	194.50	11.0	2042.10	2042.10	2042.86	0.76
0.939	0.939	40.67	182.09	11.8	2028.61	2028.61	2029.52	0.90
0.839	0.839	61.14	216.72	9.9	2016.69	2016.69	2017.24	0.55
0.741	0.741	60.22	212.83	10.1	2003.33	2003.33	2004.20	0.87
0.662	0.662	58.54	213.38	10.0	1994.25	1994.25	1994.93	0.69
0.597	0.597	173.12	336.62	6.4	1984.91	1984.91	1985.87	0.96
0.526	0.526	107.11	296.79	7.2	1978.62	1978.62	1979.11	0.48
0.502	0.502	75.74	246.77	8.7	1976.06	1976.06	1976.71	0.65
0.442	0.442	48.64	202.24	10.6	1969.15	1969.15	1969.49	0.34
0.352	0.352	57.53	212.30	10.1	1957.21	1957.21	1957.86	0.65
0.274	0.274	47.49	193.00	11.1	1948.29	1948.29	1948.51	0.22
0.206	0.206	32.20	166.32	12.9	1940.49	1940.49	1941.39	0.90
0.147	0.147	47.23	441.19	4.9	1939.20	1939.20	1939.38	0.18
0.129	0.129	63.40	628.25	3.4	1939.01	1939.01	1939.39	0.39
0.122	0.122	Bridge						
0.106	0.106	40.03	181.37	12.0	1930.28	1930.28	1930.28	0.00
Outlet - Hassayampa River								
Monarch Wash / Reach 1								
3.984	3.984	48.84	167.48	10.6	2374.04	2374.04	2374.51	0.47
3.874	3.874	57.48	179.86	9.9	2359.34	2359.34	2359.35	0.01
3.774	3.774	85.12	202.44	8.8	2345.13	2345.13	2345.87	0.75
3.661	3.661	77.37	201.24	8.9	2332.04	2332.04	2332.96	0.91
3.560	3.560	70.64	192.83	9.2	2318.13	2318.13	2318.16	0.04
3.451	3.451	61.87	182.23	9.8	2303.01	2303.01	2303.42	0.42
3.347	3.347	84.24	201.59	8.8	2289.09	2289.09	2289.09	0.00
3.239	3.239	50.10	178.60	10.8	2274.05	2274.05	2274.76	0.71
3.130	3.130	56.75	191.04	10.1	2257.58	2257.58	2258.55	0.97
3.024	3.024	95.66	222.41	8.7	2244.15	2244.15	2244.99	0.84

Table 18 (Continued) – Floodway Data Summary

Cross-Section	Distance[1]	Floodway			Base Flood Water Surface Elevation			
		Width (feet)	Section Area (square feet)	Mean Velocity (feet per second)	Regulatory	Without Floodway	With Floodway	Increase
					(Feet NAVD88)			
Monarch Wash / Reach 1 *(Continued)*								
2.908	2.908	82.10	213.69	9.1	2228.77	2228.77	2229.63	0.86
2.806	2.806	126.55	252.96	7.7	2215.71	2215.71	2216.36	0.65
2.695	2.695	85.00	237.95	8.1	2202.20	2202.20	2203.12	0.91
2.592	2.592	91.39	222.26	8.7	2187.29	2187.29	2187.71	0.41
2.486	2.486	107.59	230.98	8.4	2174.91	2174.91	2175.02	0.11
2.382	2.382	98.00	471.07	11.1	2164.01	2164.01	2164.97	0.97
2.301	2.301	142.69	539.25	9.7	2154.65	2154.65	2154.93	0.28
2.205	2.205	88.48	439.72	11.9	2143.41	2143.41	2143.84	0.43
2.093	2.093	271.86	670.45	7.8	2130.35	2130.35	2131.35	0.99
1.973	1.973	113.80	462.27	11.3	2119.00	2119.00	2119.68	0.68
1.880	1.880	165.12	562.91	9.3	2106.52	2106.52	2107.28	0.75
1.763	1.763	171.56	542.96	9.7	2092.49	2092.49	2093.47	0.98
1.660	1.660	147.09	525.19	10.0	2079.34	2079.34	2080.21	0.87
1.554	1.554	168.60	524.63	10.0	2067.16	2067.16	2067.22	0.06
1.431	1.431	139.59	492.48	10.6	2056.06	2056.06	2056.26	0.20
1.327	1.327	79.39	407.94	12.9	2044.05	2044.05	2044.67	0.62
1.240	1.240	105.42	449.49	11.7	2033.10	2033.10	2033.10	0.00
1.131	1.131	80.79	465.83	11.3	2022.59	2022.59	2023.39	0.80
1.035	1.035	65.62	399.59	13.1	2012.58	2012.58	2013.55	0.97
0.928	0.928	54.17	393.78	13.3	2002.09	2002.09	2002.78	0.68
0.831	0.831	68.57	388.19	13.5	1991.99	1991.99	1992.32	0.32
0.739	0.739	162.77	614.67	8.5	1982.33	1982.33	1982.48	0.16
0.658	0.658	288.12	771.58	6.8	1971.32	1971.32	1972.27	0.95
0.556	0.556	126.21	547.40	9.8	1961.19	1961.19	1962.09	0.90
0.444	0.444	97.07	475.86	11.3	1950.39	1950.39	1950.99	0.60
0.361	0.361	124.39	605.81	8.8	1940.76	1940.76	1941.46	0.70
0.286	0.286	198.06	675.80	7.9	1931.45	1931.45	1932.41	0.96
0.192	0.192	145.37	666.39	8.0	1924.96	1924.96	1925.88	0.92
0.076	0.076	90.00	490.74	10.9	1914.19	1914.19	1914.46	0.27
0.065	0.065	Bridge						
0.060	0.060	121.46	649.31	8.3	1913.58	1913.58	1913.59	0.00
0.055	0.055	118.33	728.19	7.4	1913.66	1913.66	1913.66	0.00
0.050	0.050	Bridge						

Table 18 (Continued) – Floodway Data Summary

Cross-Section	Distance[1]	Floodway Width (feet)	Floodway Section Area (square feet)	Floodway Mean Velocity (feet per second)	Base Flood Water Surface Elevation Regulatory (Feet NAVD88)	Without Floodway (Feet NAVD88)	With Floodway (Feet NAVD88)	Increase (Feet NAVD88)
Monarch Wash / Reach 1 *(Continued)*								
0.042	0.042	112.41	512.10	10.5	1910.83	1910.83	1910.90	0.07
Outlet - Hassayampa River								
Wash H / Reach 1								
1.915	1.915	40.31	125.19	10.0	2054.42	2054.42	2054.76	0.34
1.792	1.792	114.84	177.06	7.1	2044.92	2044.92	2044.96	0.04
1.686	1.686	83.32	158.75	7.9	2035.73	2035.73	2036.14	0.40
1.556	1.556	72.47	178.60	7.0	2024.87	2024.87	2025.42	0.55
1.449	1.449	88.95	190.59	6.6	2015.75	2015.75	2016.13	0.38
1.313	1.313	136.51	216.71	5.8	2004.43	2004.43	2005.43	1.00
1.209	1.209	102.87	173.88	7.2	1997.15	1997.15	1997.18	0.02
1.110	1.110	65.85	146.87	8.5	1987.92	1987.92	1988.03	0.11
1.006	1.006	54.90	161.07	9.2	1979.17	1979.17	1979.78	0.61
0.899	0.899	57.49	164.39	9.0	1970.81	1970.81	1971.46	0.65
0.796	0.796	94.25	210.15	7.0	1960.03	1960.03	1960.73	0.70
0.702	0.702	79.88	205.49	7.2	1950.02	1950.02	1950.94	0.92
0.603	0.603	40.86	140.34	10.6	1939.62	1939.62	1939.86	0.24
0.521	0.521	65.67	165.41	9.0	1930.88	1930.88	1930.92	0.05
0.418	0.418	43.94	143.49	10.3	1920.01	1920.01	1920.06	0.05
0.318	0.318	73.33	178.82	8.3	1908.28	1908.28	1908.58	0.31
0.214	0.214	115.00	358.50	4.1	1898.96	1898.96	1899.95	0.99
0.143	0.143	31.00	479.58	11.6	1895.26	1895.26	1895.26	0.00
0.130	0.130	Culvert						
0.117	0.117	31.00	173.45	11.3	1891.78	1891.78	1891.78	0.00
Outlet - Hassayampa River								
Wash G / Reach 1								
1.233	1.233	20.33	68.18	9.1	2023.57	2023.57	2024.16	0.59
1.149	1.149	22.13	68.29	9.1	2014.57	2014.57	2014.99	0.42
1.089	1.089	29.02	70.12	8.8	2008.38	2008.38	2008.79	0.41
1.011	1.011	25.66	68.09	9.1	1999.71	1999.71	1999.93	0.22
0.909	0.909	51.19	84.50	7.3	1990.57	1990.57	1990.59	0.01
0.823	0.823	22.04	69.76	8.9	1983.77	1983.77	1984.04	0.26
0.737	0.737	16.06	57.89	10.7	1972.26	1972.26	1972.39	0.13
0.643	0.643	16.68	58.66	10.6	1960.55	1960.55	1960.80	0.25
0.555	0.555	16.34	57.89	10.7	1948.11	1948.11	1948.20	0.09

Table 18 (Continued) – Floodway Data Summary

Cross-Section	Distance[1]	Floodway Width (feet)	Floodway Section Area (square feet)	Floodway Mean Velocity (feet per second)	Base Flood Water Surface Elevation Regulatory (Feet NAVD88)	Without Floodway (Feet NAVD88)	With Floodway (Feet NAVD88)	Increase (Feet NAVD88)
Wash G / Reach 1 *(Continued)*								
0.477	0.477	30.61	71.62	8.7	1935.66	1935.66	1935.69	0.03
0.398	0.398	20.93	63.22	9.8	1922.25	1922.25	1922.25	0.00
0.316	0.316	21.78	63.87	9.7	1899.09	1899.09	1899.19	0.09
0.229	0.229	74.37	727.75	0.9	1895.18	1895.18	1895.86	0.68
0.184	0.184	74.74	692.35	0.9	1895.16	1895.16	1895.85	0.69
0.172	0.172	Culvert						
0.151	0.151	131.57	140.55	4.4	1881.25	1881.25	1882.06	0.80
Outlet - Hassayampa River								
Wash F / Reach 1								
1.094	1.094	42.31	53.15	5.4	2030.14	2030.14	2030.16	0.01
1.021	1.021	38.19	56.09	5.1	2024.01	2024.01	2024.03	0.02
0.940	0.940	41.91	160.71	1.8	2018.81	2018.81	2019.55	0.74
0.920	0.920	50.60	259.48	1.1	2018.84	2018.84	2019.56	0.72
0.917	0.917	Culvert						
0.9101	0.9101	33.24	69.72	4.1	2014.07	2014.07	2014.16	0.09
0.895	0.895	27.07	49.19	5.8	2012.85	2012.85	2012.95	0.10
0.798	0.798	18.21	38.30	7.5	2006.05	2006.05	2006.05	0.00
0.754	0.754	28.41	47.01	6.1	2000.65	2000.65	2000.83	0.18
0.691	0.691	30.72	45.50	6.3	1996.06	1996.06	1996.57	0.51
0.597	0.597	34.57	56.87	5.1	1987.60	1987.60	1987.69	0.09
0.504	0.504	22.19	39.95	7.2	1979.19	1979.19	1979.19	0.00
0.396	0.396	21.84	38.10	7.5	1932.57	1932.57	1932.60	0.03
0.302	0.302	20.06	38.61	7.4	1888.60	1888.60	1888.64	0.03
0.213	0.213	62.37	54.88	5.2	1874.57	1874.57	1874.58	0.00
Wash F / Reach 2								
0.095	0.095	15.06	2492.01	3.6	1874.54	1874.54	1874.54	0.00
0.079	0.079	Culvert						
0.065	0.065	83.12	109.59	5.3	1864.29	1864.29	1864.29	0.01
Outlet - Hassayampa River								
Wash F Tributary 1/ Reach 2								
0.406	0.406	16.30	29.00	7.5	1954.45	1954.45	1954.68	0.22
0.300	0.300	16.16	28.62	7.6	1933.97	1933.97	1934.03	0.06
0.212	0.212	30.34	35.55	6.1	1914.57	1914.57	1914.58	0.01
0.134	0.134	22.40	34.28	6.4	1896.83	1896.83	1896.87	0.04

Table 18 (Continued) – Floodway Data Summary

Cross-Section	Distance[1]	Floodway Width (feet)	Floodway Section Area (square feet)	Floodway Mean Velocity (feet per second)	Base Flood Water Surface Elevation Regulatory (Feet NAVD88)	Without Floodway (Feet NAVD88)	With Floodway (Feet NAVD88)	Increase (Feet NAVD88)
Wash F Tributary 1/ Reach 2 *(Continued)*								
0.047	0.047	35.12	38.13	5.7	1879.54	1879.54	1879.93	0.39
Outlet – Wash F								
San Domingo Wash / Reach 1								
2.328	2.328	242.64	1195.56	10.6	2024.81	2024.81	2025.57	0.76
2.185	2.185	424.54	1572.60	8.1	2013.65	2013.65	2014.10	0.45
2.059	2.059	297.27	1448.70	8.8	2007.43	2007.43	2007.43	0.00
1.951	1.951	274.45	1399.89	9.1	1998.18	1998.18	1998.55	0.37
1.834	1.834	317.48	1516.19	8.4	1988.20	1988.20	1988.83	0.64
1.719	1.719	536.95	1667.97	7.6	1975.76	1975.76	1976.71	0.95
1.582	1.582	326.92	1494.53	8.5	1967.33	1967.33	1967.94	0.61
1.455	1.455	339.77	1547.29	8.2	1957.65	1957.65	1958.26	0.60
1.353	1.353	435.55	1748.49	7.3	1949.14	1949.14	1949.95	0.81
1.248	1.248	328.73	1399.35	9.1	1941.25	1941.25	1941.94	0.68
1.148	1.148	381.17	1621.22	7.8	1933.28	1933.28	1934.19	0.91
1.039	1.039	301.72	1445.66	9.0	1924.05	1924.05	1924.92	0.88
0.934	0.934	221.46	1215.71	10.7	1915.23	1915.23	1915.93	0.69
0.826	0.826	215.37	1328.23	9.8	1906.90	1906.90	1907.41	0.51
0.741	0.741	314.03	1633.38	7.9	1898.80	1898.80	1899.49	0.69
0.663	0.663	392.33	1370.41	9.5	1890.41	1890.41	1890.89	0.48
0.566	0.566	367.26	1354.41	9.6	1880.75	1880.75	1881.24	0.49
0.470	0.470	252.92	1124.35	11.5	1875.03	1875.03	1875.65	0.63
0.389	0.389	270.86	1817.10	7.1	1873.31	1873.31	1874.09	0.78
0.298	0.298	209.89	1269.66	10.2	1869.84	1869.84	1869.96	0.12
0.203	0.203	370.71	4244.40	3.1	1870.87	1870.87	1870.90	0.02
0.114	0.114	179.16	2616.82	5.0	1870.01	1870.01	1870.01	0.00
0.078	0.078	57.08	746.43	17.4	1863.79	1863.79	1863.87	0.08
0.067	0.067	Bridge						
0.057	0.057	54.91	712.67	18.2	1860.48	1860.48	1860.48	0.00
0.042	0.042	101.77	992.47	13.1	1860.91	1860.91	1860.99	0.08
Outlet - Hassayampa River								
Ox Wash / Reach 1								
2.186	2.186	118.24	408.29	8.1	1985.26	1985.26	1985.75	0.49
2.068	2.068	102.75	380.17	8.7	1975.85	1975.85	1975.96	0.11
1.968	1.968	190.58	496.57	6.7	1969.59	1969.59	1969.59	0.00

Table 18 (Continued) – Floodway Data Summary

Cross-Section	Distance[1]	Floodway Width (feet)	Floodway Section Area (square feet)	Floodway Mean Velocity (feet per second)	Base Flood Water Surface Elevation Regulatory (Feet NAVD88)	Without Floodway (Feet NAVD88)	With Floodway (Feet NAVD88)	Increase (Feet NAVD88)
Ox Wash / Reach 1 *(Continued)*								
1.856	1.856	78.48	350.01	9.5	1963.01	1963.01	1963.13	0.12
1.746	1.746	238.45	636.25	7.4	1954.74	1954.74	1954.78	0.05
1.630	1.630	154.62	543.23	8.7	1945.89	1945.89	1946.20	0.31
1.519	1.519	255.38	683.99	6.9	1937.28	1937.28	1937.47	0.19
1.402	1.402	437.03	797.13	5.9	1928.46	1928.46	1928.79	0.33
1.280	1.280	369.44	801.55	5.9	1920.88	1920.88	1920.88	0.00
1.175	1.175	396.00	899.28	5.3	1911.68	1911.68	1912.17	0.49
1.073	1.073	397.74	689.82	6.9	1903.36	1903.36	1904.21	0.85
0.979	0.979	370.75	2035.05	2.3	1900.71	1900.71	1900.74	0.03
0.872	0.872	72.40	1170.23	4.3	1900.19	1900.19	1900.19	0.00
0.842	0.842	Culvert						
0.812	0.812	46.71	346.28	13.7	1879.84	1879.84	1879.90	0.06
0.757	0.757	49.78	338.94	13.9	1876.88	1876.88	1876.96	0.08
0.669	0.669	51.70	341.10	13.9	1869.21	1869.21	1869.30	0.09
0.576	0.576	69.13	368.99	12.8	1858.89	1858.89	1859.04	0.15
0.496	0.496	68.55	388.59	12.2	1852.55	1852.55	1853.03	0.48
0.413	0.413	74.27	446.78	10.6	1847.66	1847.66	1848.49	0.83
0.373	0.373	70.92	578.44	8.2	1846.11	1846.11	1846.86	0.75
0.371	0.371	Culvert						
0.368	0.368	84.06	498.42	11.5	1844.41	1844.41	1844.74	0.34
0.335	0.335	84.22	454.61	12.6	1841.73	1841.73	1841.78	0.05
0.248	0.248	83.20	513.11	11.2	1836.18	1836.18	1836.47	0.29
Outlet - Hassayampa River								
Little San Domingo Wash / Reach 1								
4.066	4.066	112.38	398.70	7.2	2069.42	2069.42	2070.35	0.93
3.972	3.972	50.92	241.33	11.9	2064.54	2064.54	2064.90	0.36
3.867	3.867	72.04	303.16	9.5	2057.93	2057.93	2058.25	0.31
3.753	3.753	54.65	273.05	10.6	2051.98	2051.98	2052.60	0.62
3.623	3.623	52.24	239.76	12.0	2044.09	2044.09	2044.15	0.07
3.497	3.497	45.48	232.75	12.4	2036.58	2036.58	2036.64	0.06
3.381	3.381	51.00	258.20	11.2	2029.76	2029.76	2029.78	0.02
3.268	3.268	42.29	231.13	12.5	2024.72	2024.72	2024.77	0.05
3.150	3.150	82.74	397.85	7.2	2018.82	2018.82	2018.84	0.01
3.093	3.093	124.90	735.22	3.9	2019.28	2019.28	2019.28	0.00

Table 18 (Continued) – Floodway Data Summary

Cross-Section	Distance[1]	Floodway			Base Flood Water Surface Elevation			
		Width (feet)	Section Area (square feet)	Mean Velocity (feet per second)	Regulatory	Without Floodway	With Floodway	Increase
					(Feet NAVD88)			
Little San Domingo Wash / Reach 1 *(Continued)*								
3.081	3.081	Culvert						
3.069	3.069	79.44	316.34	9.1	2008.32	2008.32	2008.83	0.51
3.022	3.022	74.00	307.93	9.7	2006.45	2006.45	2006.63	0.18
2.923	2.923	118.32	376.03	7.9	2001.18	2001.18	2001.18	0.00
2.817	2.817	36.82	231.29	12.9	1994.07	1994.07	1994.48	0.41
2.700	2.700	44.36	233.06	12.8	1986.63	1986.63	1986.87	0.25
2.594	2.594	42.00	235.78	12.7	1981.42	1981.42	1981.46	0.04
2.477	2.477	46.80	260.13	12.7	1975.33	1975.33	1975.37	0.04
2.374	2.374	107.75	360.46	9.2	1969.00	1969.00	1969.04	0.04
2.256	2.256	145.15	662.02	5.0	1963.77	1963.77	1963.77	0.00
2.208	2.208	90.12	471.03	7.0	1963.43	1963.43	1963.43	0.00
2.197	2.197	Culvert						
2.161	2.161	65.80	314.58	10.7	1948.13	1948.13	1948.14	0.01
2.083	2.083	45.49	252.17	13.3	1944.06	1944.06	1944.06	0.00
2.051	2.051	88.35	409.71	8.2	1941.39	1941.39	1941.39	0.00
2.049	2.049	Bridge						
2.047	2.047	79.60	303.01	11.1	1940.00	1940.00	1940.02	0.02
2.045	2.045	84.83	309.95	10.8	1939.82	1939.82	1939.85	0.03
2.045	2.045	89.05	312.93	10.7	1939.19	1939.19	1939.17	0.00
2.044	2.044	86.36	309.69	10.9	1938.89	1938.89	1938.89	0.00
2.043	2.043	86.18	309.80	10.9	1937.89	1937.89	1937.89	0.00
2.039	2.039	101.68	331.37	10.1	1936.33	1936.33	1936.37	0.04
2.037	2.037	98.60	325.04	10.3	1935.16	1935.16	1935.18	0.02
2.004	2.004	95.65	333.08	10.1	1932.57	1932.57	1932.60	0.02
1.928	1.928	120.00	381.77	8.8	1926.28	1926.28	1927.18	0.90
1.782	1.782	102.92	329.59	10.2	1916.05	1916.05	1916.04	0.00
1.669	1.669	118.23	414.28	8.1	1906.53	1906.53	1907.14	0.61
1.564	1.564	105.00	356.09	9.4	1897.65	1897.65	1898.15	0.50
1.441	1.441	124.00	412.31	8.2	1888.07	1888.07	1888.54	0.48
1.321	1.321	188.00	481.00	7.0	1876.65	1876.65	1877.61	0.96
1.211	1.211	221.67	488.90	7.1	1868.27	1868.27	1869.14	0.87
1.085	1.085	201.28	485.10	7.1	1858.81	1858.81	1859.74	0.93
0.978	0.978	282.00	597.28	5.8	1851.57	1851.57	1852.42	0.85

Table 18 (Continued) – Floodway Data Summary

Cross-Section	Distance[1]	Floodway Width (feet)	Floodway Section Area (square feet)	Floodway Mean Velocity (feet per second)	Base Flood Water Surface Elevation (Feet NAVD88) Regulatory	Without Floodway	With Floodway	Increase
Little San Domingo Wash / Reach 1 *(Continued)*								
0.978	0.978	Lateral Structure						
0.896	0.896	146.82	413.91	8.4	1846.80	1846.80	1846.85	0.05
Little San Domingo Wash / Reach 2								
0.687	0.687	249.13	503.86	8.1	1830.04	1830.04	1830.34	0.30
0.597	0.597	256.38	533.22	8.4	1822.80	1822.80	1822.99	0.19
Little San Domingo Wash / Reach 3								
0.476	0.476	467.51	933.96	4.8	1814.21	1814.21	1815.18	0.97
0.368	0.368	438.63	970.66	4.6	1806.03	1806.03	1807.03	1.00
0.253	0.253	182.32	564.34	7.9	1798.10	1798.10	1798.91	0.81
0.145	0.145	133.32	517.57	8.6	1790.75	1790.75	1791.42	0.67
Outlet - Hassayampa River								

[1] Miles above confluence with outlet wash

7.3 Annotated Flood Insurance Rate Map

Annotated Flood Insurance Rate Maps, covering Map Panels numbered 04013C0755L, 04013C0345L, 04013C0340L, 04013C0365L, 04013C0335L, 04013C0329L and 04013C0735L are shown in Figures 8A through 8G, following this section.

7.4 Flood Profiles

Flood profiles for the 10-, 50-, 100-, and 500-year floods are provided in Appendix E.5.5.

NOTES TO USERS

This map is for use in administering the Nation Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Arizona State Plane Central zone (FIPSZONE 0202). The **horizontal datum** was NAD 83 HARN, GRS1980 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988 (NAVD 88). These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. Map users wishing to obtain flood elevations referenced to the National Geodetic Vertical Datum of 1929 (NGVD 29) may use the following Maricopa County website application: http://www.fcd.maricopa.gov/Maps/gismaps/apps/gdacs/application/index.cfm

This web tool allows users to obtain point-specific datum conversion values by zooming in and hovering over a VERTCON checkbox on the layers menu on the left side of the screen. The VERTCON grid referenced in this web application was also used to convert existing flood elevations from NGVD 29 to NAVD 88.

To obtain current elevation, description, and/or location information for National Geodetic Survey bench marks shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242, or visit its website at http://www.ngs.noaa.gov. To obtain information about Geodetic Densification and Cadastral Survey bench marks produced by the Maricopa County Department of Transportation, please visit the Flood Control District of Maricopa County website at:
http://www.fcd.maricopa.gov/Maps/gismaps/apps/gdacs/application/index.cfm.

Base map information shown on this FIRM was derived from multiple sources. Aerial imagery was provided in digital format by the Maricopa County Department of Public Works, Flood Control District. The imagery is dated October 2009 to November 2009. Additional National Agricultural Imagery Program (NAIP) imagery was provided by the Arizona State Land Department (ALRIS) and is dated 2007. The coordinate system used for the production of the digital FIRM is State Plane Arizona Central NAD83 HARN, International Feet.

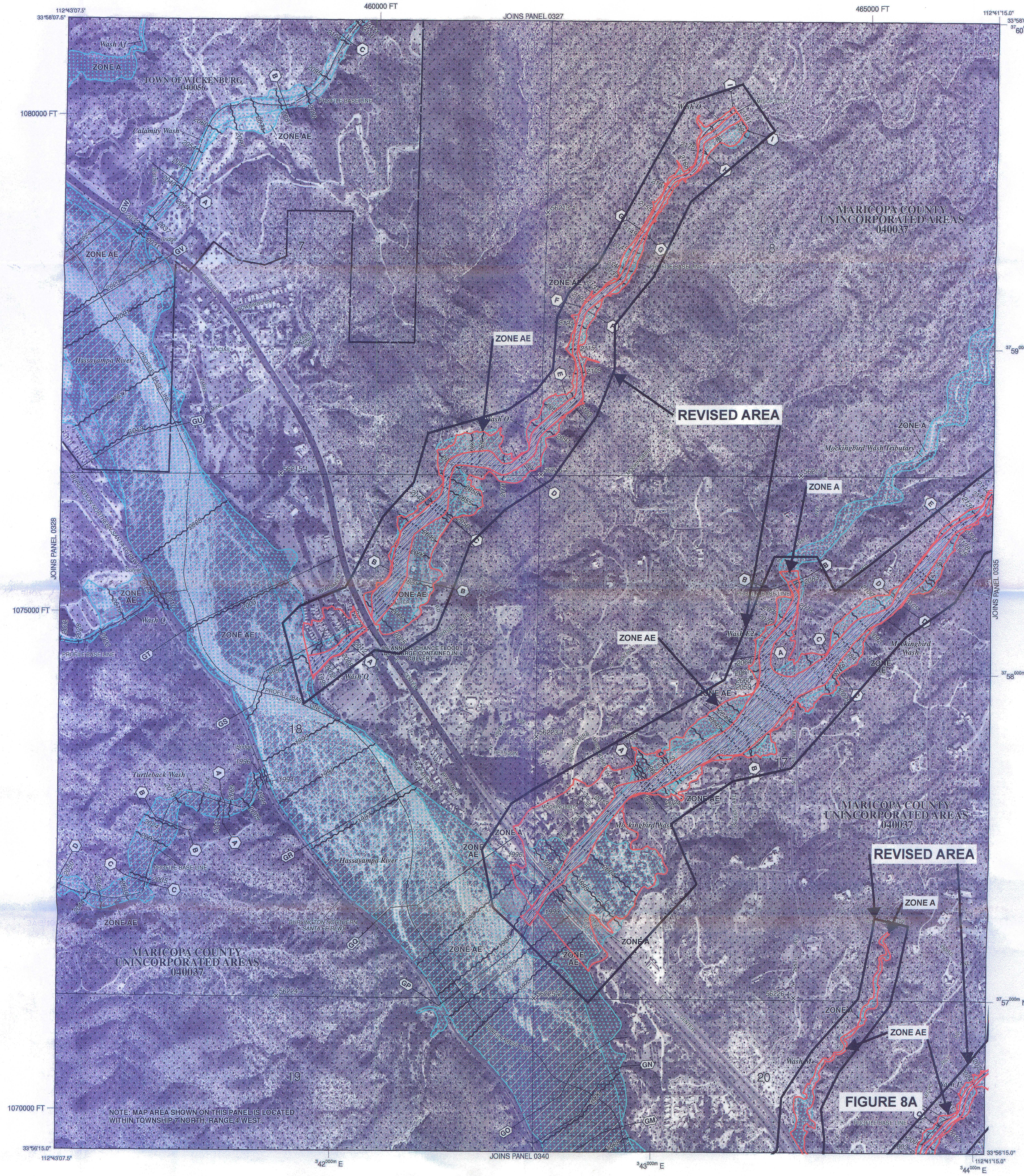
The **profile base line** depicted on this map represents the hydraulic modeling baselines that match flood profiles in the FIS report. As a result of improved topographic data, the profile base line, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county *showing the layout of map panels; community map repository addresses;* and a Listing of Communities table containing National Flood Insurance Program dates for each community, as well as a listing of the panels on which each community is located.

For Information on available products associated with this FIRM, visit the **FEMA Map Service Center (MSC)** website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, or digital versions of this map. Many of these products can be ordered or obtained directly from the MSC website.

If you have **questions about this map,** how to order products, or the National Flood Insurance Program in general, please call the **FEMA Map Information eXchange (FMIX)** at **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% annual chance floodplain boundary
0.2% annual chance floodplain boundary
Floodway boundary
Zone D boundary
CBRS and OPA boundary
Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.

513	Base Flood Elevation line and value; elevation in feet*
(EL 987)	Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

A — A	Cross section line
23 - - - 23	Transect line
97°07'30", 32°22'30"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
$^{42}75^{000m}$N	1000-meter Universal Transverse Mercator grid ticks, zone 12
6000000 M	5000-foot grid ticks: Arizona State Plane coordinate system, central zone (FIPSZONE 0202), Transverse Mercator
DX5510 ×	Bench mark (see explanation in Notes to Users section of this FIRM panel)
• M1.5	*River Mile*

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
April 15, 1988
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
September 29, 1989, September 4, 1991, July 19, 2001, September 30, 2005
October 16, 2013 –to change base flood elevations, to add special flood hazard areas, to change floodway, to add base flood elevation, to add roads and road names, to incorporate previously issued letters of map revision, to update corporate limits, to add floodway, and to advance suffix.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

N

MAP SCALE 1" = 500'

250 0 500 1000 FEET

150 0 150 300 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0329L

FIRM

FLOOD INSURANCE RATE MAP

MARICOPA COUNTY, ARIZONA

AND INCORPORATED AREAS

PANEL 329 OF 4425

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
MARICOPA COUNTY	040037	0329	L
WICKENBURG, TOWN OF	040056	0329	L

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

U.S. DEPARTMENT OF HOMELAND SECURITY

MAP NUMBER
04013C0329L

MAP REVISED
OCTOBER 16, 2013

Federal Emergency Management Agency

NOTES TO USERS

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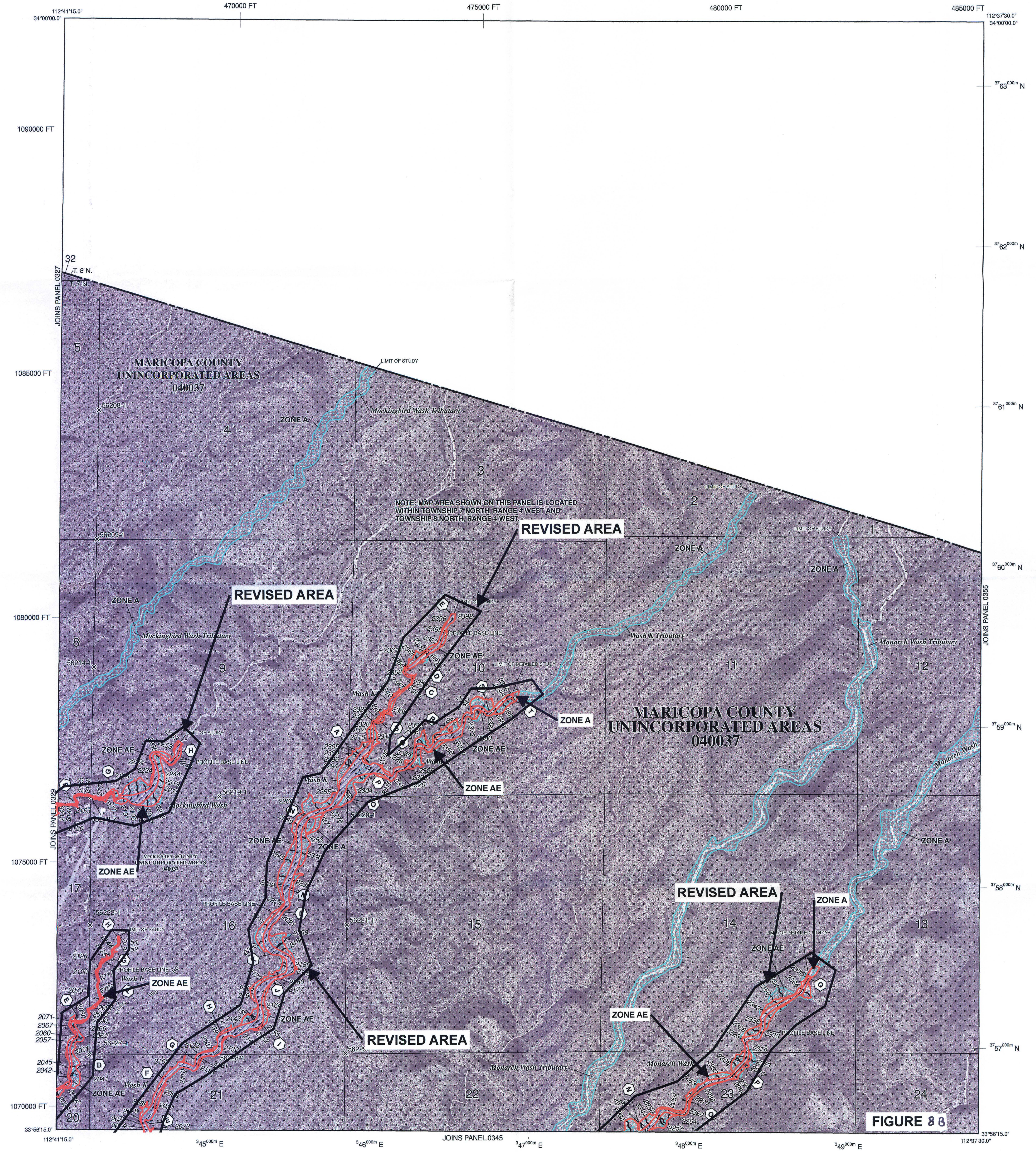

FIGURE 8

LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

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ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

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OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
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513	Base Flood Elevation line and value; elevation in feet*
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* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

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April 15, 1988
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July 19, 2001 September 30, 2005
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MAP SCALE 1" = 1000'
500 0 1000 2000 FEET
300 0 300 600 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0335L

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

PANEL 335 OF 4425
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
MARICOPA COUNTY	040037	0335	L

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER 04013C0335L

MAP REVISED OCTOBER 16, 2013

Federal Emergency Management Agency

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Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

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Flood elevations on this map are referenced to the North American Vertical Datum of 1988 (NAVD 88). These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. Map users wishing to obtain flood elevations referenced to the National Geodetic Vertical Datum of 1929 (NGVD 29) may use the following Maricopa County website application: http://www.fcd.maricopa.gov/Maps/gismaps/apps/gdacs/application/index.cfm

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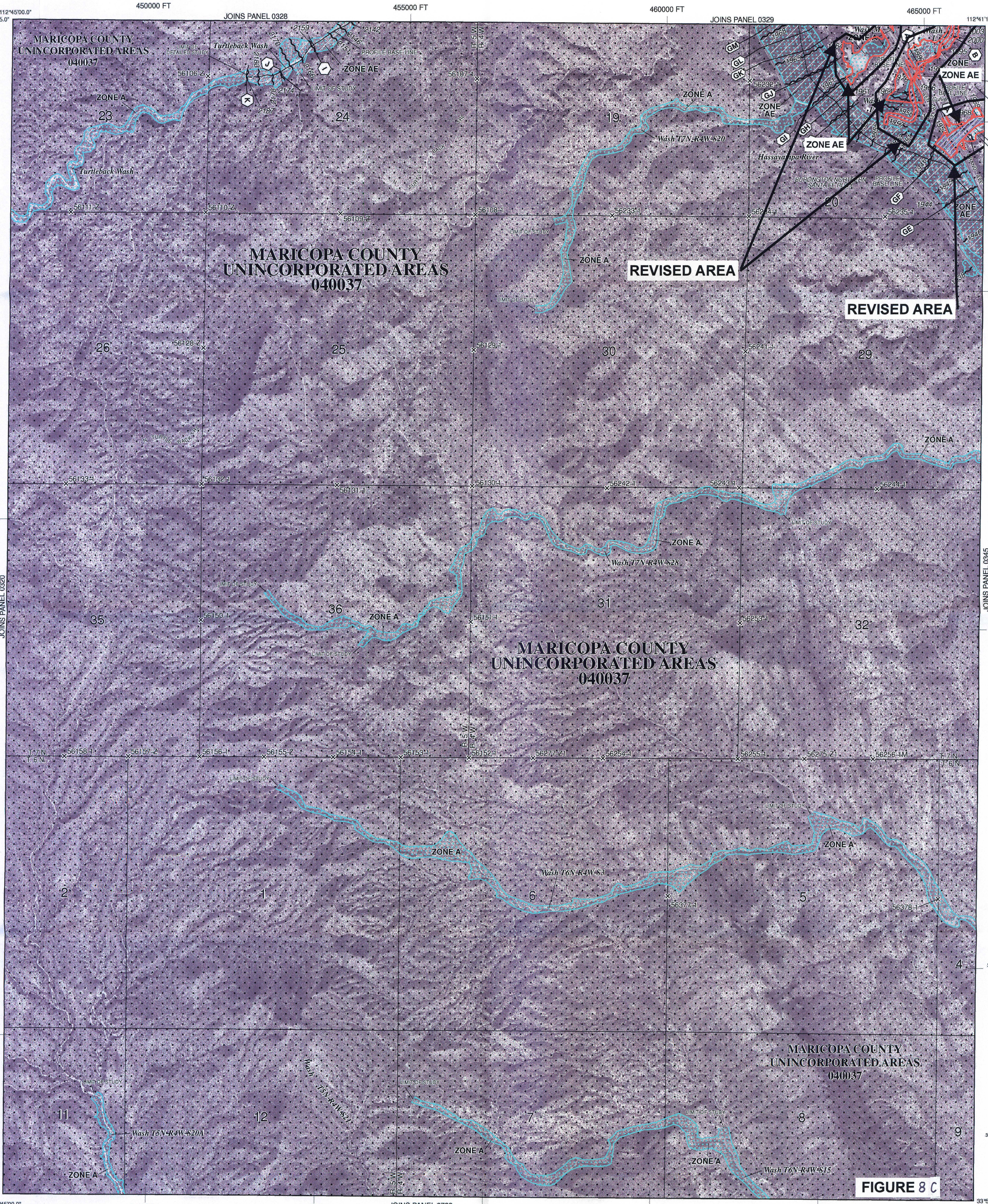

LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% annual chance floodplain boundary
0.2% annual chance floodplain boundary
Floodway boundary
Zone D boundary
CBRS and OPA boundary
Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.

~~ 513 ~~~~	Base Flood Elevation line and value; elevation in feet*
(EL 987)	Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

(A)——(A)	Cross section line
(23)——(23)	Transect line
97°07'30", 32°22'30"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
4275000mN	1000-meter Universal Transverse Mercator grid ticks, zone 12
6000000 M	5000-foot grid ticks: Arizona State Plane coordinate system, central zone (FIPSZONE 0202), Transverse Mercator
DX5510 ×	Bench mark (see explanation in Notes to Users section of this FIRM panel)
• M1.5	River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
April 15, 1988
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
September 4, 1991 July 19, 2001 September 30, 2005
October 16, 2013 – to incorporate previously issued letters of map revision, to update corporate limits, to add base flood elevation, to change base flood elevations, to advance suffix, to change floodway, to add roads and road names, to add special flood hazard areas, and to add floodway.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 1000'
500 0 1000 2000 FEET
300 0 300 600 METERS

NFIP

PANEL 0340L

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

PANEL 340 OF 4425
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
MARICOPA COUNTY	040037	0340	L

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

NATIONAL FLOOD INSURANCE PROGRAM

MAP NUMBER
04013C0340L

MAP REVISED
OCTOBER 16, 2013

Federal Emergency Management Agency

NOTES TO USERS

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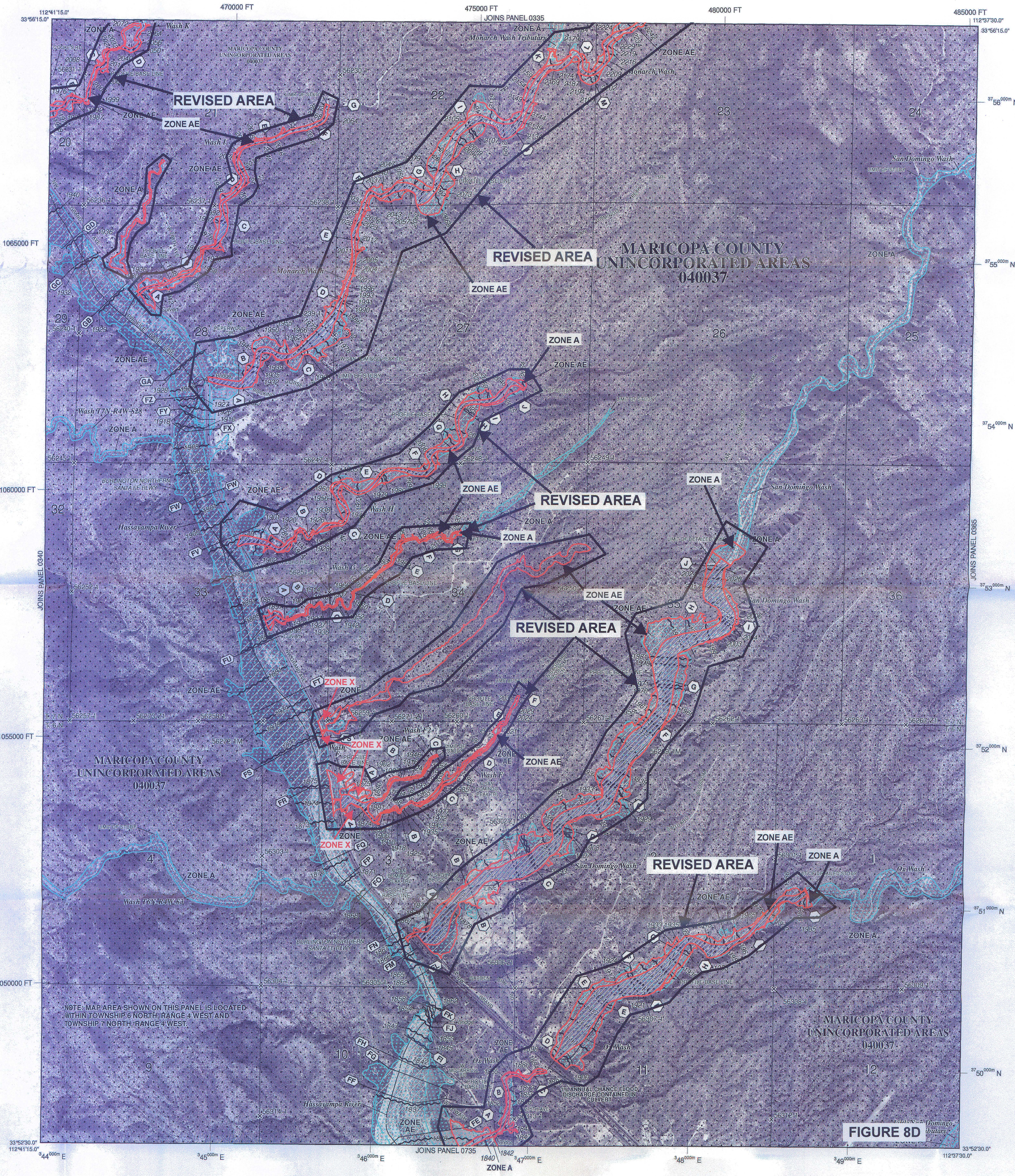

LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

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ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
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COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% annual chance floodplain boundary
0.2% annual chance floodplain boundary
Floodway boundary
Zone D boundary
CBRS and OPA boundary
Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.

513	Base Flood Elevation line and value; elevation in feet*
(EL 987)	Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

A —— A	Cross section line
23 - - - - 23	Transect line
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$^{42}75^{000m}$N	1000-meter Universal Transverse Mercator grid ticks, zone 12
6000000 M	5000-foot grid ticks: Arizona State Plane coordinate system, central zone (FIPSZONE 0202), Transverse Mercator
DX5510 ×	Bench mark (see explanation in Notes to Users section of this FIRM panel)
• M1.5	*River Mile*

MAP REPOSITORIES
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EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
April 15, 1988

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
September 4, 1991 July 19, 2001 September 30, 2005
October 16, 2013 –to add roads and road names, to add base flood elevation, to update corporate limits, to add floodway, to change floodway, to incorporate previously issued letters of map revision, to advance suffix, to change base flood elevations, and to add special flood hazard areas.

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MAP SCALE 1" = 1000'

500 0 1000 2000 FEET
300 0 300 600 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0345L

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

PANEL 345 OF 4425
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
MARICOPA COUNTY	040037	0345	L

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MAP NUMBER
04013C0345L

MAP REVISED
OCTOBER 16, 2013

Federal Emergency Management Agency

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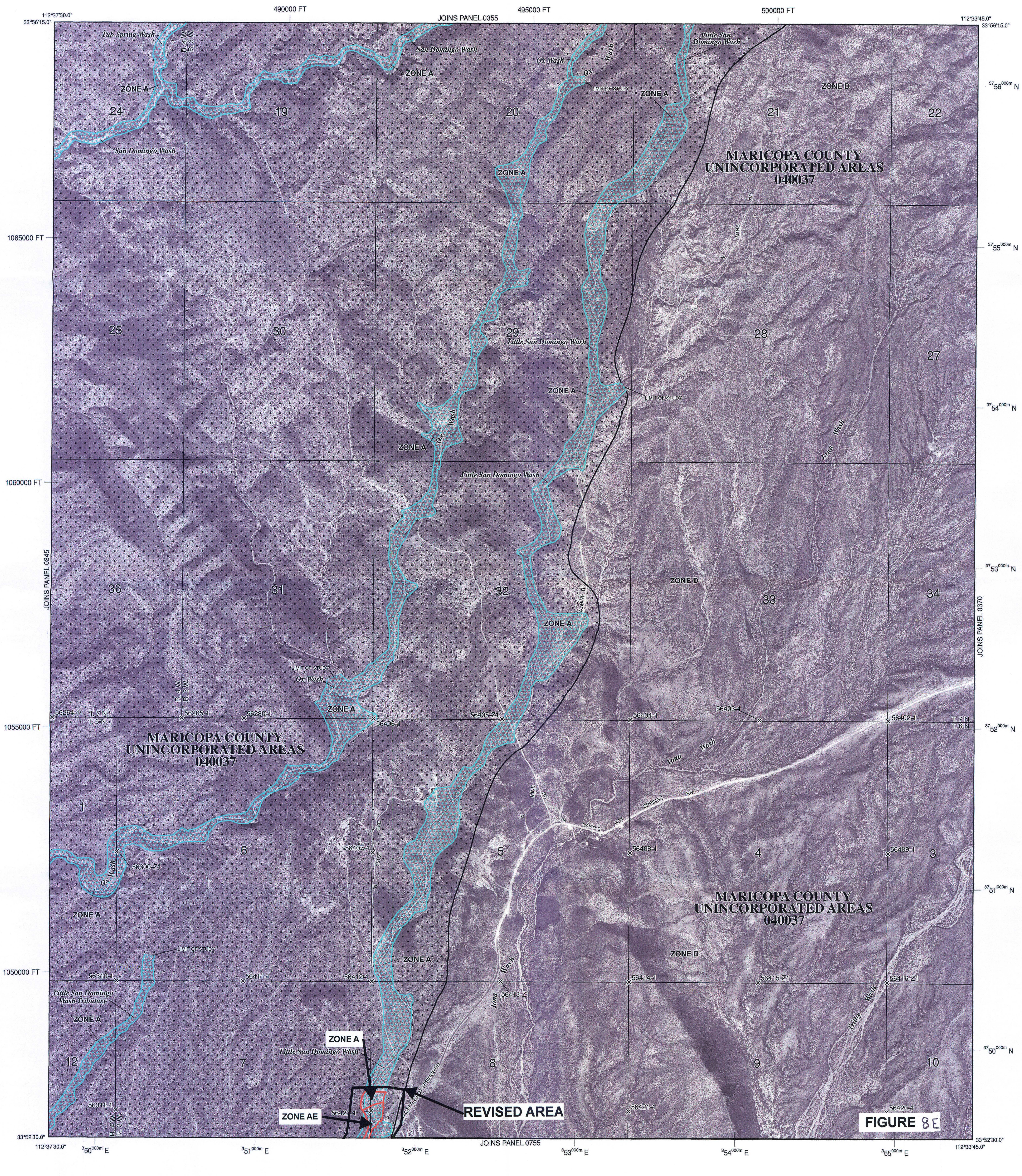

LEGEND

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ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

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OTHER FLOOD AREAS

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October 16, 2013 –to add floodway, to add special flood hazard areas, to advance suffix, to update corporate limits, to incorporate previously issued letters of map revision, to change base flood elevations, to change floodway, to add base flood elevation, and to add roads and road names.

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N

MAP SCALE 1" = 1000'
500 0 1000 2000 FEET
300 0 300 600 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0365L

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

PANEL 365 OF 4425
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
MARICOPA COUNTY	040037	0365	L

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U.S. DEPARTMENT OF HOMELAND SECURITY

MAP NUMBER
04013C0365L

MAP REVISED
OCTOBER 16, 2013

Federal Emergency Management Agency

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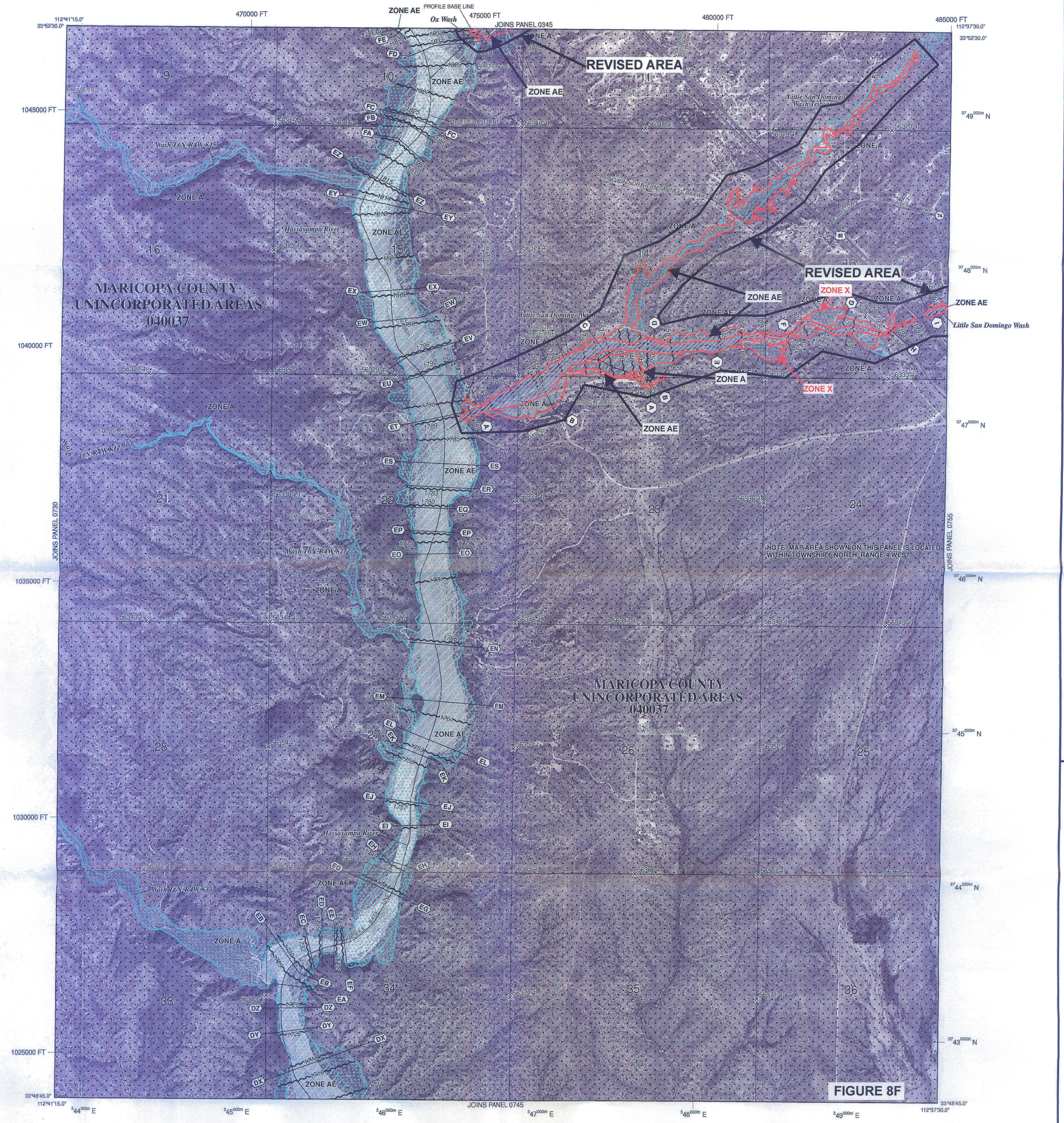

LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

	1% annual chance floodplain boundary
	0.2% annual chance floodplain boundary
	Floodway boundary
	Zone D boundary
	CBRS and OPA boundary
	Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
~~ 513 ~~~~	Base Flood Elevation line and value; elevation in feet*
(EL 987)	Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

(A)——(A)	Cross section line
(23)- - - -(23)	Transect line
97°07'30", 32°22'30"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
$^{42}75^{000m}$N	1000-meter Universal Transverse Mercator grid ticks, zone 12
6000000 M	5000-foot grid ticks: Arizona State Plane coordinate system, central zone (FIPSZONE 0202), Transverse Mercator
DX5510 ×	Bench mark (see explanation in Notes to Users section of this FIRM panel)
• M1.5	River Mile

MAP REPOSITORIES
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EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
April 15, 1988
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
September 4, 1991 July 19, 2001 September 30, 2005
October 16, 2013 –to change base flood elevations, to add roads and road names, to add special flood hazard areas, to incorporate previously issued letters of map revision, to change floodway, to advance suffix, to add base flood elevation, to add floodway, and to update corporate limits.

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MAP SCALE 1" = 1000'
500 0 1000 2000 FEET
300 0 300 600 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0735L

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

PANEL 735 OF 4425
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
MARICOPA COUNTY	040037	0735	L

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
04013C0735L

MAP REVISED
OCTOBER 16, 2013

Federal Emergency Management Agency

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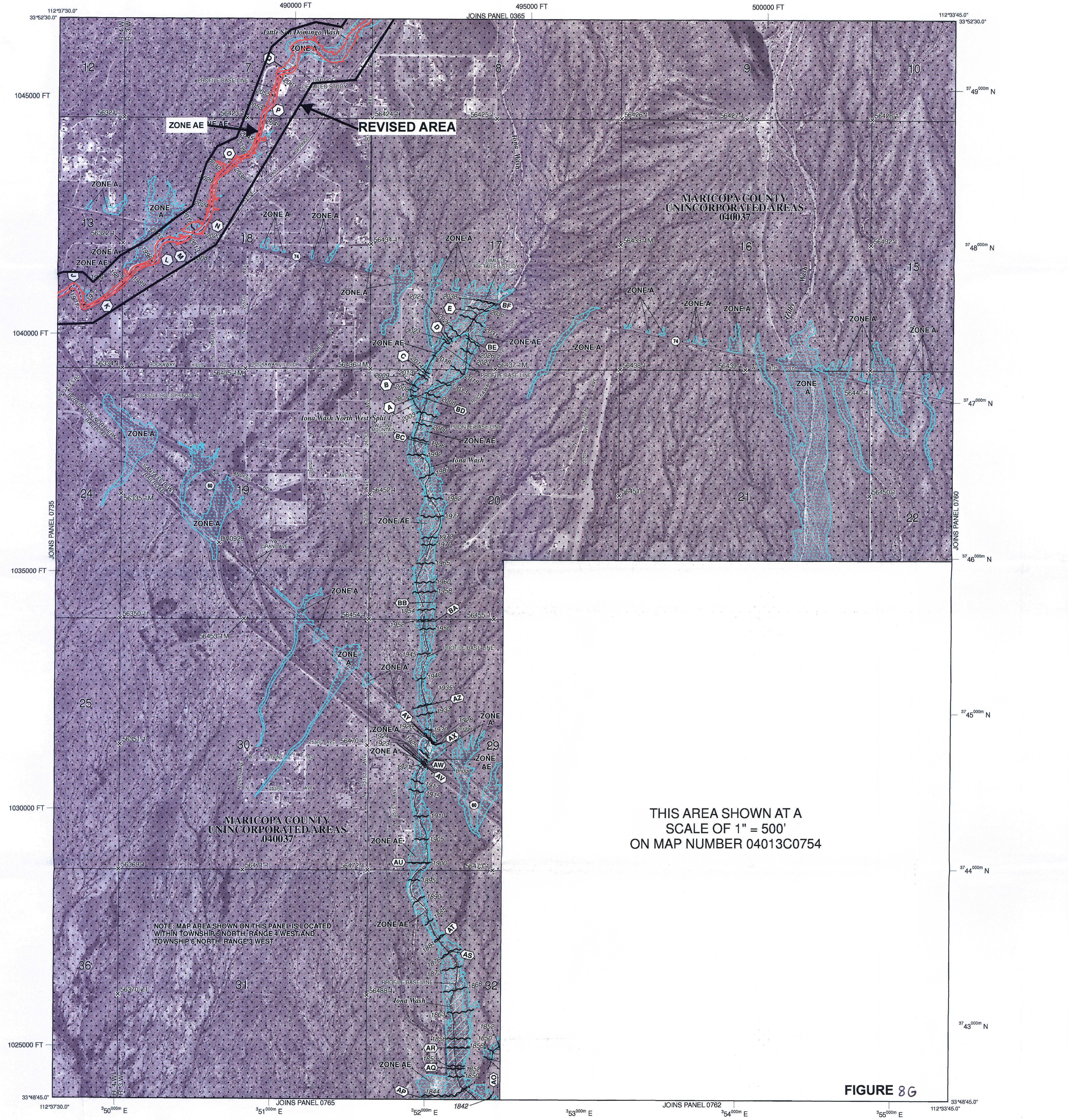

FIGURE 8G

LEGEND

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NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0755L

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

PANEL 755 OF 4425
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

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MARICOPA COUNTY	040037	0755	L

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MAP NUMBER 04013C0755L

MAP REVISED OCTOBER 16, 2013

Federal Emergency Management Agency

San Domingo Wash

HEC-1 I.D.	Contributing Area (sq. mi.)	100-Year 6-Hour Peak Discharge (cfs)	100-Year 24-Hour Peak Discharge (cfs)
SD01	0.87	821	742
SD02	0.78	1083	971
SD03	1.32	1224	1206
SD04	1.52	1561	1656
SD05	1.55	1425	1500
SD06	1.49	1861	1907
SD07	1.39	1489	1446
SD08	0.52	1289	1040
SD09	1.08	1352	1220
SD10	0.58	1164	952
SD11	0.73	1069	903
SD21	1.16	1054	1008
SD22	1.26	1217	1206
SD31	1.49	1729	1801
SD32	0.69	931	788
SD33	1.26	1263	1194
SD41	0.93	1111	995
SD42	0.55	868	713
SD43	1.32	1755	1675
CSD02	1.65	1410	1531
CSD03	4.49	3070	4164
CSD04	3.18	2314	2984
CSD05	8.46	4859	7137
CSD05A	6.04	3772	5247
CSD06	9.94	5304	8019
CSD07	14.78	7164	10719
CSD07A	11.34	5619	8512
CSD08	18.1	8743	12651
CSD08A	15.3	7261	10780
CSD09	19.18	8733	12689
CSD10	20.49	8993	12949
CSD11	19.91	8975	12961
CSD22	2.41	1724	1919
CSD33	3.44	2790	3408
CSD41	2.8	2667	2954
CSD42	1.48	1680	1681

Wash O

HEC-1 I.D.	Contributing Area (sq. mi.)	100-Year 6-Hour Peak Discharge (cfs)	100-Year 24-Hour Peak Discharge (cfs)
O1	1.29	1257	1212
O2	0.93	1014	914
O3	0.72	1215	1038
CO2	2.22	1956	2118
CO3	2.94	2284	2412

Little San Domingo Wash

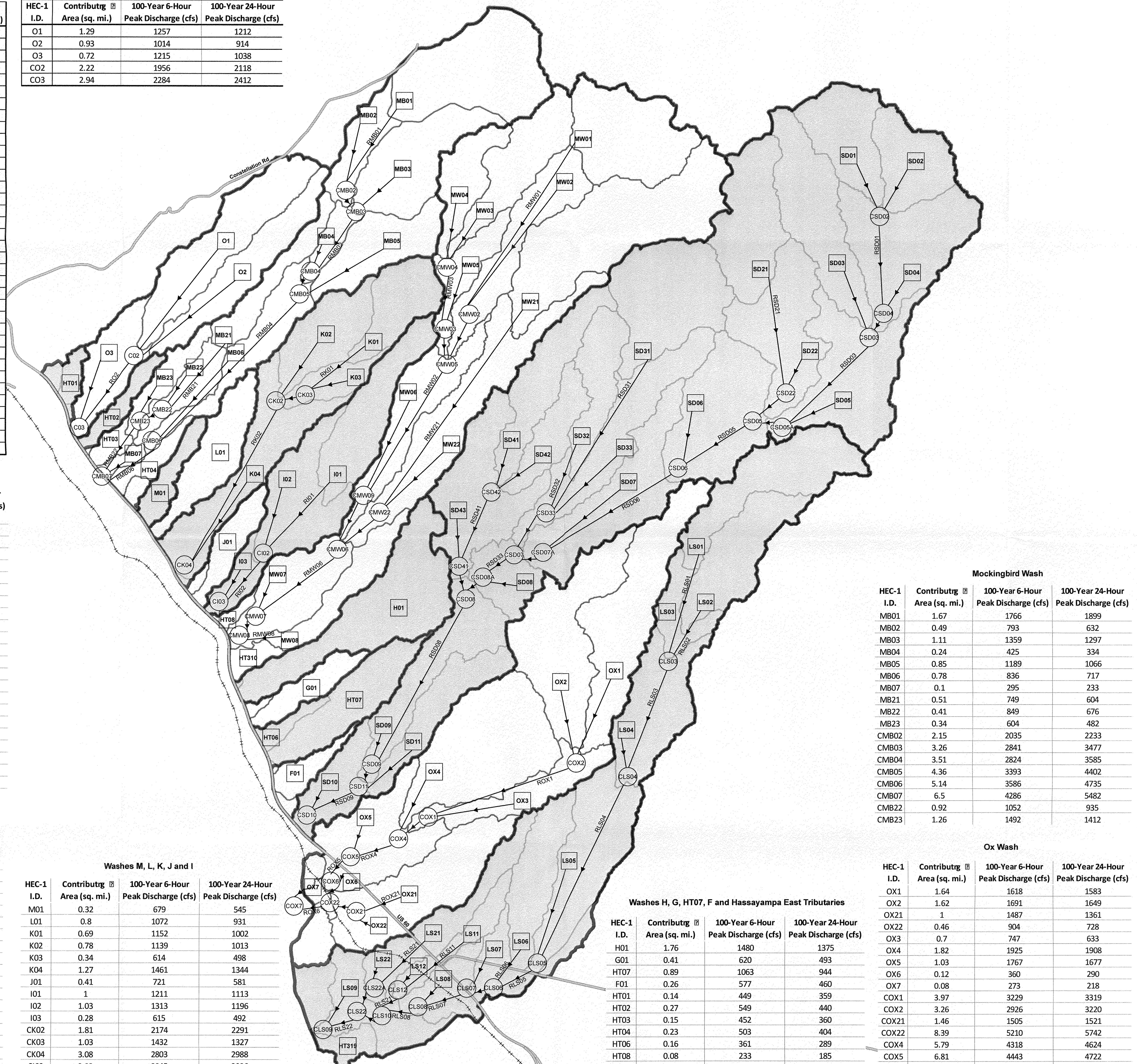
HEC-1 I.D.	Contributing Area (sq. mi.)	100-Year 6-Hour Peak Discharge (cfs)	100-Year 24-Hour Peak Discharge (cfs)
LS01	1.23	1026	952
LS02	1.01	929	841
LS03	0.39	814	654
LS04	1.08	1486	1376
LS05	1.33	1429	1326
LS06	0.84	1149	1011
LS07	0.39	910	735
LS08	0.5	1050	852
LS09	0.76	1163	1021
LS11	0.26	486	395
LS12	0.13	378	305
LS21	0.51	791	644
LS22	0.33	787	632
CLS03	2.63	1791	1827
CLS04	3.71	2380	2395
CLS05	5.04	2819	2882
CLS06	5.88	3162	3281
CLS07	6.27	3178	3314
CLS08	6.77	3211	3360
CLS09	8.76	3943	4456
CLS10	7.16	3295	3466
CLS12	0.39	595	482
CLS22	8	3671	4089
CLS22A	0.84	999	891

Monarch Wash

HEC-1 I.D.	Contributing Area (sq. mi.)	100-Year 6-Hour Peak Discharge (cfs)	100-Year 24-Hour Peak Discharge (cfs)
MW01	1.3	1323	1309
MW02	1	895	811
MW03	0.92	863	772
MW04	0.59	836	688
MW05	0.49	786	625
MW06	0.93	955	858
MW07	0.93	1176	1068
MW08	0.59	761	625
MW21	2.3	1286	1410
MW22	1.6	1228	1196
CMW02	2.3	1690	1797
CMW03	2	1532	1495
CMW04	1.51	1343	1312
CMW05	4.3	2793	3262
CMW06	9.13	4172	5230
CMW07	10.06	4150	5241
CMW08	10.65	4236	5357
CMW09	5.23	2945	3319
CMW22	3.9	1779	1936

Washes M, L, K, J and I

HEC-1 I.D.	Contributing Area (sq. mi.)	100-Year 6-Hour Peak Discharge (cfs)	100-Year 24-Hour Peak Discharge (cfs)
M01	0.32	679	545
L01	0.8	1072	931
K01	0.69	1152	1002
K02	0.78	1139	1013
K03	0.34	614	498
K04	1.27	1461	1344
J01	0.41	721	581
I01	1	1211	1113
I02	1.03	1313	1196
I03	0.28	615	492
CK02	1.81	2174	2291
CK03	1.03	1432	1327
CK04	3.08	2803	2988
CI02	2.03	2045	2096
CI03	2.31	2097	2139



Washes H, G, HT07, F and Hassayampa East Tributaries

HEC-1 I.D.	Contributing Area (sq. mi.)	100-Year 6-Hour Peak Discharge (cfs)	100-Year 24-Hour Peak Discharge (cfs)
H01	1.76	1480	1375
G01	0.41	620	493
HT07	0.89	1063	944
F01	0.26	577	460
HT01	0.14	449	359
HT02	0.27	549	440
HT03	0.15	452	360
HT04	0.23	503	404
HT06	0.16	361	289
HT08	0.08	233	185
HT310	0.16	459	364
HT319	0.21	532	421

Mockingbird Wash

HEC-1 I.D.	Contributing Area (sq. mi.)	100-Year 6-Hour Peak Discharge (cfs)	100-Year 24-Hour Peak Discharge (cfs)
MB01	1.67	1766	1899
MB02	0.49	793	632
MB03	1.11	1359	1297
MB04	0.24	425	334
MB05	0.85	1189	1066
MB06	0.78	836	717
MB07	0.1	295	233
MB21	0.51	749	604
MB22	0.41	849	676
MB23	0.34	604	482
CMB02	2.15	2035	2233
CMB03	3.26	2841	3477
CMB04	3.51	2824	3585
CMB05	4.36	3393	4402
CMB06	5.14	3586	4735
CMB07	6.5	4286	5482
CMB22	0.92	1052	935
CMB23	1.26	1492	1412

Ox Wash

HEC-1 I.D.	Contributing Area (sq. mi.)	100-Year 6-Hour Peak Discharge (cfs)	100-Year 24-Hour Peak Discharge (cfs)
OX1	1.64	1618	1583
OX2	1.62	1691	1649
OX21	1	1487	1361
OX22	0.46	904	728
OX3	0.7	747	633
OX4	1.82	1925	1908
OX5	1.03	1767	1677
OX6	0.12	360	290
OX7	0.08	273	218
COX1	3.97	3229	3319
COX2	3.26	2926	3220
COX21	1.46	1505	1521
COX22	8.39	5210	5742
COX4	5.79	4318	4624
COX5	6.81	4443	4722
COX6	6.93	4432	4726
COX7	8.47	5213	5734

LEGEND

- Watershed Boundary
- SD01 Sub-basin ID
- CSD01 Concentration Point ID
- RC1C2 Channel Routing ID
- Railroad
- Streets

N

0 1,000 2,000 4,000 6,000 Feet

1 inch = 3,000 feet

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

Hoskin • Ryan Consultants, Inc. *creative engineering solutions*

Dewberry

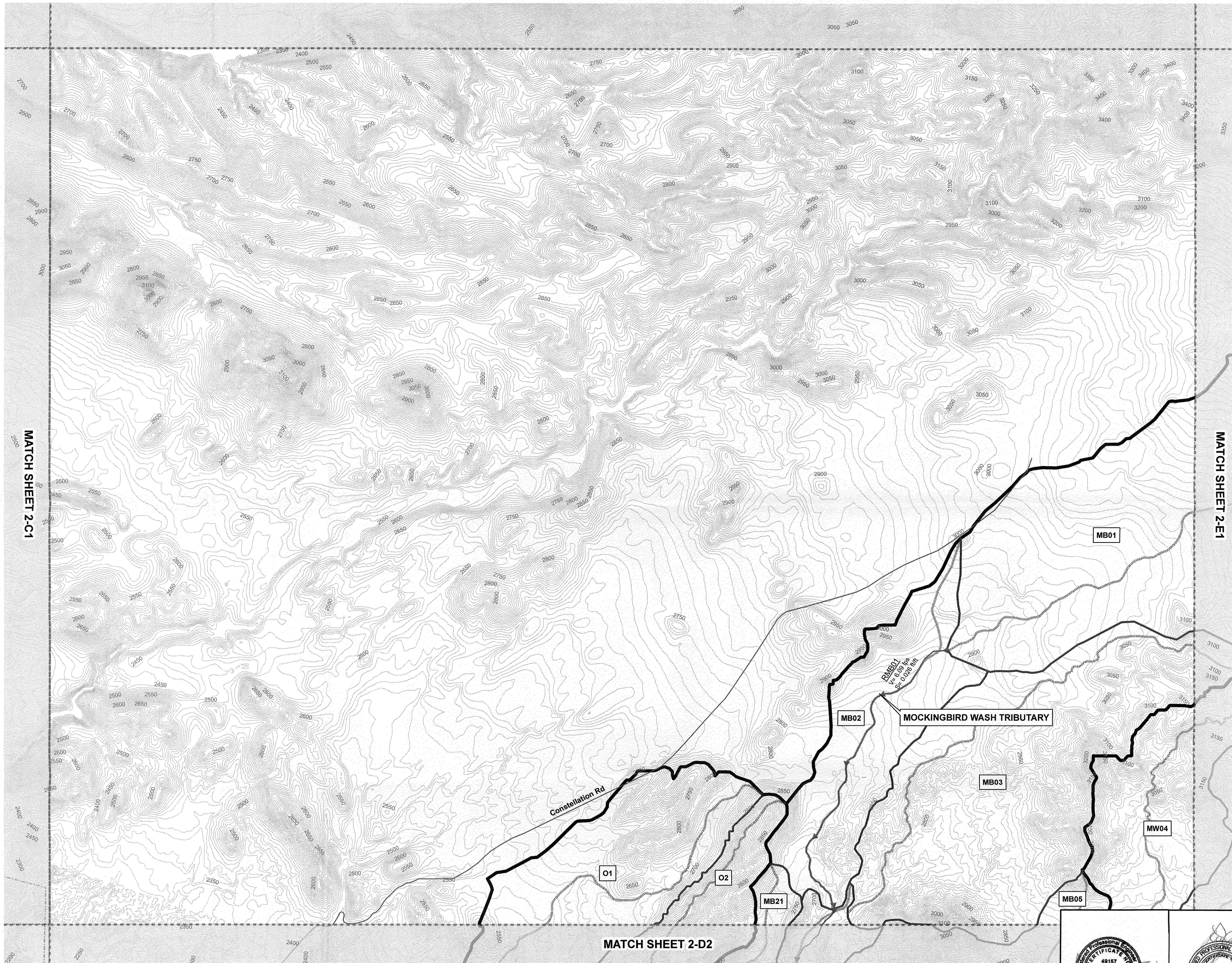
CVL COE & VAN LOO

WICKENBURG AREA DRAINAGE MASTER STUDY / PLAN PHASE 3

F.C.D. CONTRACT No. 2009-C030

HEC-1 SCHEMATIC MAP
EXHIBIT 1

G:\Projects\10\10-003 Wickenburg ADMS\03-Phase 3\E_HEC-1 East Schematic Map.mxd



LEGEND

- Watershed Boundary
- SN3 Sub-basin ID
- City Boundary
- TC Flow Path
- Railroad
- Township and Range
- Streets
- Routing Reach
- RC7C8 V= 9.16 fps S= 0.014 ft/ft Routing Reach HEC1 ID Reach 100yr Velocity & Slope
- Storm Drain
- XS-2 Cross Sections for Routing Reach 'n' Values
- 2400 Elevation in Feet

0 1,000 2,000 Feet

1 inch = 1,000 feet

Notes:

1) See Phase 3 Field Reconnaissance Reports for cross section, photographs and Mannings 'n' value calculations.

2) Velocities were calculated for initial nstp calculations using flows from the controlling storm for each watershed. See Appendix D for calculations.

Reference:
Wickenburg Topographic Mapping, dated 12/16/2004, provided by FCDMC in 2010

INDEX MAP

	A	B	C	D	E	F
1	2-A1	2-B1	2-C1	2-D1	2-E1	2-F1
2	2-A2	2-B2	2-C2	2-D2	2-E2	2-F2
3	2-A3	2-B3	2-C3	2-D3	2-E3	
4			2-C4	2-D4	2-E4	

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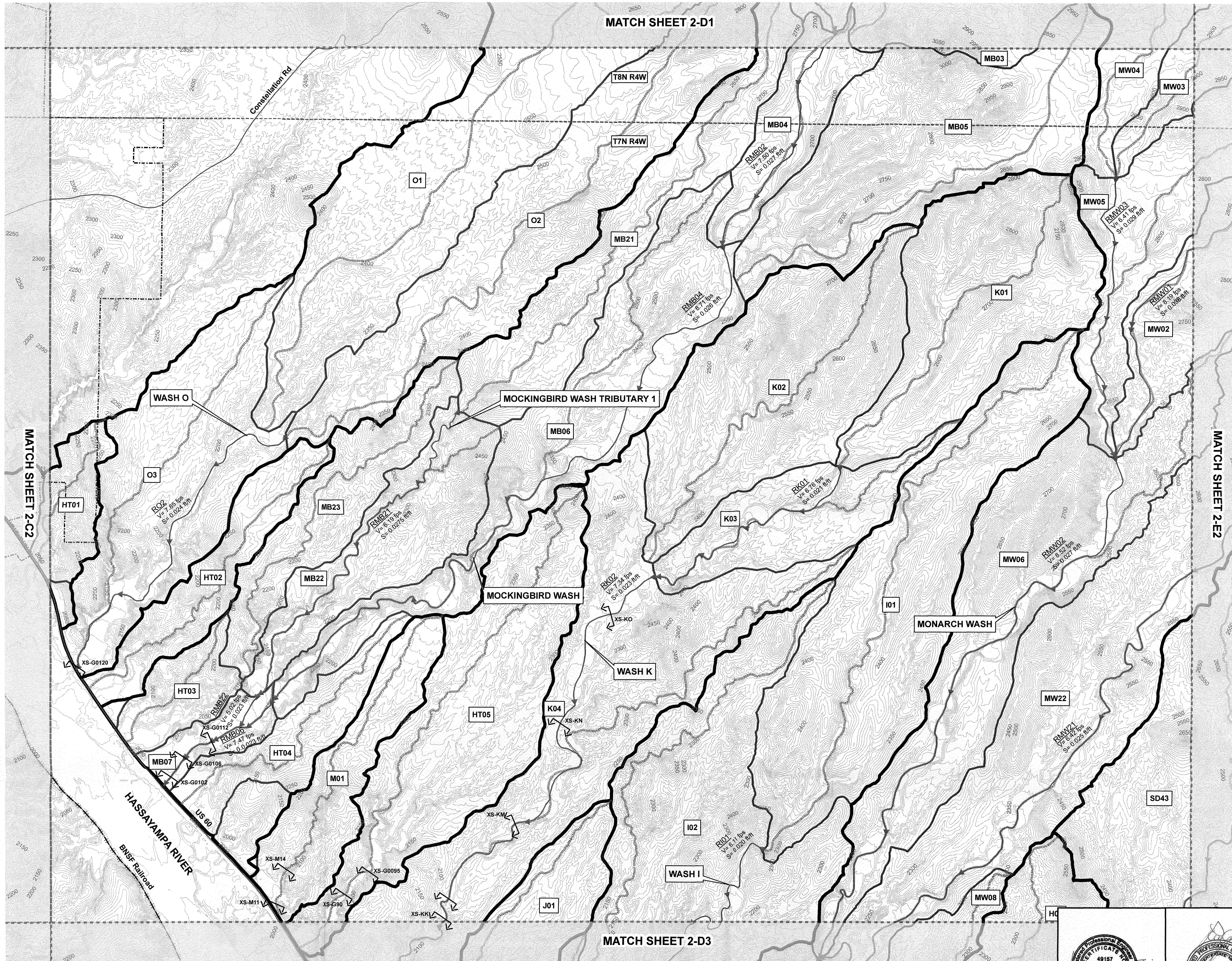
WICKENBURG
AREA DRAINAGE MASTER STUDY / PLAN

F.C.D. CONTRACT No. 2009-C030

ROUTING MAP
EXHIBIT 2-D1



LEGEND

- Watershed Boundary
- SN3 Sub-basin ID
- City Boundary
- TC Flow Path
- Railroad
- Township and Range
- Streets
- Routing Reach
- RC7C8 V= 9.16 fps S= 0.014 ft/ft Routing Reach HEC1 ID Reach 100yr Velocity & Slope
- Storm Drain
- XS-2 Cross Sections for Routing Reach 'n' Values
- 2400 Elevation in Feet

N

0 1,000 2,000 Feet

1 inch = 1,000 feet

Notes:

1) *See Phase 3 Field Reconnaissance Reports for cross section, photographs and Mannings 'n' value calculations.*
2) *Velocities were calculated for initial nstp calculations using flows from the controlling storm for each watershed. See Appendix D for calculations.*

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INDEX MAP

	A	B	C	D	E	F
1	2-A1	2-B1	2-C1	2-D1	2-E1	2-F1
2	2-A2	2-B2	2-C2	2-D2	2-E2	2-F2
3	2-A3	2-B3	2-C3	2-D3	2-E3	
4			2-C4	2-D4	2-E4	

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WICKENBURG
AREA DRAINAGE MASTER STUDY / PLAN

F.C.D. CONTRACT No. 2009-C030

ROUTING MAP
EXHIBIT 2-D2

LEGEND

- Watershed Boundary
- SN3 — Sub-basin ID
- City Boundary
- TC Flow Path
- Railroad
- Township and Range
- Streets
- Routing Reach
- RC7C8 V= 9.16 fps S= 0.014 ft/ft — Routing Reach HEC1 ID, Reach 100yr Velocity & Slope
- Storm Drain
- XS-2 — Cross Sections for Routing Reach 'n' Values
- 2400 — Elevation in Feet

0 1,000 2,000 Feet

1 inch = 1,000 feet

Notes:

1) See Phase 3 Field Reconnaissance Reports for cross section, photographs and Mannings 'n' value calculations.

2) Velocities were calculated for initial nstp calculations using flows from the controlling storm for each watershed. See Appendix D for calculations.

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	A	B	C	D	E	F
1	2-A1	2-B1	2-C1	2-D1	2-E1	2-F1
2	2-A2	2-B2	2-C2	2-D2	2-E2	2-F2
3	2-A3	2-B3	2-C3	2-D3	2-E3	
4			2-C4	2-D4	2-E4	

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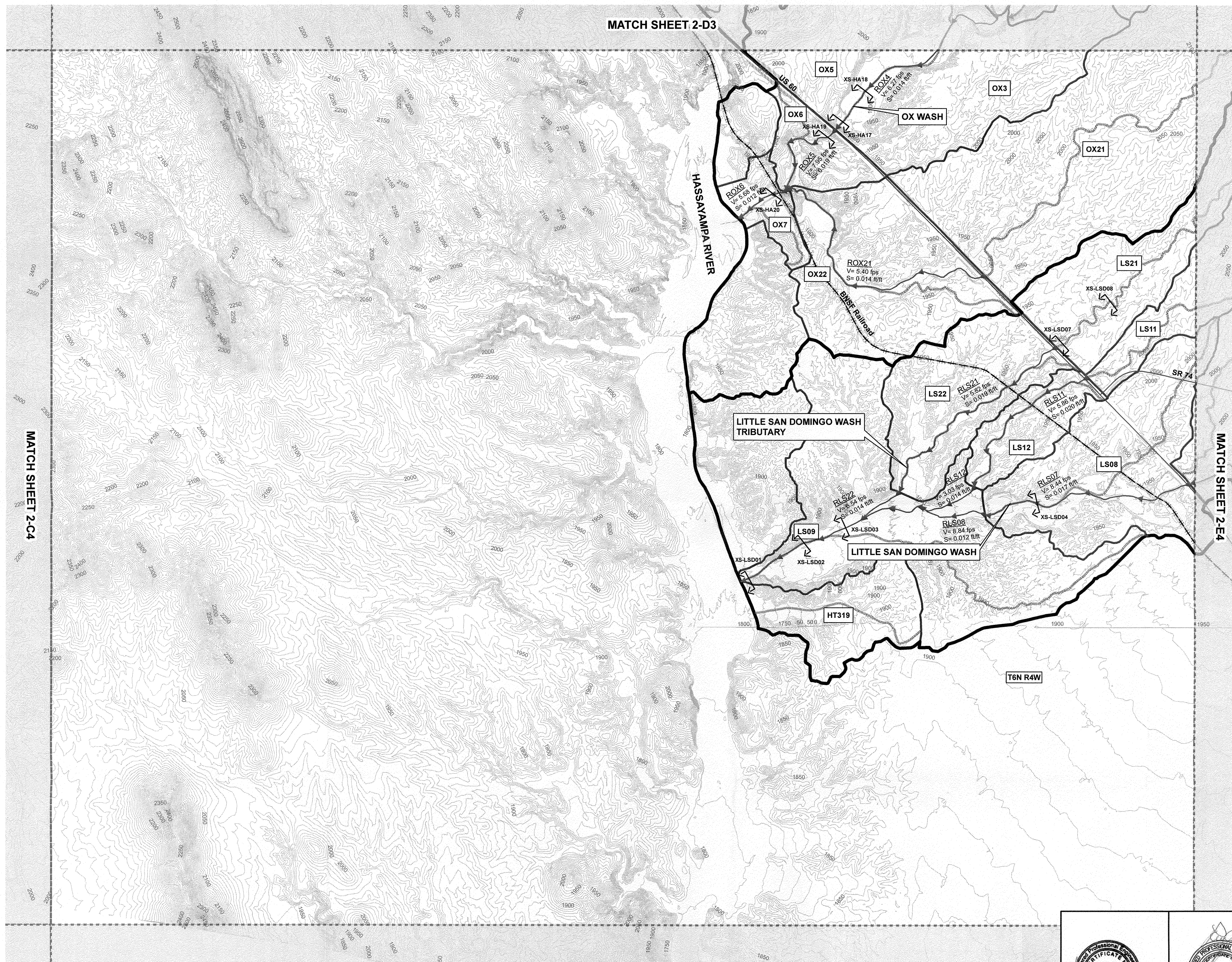
WICKENBURG AREA DRAINAGE MASTER STUDY / PLAN

F.C.D. CONTRACT No. 2009-C030

ROUTING MAP
EXHIBIT 2-D3



LEGEND

- Watershed Boundary
- SN3 — Sub-basin ID
- City Boundary
- TC Flow Path
- Railroad
- Township and Range
- Streets
- Routing Reach
- RC7C8 V= 9.16 fps S= 0.014 ft/ft — Routing Reach HEC1 ID, Reach 100yr Velocity & Slope
- Storm Drain
- XS-2 — Cross Sections for Routing Reach 'n' Values
- 2400 — Elevation in Feet

0 1,000 2,000 Feet

1 inch = 1,000 feet

Notes:

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	A	B	C	D	E	F
1	2-A1	2-B1	2-C1	2-D1	2-E1	2-F1
2	2-A2	2-B2	2-C2	2-D2	2-E2	2-F2
3	2-A3	2-B3	2-C3	2-D3	2-E3	
4			2-C4	2-D4	2-E4	

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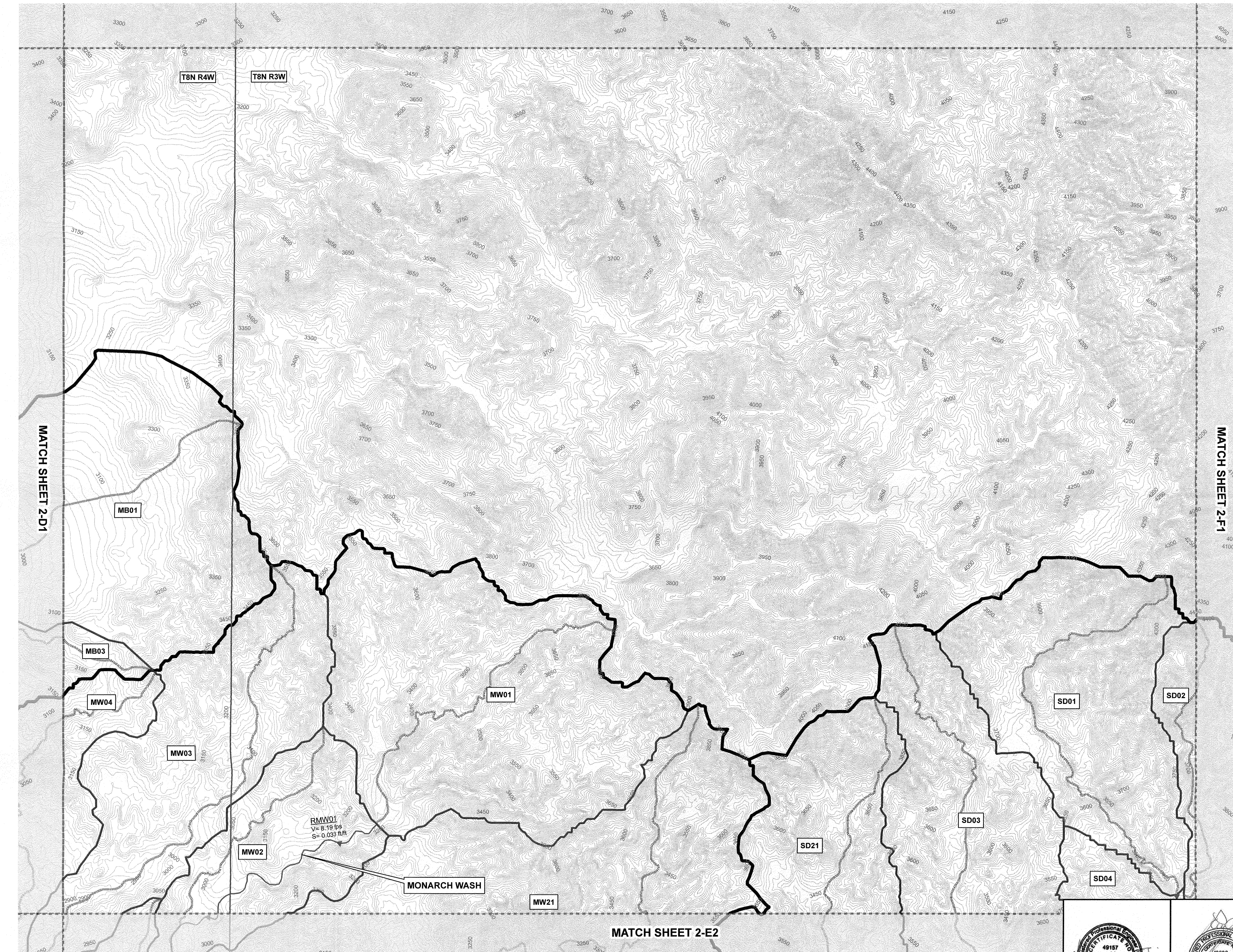
WICKENBURG AREA DRAINAGE MASTER STUDY / PLAN

F.C.D. CONTRACT No. 2009-C030

ROUTING MAP
EXHIBIT 2-D4



LEGEND

Watershed Boundary

SN3 Sub-basin ID

City Boundary

TC Flow Path

Railroad

Township and Range

Streets

Routing Reach

RC7C8 V= 9.16 fps S= 0.014 ft/ft Routing Reach HEC1 ID Reach 100yr Velocity & Slope

Storm Drain

XS-2 Cross Sections for Routing Reach 'n' Values

2400 Elevation in Feet

0 1,000 2,000 Feet

1 inch = 1,000 feet

Notes:

1) See Phase 3 Field Reconnaissance Reports for cross section, photographs and Mannings 'n' value calculations.

2) Velocities were calculated for initial nstp calculations using flows from the controlling storm for each watershed. See Appendix D for calculations.

Reference:
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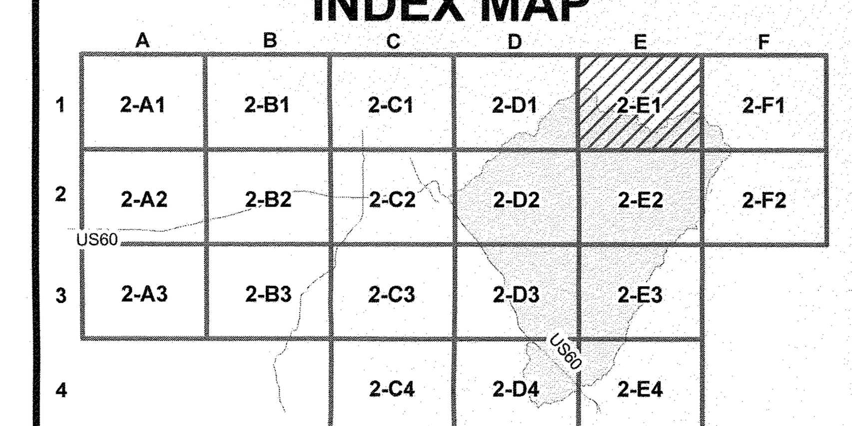
INDEX MAP



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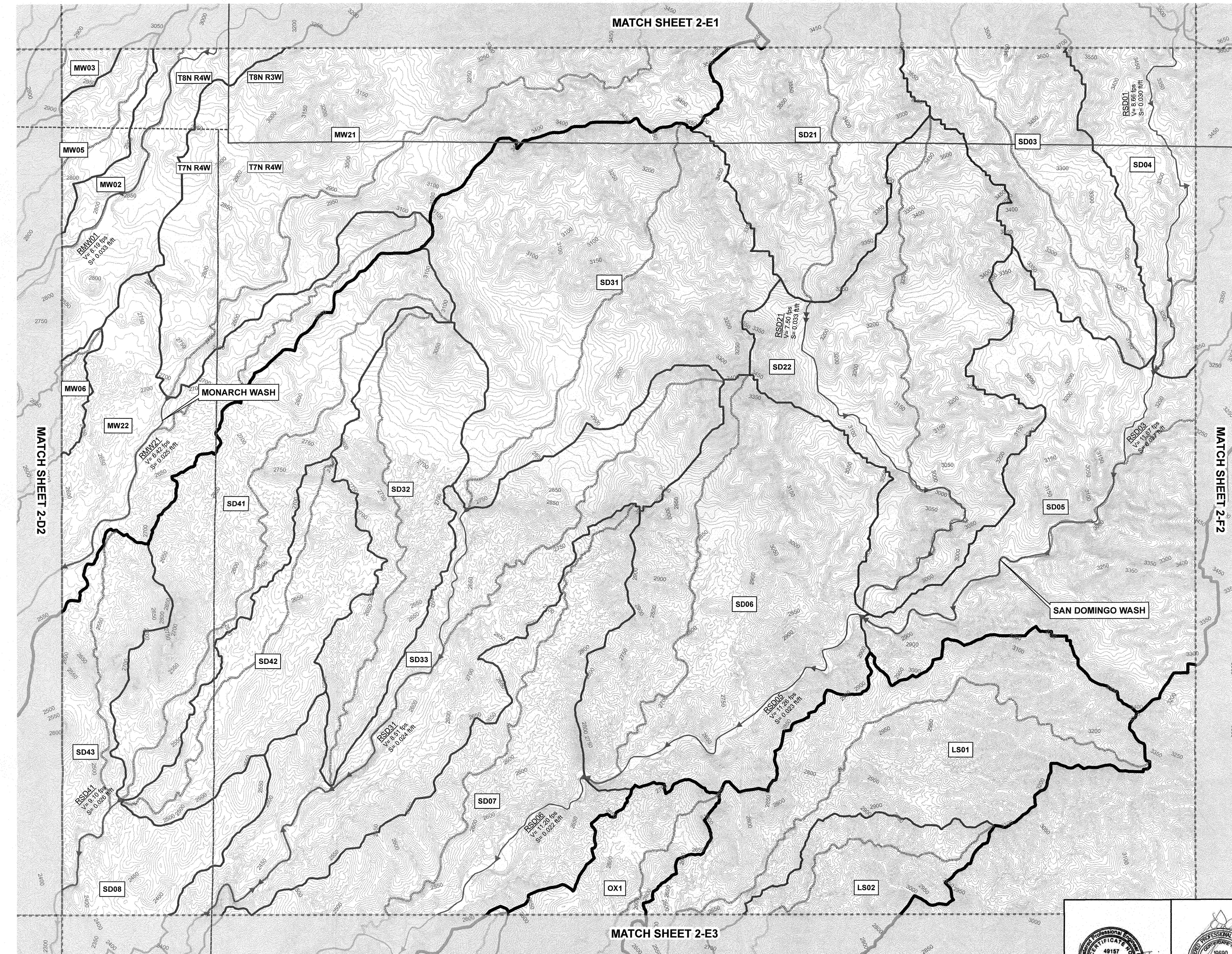
F.C.D. CONTRACT No. 2009-C030

ROUTING MAP
EXHIBIT 2-E1



LEGEND

- Watershed Boundary
- SN3 Sub-basin ID
- City Boundary
- TC Flow Path
- Railroad
- Township and Range
- Streets
- Routing Reach
- RC7C8 V= 9.16 fps S= 0.014 ft/ft — Routing Reach HEC1 ID Reach 100yr Velocity & Slope
- Storm Drain
- XS-2 — Cross Sections for Routing Reach 'n' Values
- Elevation in Feet

0 1,000 2,000 Feet

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Notes:

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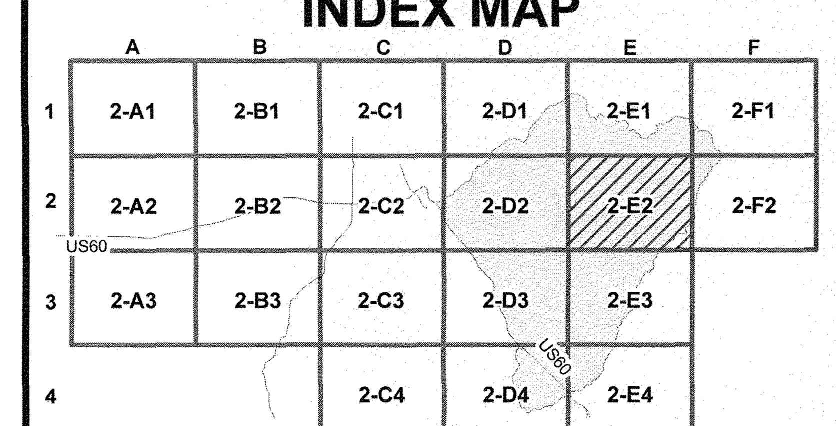

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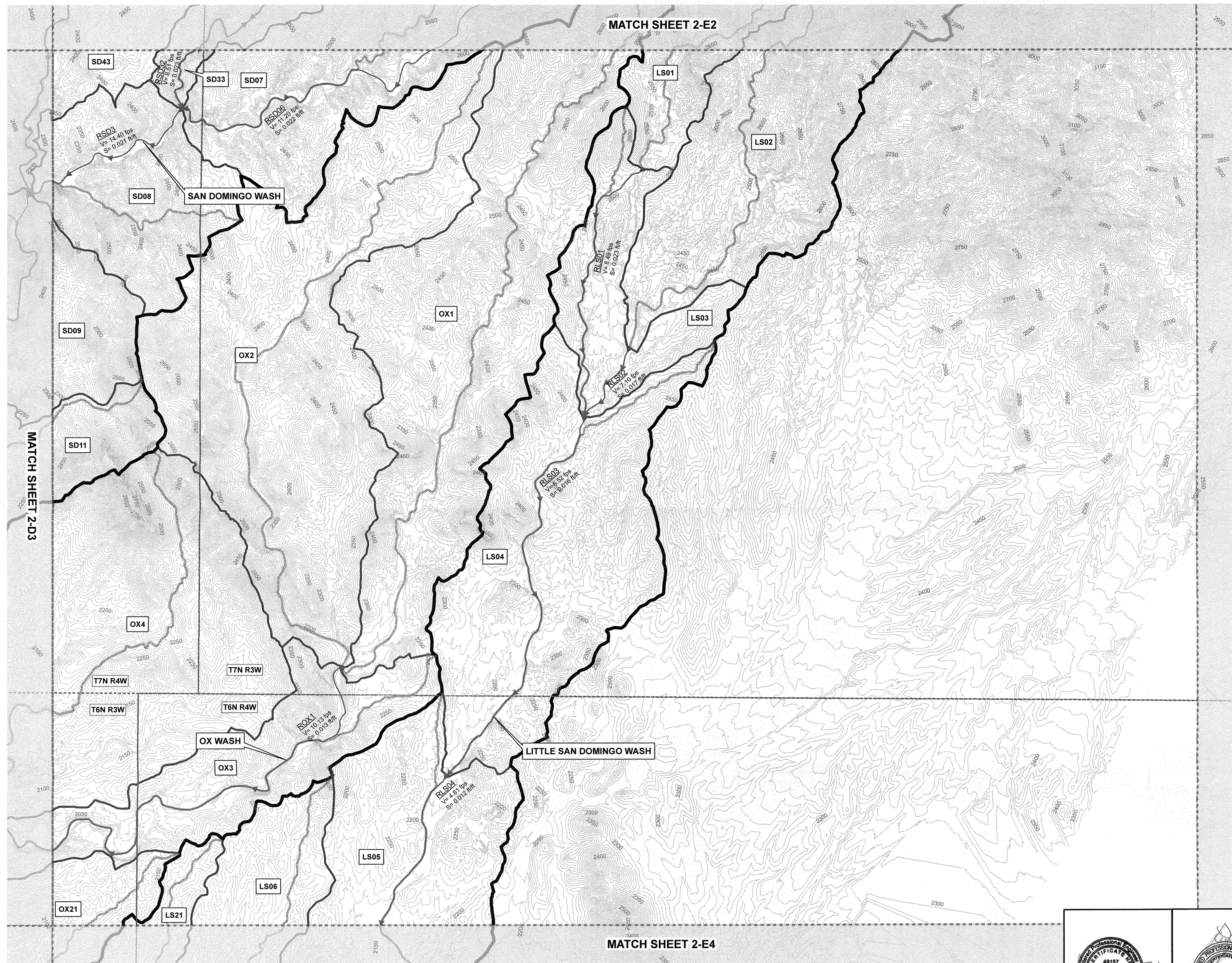
WICKENBURG AREA DRAINAGE MASTER STUDY / PLAN

F.C.D. CONTRACT No. 2009-C030

ROUTING MAP
EXHIBIT 2-E2



LEGEND

- Watershed Boundary
- SN3 Sub-basin ID
- City Boundary
- TC Flow Path
- Railroad
- Township and Range
- Streets
- Routing Reach
- RC7C8 V= 9.16 fps S= 0.014 ft/ft — Routing Reach HEC1 ID Reach 100yr Velocity & Slope
- Storm Drain
- XS-2 Cross Sections for Routing Reach 'n' Values
- 2450 Elevation in Feet

N

0 1,000 2,000 Feet

1 inch = 1,000 feet

Notes:

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2	2-A2	2-B2	2-C2	2-D2	2-E2	2-F2
3	2-A3	2-B3	2-C3	2-D3	2-E3	
4			2-C4	2-D4	2-E4	

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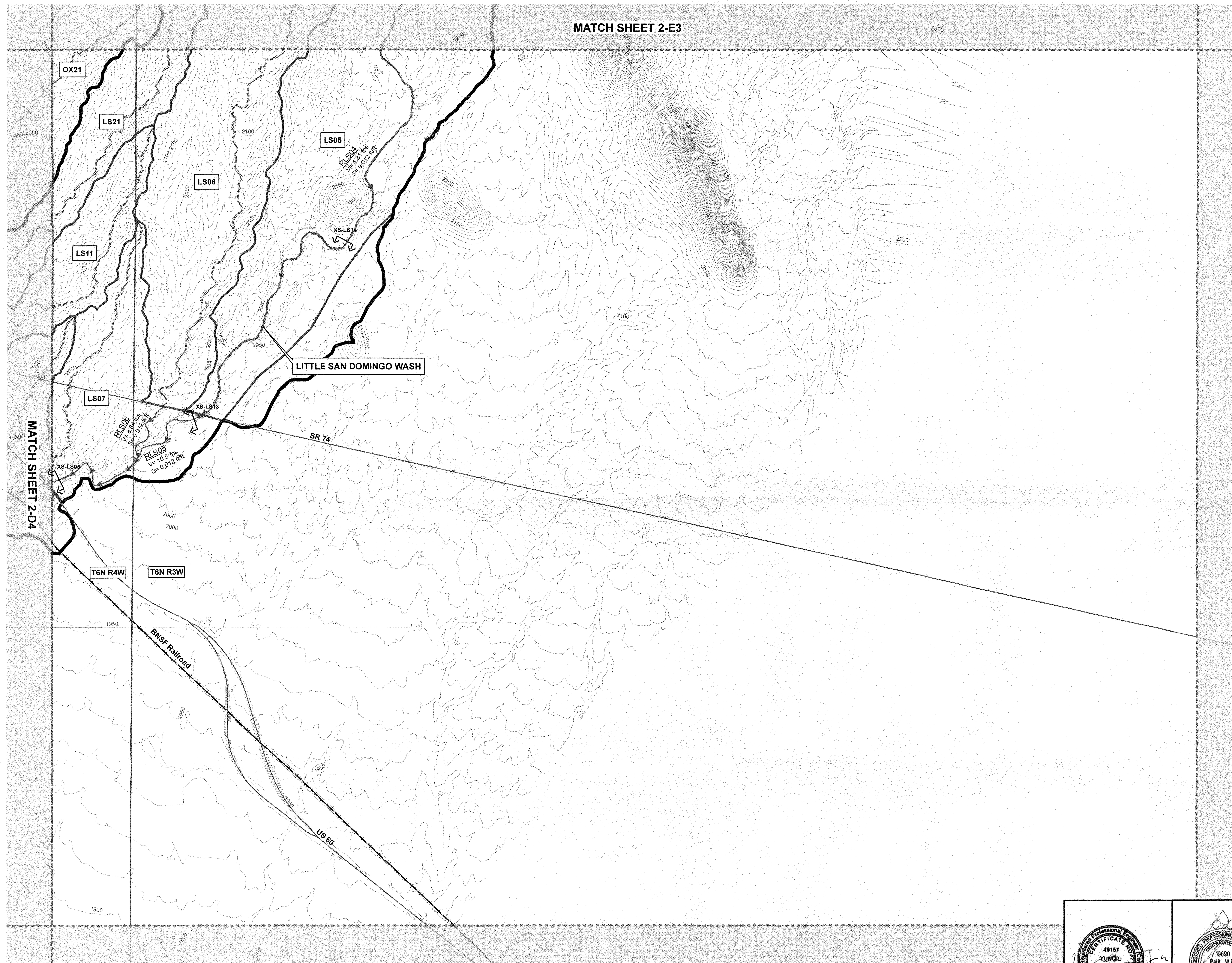
F.C.D. CONTRACT No. 2009-C030

ROUTING MAP
EXHIBIT 2-E3



LEGEND

- Watershed Boundary
- SN3 Sub-basin ID
- City Boundary
- TC Flow Path
- Railroad
- Township and Range
- Streets
- Routing Reach
- RC7C8 V= 9.16 fps S= 0.014 ft/ft — Routing Reach HEC1 ID Reach 100yr Velocity & Slope
- Storm Drain
- XS-2 — Cross Sections for Routing Reach 'n' Values
- 2400 — Elevation in Feet

0 1,000 2,000 Feet

1 inch = 1,000 feet

Notes:
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2	2-A2	2-B2	2-C2	2-D2	2-E2	2-F2
3	2-A3	2-B3	2-C3	2-D3	2-E3	
4			2-C4	2-D4	2-E4	

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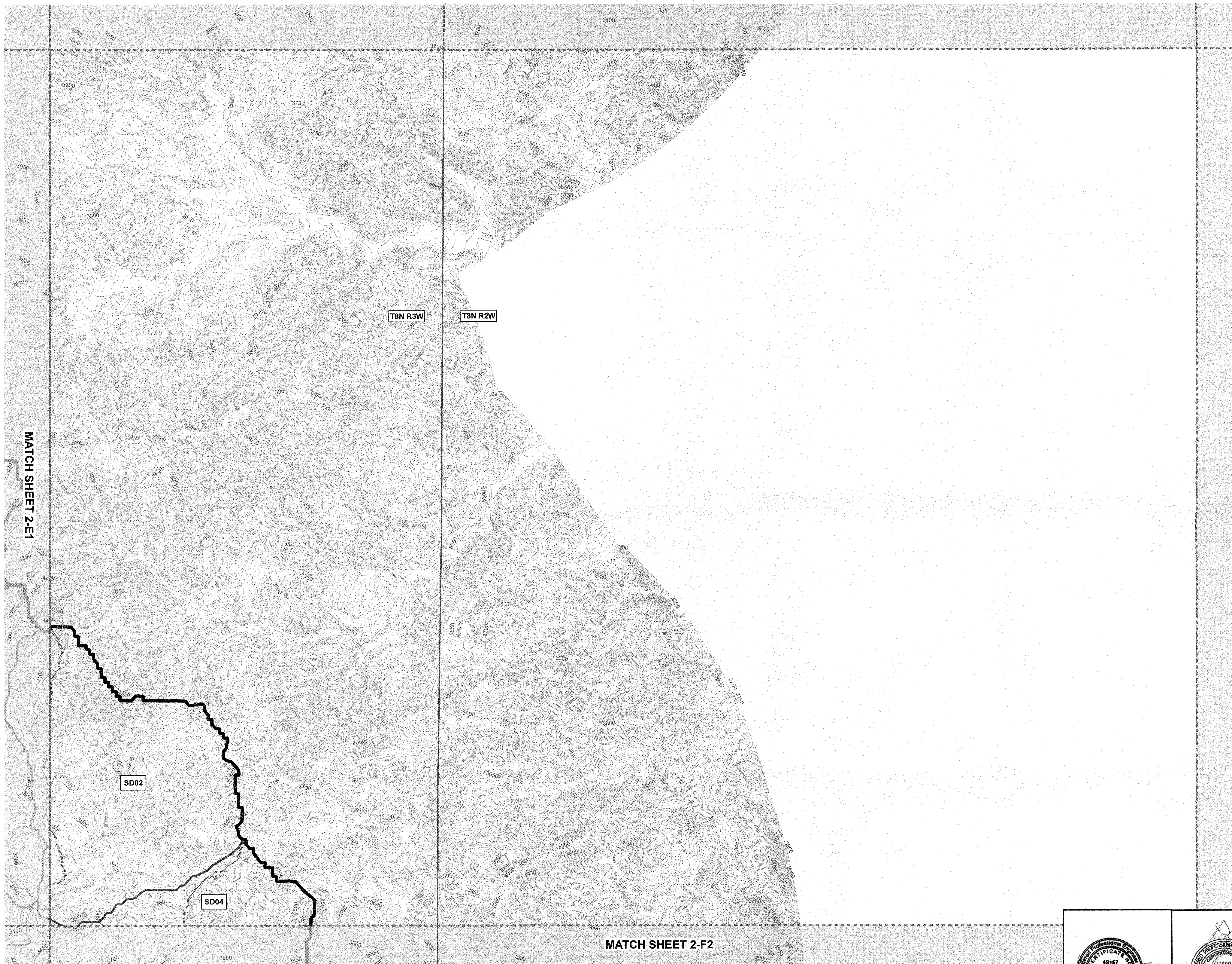
F.C.D. CONTRACT No. 2009-C030

ROUTING MAP
EXHIBIT 2-E4



LEGEND

- Watershed Boundary
- SN3 Sub-basin ID
- City Boundary
- TC Flow Path
- Railroad
- Township and Range
- Streets
- Routing Reach
- RC7C8 V= 9.16 fps S= 0.014 ft/ft — Routing Reach HEC1 ID, Reach 100yr Velocity & Slope
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- XS-2 — Cross Sections for Routing Reach 'n' Values
- 2400 — Elevation in Feet

0 1,000 2,000 Feet

1 inch = 1,000 feet

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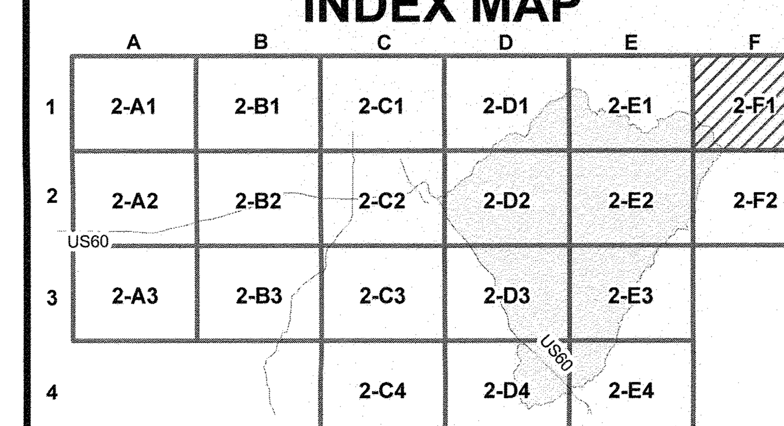
INDEX MAP



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WICKENBURG AREA DRAINAGE MASTER STUDY / PLAN

F.C.D. CONTRACT No. 2009-C030

ROUTING MAP
EXHIBIT 2-F1

LEGEND

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- SN3 — Sub-basin ID
- City Boundary
- TC Flow Path
- Railroad
- Township and Range
- Streets
- Routing Reach
- RC7C8 V= 9.16 fps S= 0.014 ft/ft — Routing Reach HEC1 ID, Reach 100yr Velocity & Slope
- Storm Drain
- XS-2 — Cross Sections for Routing Reach 'n' Values
- 2450 — Elevation in Feet

0 1,000 2,000 Feet

1 inch = 1,000 feet

Notes:

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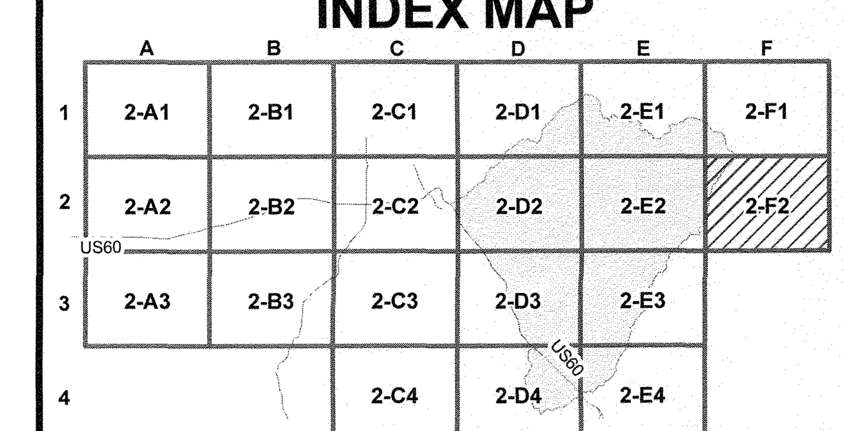
INDEX MAP



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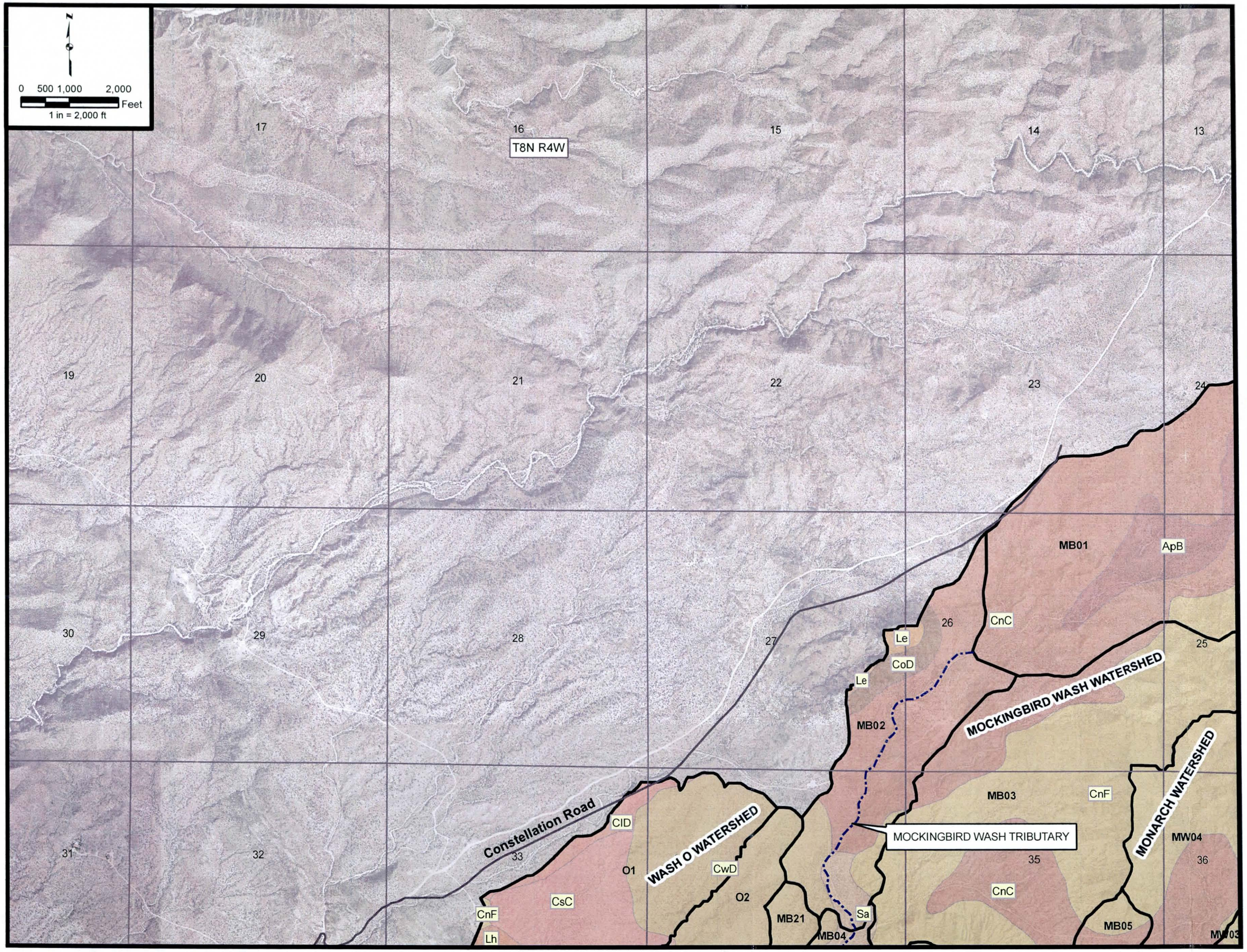
ROUTING MAP
EXHIBIT 2-F2

MATCH SHEET 3-C1



MATCH SHEET 3-E1

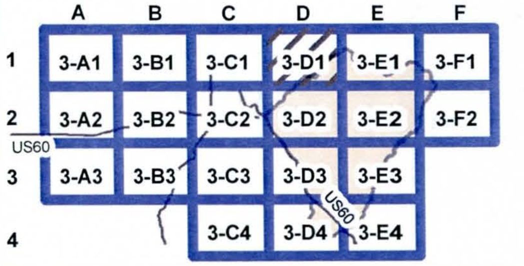
MATCH SHEET 3-D2

LEGEND

- Watershed Boundary
- FE1 Sub-basin ID
- Flow Line
- Streets
- Railroad
- Township and Range
- 13 Section Line and ID
- 7 Anthony-Arizo complex, low precipitation
- 8 Arizo cobbly sandy loam
- ClD Cave-Continental Gravelly Sandy Loams, 2-30% Slopes
- CoD Cellar Chiricahua Complex
- CnF Cellar Very Rocky Sandy Loam
- 16 Cellar-Rock outcrop complex, low precipitation, 10 to 70 % slopes
- CsC Continental Gravelly Sandy Loam, 2 to 15% Slopes
- 28 Continental-Ohaco complex
- 31 Dixaleta-Rock outcrop complex, 25 to 65 percent slopes
- 32 Dixaleta-Rock outcrop Complex, low precipitation, 25 to 65% slopes
- 33 Eba very gravelly loam, 1 to 8 percent slopes
- 35 Eba very gravelly loam, 8 to 20 % slopes
- 38 Eba-Continental-Cave association, low precipitation, 3 to 20 percent
- 39 Eba-Nickel-Cave association, 3 to 25 % slopes
- 42 Eba-Pinaleno complex, low precipitation, 3 to 20 % slopes
- 43 Eba-Pinaleno complex, low precipitation, 20 to 40 % slopes
- 64 Gran-Wickenburg-Rock outcrop complex, low precipitation, 10 to 65 % slopes
- 62 Gran-Wickenburg complex, low precipitation, 1 to 10 % slopes
- 70 Gunsight-Rillito complex, 1 to 25 % slopes
- Lc Latene-Mohave Complex
- Le Lehmans Gravelly Clay Loam
- 73 Lehmans-Rock outcrop complex, low precipitation, 8 to 65 % slopes
- 83 Mohave loam
- 84 Mohave loam, calcareous solum
- 94 Nickel-Cave complex, low precipitation, 8 to 30 % slopes
- 105 Rock outcrop-Lehmans complex, low precipitation, 15 to 65 % slopes
- 24 Continental clay loam, 0 to 3 % slopes
- ApB Anthony Gravelly Sandy Loam
- CnF Cellar Very Rocky Sandy Loam Rock
- CwD Continental Soil
- Lh Lehmans Extremely Rocky Clay
- Sa Sandy & Gravelly Alluvial Land
- 75 Mohall loam

NOTE: Yavapai County has a different soil classification than Maricopa County, hence the difference in labeling.

INDEX MAP



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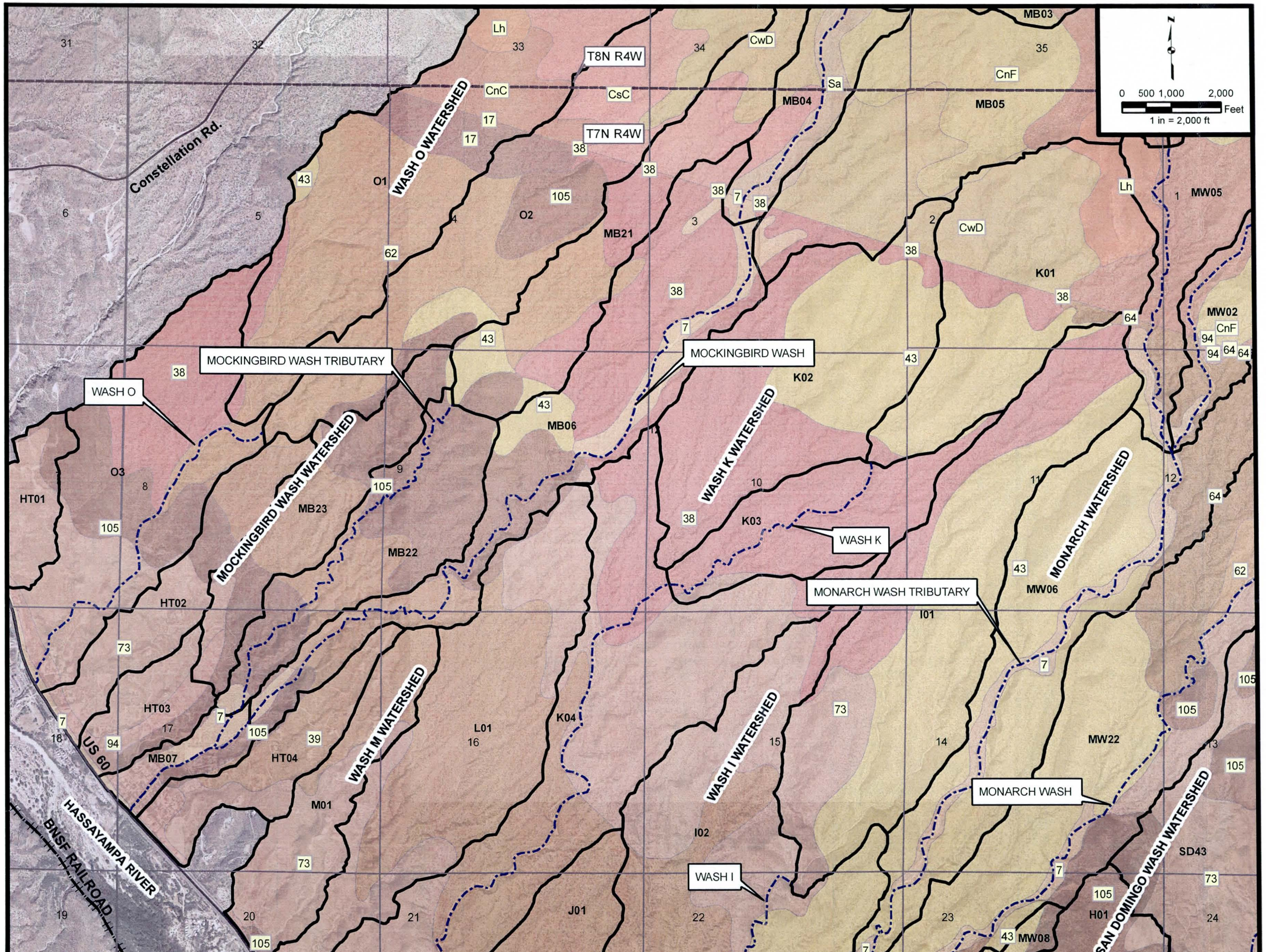
F.C.D. Contract No. 2009-C030

SOILS MAP
EXHIBIT 3-D1

MATCH SHEET 3-D1

MATCH SHEET 3-C2



MATCH SHEET 3-E2

MATCH SHEET 3-D3

LEGEND

- Watershed Boundary
- FE1 Sub-basin ID
- Flow Line
- Streets
- Railroad
- Township and Range
- 13 Section Line and ID
- 7 Anthony-Arizo complex, low precipitation
- 8 Arizo cobbly sandy loam
- CID Cave-Continental Gravelly Sandy Loams, 2-30% Slopes
- CoD Cellar Chiricahua Complex
- CnF Cellar Very Rocky Sandy Loam
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- CsC Continental Gravelly Sandy Loam, 2 to 15% Slopes
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- 64 Gran-Wickenburg-Rock outcrop complex, low precipitation, 10 to 65 % slopes
- 62 Gran-Wickenburg complex, low precipitation, 1 to 10 % slopes
- 70 Gunsight-Rillito complex, 1 to 25 % slopes
- Lc Latene-Mohave Complex
- Le Lehmans Gravelly Clay Loam
- 73 Lehmans-Rock outcrop complex, low precipitation, 8 to 65 % slopes
- 83 Mohave loam
- 84 Mohave loam, calcareous solum
- 94 Nickel-Cave complex, low precipitation, 8 to 30 % slopes
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- 24 Continental clay loam, 0 to 3 % slopes
- ApB Anthony Gravelly Sandy Loam
- CnF Cellar Very Rocky Sandy Loam Rock
- CwD Continental Soil
- Lh Lehmans Extremely Rocky Clay
- Sa Sandy & Gravelly Alluvial Land
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INDEX MAP

	A	B	C	D	E	F
1	3-A1	3-B1	3-C1	3-D1	3-E1	3-F1
2	3-A2	3-B2	3-C2	3-D2	3-E2	3-F2
3	3-A3	3-B3	3-C3	3-D3	3-E3	
4			3-C4	3-D4	3-E4	

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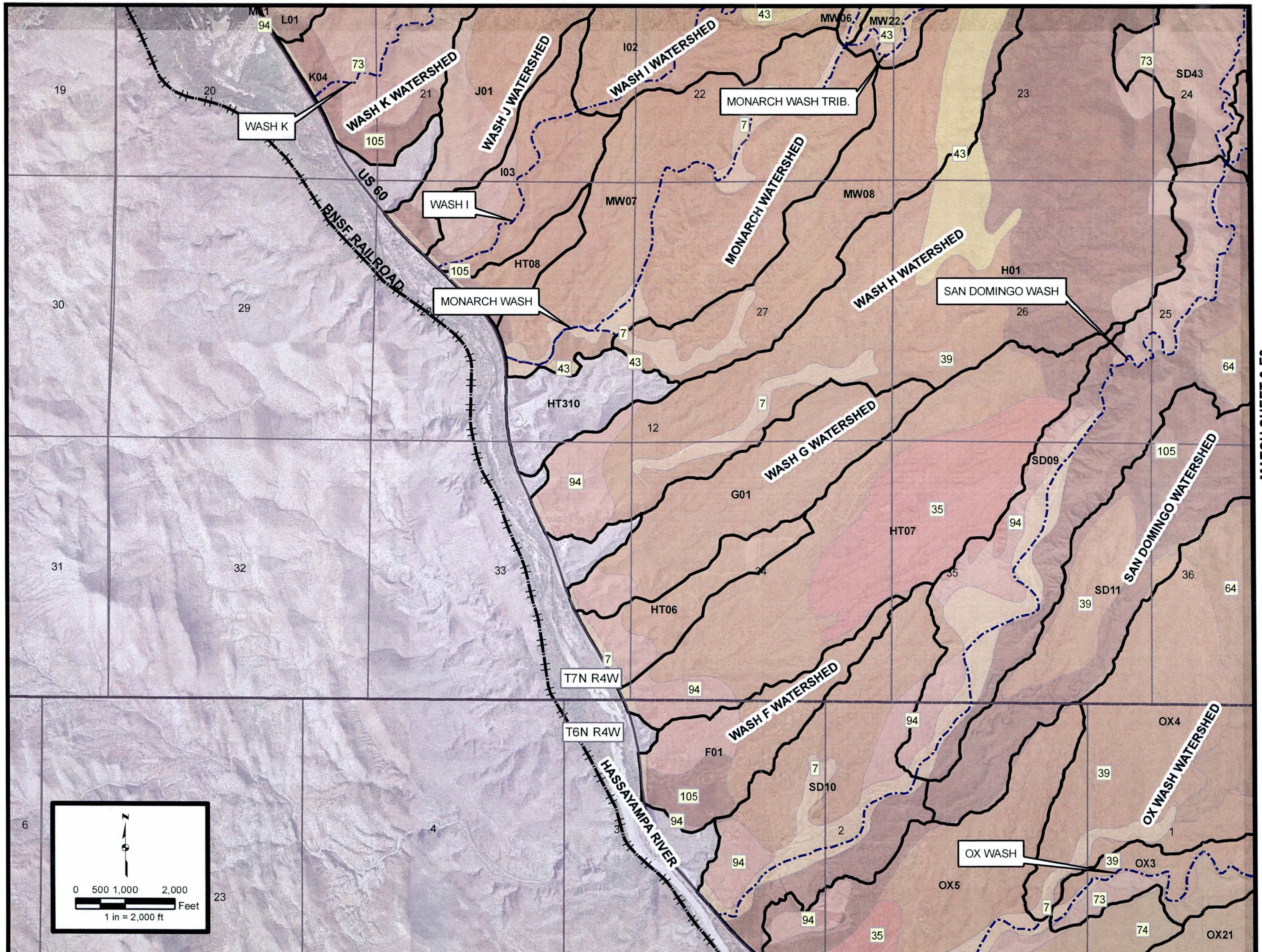
SOILS MAP
EXHIBIT 3-D2

MATCH SHEET 3-D2



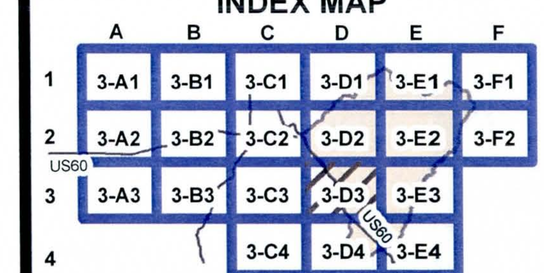
MATCH SHEET 3-D4

LEGEND

- Watershed Boundary
- FE1 Sub-basin ID
- Flow Line
- Streets
- Railroad
- Township and Range
- 13 Section Line and ID
- 7 Anthony-Arizo complex, low precipitation
- 8 Arizo cobbly sandy loam
- CID Cave-Continental Gravelly Sandy Loams, 2-30% Slopes
- CoD Cellar Chiricahua Complex
- CnF Cellar Very Rocky Sandy Loam
- 16 Cellar-Rock outcrop complex, low precipitation, 10 to 70 % slopes
- 28 Continental-Ohaco complex
- 31 Dixaleta-Rock outcrop complex, 25 to 65 percent slopes
- 32 Dixaleta-Rock outcrop Complex, low precipitation, 25 to 65% slopes
- 33 Eba very gravelly loam, 1 to 8 percent slopes
- 35 Eba very gravelly loam, 8 to 20 % slopes
- 38 Eba-Continental-Cave association, low precipitation, 3 to 20 percent
- 39 Eba-Nickel-Cave association, 3 to 25 % slopes
- 42 Eba-Pinaleno complex, low precipitation, 3 to 20 % slopes
- 43 Eba-Pinaleno complex, low precipitation, 20 to 40 % slopes
- 64 Gran-Wickenburg-Rock outcrop complex, low precipitation, 10 to 65 % slopes
- 70 Gunsight-Rillito complex, 1 to 25 % slopes
- 73 Lehmans-Rock outcrop complex, low precipitation, 8 to 65 % slopes
- 94 Nickel-Cave complex, low precipitation, 8 to 30 % slopes
- 105 Rock outcrop-Lehmans complex, low precipitation, 15 to 65 % slopes
- 3 Antho-Carrizo-Maripo complex
- 10 Brios-Carrizo complex, 1 to 5 percent slopes
- 13 Carefree-Beardsley complex
- 35 Eba very gravelly loam, low precipitation, 8 to 20 % slopes
- 46 Ebon-Contine complex, 1 to 8 percent
- 45 Ebon very gravelly loam, 8 to 20 % slopes
- 49 Ebon-Gunsight-Cipriano association, 3 to 25 % slopes
- 47 Ebon-Pinamt complex, 20 to 40 % slopes
- 48 Ebon-Pinamt complex, 3 to 20 percent slopes
- 55 Gilman loams
- 68 Gunsight-Cipriano complex, 1 to 7 % slopes
- 74 Luke-Cipriano association, 1 to 15 % slopes
- 110 Suncity-Cipriano complex, 1 to 7 % slopes
- 125 Vint loamy fine sand

NOTE: Yavapai County has a different soil classification than Maricopa County, hence the difference in labeling.

INDEX MAP



FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

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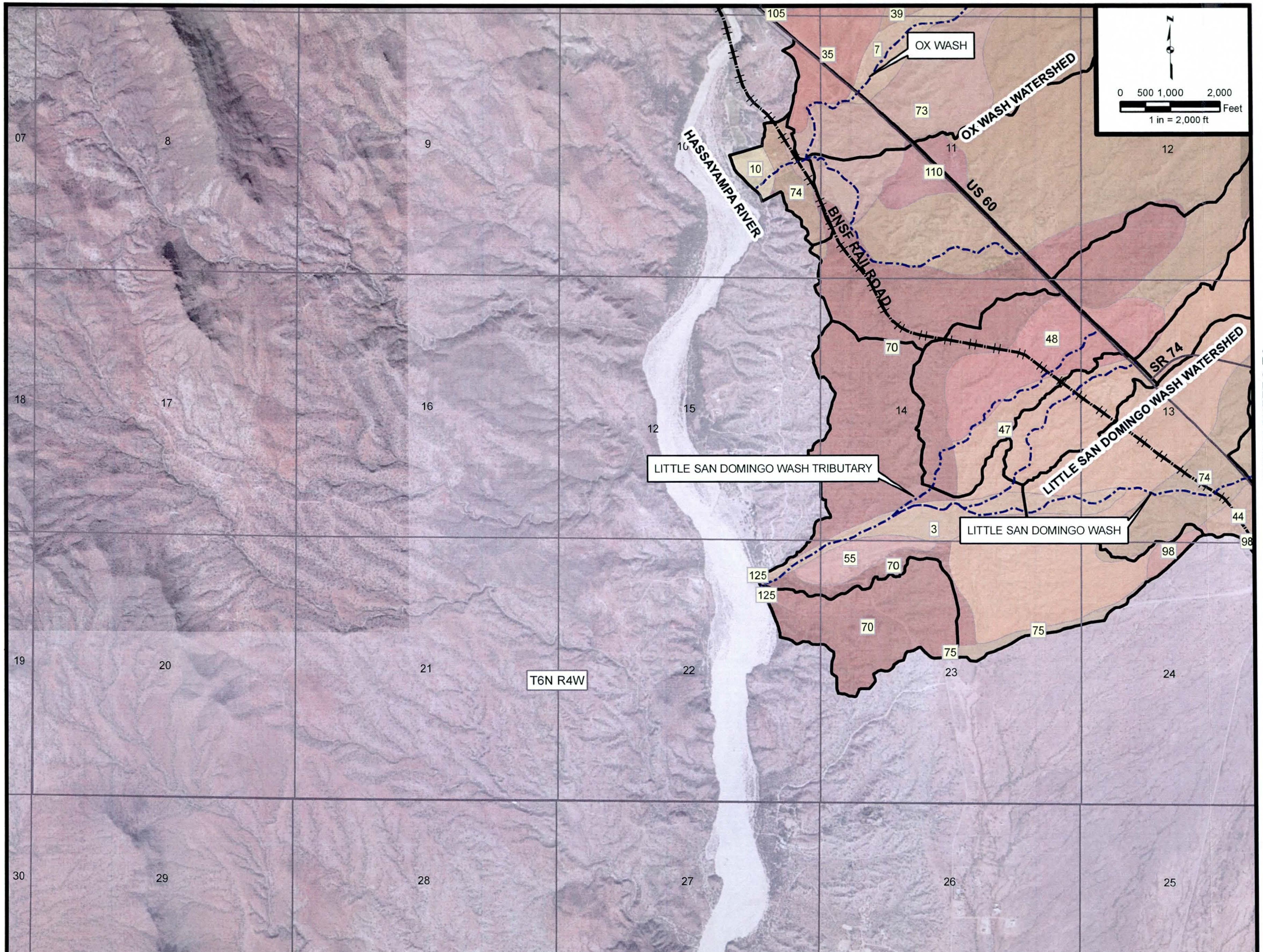
F.C.D. Contract No. 2009-C030

SOILS MAP
EXHIBIT 3-D3

MATCH SHEET 3-D3

MATCH SHEET 3-C4



MATCH SHEET 3-E4

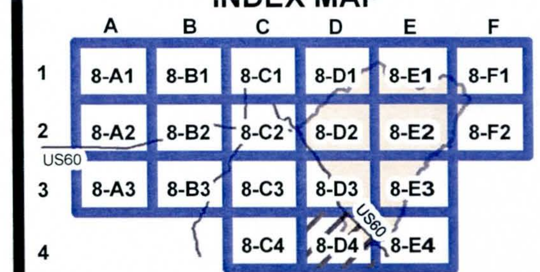
LEGEND

- Watershed Boundary
- FE1 Sub-basin ID
- Flow Line
- Streets
- Railroad
- Township and Range
- 13 Section Line and ID

ID	Soil
7	Anthony-Arizo complex, low precipitation
8	Arizo cobbly sandy loam
ClD	Cave-Continental Gravelly Sandy Loams, 2-30% Slopes
CoD	Cellar Chiricahua Complex
CnF	Cellar Very Rocky Sandy Loam
16	Cellar-Rock outcrop complex, low precipitation, 10 to 70 % slopes
28	Continental-Ohaco complex
31	Dixaleta-Rock outcrop complex, 25 to 65 percent slopes
32	Dixaleta-Rock outcrop Complex, low precipitation, 25 to 65% slopes
33	Eba very gravelly loam, 1 to 8 percent slopes
35	Eba very gravelly loam, 8 to 20 % slopes
38	Eba-Continental-Cave association, low precipitation, 3 to 20 percent
39	Eba-Nickel-Cave association, 3 to 25 % slopes
42	Eba-Pinaleno complex, low precipitation, 3 to 20 % slopes
43	Eba-Pinaleno complex, low precipitation, 20 to 40 % slopes
64	Gran-Wickenburg-Rock outcrop complex, low precipitation, 10 to 65 % slopes
70	Gunsight-Rillito complex, 1 to 25 % slopes
73	Lehmans-Rock outcrop complex, low precipitation, 8 to 65 % slopes
94	Nickel-Cave complex, low precipitation, 8 to 30 % slopes
105	Rock outcrop-Lehmans complex, low precipitation, 15 to 65 % slopes
3	Antho-Carrizo-Maripo complex
10	Brios-Carrizo complex, 1 to 5 percent slopes
13	Carefree-Beardsley complex
35	Eba very gravelly loam, low precipitation, 8 to 20 % slopes
46	Ebon-Contine complex, 1 to 8 percent
45	Ebon very gravelly loam, 8 to 20 % slopes
49	Ebon-Gunsight-Cipriano association, 3 to 25 % slopes
47	Ebon-Pinamt complex, 20 to 40 % slopes
48	Ebon-Pinamt complex, 3 to 20 percent slopes
55	Gilman loams
68	Gunsight-Cipriano complex, 1 to 7 % slopes
74	Luke-Cipriano association, 1 to 15 % slopes
110	Suncity-Cipriano complex, 1 to 7 % slopes
125	Vint loamy fine sand

NOTE: Yavapai County has a different soil classification than Maricopa County, hence the difference in labeling.

INDEX MAP



FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

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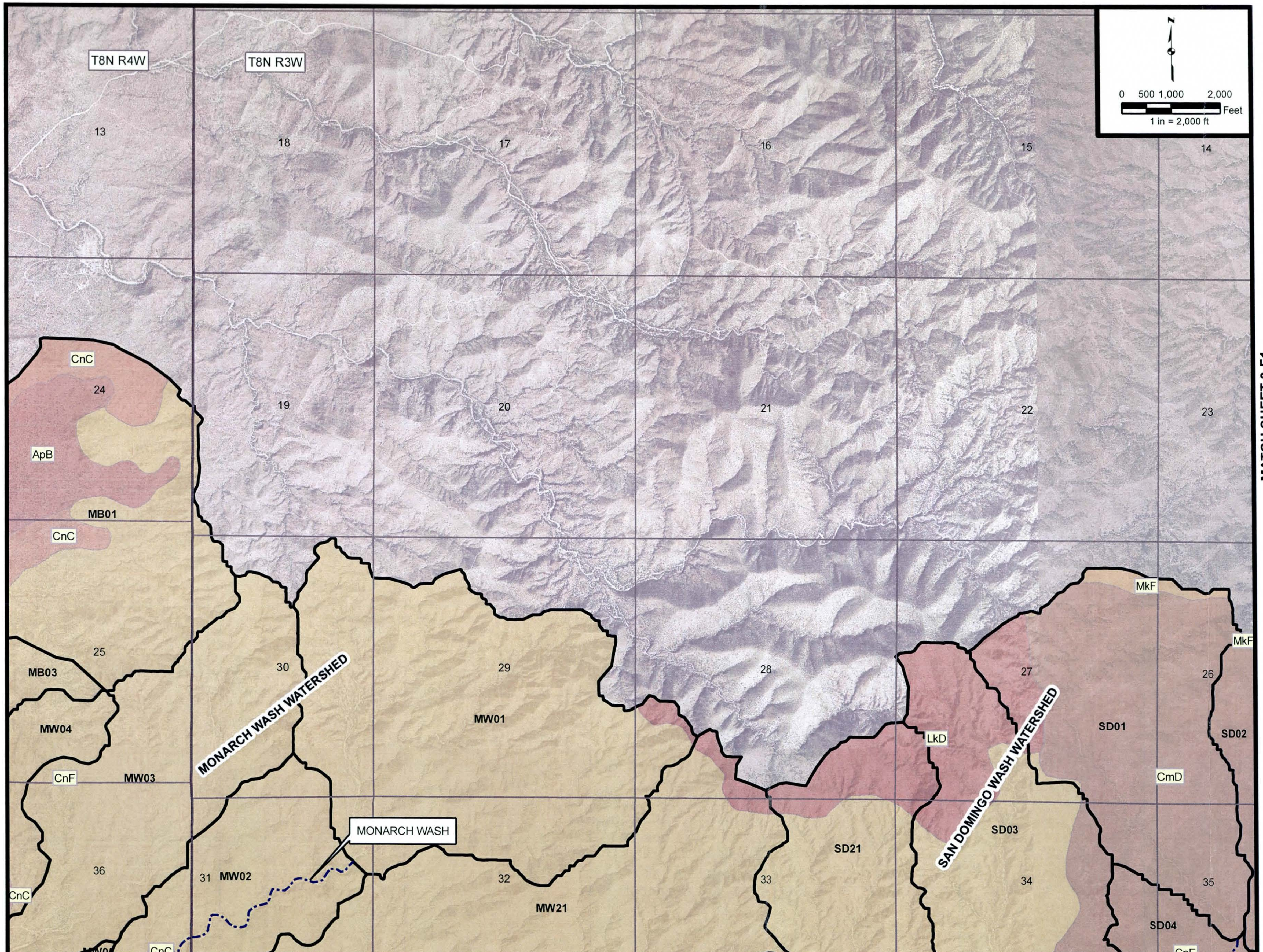
F.C.D. Contract No. 2009-C030

SOILS MAP
EXHIBIT 3-D4



MATCH SHEET 3-D1

MATCH SHEET 3-F1

MATCH SHEET 3-E2

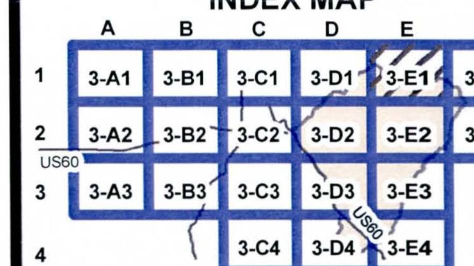
LEGEND

- Watershed Boundary
- FE1 Sub-basin ID
- Flow Line
- Streets
- Railroad
- Township and Range
- 13 Section Line and ID

Symbol	Description
7	Anthony-Arizo complex, low precipitation
8	Arizo cobbly sandy loam
ClD	Cave-Continental Gravelly Sandy Loams, 2-30% Slopes
CoD	Cellar Chiricahua Complex
CnF	Cellar Very Rocky Sandy Loam
16	Cellar-Rock outcrop complex, low precipitation, 10 to 70 % slopes
CsC	Continental Gravelly Sandy Loam, 2 to 15% Slopes
28	Continental-Ohaco complex
31	Dixaleta-Rock outcrop complex, 25 to 65 percent slopes
32	Dixaleta-Rock outcrop Complex, low precipitation, 25 to 65% slopes
33	Eba very gravelly loam, 1 to 8 percent slopes
35	Eba very gravelly loam, 8 to 20 % slopes
38	Eba-Continental-Cave association, low precipitation, 3 to 20 percent
39	Eba-Nickel-Cave association, 3 to 25 % slopes
42	Eba-Pinaleno complex, low precipitation, 3 to 20 % slopes
43	Eba-Pinaleno complex, low precipitation, 20 to 40 % slopes
64	Gran-Wickenburg-Rock outcrop complex, low precipitation, 10 to 65 % slopes
62	Gran-Wickenburg complex, low precipitation,1 to 10 % slopes
70	Gunsight-Rillito complex, 1 to 25 % slopes
Lc	Latene-Mohave Complex
Le	Lehmans Gravelly Clay Loam
73	Lehmans-Rock outcrop complex, low precipitation, 8 to 65 % slopes
83	Mohave loam
84	Mohave loam, calcareous solum
94	Nickel-Cave complex, low precipitation, 8 to 30 % slopes
105	Rock outcrop-Lehmans complex, low precipitation, 15 to 65 % slopes
24	Continental clay loam, 0 to 3 % slopes
ApB	Anthony Gravelly Sandy Loam
CmD	Cellar Very Gravelly Sandy Loam
CnF	Cellar Very Rocky Sandy Loam Rock
63	Gran-Wickenburg-Rock outcrop complex, 1 to 7 % slopes
73	Lehmans-Rock outcrop complex, 8 to 65 % slopes
LkD	Lonti Gravelly Sandy Loam
MkF	Moano Very Rocky Loam

NOTE: Yavapai County has a different soil classification than Maricopa County, hence the difference in labeling.

INDEX MAP



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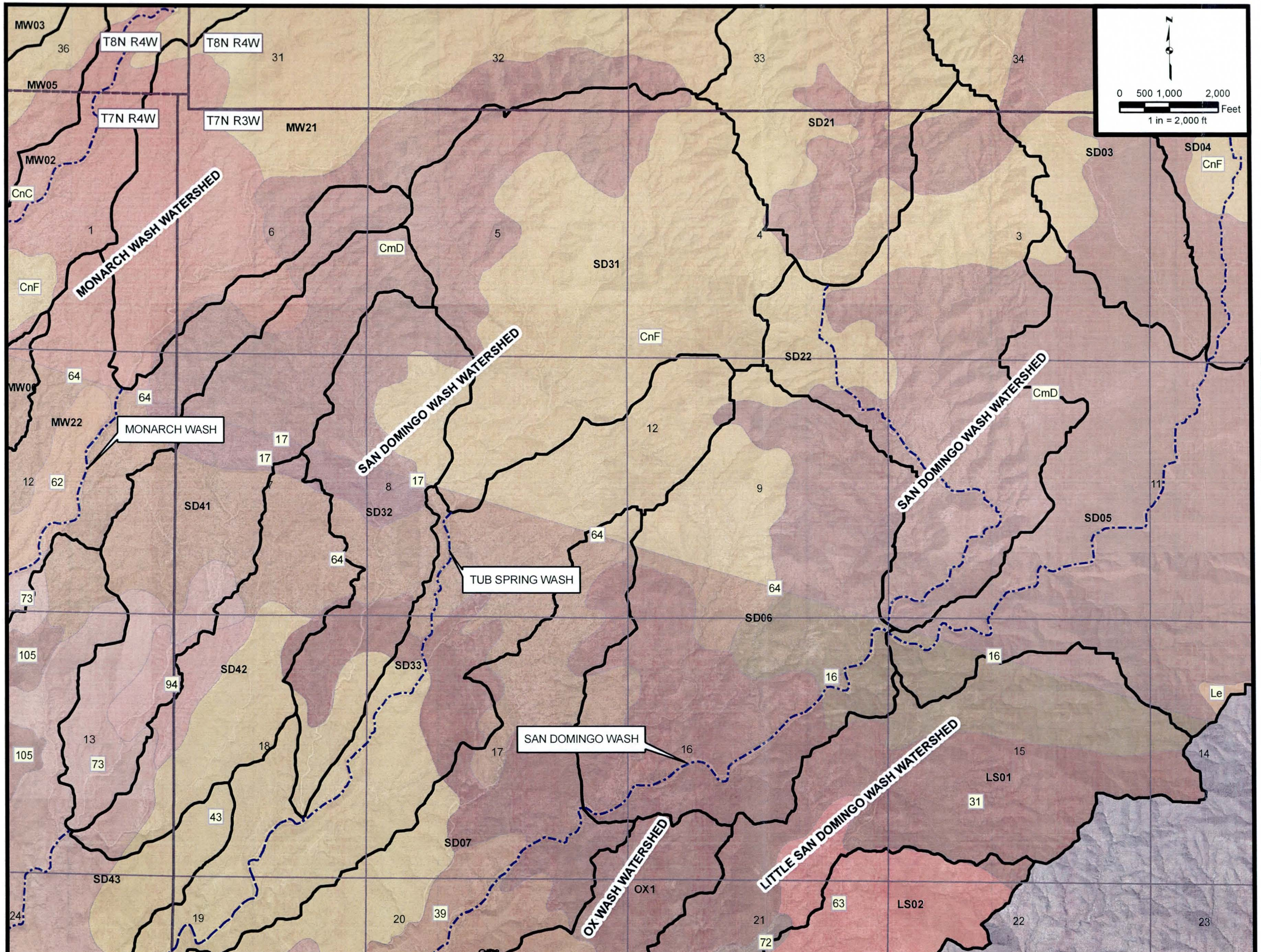
F.C.D. Contract No. 2009-C030

SOILS MAP
EXHIBIT 3-E1

MATCH SHEET 3-E1



MATCH SHEET 3-E3

MATCH SHEET 3-D2

MATCH SHEET 3-F2

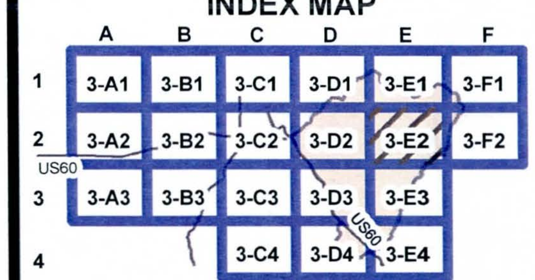
LEGEND

- Watershed Boundary
- FE1 Sub-basin ID
- Flow Line
- Streets
- Railroad
- Township and Range
- 13 Section Line and ID
- 7 Anthony-Arizo complex, low precipitation
- 8 Arizo cobbly sandy loam
- CID Cave-Continental Gravelly Sandy Loams, 2-30% Slopes
- CoD Cellar Chiricahua Complex
- CnF Cellar Very Rocky Sandy Loam
- 16 Cellar-Rock outcrop complex, low precipitation, 10 to 70 % slopes
- CsC Continental Gravelly Sandy Loam, 2 to 15% Slopes
- 28 Continental-Ohaco complex
- 31 Dixaleta-Rock outcrop complex, 25 to 65 percent slopes
- 32 Dixaleta-Rock outcrop Complex, low precipitation, 25 to 65% slopes
- 33 Eba very gravelly loam, 1 to 8 percent slopes
- 35 Eba very gravelly loam, 8 to 20 % slopes
- 38 Eba-Continental-Cave association, low precipitation, 3 to 20 percent
- 39 Eba-Nickel-Cave association, 3 to 25 % slopes
- 42 Eba-Pinaleno complex, low precipitation, 3 to 20 % slopes
- 43 Eba-Pinaleno complex, low precipitation, 20 to 40 % slopes
- 64 Gran-Wickenburg-Rock outcrop complex, low precipitation, 10 to 65 % slopes
- 62 Gran-Wickenburg complex, low precipitation, 1 to 10 % slopes
- 70 Gunsight-Rillito complex, 1 to 25 % slopes
- Lc Latene-Mohave Complex
- Le Lehmans Gravelly Clay Loam
- 73 Lehmans-Rock outcrop complex, low precipitation, 8 to 65 % slopes
- 83 Mohave loam
- 84 Mohave loam, calcareous solum
- 94 Nickel-Cave complex, low precipitation, 8 to 30 % slopes
- 105 Rock outcrop-Lehmans complex, low precipitation, 15 to 65 % slopes
- 24 Continental clay loam, 0 to 3 % slopes
- ApB Anthony Gravelly Sandy Loam
- CmD Cellar Very Gravelly Sandy Loam
- CnF Cellar Very Rocky Sandy Loam Rock
- 63 Gran-Wickenburg-Rock outcrop complex, 1 to 7 % slopes
- 73 Lehmans-Rock outcrop complex, 8 to 65 % slopes
- LkD Lonti Gravelly Sandy Loam
- MkF Moano Very Rocky Loam

NOTE: Yavapai County has a different soil classification than Maricopa County, hence the difference in labeling.

0 500 1,000 2,000 Feet
1 in = 2,000 ft

INDEX MAP



FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

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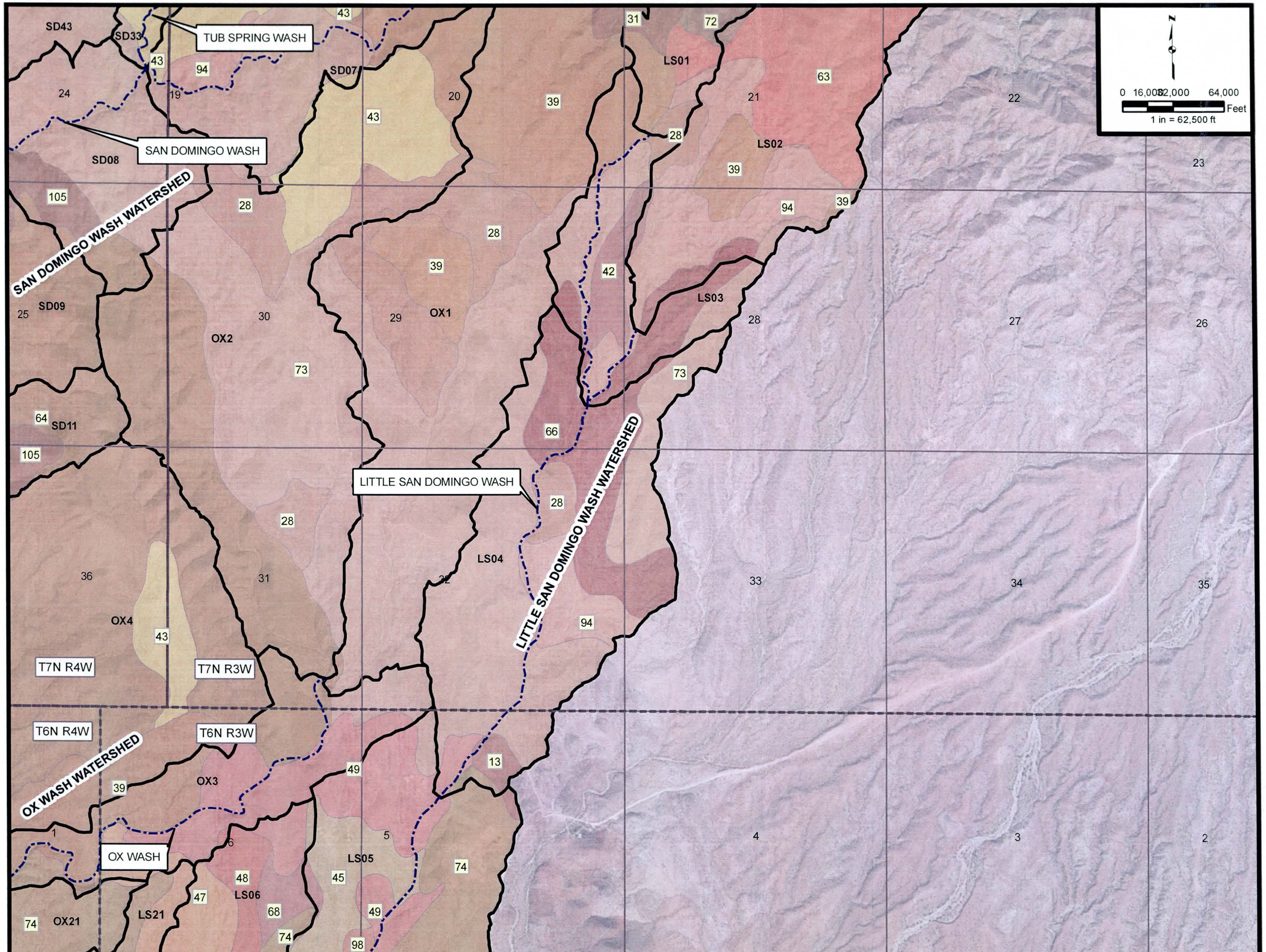
SOILS MAP
EXHIBIT 3-E2

MATCH SHEET 3-E2

MATCH SHEET 3-D3



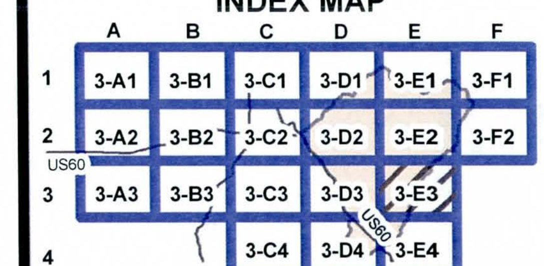
MATCH SHEET 3-E4

LEGEND

- Watershed Boundary
- FE1 Sub-basin ID
- Flow Line
- Streets
- Railroad
- Township and Range
- 13 Section Line and ID
- 7 Anthony-Arizo complex, low precipitation
- 8 Arizo cobbly sandy loam
- CID Cave-Continental Gravelly Sandy Loams, 2-30% Slopes
- CoD Cellar Chiricahua Complex
- CnF Cellar Very Rocky Sandy Loam
- 16 Cellar-Rock outcrop complex, low precipitation, 10 to 70 % slopes
- CsC Continental Gravelly Sandy Loam, 2 to 15% Slopes
- 28 Continental-Ohaco complex
- 31 Dixaleta-Rock outcrop complex, 25 to 65 percent slopes
- 32 Dixaleta-Rock outcrop Complex, low precipitation, 25 to 65% slopes
- 33 Eba very gravelly loam, 1 to 8 percent slopes
- 39 Eba-Nickel-Cave association, 3 to 25 % slopes
- 42 Eba-Pinaleno complex, low precipitation, 3 to 20 % slopes
- 43 Eba-Pinaleno complex, low precipitation, 20 to 40 % slopes
- 64 Gran-Wickenburg-Rock outcrop complex, low precipitation, 10 to 65 % slopes
- 62 Gran-Wickenburg complex, low precipitation, 1 to 10 % slopes
- Le Lehmans Gravelly Clay Loam
- 73 Lehmans-Rock outcrop complex, low precipitation, 8 to 65 % slopes
- 94 Nickel-Cave complex, low precipitation, 8 to 30 % slopes
- 105 Rock outcrop-Lehmans complex, low precipitation, 15 to 65 % slopes
- 10 Brios-Carrizo complex 1 to 5 percent slopes
- CID Carefree-Beardsley complex
- 16 Cellar-Rock outcrop complex, 10 to 70 % slopes
- 46 Ebon-Contine complex, 1 to 8 %
- 45 Ebon very gravelly loam, 8 to 20 % slopes
- 47 Ebon-Gunsight-Cipriano association, 3 to 25 % slopes
- 49 Ebon-Pinamt complex, 20 to 40 % slopes
- 48 Ebon-Pinamt complex, 3 to 20 % slopes
- 63 Gran-Wickenburg-Rock outcrop complex 1 to 7 % slopes
- 66 Greyeagle-Suncity Variant complex, 1 to 7 % slopes
- 68 Gunsight-Cipriano complex, 1 to 7 % slopes
- 73 Lehmans-Rock outcrop complex, 8 to 65 % slopes
- 74 Luke-Cipriano association, 1 to 15 % slopes
- 98 Pinamt-Tremant complex, 1 to 10 % slopes

NOTE: Yavapai County has a different soil classification than Maricopa County, hence the difference in labeling.

INDEX MAP



FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

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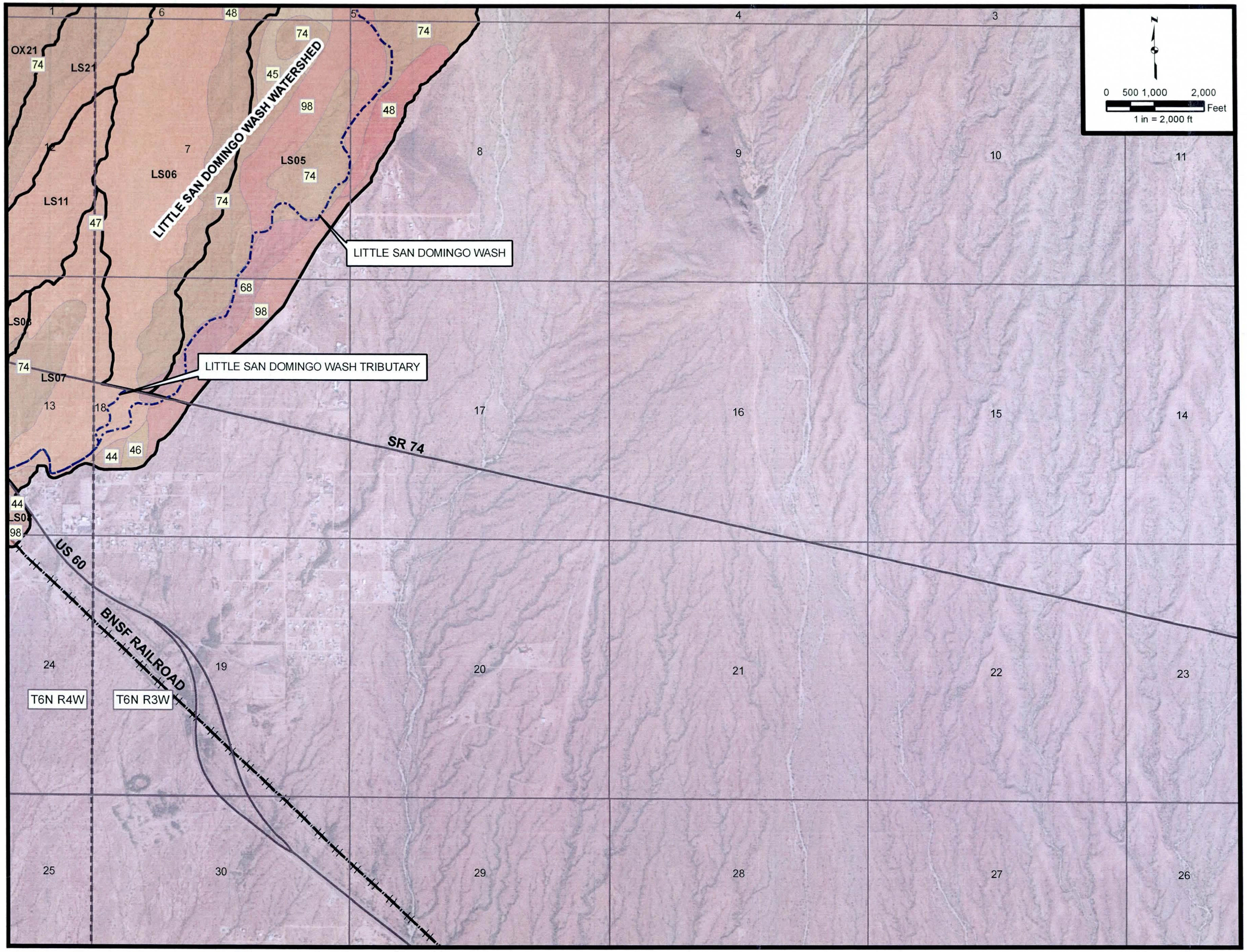
SOILS MAP
EXHIBIT 3-E3

MATCH SHEET 3-E3

MATCH SHEET 3-D4



LEGEND

Watershed Boundary

FE1 Sub-basin ID

Flow Line

Streets

Railroad

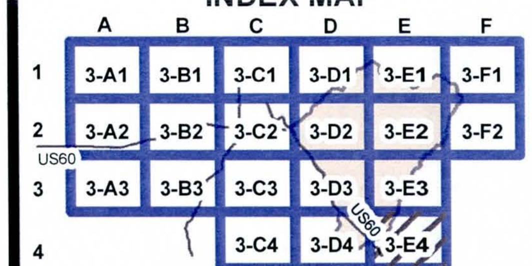
Township and Range

13 Section Line and ID

Code	Description
7	Anthony-Arizo complex, low precipitation
8	Arizo cobbly sandy loam
CID	Cave-Continental Gravelly Sandy Loams, 2-30% Slopes
CoD	Cellar Chiricahua Complex
CnF	Cellar Very Rocky Sandy Loam
16	Cellar-Rock outcrop complex, low precipitation, 10 to 70 % slopes
CsC	Continental Gravelly Sandy Loam, 2 to 15% Slopes
28	Continental-Ohaco complex
31	Dixaleta-Rock outcrop complex, 25 to 65 percent slopes
32	Dixaleta-Rock outcrop Complex, low precipitation, 25 to 65% slopes
33	Eba very gravelly loam, 1 to 8 percent slopes
39	Eba-Nickel-Cave association, 3 to 25 % slopes
42	Eba-Pinaleno complex, low precipitation, 3 to 20 % slopes
43	Eba-Pinaleno complex, low precipitation, 20 to 40 % slopes
64	Gran-Wickenburg-Rock outcrop complex, low precipitation, 10 to 65 % slopes
62	Gran-Wickenburg complex, low precipitation, 1 to 10 % slopes
Le	Lehmans Gravelly Clay Loam
73	Lehmans-Rock outcrop complex, low precipitation, 8 to 65 % slopes
94	Nickel-Cave complex, low precipitation, 8 to 30 % slopes
105	Rock outcrop-Lehmans complex, low precipitation, 15 to 65 % slopes
10	Brios-Carrizo complex 1 to 5 percent slopes
CID	Carefree-Beardsley complex
16	Cellar-Rock outcrop complex, 10 to 70 % slopes
46	Ebon-Contine complex, 1 to 8 %
45	Ebon very gravelly loam, 8 to 20 % slopes
47	Ebon-Gunsight-Cipriano association, 3 to 25 % slopes
49	Ebon-Pinamt complex, 20 to 40 % slopes
48	Ebon-Pinamt complex, 3 to 20 % slopes
63	Gran-Wickenburg-Rock outcrop complex 1 to 7 % slopes
66	Greyeagle-Suncity Variant complex, 1 to 7 % slopes
68	Gunsight-Cipriano complex, 1 to 7 % slopes
73	Lehmans-Rock outcrop complex, 8 to 65 % slopes
74	Luke-Cipriano association, 1 to 15 % slopes
98	Pinamt-Tremant complex, 1 to 10 % slopes

NOTE: Yavapai County has a different soil classification than Maricopa County, hence the difference in labeling.

INDEX MAP



FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

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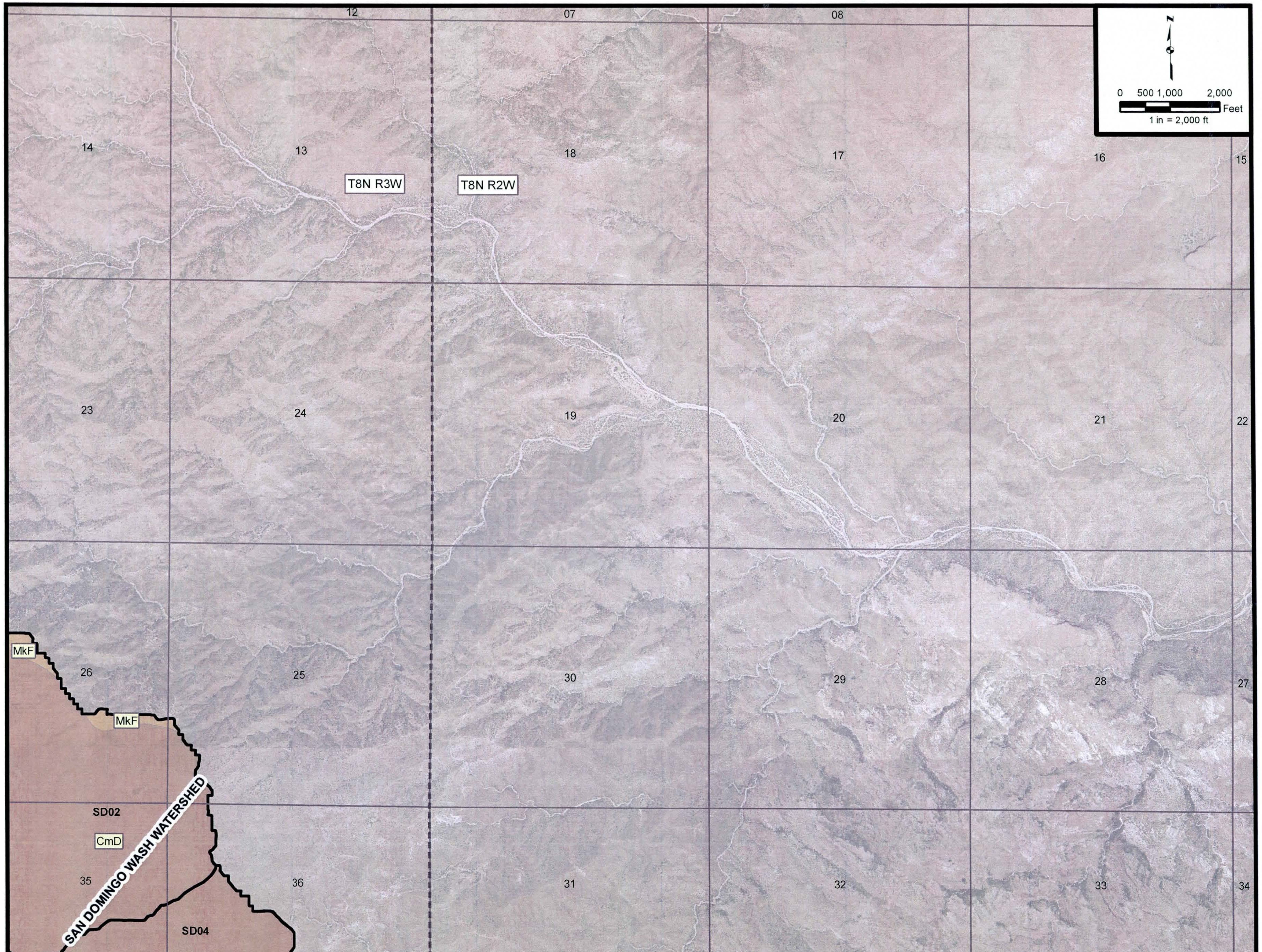
SOILS MAP
EXHIBIT 3-E4

MATCH SHEET 3-E1



MATCH SHEET 3-F2

LEGEND

- Watershed Boundary
- FE1 Sub-basin ID
- Flow Line
- Streets
- Railroad
- Township and Range
- 13 Section Line and ID
- 7 Anthony-Arizo complex, low precipitation
- 8 Arizo cobbly sandy loam
- ClD Cave-Continental Gravelly Sandy Loams, 2-30% Slopes
- CoD Cellar Chiricahua Complex
- CnF Cellar Very Rocky Sandy Loam
- 16 Cellar-Rock outcrop complex, low precipitation, 10 to 70 % slopes
- CsC Continental Gravelly Sandy Loam, 2 to 15% Slopes
- 28 Continental-Ohaco complex
- 31 Dixaleta-Rock outcrop complex, 25 to 65 percent slopes
- 32 Dixaleta-Rock outcrop Complex, low precipitation, 25 to 65% slopes
- 33 Eba very gravelly loam, 1 to 8 percent slopes
- 35 Eba very gravelly loam, 8 to 20 % slopes
- 38 Eba-Continental-Cave association, low precipitation, 3 to 20 percent
- 39 Eba-Nickel-Cave association, 3 to 25 % slopes
- 42 Eba-Pinaleno complex, low precipitation, 3 to 20 % slopes
- 43 Eba-Pinaleno complex, low precipitation, 20 to 40 % slopes
- 64 Gran-Wickenburg-Rock outcrop complex, low precipitation, 10 to 65 % slopes
- 62 Gran-Wickenburg complex, low precipitation,1 to 10 % slopes
- 70 Gunsight-Rillito complex, 1 to 25 % slopes
- Lc Latene-Mohave Complex
- Le Lehmans Gravelly Clay Loam
- 73 Lehmans-Rock outcrop complex, low precipitation, 8 to 65 % slopes
- 83 Mohave loam
- 84 Mohave loam, calcareous solum
- 94 Nickel-Cave complex, low precipitation, 8 to 30 % slopes
- 105 Rock outcrop-Lehmans complex, low precipitation, 15 to 65 % slopes
- 24 Continental clay loam, 0 to 3 % slopes
- CmD Cellar Very Gravelly Sandy Loam
- CnC Cellar Very Rocky Sandy Loam Rock
- MkF Moano Very Rocky Loam

NOTE: Yavapai County has a different soil classification than Maricopa County, hence the difference in labeling.

INDEX MAP

	A	B	C	D	E	F
1	3-A1	3-B1	3-C1	3-D1	3-E1	3-F1
2	3-A2	3-B2	3-C2	3-D2	3-E2	3-F2
3	3-A3	3-B3	3-C3	3-D3	3-E3	
4			3-C4	3-D4	3-E4	

US60
US60

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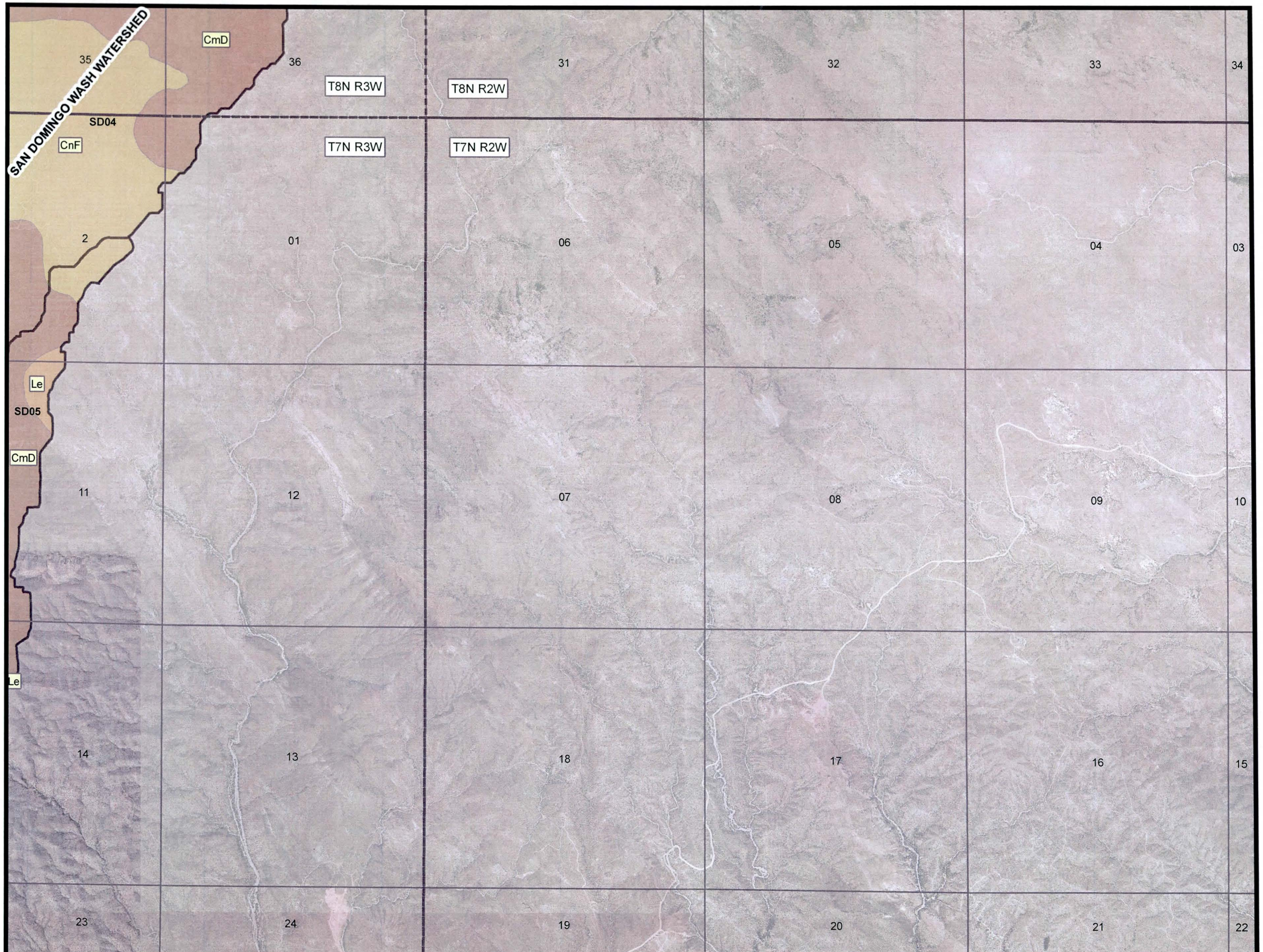
F.C.D. Contract No. 2009-C030

SOILS MAP
EXHIBIT 3-F1

MATCH SHEET 3-F1

MATCH SHEET 3-E2



LEGEND

- Watershed Boundary
- FE1 Sub-basin ID
- Flow Line
- Streets
- Railroad
- Township and Range
- 13 Section Line and ID
- 7 Anthony-Arizo complex, low precipitation
- 8 Arizo cobbly sandy loam
- CID Cave-Continental Gravelly Sandy Loams, 2-30% Slopes
- CoD Cellar Chiricahua Complex
- CnF Cellar Very Rocky Sandy Loam
- 16 Cellar-Rock outcrop complex, low precipitation, 10 to 70 % slopes
- CsC Continental Gravelly Sandy Loam, 2 to 15% Slopes
- 28 Continental-Ohaco complex
- 31 Dixaleta-Rock outcrop complex, 25 to 65 percent slopes
- 32 Dixaleta-Rock outcrop Complex, low precipitation, 25 to 65% slopes
- 33 Eba very gravelly loam, 1 to 8 percent slopes
- 35 Eba very gravelly loam, 8 to 20 % slopes
- 38 Eba-Continental-Cave association, low precipitation, 3 to 20 percent
- 39 Eba-Nickel-Cave association, 3 to 25 % slopes
- 42 Eba-Pinaleno complex, low precipitation, 3 to 20 % slopes
- 43 Eba-Pinaleno complex, low precipitation, 20 to 40 % slopes
- 64 Gran-Wickenburg-Rock outcrop complex, low precipitation, 10 to 65 % slopes
- 62 Gran-Wickenburg complex, low precipitation, 1 to 10 % slopes
- 70 Gunsight-Rillito complex, 1 to 25 % slopes
- Lc Latene-Mohave Complex
- Le Lehmans Gravelly Clay Loam
- 73 Lehmans-Rock outcrop complex, low precipitation, 8 to 65 % slopes
- 83 Mohave loam
- 84 Mohave loam, calcareous solum
- 94 Nickel-Cave complex, low precipitation, 8 to 30 % slopes
- 105 Rock outcrop-Lehmans complex, low precipitation, 15 to 65 % slopes
- 24 Continental clay loam, 0 to 3 % slopes
- CmD Cellar Very Gravelly Sandy Loam
- CnC Cellar Very Rocky Sandy Loam Rock
- MkF Moano Very Rocky Loam

0 500 1,000 2,000 Feet

1 in = 2,000 ft

NOTE: Yavapai County has a different soil classification than Maricopa County, hence the difference in labeling.

INDEX MAP

	A	B	C	D	E	F
1	3-A1	3-B1	3-C1	3-D1	3-E1	3-F1
2	3-A2	3-B2	3-C2	3-D2	3-E2	3-F2
3	3-A3	3-B3	3-C3	3-D3	3-E3	
4			3-C4	3-D4	3-E4	

US60

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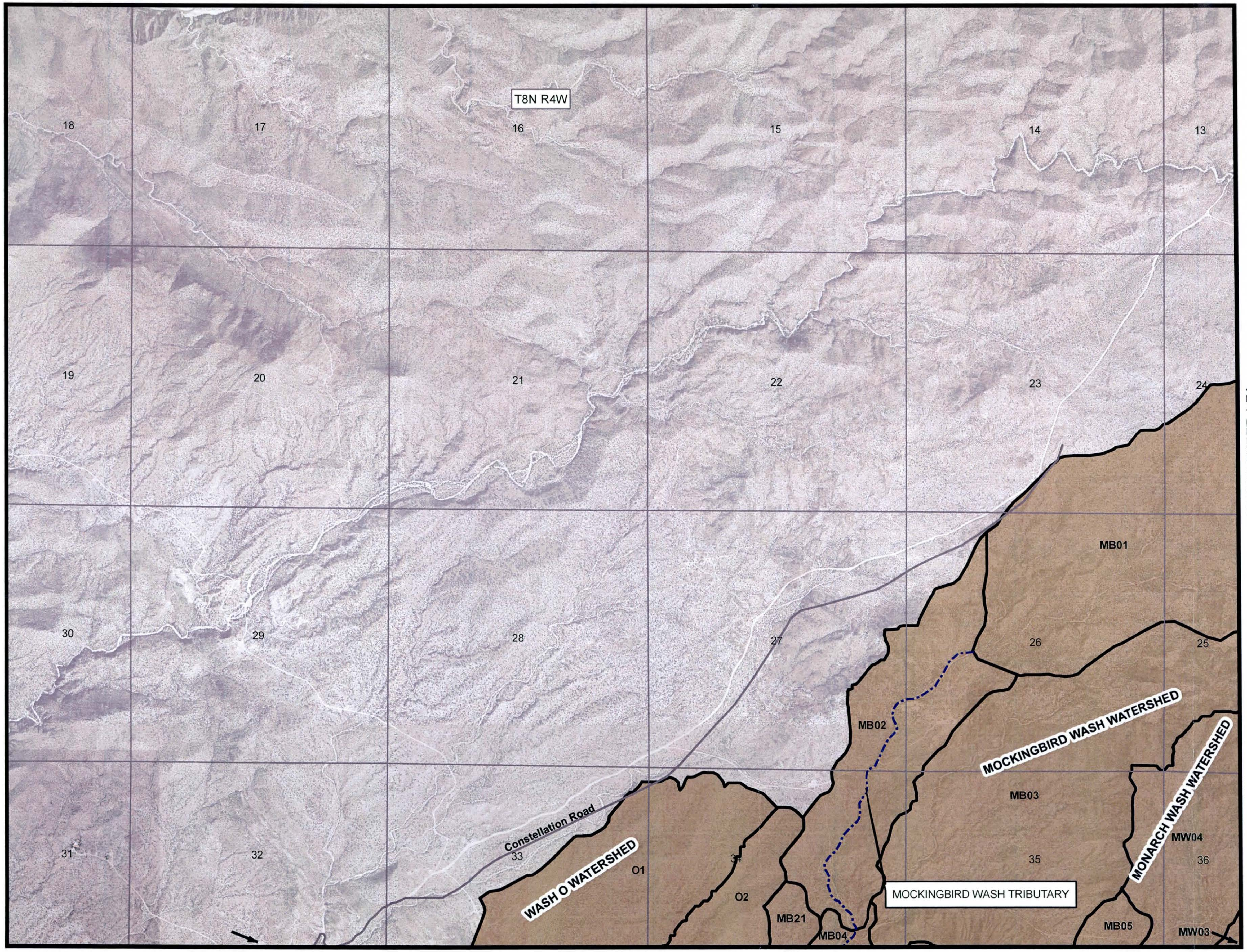
F.C.D. Contract No. 2009-C030

SOILS MAP
EXHIBIT 3-F2

MATCH SHEET 4-C1

MATCH SHEET 4-E1



MATCH SHEET 4-D2

LEGEND

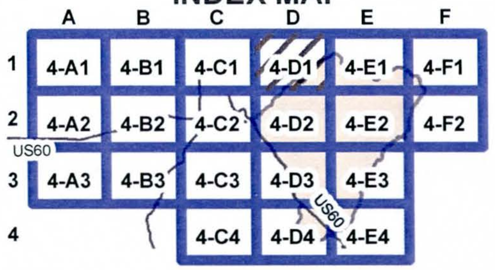
- Watershed Boundary
- FE1 Sub-basin ID
- Flow Line
- Streets
- Railroad
- Township and Range
- 13 Section Line and ID
- Active Open Space
- Airport
- Commercial
- Developing Commercial
- Developing Employment Generating
- Developing Residential
- Educational
- Estate Residential
- General Commercial
- General Industrial
- Golf Courses
- Golf Course Resort
- High Density Residential
- Large Lot Residential
- Light Industrial
- Medical/Nursing Home
- Medium Density Residential
- Medium Lot Residential
- Mortuary
- Office Low Rise
- Parking Lot
- Passive Open Space
- Public Facilities
- Public/Special Event/Military
- Religious Institutions
- Rural Residential
- Semi Rural Residential
- Small Lot Residential
- Speciality Commercial
- Tourist and Visitor Accomodations
- Transportation
- Vacant
- Vacant with Minor Development
- Warehouse

N

0 500 1,000 2,000 Feet

1 in = 2,000 ft

INDEX MAP



FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

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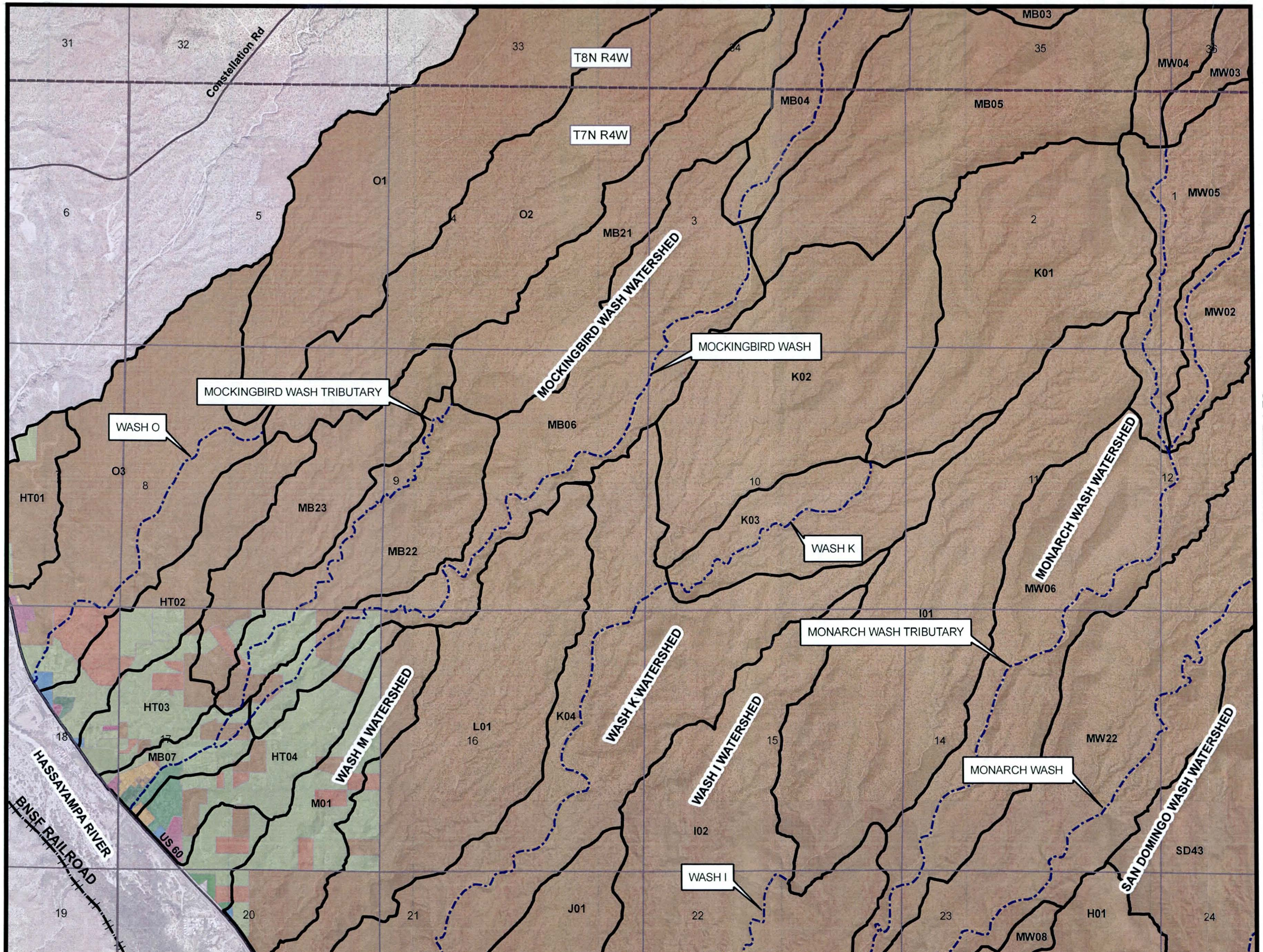
AREA DRAINAGE MASTER STUDY / PLAN

F.C.D. Contract No. 2009-C030

EXISTING LAND USE MAP
EXHIBIT 4-D1

MATCH SHEET 4-D1

MATCH SHEET 4-C2



MATCH SHEET 4-E2

MATCH SHEET 4-D3

LEGEND

- Watershed Boundary
- FE1 Sub-basin ID
- Flow Line
- Streets
- Railroad
- Township and Range
- 13 Section Line and ID
- Active Open Space
- Airport
- Commercial
- Developing Commercial
- Developing Employment Generating
- Developing Residential
- Educational
- Estate Residential
- General Commercial
- General Industrial
- Golf Courses
- Golf Course Resort
- High Density Residential
- Large Lot Residential
- Light Industrial
- Medical/Nursing Home
- Medium Density Residential
- Medium Lot Residential
- Mortuary
- Office Low Rise
- Parking Lot
- Passive Open Space
- Public Facilities
- Public/Special Event/Military
- Religious Institutions
- Rural Residential
- Semi Rural Residential
- Small Lot Residential
- Speciality Commercial
- Tourist and Visitor Accomodations
- Transportation
- Vacant
- Vacant with Minor Development
- Warehouse

0 500 1,000 2,000 Feet

1 in = 2,000 ft

INDEX MAP

	A	B	C	D	E	F
1	4-A1	4-B1	4-C1	4-D1	4-E1	4-F1
2	4-A2	4-B2	4-C2	4-D2	4-E2	4-F2
3	4-A3	4-B3	4-C3	4-D3	4-E3	
4			4-C4	4-D4	4-E4	

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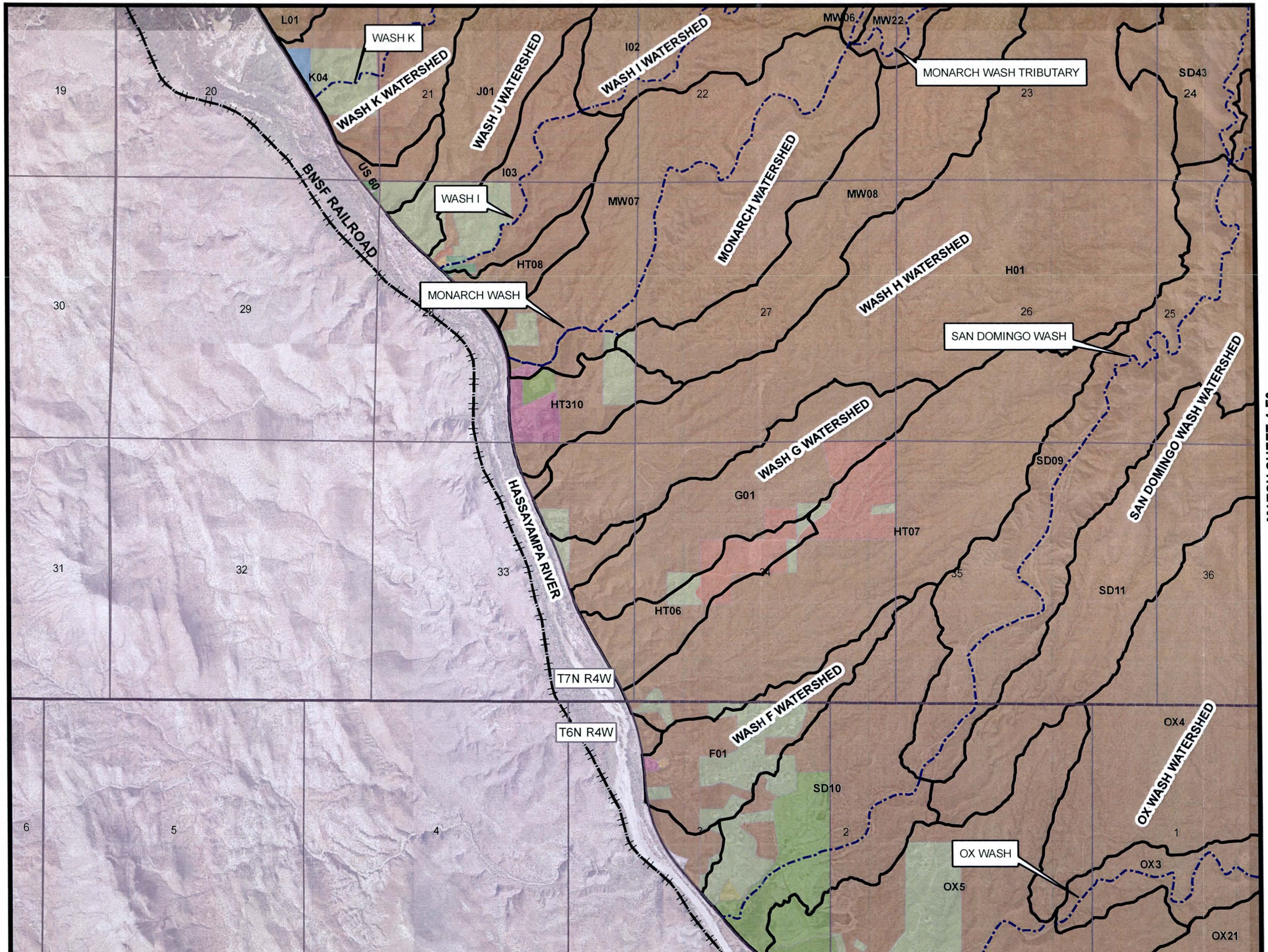
EXISTING LAND USE MAP
EXHIBIT 4-D2

MATCH SHEET 4-D2

MATCH SHEET 4-C3



MATCH SHEET 4-E3

MATCH SHEET 4-D4

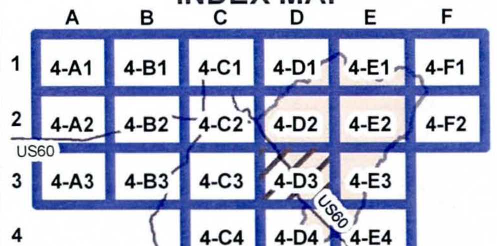
LEGEND

Watershed Boundary
FE1 Sub-basin ID
Flow Line
Streets
Railroad
Township and Range
13 Section Line and ID
Active Open Space
Airport
Commercial
Developing Commercial
Developing Employment Generating
Developing Residential
Educational
Estate Residential
General Commercial
General Industrial
Golf Courses
Golf Course Resort
High Density Residential
Large Lot Residential
Light Industrial
Medical/Nursing Home
Medium Density Residential
Medium Lot Residential
Mortuary
Office Low Rise
Parking Lot
Passive Open Space
Public Facilities
Public/Special Event/Military
Religious Institutions
Rural Residential
Semi Rural Residential
Small Lot Residential
Speciality Commercial
Tourist and Visitor Accomodations
Transportation
Vacant
Vacant with Minor Development
Warehouse

0 500 1,000 2,000 Feet

1 in = 2,000 ft

INDEX MAP



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EXISTING LAND USE MAP
EXHIBIT 4-D3

MATCH SHEET 4-D3

MATCH SHEET 4-C4

MATCH SHEET 4-E4

LEGEND

- Watershed Boundary
- FE1 Sub-basin ID
- Flow Line
- Streets
- Railroad
- Township and Range
- 13 Section Line and ID
- Active Open Space
- Airport
- Commercial
- Developing Commercial
- Developing Employment Generating
- Developing Residential
- Educational
- Estate Residential
- General Commercial
- General Industrial
- Golf Courses
- Golf Course Resort
- High Density Residential
- Large Lot Residential
- Light Industrial
- Medical/Nursing Home
- Medium Density Residential
- Medium Lot Residential
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- Religious Institutions
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- Speciality Commercial
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0 500 1,000 2,000 Feet

1 in = 2,000 ft

INDEX MAP

	A	B	C	D	E	F
1	4-A1	4-B1	4-C1	4-D1	4-E1	4-F1
2	4-A2	4-B2	4-C2	4-D2	4-E2	4-F2
3	4-A3	4-B3	4-C3	4-D3	4-E3	
4			4-C4	4-D4	4-E4	

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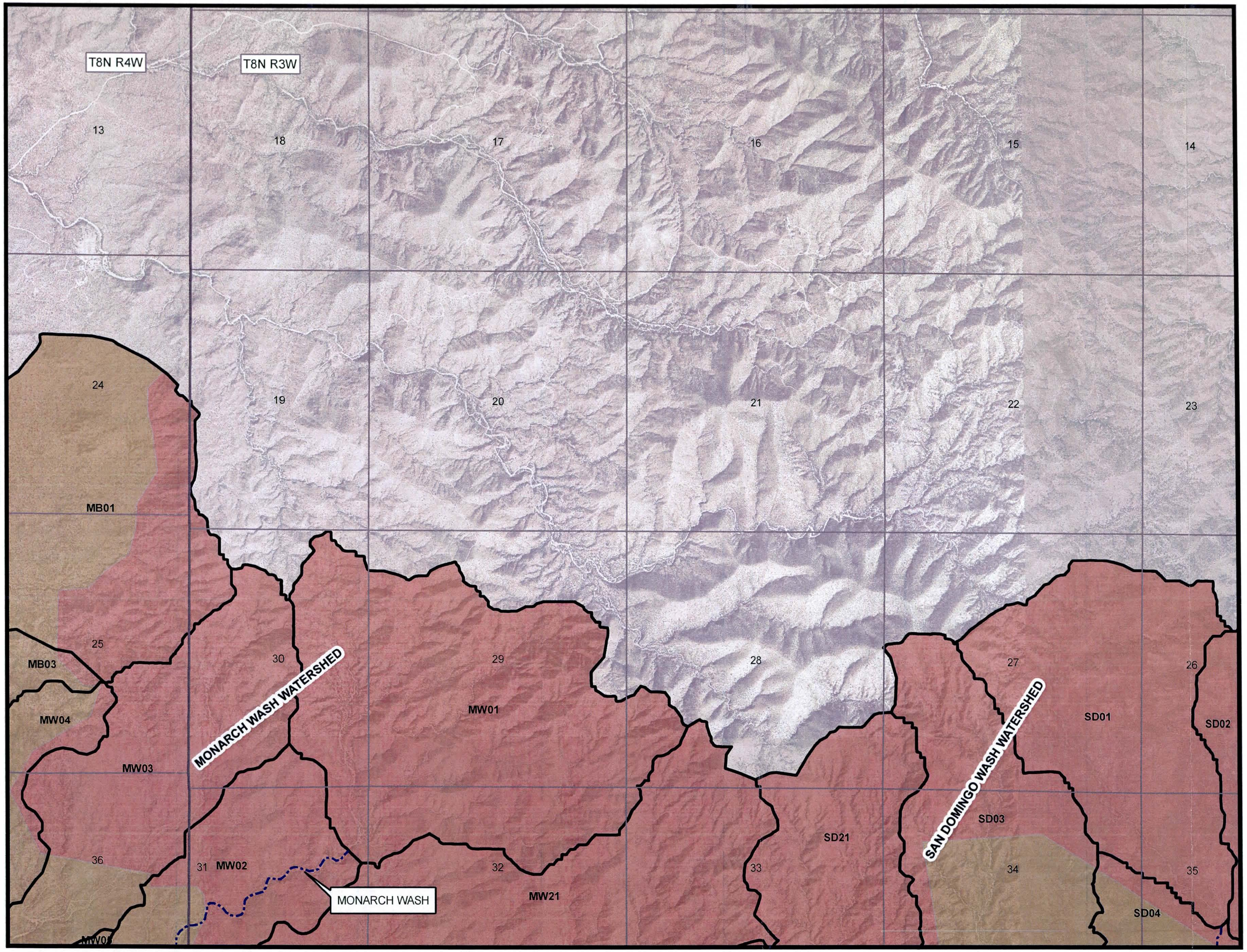
EXISTING LAND USE MAP
FIGURE 4-D4



MATCH SHEET 4-D1

MATCH SHEET 4-F1

MATCH SHEET 4-E2

LEGEND

- Watershed Boundary
- FE1 Sub-basin ID
- Flow Line
- Streets
- Railroad
- Township and Range
- 13 Section Line and ID
- Active Open Space
- Airport
- Commercial
- Developing Commercial
- Developing Employment Generating
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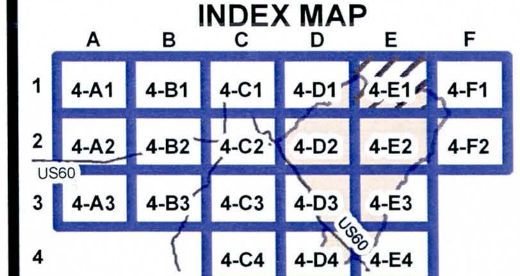
- Transportation
- Vacant
- Vacant with Minor Development
- Warehouse

0 500 1,000 2,000 Feet

1 in = 2,000 ft

INDEX MAP



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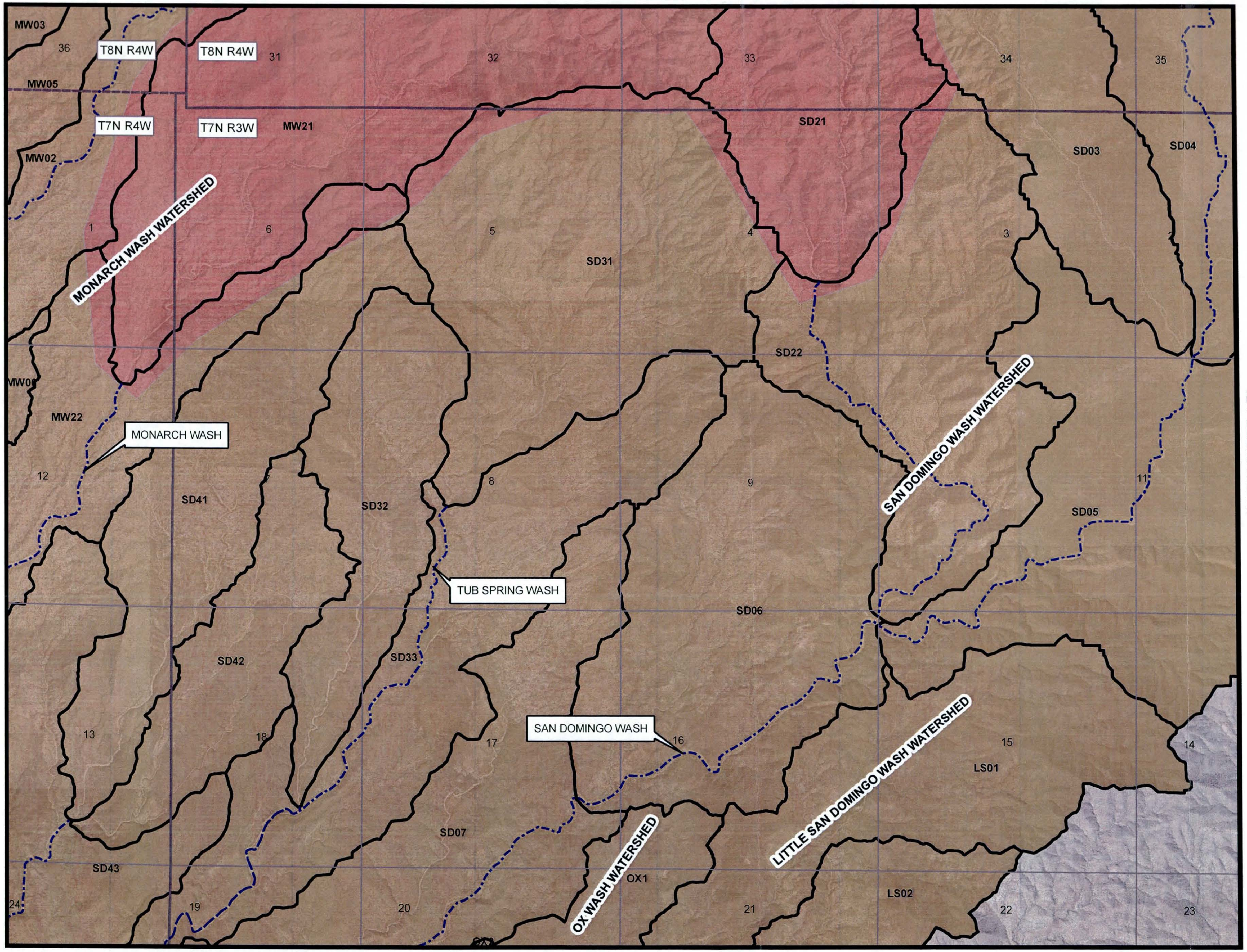
EXISTING LAND USE MAP
EXHIBIT 4-E1

MATCH SHEET 4-E1

MATCH SHEET 4-D2



MATCH SHEET 4-F2

MATCH SHEET 4-E3

LEGEND

- Watershed Boundary
- FE1 Sub-basin ID
- Flow Line
- Streets
- Railroad
- Township and Range
- 13 Section Line and ID
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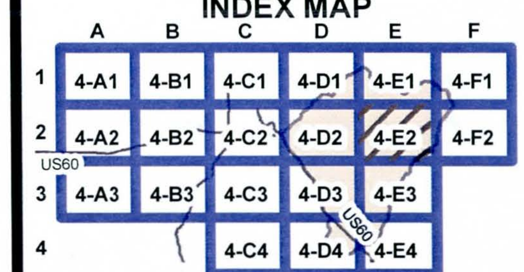
N

0 500 1,000 2,000 Feet

1 in = 2,000 ft

INDEX MAP



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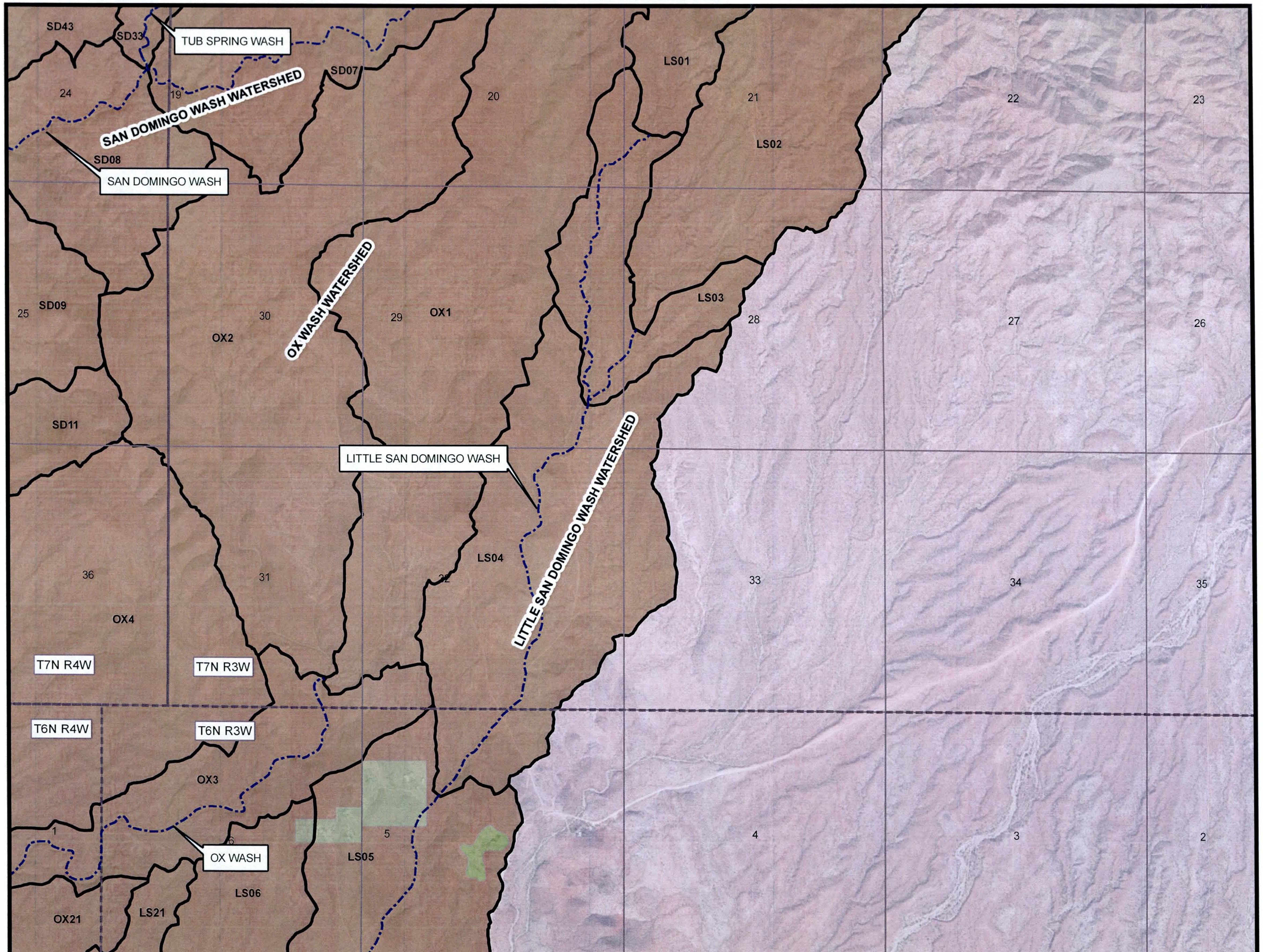
EXISTING LAND USE MAP
EXHIBIT 4-E2

MATCH SHEET 4-E2

MATCH SHEET 4-D3



MATCH SHEET 4-E4

LEGEND

- Watershed Boundary
- FE1 Sub-basin ID
- Flow Line
- Streets
- Railroad
- Township and Range
- 13 Section Line and ID
- Active Open Space
- Airport
- Commercial
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0 500 1,000 2,000 Feet

1 in = 2,000 ft

INDEX MAP

	A	B	C	D	E	F
1	4-A1	4-B1	4-C1	4-D1	4-E1	4-F1
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3	4-A3	4-B3	4-C3	4-D3	4-E3	
4			4-C4	4-D4	4-E4	

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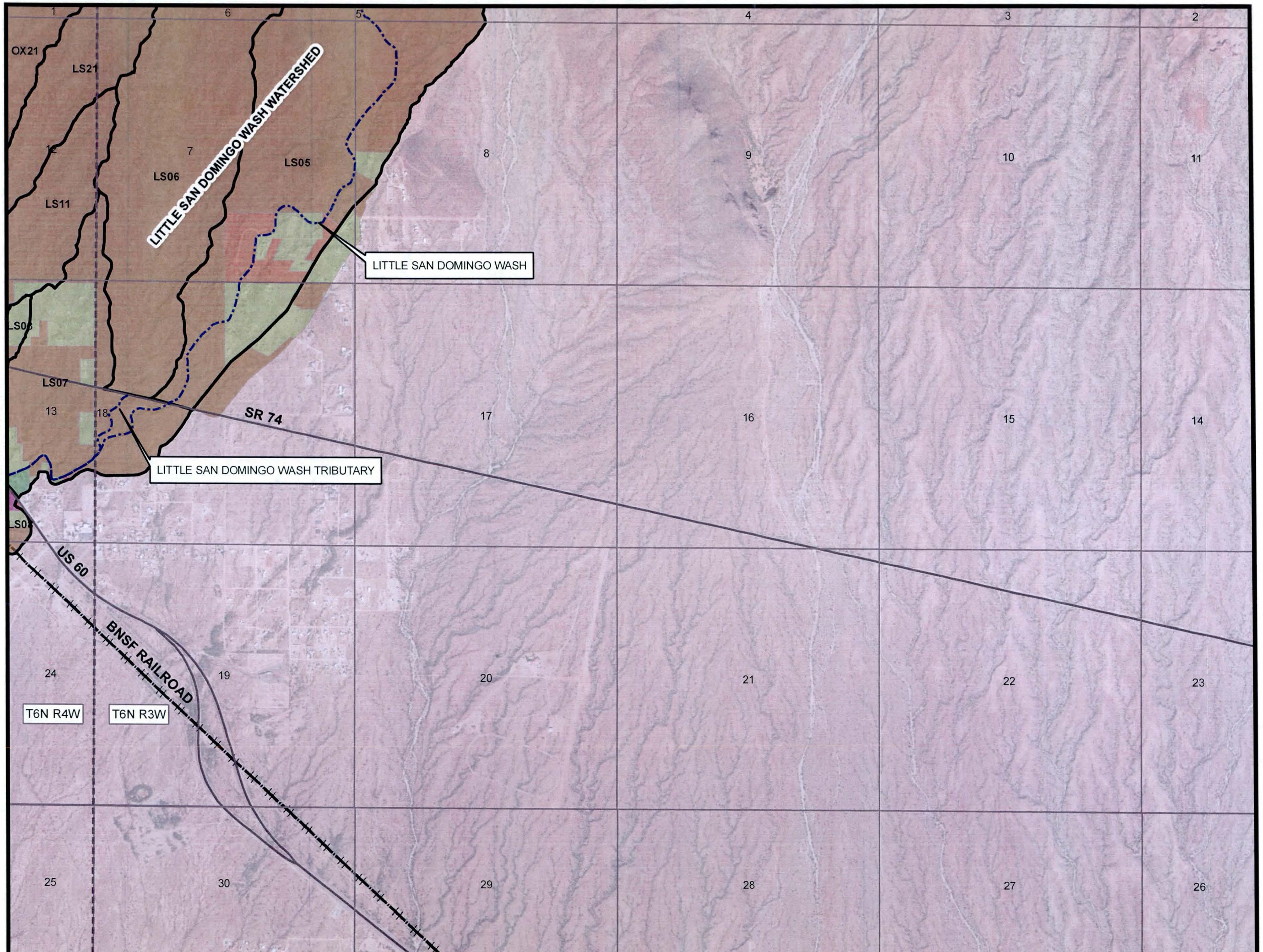
EXISTING LAND USE MAP
EXHIBIT 4-E3

MATCH SHEET 4-E3

MATCH SHEET 4-D4



LEGEND

- Watershed Boundary
- FE1 Sub-basin ID
- Flow Line
- Streets
- Railroad
- Township and Range
- 13 Section Line and ID
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- Transportation
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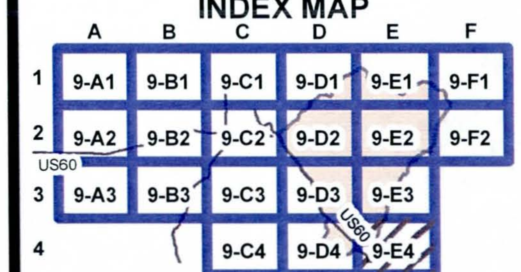
- Vacant with Minor Development
- Warehouse

0 500 1,000 2,000 Feet

1 in = 2,000 ft

INDEX MAP



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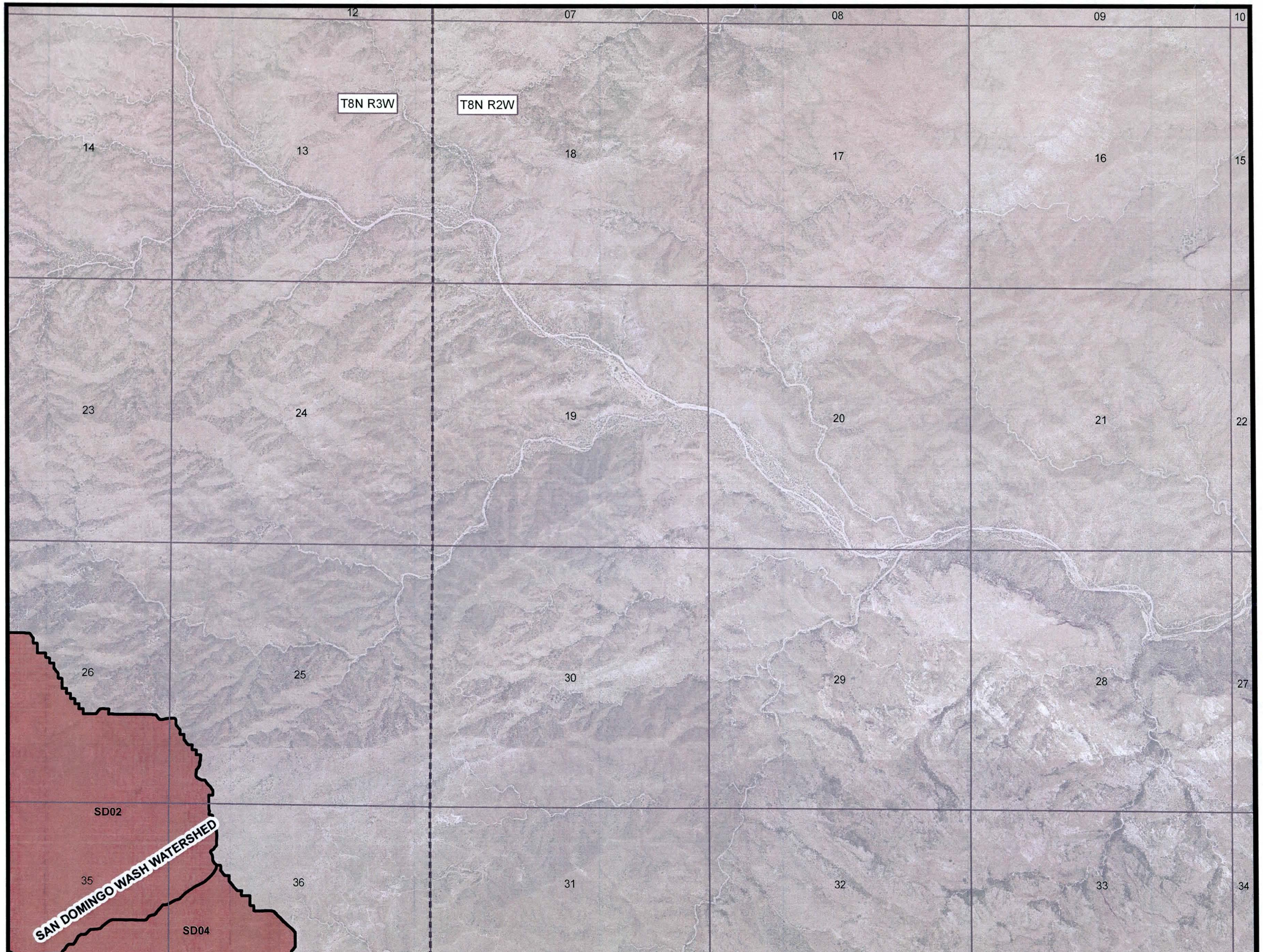
EXISTING LAND USE MAP
FIGURE 4-E4

MATCH SHEET 4-E1



MATCH SHEET 4-F2

LEGEND

- Watershed Boundary
- FE1 Sub-basin ID
- Flow Line
- Streets
- Railroad
- Township and Range
- 13 Section Line and ID
- Active Open Space
- Airport
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- Speciality Commercial
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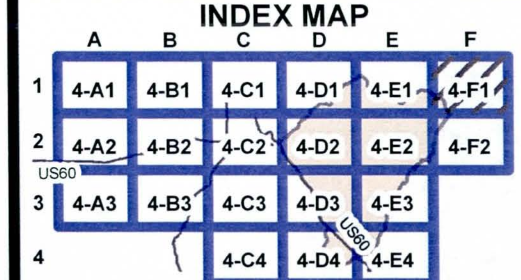
- Transportation
- Vacant
- Vacant with Minor Development
- Warehouse

0 500 1,000 2,000 Feet

1 in = 2,000 ft

INDEX MAP



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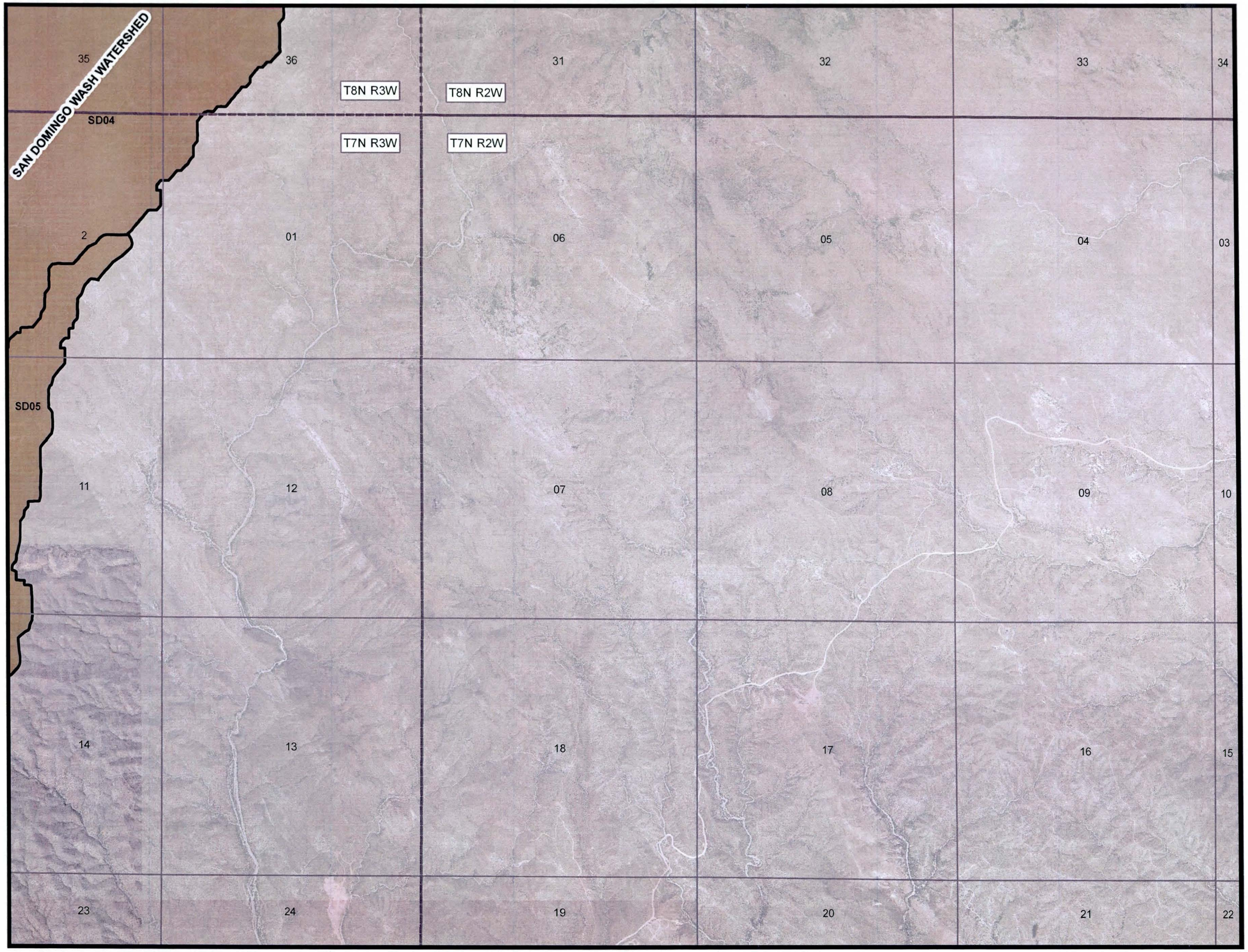
EXISTING LAND USE MAP
EXHIBIT 4-F1

MATCH SHEET 4-F1

MATCH SHEET 4-E2



LEGEND

- Watershed Boundary
- FE1 Sub-basin ID
- Flow Line
- Streets
- Railroad
- Township and Range
- 13 Section Line and ID
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- Vacant with Minor Development
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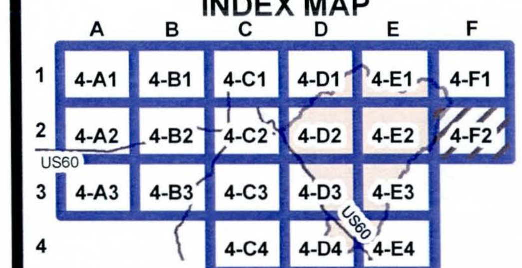
0 500 1,000 2,000 Feet

1 in = 2,000 ft

INDEX MAP



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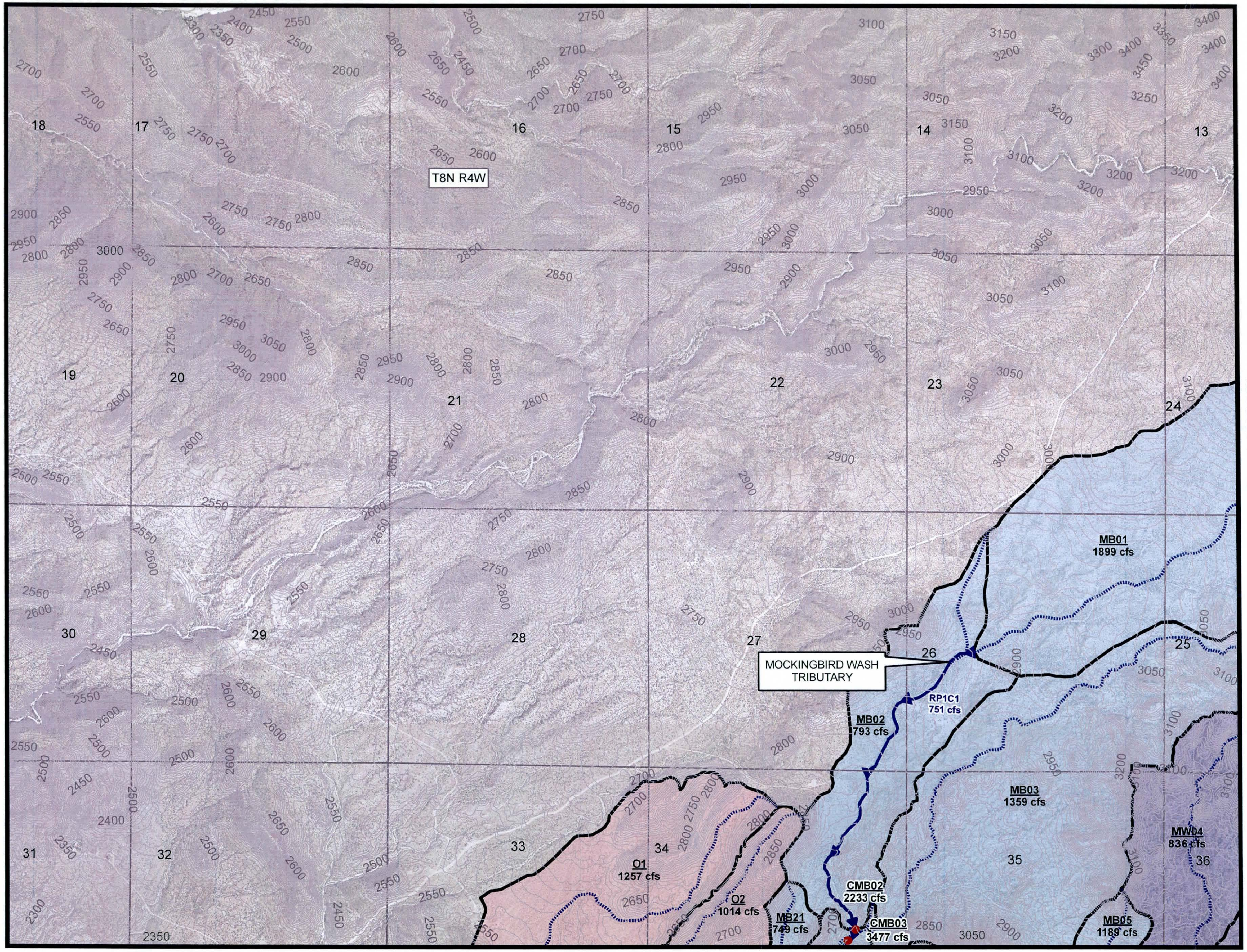
EXISTING LAND USE MAP
EXHIBIT 4-F2

MATCH SHEET 5-C1



MATCH SHEET 5-E1

MATCH SHEET 5-D2

LEGEND

- WASH AF SUBBASINS
- BLUE TANK WASH SUBBASINS
- CALAMITY WASH SUBBASINS
- POWDER HOUSE WASH SUBBASINS
- WASH F SUBBASINS
- WASH G SUBBASINS
- WASH H SUBBASINS
- WASH I SUBBASINS
- WASH J SUBBASINS
- WASH K SUBBASINS
- WASH M SUBBASINS
- MOCKINGBIRD WASH SUBBASINS
- MONARCH WASH SUBBASINS
- WASH O SUBBASINS
- WASH P SUBBASINS

FE3 / 430 cfs — Subbasin ID / Subbasin 100-yr Q (cfs)

C3 — Concentration Point

RC6C7 — Routing Reach ID

Routing Reach

Flow Path

Railroad

Township and Range

Streets

11 — Section Line and ID

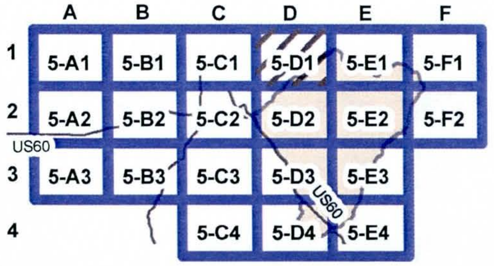
2000 — Elevation in Feet

0 500 1,000 2,000 Feet

1 in = 2,000 ft

Note:
Flows correspond to the greater of the 100 Year-24 Hour or the 100 Year-6 Hour.

INDEX MAP



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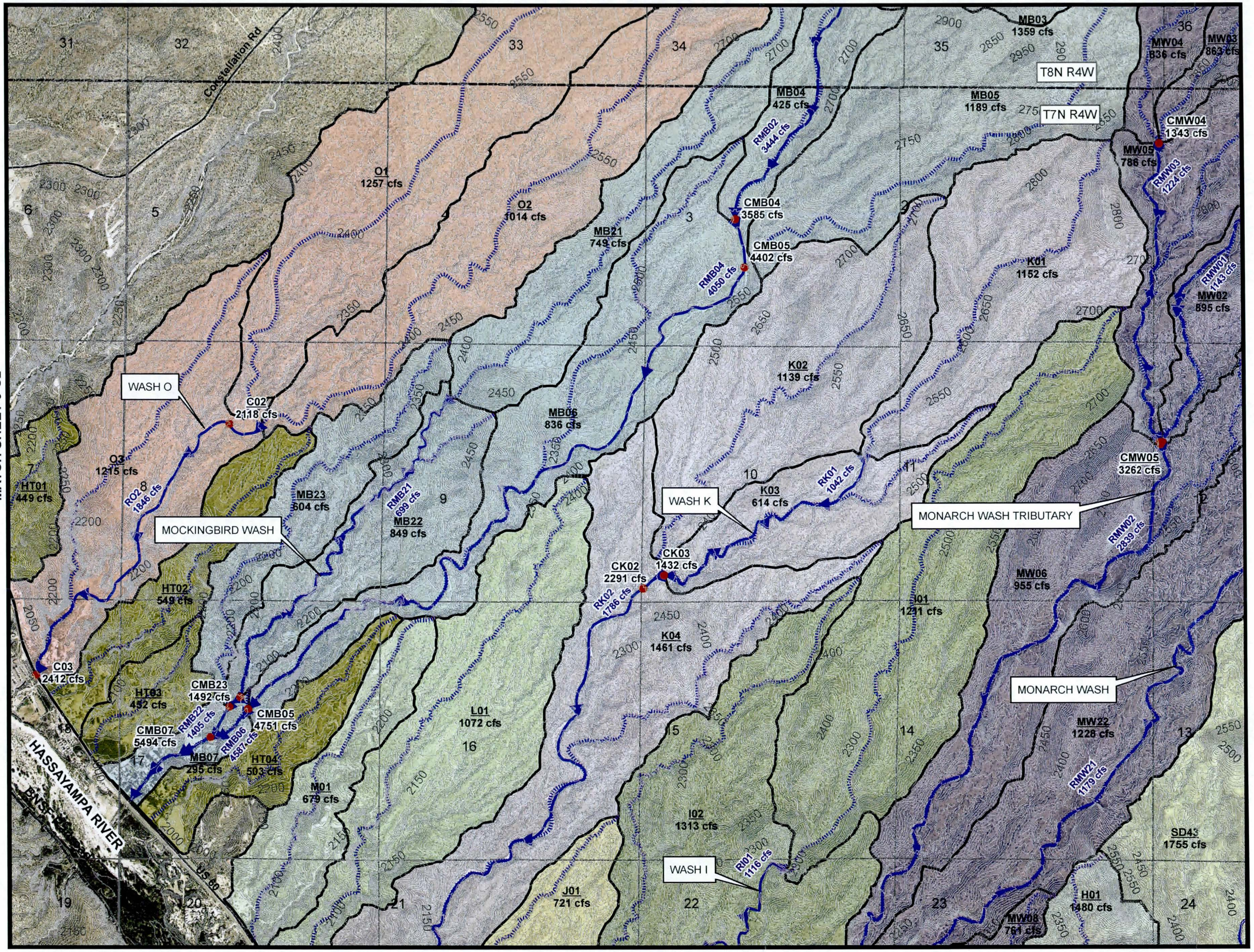
FLOW MAP
EXHIBIT 5-D1

MATCH SHEET 5-D1

MATCH SHEET 5-C2



MATCH SHEET 5-D3

MATCH SHEET 5-E2

LEGEND

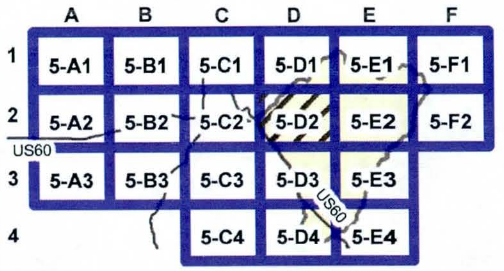
- Wash HT Subbasins
- Wash AF Subbasins
- Calamity Wash Subbasins
- Powder House Wash Subbasins
- Wash HTW Subbasins
- Vulture Mountain Wash Subbasins
- Wash H Subbasins
- Wash I Subbasins
- Wash J Subbasins
- Wash K Subbasins
- Wash M Subbasins
- Mockingbird Wash Subbasins
- Monarch Wash Subbasins
- Wash O Subbasins
- San Domingo Wash Subbasins
- Vulture Mountain Wash Subbasins
- Wash HT Subbasin
- Wash L
- FE3 / 430 cfs / C3 — Subbasin ID / Subbasin 100-yr Q (cfs) / Concentration Point
- RC6C7 — Routing Reach ID
- Routing Reach
- Flow Path
- Railroad
- Township and Range
- Streets
- 11 — Section Line and ID
- 2000 — Elevation in Feet

0 500 1,000 2,000 Feet

1 in = 2,000 ft

Note:
Flows correspond to the greater of the 100 Year-24 Hour or the 100 Year-6 Hour.

INDEX MAP



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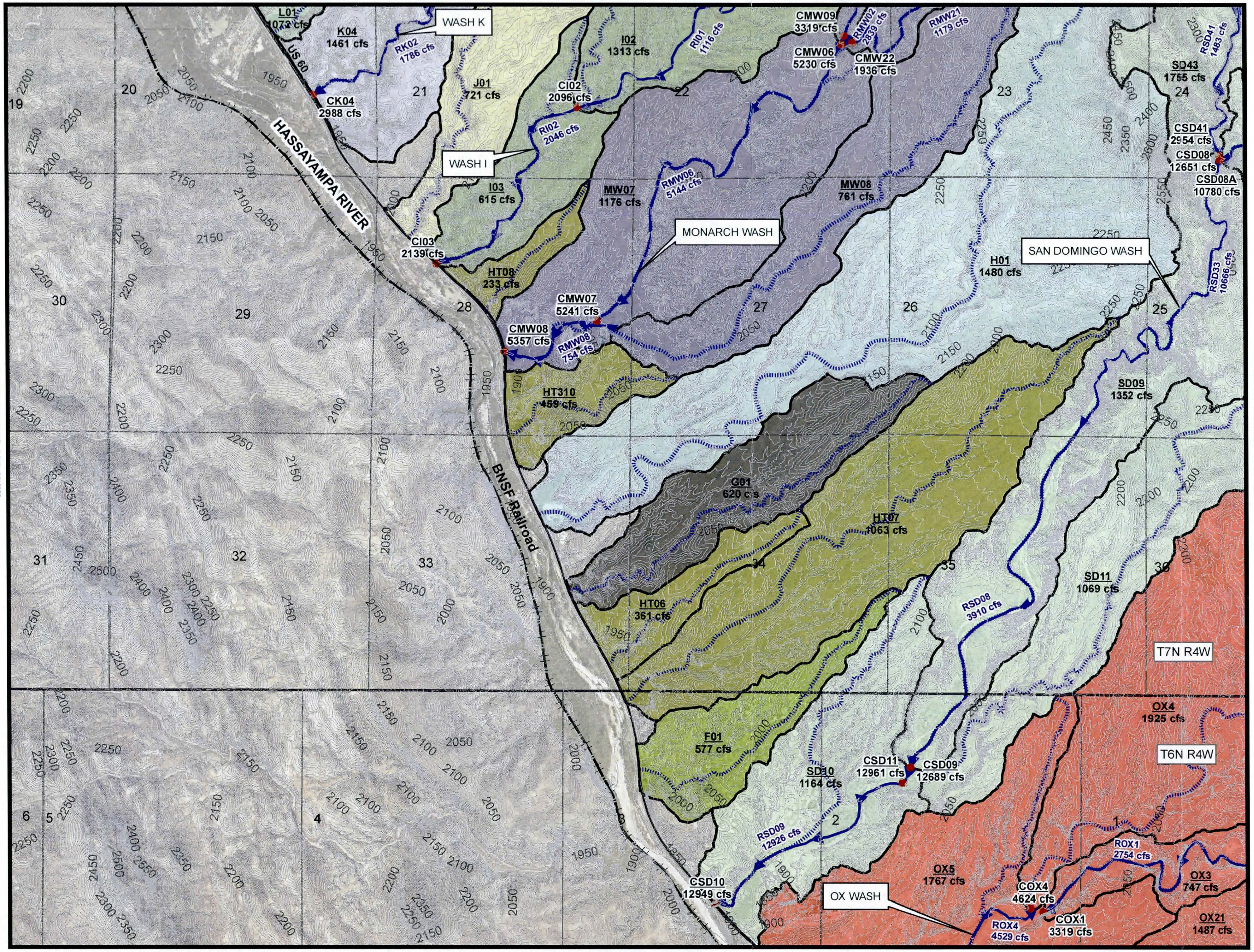
FLOW MAP
EXHIBIT 5-D2

MATCH SHEET 5-D2



MATCH SHEET 5-C3

MATCH SHEET 5-E3

MATCH SHEET 5-D4

LEGEND

- Wash HT Subbasins
- Powder House Wash Subbasins
- Wash HTW Subbasins
- Vulturte Mountain Wash Subbasins
- Wash H Subbasins
- Wash I Subbasins
- Wash J Subbasins
- Wash K Subbasins
- Wash M Subbasins
- Monarch Wash Subbasins
- San Domingo Wash Subbasins
- Vulture Mountain Wash Subbasins
- Wash HT Subbasins
- Wash F Subbasins
- Wash G Subbasins
- Ox Wash Subbains
- Wash L
- FE3 / 430 cfs / C3 — Subbasin ID / Subbasin 100-yr Q (cfs) / Concentration Point
- RC6C7 — Routing Reach ID
- Routing Reach
- Flow Path
- Railroad
- Township and Range
- Streets
- 11 — Section Line and ID
- 2000 — Elevation in Feet

0 500 1,000 2,000 Feet

1 in = 2,000 ft

Note:
Flows correspond to the greater of the 100 Year-24 Hour or the 100 Year-6 Hour.

INDEX MAP

	A	B	C	D	E	F
1	5-A1	5-B1	5-C1	5-D1	5-E1	5-F1
2	5-A2	5-B2	5-C2	5-D2	5-E2	5-F2
3	5-A3	5-B3	5-C3	5-D3	5-E3	
4			5-C4	5-D4	5-E4	

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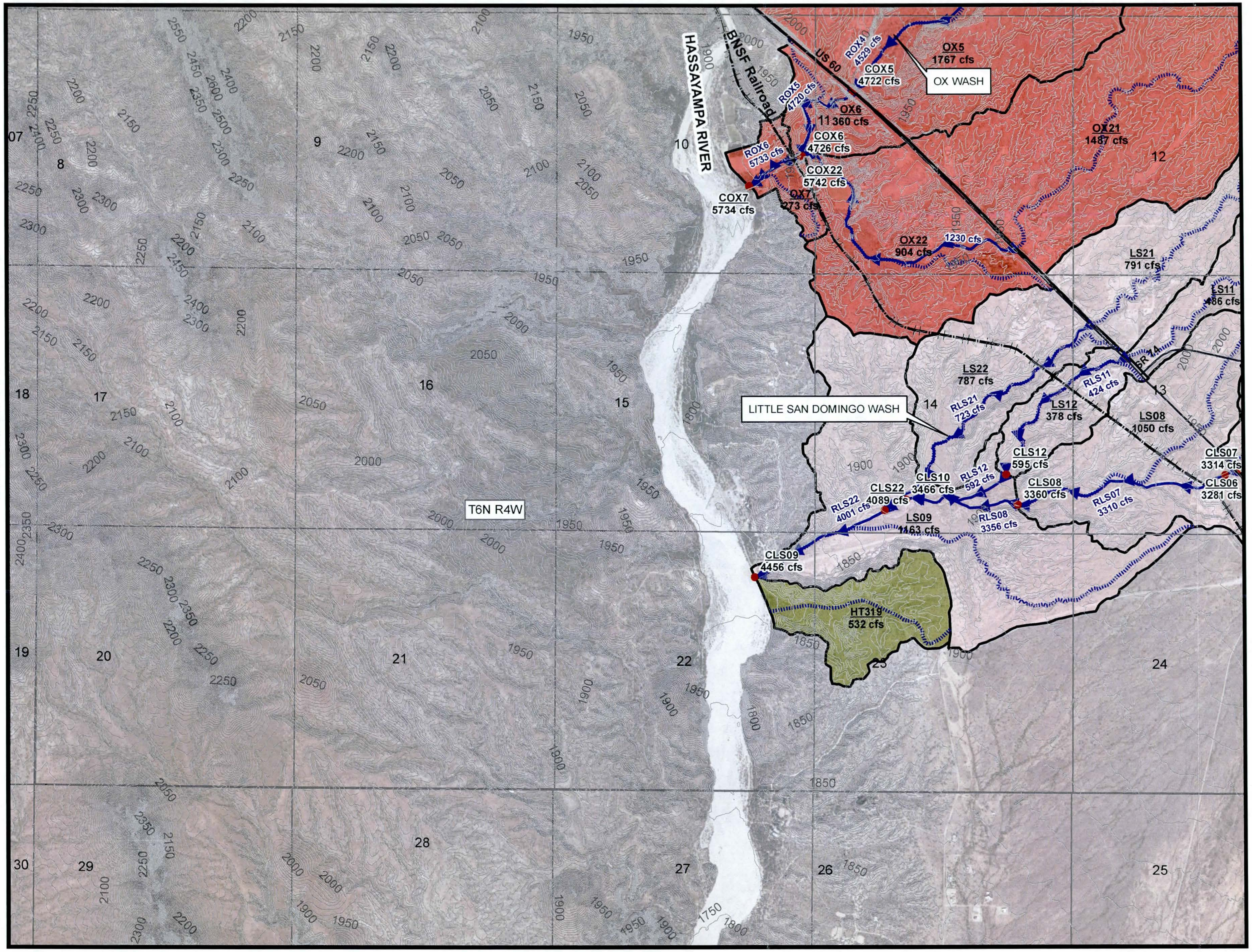
FLOW MAP
EXHIBIT 5-D3

MATCH SHEET 5-D3



MATCH SHEET 5-C4

MATCH SHEET 5-E4

LEGEND

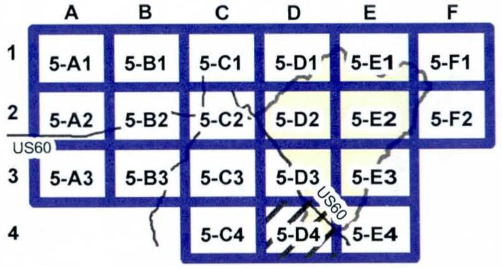
- Wash HT Subbasins
- Powder House Wash Subbasins
- Wash HTW Subbasins
- Vulturte Mountain Wash Subbasins
- Wash H Subbasins
- Wash I Subbasins
- Wash J Subbasins
- Wash K Subbasins
- Wash M Subbasins
- Monarch Wash Subbasins
- San Domingo Wash Subbasins
- Vulture Mountain Wash Subbasins
- Wash HT Subbasins
- Wash F Subbasins
- Wash G Subbasins
- Ox Wash Subbains
- FE3 / 430 cfs — Subbasin ID / Subbasin 100-yr Q (cfs)
- C3 — Concentration Point
- RC6C7 — Routing Reach ID
- Routing Reach
- Flow Path
- Railroad
- Township and Range
- Streets
- 11 — Section Line and ID
- 2000 — Elevation in Feet

0 500 1,000 2,000 Feet

1 in = 2,000 ft

Note:
Flows correspond to the greater of the 100 Year-24 Hour or the 100 Year-6 Hour.

INDEX MAP



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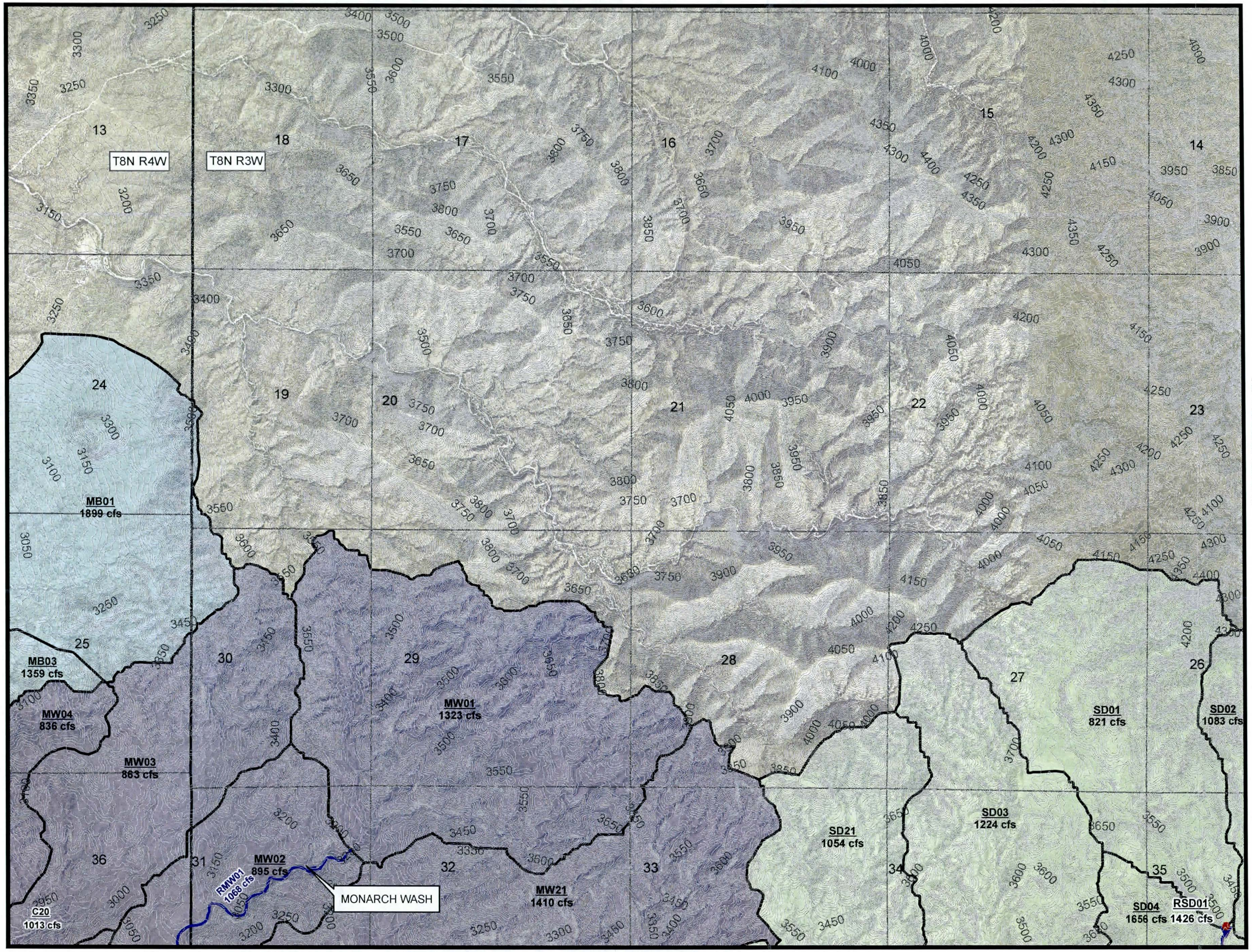
FLOW MAP
EXHIBIT 5-D4



MATCH SHEET 5-D1

MATCH SHEET 5-F1

MATCH SHEET 5-E2

LEGEND

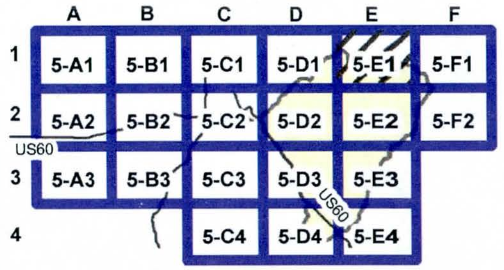
- Wash Ht Subbasins
- Blue tank Wash Subbasins
- Powder House Wash Subbasins
- Wash J Subbasins
- Wash K Subbasins
- Little San Domingo Wash Subbasins
- Wash M Subbasins
- Mockingbird Wash Subbasins
- Monarch Wash Subbasins
- Wash O Subbasins
- San Domingo Wash Subbasins
- Vulture Mountain Wash Subbasins
- Wash HT Subbasins
- Wash P Subbasins
- Ox Wash Subbasins

FE3 — Subbasin ID
430 cfs — Subbasin 100-yr Q (cfs)
C3 — Concentration Point
RC6C7 — Routing Reach ID
Routing Reach
Flow Path
Railroad
Township and Range
Streets
11 — Section Line and ID
2000 — Elevation in Feet

0 500 1,000 2,000 Feet
1 in = 2,000 ft

Note:
Flows correspond to the greater of the 100 Year-24 Hour or the 100 Year-6 Hour.

INDEX MAP



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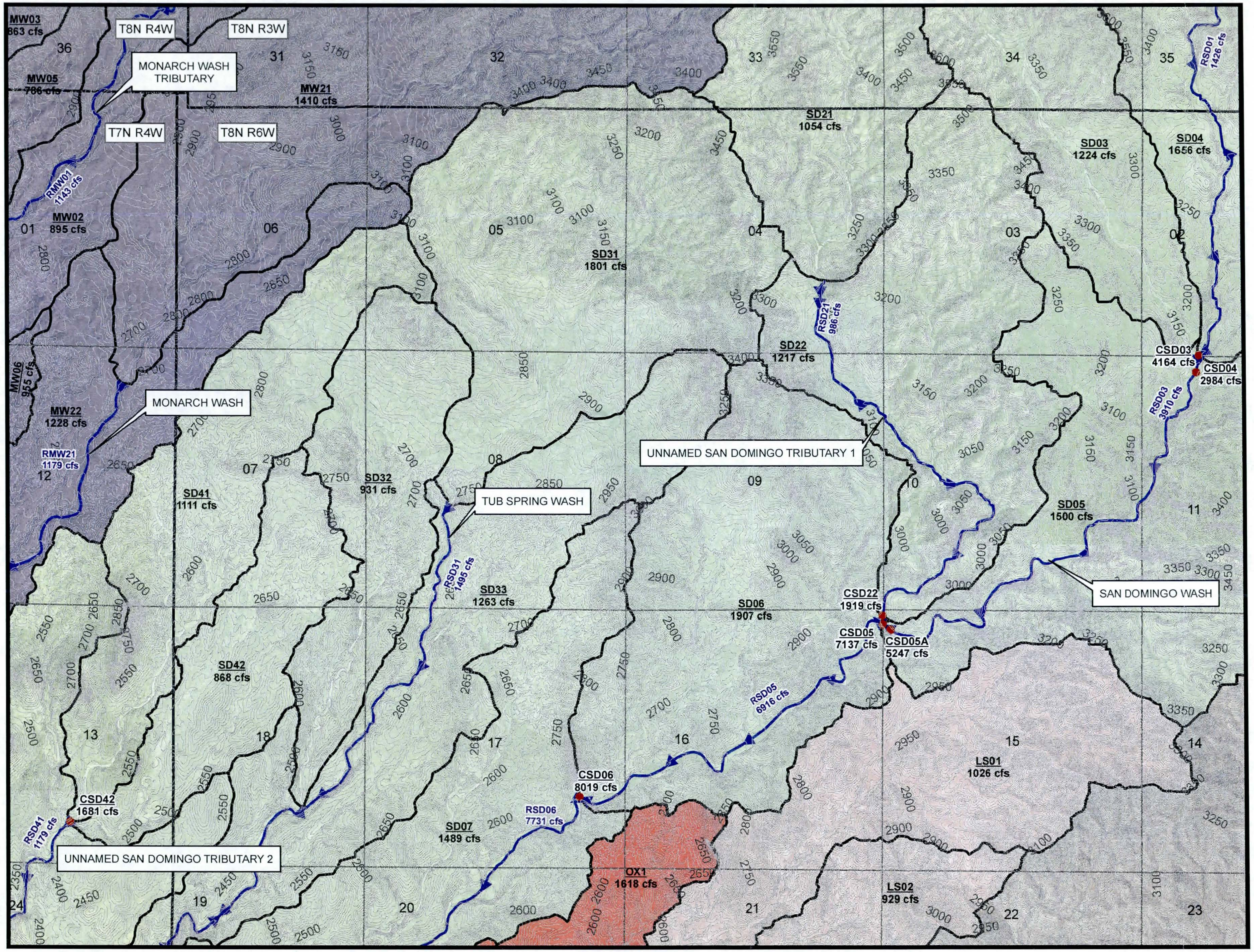
FLOW MAP
EXHIBIT 5-E1

MATCH SHEET 5-E1



MATCH SHEET 5-E3

LEGEND

- Wash Ht Subbasins
- Blue tank Wash Subbasins
- Powder House Wash Subbasins
- Wash J Subbasins
- Wash K Subbasins
- Little San Domingo Wash Subbasins
- Wash M Subbasins
- Mockingbird Wash Subbasins
- Monarch Wash Subbasins
- Wash O Subbasins
- San Domingo Wash Subbasins
- Vulture Mountain Wash Subbasins
- Wash HT Subbasins
- Wash P Subbasins
- Ox Wash Subbasins
- FE3 / 430 cfs — Subbasin ID / Subbasin 100-yr Q (cfs)
- C3 — Concentration Point
- RC6C7 — Routing Reach ID
- Routing Reach
- Flow Path
- Railroad
- Township and Range
- Streets
- 11 — Section Line and ID
- 2000 — Elevation in Feet

0 500 1,000 2,000 Feet

1 in = 2,000 ft

Note:
Flows correspond to the greater of the 100 Year-24 Hour or the 100 Year-6 Hour.

INDEX MAP

	A	B	C	D	E	F
1	5-A1	5-B1	5-C1	5-D1	5-E1	5-F1
2	5-A2	5-B2	5-C2	5-D2	5-E2	5-F2
3	5-A3	5-B3	5-C3	5-D3	5-E3	
4			5-C4	5-D4	5-E4	

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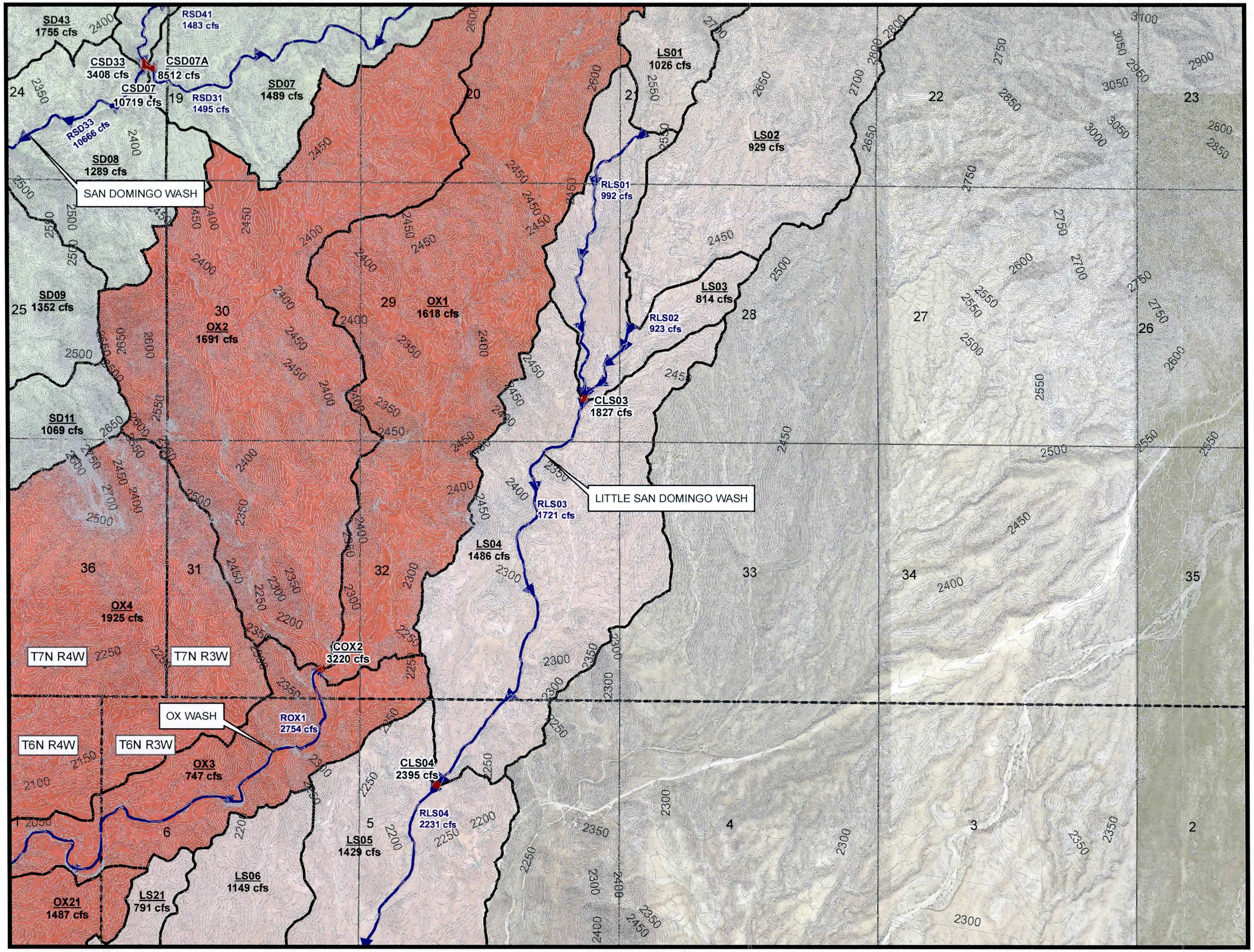
FLOW MAP
EXHIBIT 5-E2

MATCH SHEET 5-E2

MATCH SHEET 5-D3



MATCH SHEET 5-E4

LEGEND

- Wash Ht Subbasins
- Blue tank Wash Subbasins
- Powder House Wash Subbasins
- Wash J Subbasins
- Wash K Subbasins
- Little San Domingo Wash Subbasins
- Wash M Subbasins
- Mockingbird Wash Subbasins
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FE3 — Subbasin ID
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Flow Path
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Township and Range
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11 — Section Line and ID
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0 500 1,000 2,000 Feet
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Note: *Flows correspond to the greater of the 100 Year-24 Hour or the 100 Year-6 Hour.*

INDEX MAP

	A	B	C	D	E	F
1	5-A1	5-B1	5-C1	5-D1	5-E1	5-F1
2	5-A2	5-B2	5-C2	5-D2	5-E2	5-F2
3	5-A3	5-B3	5-C3	5-D3	5-E3	
4			5-C4	5-D4	5-E4	

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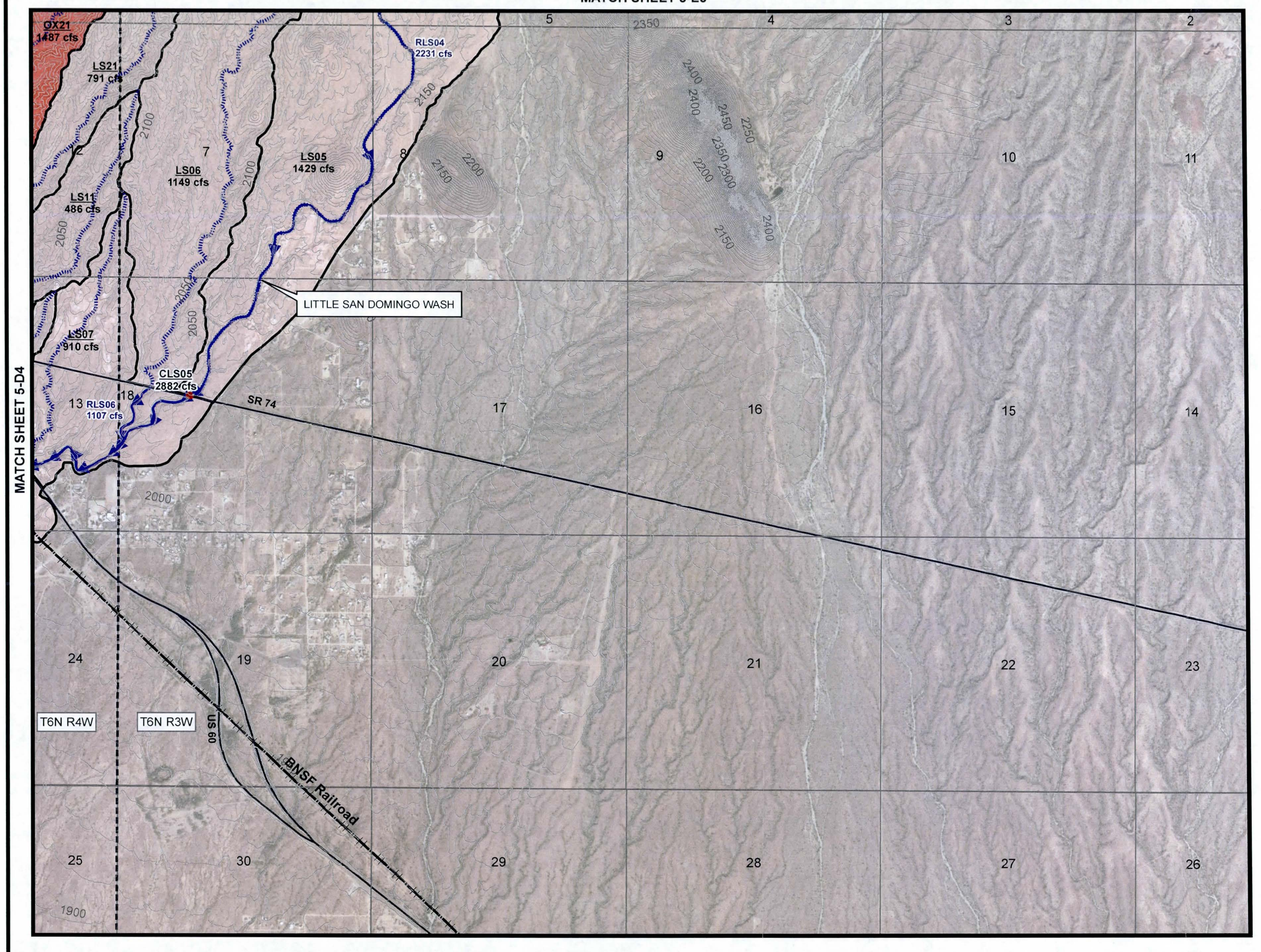
FLOW MAP
EXHIBIT 5-E3

MATCH SHEET 5-E3



LEGEND

- Wash Ht Subbasins
- Blue tank Wash Subbasins
- Powder House Wash Subbasins
- Wash J Subbasins
- Wash K Subbasins
- Little San Domingo Wash Subbasins
- Wash M Subbasins
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0 500 1,000 2,000 Feet

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Note:
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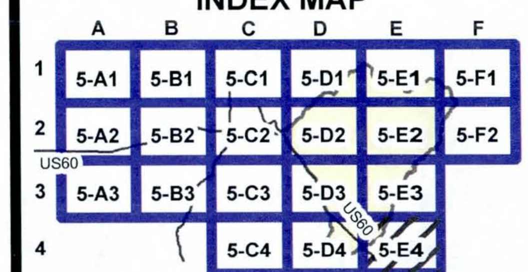
INDEX MAP



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F.C.D. Contract No. 2009-C030

FLOW MAP
EXHIBIT 5-E4

MATCH SHEET 5-E1

MATCH SHEET 5-F2

LEGEND

- Wash Ht Subbasins
- Blue tank Wash Subbasins
- Powder House Wash Subbasins
- Wash J Subbasins
- Wash K Subbasins
- Little San Domingo Wash Subbasins
- Wash M Subbasins
- Mockingbird Wash Subbasins
- Monarch Wash Subbasins
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- San Domingo Wash Subbasins
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- Wash HT Subbasins
- Wash P Subbasins
- Ox Wash Subbasins

FE3 Subbasin ID
430 cfs Subbasin 100-yr Q (cfs)
C3 Concentration Point
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Routing Reach
Flow Path
Railroad
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Note:
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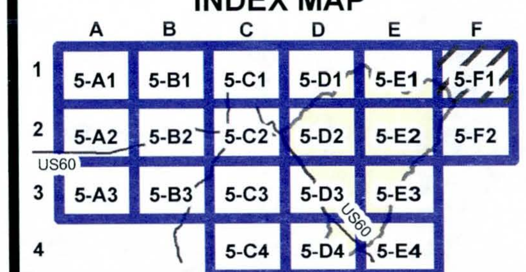
INDEX MAP



FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

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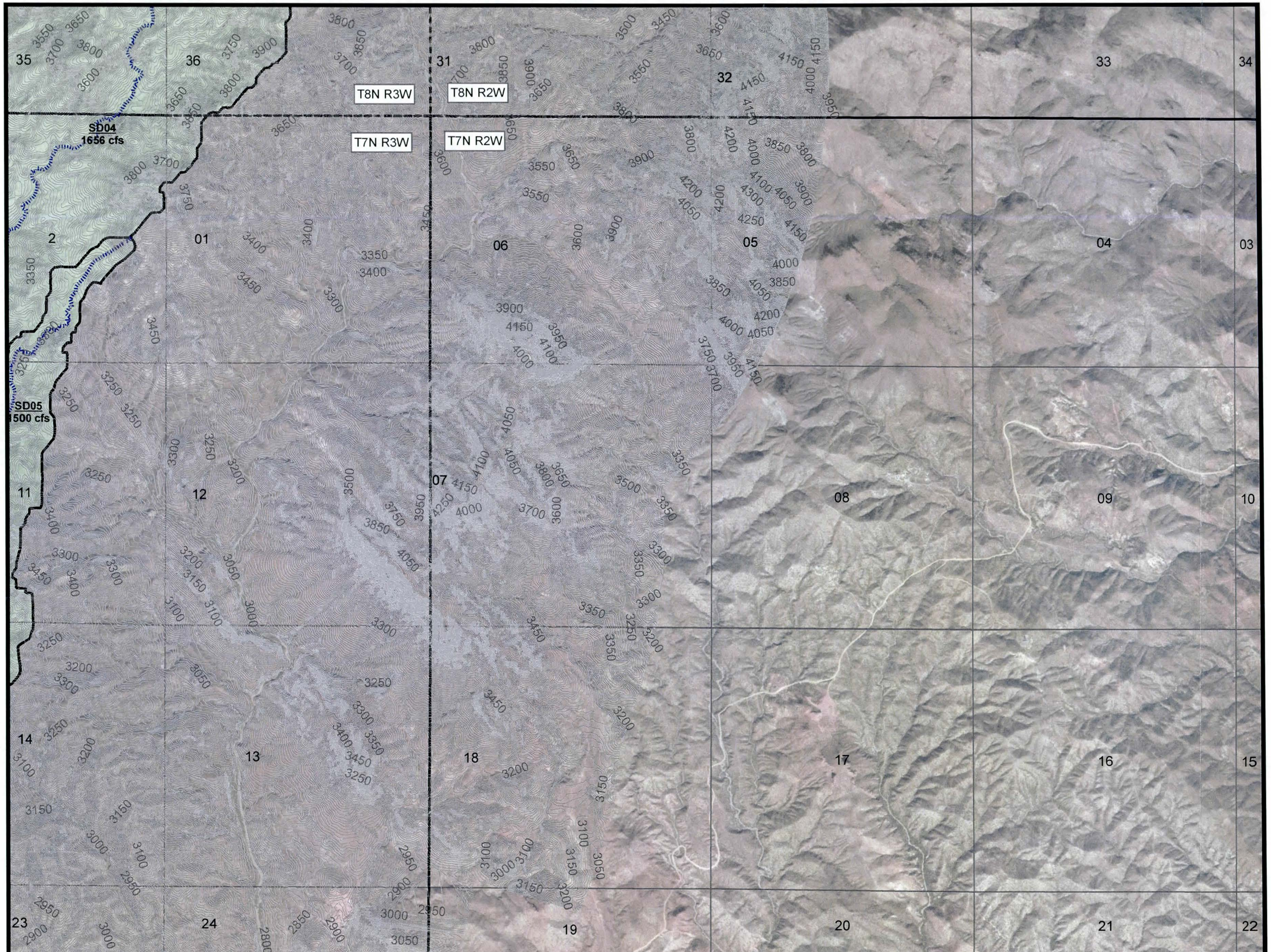
F.C.D. Contract No. 2009-C030

FLOW MAP
EXHIBIT 5-F1

MATCH SHEET 5-F1

MATCH SHEET 5-E2



LEGEND

- Wash Ht Subbasins
- Blue tank Wash Subbasins
- Powder House Wash Subbasins
- Wash J Subbasins
- Wash K Subbasins
- Little San Domingo Wash Subbasins
- Wash M Subbasins
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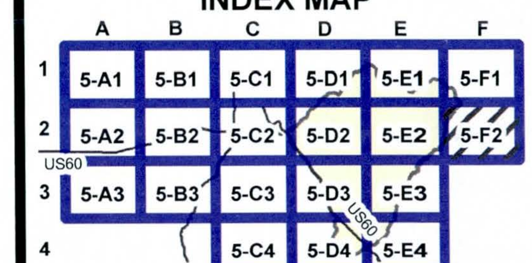
- 430 cfs — Subbasin 100-yr Q (cfs)
- C3 — Concentration Point
- RC6C7 — Routing Reach ID
- Routing Reach
- Flow Path
- Railroad
- Township and Range
- Streets
- 11 — Section Line and ID
- 2000 — Elevation in Feet

0 500 1,000 2,000 Feet

1 in = 2,000 ft

Note:
Flows correspond to the greater of the 100 Year-24 Hour or the 100 Year-6 Hour.

INDEX MAP



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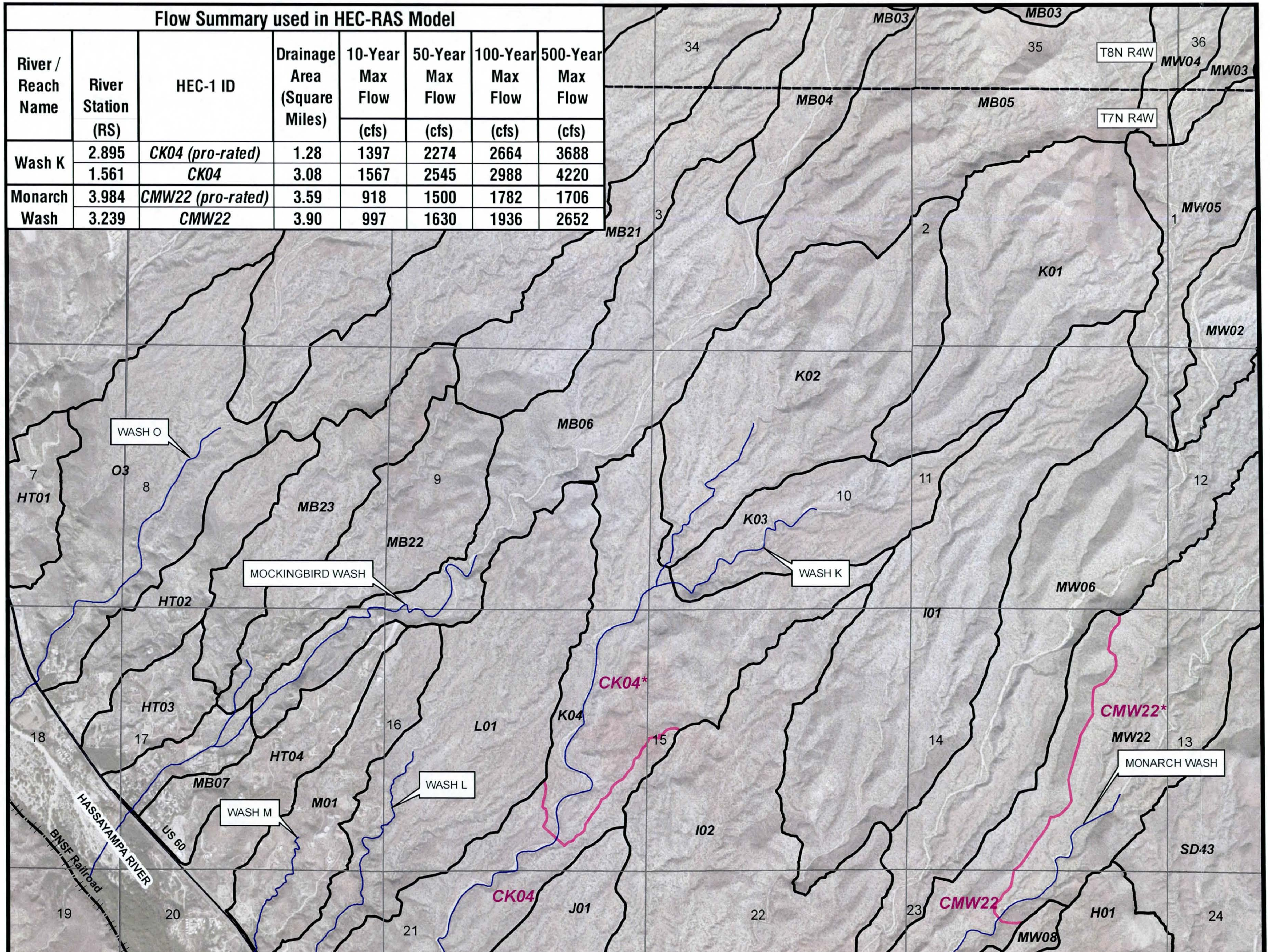
FLOW MAP
EXHIBIT 5-F2

MATCH SHEET 6-D1

Flow Summary used in HEC-RAS Model

River / Reach Name	River Station (RS)	HEC-1 ID	Drainage Area (Square Miles)	10-Year Max Flow (cfs)	50-Year Max Flow (cfs)	100-Year Max Flow (cfs)	500-Year Max Flow (cfs)
Wash K	2.895	*CK04 (pro-rated)*	1.28	1397	2274	2664	3688
	1.561	*CK04*	3.08	1567	2545	2988	4220
Monarch Wash	3.984	*CMW22 (pro-rated)*	3.59	918	1500	1782	1706
	3.239	*CMW22*	3.90	997	1630	1936	2652



MATCH SHEET 6-D3

MATCH SHEET 6-C2

MATCH SHEET 6-E2

LEGEND

- Sub-Basin Boundary
- Prorated Sub-Basin Boundary
- Flowline
- *ST1* Sub-Basin/Concentration Point ID
- *ST1** Sub-Basin/Concentration Point ID (Pro-Rated)
- *ST3* Sub-Basin ID (not Pro-Rated)
- Township and Range
- Streets
- 11 Section Line and ID
- Railroad

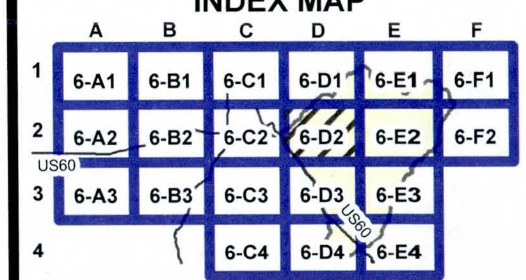
N

0 500 1,000 2,000 Feet

1 in = 2,000 ft

Note:
Flows correspond to the greater of the 100 Year-24 Hour or the 100 Year-6 Hour.

INDEX MAP



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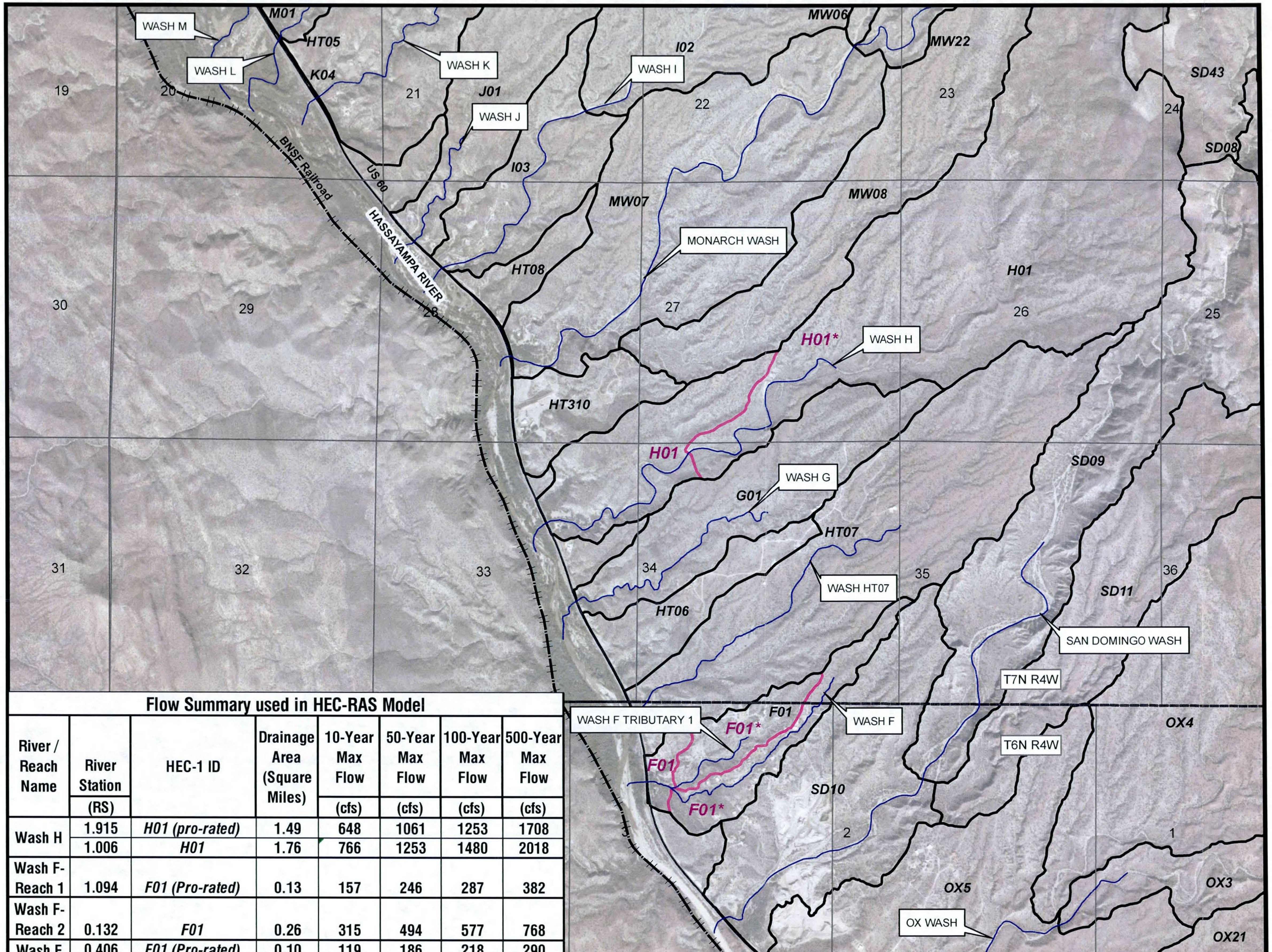
PRORATED FLOW MAP
EXHIBIT 6-D2

MATCH SHEET 6-D2



MATCH SHEET 6-C3

MATCH SHEET 6-E3

MATCH SHEET 6-D4

Flow Summary used in HEC-RAS Model

River / Reach Name	River Station (RS)	HEC-1 ID	Drainage Area (Square Miles)	10-Year Max Flow (cfs)	50-Year Max Flow (cfs)	100-Year Max Flow (cfs)	500-Year Max Flow (cfs)
Wash H	1.915	*H01 (pro-rated)*	1.49	648	1061	1253	1708
	1.006	*H01*	1.76	766	1253	1480	2018
Wash F-Reach 1	1.094	*F01 (Pro-rated)*	0.13	157	246	287	382
Wash F-Reach 2	0.132	*F01*	0.26	315	494	577	768
Wash F	0.406	*F01 (Pro-rated)*	0.10	119	186	218	290

LEGEND

- Sub-Basin Boundary
- Prorated Sub-Basin Boundary
- Flowline
- *ST1* Sub-Basin/Concentration Point ID
- *ST1** Sub-Basin ID/Concentration Point (Pro-Rated)
- *ST3* Sub-Basin ID (not Pro-Rated)
- Township and Range
- Streets
- 11 Section Line and ID
- Railroad

N

0 500 1,000 2,000 Feet

1 in = 2,000 ft

Note:
Flows correspond to the greater of the 100 Year-24 Hour or the 100 Year-6 Hour.

INDEX MAP

	A	B	C	D	E	F
1	6-A1	6-B1	6-C1	6-D1	6-E1	6-F1
2	6-A2	6-B2	6-C2	6-D2	6-E2	6-F2
3	6-A3	6-B3	6-C3	6-D3	6-E3	
4			6-C4	6-D4	6-E4	

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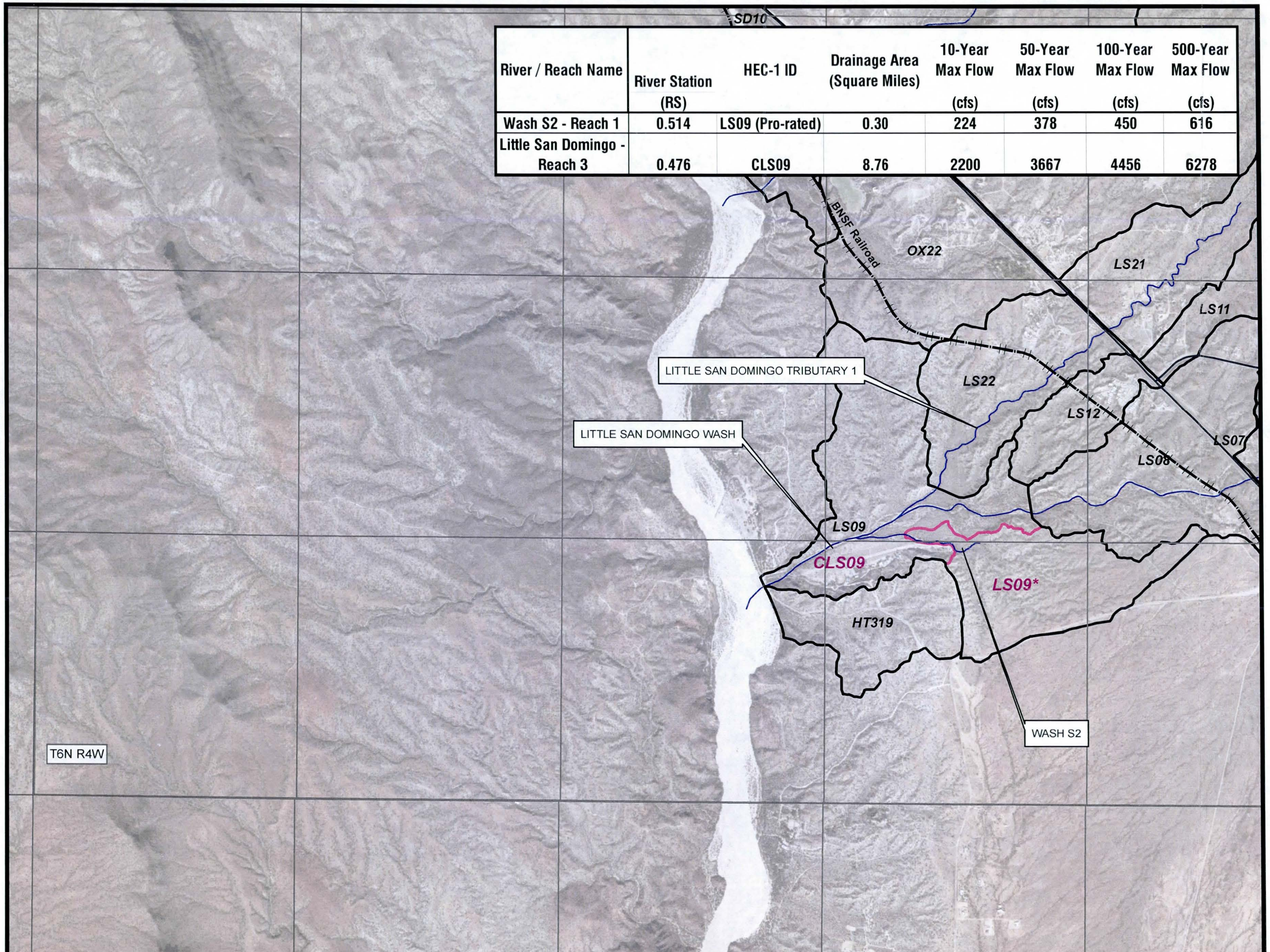
PRORATED FLOW MAP
EXHIBIT 6-D3

MATCH SHEET 6-D3

River / Reach Name	River Station (RS)	HEC-1 ID	Drainage Area (Square Miles)	10-Year Max Flow (cfs)	50-Year Max Flow (cfs)	100-Year Max Flow (cfs)	500-Year Max Flow (cfs)
Wash S2 - Reach 1	0.514	LS09 (Pro-rated)	0.30	224	378	450	616
Little San Domingo - Reach 3	0.476	CLS09	8.76	2200	3667	4456	6278



MATCH SHEET 6-C4

MATCH SHEET 6-E4

LEGEND

- Sub-Basin Boundary
- Prorated Sub-Basin Boundary
- Flowline
- *ST1* Sub-Basin/Concentration Point ID
- *ST1** Sub-Basin ID/Concentration Point (Pro-Rated)
- *ST3* Sub-Basin ID (not Pro-Rated)
- Township and Range
- Streets
- 11 Section Line and ID
- Railroad

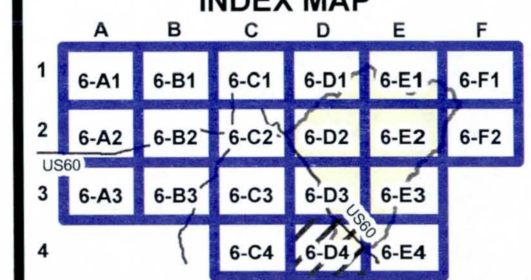
N

0 500 1,000 2,000 Feet

1 in = 2,000 ft

Note:
Flows correspond to the greater of the 100 Year-24 Hour or the 100 Year-6 Hour.

INDEX MAP



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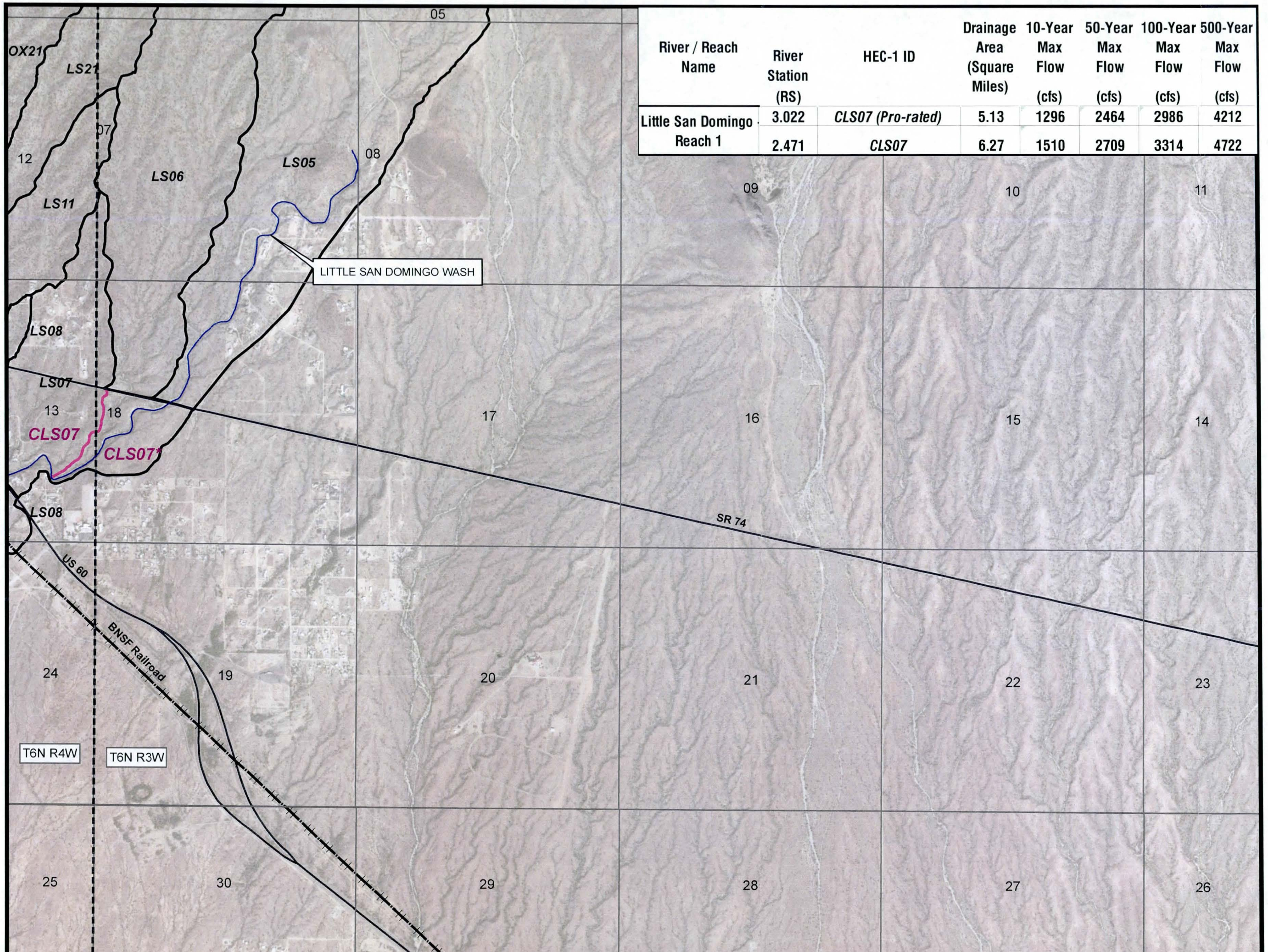
PRORATED FLOW MAP
EXHIBIT 6-D4

MATCH SHEET 6-E3

MATCH SHEET 6-D4



River / Reach Name	River Station (RS)	HEC-1 ID	Drainage Area (Square Miles)	10-Year Max Flow (cfs)	50-Year Max Flow (cfs)	100-Year Max Flow (cfs)	500-Year Max Flow (cfs)
Little San Domingo Reach 1	3.022	*CLS07 (Pro-rated)*	5.13	1296	2464	2986	4212
	2.471	*CLS07*	6.27	1510	2709	3314	4722

LEGEND

Sub-Basin Boundary

Prorated Sub-Basin Boundary

Flowline

ST1 Sub-Basin/Concentration Point ID

*ST1** Sub-Basin ID/Concentration Point (Pro-Rated)

ST3 Sub-Basin ID (not Pro-Rated)

Township and Range

Streets

11 Section Line and ID

Railroad

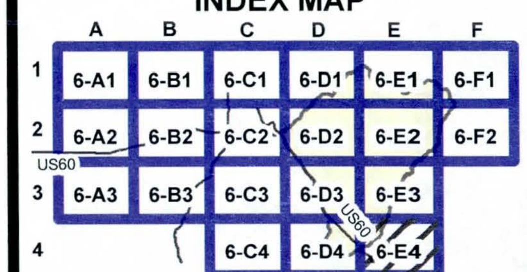
N

0 500 1,000 2,000 Feet

1 in = 2,000 ft

Note:
Flows correspond to the greater of the 100 Year-24 Hour or the 100 Year-6 Hour.

INDEX MAP



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PRORATED FLOW MAP
EXHIBIT 6-E4

Appendix A:References

A.1 References (Included in CD)

Appendix B: General Documentation and Correspondence

B.1 Special Problem Reports

Note: There are no Special Problem Reports.

B.2 Contact Reports ***(Included in CD)***

B.3 Meeting Minutes ***(Included in CD)***

B.4 General Correspondence ***(Included in CD)***

B.5 Contract Documents ***(Included in CD)***

B.6 Public Notification ***(Included in CD and report)***

B.7 FEMA Correspondence ***(Included in report)***

Flood Control District
of Maricopa County

www.fcd.maricopa.gov

2801 West Durango Street
Phoenix, Arizona 85009
Phone: 602-506-1501
Fax: 602-506-4601
TT: 602-505-5897

NOTICE OF INTENT TO REVISE FLOODPLAIN/FLOODWAY DELINEATIONS WITHIN THE TOWN OF WICKENBURG AND UNINCORPORATED MARICOPA COUNTY

The Flood Control District of Maricopa County (District) invites all interested persons to attend an open house public meeting at which the Phase 3 results of the revised Wickenburg Area Drainage Master Study/Plan (ADMS/P) will be presented. Floodplain/floodway delineations were performed in this phase which revised the current floodplain/floodway boundaries within the drainage areas contributing to the various washes within and surrounding the Town of Wickenburg. **Based on property ownership records, your property (Assessor Parcel Number(s): XX) is near or within one of the recently revised floodplain/floodways.**

The public open house will be held at the Wickenburg Community Center from 5:30 to 7:30 p.m. on Thursday, August 15, 2013. At the open house you will have an opportunity to review the revised floodplain/floodway boundaries and speak with project team members about the Phase 3 results.

The revised floodplain boundaries include: establishing 1.4 new linear miles of detailed Zone AE floodplains with base flood elevations; revising 3.8 linear miles of approximate Zone A floodplains to detailed Zone AE floodplains with base flood elevations; and revising 27.5 linear miles of detailed Zone AE floodplains and floodways resulting in changes in widths and base flood elevations (increases and decreases) for areas with previously delineated detailed Zone AE floodplains and floodways.

The washes being updated are:

- Mockingbird Wash: Revised detailed Zone AE floodplains/floodways from Hassayampa River to 2.4 miles upstream.
- Mockingbird Wash Tributary 1: Revised detailed Zone AE floodplains/floodways from Mockingbird Wash to 0.4 miles upstream.
- Wash L: Revised detailed Zone AE floodplains/floodways from Hassayampa River to 1.2 miles upstream.
- Wash O: Revised detailed Zone AE floodplains/floodways from Hassayampa River to 1.4 miles upstream.
- Wash K: Revised detailed Zone AE floodplains/floodways from Hassayampa River to 3.6 miles upstream.
- Wash K Tributary 1: Revised detailed Zone AE floodplains/floodways from Wash K to 0.8 miles upstream.
- Wash I: Revised detailed Zone AE floodplains/floodways from Hassayampa River to 1.2 miles upstream.
- Monarch Wash: Revised detailed Zone AE floodplains/floodways from Hassayampa River to 3.9 miles upstream.

- Wash H: Revised the approximate Zone A floodplains to detailed Zone AE floodplains with no floodways from the Hassayampa River to 1.8 miles upstream.
- Wash J: Revised the approximate Zone A floodplains to detailed Zone AE floodplains with no floodways from the Hassayampa River to 0.6 miles upstream.
- Wash M: Revised the approximate Zone A floodplains to detailed Zone AE floodplains with no floodways from the Hassayampa River to 0.6 miles upstream.
- Wash HT07: Established new detailed Zone AE floodplains with no floodways from the Hassayampa River to 1.4 miles upstream.
- Wash F: Revised the detailed Zone AE floodplains/floodways from the Hassayampa River to 1.0 miles upstream.
- Wash F Tributary 1: Revised the detailed Zone AE floodplains/floodways from Wash F to 0.4 miles upstream.
- Wash G: Revised the approximate Zone A floodplains to detailed Zone AE floodplains with no floodways from the Hassayampa River to 1.1 miles upstream.
- San Domingo Wash: Revised the detailed Zone AE floodplains/floodways from the Hassayampa River to 2.3 miles upstream.
- Ox Wash: Revised the detailed Zone AE floodplains/floodways from the Hassayampa River to 2.0 miles upstream.
- Little San Domingo Wash: Revised the detailed Zone AE floodplains/floodways from the Hassayampa River to 4.0 miles upstream and established new detailed Zone AE floodplains without floodways from 4.0 miles upstream of the Hassayampa River to 4.6 miles upstream.
- Little San Domingo Wash Tributary 1: Revised the approximate Zone A floodplains to detailed Zone AE floodplains without floodways from Little San Domingo Wash to 2.0 miles upstream.

The District's delineation study will be submitted for approval to the Federal Emergency Management Agency (FEMA), who will use the study data to update the Flood Insurance Rate Maps (FIRMs). Once the data is submitted, FEMA's approval period may be approximately one year; however, the incorporation of the new floodplain boundaries and data onto the FIRMs will take place at a later date to be determined by FEMA. In the interim, the District and other jurisdictions may use the data as the best available information for floodplain management. Changes in flood insurance rating and federal mandatory purchase requirements will not become effective until after the study is approved by FEMA and the new FIRMs become effective. The District, however, recommends that property owners financially protect their buildings and contents with flood insurance.

If you have any questions about the revised floodplain/floodway boundaries, please contact Kathryn Gross, Senior Hydrologist, at (602) 506-4837 or kag@mail.maricopa.gov, or Greg Jones, Regional Area Planning Manager, at (602) 506-5537 or glj@mail.maricopa.gov.

Wickenburg Area Drainage Master Study/Plan

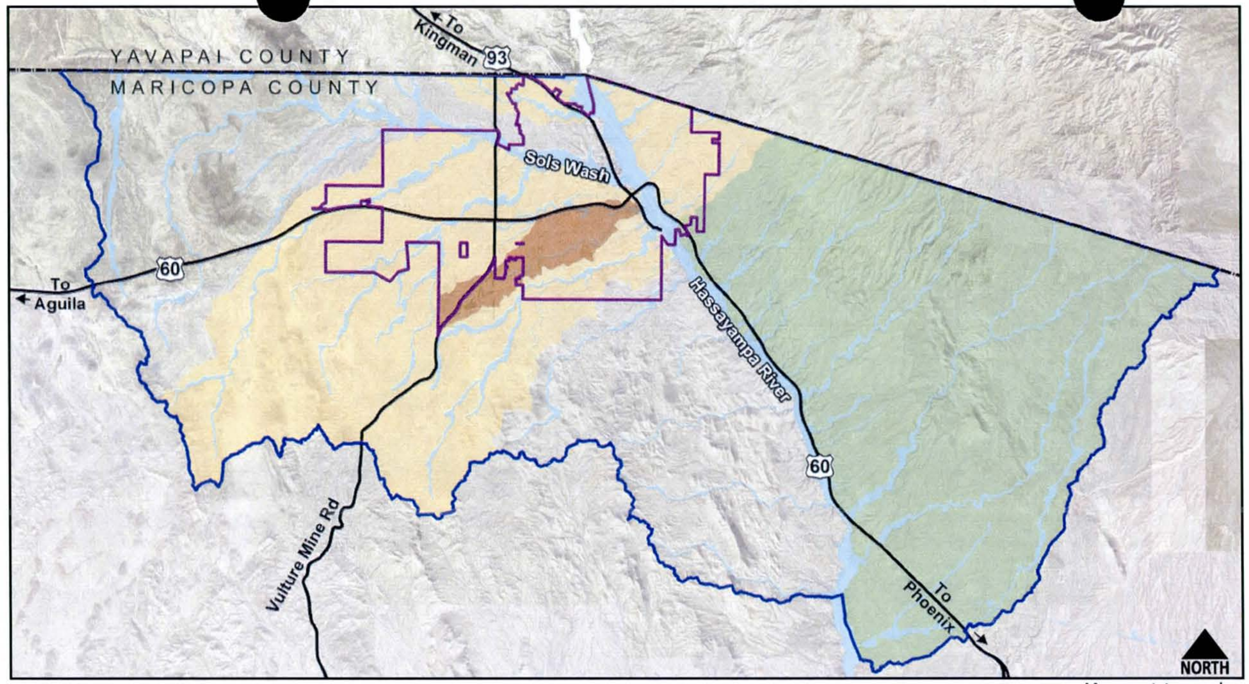
The Flood Control District of Maricopa County (District), in partnership with the Town of Wickenburg (Town), is currently working to update the original Wickenburg Area Drainage Master Study (ADMS), which was completed in 1994. This study identifies known and potential flooding and erosion hazards in the Wickenburg area. The ADMS/P is being completed in three phases as shown on the graphic and described below.

Phase 1

Phase 1, which was completed in 2011, identified the current floodplain and flood hazards for Sunset Wash and Sunnycove Wash. The results of the flood hazard study for the Phase 1 area were approved by the Federal Emergency Management Agency (FEMA) and a Letter of Map Revision (LOMR) was issued for the studied area. This LOMR, which became effective on August 24, 2012, provides the most up-to-date picture of the flood risks along Sunset Wash and Sunnycove Wash.

Phase 2

The District began Phase 2 in February 2011 and has now completed mapping the floodplain boundaries along approximately 80 linear miles of washes within the Town, as well as drainage areas in the surrounding areas that contribute to Town washes. The final results were sent to FEMA for review and approval. Once approved, they will be used to update the Flood Insurance Rate Maps. At the August 14 public open house, the District will again present the maps of the updated floodplain boundaries.



Map not to scale.

Phase 3

The District has initiated a study on approximately 30 linear miles of washes for the identification and mapping of flooding hazards in Phase 3. This phase is targeted for completion by the end of 2013. The draft study results will be presented at the August 14 public open house. The proposed changes in floodplain boundaries can ultimately affect local building and federal flood insurance requirements.

Other Areas and Future Studies

Due to funding limitations, the District is currently unable to study the entire ADMS/P, however, additional studies may be initiated by the District and/or Town in the future to complete the remaining areas. Additionally, the District and/or Town may initiate planning studies for recommended solutions to the identified flooding hazards. These studies could include structural flood control facilities such as channels and basins, or non-structural methods such as development codes, to help reduce and manage flooding in areas identified with particular flooding concerns.

You are Invited to a

Public Open House

Thursday, August 15, 2013

5:30–7:30PM

Wickenburg Community Center

160 North Valentine Street

Wickenburg, Arizona

Your Input Counts

The upcoming public open house is being held to help local residents and business owners understand the proposed changes in floodplain boundaries and the potential effect of those boundaries on specific properties and the community as a whole. Area property owners are encouraged to attend to learn more about these changes and the study, as well as to share their knowledge of flooding in the area (e.g. experiences, issues, photos). Please bring any flooding photos to the public open house where they will be scanned for use in the District's data collection efforts.

Stay up-to-date by visiting the District's website at www.fcd.maricopa.gov/ads/WickenburgADMS.htm.

Contact

Gregory L. Jones, P.E., AICP

2801 West Durango Street

Phoenix, Arizona 85009

601-506-5537

glj@mail.maricopa.gov

Flood Control District of Maricopa County

2801 West Durango Street

Phoenix, Arizona 85009

August 2013

Wickenburg Area Drainage Master Study/Plan

Open House Notification

Maricopa County Supervisor:

Clint Hickman, District 4

Town of Wickenburg:

John Cook, Mayor

www.fcd.maricopa.gov

APN	Address	City	State	Zip			
50304013	360 W LINDBERGH AVE	COOLIDGE	AZ	85128-4120			
50321003M	6501 UTE HWY	LONGMONT	CO	80503-9132			
50321003M	PO BOX 524	MORRISTOWN	AZ	85342			
50322008K	26420 W HIGHWAY 60 UNIT 89	MORRISTOWN	AZ	85342			
50326003D	PO BOX 578	MORRISTOWN	AZ	85342-0578			
50321003P	PO BOX 422	MORRISTOWN	AZ	85342-0422			
50322035, 50325011, 50326005	PO BOX 960189	FORT WORTH	TX	76161			
50324002Y, 50324002Z	843 E GEMINI PL	CHANDLER	AZ	85249-3635			
50322039	PO BOX 435	MEDORA	ND	58645-0435			
50304027C	50810 N 292ND AVE	WICKENBURG	AZ	85390-2507			
50324002Q	45355 N US 60-89	MORRISTOWN	AZ	85342			
50324003N	45531 N HIGHWAY 60 # 89	MORRISTOWN	AZ	85342-9014			
50324003N	PO BOX 3857	WICKENBURG	AZ	85358-3857			
50302012B	BOX 1194	SUNDRE AB TOM 1X0	CANADA				
50302027C, 50302004	PO BOX 994	WICKENBURG	AZ	85358-0994			
50323023	44219 SAGUARO BLOSSOM LN	MORRISTOWN	AZ	85342-9800			
50324009V	44615 N HIGHWAY 60 89	MORRISTOWN	AZ	85342			
50322008P, 50322005H	42415 N 265TH AVE	MORRISTOWN	AZ	85342			
50323020	5595 TURQUOISE AVE	ALTA LOMA	CA	91701-1822			
50304011J	51063 N MOCKINGBIRD RD	WICKENBURG	AZ	85390-1590			
50304051J	50628 N 292ND AVE	WICKENBURG	AZ	85390-2584			
50306010C	11463 ALONDRA BLVD	NORWALK	CA	90650-6301			
50306018A	US HIGHWAY 60	WICKENBURG	AZ	85390			
50306030A, 50306007B	28944 N HWY 60/89 UNIT 1	MORRISTOWN	AZ	85342-9095			
50306030A, 50306007B	PO BOX 1011	WICKENBURG	AZ	85358			
50304011T	1138 OLD COUNTY RD	BARNET	VT	05821-9412			
50307010E	P O BOX 3617	WICKENBURG	AZ	85358-3617			
50307010E	139 N FRONTIER ST	WICKENBURG	AZ	85390			
50307006A	36 W SAN JUAN	PHOENIX	AZ	85013			
50307006A	PO BOX 3617	WICKENBURG	AZ	85358			
50302001C	30102 HWY 60/89	WICKENBURG	AZ	85390-3374			
50304051G	12 S TEGNER	WICKENBURG	AZ	85390-2317			
50324002M	45563 GRAND AVE	MORRISTOWN	AZ	85342-9094			
50305003H	400 N JEFFERSON ST APT 24	WICKENBURG	AZ	85390-3216			
50305003H	PO BOX 1617	WICKENBURG	AZ	85358			
50322043C	148 N 48TH ST	PHOENIX	AZ	85034-1900			
50305003L	49601 N HWY 60-89 (GRAND AVE)	MORRISTOWN	AZ	85342			
50306023M	PO BOX 3317	WICKENBURG	AZ	85358-3317			
50306005	PO BOX 1796-85358	WICKENBURG	AZ	85358			
50306014	PO BOX 1796-85358	WICKENBURG	AZ	85358			
50306014, 50306005	PO BOX 515	WICKENBURG	AZ	85358			
50324002U	5080 N 40TH ST STE 455	PHOENIX	AZ	85018-2150			
50304009, 50304005K	PO BOX 939	PARK CITY	UT	84060-0939			
50306025	PO BOX 1796	WICKENBURG	AZ	85358-1796			

50304078F	51907 N 297TH AVE	WICKENBURG	AZ	85390			
50304062B	51417 N 295TH AVE	WICKENBURG	AZ	85390-2500			
50304065B	PO BOX 2924	WICKENBURG	AZ	85358-2924			
50324003S	PO BOX 2255	WICKENBURG	AZ	85358-2255			
50307014A	PO BOX 9	BEAVER	PA	15009			
50307001	PO BOX 836	MAYER	AZ	86333-0836			
50304016H	51033 N MOCKINGBIRD RD	WICKENBURG	AZ	85390-1590			
50304016F	51027 N MOCKINGBIRD RD	WICKENBURG	AZ	85390-1590			
50304016G	51027 N MOCKINGBIRD RD	WICKENBURG	AZ	85390-1590			
50324002G	PO BOX 273	MORRISTOWN	AZ	85342			
50324002G	45405 N GRAND AVE	MORRISTOWN	AZ	85342			
50304021A	80537 US HIGHWAY 60	WICKENBURG	AZ	85390			
50305003B	49932 N HIGHWAY 60-89	WICKENBURG	AZ	85390-2532			
50326012, 50326011D	42210 N US HWY 60	MORRISTOWN	AZ	85342			
50321003V	9211 N MARTINGALE RD	PARADISE VALLEY	AZ	85253			
50306023D, 50306028B	PO BOX 1928	WICKENBURG	AZ	85358-1928			
50306023D, 50306028B	48425 N HIGHWAY 60	MORRISTOWN	AZ	85342			
50325001Q	PO BOX 20958	WICKENBURG	AZ	85358-5958			
50304030	51825 N 293RD AVE	WICKENBURG	AZ	85390-2501			
50304030	P O BOX 588	WICKENBURG	AZ	85358			
50323002A, 50324011	164 S GERONIMO RD	APACHE JUNCTION	AZ	85119			
50324001B	PO BOX 2240	WICKENBURG	AZ	85358-2240			
50304011P	590 BASS RD	WICKENBURG	AZ	85390-1503			
50324025	PO BOX 9	MORRISTOWN	AZ	85342-0009			
50325001L	PO BOX 105	MORRISTOWN	AZ	85342-0105			
50325001L	26223 DEL ORO RD	APPLE VALLEY	CA	92308			
50304072	16716 187TH AVE NE	WOODINVILLE	WA	98072-9187			
50302028A	1515 E MISSOURI AVE STE 110	PHOENIX	AZ	85014-2443			
50306021B	PO BOX 2407	WICKENBURG	AZ	85358-2407			
50324027	45257 N US HWY 60	MORRISTOWN	AZ	85342-9063			
50306012	29005 N HIGHWAY 60 89	MORRISTOWN	AZ	85342-9895			
50324039C	45529 NORTH HWY 60	MORRISTOWN	AZ	85342			
50324009G, 50324018	13155 NOEL RD STE 100	DALLAS	TX	75240-5050			
50306027Q, 50306027A, 50306027C, 50306009, 50306022B, 50306027N, 50306027B	1104 S VALLEY HILL RD	WOODSTOCK	IL	60098-7853			
50306017B	1104 S VALLEY HILL RD	WOODSTOCK	IL	60098-7853			
50306027P	1104 S VALLEY HILL RD	WOODSTOCK	IL	60098-7853			
50307003E	5412 W 52ND ST	FAIRVIEW	PA	16415-2332			
50304012G	PO BOX 651	PARKER	AZ	85344-0651			
50306032A	PO BOX 608	WICKENBURG	AZ	85358-0608			
50322005A	PO BOX 597	MORRISTOWN	AZ	85342-0597			
50322045	23760 DECORAH RD	DIAMOND BAR	CA	91765-1301			
50304001D	50843 HIGHWAY 60	WICKENBURG	AZ	85390			
50322032E	P O BOX 274	MORRISTOWN	AZ	85342-0274			
50322032E	26456 NW GRAND AVE	MORRISTOWN	AZ	85342			

50324043	3265 CHAMBOURNE ST	COMMERCE TWP	MI	48382-4609			
50304018A	260 NEWPORT CENTER DR	NEWPORT BEACH	CA	92660			
50324028	PO BOX 148	MORRISTOWN	AZ	85342-0148			
50324026	1842 GLISTENING SANDS DR	LAS VEGAS	NV	89119-0418			
50304011S	51444 N 323 RD PL	WICKENBURG	AZ	85390			
50304018B, 50304018D, 50304018C	2100 W TERRACE DR	WICKENBURG	AZ	85390-3220			
50304017H	53377 N MOCKINGBIRD RD	WICKENBURG	AZ	85390-1550			
50324003X	45625 N SAN DOMINGO PEAK TRL	MORRISTOWN	AZ	85342-9801			
50324029	PO BOX 545	MORRISTOWN	AZ	85342-0545			
50324048	22323 GREEN PINES RD	PARK RAPIDS	MN	56470-6307			
50324033B	PO BOX 680	WICKENBURG	AZ	85358-0680			
50323026	830 N TEGNER ST	WICKENBURG	AZ	85390-1466			
50304051K	50619 N 292ND AVE	WICKENBURG	AZ	85390-3548			
50304017F, 50304017C,	51061 ROADRUNNER FT	WICKENBURG	AZ	85390-1551			
50304017J	51061 ROAD RUNNER FLAT	WICKENBURG	AZ	85390-1551			
50325003A	7255 BAYMEADOWS WY	JACKSONVILLE	FL	32256-6851			
50304031	125 GOOSE BAY VIEW TR	CHESTER	CA	96020-9737			
50304063	51658 N 293RD AVE	WICKENBURG	AZ	85390-2544			
50304017D, 50304017A	51035 ROAD RUNNER FLAT	WICKENBURG	AZ	85390-1551			
50304007B	510 N TEGNER ST 3	WICKENBURG	AZ	85390-3421			
50307002, 50307011B	3575 RUNNING DEER RD	HELENA	MT	59602-6468			
50323021	2199 APPLEGATE RD	ATWATER	CA	95301-9768			
50307011R	1281 W CHILTON AVE	GILBERT	AZ	85233-4625			
50323024	PO BOX 804	BETHEL	AK	99559-0804			
50304085A	51202 MOCKINGBIRD RD	WICKENBURG	AZ	85390-2563			
50305003J	PO BOX 3200	WICKENBURG	AZ	85358-3200			
50305003J	49637 N US HWY 60/89	WICKENBURG	AZ	85390			
50305003G	49435 US HWY 60/89	WICKENBURG	AZ	85390-2533			
50323013E	PO BOX 400	MORRISTOWN	AZ	85342-0400			
50307010B	19042 E PHOENIX HWY	MORRISTOWN	AZ	85342			
50304088A, 50304089A, 50304089B	31 E CALLE TIERRA SANDIA	SAHUARITA	AZ	85629-9038			
50304062C	PO BOX 651	PARKER	AZ	85344-0651			
50306035C, 50307009A	5318 E ARCADIA LN	PHOENIX	AZ	85018-3005			
50304016B	PO BOX 1473	WICKENBURG	AZ	85358-1473			
50323025	44407 SAGUARO BLOSSOM LN	MORRISTOWN	AZ	85342-9884			
50324009U	PO BOX 20957	WICKENBURG	AZ	85358-5957			
50324003Q	10710 E SAN SALVADOR DR	SCOTTSDALE	AZ	85258-6137			
50304054	3108 90TH AVE	LOME ROCK	IA	50559-8558			
50304015B	51021 US HWY 60-89 LOT 17	WICKENBURG	AZ	85390-2543			
50304014A	50811 HWY 60	WICKENBURG	AZ	85390			
50304011L	PO BOX 1313	WICKENBURG	AZ	85358-1313			
50324040A	45535 N HIGHWAY 60	MORRISTOWN	AZ	85342-9014			
50304012V	275 SENEXET RD	WOODSTOCK	CT	06281-2331			
50304025	PO BOX 218	THOMPSON	CT	06277-0218			
50306010E	PO BOX 618	WICKENBURG	AZ	85358-0618			

50323022	1687 TERRY ROBIN RD	PAGOSA SPRINGS	CO	81147				
50304008T	50905 N 294TH AVE	WICKENBURG	AZ	85390-1501				
50304015A	35725 S CALICO CIR	WICKENBURG	AZ	85390-3542				
50307010D	380 N SEVIER HWY	SEVIER	UT	84766-6039				
50304012N, 50304068A	PO BOX 365	LOVELAND	CO	80539-0365				
50304001F	1226 N 66TH ST	SCOTTSDALE	AZ	85257				
50304046P, 50304046M, 50304046L	PO BOX 731	WICKENBURG	AZ	85258				
50304046P, 50304046M, 50304046L	51425 N 297TH AVE	WICKENBURG	AZ	85390				
50304011M	1140 OLD COUNTY RD	BARNET	VT	05821-9412				
50305006A, 50305010B	PO BOX 3617	WICKENBURG	AZ	85358-3617				
50324003H	PO BOX 183	DUNCANS MILLS	CA	95430-0183				
50305008B, 50305015H, 50307009C, 50305012D, 50324016, 50306037C, 50324010D, 50324015C	1510 E FT LOWELL RD	TUCSON	AZ	85719-2313				
50302017M	10911 THANLET LN	RESTON	VA	20190-3922				
50324042	45521 NORTH SAN DOMINGO TRAIL	MORRISTOWN	AZ	85342-9880				
50307011Z	PO BOX 166	CAVE CREEK	AZ	85331-0166				
50304048	7944 W SWEETWATER	PEORIA	AZ	85381-4012				
50304058B	51035 N 297TH AVE	WICKENBURG	AZ	85390-1587				
50304065A	PO BOX 33248	PHOENIX	AZ	85067-3248				
50321026	P O BOX 594	BAGDAD	AZ	86321-0594				
50306023P	PO BOX 1701	WICKENBURG	AZ	85358-1701				
50323011D	12400 GOOCH HILL RD	GALLATIN GATEWAY	MT	59730				
50305003K	49309 US HWY 60 /89	MORRISTOWN	AZ	85342-9703				
50304019	51630 N 329TH AVE	WICKENBURG	AZ	85390-1192				
50320015C, 50320015E, 50320016Q	42400 N CASTLE HOT SPRINGS RD	MORRISTOWN	AZ	85342-9104				
50324002B, 50324002P	1180 E LAKE MEAD PKWY UNIT 2314A	HENDERSON	NV	89015-5561				
50305022	1515 E MISSOURI AVE STE 110	PHOENIX	AZ	85014-2443				
50324009G, 50324018, 50324009F, 50324019	PO BOX 52427	ATLANTA	GA	30355				
50324009F	13155 NOEL RD STE 100	DALLAS	TX	75240-5050				
50324019	13155 NOEL RD STE 100	DALLAS	TX	75240				
50304050C	5356 E HILLERY DR	SCOTTSDALE	AZ	85254-2336				
50304011Q	31 E CALLE TIERRA SANDIA	SAHUARITA	AZ	85629-9038				
50304011R	31 E CALLE TIERRA SANDIA	SAHUARITA	AZ	85629-9038				
50304087	51213 N 298TH LN	WICKENBURG	AZ	85390-1549				
50325003A	27530 W MCCAROLL RD	WICKENBURG	AZ	85390				
50306007A	14832 N 72ND DR	PEORIA	AZ	85381-4448				
50326003L	PO BOX 114	MORRISTOWN	AZ	85342-0114				
50304062A	51413 N 295TH AVE	WICKENBURG	AZ	85390-2500				
50304011E	PO BOX 2621	CHINO VALLEY	AZ	86323-2621				
50304011E	P O BOX 64	WICKENBURG	AZ	85358				
50304077G	236 S THIRD ST #335	MONTROSE	CO	81401-3618				
50304005N, 50302005	802 W EL CAMINITO DR	PHOENIX	AZ	85021-5538				
50322032G	HC 80 BOX 738	RICHFIELD	UT	84701-9547				

50322032G	PO BOX 593	YARNELL	AZ	85362			
50321003N	PO BOX 422	MORRISTOWN	AZ	85342-0422			
50302016A	PO BOX 1117	WICKENBURG	AZ	85358-1117			
50302027D	BOX 1117	WICKENBURG	AZ	85358-1117			
50302012J	15983 W SAHNGRI LA RD	SURPRISE	AZ	85379-4804			
50304011S	PO BOX 1313	WICKENBURG	AZ	85358-1313			
50304011H	PO BOX 1313	WICKENBURG	AZ	85358-1313			
50323011B	634 OAK GROVE DR	GLENDORA	CA	91741-2258			
50322028A, 50322028B, 50322028C	PO BOX 98	MORRISTOWN	AZ	85342-0098			
50324049	4211 LA SALLE AVE	CULVER CITY	CA	90232-3211			
50323010E	PO BOX 1286	WICKENBURG	AZ	85358-1286			
50307021K	11 W RIDGECREST RD	PHOENIX	AZ	85086-6520			
50304047	22701 BUNKER HILL RD	HARVARD	IL	60033-9738			
50321001G	37617 N HIGHWAY 60 89	MORRISTOWN	AZ	85342-9011			
50304085B	PO BOX 905	CONGRESS	AZ	85332-0905			
50304016D	1420 N 40 ROAD	WICKENBURG	AZ	85390-1621			
50304027A	50817 N 292ND AVE	WICKENBURG	AZ	85390-2568			
50324041A	PO BOX 13516	TRAPPER CREEK	AK	99683-0516			
50326013, 50322031	42002 NW GRAND AVE	MORRISTOWN	AZ	85342-9868			
50304003B	PO BOX 3109	WICKENBURG	AZ	85358-3109			
50304003B	DRAWER I	WICKENBURG	AZ	85358			
50325001H, 50325001P	PO BOX 280	MORRISTOWN	AZ	85342-0280			
50305004	1245 NORTH SHORE DR	ROSWELL	GA	30076			
50302017L, 50324002X	51212 N HWY 60-89	WICKENBURG	AZ	85390-1597			
50322017B	PO BOX 576	MORRISTOWN	AZ	85342-0576			
50322008L	3450 N 3RD ST	PHOENIX	AZ	85012-2331			
50304003A	1010 ANGLER LN	GRANTS PASS	OR	97527-6273			
50304001B	50843 HWY 60	WICKENBURG	AZ	85390			
50320014	205 S 17TH AVE RM 370	PHOENIX	AZ	85007-3212			
50321003Y, 50321011, 50321018, 50321021,	PO BOX 129	BOULDER	WY	82923-0129			
50304029A	51829 N 295TH AVE	WICKENBURG	AZ	85390-2502			
50302017K	51802 HWY 60	WICKENBURG	AZ	85390			
50326003K	PO BOX 84	MORRISTOWN	AZ	85342			
50326003K	27308 W GATES RD	MORRISTOWN	AZ	85342			
50304077E	52023 N 295TH AVE	WICKENBURG	AZ	85390-2541			
50322018, 50322017A	8206 N 16TH ST	PHOENIX	AZ	85020-3903			
50322040A, 50322040B	PO BOX 600	MORRISTOWN	AZ	85342-0600			
50322004	PO BOX 400	MORRISTOWN	AZ	85342-0400			
50324003E	16626 N 153RD DR	SURPRISE	AZ	85374-7411			
50324003R	45525 N US HIGHWAY 60 SAN DOMI T	MORRISTOWN	AZ	85342			
50321001H	43308 N CASTLE HOT SPRINGS RD	MORRISTOWN	AZ	85342-9623			
50304055A	51123 N 297TH AVE	WICKENBURG	AZ	85390-2579			
50306015, 50306028C, 50306016	3471 N US HIGHWAY 89	CHINO VALLEY	AZ	86323-5105			
50326015	ONE NORTH CENTRAL AVE STE 800	PHOENIX	AZ	85004			
50304046C	51450 N 295TH AVE	WICKENBURG	AZ	85390-2566			

50322020Q	PO BOX 87	MORRISTOWN	AZ	85342-0087			
50304001B	1661 WORTHINGTON RD STE 100	WEST PALM BEACH	FL	33415			
50323018A	43821 N SAGUARO BLOSSOM LN	MORRISTOWN	AZ	85342-9070			
50320015D	42400 N CASTLE HOT SPRINGS RD	MORRISTOWN	AZ	85252-9104			
50304005P, 50304001E, 50304005Q, 50304058C	PO BOX 821	WICKENBURG	AZ	85358-0821			
50304007R	1413B PARSONS CT	CAMPBELL	CA	95008-6731			
50322011A, 50322020P, 50322020Y	PO BOX 273	MORRISTOWN	AZ	85342-0273			
50304050D	51221 N 296TH AVE	WICKENBURG	AZ	85390-1580			
50304086	51312 N MOCKINGBIRD TRL	WICKENBURG	AZ	85390-2573			
50302006G	450 S 15TH AVE	PHOENIX	AZ	85007-3327			
50306017C	1104 S VALLEY HILL RD	WOODSTOCK	IL	60098-7853			
50320016N	PO BOX 352	MORRISTOWN	AZ	85342-0352			
50302001B, 50301013	PO BOX 988	WICKENBURG	AZ	85358-0988			
50322005G	42418 N 265TH DR	MORRISTOWN	AZ	85342			
50302029D	13727 ROCKY POINT DR	HERRIMAN	UT	84096-1719			

AFFIDAVIT OF PUBLICATION

THE ARIZONA REPUBLIC

STATE OF ARIZONA
COUNTY OF MARICOPA } SS.

OPEN HOUSE NOTIFICATION

Wickenburg Area Drainage Master Study/Plan

Thursday, August 15, 2013
5:30 – 7:30 p.m.
Wickenburg Community Center
160 North Valentine Street

Residents of Wickenburg and the surrounding communities are invited to a public open house being held e Flood Control District of Maricopa County (District) and the Town of Wickenburg (Town).

At the open house, community members will learn about the results of phase three of the Wickenburg Area Drainage Master Study/Plan (ADMS/P), which includes approximately 30 linear miles of washes in the Wickenburg area. Project team members will be present to help local residents and business owners understand the proposed changes in floodplain boundaries and the potential effect of those boundaries on specific properties and the community as a whole. The proposed changes in floodplain boundaries can ultimately affect local building and federal flood insurance requirements.

Additionally, the results of phase two of the ADMS/P will be displayed at the open house. Phase two results were presented at a public meeting in August 2012 and have since been sent to the Federal Emergency Management Agency (FEMA) for review and approval. Once approved, they will be used to update the Flood Insurance Rate Maps.

For more information on the study, visit www.fcd.maricopa.gov/ads/WickenburgADMS.htm or call Gregory Jones at 602-506-5537.

Requests for a sign language interpreter, listening devices and alternative format materials require at least 72 hours of notice and can be made to 602-506-7841.
Para mas informacion sobre este proyecto, favor de llamar al 602-506-1501.

g first duly sworn, upon oath deposes
a legal advertising representative of
s Gazette, a newspaper of general
unty of Maricopa, State of Arizona,
, Arizona, by Phoenix Newspapers
ishes The Arizona Republic, and that
ed is a true copy of the advertisement
aper on the dates as indicated.

he Arizona Republic
Zones 1/20

Sworn to before me this
9st day of
August A.D. 2013

MANUEL VARGAS
Notary Public - State of Arizona
MARICOPA COUNTY
My Commission Expires
November 30, 2015

Notary Public

AFFIDAVIT OF PUBLICATION

THE ARIZONA REPUBLIC

STATE OF ARIZONA
COUNTY OF MARICOPA } SS.

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

The Arizona Republic
Zones 1/20

August 7, 2013

Flood Control District of Maricopa County

OPEN HOUS
NOTIFICATIO

Wickenburg Area Drainage Mast

Thursday, August 15, 2013
5:30 – 7:30 p.m.
Wickenburg Community Cen
160 North Valentine Street

Residents of Wickenburg and the surrounding communities are invited t
by the Flood Control District of Maricopa County (District) and the Town

At the open house, community members will learn about the results o
Area Drainage Master Study/Plan (ADMS/P), which includes approxima
the Wickenburg area. Project team members will be present to help loc
understand the proposed changes in floodplain boundaries and the pot
on specific properties and the community as a whole. The proposed cha
ultimately affect local building and federal flood insurance requirements

Additionally, the results of phase two of the ADMS/P will be displayed at t
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Management Agency (FEMA) for review and approval. Once approved,
Flood Insurance Rate Maps.

For more information on the study, visit www.fcd.maricopa.gov/ads/Wick
Jones at 602-506-5537.

Requests for a sign language interpreter, listening devices and alternative
72 hours of notice and can be made to 602-506-7841.
Para mas informacion sobre este proyecto, favor de llamar al 602-506-

Sworn to before me this
9st day of
August A.D. 2013

MANUEL VARGAS
Notary Public - State of Arizona
MARICOPA COUNTY
My Commission Expires
November 30, 2015

Notary Public

080713

Arrowhead Media
Peoria Independent
Peoria, AZ

OPEN HOUSE NOTIFICATION

Wickenburg Area Drainage Master Study/Plan

Thursday, August 15, 2013
5:30 – 7:30 p.m.
Wickenburg Community Center
160 North Valentine Street

Residents of Wickenburg and the surrounding communities are invited to a public open house being held by the Flood Control District of Maricopa County (District) and the Town of Wickenburg (Town).

At the open house, community members will learn about the results of phase three of the Wickenburg Area Drainage Master Study/Plan (ADMS/P), which includes approximately 30 linear miles of washes in the Wickenburg area. Project team members will be present to help local residents and business owners understand the proposed changes in floodplain boundaries and the potential effect of those boundaries on specific properties and the community as a whole. The proposed changes in floodplain boundaries can ultimately affect local building and federal flood insurance requirements.

Additionally, the results of phase two of the ADMS/P will be displayed at the open house. Phase two results were presented at a public meeting in August 2012 and have since been sent to the Federal Emergency Management Agency (FEMA) for review and approval. Once approved, they will be used to update the Flood Insurance Rate Maps.

For more information on the study, visit www.fcd.maricopa.gov/ads/WickenburgADMS.htm or call Gregory Jones at 602-506-5537.

Requests for a sign language interpreter, listening devices and alternative format materials require at least 72 hours of notice and can be made to 602-506-7841.

Para mas informacion sobre este proyecto, favor de llamar al 602-506-1501.

08 1413

Arrowhead Media
Surprise Republic
Phoenix, AZ

BRIEFS

Flood district meeting Thursday

Residents of Wickenburg and the surrounding communities can attend an open house hosted by the Flood Control District of Maricopa County and the Town of Wickenburg from 5:30 to 7:30 p.m. Thursday at the Wickenburg Community Center, 160 N. Valentine St.

Officials will share results of Phase 3 of the Wickenburg Area Drainage Master Study/Plan, which includes about 30 linear miles of washes in the Wickenburg area. Project team members will be available to explain proposed changes in floodplain boundaries and the potential impact on specific properties and the community. The proposed changes in floodplain boundaries ultimately can affect local building and federal flood insurance requirements.

The current plan is an update to the original study completed in 1994. Since then, growth, development and other factors have altered previous drainage characteristics and patterns in some areas, which could cause new flooding hazards. Alternately, areas where flooding hazards previously existed may no longer be areas of concern.

Details: www.fcd.maricopa.gov/ads/WickenburgADMS.htm or call Gregory Jones at 602-506-5537.

081413

Arrowhead Media
Wickenburg Sun
Cir: 4,086
Wickenburg, AZ

Floodplain open house this week

Residents of Wickenburg and the surrounding communities are invited to an open house hosted by the Flood Control District of Maricopa County and the Town of Wickenburg from 5:30 to 7:30 p.m. this Thursday (Aug. 15) at the Wickenburg Community Center.

Community members will learn about the results of Phase 3 of the Wickenburg Area Drainage Master Study/Plan (ADMS/P), which includes approximately 30 linear miles of washes in the Wickenburg area.

Project team members will be present to help local residents and business owners understand the proposed changes in floodplain boundaries and the potential effect of those boundaries on specific properties and the community as a whole.

The proposed changes in floodplain boundaries can ultimately affect local building and federal flood insurance requirements.

The current ADMS/P is an update to the original study completed in 1994. Since then, growth, development and other factors have altered previous drainage characteristics and patterns in some areas, which could cause new flooding hazards to arise where none existed before.

Alternately, areas where flooding hazards previously existed may no longer be areas of concern.

The results of Phase 2 of the ADMS/P will also be displayed at the open house. Phase 2 results were presented at a public meeting in August 2012 and have since been sent to the Federal Emergency Management Agency (FEMA) for review and approval. Once approved, they will be used to update the Flood Insurance Rate Maps.

For more information on the study, visit www.fcd.maricopa.gov/ads/WickenburgADMS.htm or call Gregory Jones at (602) 506-5537.

Tuesday, July 30, 2013
Sun City, Arizona
THE DAILY NEWS-SUN
Page: A4

COUNTY

Wickenburg meeting focuses on area floodplain

STAFF REPORT

Residents of Wickenburg and surrounding communities are invited to a public open house being conducted by the Flood Control District of Maricopa County and the town of Wickenburg from 5:30-7:30 p.m. Aug. 15.

The session will be at the Wickenburg Community Center, 160 N. Valentine St.

At the open house, community members will learn about the results of phase three of the Wickenburg Area Drainage Master Study/Plan, which includes approximately 30 linear miles of washes in the Wickenburg area.

Project team members will be present to help local residents and business owners understand the proposed changes in floodplain boundaries and the potential effect of those boundaries on specific properties and the community as a whole.

The proposed changes in floodplain boundaries can ultimately affect local building and federal flood insurance requirements, flood control district officials said.

The current ADMS/P is an update to the original study completed in 1994. Since then, growth, development and other factors have altered previous drainage characteristics and patterns in some areas, which could cause new flooding hazards to arise where none existed before, officials stated in a release. Alternately, areas where flooding hazards previously existed may no longer be areas of concern.

The results of phase two of the ADMS/P will also be displayed at the open house. Phase two results were presented at a public meeting in August 2012 and have since been sent to the Federal Emergency Management Agency for review and approval. Once approved, they will be used to update the Flood Insurance Rate Maps.

For more information on the study, visit www.fcd.maricopa.gov/ads/WickenburgADMS.htm or call Gregory Jones at 602-506-5537.

080713
Arrowhead Media
Wickenburg Sun
Cir: 4,086
Wickenburg, AZ

FOR YOUR INFORMATION
Maricopa County Flood Control Update

Residents of Wickenburg and surrounding communities are invited to a public open house being conducted by the Flood Control District of Maricopa County and the town of Wickenburg from 5:30-7:30 p.m. Aug. 15.

The session will be at the Wickenburg Community Center, 160 N. Valentine St.

At the open house, community members will learn about the results of phase three of the Wickenburg Area Drainage Master Study/Plan, which includes approximately 30 linear miles of washes in the Wickenburg area.

Project team members will be present to help local residents and business owners understand the proposed changes in floodplain boundaries and the potential effect of those boundaries on specific properties and the community as a whole.

The proposed changes in floodplain boundaries can ultimately affect local building and federal flood insurance requirements, flood control district officials said.

The current ADMS/P is an update to the original study completed in 1994. Since then, growth, development and other factors have altered previous drainage characteristics and patterns in some areas, which could cause new flooding hazards to arise where none existed before, officials stated in a release. Alternately, areas where flooding hazards previously existed may no longer be areas of concern.

The results of phase two of the ADMS/P will also be displayed at the open house. Phase two results were presented at a public meeting in August 2012 and have since been sent to the Federal Emergency Management Agency for review and approval. Once approved, they will be used to update the Flood Insurance Rate Maps.

For more information on the study, visit www.fcd.maricopa.gov/ads/WickenburgADMS.htm or call Gregory Jones at 602-506-5537.

B.7 FEMA CORRESPONDENCE

National Flood Insurance Program

FEMA Production and Technical Services Contractor

October 15, 2014

The Honorable Denny Barney
Chairman, Maricopa County Board of Commissioners
301 West Jefferson, 10th Floor
Phoenix, AZ 85003

IN REPLY REFER TO:
Case No.: 14-09-2457P
Community: Maricopa County, AZ
Community No.: 040037

316-PMR

Dear Mr. Barney:

This is in reference to a request for a revision to the effective Flood Insurance Rate Map (FIRM) and Flood Insurance Study (FIS) report for your community. Information pertinent to this revision request is listed below.

Requester:	Ms. Kathryn Gross, CFM
Flooding Sources:	Little San Domingo Wash, Little San Domingo Wash Tributary 1, Mockingbird Wash, Mockingbird Wash Tributary, Monarch Wash, Ox Wash, San Domingo Wash, Wash F, Wash F Tributary 1, Wash G, Wash H, Wash HT07, Wash I, Wash J, Wash K, Wash K-1, Wash L, Wash M, Wash O, Wash S2
FIRM Panels Affected:	04013C0329L, 0335L, 0340L, 0345L, 0365L, 0735L, and 0755L

We have completed our review of the submitted data and determined that the FIRM and FIS report should be revised as a Physical Map Revision (PMR). As a result of this PMR, the flood hazard information along Little San Domingo Wash will be revised from approximately 90 feet upstream of Gates Road to approximately 8,440 upstream of State Highway 74; Little San Domingo Wash Tributary 1 will be revised from the confluence with Little San Domingo Wash to approximately 5,050 feet upstream of State Highway 60; Mockingbird Wash will be revised from approximately 490 feet downstream of East Center to approximately 3,340 feet upstream of Red Hill Road; Mockingbird Wash Tributary will be revised from the confluence with Mockingbird Wash to approximately 2,140 feet upstream; Monarch Wash will be revised from approximately 90 feet upstream of Northwest Grand Avenue to approximately 18,430 feet upstream of West San Domingo Peak Trail; Ox Wash will be revised from approximately 810 feet downstream of Burlington Northern Santa Fe Railway to approximately 7,150 feet upstream of Northwest Grand Avenue; San Domingo Wash will be revised from approximately 130 feet downstream of North West Grand Avenue to approximately 12,280 feet upstream; Wash F will be revised from approximately 120 feet downstream of Northwest Grand Avenue to approximately 2,220 feet upstream of North San Domingo Peak Trail; Wash F Tributary 1 will be revised from the confluence with Wash F to approximately 2,150 feet upstream; Wash G will be revised from approximately 460 feet downstream of Northwest Grand Avenue to approximately 5,680 feet upstream; Wash H will be revised from approximately 700 feet downstream of Northwest Grand Avenue to approximately 9,430 feet upstream; Wash HT07 will be revised from approximately 70 feet downstream of Northwest Grand Avenue to approximately 7,530 feet upstream; Wash I will be revised from approximately 80 feet downstream of Northwest Grand Avenue to approximately 6,480 feet upstream; Wash J will be revised from approximately 80 feet downstream of Northwest Grand Avenue to approximately 2,910 feet upstream; Wash K will be revised from approximately 360 feet downstream of Northwest Grand Avenue to approximately 7,230 feet upstream of 297th Avenue; Wash K-1 will be revised from the confluence with Wash K to approximately feet 4,360 upstream; Wash L will be revised from approximately 1,640 feet downstream of East Center to approximately 3,870 feet upstream of Echo Hill Road; Wash M will be revised from approximately 1,320 feet downstream of East Center to approximately 2,960 feet upstream; Wash O will be revised from approximately 790 feet downstream of East Center to approximately 7,070 feet upstream; and Wash S2 will be revised from the confluence with Little San Domingo Wash to approximately 2,710 feet upstream.

Due to funding constraints FEMA is not able to initiate the PMR at this time. As soon as FEMA Region 9 has programmed funds to process the PMR as part of the revised FIRM and FIS report for Maricopa County, Arizona and Incorporated Areas, preliminary copies of the FIRM panels and FIS report will be distributed for review to determine if any additional changes are warranted.

In order to provide your community with the most up-to-date information possible, we request that your community review the affected FIRM panels and revised FIS report to determine if any additional changes are warranted. Examples of possible changes include updates to corporate limits and new streets. To assist us in processing the revised FIRM and FIS report in a timely manner, we request that your community submit the changes within 30 days of the date of this letter. Please submit any requested changes, along with supporting documentation (e.g. annotated copies of FIRM panels, corporate limits map, topographic mapping), to us at the address shown at the bottom of the first page.

Any changes to the affected FIRM panel or FIS report for your community that are received during this 30-day period will be reviewed and incorporated, as appropriate, before we initiate the revision and republication process. We will send preliminary copies of the revised FIRM and FIS report to your community for review. At that time, your community will have an additional 30 days to provide information to support other changes to the affected portions of the FIS report and map. We will review all information submitted during that 30-day period and incorporate it, as appropriate, before the FIS report and map are republished and distributed.

Your submittal of requested changes during the initial 30-day period will facilitate the revision and republication process. While it may be possible to incorporate requested changes later, it will probably cause significant delays in the revision and republication process. Therefore, if the data to support additional changes are not immediately available, or if additional time is needed, please inform us immediately.

If you have general questions about this case, the review and revision process, FEMA policy, or the National Flood Insurance Program, please call the FEMA Map Information eXchange (FMIX), toll free, at 1-877-FEMA MAP (1-877-336-2627). If you have specific questions concerning this case, please call the Revisions Coordinator for this request, Mr. Joseph Kuechenmeister, P.E., CFM, at jkuechenmeister@mbakercorp.com or at (720) 479-3181.

Sincerely,

Syed Qayum

Syed Qayum, CFM
LOMR Technical Manager
BakerAECOM

cc: Ms. Kelli Sertich, AICP, CFM
FMS Division Manger
Flood Control District of Maricopa County

Mr. Tim Murphy, P.E.
Manager, Mitigation Planning and Technical Programs
Floodplain Management and Services Division
Flood Control District of Maricopa County

Ms. Kathryn Gross, CFM
Senior Hydrologist
Flood Control District of Maricopa County

Mr. Kevin Lavalle
GIS Analyst
Flood Control District of Maricopa County

Mr. Brian Cosson, CFM
NFIP State Manager
Arizona Department of Water Resources

Mr. Paul W.R. Hoskin, P.E.
Principal
Hoskin-Ryan Consultants, Inc.

NATIONAL FLOOD INSURANCE PROGRAM

FEMA PRODUCTION AND TECHNICAL SERVICES CONTRACTOR

May 14, 2014

Ms. Kathryn Gross, CFM
Senior Hydrologist
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, AZ 85009

IN REPLY REFER TO:
Case No.: 14-09-2457P
Community: Maricopa County, AZ
Community No.: 040037

316-AD

Dear Mr. Gross:

This responds to your request dated April 3, 2014, that the Department of Homeland Security's Federal Emergency Management Agency (FEMA) issue a revision to the Flood Insurance Rate Map (FIRM) for Maricopa County, Arizona and Incorporated Areas. Pertinent information about the request is listed below.

Identifier:	Wickenburg Area Drainage Master Study/Planning Phase III
Flooding Sources:	Little San Domingo Wash, Little San Domingo Wash Tributary 1, Mockingbird Wash, Mockingbird Wash Tributary, Monarch Wash, Ox Wash, San Domingo Wash, Wash F, Wash F Tributary 1, Wash G, Wash H, Wash HT07, Wash I, Wash J, Wash K, Wash K-1, Wash L, Wash M, Wash O, Wash S2,
FIRM Panel(s) Affected:	04013C0329L, 0335L, 0340L, 0345L, 0365L, 0735L, 0755L

The data required to complete our review, which must be submitted within 90 days of the date of this letter, are listed on the enclosed summary.

If we do not receive the required data within 90 days, we will suspend our processing of your request. Any data submitted after 90 days will be treated as an original submittal and will be subject to all submittal/payment procedures, including the flat review and processing fee for requests of this type established by the current fee schedule. A copy of the notice summarizing the current fee schedule, which was published in the *Federal Register,* is available on the FEMA website at http://www.fema.gov/plan/prevent/fhm/frm_fees.shtm for your information.

FEMA receives a very large volume of requests and cannot maintain inactive requests for an indefinite period of time. Therefore, we are unable to grant extensions for the submission of required data/fees for revision requests. If a requester is informed by letter that additional data are required to complete our review of a request, the data/fee **must** be submitted within 90 days of the date of the letter. Any fees already paid will be forfeited for any request for which the requested data are not received within 90 days.

If you have general questions about your request, FEMA policy, or the National Flood Insurance Program, please call the FEMA Map Information eXchange (FMIX), toll free, at 1-877-FEMA MAP (1-877-336-2627). If you have specific questions concerning your request, please contact your case reviewer, Mr. Paul Anderson, P.E., CFM, by e-mail at PMAnderson@mbakerintl.com or by telephone at 720-514-1121, or the Revisions Coordinator for your request, Mr. Joseph Kuechenmeister, P.E., CFM, at jkuechenmeister@mbakerintl.com or at (720) 479-3181.

Sincerely,

Syed Qayum

Syed Qayum, CFM
LOMR Technical Manager
BakerAECOM

Enclosure

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

Mr. Paul W.R. Hoskin, P.E.
Principal
Hoskin-Ryan Consultants, Inc.

NATIONAL FLOOD INSURANCE PROGRAM

FEMA PRODUCTION AND TECHNICAL SERVICES CONTRACTOR

Summary of Additional Data Required to Support a
Letter of Map Revision (LOMR)

Case No.: 14-09-2457P

Requester: Ms. Kathryn Gross, CFM

Community: Maricopa County, AZ

Community No.: 040037

The issues listed below must be addressed before we can continue the review of your request.

1. Our detailed review reveals that the regulatory floodway for several washes were determined by setting narrow floodplain fringes along steep mountain washes with small surcharges. For example, Wash F at Cross Sections 1.084, 1.021 and 0.065 has surcharges of 0.01 and 0.02. Please remove the floodway encroachments at these cross sections.

2. Our detailed review reveals that road crossings were observed along Wash F at North Sugar Street and at Cross Section 0.9172 along Mockingbird Wash. Please verify that roads are present along these and other washes and explain why no culverts or bridges were modeled.

3. Our detailed review reveals that the invert along Wash M at Cross Section 0.473 is approximately 1.5 feet lower than the channel thalweg. In addition, along Wash J the culvert invert is approximately 2.5 feet lower than the channel thalweg at Cross Section 0.123. Please verify this culvert data and make any necessary changes to the submitted existing conditions HEC-RAS models for these washes if needed.

4. Our detailed review revealed that Cross Section 3.386 along Wash K should contain areas of ineffective flow during the base (1-percent-annual-chance) flood. Please revise this cross section to show the ineffective flow area or provide an explanation why this area should actively convey flow.

5. Our detailed review reveals Manning n-values for Mockingbird Wash, Monarch Wash, Wash H, Ox Wash, Wash F, and Wash HT07 that are less than 0.03. These values do not appear to be indicative of natural conditions and are less than those recommended for clean straight streams at normal conditions according to the "HEC-RAS River Analysis System – Hydraulic Reference Manual – Version 4.1," prepared by the United States Army Corps of Engineers, dated January 2010. Please provide an explanation for the use of the low Manning n-values, or revise the submitted hydraulic models using a reasonable Manning n-value.

6. Our detailed review revealed multiple cross sections that have improperly placed bank stations. For example, along Little San Domingo Wash, the channel bank stations at Cross Sections 1.574, 3.150 and 3.897 were placed at the bottom of the channel. In addition, various cross sections have the floodway stations within the natural channel such as along Ox Wash at Cross Section 1.159. Please provide updated submitted existing conditions models that correct these discrepancies or explain why this is not necessary.

7. Our detailed review reveals areas where the revised floodway is narrower than the effective regulatory floodway delineation. These areas have segments with braided channels which are not included in the floodway delineation and could present areas of high risk for future development. Please review all areas with multiple braided channels and submit revised floodway analyses that have these lower flow channels included within the channel banks and the floodway delineation.

8. It appears from our detailed review that a tributary exists on the left overbank between Cross Sections 0.283 and 0.381 along Wash HT07. This also occurs between Cross Sections 2.137 and 2.053 along Mockingbird Wash. Please provide additional cross sections that model these tributaries or explain why this is not necessary. In addition, please explain why the deepest part of the channel at Cross Section 0.498 along Wash HT07 is not defined as in the channel but on the overbank floodplain.

9. Our detailed review reveals a sharp increase in velocity head between Cross Sections 0.235 and 0.283 along Wash O. Please add additional cross sections to the submitted existing conditions HEC-RAS analysis to better model this area or explain why this is not necessary.

10. Our detailed review reveals issues with the centerlines or profile baselines on the topographic work maps entitled, "Wickenburg Area Drainage Master Study / Plan Phase 3," prepared by Hoskin-Ryan Consultants Inc., dated November 2013.

    (a) "Swtrln" shapefile lines are outside of the floodway boundaries along the Little San Domingo Wash, Wash H, Wash I, Wash K and Monarch Wash.
    (b) The floodway is not along the stream centerline or is away from the floodplain along Wash L.
    (c) The channel centerline/profile baselines were not present for Wash HT07, Wash J and Wash M downstream of US Highway 60.

11. Our detailed review reveals naming inconsistencies within the submitted existing conditions HEC-RAS models and the submitted GIS shapefiles. Please correct the following naming discrepancies.

    (a) Wash F Tributary 1 is shown as F2 in the submitted HEC-RAS model. In addition, the IDs of two cross section at the most downstream location in the submitted cross section shapefile do not match the IDs in the submitted HEC-RAS model.
    (b) The Little San Domingo Wash submitted HEC-RAS model has a reach that is named S2. However the reach is named 52 in the submitted "swtrln" shapefile.

12. From our technical review it appears as though the base floodplain delineation is not mapped correctly at certain locations along Wash G. For example, the base flood elevations (BFEs) at Cross Sections 0.184 and 0.316 are 1895 and 1899 respectively; however on the above referenced topographic work map the base floodplain is mapped to approximately 1890 at the right overbank breakout. Please check all other floodplain delineations and provide an explanation for these discrepancies, or make the appropriate revisions.

13. Our detailed review reveals that the submitted ground elevation contour data is incomplete for Little San Domingo Wash upstream of Cross Section 1.441. Please submit additional topographic contour information for this Wash.

14. Our detailed review reveals that the topographic contour information is at 4-foot contours at the upstream end of Wash K. Please confirm that this contour interval is at least as accurate as or more accurate than the contour interval level used for the effective mapping information.

15. Paragraph 65.6(a)(2) of the National Flood Insurance Program (NFIP) regulations states that to avoid discontinuities between revised and unrevised flood data, the hydraulic analyses must be extensive enough to ensure a logical transition between the revised floodplain boundaries and those developed previously for areas not affected by the revision. Our review indicates that the boundary of the base flood and regulatory floodway shown on the above-referenced topographic work maps do not logically tie in to the effective base floodplain and regulatory floodway boundaries at the downstream end of the revision for Washes H, Little San Domingo Wash and Monarch Wash. Please revise the boundary delineation at the downstream end of the revision to provide a logical tie in.

Please send the required data and/or fee directly to us at the address shown at the bottom of the first page. For identification purposes, please include the case number referenced above on all correspondence.

Flood Control District
of Maricopa County

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

April 3, 2014

LOMR Manager
LOMC Clearinghouse
847 South Pickett Street
Alexandria, VA 22304-4605

Subject: Wickenburg Area Drainage Master Plan: Phase 3 Floodplain Delineation Study TDN (FCD Contract FCD2009C030) by Hoskin Ryan Consultants, Inc.

Communities: Unincorporated Maricopa County, Community No. 040037

Flooding Sources:	Wash L	Wash O	Wash HT07
	Mockingbird Wash	Mockingbird Wash Tributary	Wash F
	Wash F Tributary 1	Wash K	Wash K-1
	Monarch Wash	San Domingo Wash	Wash I
	Wash H	Wash J	Ox Wash
	Wash M	Wash G	Wash S2
	Little San Domingo Wash	Little San Domingo Wash Tributary 1	

FIRM panels affected: 04013C0329L, 04013C0335L, 04013C0340L, 04013C0345L, 04013C0365L, 04013C0735L, 04013C0755

LOMR Manager:

Enclosed is the technical supporting data for the Wickenburg Area Drainage Master Plan: Phase 3 Floodplain Delineation Study TDN. This study includes new hydrology and the re-delineation of 27.5 linear miles of Zone AE floodplain and floodway, re-delineation of 3.8 linear miles of Zone A to Zone AE floodplains without floodways and 1.4 linear miles of new Zone AE floodplains without floodways for the various flooding sources listed above within Unincorporated Maricopa County. The study area is located in the northwest portion of Maricopa County.

The results are presented in one Technical Data Notebook. Hydrologic and hydraulic information is located in Section 4 and 5. The FEMA forms are located in Section 2. A full-size set of floodplain delineation work maps are included as a roll with this Notebook. Annotated FIRM panels are located in at the back of the report. Digital versions of the hydrologic and hydraulic analysis are included on the CD in the front pocket of the Notebook.

The digital floodplain limits and topographic contours are included on a DVD "GIS Data in the Wickenburg Phase III Project Area". The DVD is located in the front pocket of the Notebook as well.

If you have any questions, please contact me at (602) 506-4837, or kag@mail.maricopa.gov.

Sincerely,

Kathryn Gross, CFM, M.A.
Hydrology and Hydraulics Branch

Enclosure: 1 binder and 1 set of rolled maps

Copy to: Brian Cosson, CFM
NFIP State Coordinator
Arizona Department of Water Resources
Office of Dam Safety and Flood Mitigation
3550 N. Central Ave.
Phoenix, AZ 85012

Robert Bezek
Federal Emergency Management Agency
Region IX
1111 Broadway, Suite 1200
Oakland, CA 94607

Paul Hoskin, P.E.
Hoskin Ryan Consultants, Inc
6245 N. 24th Parkway, Suite 100
Phoenix, AZ 85016

Appendix C: Survey Field Notes

The *Wickenburg Area Drainage Master Study/Plan Phase 3 Survey Report*, prepared by Hoskin-Ryan Consultants, Inc. is included as Appendix C. ***(Included in CD)***

Appendix D: Hydrologic Analysis Supporting Documentation

D.1 Precipitation Data ***(Included in CD)***

D.2 Physical Parameter Calculations ***(Included in CD)***

D.3 Hydrograph Routing Data ***(Included in CD)***

D.4 Reservoir Routing Data

Note: No reservoirs are included with this study.

D.5 Flow Splits and Diversions Data

Note: No flow splits or diversions are included with this study.

D.6 Hydrologic Calculations ***(Included in CD, 100 yr 6 and 24hr Summary tables included in report)***

D.7 Verification ***(Included in CD)***

D.6 HYDROLOGIC CALCULATIONS

			6-HR	24-HR	72-HR	166.58-HR
+ (CFS)	(HR)					
		(CFS)				
+ 31292.	5.00		9968.	2546.	849.	367.
		(INCHES)	1.335	1.364	1.364	1.364
		(AC-FT)	4943.	5050.	5050.	5050.

CUMULATIVE AREA = 69.43 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION DUMMY6
TRANSPOSITION AREA 90.0 SQ MI

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
+ (CFS)	(HR)					
		(CFS)				
+ 19845.	4.92		6739.	1741.	580.	251.
		(INCHES)	0.902	0.932	0.932	0.932
		(AC-FT)	3342.	3452.	3452.	3452.

CUMULATIVE AREA = 69.43 SQ MI

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INTERPOLATED HYDROGRAPH AT DUMMY6

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
+ (CFS)	(HR)					
		(CFS)				
+ 21563.	4.92		7223.	1862.	621.	268.
		(INCHES)	0.967	0.997	0.997	0.997
		(AC-FT)	3582.	3692.	3692.	3692.

CUMULATIVE AREA = 69.43 SQ MI

1

RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

	OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
+	HYDROGRAPH AT	MB01	1766.	4.33	280.	70.	23.	1.67		
+	ROUTED TO	RMB01	1719.	4.50	280.	70.	23.	1.67		
+	HYDROGRAPH AT	MB02	793.	4.33	94.	24.	8.	0.49		
+	2 COMBINED AT	CMB02	2035.	4.50	351.	88.	29.	2.15		
+	HYDROGRAPH AT	MB03	1359.	4.33	206.	52.	17.	1.11		
+	2 COMBINED AT	CMB03	2841.	4.42	516.	130.	43.	3.26		
+	ROUTED TO	RMB02	2747.	4.67	515.	130.	43.	3.26		
+	HYDROGRAPH AT	MB04	425.	4.25	37.	9.	3.	0.24		
+	2 COMBINED AT	CMB04	2824.	4.58	537.	135.	45.	3.51		
+	HYDROGRAPH AT	MB05	1189.	4.33	164.	41.	14.	0.85		
+	2 COMBINED AT	CMB05	3393.	4.58	658.	165.	55.	4.36		
+	ROUTED TO	RMB04	3115.	4.92	658.	165.	55.	4.36		
+	HYDROGRAPH AT	MB06	836.	4.67	161.	41.	14.	0.78		
+	2 COMBINED AT	CMB06	3586.	4.83	780.	196.	65.	5.14		
+	ROUTED TO	RMB06	3588.	4.92	780.	196.	65.	5.14		
+	HYDROGRAPH AT	MB21	749.	4.42	101.	25.	8.	0.51		
+	ROUTED TO	RMB21	699.	4.67	101.	25.	8.	0.51		
+	HYDROGRAPH AT	MB22	849.	4.33	109.	27.	9.	0.41		
+	2 COMBINED AT	CMB22	1052.	4.50	201.	51.	17.	0.92		

+	HYDROGRAPH AT	MB23	604.	4.42	83.	21.	7.	0.34
+	2 COMBINED AT	CMB23	1492.	4.42	275.	69.	23.	1.26
+	ROUTED TO	RMB22	1493.	4.50	275.	69.	23.	1.26
+	HYDROGRAPH AT	MB07	295.	4.17	23.	6.	2.	0.10
+	3 COMBINED AT	CMB07	4286.	4.92	1014.	256.	85.	6.50
+	HYDROGRAPH AT	O1	1257.	4.58	230.	58.	19.	1.29
+	HYDROGRAPH AT	O2	1014.	4.50	184.	46.	15.	0.93
+	2 COMBINED AT	CO2	1956.	4.58	387.	97.	32.	2.22
+	ROUTED TO	RO2	1771.	4.75	387.	97.	32.	2.22
+	HYDROGRAPH AT	O3	1215.	4.42	169.	42.	14.	0.72
+	2 COMBINED AT	CO3	2284.	4.67	530.	133.	44.	2.94
+	HYDROGRAPH AT	HT01	449.	4.17	38.	10.	3.	0.14
+	HYDROGRAPH AT	HT03	452.	4.17	36.	9.	3.	0.15
+	HYDROGRAPH AT	HT04	503.	4.25	50.	13.	4.	0.23
+	5 COMBINED AT	DUMMY1	5888.	4.83	1519.	384.	128.	9.95
+	HYDROGRAPH AT	M01	679.	4.33	78.	20.	7.	0.32
+	HYDROGRAPH AT	L01	1072.	4.50	167.	42.	14.	0.80
+	HYDROGRAPH AT	K01	1152.	4.25	141.	35.	12.	0.69
+	ROUTED TO	RK01	1042.	4.42	141.	35.	12.	0.69
+	HYDROGRAPH AT	K03	614.	4.25	70.	18.	6.	0.34
+	2 COMBINED AT	CK03	1432.	4.42	203.	51.	17.	1.03
+	HYDROGRAPH AT	K02	1139.	4.33	148.	37.	12.	0.78
+	2 COMBINED AT	CK02	2174.	4.42	330.	83.	28.	1.81
+	ROUTED TO	RK02	1786.	4.83	330.	83.	28.	1.81
+	HYDROGRAPH AT	K04	1461.	4.58	288.	72.	24.	1.27
+	2 COMBINED AT	CK04	2803.	4.75	586.	147.	49.	3.08
+	HYDROGRAPH AT	I01	1211.	4.50	200.	50.	17.	1.00
+	ROUTED TO	RI01	1116.	4.67	200.	50.	17.	1.00
+	HYDROGRAPH AT	I02	1313.	4.50	207.	52.	17.	1.03
+	2 COMBINED AT	CI02	2045.	4.58	384.	96.	32.	2.03
+	ROUTED TO	RI02	2018.	4.75	384.	96.	32.	2.03
+	HYDROGRAPH AT	I03	615.	4.25	57.	14.	5.	0.28
+	2 COMBINED AT	CI03	2097.	4.67	429.	108.	36.	2.31
+	HYDROGRAPH AT	HT08	233.	4.17	16.	4.	1.	0.08
+	6 COMBINED AT	DUMMY2	9794.	4.75	2444.	616.	205.	16.54

+	HYDROGRAPH AT	MW01	1323.	4.42	229.	57.	19.	1.30
+	ROUTED TO	RMW01	1143.	4.75	228.	57.	19.	1.30
+	HYDROGRAPH AT	MW02	895.	4.67	185.	47.	16.	1.00
+	2 COMBINED AT	CMW02	1690.	4.75	382.	97.	32.	2.30
+	HYDROGRAPH AT	MW03	863.	4.58	167.	42.	14.	0.92
+	HYDROGRAPH AT	MW04	836.	4.33	118.	30.	10.	0.59
+	2 COMBINED AT	CMW04	1343.	4.50	265.	67.	22.	1.51
+	ROUTED TO	RMW03	1224.	4.67	265.	67.	22.	1.51
+	HYDROGRAPH AT	MW05	786.	4.33	105.	26.	9.	0.49
+	2 COMBINED AT	CMW03	1532.	4.67	348.	88.	29.	2.00
+	2 COMBINED AT	CMW05	2793.	4.75	672.	170.	57.	4.30
+	ROUTED TO	RMW02	2534.	5.00	672.	170.	57.	4.30
+	HYDROGRAPH AT	MW06	955.	4.58	175.	44.	15.	0.93
+	2 COMBINED AT	CMW09	2945.	4.92	800.	203.	68.	5.23
+	HYDROGRAPH AT	MW21	1286.	4.92	354.	91.	30.	2.30
+	ROUTED TO	RMW21	1179.	5.42	354.	91.	30.	2.30
+	HYDROGRAPH AT	MW22	1228.	4.83	304.	77.	26.	1.60
+	2 COMBINED AT	CMW22	1779.	5.17	607.	155.	52.	3.90
+	2 COMBINED AT	CMW06	4172.	5.00	1279.	327.	109.	9.13
+	ROUTED TO	RMW06	4131.	5.33	1279.	327.	109.	9.13
+	HYDROGRAPH AT	MW07	1176.	4.42	151.	38.	13.	0.93
+	2 COMBINED AT	CMW07	4150.	5.33	1366.	349.	116.	10.06
+	HYDROGRAPH AT	MW08	761.	4.50	109.	27.	9.	0.59
+	ROUTED TO	RMW08	754.	4.58	109.	27.	9.	0.59
+	2 COMBINED AT	CMW08	4236.	5.25	1428.	365.	122.	10.65
+	HYDROGRAPH AT	HT310	459.	4.17	33.	8.	3.	0.16
+	HYDROGRAPH AT	H01	1480.	4.92	389.	99.	33.	1.76
+	HYDROGRAPH AT	G01	620.	4.42	71.	18.	6.	0.41
+	HYDROGRAPH AT	F01	577.	4.25	55.	14.	5.	0.26
+	HYDROGRAPH AT	HT07	1063.	4.50	158.	39.	13.	0.89
+	7 COMBINED AT	DUMMY3	12707.	4.83	3772.	965.	322.	30.66
+	HYDROGRAPH AT	SD01	821.	4.50	123.	31.	10.	0.87
+	HYDROGRAPH AT	SD02	1083.	4.25	113.	28.	9.	0.78
+	2 COMBINED AT	CSD02	1410.	4.33	210.	52.	17.	1.65
+	ROUTED TO	RSD01	1339.	4.50	210.	52.	17.	1.65
	HYDROGRAPH AT							

+		SD04	1561.	4.42	231.	58.	19.	1.52
+	2 COMBINED AT	CSD04	2314.	4.50	391.	98.	33.	3.18
+	HYDROGRAPH AT	SD03	1224.	4.50	205.	51.	17.	1.32
+	2 COMBINED AT	CSD03	3070.	4.50	538.	135.	45.	4.49
+	ROUTED TO	RSD03	2974.	4.58	538.	135.	45.	4.49
+	HYDROGRAPH AT	SD05	1425.	4.42	220.	55.	18.	1.55
+	2 COMBINED AT	CSD05A	3772.	4.58	685.	172.	57.	6.04
+	HYDROGRAPH AT	SD21	1054.	4.50	190.	48.	16.	1.16
+	ROUTED TO	RSD21	986.	4.67	189.	48.	16.	1.16
+	HYDROGRAPH AT	SD22	1217.	4.42	192.	48.	16.	1.26
+	2 COMBINED AT	CSD22	1724.	4.58	346.	87.	29.	2.41
+	2 COMBINED AT	CSD05	4859.	4.58	926.	233.	78.	8.46
+	ROUTED TO	RSD05	4604.	4.75	925.	233.	78.	8.46
+	HYDROGRAPH AT	SD06	1861.	4.33	281.	71.	24.	1.49
+	2 COMBINED AT	CSD06	5304.	4.67	1124.	283.	94.	9.94
+	ROUTED TO	RSD06	4987.	4.92	1123.	283.	94.	9.94
+	HYDROGRAPH AT	SD07	1489.	4.50	288.	72.	24.	1.39
+	2 COMBINED AT	CSD07A	5619.	4.92	1332.	336.	112.	11.34
+	HYDROGRAPH AT	SD31	1729.	4.33	253.	63.	21.	1.49
+	ROUTED TO	RSD31	1469.	4.58	253.	63.	21.	1.49
+	HYDROGRAPH AT	SD32	931.	4.42	136.	34.	11.	0.69
+	ROUTED TO	RSD32	865.	4.58	136.	34.	11.	0.69
+	HYDROGRAPH AT	SD33	1263.	4.58	247.	62.	21.	1.26
+	3 COMBINED AT	CSD33	2790.	4.67	566.	143.	48.	3.44
+	2 COMBINED AT	CSD07	7164.	4.83	1738.	439.	146.	14.78
+	ROUTED TO	RSD33	7125.	4.92	1738.	439.	146.	14.78
+	HYDROGRAPH AT	SD08	1289.	4.17	137.	34.	11.	0.52
+	2 COMBINED AT	CSD08A	7261.	4.83	1840.	465.	155.	15.30
+	HYDROGRAPH AT	SD41	1111.	4.50	189.	48.	16.	0.93
+	HYDROGRAPH AT	SD42	868.	4.33	118.	30.	10.	0.55
+	2 COMBINED AT	CSD42	1680.	4.42	291.	73.	24.	1.48
+	ROUTED TO	RSD41	1453.	4.58	290.	73.	24.	1.48
+	HYDROGRAPH AT	SD43	1755.	4.42	327.	82.	27.	1.32
+	2 COMBINED AT	CSD41	2667.	4.50	590.	149.	50.	2.80
+	2 COMBINED AT	CSD08	8743.	4.83	2268.	574.	191.	18.10
+	ROUTED TO	RSD08	8405.	5.17	2267.	574.	191.	18.10

+	HYDROGRAPH AT	SD09	1352.	4.58	252.	63.	21.	1.08
+	2 COMBINED AT	CSD09	8733.	5.17	2434.	617.	206.	19.18
+	HYDROGRAPH AT	SD11	1069.	4.50	189.	47.	16.	0.73
+	2 COMBINED AT	CSD11	8975.	5.08	2564.	650.	217.	19.91
+	ROUTED TO	RSD09	8983.	5.25	2564.	650.	217.	19.91
+	HYDROGRAPH AT	SD10	1164.	4.25	133.	33.	11.	0.58
+	2 COMBINED AT	CSD10	8993.	5.25	2642.	671.	224.	20.49
+	HYDROGRAPH AT	HT02	549.	4.33	65.	16.	5.	0.27
+	HYDROGRAPH AT	HT06	361.	4.17	27.	7.	2.	0.16
+	4 COMBINED AT	DUMMY4	17133.	5.00	5538.	1418.	473.	51.57
+	HYDROGRAPH AT	OX1	1618.	4.67	359.	91.	30.	1.64
+	HYDROGRAPH AT	OX2	1691.	4.58	369.	93.	31.	1.62
+	2 COMBINED AT	COX2	2926.	4.67	698.	176.	59.	3.26
+	ROUTED TO	ROX1	2748.	4.92	697.	176.	59.	3.26
+	HYDROGRAPH AT	OX3	747.	4.75	151.	38.	13.	0.70
+	2 COMBINED AT	COX1	3229.	4.92	818.	207.	69.	3.97
+	HYDROGRAPH AT	OX4	1925.	4.58	354.	89.	30.	1.82
+	2 COMBINED AT	COX4	4318.	4.83	1103.	280.	93.	5.79
+	ROUTED TO	ROX4	4232.	5.00	1103.	280.	93.	5.79
+	HYDROGRAPH AT	OX5	1767.	4.25	209.	52.	17.	1.03
+	2 COMBINED AT	COX5	4443.	4.92	1257.	319.	106.	6.81
+	ROUTED TO	ROX5	4428.	4.92	1257.	319.	106.	6.81
+	HYDROGRAPH AT	OX6	360.	4.08	28.	7.	2.	0.12
+	2 COMBINED AT	COX6	4432.	4.92	1277.	324.	108.	6.93
+	HYDROGRAPH AT	OX21	1487.	4.42	214.	54.	18.	1.00
+	ROUTED TO	ROX21	1187.	4.67	214.	54.	18.	1.00
+	HYDROGRAPH AT	OX22	904.	4.33	94.	23.	8.	0.46
+	2 COMBINED AT	COX21	1505.	4.58	294.	74.	25.	1.46
+	2 COMBINED AT	COX22	5210.	4.92	1503.	381.	127.	8.39
+	ROUTED TO	ROX6	5213.	4.92	1503.	381.	127.	8.39
+	HYDROGRAPH AT	OX7	273.	4.08	16.	4.	1.	0.08
+	2 COMBINED AT	COX7	5213.	4.92	1515.	384.	128.	8.47
+	HYDROGRAPH AT	LS01	1026.	4.75	247.	63.	21.	1.23
+	ROUTED TO	RLS01	992.	4.83	247.	63.	21.	1.23
+	HYDROGRAPH AT	LS02	929.	4.67	201.	51.	17.	1.01

+	ROUTED TO	RLS02	923.	4.75	201.	51.	17.	1.01
+	HYDROGRAPH AT	LS03	814.	4.25	83.	21.	7.	0.39
+	3 COMBINED AT	CLS03	1791.	4.75	486.	124.	41.	2.63
+	ROUTED TO	RLS03	1721.	5.00	485.	124.	41.	2.63
+	HYDROGRAPH AT	LS04	1486.	4.42	242.	61.	20.	1.08
+	2 COMBINED AT	CLS04	2380.	4.75	689.	176.	59.	3.71
+	ROUTED TO	RLS04	2231.	5.33	688.	176.	59.	3.71
+	HYDROGRAPH AT	LS05	1429.	4.67	275.	69.	23.	1.33
+	2 COMBINED AT	CLS05	2819.	5.17	914.	232.	77.	5.04
+	ROUTED TO	RLS05	2792.	5.25	913.	232.	77.	5.04
+	HYDROGRAPH AT	LS06	1149.	4.50	176.	44.	15.	0.84
+	ROUTED TO	RLS06	1107.	4.58	176.	44.	15.	0.84
+	2 COMBINED AT	CLS06	3162.	5.17	1050.	267.	89.	5.88
+	HYDROGRAPH AT	LS07	910.	4.25	85.	21.	7.	0.39
+	2 COMBINED AT	CLS07	3178.	5.17	1113.	282.	94.	6.27
+	ROUTED TO	RLS07	3168.	5.25	1113.	282.	94.	6.27
+	HYDROGRAPH AT	LS08	1050.	4.25	109.	27.	9.	0.50
+	2 COMBINED AT	CLS08	3211.	5.17	1193.	303.	101.	6.77
+	ROUTED TO	RLS08	3205.	5.25	1193.	303.	101.	6.77
+	HYDROGRAPH AT	LS11	486.	4.33	56.	14.	5.	0.26
+	ROUTED TO	RLS11	424.	4.50	56.	14.	5.	0.26
+	HYDROGRAPH AT	LS12	378.	4.17	31.	8.	3.	0.13
+	2 COMBINED AT	CLS12	595.	4.25	86.	22.	7.	0.39
+	ROUTED TO	RLS12	592.	4.33	86.	22.	7.	0.39
+	2 COMBINED AT	CLS10	3295.	5.17	1255.	319.	106.	7.16
+	HYDROGRAPH AT	LS21	791.	4.42	108.	27.	9.	0.51
+	ROUTED TO	RLS21	723.	4.67	108.	27.	9.	0.51
+	HYDROGRAPH AT	LS22	787.	4.25	68.	17.	6.	0.33
+	2 COMBINED AT	CLS22A	999.	4.33	170.	42.	14.	0.84
+	2 COMBINED AT	CLS22	3671.	4.75	1378.	350.	117.	8.00
+	ROUTED TO	RLS22	3633.	4.83	1378.	350.	117.	8.00
+	HYDROGRAPH AT	LS09	1163.	4.33	141.	35.	12.	0.76
+	2 COMBINED AT	CLS09	3943.	4.75	1467.	372.	124.	8.76
+	HYDROGRAPH AT	HT319	532.	4.17	36.	9.	3.	0.21
+	HYDROGRAPH AT	J01	721.	4.33	87.	22.	7.	0.41

5 COMBINED AT

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+                           DUMMY6     21563.     4.92       7223.       1862.         621.        69.43

*** NORMAL END OF HEC-1 ***
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HYDROGRAPH AT STATION DUMMY6
TRANSPOSITION AREA 90.0 SQ MI

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	166.58-HR
+ (CFS)	(HR)					
		(CFS)				
+ 33597.	12.92		10213.	2854.	954.	412.
		(INCHES)	1.368	1.529	1.532	1.532
		(AC-FT)	5064.	5661.	5674.	5674.

CUMULATIVE AREA = 69.43 SQ MI

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INTERPOLATED HYDROGRAPH AT DUMMY6

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	166.58-HR
+ (CFS)	(HR)					
		(CFS)				
+ 34333.	12.92		10417.	2909.	972.	420.
		(INCHES)	1.395	1.558	1.562	1.562
		(AC-FT)	5166.	5770.	5784.	5784.

CUMULATIVE AREA = 69.43 SQ MI

1

RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

	OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
+										
+	HYDROGRAPH AT	MB01	1899.	12.33	268.	76.	25.	1.67		
+	ROUTED TO	RMB01	1768.	12.50	268.	76.	25.	1.67		
+	HYDROGRAPH AT	MB02	632.	12.25	78.	22.	7.	0.49		
+	2 COMBINED AT	CMB02	2233.	12.42	345.	98.	33.	2.15		
+	HYDROGRAPH AT	MB03	1297.	12.33	189.	55.	18.	1.11		
+	2 COMBINED AT	CMB03	3477.	12.42	532.	152.	51.	3.26		
+	ROUTED TO	RMB02	3444.	12.50	532.	152.	51.	3.26		
+	HYDROGRAPH AT	MB04	334.	12.25	30.	8.	3.	0.24		
+	2 COMBINED AT	CMB04	3585.	12.50	561.	160.	53.	3.51		
+	HYDROGRAPH AT	MB05	1066.	12.33	143.	40.	13.	0.85		
+	2 COMBINED AT	CMB05	4402.	12.50	702.	199.	66.	4.36		
+	ROUTED TO	RMB04	4050.	12.75	702.	199.	66.	4.36		
+	HYDROGRAPH AT	MB06	717.	12.67	140.	38.	13.	0.78		
+	2 COMBINED AT	CMB06	4735.	12.75	839.	236.	79.	5.14		
+	ROUTED TO	RMB06	4573.	12.83	839.	236.	79.	5.14		
+	HYDROGRAPH AT	MB21	604.	12.42	83.	22.	7.	0.51		
+	ROUTED TO	RMB21	493.	12.67	83.	22.	7.	0.51		
+	HYDROGRAPH AT	MB22	676.	12.33	96.	30.	10.	0.41		
+	2 COMBINED AT	CMB22	935.	12.42	179.	51.	17.	0.92		
+	HYDROGRAPH AT	MB23	482.	12.33	72.	22.	7.	0.34		
+	2 COMBINED AT	CMB23	1412.	12.42	250.	73.	24.	1.26		
+	ROUTED TO	RMB22	1405.	12.50	250.	73.	24.	1.26		

+	HYDROGRAPH AT	MB07	233.	12.17	20.	6.	2.	0.10
+	3 COMBINED AT	CMB07	5482.	12.83	1105.	314.	105.	6.50
+	HYDROGRAPH AT	O1	1212.	12.50	207.	54.	18.	1.29
+	HYDROGRAPH AT	O2	914.	12.50	161.	44.	15.	0.93
+	2 COMBINED AT	CO2	2118.	12.50	366.	97.	32.	2.22
+	ROUTED TO	RO2	1846.	12.75	366.	97.	32.	2.22
+	HYDROGRAPH AT	O3	1038.	12.42	148.	42.	14.	0.72
+	2 COMBINED AT	CO3	2412.	12.67	512.	139.	46.	2.94
+	HYDROGRAPH AT	HT01	359.	12.17	34.	10.	3.	0.14
+	HYDROGRAPH AT	HT03	360.	12.17	31.	9.	3.	0.15
+	HYDROGRAPH AT	HT04	404.	12.25	43.	12.	4.	0.23
+	5 COMBINED AT	DUMMY1	7687.	12.83	1715.	482.	161.	9.95
+	HYDROGRAPH AT	M01	545.	12.25	67.	19.	6.	0.32
+	HYDROGRAPH AT	L01	931.	12.50	145.	40.	13.	0.80
+	HYDROGRAPH AT	K01	1002.	12.25	120.	32.	11.	0.69
+	ROUTED TO	RK01	898.	12.42	120.	32.	11.	0.69
+	HYDROGRAPH AT	K03	498.	12.25	58.	15.	5.	0.34
+	2 COMBINED AT	CK03	1327.	12.42	178.	46.	15.	1.03
+	HYDROGRAPH AT	K02	1013.	12.33	126.	31.	10.	0.78
+	2 COMBINED AT	CK02	2291.	12.33	302.	77.	26.	1.81
+	ROUTED TO	RK02	1771.	12.83	302.	77.	26.	1.81
+	HYDROGRAPH AT	K04	1344.	12.58	260.	74.	25.	1.27
+	2 COMBINED AT	CK04	2988.	12.75	559.	151.	50.	3.08
+	HYDROGRAPH AT	I01	1113.	12.42	175.	45.	15.	1.00
+	ROUTED TO	RI01	1014.	12.67	175.	45.	15.	1.00
+	HYDROGRAPH AT	I02	1196.	12.50	183.	50.	17.	1.03
+	2 COMBINED AT	CI02	2096.	12.58	356.	95.	32.	2.03
+	ROUTED TO	RI02	2046.	12.75	356.	95.	32.	2.03
+	HYDROGRAPH AT	I03	492.	12.25	48.	13.	4.	0.28
+	2 COMBINED AT	CI03	2139.	12.67	402.	107.	36.	2.31
+	HYDROGRAPH AT	HT08	185.	12.17	14.	4.	1.	0.08
+	6 COMBINED AT	DUMMY2	12853.	12.75	2793.	774.	258.	16.54
+	HYDROGRAPH AT	MW01	1309.	12.42	215.	63.	21.	1.30
+	ROUTED TO	RMW01	1068.	12.75	215.	63.	21.	1.30
+	HYDROGRAPH AT	MW02	811.	12.58	169.	49.	16.	1.00
	2 COMBINED AT							

+		CMW02	1797.	12.75	382.	111.	37.	2.30
+	HYDROGRAPH AT	MW03	772.	12.58	152.	44.	15.	0.92
+	HYDROGRAPH AT	MW04	688.	12.33	101.	29.	10.	0.59
+	2 COMBINED AT	CMW04	1312.	12.50	253.	74.	25.	1.51
+	ROUTED TO	RMW03	1165.	12.67	253.	74.	25.	1.51
+	HYDROGRAPH AT	MW05	625.	12.33	89.	26.	9.	0.49
+	2 COMBINED AT	CMW03	1495.	12.67	340.	99.	33.	2.00
+	2 COMBINED AT	CMW05	3262.	12.67	719.	209.	70.	4.30
+	ROUTED TO	RMW02	2839.	13.00	719.	209.	70.	4.30
+	HYDROGRAPH AT	MW06	858.	12.58	152.	39.	13.	0.93
+	2 COMBINED AT	CMW09	3319.	12.92	868.	248.	83.	5.23
+	HYDROGRAPH AT	MW21	1410.	12.92	362.	104.	35.	2.30
+	ROUTED TO	RMW21	965.	13.17	360.	104.	35.	2.30
+	HYDROGRAPH AT	MW22	1196.	12.83	282.	78.	26.	1.60
+	2 COMBINED AT	CMW22	1936.	12.92	638.	181.	61.	3.90
+	2 COMBINED AT	CMW06	5230.	12.92	1497.	427.	143.	9.13
+	ROUTED TO	RMW06	5144.	13.25	1497.	427.	143.	9.13
+	HYDROGRAPH AT	MW07	1068.	12.42	131.	33.	11.	0.93
+	2 COMBINED AT	CMW07	5241.	13.25	1624.	459.	153.	10.06
+	HYDROGRAPH AT	MW08	625.	12.50	90.	23.	8.	0.59
+	ROUTED TO	RMW08	607.	12.58	90.	23.	8.	0.59
+	2 COMBINED AT	CMW08	5357.	13.17	1705.	480.	160.	10.65
+	HYDROGRAPH AT	HT310	364.	12.17	28.	8.	3.	0.16
+	HYDROGRAPH AT	H01	1375.	12.83	364.	108.	36.	1.76
+	HYDROGRAPH AT	G01	493.	12.42	57.	14.	5.	0.41
+	HYDROGRAPH AT	F01	460.	12.25	47.	13.	4.	0.26
+	HYDROGRAPH AT	HT07	944.	12.50	136.	35.	12.	0.89
+	7 COMBINED AT	DUMMY3	17896.	12.83	4820.	1351.	451.	30.66
+	HYDROGRAPH AT	SD01	742.	12.50	109.	28.	9.	0.87
+	HYDROGRAPH AT	SD02	971.	12.25	98.	25.	8.	0.78
+	2 COMBINED AT	CSD02	1531.	12.33	206.	52.	17.	1.65
+	ROUTED TO	RSD01	1426.	12.50	206.	52.	17.	1.65
+	HYDROGRAPH AT	SD04	1656.	12.33	219.	59.	20.	1.52
+	2 COMBINED AT	CSD04	2984.	12.42	423.	110.	37.	3.18
+	HYDROGRAPH AT	SD03	1206.	12.50	192.	52.	17.	1.32
+	2 COMBINED AT	CSD03	4164.	12.42	612.	162.	54.	4.49

+	ROUTED TO	RSD03	3910.	12.58	612.	162.	54.	4.49
+	HYDROGRAPH AT	SD05	1500.	12.42	206.	52.	17.	1.55
+	2 COMBINED AT	CSD05A	5247.	12.50	815.	213.	71.	6.04
+	HYDROGRAPH AT	SD21	1008.	12.50	176.	50.	17.	1.16
+	ROUTED TO	RSD21	934.	12.67	176.	50.	17.	1.16
+	HYDROGRAPH AT	SD22	1206.	12.42	177.	47.	16.	1.26
+	2 COMBINED AT	CSD22	1919.	12.50	352.	96.	32.	2.41
+	2 COMBINED AT	CSD05	7137.	12.50	1162.	308.	103.	8.46
+	ROUTED TO	RSD05	6916.	12.58	1162.	308.	103.	8.46
+	HYDROGRAPH AT	SD06	1907.	12.33	262.	76.	25.	1.49
+	2 COMBINED AT	CSD06	8019.	12.58	1419.	383.	128.	9.94
+	ROUTED TO	RSD06	7731.	12.83	1419.	383.	128.	9.94
+	HYDROGRAPH AT	SD07	1446.	12.50	262.	74.	25.	1.39
+	2 COMBINED AT	CSD07A	8512.	12.83	1663.	452.	151.	11.34
+	HYDROGRAPH AT	SD31	1801.	12.33	238.	67.	22.	1.49
+	ROUTED TO	RSD31	1495.	12.58	238.	67.	22.	1.49
+	HYDROGRAPH AT	SD32	788.	12.33	117.	33.	11.	0.69
+	ROUTED TO	RSD32	744.	12.58	117.	33.	11.	0.69
+	HYDROGRAPH AT	SD33	1194.	12.58	224.	62.	21.	1.26
+	3 COMBINED AT	CSD33	3408.	12.58	575.	161.	54.	3.44
+	2 COMBINED AT	CSD07	10719.	12.75	2187.	600.	200.	14.78
+	ROUTED TO	RSD33	10666.	12.83	2187.	600.	200.	14.78
+	HYDROGRAPH AT	SD08	1040.	12.17	121.	36.	12.	0.52
+	2 COMBINED AT	CSD08A	10780.	12.83	2298.	633.	211.	15.30
+	HYDROGRAPH AT	SD41	995.	12.42	167.	47.	16.	0.93
+	HYDROGRAPH AT	SD42	713.	12.33	100.	27.	9.	0.55
+	2 COMBINED AT	CSD42	1681.	12.42	266.	73.	25.	1.48
+	ROUTED TO	RSD41	1483.	12.58	266.	73.	25.	1.48
+	HYDROGRAPH AT	SD43	1675.	12.42	297.	88.	29.	1.32
+	2 COMBINED AT	CSD41	2954.	12.50	560.	161.	54.	2.80
+	2 COMBINED AT	CSD08	12651.	12.75	2805.	779.	260.	18.10
+	ROUTED TO	RSD08	12273.	13.17	2805.	779.	260.	18.10
+	HYDROGRAPH AT	SD09	1220.	12.50	227.	68.	23.	1.08
+	2 COMBINED AT	CSD09	12689.	13.08	3008.	841.	281.	19.18
+	HYDROGRAPH AT	SD11	903.	12.50	169.	53.	18.	0.73

+	2 COMBINED AT	CSD11	12961.	13.08	3160.	888.	297.	19.91
+	ROUTED TO	RSD09	12926.	13.25	3160.	888.	297.	19.91
+	HYDROGRAPH AT	SD10	952.	12.25	116.	35.	12.	0.58
+	2 COMBINED AT	CSD10	12949.	13.25	3262.	920.	307.	20.49
+	HYDROGRAPH AT	HT02	440.	12.33	56.	16.	5.	0.27
+	HYDROGRAPH AT	HT06	289.	12.17	22.	6.	2.	0.16
+	4 COMBINED AT	DUMMY4	26440.	13.00	7770.	2187.	730.	51.57
+	HYDROGRAPH AT	OX1	1583.	12.58	328.	92.	31.	1.64
+	HYDROGRAPH AT	OX2	1649.	12.58	336.	94.	31.	1.62
+	2 COMBINED AT	COX2	3220.	12.58	662.	185.	62.	3.26
+	ROUTED TO	ROX1	2754.	12.92	661.	185.	62.	3.26
+	HYDROGRAPH AT	OX3	633.	12.75	130.	34.	11.	0.70
+	2 COMBINED AT	COX1	3319.	12.92	788.	218.	73.	3.97
+	HYDROGRAPH AT	OX4	1908.	12.58	328.	91.	30.	1.82
+	2 COMBINED AT	COX4	4624.	12.83	1111.	308.	103.	5.79
+	ROUTED TO	ROX4	4529.	12.92	1111.	308.	103.	5.79
+	HYDROGRAPH AT	OX5	1677.	12.25	184.	51.	17.	1.03
+	2 COMBINED AT	COX5	4722.	12.92	1291.	358.	119.	6.81
+	ROUTED TO	ROX5	4720.	12.92	1291.	358.	119.	6.81
+	HYDROGRAPH AT	OX6	290.	12.08	24.	7.	2.	0.12
+	2 COMBINED AT	COX6	4726.	12.92	1313.	364.	122.	6.93
+	HYDROGRAPH AT	OX21	1361.	12.42	188.	47.	16.	1.00
+	ROUTED TO	ROX21	1230.	12.67	188.	47.	16.	1.00
+	HYDROGRAPH AT	OX22	728.	12.25	77.	20.	7.	0.46
+	2 COMBINED AT	COX21	1521.	12.58	264.	67.	22.	1.46
+	2 COMBINED AT	COX22	5742.	12.83	1573.	430.	144.	8.39
+	ROUTED TO	ROX6	5733.	12.92	1573.	430.	144.	8.39
+	HYDROGRAPH AT	OX7	218.	12.08	14.	4.	1.	0.08
+	2 COMBINED AT	COX7	5734.	12.92	1586.	434.	145.	8.47
+	HYDROGRAPH AT	LS01	952.	12.75	230.	69.	23.	1.23
+	ROUTED TO	RLS01	913.	12.83	230.	69.	23.	1.23
+	HYDROGRAPH AT	LS02	841.	12.67	180.	50.	17.	1.01
+	ROUTED TO	RLS02	829.	12.75	180.	50.	17.	1.01
+	HYDROGRAPH AT	LS03	654.	12.25	69.	19.	6.	0.39
+	3 COMBINED AT	CLS03	1827.	12.75	476.	137.	46.	2.63
	ROUTED TO							

+		RLS03	1692.	12.92	475.	137.	46.	2.63
+	HYDROGRAPH AT	LS04	1376.	12.42	215.	60.	20.	1.08
+	2 COMBINED AT	CLS04	2395.	12.50	686.	196.	66.	3.71
+	ROUTED TO	RLS04	2215.	13.25	686.	196.	66.	3.71
+	HYDROGRAPH AT	LS05	1326.	12.67	244.	62.	21.	1.33
+	2 COMBINED AT	CLS05	2882.	13.08	926.	257.	86.	5.04
+	ROUTED TO	RLS05	2850.	13.17	925.	257.	86.	5.04
+	HYDROGRAPH AT	LS06	1011.	12.50	152.	38.	13.	0.84
+	ROUTED TO	RLS06	971.	12.58	152.	38.	13.	0.84
+	2 COMBINED AT	CLS06	3281.	13.08	1073.	294.	98.	5.88
+	HYDROGRAPH AT	LS07	735.	12.25	72.	18.	6.	0.39
+	2 COMBINED AT	CLS07	3314.	13.08	1143.	312.	104.	6.27
+	ROUTED TO	RLS07	3310.	13.17	1143.	312.	104.	6.27
+	HYDROGRAPH AT	LS08	852.	12.25	91.	23.	8.	0.50
+	2 COMBINED AT	CLS08	3360.	13.08	1231.	334.	112.	6.77
+	ROUTED TO	RLS08	3356.	13.17	1231.	334.	112.	6.77
+	HYDROGRAPH AT	LS11	395.	12.33	47.	12.	4.	0.26
+	ROUTED TO	RLS11	330.	12.50	47.	12.	4.	0.26
+	HYDROGRAPH AT	LS12	305.	12.17	26.	7.	2.	0.13
+	2 COMBINED AT	CLS12	482.	12.25	73.	19.	6.	0.39
+	ROUTED TO	RLS12	480.	12.33	73.	19.	6.	0.39
+	2 COMBINED AT	CLS10	3466.	13.17	1301.	353.	118.	7.16
+	HYDROGRAPH AT	LS21	644.	12.42	90.	23.	8.	0.51
+	ROUTED TO	RLS21	587.	12.67	90.	23.	8.	0.51
+	HYDROGRAPH AT	LS22	632.	12.25	57.	15.	5.	0.33
+	2 COMBINED AT	CLS22A	891.	12.25	146.	37.	12.	0.84
+	2 COMBINED AT	CLS22	4089.	12.58	1444.	389.	130.	8.00
+	ROUTED TO	RLS22	4001.	12.75	1443.	389.	130.	8.00
+	HYDROGRAPH AT	LS09	1021.	12.33	120.	31.	10.	0.76
+	2 COMBINED AT	CLS09	4456.	12.67	1559.	419.	140.	8.76
+	HYDROGRAPH AT	HT319	421.	12.17	29.	7.	2.	0.21
+	HYDROGRAPH AT	J01	581.	12.33	73.	20.	7.	0.41
+	5 COMBINED AT	DUMMY6	34333.	12.92	10417.	2909.	972.	69.43

*** NORMAL END OF HEC-1 ***

Appendix E: Hydraulic Analysis Supporting Documentation

E.1 Roughness Coefficient Estimation ***(Included in CD)***

E.2 Cross-Section Plots

Note: HEC-RAS cross-section plots are located in Appendix E.5.

E.3 Expansion and Contraction Coefficients ***(Included in CD)***

E.4 Analysis of Structures

Note: No additional structures analysis is included with this study.

E.5 Hydraulic Calculations

E.5.1 Schematic ***(Included in CD and report)***

E.5.2 Report ***(Included in CD)***

E.5.3 Summary Tables ***(Included in CD and report)***

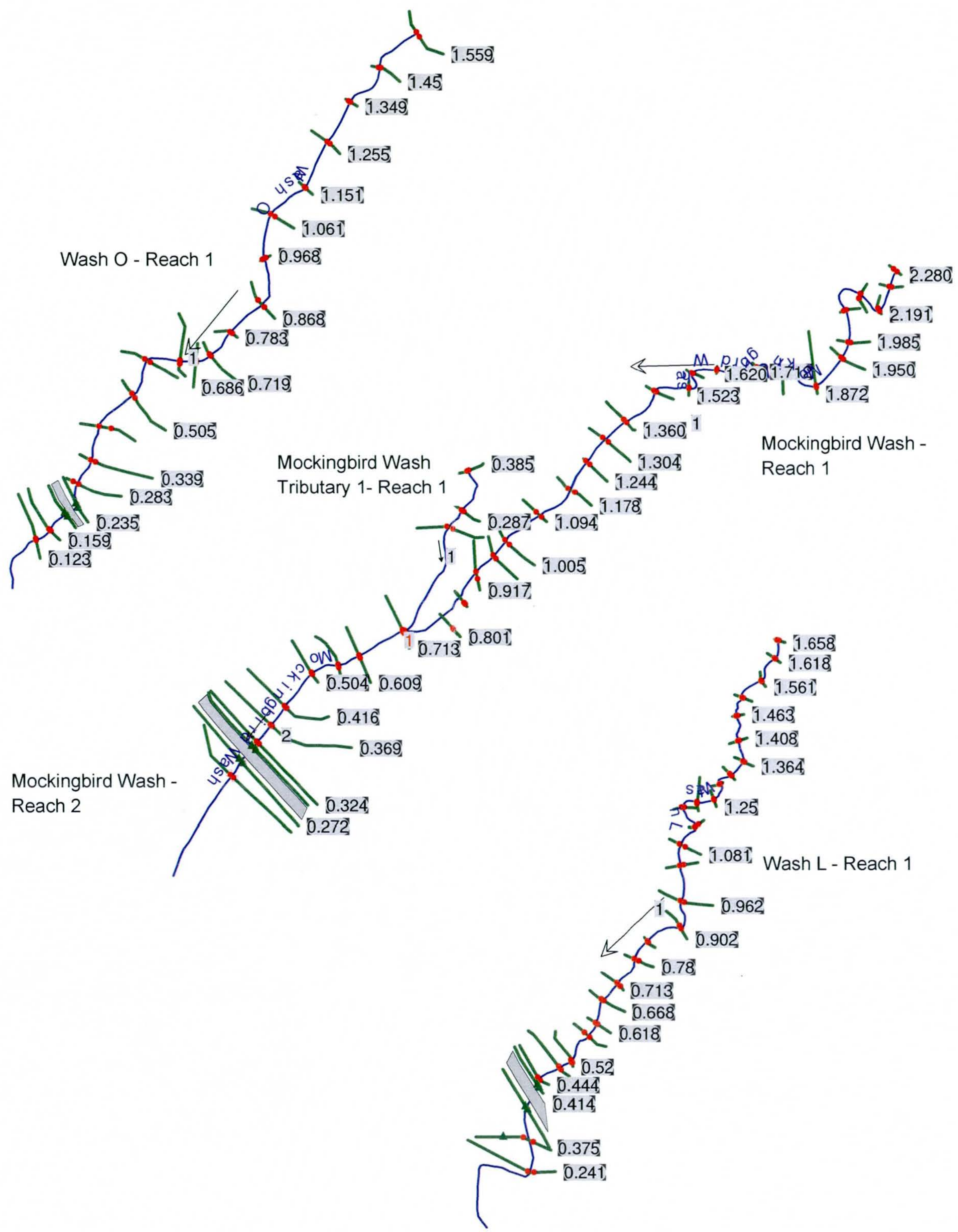
E.5.4 Cross-Sections ***(Included in CD)***

E.5.5 Flood Profiles ***(Included in CD)***

E.5.6 Modeling Warning and Error Messages ***(Included in CD)***

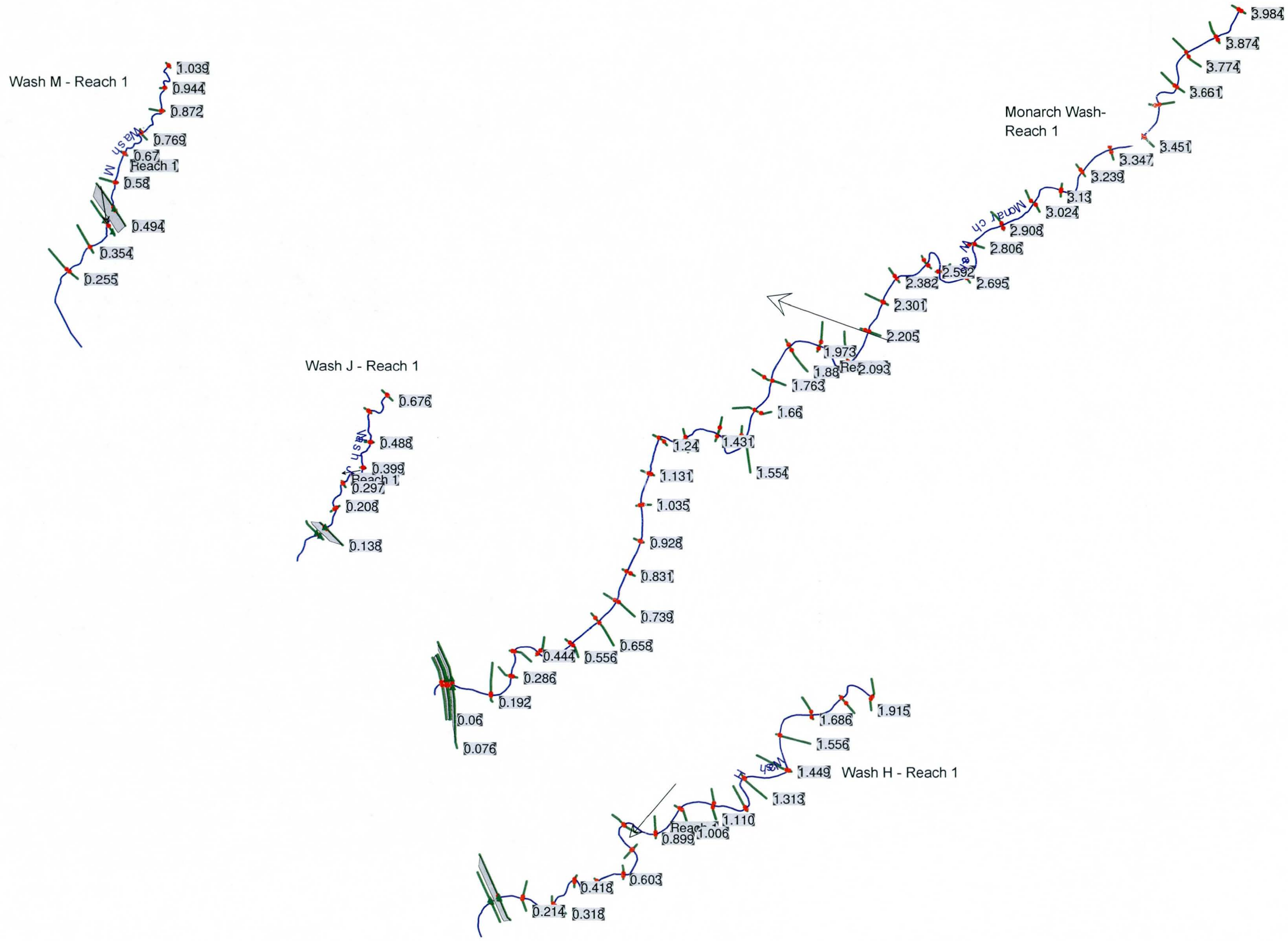
E.5.1 SCHEMATIC

100-year HEC-RAS Model Schematic for Wash O, Mockingbird Wash Watershed and Wash L

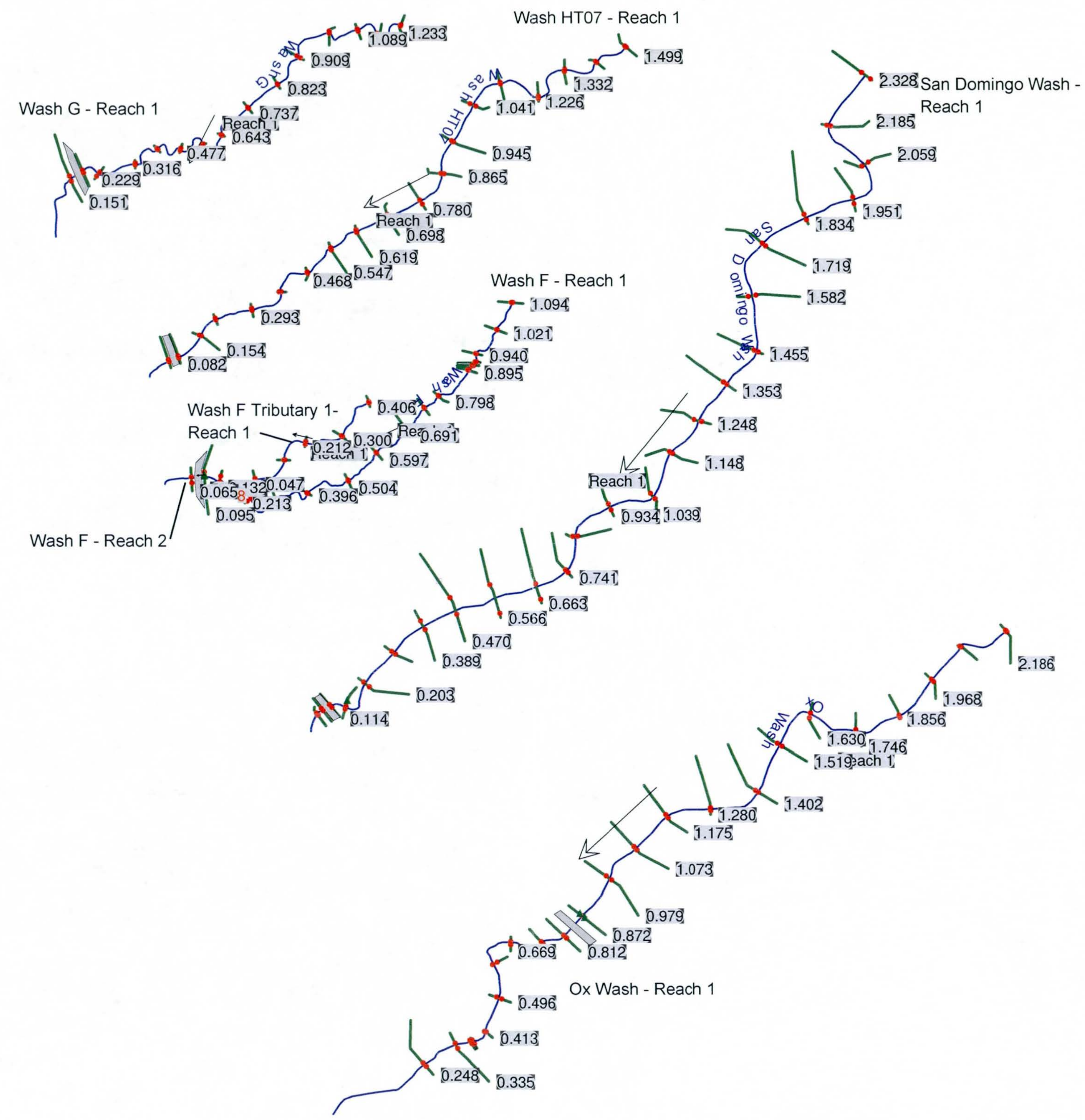


100-year HEC-RAS Model Schematic for Wash K Watershed and Wash I

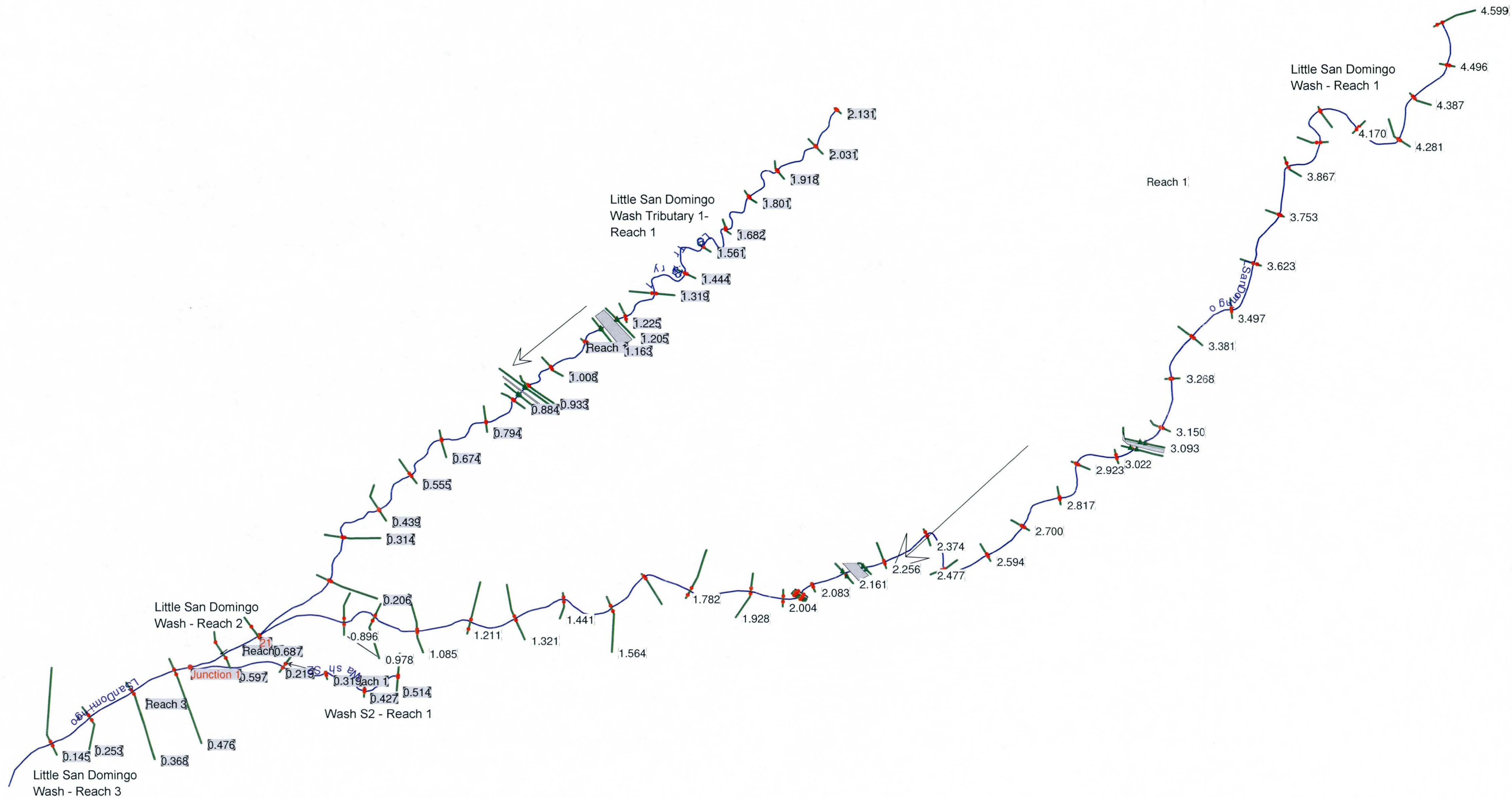
100-year HEC-RAS Model Schematic for Wash M, Wash J, Monarch Wash and Wash H



100-year HEC-RAS Model Schematic for Wash G, Wash HT07, Wash F Watershed, San Domingo Wash and Ox Wash



100-year HEC-RAS Model Schematic for Little San Domingo Wash Watershed



E.5.3 SUMMARY TABLES

Flow Summary used in HEC-RAS Model

River / Reach Name	River Station (RS)	HEC-1 ID	Drainage Area (Square Miles)	10-Year, 6-Hour	10-Year, 24-Hour	10-Year Max Flow	50-Year, 6-Hour	50-Year, 24-Hour	50-Year Max Flow	100-Year, 6-Hour	100-Year, 24-Hour	100-Year Max Flow	500-Year, 6-Hour	500-Year, 24-Hour	500-Year Max Flow
				(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
Wash O	1.559	CO3	2.94	1040	1236	1236	1894	2018	2018	2284	2412	2412	3483	3625	3625
Mockingbird Wash	2.28	CMB06	3.51	1352	2222	2222	2836	3813	3813	3586	4735	4735	5472	6748	6748
	0.856	CMB07	6.5	1652	2572	2572	3393	4382	4382	4286	5482	5482	6564	7840	7840
	0.713	CMB07	6.5	1652	2572	2572	3393	4382	4382	4286	5482	5482	6564	7840	7840
Mockingbird Wash Tributary 1	0.385	CMB22	0.92	543	518	543	883	805	883	1052	935	1052	1565	1243	1565
	0.243	CMB23	1.26	784	791	791	1268	1218	1268	1052	1412	1412	2096	1869	2096
Wash M	1.039	M01	0.32	387	314	387	588	473	588	679	545	679	890	710	890
Wash L	1.658	L01	0.80	553	503	553	909	796	909	1072	931	1072	1452	1242	1452
Wash K	3.757	CK03	1.03	698	691	698	1210	1135	1210	1432	1327	1432	1947	1770	1947
	2.895	CK04 (pro-rated)	1.28	1165	1397	1397	2094	2274	2274	2514	2667	2664	3562	3688	3688
	1.561	CK04	3.08	1294	1567	1567	2327	2545	2545	2803	2988	2988	4049	4220	4220
Wash K-1	0.821	K02	0.78	577	540	577	963	866	963	1139	1013	1139	1548	1351	1548
Wash J	0.676	J01	0.41	380	314	380	614	498	614	721	581	721	969	773	969
Wash H	1.915	H01 (pro-rated)	1.49	648	648	648	1061	1000	1061	1253	1164	1253	1708	1550	1708
	1.006	H01	1.76	765	766	766	1253	1181	1253	1480	1375	1480	2018	1831	2018
Wash I	1.34	CI03	2.31	982	1136	1136	1741	1823	1823	2097	2139	2139	2934	2884	2934
Monarch Wash	3.984	CMW22 (pro-rated)	3.59	643	918	918	1316	1500	1500	1638	1782	1782	1677	1706	1706
	3.239	CMW22	3.90	699	997	997	1430	1630	1630	1779	1936	1936	2606	2652	2652
	2.382	CMW06	9.13	1525	2601	2601	3305	4373	4373	4172	5230	5230	6233	7345	7345
	2.301	CMW07	10.06	1506	2606	2606	3275	4381	4381	4150	5241	5241	6375	7599	7599
	0.556	CMW08	10.65	1520	2663	2663	3334	4473	4473	4236	5357	5357	6603	7957	7957
Wash G	1.148	G01	0.41	308	247	308	518	414	518	620	493	620	856	677	856
Wash F- Reach 1	1.094	F01 (Pro-rated)	0.13	157	126	157	246	196	246	287	229	287	382	303	382
Wash F- Reach 2	0.132	F01	0.26	315	254	315	494	395	494	577	460	577	768	610	768
Wash F Tributary	0.406	F01 (Pro-rated)	0.10	119	96	119	186	149	186	218	174	218	290	230	290
Basin HT07	1.499	HT07	0.89	507	479	507	885	794	885	1063	944	1063	1478	1287	1478
Ox Wash	2.186	COX1	3.97	1551	1729	1729	2661	2787	2787	3229	3319	3319	4475	4546	4546
	1.746	COX5	6.81	1880	2372	2372	3614	3958	3958	4443	4722	4722	6419	6663	6663
	0.812	COX6	6.93	1865	2385	2385	3609	3957	3957	4432	4726	4726	6446	6692	6692
	0.368	COX7	8.47	2121	2932	2932	4218	4824	4824	5213	5734	5734	7609	8092	8092
San Domingo Wash - Reach 1	2.328	CSD09	19.18	3059	5863	5863	6803	10366	10366	8733	12689	12689	13601	18950	18950
	1.039	CSD10	20.49	3252	6044	6044	7024	10611	10611	8993	12949	12949	13940	19326	19326
Little San Domingo - Reach 1	4.599	CLS05	5.04	1047	1228	1228	2279	2387	2387	2819	2882	2882	4060	4006	4060
	3.022	CLS07 (Pro-rated)	5.13	1095	1296	1296	2335	2464	2464	2905	2986	2986	4212	4178	4212
	2.471	CLS07	6.27	1245	1510	1510	2511	2709	2709	3178	3314	3314	4694	4722	4722
	2.161	CLS08	6.77	1259	1535	1535	2513	2733	2733	3211	3360	3360	4807	4840	4840
	1.211	CLS10	8.00	1337	1631	1631	2567	2865	2865	3295	3466	3466	4989	5036	5036
Little San Domingo - Reach 2	0.687	CLS09 (minus Wash S2)	N/A			1995			3332			4061			5746
	0.597	CLS09	8.76	1617	2200	2200	3130	3667	3667	3943	4456	4456	5740	6278	6278
Little San Domingo - Reach 3	0.476	CLS09	8.76	1617	2200	2200	3130	3667	3667	3943	4456	4456	5740	6278	6278
Little San Domingo Tributary 1 - Reach 1	2.131	LS21	0.51	419	351	419	674	554	674	791	644	791	1062	855	1062
	1.163	CLS22a	0.84	512	488	512	843	767	843	999	891	999	1366	1190	1366
Wash S2 - Reach 1	0.514	LS09 (Pro-rated)	0.30	224	205	224	378	336	378	450	396	450	616	533	616
	0.427	LS09 (Pro-rated+weir)	n/a			224			382			461			786

HEC-RAS Plan: All Floods

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Wash O	1	1.559 74	100yr	2412.00	2183.53	2185.70	2185.70	2186.44	0.014066	8.44	387.01	258.86	1.06
Wash O	1	1.559 74	Floodway	2412.00	2183.53	2186.59	2186.59	2187.97	0.012664	10.26	269.84	98.00	1.07
Wash O	1	1.45 73	100yr	2412.00	2168.39	2171.96	2171.96	2173.23	0.012709	11.47	292.28	112.50	1.09
Wash O	1	1.45 73	Floodway	2412.00	2168.39	2172.86	2172.86	2174.82	0.013521	12.62	222.73	55.00	1.07
Wash O	1	1.349 24	100yr	2412.00	2154.48	2158.36	2158.36	2159.89	0.011864	11.96	264.95	86.17	1.08
Wash O	1	1.349 24	Floodway	2412.00	2154.48	2159.29	2159.29	2161.55	0.013223	13.21	207.40	45.00	1.07
Wash O	1	1.255 58	100yr	2412.00	2142.86	2147.35	2147.35	2149.00	0.009122	11.43	262.24	80.11	0.97
Wash O	1	1.255 58	Floodway	2412.00	2142.86	2148.23	2148.23	2150.81	0.012392	12.88	187.26	35.84	0.99
Wash O	1	1.151 23	100yr	2412.00	2129.43	2133.01	2133.01	2134.35	0.013884	11.83	279.24	103.69	1.14
Wash O	1	1.151 23	Floodway	2412.00	2129.43	2133.79	2133.79	2135.74	0.015224	12.79	220.93	56.14	1.11
Wash O	1	1.061 72	100yr	2412.00	2116.87	2120.00	2120.00	2121.01	0.012561	9.48	340.93	165.33	1.00
Wash O	1	1.061 72	Floodway	2412.00	2116.87	2120.90	2120.90	2122.73	0.012626	11.03	227.58	62.00	1.01
Wash O	1	0.968 22	100yr	2412.00	2105.70	2109.63	2109.63	2111.29	0.013821	11.52	248.74	77.77	1.08
Wash O	1	0.968 22	Floodway	2412.00	2105.70	2110.46	2110.46	2112.64	0.013763	12.37	211.01	48.56	1.04
Wash O	1	0.868 57	100yr	2412.00	2092.82	2095.68	2095.68	2096.70	0.012163	8.60	324.20	167.54	0.96
Wash O	1	0.868 57	Floodway	2412.00	2092.82	2095.85	2095.85	2097.20	0.013787	9.31	259.16	97.30	1.00
Wash O	1	0.783 21	100yr	2412.00	2081.04	2083.85	2083.85	2084.65	0.019344	9.23	355.57	221.73	1.16
Wash O	1	0.783 21	Floodway	2412.00	2081.04	2084.71	2084.71	2086.01	0.017756	10.82	272.55	104.18	1.13
Wash O	1	0.719 71	100yr	2412.00	2072.37	2075.71	2075.71	2076.57	0.012568	10.16	376.12	196.70	1.01
Wash O	1	0.719 71	Floodway	2412.00	2072.37	2076.68	2076.68	2078.09	0.012865	11.32	276.65	89.75	0.99
Wash O	1	0.686 100	100yr	2412.00	2065.17	2069.12	2069.12	2069.82	0.011792	9.28	437.50	278.69	0.96
Wash O	1	0.686 100	Floodway	2412.00	2065.17	2070.10	2070.10	2071.32	0.010561	10.68	318.18	116.68	0.96
Wash O	1	0.653 1	100yr	2412.00	2060.52	2064.05	2064.05	2064.61	0.010249	8.56	519.80	392.73	0.90
Wash O	1	0.653 1	Floodway	2412.00	2060.52	2065.00	2065.00	2065.93	0.009607	9.56	382.20	177.00	0.87
Wash O	1	0.584 20	100yr	2412.00	2053.68	2056.40	2056.40	2057.08	0.012636	8.22	430.23	349.62	1.01
Wash O	1	0.584 20	Floodway	2412.00	2053.68	2057.25	2057.25	2058.78	0.013048	10.33	250.16	84.15	1.06
Wash O	1	0.505 79	100yr	2412.00	2043.61	2044.42	2044.42	2045.13	0.021586	4.66	364.00	261.59	1.07
Wash O	1	0.505 79	Floodway	2412.00	2043.61	2045.41	2045.41	2046.42	0.022362	8.99	301.70	160.11	1.26
Wash O	1	0.411 19	100yr	2412.00	2032.53	2035.07	2035.07	2035.68	0.010261	6.96	475.43	386.47	0.85
Wash O	1	0.411 19	Floodway	2412.00	2032.53	2035.18	2035.18	2036.27	0.014419	8.41	286.64	132.35	1.01
Wash O	1	0.339 56	100yr	2412.00	2024.78	2026.95	2026.95	2027.46	0.016366	8.34	542.67	462.36	1.07
Wash O	1	0.339 56	Floodway	2412.00	2024.78	2027.92	2027.92	2028.93	0.013226	9.60	359.27	165.05	1.00
Wash O	1	0.283 18	100yr	2412.00	2019.27	2022.39	2020.43	2022.44	0.000512	2.11	1483.58	548.90	0.23
Wash O	1	0.283 18	Floodway	2412.00	2019.27	2022.44	2020.87	2022.62	0.001834	3.92	710.40	233.01	0.42
Wash O	1	0.235 99	100yr	2412.00	2013.03	2021.48	2018.13	2022.08	0.001232	6.37	393.57	450.42	0.41
Wash O	1	0.235 99	Floodway	2412.00	2013.03	2021.43	2018.14	2022.08	0.001350	6.63	390.87	53.00	0.43
Wash O	1	0.217 718		Culvert									
Wash O	1	0.205 98	100yr	2412.00	2007.68	2013.25	2013.25	2015.41	0.007991	12.03	213.13	240.37	0.97
Wash O	1	0.205 98	Floodway	2412.00	2007.68	2013.25	2013.25	2015.44	0.008078	12.10	213.11	49.68	0.98
Wash O	1	0.159 96	100yr	2412.00	2003.39	2007.30	2007.30	2007.90	0.008039	9.32	542.78	422.73	0.90
Wash O	1	0.159 96	Floodway	2412.00	2003.39	2008.10	2008.10	2009.55	0.010241	11.64	279.30	91.82	1.01
Wash O	1	0.123 97	100yr	2412.00	1999.67	2005.11	2005.11	2005.78	0.004998	9.77	584.32	385.48	0.77
Wash O	1	0.123 97	Floodway	2412.00	1999.67	2005.48	2005.48	2007.05	0.009394	12.27	271.43	75.21	0.93
Wash L	1	1.658 66	100yr	1072.00	2150.02	2154.35	2154.35	2155.93	0.008348	10.74	119.64	41.38	0.94
Wash L	1	1.658 66	Floodway	1072.00	2150.02	2154.63	2154.63	2156.77	0.013645	11.75	91.26	21.00	0.99
Wash L	1	1.618 5	100yr	1072.00	2142.41	2148.15	2148.15	2149.90	0.007474	11.55	118.22	36.67	0.90
Wash L	1	1.618 5	Floodway	1072.00	2142.41	2148.54	2148.54	2151.26	0.016144	13.24	80.94	14.82	1.00
Wash L	1	1.561 65	100yr	1072.00	2130.21	2135.81	2135.81	2137.76	0.009124	11.77	107.71	30.85	0.92
Wash L	1	1.561 65	Floodway	1072.00	2130.21	2135.94	2135.94	2138.52	0.017065	12.89	83.17	16.00	1.00
Wash L	1	1.505 6	100yr	1072.00	2122.53	2126.92	2126.92	2128.62	0.009620	11.21	117.39	37.97	0.95
Wash L	1	1.505 6	Floodway	1072.00	2122.53	2127.27	2127.27	2129.57	0.016182	12.16	88.14	19.00	1.00
Wash L	1	1.463 52	100yr	1072.00	2115.06	2120.08	2120.08	2121.81	0.009045	11.24	118.03	38.70	0.93
Wash L	1	1.463 52	Floodway	1072.00	2115.06	2120.28	2120.28	2122.70	0.016446	12.48	85.90	18.00	1.01
Wash L	1	1.408 7	100yr	1072.00	2106.49	2111.97	2111.97	2114.14	0.009642	12.19	100.22	25.86	0.95
Wash L	1	1.408 7	Floodway	1072.00	2106.49	2112.04	2112.04	2114.62	0.017319	12.88	83.22	16.05	1.00
Wash L	1	1.364 64	100yr	1072.00	2100.56	2105.50	2105.50	2107.21	0.009347	10.99	115.35	37.73	0.93
Wash L	1	1.364 64	Floodway	1072.00	2100.56	2105.60	2105.60	2107.82	0.015197	11.94	89.80	20.26	1.00

HEC-RAS Plan: All Floods (Continued)

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Wash L	1	1.326 8	100yr	1072.00	2096.09	2099.75	2099.75	2101.12	0.011250	9.67	122.70	48.72	0.97
Wash L	1	1.326 8	Floodway	1072.00	2096.09	2100.65	2099.72	2101.53	0.005547	7.66	147.46	38.00	0.68
Wash L	1	1.29 51	100yr	1072.00	2091.79	2097.20	2097.20	2099.03	0.008881	11.63	116.01	35.49	0.92
Wash L	1	1.29 51	Floodway	1072.00	2091.79	2097.31	2097.31	2099.77	0.013635	12.85	89.45	18.35	1.01
Wash L	1	1.25 9	100yr	1072.00	2072.75	2080.69	2080.69	2083.16	0.011609	12.84	91.18	20.50	0.95
Wash L	1	1.25 9	Floodway	1072.00	2072.75	2080.69	2080.69	2083.16	0.011599	12.84	91.01	20.00	0.95
Wash L	1	1.214 81	100yr	1072.00	2067.62	2070.85	2070.85	2072.08	0.015859	10.38	134.00	53.94	1.05
Wash L	1	1.214 81	Floodway	1072.00	2067.62	2071.73	2071.73	2073.75	0.014856	11.90	101.74	26.00	1.06
Wash L	1	1.179 10	100yr	1072.00	2064.48	2066.94	2066.94	2067.66	0.016597	8.57	175.36	116.76	1.09
Wash L	1	1.179 10	Floodway	1072.00	2064.48	2067.73	2067.73	2069.09	0.015380	10.07	120.13	45.00	1.08
Wash L	1	1.131 50	100yr	1072.00	2058.38	2061.31	2061.31	2062.20	0.014347	8.21	157.44	88.71	0.95
Wash L	1	1.131 50	Floodway	1072.00	2058.38	2061.57	2061.57	2062.88	0.017369	9.19	116.60	45.00	1.01
Wash L	1	1.081 11	100yr	1072.00	2052.67	2054.05	2053.77	2054.37	0.012974	5.09	239.13	186.41	0.81
Wash L	1	1.081 11	Floodway	1072.00	2052.67	2054.89	2054.64	2055.60	0.012311	6.91	162.11	78.99	0.85
Wash L	1	1.037 49	100yr	1072.00	2048.18	2050.07	2050.07	2050.67	0.021267	7.54	187.34	153.28	1.08
Wash L	1	1.037 49	Floodway	1072.00	2048.18	2050.97	2050.97	2052.18	0.017823	9.14	124.99	52.84	1.03
Wash L	1	0.962 70	100yr	1072.00	2039.26	2041.75	2041.75	2042.30	0.013701	7.26	227.41	223.92	0.90
Wash L	1	0.962 70	Floodway	1072.00	2039.26	2042.36	2042.36	2043.67	0.016987	9.21	116.33	44.45	1.00
Wash L	1	0.902 12	100yr	1072.00	2032.23	2034.49	2034.49	2035.26	0.011861	8.45	187.63	118.41	1.06
Wash L	1	0.902 12	Floodway	1072.00	2032.23	2035.33	2035.33	2036.74	0.010933	9.55	112.29	39.98	1.00
Wash L	1	0.825 48	100yr	1072.00	2023.11	2025.83	2025.83	2026.92	0.011346	10.56	161.56	77.55	1.13
Wash L	1	0.825 48	Floodway	1072.00	2023.11	2026.70	2026.70	2028.52	0.012030	11.82	110.50	31.00	1.10
Wash L	1	0.78 13	100yr	1072.00	2018.36	2020.70	2020.70	2021.48	0.009986	7.95	183.89	117.96	1.01
Wash L	1	0.78 13	Floodway	1072.00	2018.36	2021.10	2021.10	2022.28	0.010315	8.74	122.67	52.47	1.01
Wash L	1	0.713 68	100yr	1072.00	2010.18	2012.70	2012.70	2013.38	0.013814	8.04	203.97	146.93	1.11
Wash L	1	0.713 68	Floodway	1072.00	2010.18	2013.53	2013.53	2014.75	0.010775	8.89	120.52	49.08	1.00
Wash L	1	0.668 14	100yr	1072.00	2004.61	2007.21	2007.21	2007.84	0.011368	8.21	233.01	186.02	1.04
Wash L	1	0.668 14	Floodway	1072.00	2004.61	2008.17	2008.17	2009.46	0.009063	9.58	136.10	55.00	0.99
Wash L	1	0.618 63	100yr	1072.00	1999.91	2001.45	2001.45	2001.98	0.022758	8.80	228.09	212.08	1.37
Wash L	1	0.618 63	Floodway	1072.00	1999.91	2002.37	2002.37	2003.36	0.013678	9.79	168.28	85.00	1.16
Wash L	1	0.586 15	100yr	1072.00	1995.41	1997.77	1997.77	1998.27	0.012232	6.71	246.21	234.37	1.01
Wash L	1	0.586 15	Floodway	1072.00	1995.41	1998.20	1998.20	1999.12	0.011582	7.69	139.39	77.84	1.01
Wash L	1	0.52 47	100yr	1072.00	1988.48	1991.34	1991.34	1991.76	0.004831	6.67	375.77	389.00	0.72
Wash L	1	0.52 47	Floodway	1072.00	1988.48	1991.68	1991.68	1993.20	0.010344	10.01	112.24	37.24	1.01
Wash L	1	0.492 16	100yr	1072.00	1985.31	1987.69	1987.69	1988.11	0.008460	6.98	318.04	346.95	0.89
Wash L	1	0.492 16	Floodway	1072.00	1985.31	1988.51	1988.51	1989.89	0.010731	9.43	113.63	41.69	1.01
Wash L	1	0.444 69	100yr	1072.00	1979.49	1985.24	1982.14	1985.25	0.000074	1.31	1710.10	475.93	0.10
Wash L	1	0.444 69	Floodway	1072.00	1979.49	1985.24	1982.26	1985.37	0.000451	3.23	459.79	96.00	0.25
Wash L	1	0.426 46	100yr	1072.00	1977.02	1985.24	1980.24	1985.24	0.000017	0.83	2605.32	425.55	0.05
Wash L	1	0.426 46	Floodway	1072.00	1977.02	1985.24	1980.24	1985.33	0.000184	2.70	565.11	75.00	0.17
Wash L	1	0.414		Culvert									
Wash L	1	0.375 109	100yr	1072.00	1968.84	1972.87	1972.87	1974.38	0.008446	10.03	114.91	486.27	0.97
Wash L	1	0.375 109	Floodway	1072.00	1968.84	1972.86	1972.86	1974.39	0.009542	10.09	114.55	38.00	0.98
Wash L	1	0.309 110	100yr	1072.00	1958.73	1960.02	1960.02	1960.31	0.009287	5.20	365.61	616.03	0.86
Wash L	1	0.309 110	Floodway	1072.00	1958.73	1960.23	1960.23	1960.91	0.012333	6.63	161.72	119.93	1.01
Wash L	1	0.241 111	100yr	1072.00	1944.61	1946.74	1946.74	1947.22	0.007535	6.26	279.12	300.76	0.83
Wash L	1	0.241 111	Floodway	1072.00	1944.61	1946.85	1946.85	1947.79	0.011197	7.79	137.67	73.71	1.00
MockingbirdTrib1	1	0.385 80	100yr	1052.00	2080.44	2083.37	2083.37	2084.10	0.012108	9.05	180.56	122.50	1.03
MockingbirdTrib1	1	0.385 80	Floodway	1052.00	2080.44	2084.14	2084.14	2085.65	0.013369	10.87	112.01	37.13	1.07
MockingbirdTrib1	1	0.287 34	100yr	1052.00	2069.31	2070.64	2070.64	2071.11	0.020656	7.31	201.01	211.20	1.20
MockingbirdTrib1	1	0.287 34	Floodway	1052.00	2069.31	2071.55	2071.55	2072.36	0.013674	8.77	159.76	95.00	1.08
MockingbirdTrib1	1	0.243 33	100yr	1492.00	2064.14	2065.37	2065.37	2065.79	0.022048	6.61	303.12	374.95	1.20
MockingbirdTrib1	1	0.243 33	Floodway	1492.00	2064.14	2066.37	2066.37	2067.33	0.013419	8.37	197.91	105.00	1.06
Mockingbird Wash	1	2.280 45	100yr	4735.00	2251.60	2257.11	2257.11	2259.11	0.006729	13.04	470.89	117.28	1.01
Mockingbird Wash	1	2.280 45	Floodway	4735.00	2251.60	2258.07	2258.07	2261.13	0.006853	14.73	361.65	60.32	1.05
Mockingbird Wash	1	2.245 62	100yr	4735.00	2246.04	2250.67	2250.67	2252.32	0.009177	13.44	512.00	162.02	1.14

HEC-RAS Plan: All Floods (Continued)

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Mockingbird Wash	1	2.245 62	Floodway	4735.00	2246.04	2251.64	2251.64	2253.86	0.009971	14.30	414.73	88.42	1.10
Mockingbird Wash	1	2.191 44	100yr	4735.00	2237.91	2242.41	2242.41	2244.33	0.009687	13.33	454.87	122.46	1.16
Mockingbird Wash	1	2.191 44	Floodway	4735.00	2237.91	2243.34	2243.34	2245.76	0.009438	13.99	395.15	80.32	1.10
Mockingbird Wash	1	2.137 3	100yr	4735.00	2229.38	2235.80	2235.80	2237.65	0.005051	12.06	513.26	136.91	0.89
Mockingbird Wash	1	2.137 3	Floodway	4735.00	2229.38	2236.33	2236.33	2239.45	0.007991	14.17	334.17	53.38	1.00
Mockingbird Wash	1	2.052 43	100yr	4735.00	2221.43	2227.21	2227.21	2228.73	0.005619	12.66	584.77	169.94	0.94
Mockingbird Wash	1	2.052 43	Floodway	4735.00	2221.43	2228.12	2228.12	2231.21	0.008555	15.40	352.53	56.00	1.06
Mockingbird Wash	1	1.985 42	100yr	4735.00	2212.01	2216.22	2216.22	2217.48	0.008749	12.33	605.34	267.20	1.10
Mockingbird Wash	1	1.985 42	Floodway	4735.00	2212.01	2217.20	2217.20	2219.09	0.008155	13.80	479.34	120.00	1.10
Mockingbird Wash	1	1.950 41	100yr	4735.00	2206.99	2211.40	2211.40	2212.42	0.006297	11.24	718.07	315.65	0.95
Mockingbird Wash	1	1.950 41	Floodway	4735.00	2206.99	2212.27	2212.27	2214.38	0.007948	14.27	452.56	103.00	1.10
Mockingbird Wash	1	1.872 40	100yr	4735.00	2196.48	2199.07	2199.07	2199.79	0.013587	11.02	755.62	500.56	1.26
Mockingbird Wash	1	1.872 40	Floodway	4735.00	2196.48	2200.03	2200.03	2201.24	0.012436	12.04	560.54	218.49	1.16
Mockingbird Wash	1	1.787 39	100yr	4735.00	2183.08	2189.61	2189.61	2191.16	0.004709	12.56	603.15	185.02	0.87
Mockingbird Wash	1	1.787 39	Floodway	4735.00	2183.08	2190.49	2190.49	2194.10	0.008469	16.17	322.18	45.00	1.05
Mockingbird Wash	1	1.712 60	100yr	4735.00	2171.97	2181.67	2181.67	2185.15	0.005794	17.64	375.19	57.75	1.02
Mockingbird Wash	1	1.712 60	Floodway	4735.00	2171.97	2182.62	2182.62	2187.86	0.010953	19.85	274.96	27.00	1.09
Mockingbird Wash	1	1.620 38	100yr	4735.00	2158.42	2170.73	2170.73	2175.05	0.004836	18.43	343.95	43.19	0.94
Mockingbird Wash	1	1.620 38	Floodway	4735.00	2158.42	2171.63	2171.63	2178.01	0.010440	20.72	249.39	20.00	1.02
Mockingbird Wash	1	1.568 4	100yr	4735.00	2151.14	2162.67	2162.67	2167.25	0.005082	18.67	327.55	39.70	0.98
Mockingbird Wash	1	1.568 4	Floodway	4735.00	2151.14	2163.39	2163.39	2169.39	0.010217	20.18	257.74	22.00	1.03
Mockingbird Wash	1	1.523 59	100yr	4735.00	2144.32	2159.16	2159.16	2164.27	0.005012	20.08	324.86	35.14	0.93
Mockingbird Wash	1	1.523 59	Floodway	4735.00	2144.32	2159.36	2159.36	2166.66	0.006288	22.70	263.44	20.00	1.05
Mockingbird Wash	1	1.451 37	100yr	4735.00	2134.29	2142.57	2142.57	2145.57	0.007114	15.53	384.50	63.59	0.98
Mockingbird Wash	1	1.451 37	Floodway	4735.00	2134.29	2143.27	2143.27	2147.39	0.010194	17.11	306.55	37.76	1.03
Mockingbird Wash	1	1.360 78	100yr	4735.00	2121.49	2126.99	2126.99	2128.64	0.008224	12.37	522.09	148.34	0.99
Mockingbird Wash	1	1.360 78	Floodway	4735.00	2121.49	2127.89	2127.89	2130.56	0.008706	14.26	391.87	73.79	1.05
Mockingbird Wash	1	1.304 104	100yr	4735.00	2114.88	2118.52	2118.52	2119.83	0.010403	10.75	565.29	213.48	1.05
Mockingbird Wash	1	1.304 104	Floodway	4735.00	2114.88	2119.35	2119.35	2121.26	0.009943	11.85	447.42	117.56	1.03
Mockingbird Wash	1	1.244 36	100yr	4735.00	2107.22	2109.81	2109.81	2110.88	0.015862	10.05	585.89	277.18	1.21
Mockingbird Wash	1	1.244 36	Floodway	4735.00	2107.22	2110.75	2110.75	2112.35	0.013529	11.50	478.49	152.00	1.15
Mockingbird Wash	1	1.178 67	100yr	4735.00	2098.84	2103.05	2103.05	2104.54	0.009008	11.02	531.88	172.33	1.00
Mockingbird Wash	1	1.178 67	Floodway	4735.00	2098.84	2103.90	2103.90	2106.20	0.008753	12.43	403.86	90.00	1.02
Mockingbird Wash	1	1.094 35	100yr	4735.00	2086.97	2089.74	2089.74	2090.79	0.012506	10.04	620.74	290.81	1.11
Mockingbird Wash	1	1.094 35	Floodway	4735.00	2086.97	2090.69	2090.69	2092.32	0.010523	11.37	490.36	150.00	1.07
Mockingbird Wash	1	1.005 77	100yr	4735.00	2074.40	2077.22	2077.22	2078.38	0.013311	10.50	579.47	249.37	1.14
Mockingbird Wash	1	1.005 77	Floodway	4735.00	2074.40	2078.20	2078.20	2079.78	0.010986	11.45	494.88	150.99	1.06
Mockingbird Wash	1	0.965 105	100yr	4735.00	2069.76	2071.39	2071.39	2072.14	0.020335	8.41	687.83	467.13	1.27
Mockingbird Wash	1	0.965 105	Floodway	4735.00	2069.76	2072.33	2072.33	2073.51	0.016215	10.64	556.65	240.00	1.24
Mockingbird Wash	1	0.917 723	100yr	4735.00	2063.06	2065.68	2065.68	2066.54	0.011557	8.98	672.14	394.84	1.01
Mockingbird Wash	1	0.917 723	Floodway	4735.00	2063.06	2066.67	2066.67	2067.95	0.010277	10.59	574.19	213.00	1.01
Mockingbird Wash	1	0.856 82	100yr	5482.00	2053.67	2056.17	2056.17	2057.06	0.008393	7.34	742.79	413.26	0.88
Mockingbird Wash	1	0.856 82	Floodway	5482.00	2053.67	2056.22	2056.22	2057.17	0.008653	7.41	702.75	372.34	0.88
Mockingbird Wash	1	0.801 61	100yr	5482.00	2046.49	2049.06	2049.06	2049.75	0.010675	7.71	867.34	655.63	0.97
Mockingbird Wash	1	0.801 61	Floodway	5482.00	2046.49	2049.50	2049.50	2050.54	0.011024	8.57	670.21	321.08	0.97
Mockingbird Wash	2	0.713 31	100yr	5482.00	2034.66	2040.02	2040.02	2041.05	0.006229	11.73	1119.63	468.16	0.93
Mockingbird Wash	2	0.713 31	Floodway	5482.00	2034.66	2040.97	2040.97	2042.62	0.007090	12.99	736.92	191.26	0.94
Mockingbird Wash	2	0.609 30	100yr	5482.00	2023.11	2028.29	2028.29	2029.36	0.006954	12.18	1037.97	474.96	0.97
Mockingbird Wash	2	0.609 30	Floodway	5482.00	2023.11	2029.18	2029.18	2030.90	0.008272	13.65	698.77	173.36	1.00
Mockingbird Wash	2	0.561 75	100yr	5482.00	2017.12	2023.16	2023.16	2024.36	0.005354	12.16	1029.64	351.12	0.89
Mockingbird Wash	2	0.561 75	Floodway	5482.00	2017.12	2023.76	2023.76	2025.94	0.006643	14.46	648.39	140.00	1.00
Mockingbird Wash	2	0.504 29	100yr	5482.00	2009.88	2018.61	2018.61	2019.99	0.003639	13.27	1157.62	393.55	0.82
Mockingbird Wash	2	0.504 29	Floodway	5482.00	2009.88	2018.61	2018.61	2020.63	0.004681	15.05	804.87	183.00	0.93
Mockingbird Wash	2	0.416 28	100yr	5482.00	2000.82	2008.30	2008.30	2009.05	0.002876	10.48	1832.61	896.94	0.71
Mockingbird Wash	2	0.416 28	Floodway	5482.00	2000.82	2009.28	2009.28	2011.85	0.005020	15.15	638.53	123.00	0.96
Mockingbird Wash	2	0.369 27	100yr	5482.00	1994.49	2002.08	2002.08	2002.71	0.002562	10.32	2301.78	1370.75	0.68
Mockingbird Wash	2	0.369 27	Floodway	5482.00	1994.49	2003.08	2003.08	2004.98	0.004156	14.34	873.32	200.00	0.88

HEC-RAS Plan: All Floods (Continued)

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Mockingbird Wash	2	0.324 103	100yr	5482.00	1990.21	1997.73	1993.50	1997.80	0.000451	4.27	3856.04	1146.08	0.28
Mockingbird Wash	2	0.324 103	Floodway	5482.00	1990.21	1998.64	1998.28	2001.48	0.004923	15.31	556.27	85.00	0.96
Mockingbird Wash	2	0.310 25	100yr	5482.00	1989.30	1997.48	1996.74	1997.71	0.001162	7.49	3201.28	1368.16	0.47
Mockingbird Wash	2	0.310 25	Floodway	5482.00	1989.30	1998.28	1998.28	2001.10	0.005391	17.19	650.13	108.00	1.02
Mockingbird Wash	2	0.302		Culvert									
Mockingbird Wash	2	0.272 102	100yr	5482.00	1985.34	1992.47	1992.47	1995.65	0.005757	14.46	395.60	1251.38	1.00
Mockingbird Wash	2	0.272 102	Floodway	5482.00	1985.34	1992.59	1992.59	1995.87	0.007223	14.54	377.03	57.00	1.00
Mockingbird Wash	2	0.236 101	100yr	5482.00	1980.56	1987.81	1987.81	1987.81	0.000012	0.68	13854.16	1341.39	0.05
Mockingbird Wash	2	0.236 101	Floodway	5482.00	1980.56	1988.21	1988.21	1991.51	0.005467	15.20	445.23	73.61	1.00

HEC-RAS Plan: Washes_I_K

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Wash K-1	Reach 1	0.821 87	100-YR	1139.00	2395.65	2399.35	2399.35	2400.24	0.021275	7.59	151.51	86.28	1.00
Wash K-1	Reach 1	0.821 87	FLOODWAY	1139.00	2395.65	2399.37	2399.37	2400.24	0.020596	7.52	153.03	86.27	0.98
Wash K-1	Reach 1	0.742 88	100-YR	1139.00	2384.81	2387.69	2387.69	2388.88	0.018131	10.39	157.41	97.18	1.19
Wash K-1	Reach 1	0.742 88	FLOODWAY	1139.00	2384.81	2388.50	2388.50	2389.82	0.011385	10.02	140.65	56.35	0.99
Wash K-1	Reach 1	0.633 86	100-YR	1139.00	2371.94	2374.11	2374.11	2374.88	0.025383	7.83	164.97	113.98	1.26
Wash K-1	Reach 1	0.633 86	FLOODWAY	1139.00	2371.94	2375.00	2375.00	2376.04	0.014833	8.59	147.11	72.63	1.05
Wash K-1	Reach 1	0.546 85	100-YR	1139.00	2358.95	2361.76	2361.76	2362.63	0.012761	8.00	168.41	95.15	0.98
Wash K-1	Reach 1	0.546 85	FLOODWAY	1139.00	2358.95	2361.99	2361.99	2363.13	0.013082	8.55	133.27	57.38	0.99
Wash K-1	Reach 1	0.464 84	100-YR	1139.00	2348.84	2354.69	2354.69	2356.56	0.011145	11.60	115.11	33.69	0.99
Wash K-1	Reach 1	0.464 84	FLOODWAY	1139.00	2348.84	2354.76	2354.76	2356.56	0.010567	11.40	117.25	33.70	0.96
Wash K-1	Reach 1	0.382 83	100-YR	1139.00	2340.99	2344.24	2344.24	2345.26	0.012705	8.98	157.72	77.82	1.01
Wash K-1	Reach 1	0.382 83	FLOODWAY	1139.00	2340.99	2344.76	2344.76	2346.19	0.012466	9.63	121.53	43.81	0.98
Wash K-1	Reach 1	0.292 82	100-YR	1139.00	2329.79	2333.37	2333.37	2334.61	0.011087	9.84	147.79	61.16	0.98
Wash K-1	Reach 1	0.292 82	FLOODWAY	1139.00	2329.79	2333.68	2333.68	2335.28	0.011118	10.49	122.24	39.39	1.00
Wash K-1	Reach 1	0.249 81	100-YR	1139.00	2324.11	2327.04	2326.05	2327.30	0.003623	5.07	314.84	135.41	0.55
Wash K-1	Reach 1	0.249 81	FLOODWAY	1139.00	2324.11	2327.23	2327.23	2328.67	0.011984	9.65	120.16	42.00	1.00
Wash K-1	Reach 1	0.223 80	100-YR	1139.00	2320.64	2324.76	2324.76	2326.35	0.011098	10.35	119.06	39.61	0.99
Wash K-1	Reach 1	0.223 80	FLOODWAY	1139.00	2320.64	2324.79	2324.79	2326.35	0.010705	10.24	120.47	39.62	0.97
Wash K-1	Reach 1	0.175 79	100-YR	1139.00	2314.98	2316.55	2316.55	2317.09	0.022112	8.45	220.68	191.49	1.22
Wash K-1	Reach 1	0.175 79	FLOODWAY	1139.00	2314.98	2317.41	2317.41	2318.53	0.017430	10.16	149.67	67.53	1.17
Wash K-1	Reach 1	0.144 89	100-YR	1139.00	2310.76	2313.25	2313.25	2314.02	0.014942	8.38	188.55	119.02	1.05
Wash K-1	Reach 1	0.144 89	FLOODWAY	1139.00	2310.76	2314.10	2314.10	2315.50	0.013010	9.58	121.71	44.40	1.01
Wash K-1	Reach 1	0.073 78	100-YR	1139.00	2301.50	2303.63	2303.33	2303.96	0.013674	6.02	265.87	239.68	0.94
Wash K-1	Reach 1	0.073 78	FLOODWAY	1139.00	2301.50	2304.44	2304.44	2305.29	0.015530	8.70	175.39	98.75	1.06
Wash K	Reach 1	3.757 77	100-YR	1432.00	2395.75	2398.54	2398.54	2399.18	0.015586	8.13	270.69	203.22	1.06
Wash K	Reach 1	3.757 77	FLOODWAY	1432.00	2395.75	2399.36	2399.36	2400.66	0.013826	9.62	165.95	65.10	1.04
Wash K	Reach 1	3.712 76	100-YR	1432.00	2391.37	2394.11	2394.11	2394.80	0.012686	8.33	267.47	176.44	0.99
Wash K	Reach 1	3.712 76	FLOODWAY	1432.00	2391.37	2394.77	2394.77	2396.09	0.012519	9.86	171.28	66.55	1.03
Wash K	Reach 1	3.628 75	100-YR	1432.00	2383.25	2385.55	2385.55	2386.03	0.010987	7.03	351.44	335.74	0.90
Wash K	Reach 1	3.628 75	FLOODWAY	1432.00	2383.25	2386.17	2386.17	2387.33	0.012115	8.90	175.70	77.21	0.99
Wash K	Reach 1	3.55 74	100-YR	1432.00	2374.03	2377.31	2377.31	2378.22	0.008199	8.42	241.64	141.84	0.84
Wash K	Reach 1	3.55 74	FLOODWAY	1432.00	2374.03	2377.38	2377.38	2378.87	0.012051	9.94	150.86	51.06	0.98
Wash K	Reach 1	3.481 73	100-YR	1432.00	2366.78	2370.01	2370.01	2371.31	0.010831	9.69	174.24	69.71	0.97
Wash K	Reach 1	3.481 73	FLOODWAY	1432.00	2366.78	2370.03	2370.03	2371.31	0.010573	9.61	175.67	69.70	0.96
Wash K	Reach 1	3.386 72	100-YR	1432.00	2356.40	2358.16	2358.16	2358.70	0.025117	7.21	260.93	260.81	1.23
Wash K	Reach 1	3.386 72	FLOODWAY	1432.00	2356.40	2359.02	2359.02	2359.85	0.014549	8.14	220.17	130.38	1.03
Wash K	Reach 1	3.305 71	100-YR	1432.00	2346.34	2349.33	2349.33	2350.17	0.012576	9.07	239.03	134.31	1.01
Wash K	Reach 1	3.305 71	FLOODWAY	1432.00	2346.34	2349.99	2349.99	2351.43	0.012108	10.38	166.33	59.04	1.03
Wash K	Reach 1	3.213 70	100-YR	1432.00	2334.92	2338.20	2338.20	2339.17	0.009758	8.71	223.07	123.57	0.91
Wash K	Reach 1	3.213 70	FLOODWAY	1432.00	2334.92	2338.39	2338.39	2339.85	0.012192	9.79	152.37	52.33	0.99
Wash K	Reach 1	3.123 69	100-YR	1432.00	2323.08	2326.46	2326.46	2327.79	0.011707	9.56	165.87	66.40	0.99
Wash K	Reach 1	3.123 69	FLOODWAY	1432.00	2323.08	2326.49	2326.49	2327.79	0.011303	9.45	167.78	66.41	0.98
Wash K	Reach 1	3.076 68	100-YR	1432.00	2317.58	2321.48	2321.48	2322.86	0.011795	10.85	177.16	64.08	1.03
Wash K	Reach 1	3.076 68	FLOODWAY	1432.00	2317.58	2321.52	2321.52	2322.86	0.011318	10.71	179.59	64.08	1.01
Wash K	Reach 1	3.02 67	100-YR	1432.00	2311.28	2313.36	2313.36	2314.11	0.024075	7.97	218.73	147.19	1.06
Wash K	Reach 1	3.02 67	FLOODWAY	1432.00	2311.28	2314.22	2314.22	2315.55	0.020453	9.33	156.81	60.06	1.02
Wash K	Reach 1	2.964 66	100-YR	1432.00	2303.04	2305.18	2305.18	2305.87	0.019218	6.75	225.93	190.02	0.94
Wash K	Reach 1	2.964 66	FLOODWAY	1432.00	2303.04	2305.19	2305.19	2305.87	0.019019	6.73	226.46	183.77	0.93
Wash K	Reach 2	2.895 65	100-YR	2664.00	2293.14	2294.81	2294.81	2295.30	0.026710	8.02	521.21	506.50	1.29
Wash K	Reach 2	2.895 65	FLOODWAY	2664.00	2293.14	2295.61	2295.61	2296.45	0.018519	9.38	408.81	237.51	1.17
Wash K	Reach 2	2.803 64	100-YR	2664.00	2280.88	2285.46	2285.46	2286.39	0.006124	9.16	520.21	310.71	0.77
Wash K	Reach 2	2.803 64	FLOODWAY	2664.00	2280.88	2285.50	2285.50	2286.78	0.007417	10.14	371.33	137.74	0.85
Wash K	Reach 2	2.707 63	100-YR	2664.00	2270.35	2275.18	2275.18	2276.34	0.007047	10.15	426.01	181.50	0.83
Wash K	Reach 2	2.707 63	FLOODWAY	2664.00	2270.35	2275.19	2275.19	2277.10	0.009770	11.98	273.24	70.90	0.98
Wash K	Reach 2	2.619 62	100-YR	2664.00	2262.63	2265.37	2265.37	2266.37	0.017004	9.99	374.13	186.18	1.15
Wash K	Reach 2	2.619 62	FLOODWAY	2664.00	2262.63	2266.23	2266.23	2267.70	0.013193	10.86	302.78	102.18	1.07
Wash K	Reach 2	2.533 61	100-YR	2664.00	2251.75	2254.49	2254.49	2255.32	0.012762	9.06	440.17	242.77	1.01
Wash K	Reach 2	2.533 61	FLOODWAY	2664.00	2251.75	2255.21	2255.21	2256.71	0.013218	10.56	291.49	97.70	1.04
Wash K	Reach 2	2.475 60	100-YR	2664.00	2244.63	2247.03	2247.03	2247.67	0.014653	8.34	509.24	369.86	1.04

HEC-RAS Plan: Washes_I_K (Continued)

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Wash K	Reach 2	2.475 60	FLOODWAY	2664.00	2244.63	2247.80	2247.80	2249.10	0.013477	9.95	316.20	122.22	1.06
Wash K	Reach 2	2.404 59	100-YR	2664.00	2236.51	2239.55	2239.55	2240.27	0.011792	8.95	495.91	299.44	0.98
Wash K	Reach 2	2.404 59	FLOODWAY	2664.00	2236.51	2240.24	2240.24	2241.54	0.011515	10.35	333.89	121.87	1.01
Wash K	Reach 2	2.329 58	100-YR	2664.00	2228.81	2230.59	2230.59	2231.25	0.024145	8.78	444.67	329.07	1.28
Wash K	Reach 2	2.329 58	FLOODWAY	2664.00	2228.81	2231.58	2231.58	2232.64	0.015421	9.88	362.42	165.04	1.11
Wash K	Reach 2	2.235 57	100-YR	2664.00	2217.46	2221.50	2221.50	2223.03	0.011297	11.44	314.48	103.16	1.03
Wash K	Reach 2	2.235 57	FLOODWAY	2664.00	2217.46	2221.90	2221.90	2223.73	0.010734	11.90	277.81	74.97	1.02
Wash K	Reach 2	2.141 56	100-YR	2664.00	2206.02	2210.32	2210.32	2211.39	0.008157	9.04	400.70	191.82	0.85
Wash K	Reach 2	2.141 56	FLOODWAY	2664.00	2206.02	2210.33	2210.33	2211.98	0.010993	10.51	270.86	84.32	0.99
Wash K	Reach 2	2.046 55	100-YR	2664.00	2194.38	2196.90	2196.90	2197.58	0.021373	8.17	449.37	345.72	1.19
Wash K	Reach 2	2.046 55	FLOODWAY	2664.00	2194.38	2197.87	2197.87	2198.93	0.012315	8.71	349.29	160.49	0.98
Wash K	Reach 2	1.976 54	100-YR	2664.00	2186.54	2189.54	2189.54	2190.35	0.016409	9.27	427.83	259.47	1.12
Wash K	Reach 2	1.976 54	FLOODWAY	2664.00	2186.54	2190.49	2190.49	2191.83	0.012957	10.54	324.44	120.00	1.05
Wash K	Reach 2	1.902 53	100-YR	2664.00	2179.65	2184.48	2184.48	2185.36	0.007767	9.89	496.28	234.65	0.86
Wash K	Reach 2	1.902 53	FLOODWAY	2664.00	2179.65	2184.99	2184.99	2186.53	0.009083	11.55	327.72	97.85	0.95
Wash K	Reach 2	1.843 52	100-YR	2664.00	2174.15	2178.77	2178.77	2180.18	0.008618	10.14	328.17	121.17	0.89
Wash K	Reach 2	1.843 52	FLOODWAY	2664.00	2174.15	2178.84	2178.84	2180.80	0.010466	11.31	243.36	63.27	0.99
Wash K	Reach 2	1.754 51	100-YR	2664.00	2165.58	2168.24	2167.90	2168.69	0.009407	5.91	544.45	320.84	0.71
Wash K	Reach 2	1.754 51	FLOODWAY	2664.00	2165.58	2168.35	2168.10	2169.11	0.012858	7.08	388.45	178.34	0.82
Wash K	Reach 2	1.709 50	100-YR	2664.00	2160.10	2163.18	2162.99	2165.26	0.022769	13.36	281.51	138.95	1.39
Wash K	Reach 2	1.709 50	FLOODWAY	2664.00	2160.10	2164.11	2164.11	2166.03	0.012455	11.90	259.07	69.44	1.07
Wash K	Reach 2	1.642 49	100-YR	2664.00	2152.40	2154.60	2154.60	2155.25	0.032401	7.34	421.72	352.59	1.18
Wash K	Reach 2	1.642 49	FLOODWAY	2664.00	2152.40	2155.58	2155.58	2156.63	0.020284	8.57	332.89	159.72	1.02
Wash K	Reach 2	1.561 48	100-YR	2988.00	2142.28	2145.70	2145.70	2146.84	0.011710	8.70	367.61	170.95	0.97
Wash K	Reach 2	1.561 48	FLOODWAY	2988.00	2142.28	2145.72	2145.72	2146.84	0.011457	8.64	370.28	170.95	0.96
Wash K	Reach 2	1.487 47	100-YR	2988.00	2134.18	2137.93	2137.93	2139.28	0.010208	9.95	380.12	155.12	0.95
Wash K	Reach 2	1.487 47	FLOODWAY	2988.00	2134.18	2138.06	2138.06	2139.78	0.011901	10.72	294.43	87.06	1.01
Wash K	Reach 2	1.387 46	100-YR	2988.00	2123.32	2126.97	2126.97	2128.32	0.011667	9.42	333.29	136.42	0.99
Wash K	Reach 2	1.387 46	FLOODWAY	2988.00	2123.32	2126.97	2126.97	2128.40	0.012795	9.60	311.24	110.33	1.01
Wash K	Reach 2	1.317 45	100-YR	2988.00	2116.00	2119.58	2119.58	2120.97	0.011570	10.13	356.86	132.72	1.00
Wash K	Reach 2	1.317 45	FLOODWAY	2988.00	2116.00	2119.99	2119.99	2121.72	0.011347	10.60	286.76	82.33	0.99
Wash K	Reach 2	1.227 44	100-YR	2988.00	2103.36	2107.68	2107.68	2109.06	0.010693	9.71	338.48	131.39	1.01
Wash K	Reach 2	1.227 44	FLOODWAY	2988.00	2103.36	2107.70	2107.70	2109.13	0.010823	9.81	323.49	115.43	1.01
Wash K	Reach 2	1.144 43	100-YR	2988.00	2094.14	2097.79	2097.79	2099.48	0.015296	10.50	292.50	90.31	0.99
Wash K	Reach 2	1.144 43	FLOODWAY	2988.00	2094.14	2097.80	2097.80	2099.48	0.015194	10.48	293.12	90.32	0.99
Wash K	Reach 2	1.047 42	100-YR	2988.00	2082.52	2087.43	2087.43	2089.04	0.007858	11.07	362.38	121.80	0.93
Wash K	Reach 2	1.047 42	FLOODWAY	2988.00	2082.52	2087.74	2087.74	2090.04	0.009686	12.28	253.02	57.13	0.99
Wash K	Reach 2	0.951 41	100-YR	2988.00	2071.46	2076.10	2076.10	2077.93	0.009242	11.40	307.48	89.26	0.99
Wash K	Reach 2	0.951 41	FLOODWAY	2988.00	2071.46	2076.23	2076.23	2078.18	0.009947	11.55	285.89	76.72	0.99
Wash K	Reach 2	0.851 40	100-YR	2988.00	2058.03	2063.12	2063.12	2065.19	0.008395	12.23	296.76	77.24	0.97
Wash K	Reach 2	0.851 40	FLOODWAY	2988.00	2058.03	2063.14	2063.14	2065.19	0.008251	12.16	298.55	77.25	0.97
Wash K	Reach 2	0.759 39	100-YR	2988.00	2044.02	2050.06	2050.06	2052.08	0.008565	12.97	323.23	83.31	0.99
Wash K	Reach 2	0.759 39	FLOODWAY	2988.00	2044.02	2050.16	2050.16	2052.08	0.007946	12.65	331.77	83.30	0.96
Wash K	Reach 2	0.693 38	100-YR	2988.00	2029.34	2039.47	2039.47	2043.16	0.006942	16.82	220.62	32.08	0.95
Wash K	Reach 2	0.693 38	FLOODWAY	2988.00	2029.34	2039.58	2039.58	2043.16	0.006627	16.57	224.34	32.07	0.93
Wash K	Reach 2	0.644 37	100-YR	2988.00	2014.82	2019.29	2019.29	2020.78	0.009476	10.94	369.99	123.72	0.95
Wash K	Reach 2	0.644 37	FLOODWAY	2988.00	2014.82	2019.90	2019.90	2022.26	0.011042	12.35	245.77	51.87	1.00
Wash K	Reach 2	0.567 36	100-YR	2988.00	2003.56	2007.56	2007.56	2009.14	0.015509	10.72	320.07	102.38	0.99
Wash K	Reach 2	0.567 36	FLOODWAY	2988.00	2003.56	2007.97	2007.97	2010.00	0.017663	11.46	260.80	64.07	1.00
Wash K	Reach 2	0.501 35	100-YR	2988.00	1993.76	2000.76	2000.76	2003.55	0.008949	13.91	249.69	49.04	0.98
Wash K	Reach 2	0.501 35	FLOODWAY	2988.00	1993.76	2000.83	2000.83	2003.54	0.008603	13.74	253.10	49.03	0.96
Wash K	Reach 2	0.434 34	100-YR	2988.00	1986.92	1992.49	1992.49	1994.62	0.008967	12.18	285.75	73.50	0.95
Wash K	Reach 2	0.434 34	FLOODWAY	2988.00	1986.92	1992.56	1992.56	1994.62	0.008517	11.98	291.01	73.50	0.93
Wash K	Reach 2	0.379 33	100-YR	2988.00	1979.32	1983.99	1983.99	1985.21	0.011709	11.40	404.95	148.06	0.97
Wash K	Reach 2	0.379 33	FLOODWAY	2988.00	1979.32	1984.94	1984.94	1986.98	0.013847	12.98	285.23	66.13	1.00
Wash K	Reach 2	0.288 32	100-YR	2988.00	1968.64	1972.86	1972.86	1974.00	0.010137	9.71	423.44	175.02	0.89
Wash K	Reach 2	0.288 32	FLOODWAY	2988.00	1968.64	1973.16	1973.16	1975.09	0.012721	11.46	281.04	73.55	1.01
Wash K	Reach 2	0.192 31	100-YR	2988.00	1957.83	1968.27	1962.58	1968.31	0.000153	2.30	2056.70	304.96	0.13
Wash K	Reach 2	0.192 31	FLOODWAY	2988.00	1957.83	1968.98	1962.47	1969.06	0.000211	2.83	1490.10	176.09	0.15

HEC-RAS Plan: Washes_I_K (Continued)

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Wash K	Reach 2	0.157 30	100-YR	2988.00	1954.31	1968.28	1958.72	1968.29	0.000023	1.07	4124.53	390.52	0.05
Wash K	Reach 2	0.157 30	FLOODWAY	2988.00	1954.31	1969.01	1958.88	1969.03	0.000048	1.60	2585.03	210.00	0.08
Wash K	Reach 2	0.138 29	100-YR	2988.00	1951.89	1968.28	1955.77	1968.29	0.000020	1.13	4091.98	345.92	0.05
Wash K	Reach 2	0.138 29	FLOODWAY	2988.00	1951.89	1969.01	1955.72	1969.02	0.000026	1.32	3299.82	235.71	0.06
Wash K	Reach 2	0.127		Bridge									
Wash K	Reach 2	0.119 28	100-YR	2988.00	1950.62	1963.50	1955.16	1963.53	0.000075	1.78	2819.49	477.10	0.09
Wash K	Reach 2	0.119 28	FLOODWAY	2988.00	1950.62	1964.15	1955.19	1964.21	0.000113	2.25	1931.76	270.00	0.11
Wash K	Reach 2	0.117 27	100-YR	2988.00	1950.13	1963.49	1955.35	1963.53	0.000082	1.79	2649.94	551.17	0.09
Wash K	Reach 2	0.117 27	FLOODWAY	2988.00	1950.13	1964.15	1955.34	1964.21	0.000100	2.05	1894.14	270.00	0.11
Wash K	Reach 2	0.109		Bridge									
Wash K	Reach 2	0.1 26	100-YR	2988.00	1949.24	1954.33	1954.33	1955.97	0.010241	10.80	322.67	289.81	0.91
Wash K	Reach 2	0.1 26	FLOODWAY	2988.00	1949.24	1954.35	1954.35	1955.97	0.010087	10.74	324.41	289.95	0.90
Wash K	Reach 2	0.097 25	100-YR	2988.00	1947.44	1952.33	1952.33	1953.27	0.007851	9.14	503.13	448.84	0.79
Wash K	Reach 2	0.097 25	FLOODWAY	2988.00	1947.44	1952.33	1952.33	1953.27	0.007858	9.14	502.95	448.83	0.79
Wash I	Reach 1	1.34 24	100-YR	2139.00	2070.40	2074.52	2074.52	2076.00	0.010798	10.18	236.67	84.04	0.96
Wash I	Reach 1	1.34 24	FLOODWAY	2139.00	2070.40	2074.57	2074.57	2075.99	0.010270	10.01	240.67	84.04	0.94
Wash I	Reach 1	1.237 23	100-YR	2139.00	2059.42	2063.22	2063.22	2064.81	0.011341	10.35	221.53	73.37	0.98
Wash I	Reach 1	1.237 23	FLOODWAY	2139.00	2059.42	2063.28	2063.28	2064.81	0.010725	10.17	225.57	73.37	0.95
Wash I	Reach 1	1.142 22	100-YR	2139.00	2049.28	2052.74	2052.74	2054.27	0.012102	10.08	221.77	75.12	1.00
Wash I	Reach 1	1.142 22	FLOODWAY	2139.00	2049.28	2052.78	2052.78	2054.27	0.011619	9.95	224.62	75.11	0.98
Wash I	Reach 1	1.044 21	100-YR	2139.00	2037.44	2042.10	2042.10	2043.55	0.012436	10.71	237.35	81.23	1.01
Wash I	Reach 1	1.044 21	FLOODWAY	2139.00	2037.44	2042.86	2042.86	2044.91	0.011665	11.83	194.50	48.40	1.01
Wash I	Reach 1	0.939 20	100-YR	2139.00	2024.69	2028.61	2028.61	2030.19	0.012839	11.28	244.99	79.91	1.05
Wash I	Reach 1	0.939 20	FLOODWAY	2139.00	2024.69	2029.52	2029.52	2031.77	0.012607	12.12	182.09	40.67	1.01
Wash I	Reach 1	0.839 19	100-YR	2139.00	2013.26	2016.69	2016.69	2017.74	0.011211	9.88	329.55	144.89	0.96
Wash I	Reach 1	0.839 19	FLOODWAY	2139.00	2013.26	2017.24	2017.24	2019.08	0.012447	11.54	216.72	61.14	1.04
Wash I	Reach 1	0.741 18	100-YR	2139.00	2000.39	2003.33	2003.33	2004.45	0.014625	10.11	298.20	132.71	1.07
Wash I	Reach 1	0.741 18	FLOODWAY	2139.00	2000.39	2004.20	2004.20	2005.97	0.013548	11.12	212.83	60.22	1.03
Wash I	Reach 1	0.662 17	100-YR	2139.00	1991.00	1994.25	1994.25	1995.30	0.012797	10.11	327.37	149.76	1.02
Wash I	Reach 1	0.662 17	FLOODWAY	2139.00	1991.00	1994.93	1994.93	1996.81	0.013215	11.76	213.38	58.54	1.07
Wash I	Reach 1	0.597 16	100-YR	2139.00	1983.17	1984.91	1984.91	1985.61	0.029941	9.47	350.01	253.12	1.38
Wash I	Reach 1	0.597 16	FLOODWAY	2139.00	1983.17	1985.87	1985.87	1986.77	0.017544	10.12	336.62	173.12	1.15
Wash I	Reach 1	0.526 15	100-YR	2139.00	1974.91	1978.62	1978.62	1979.62	0.011144	10.13	351.71	160.71	0.97
Wash I	Reach 1	0.526 15	FLOODWAY	2139.00	1974.91	1979.11	1979.11	1980.40	0.010417	10.70	296.79	107.11	0.96
Wash I	Reach 1	0.502 14	100-YR	2139.00	1972.24	1976.06	1976.06	1977.04	0.010798	10.05	360.97	171.63	0.95
Wash I	Reach 1	0.502 14	FLOODWAY	2139.00	1972.24	1976.71	1976.71	1978.30	0.012469	11.34	246.77	75.74	0.99
Wash I	Reach 1	0.442 13	100-YR	2139.00	1964.66	1969.15	1969.15	1970.67	0.010036	11.29	254.12	79.87	0.96
Wash I	Reach 1	0.442 13	FLOODWAY	2139.00	1964.66	1969.49	1969.49	1971.64	0.011268	12.58	202.24	48.64	1.03
Wash I	Reach 1	0.352 12	100-YR	2139.00	1953.70	1957.21	1957.21	1958.37	0.015711	10.40	292.16	121.24	0.98
Wash I	Reach 1	0.352 12	FLOODWAY	2139.00	1953.70	1957.86	1957.86	1959.68	0.018178	11.76	212.30	57.53	1.02
Wash I	Reach 1	0.274 11	100-YR	2139.00	1944.22	1948.29	1948.29	1949.71	0.013051	10.15	255.94	113.08	0.91
Wash I	Reach 1	0.274 11	FLOODWAY	2139.00	1944.22	1948.51	1948.43	1950.42	0.017280	11.08	193.00	47.49	0.97
Wash I	Reach 1	0.206 10	100-YR	2139.00	1935.56	1940.49	1940.49	1941.56	0.011359	9.91	338.16	151.83	0.85
Wash I	Reach 1	0.206 10	FLOODWAY	2139.00	1935.56	1941.39	1941.39	1943.96	0.018560	12.86	166.32	32.20	1.00
Wash I	Reach 1	0.147 9	100-YR	2139.00	1929.20	1939.20	1932.82	1939.22	0.000087	1.47	2286.28	300.88	0.09
Wash I	Reach 1	0.147 9	FLOODWAY	2139.00	1929.20	1939.38	1934.03	1939.74	0.001326	4.85	441.19	47.23	0.28
Wash I	Reach 1	0.129 8	100-YR	2139.00	1927.37	1939.01	1932.77	1939.16	0.000443	3.26	761.46	298.33	0.19
Wash I	Reach 1	0.129 8	FLOODWAY	2139.00	1927.37	1939.39	1932.76	1939.57	0.000596	3.40	628.25	63.40	0.19
Wash I	Reach 1	0.122		Bridge									
Wash I	Reach 1	0.106 7	100-YR	2139.00	1924.76	1930.28	1930.28	1932.51	0.015087	11.97	178.69	431.12	1.00
Wash I	Reach 1	0.106 7	FLOODWAY	2139.00	1924.76	1930.28	1930.28	1932.51	0.015087	11.97	178.69	51.74	1.00

HEC-RAS Plan: Basic Plan File

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Wash M	Reach 1	1.039 29	100-Year	679.00	2061.02	2067.02	2067.02	2068.71	0.007883	11.17	78.24	26.45	0.93
Wash M	Reach 1	1.039 29	Floodway	679.00	2061.02	2067.02	2067.02	2068.71	0.007883	11.17	78.24	26.45	0.93
Wash M	Reach 1	0.944 30	100-Year	679.00	2045.70	2050.69	2050.69	2051.94	0.010332	10.81	92.72	36.86	0.98
Wash M	Reach 1	0.944 30	Floodway	679.00	2045.70	2050.69	2050.69	2051.94	0.010332	10.81	92.72	36.86	0.98
Wash M	Reach 1	0.872 31	100-Year	679.00	2038.55	2041.32	2041.32	2042.01	0.012586	8.53	127.11	91.09	1.08
Wash M	Reach 1	0.872 31	Floodway	679.00	2038.55	2041.32	2041.32	2042.01	0.012586	8.53	127.11	91.09	1.08
Wash M	Reach 1	0.769 32	100-Year	679.00	2026.10	2030.63	2030.63	2031.98	0.007909	11.04	94.58	36.32	0.97
Wash M	Reach 1	0.769 32	Floodway	679.00	2026.10	2030.63	2030.63	2031.98	0.007909	11.04	94.58	36.32	0.97
Wash M	Reach 1	0.67 33	100-Year	679.00	2004.39	2008.08	2008.08	2009.16	0.010289	9.51	97.18	45.74	1.02
Wash M	Reach 1	0.67 33	Floodway	679.00	2004.39	2008.08	2008.08	2009.16	0.010289	9.51	97.18	45.74	1.02
Wash M	Reach 1	0.58 34	100-Year	679.00	1993.01	1996.88	1996.79	1997.33	0.007232	6.92	191.98	149.49	0.77
Wash M	Reach 1	0.58 34	Floodway	679.00	1993.01	1996.88	1996.79	1997.33	0.007232	6.92	191.98	149.49	0.77
Wash M	Reach 1	0.494 36	100-Year	679.00	1983.25	1990.08	1990.08	1993.12	0.008777	14.01	48.47	355.44	1.00
Wash M	Reach 1	0.494 36	Floodway	679.00	1983.25	1990.08	1990.08	1993.12	0.008777	14.01	48.47	355.44	1.00
Wash M	Reach 1	0.473		Culvert									
Wash M	Reach 1	0.448 35	100-Year	679.00	1977.58	1977.85	1977.85	1978.20	0.037799	3.24	146.15	236.58	1.20
Wash M	Reach 1	0.448 35	Floodway	679.00	1977.58	1977.85	1977.85	1978.20	0.037799	3.24	146.15	236.58	1.20
Wash M	Reach 1	0.354 38	100-Year	679.00	1966.66	1968.70	1967.64	1968.74	0.001949	2.92	453.69	280.71	0.38
Wash M	Reach 1	0.354 38	Floodway	679.00	1966.66	1968.70	1967.64	1968.74	0.001949	2.92	453.69	280.71	0.38
Wash M	Reach 1	0.255 201	100-Year	679.00	1963.78	1965.81	1965.81	1966.48	0.014825	6.91	117.49	105.85	1.02
Wash M	Reach 1	0.255 201	Floodway	679.00	1963.78	1965.81	1965.81	1966.48	0.014825	6.91	117.49	105.85	1.02
Wash J	Reach 1	0.676 24	100-Year	721.00	2029.22	2032.88	2032.88	2034.19	0.008345	9.71	92.87	41.35	0.94
Wash J	Reach 1	0.676 24	Floodway	721.00	2029.22	2032.88	2032.88	2034.19	0.008345	9.71	92.87	41.35	0.94
Wash J	Reach 1	0.58 78	100-Year	721.00	2010.99	2014.31	2014.31	2015.67	0.009802	9.38	80.00	32.53	0.98
Wash J	Reach 1	0.58 78	Floodway	721.00	2010.99	2014.31	2014.31	2015.67	0.009802	9.38	80.00	32.53	0.98
Wash J	Reach 1	0.488 25	100-Year	721.00	1991.94	1995.84	1995.84	1997.36	0.009178	10.19	79.90	29.54	0.98
Wash J	Reach 1	0.488 25	Floodway	721.00	1991.94	1995.84	1995.84	1997.36	0.009178	10.19	79.90	29.54	0.98
Wash J	Reach 1	0.399 26	100-Year	721.00	1966.16	1970.16	1970.16	1971.81	0.008833	10.54	76.48	25.69	0.96
Wash J	Reach 1	0.399 26	Floodway	721.00	1966.16	1970.16	1970.16	1971.81	0.008833	10.54	76.48	25.69	0.96
Wash J	Reach 1	0.297 77	100-Year	721.00	1940.62	1943.55	1943.55	1944.36	0.012464	9.05	117.34	68.86	1.06
Wash J	Reach 1	0.297 77	Floodway	721.00	1940.62	1943.55	1943.55	1944.36	0.012464	9.05	117.34	68.86	1.06
Wash J	Reach 1	0.208 27	100-Year	721.00	1931.38	1941.33	1934.16	1941.37	0.000059	1.62	612.99	101.57	0.09
Wash J	Reach 1	0.208 27	Floodway	721.00	1931.38	1941.33	1934.16	1941.37	0.000059	1.62	612.99	101.57	0.09
Wash J	Reach 1	0.138 28	100-Year	721.00	1927.23	1940.34	1933.77	1941.10	0.000712	6.99	103.22	418.29	0.34
Wash J	Reach 1	0.138 28	Floodway	721.00	1927.23	1940.34	1933.77	1941.10	0.000712	6.99	103.22	418.29	0.34
Wash J	Reach 1	0.123		Culvert									
Wash J	Reach 1	0.11 37	100-Year	721.00	1924.59	1930.94	1930.94	1931.83	0.009450	8.30	114.15	66.41	0.89
Wash J	Reach 1	0.11 37	Floodway	721.00	1924.59	1930.94	1930.94	1931.83	0.009450	8.30	114.15	66.41	0.89
Wash H	Reach 1	1.915 1	100-Year	1253.00	2051.15	2054.42	2054.42	2055.23	0.008797	8.28	244.63	185.45	0.88
Wash H	Reach 1	1.915 1	Floodway	1253.00	2051.15	2054.76	2054.76	2056.31	0.012783	10.01	125.19	40.31	1.00
Wash H	Reach 1	1.792 2	100-Year	1253.00	2042.44	2044.92	2044.92	2045.57	0.012661	6.70	214.81	177.25	0.96
Wash H	Reach 1	1.792 2	Floodway	1253.00	2042.44	2044.96	2044.96	2045.75	0.014032	7.11	177.06	114.84	1.00
Wash H	Reach 1	1.686 76	100-Year	1253.00	2033.58	2035.73	2035.73	2036.20	0.012073	6.48	288.06	280.80	0.93
Wash H	Reach 1	1.686 76	Floodway	1253.00	2033.58	2036.14	2036.14	2037.11	0.013539	7.89	158.75	83.32	1.01
Wash H	Reach 1	1.556 75	100-Year	1253.00	2021.12	2024.87	2024.87	2025.38	0.006379	7.66	351.93	287.98	0.75
Wash H	Reach 1	1.556 75	Floodway	1253.00	2021.12	2025.42	2025.42	2026.62	0.008483	9.80	178.60	72.47	0.88
Wash H	Reach 1	1.449 3	100-Year	1253.00	2012.37	2015.75	2015.75	2016.48	0.008002	8.31	268.22	205.00	0.84
Wash H	Reach 1	1.449 3	Floodway	1253.00	2012.37	2016.13	2016.13	2017.19	0.008181	9.10	190.59	88.95	0.87
Wash H	Reach 1	1.313 4	100-Year	1253.00	2003.10	2004.43	2004.43	2004.93	0.031821	8.45	238.55	245.60	1.43
Wash H	Reach 1	1.313 4	Floodway	1253.00	2003.10	2005.43	2005.43	2006.17	0.017098	9.56	216.71	136.51	1.17
Wash H	Reach 1	1.209 74	100-Year	1253.00	1993.44	1997.15	1997.15	1997.86	0.005903	7.63	276.66	224.34	0.73
Wash H	Reach 1	1.209 74	Floodway	1253.00	1993.44	1997.18	1997.18	1998.35	0.008206	9.04	173.88	102.87	0.86
Wash H	Reach 1	1.110 73	100-Year	1253.00	1985.61	1987.92	1987.92	1988.67	0.010166	7.49	217.58	151.80	0.91
Wash H	Reach 1	1.110 73	Floodway	1253.00	1985.61	1988.03	1988.03	1989.16	0.013226	8.53	146.87	65.85	1.01
Wash H	Reach 1	1.006 72	100-Year	1480.00	1975.88	1979.17	1979.17	1979.82	0.008590	7.97	317.77	223.70	0.86
Wash H	Reach 1	1.006 72	Floodway	1480.00	1975.88	1979.78	1979.78	1981.28	0.010313	10.03	161.07	54.90	0.98
Wash H	Reach 1	0.899 71	100-Year	1480.00	1967.67	1970.81	1970.81	1971.40	0.007793	7.72	341.47	247.81	0.82
Wash H	Reach 1	0.899 71	Floodway	1480.00	1967.67	1971.46	1971.46	1972.93	0.009807	9.97	164.39	57.49	0.95

HEC-RAS Plan: Basic Plan File (Continued)

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Wash H	Reach 1	0.796 5	100-Year	1480.00	1957.73	1960.03	1960.03	1960.71	0.017683	9.46	268.97	187.76	1.18
Wash H	Reach 1	0.796 5	Floodway	1480.00	1957.73	1960.73	1960.73	1961.80	0.014354	10.42	210.15	94.25	1.12
Wash H	Reach 1	0.702 6	100-Year	1480.00	1947.18	1950.02	1950.02	1950.84	0.015636	10.36	260.97	168.60	1.15
Wash H	Reach 1	0.702 6	Floodway	1480.00	1947.18	1950.94	1950.94	1952.14	0.011462	10.93	205.49	79.88	1.04
Wash H	Reach 1	0.603 70	100-Year	1480.00	1935.90	1939.62	1939.62	1941.34	0.011633	10.78	150.93	53.94	1.04
Wash H	Reach 1	0.603 70	Floodway	1480.00	1935.90	1939.86	1939.86	1941.61	0.011519	10.64	140.34	40.86	0.99
Wash H	Reach 1	0.521 7	100-Year	1480.00	1927.61	1930.88	1930.88	1932.26	0.010709	9.51	162.31	65.67	0.98
Wash H	Reach 1	0.521 7	Floodway	1480.00	1927.61	1930.92	1930.92	1932.26	0.010135	9.35	165.41	65.67	0.95
Wash H	Reach 1	0.418 69	100-Year	1480.00	1916.24	1920.01	1920.01	1921.22	0.009112	9.30	192.59	82.90	0.91
Wash H	Reach 1	0.418 69	Floodway	1480.00	1916.24	1920.06	1920.06	1921.71	0.012260	10.31	143.49	43.94	1.01
Wash H	Reach 1	0.318 68	100-Year	1480.00	1905.62	1908.28	1908.28	1909.06	0.012461	8.61	257.96	165.37	1.01
Wash H	Reach 1	0.318 68	Floodway	1480.00	1905.62	1908.58	1908.58	1909.81	0.014045	9.69	178.82	73.33	1.07
Wash H	Reach 1	0.214 8	100-Year	1480.00	1896.79	1898.96	1897.19	1899.00	0.001199	2.77	925.62	379.23	0.35
Wash H	Reach 1	0.214 8	Floodway	1480.00	1896.79	1899.95	1898.74	1900.36	0.004021	6.67	358.50	115.00	0.68
Wash H	Reach 1	0.143 9	100-Year	1480.00	1889.86	1895.26	1895.26	1897.33	0.013306	11.55	128.12	665.91	1.00
Wash H	Reach 1	0.143 9	Floodway	1480.00	1889.86	1895.26	1895.26	1897.33	0.013306	11.55	128.12	186.63	1.00
Wash H	Reach 1	0.13		Culvert									
Wash H	Reach 1	0.117 67	100-Year	1480.00	1887.17	1891.78	1891.78	1893.88	0.012204	11.80	130.74	298.40	1.00
Wash H	Reach 1	0.117 67	Floodway	1480.00	1887.17	1891.78	1891.78	1893.88	0.012204	11.80	130.74	49.39	1.00
Monarch Wash	Reach 1	3.984 10	100-Year	1782.00	2370.79	2374.04	2374.04	2375.27	0.011743	9.75	231.66	100.86	1.00
Monarch Wash	Reach 1	3.984 10	Floodway	1782.00	2370.79	2374.51	2374.51	2376.27	0.013296	10.64	167.48	48.84	1.01
Monarch Wash	Reach 1	3.874 66	100-Year	1782.00	2355.24	2359.34	2359.34	2360.77	0.011059	9.80	201.91	81.23	0.98
Monarch Wash	Reach 1	3.874 66	Floodway	1782.00	2355.24	2359.35	2359.35	2360.93	0.012349	10.15	179.86	57.48	1.01
Monarch Wash	Reach 1	3.774 65	100-Year	1782.00	2342.68	2345.13	2345.13	2345.89	0.017602	8.17	292.43	205.33	1.11
Monarch Wash	Reach 1	3.774 65	Floodway	1782.00	2342.68	2345.87	2345.87	2347.09	0.013077	8.88	202.44	85.12	1.01
Monarch Wash	Reach 1	3.661 11	100-Year	1782.00	2329.93	2332.04	2332.04	2332.97	0.025409	9.00	236.16	145.87	1.30
Monarch Wash	Reach 1	3.661 11	Floodway	1782.00	2329.93	2332.96	2332.96	2334.32	0.018022	10.44	201.24	77.37	1.19
Monarch Wash	Reach 1	3.560 64	100-Year	1782.00	2314.34	2318.13	2318.13	2319.52	0.012011	9.49	192.16	73.47	1.00
Monarch Wash	Reach 1	3.560 64	Floodway	1782.00	2314.34	2318.16	2318.16	2319.53	0.011873	9.39	192.83	70.64	0.98
Monarch Wash	Reach 1	3.451 63	100-Year	1782.00	2300.30	2303.01	2303.01	2303.93	0.011362	8.64	280.55	155.33	0.96
Monarch Wash	Reach 1	3.451 63	Floodway	1782.00	2300.30	2303.42	2303.42	2304.91	0.013061	9.78	182.23	61.87	1.00
Monarch Wash	Reach 1	3.347 12	100-Year	1782.00	2286.22	2289.09	2289.09	2289.86	0.009360	7.56	309.57	206.95	0.86
Monarch Wash	Reach 1	3.347 12	Floodway	1782.00	2286.22	2289.09	2289.09	2290.30	0.013351	8.84	201.59	84.24	1.01
Monarch Wash	Reach 1	3.239 13	100-Year	1936.00	2270.29	2274.05	2274.05	2275.12	0.011551	9.44	279.64	131.29	0.98
Monarch Wash	Reach 1	3.239 13	Floodway	1936.00	2270.29	2274.76	2274.76	2276.58	0.013509	10.84	178.60	50.10	1.01
Monarch Wash	Reach 1	3.13 62	100-Year	1936.00	2255.31	2257.58	2257.58	2258.70	0.020205	10.06	246.43	118.00	1.23
Monarch Wash	Reach 1	3.13 62	Floodway	1936.00	2255.31	2258.55	2258.55	2260.31	0.018034	11.74	191.04	56.75	1.19
Monarch Wash	Reach 1	3.024 61	100-Year	1936.00	2242.41	2244.15	2244.15	2244.71	0.016724	7.35	381.62	336.32	1.06
Monarch Wash	Reach 1	3.024 61	Floodway	1936.00	2242.41	2244.99	2244.99	2246.16	0.013531	8.70	222.41	95.66	1.01
Monarch Wash	Reach 1	2.908 60	100-Year	1936.00	2226.75	2228.77	2228.77	2229.41	0.014826	7.88	369.53	272.90	1.03
Monarch Wash	Reach 1	2.908 60	Floodway	1936.00	2226.75	2229.63	2229.63	2230.97	0.012372	9.34	213.69	82.10	1.01
Monarch Wash	Reach 1	2.806 59	100-Year	1936.00	2213.97	2215.71	2215.71	2216.41	0.020984	7.92	313.78	228.96	1.18
Monarch Wash	Reach 1	2.806 59	Floodway	1936.00	2213.97	2216.36	2216.36	2217.37	0.014757	8.49	252.96	126.55	1.05
Monarch Wash	Reach 1	2.695 14	100-Year	1936.00	2199.40	2202.20	2202.20	2203.02	0.013833	9.32	331.61	189.16	1.05
Monarch Wash	Reach 1	2.695 14	Floodway	1936.00	2199.40	2203.12	2203.12	2204.52	0.011520	10.51	237.95	85.00	1.01
Monarch Wash	Reach 1	2.592 15	100-Year	1936.00	2184.83	2187.29	2187.29	2188.12	0.012945	8.23	314.43	192.52	0.99
Monarch Wash	Reach 1	2.592 15	Floodway	1936.00	2184.83	2187.71	2187.71	2188.96	0.012472	9.09	222.26	91.39	1.00
Monarch Wash	Reach 1	2.486 58	100-Year	1936.00	2172.22	2174.91	2174.91	2175.88	0.010563	8.17	265.01	145.81	1.01
Monarch Wash	Reach 1	2.486 58	Floodway	1936.00	2172.22	2175.02	2175.02	2176.11	0.010863	8.38	230.98	107.59	1.01
Monarch Wash	Reach 1	2.382 57	100-Year	5230.00	2159.67	2164.01	2164.01	2165.76	0.009787	12.54	555.32	157.74	1.09
Monarch Wash	Reach 1	2.382 57	Floodway	5230.00	2159.67	2164.97	2164.97	2167.36	0.008652	13.58	471.07	98.00	1.06
Monarch Wash	Reach 1	2.301 56	100-Year	5241.00	2150.03	2154.65	2154.65	2156.01	0.017118	13.85	652.69	227.10	1.23
Monarch Wash	Reach 1	2.301 56	Floodway	5241.00	2150.03	2154.93	2154.93	2156.74	0.017591	14.70	539.25	142.69	1.26
Monarch Wash	Reach 1	2.205 55	100-Year	5241.00	2137.94	2143.41	2143.41	2145.09	0.008854	11.81	625.13	187.85	0.94
Monarch Wash	Reach 1	2.205 55	Floodway	5241.00	2137.94	2143.84	2143.84	2146.39	0.010093	13.33	439.72	88.48	1.02
Monarch Wash	Reach 1	2.093 54	100-Year	5241.00	2128.35	2130.35	2130.35	2131.43	0.031079	10.99	655.94	349.45	1.48
Monarch Wash	Reach 1	2.093 54	Floodway	5241.00	2128.35	2131.35	2131.35	2132.54	0.019118	11.71	670.45	271.86	1.26
Monarch Wash	Reach 1	1.973 16	100-Year	5241.00	2115.13	2119.00	2119.00	2120.19	0.009967	9.99	733.53	298.08	0.94
Monarch Wash	Reach 1	1.973 16	Floodway	5241.00	2115.13	2119.68	2119.68	2121.72	0.010781	11.49	462.27	113.80	0.99

HEC-RAS Plan: Basic Plan File (Continued)

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Monarch Wash	Reach 1	1.88 52	100-Year	5241.00	2102.86	2106.52	2106.52	2107.49	0.009404	9.63	874.49	414.20	0.92
Monarch Wash	Reach 1	1.88 52	Floodway	5241.00	2102.86	2107.28	2107.28	2108.99	0.009639	11.13	562.91	165.12	0.96
Monarch Wash	Reach 1	1.763 17	100-Year	5241.00	2089.15	2092.49	2092.49	2093.36	0.013445	9.06	844.94	467.98	1.03
Monarch Wash	Reach 1	1.763 17	Floodway	5241.00	2089.15	2093.47	2093.47	2095.06	0.011363	10.34	542.96	171.56	0.99
Monarch Wash	Reach 1	1.66 53	100-Year	5241.00	2075.73	2079.34	2079.34	2080.30	0.012048	9.71	861.22	456.16	1.01
Monarch Wash	Reach 1	1.66 53	Floodway	5241.00	2075.73	2080.21	2080.21	2081.97	0.011660	11.19	525.19	147.09	1.02
Monarch Wash	Reach 1	1.554 51	100-Year	5241.00	2062.72	2067.16	2067.16	2068.20	0.009033	8.74	780.20	447.10	0.88
Monarch Wash	Reach 1	1.554 51	Floodway	5241.00	2062.72	2067.22	2067.22	2068.77	0.011892	9.99	524.63	168.60	1.00
Monarch Wash	Reach 1	1.431 50	100-Year	5241.00	2052.01	2056.06	2056.06	2057.33	0.009858	9.66	673.42	272.47	0.93
Monarch Wash	Reach 1	1.431 50	Floodway	5241.00	2052.01	2056.26	2056.26	2058.02	0.011781	10.64	492.48	139.59	1.00
Monarch Wash	Reach 1	1.327 18	100-Year	5241.00	2038.89	2044.05	2044.05	2045.56	0.006353	11.14	718.57	267.31	0.92
Monarch Wash	Reach 1	1.327 18	Floodway	5241.00	2038.89	2044.67	2044.67	2047.24	0.008121	12.85	407.94	79.39	1.00
Monarch Wash	Reach 1	1.24 49	100-Year	5241.00	2028.25	2033.10	2033.10	2034.98	0.006974	11.22	513.82	147.61	0.96
Monarch Wash	Reach 1	1.24 49	Floodway	5241.00	2028.25	2033.10	2033.10	2035.21	0.008181	11.66	449.49	105.42	1.00
Monarch Wash	Reach 1	1.131 19	100-Year	5241.00	2016.18	2022.59	2022.59	2024.67	0.007044	14.22	599.30	141.06	1.01
Monarch Wash	Reach 1	1.131 19	Floodway	5241.00	2016.18	2023.39	2023.39	2026.12	0.008105	15.04	465.83	80.79	1.01
Monarch Wash	Reach 1	1.035 20	100-Year	5241.00	2005.92	2012.58	2012.58	2014.79	0.006677	13.45	546.95	124.96	0.98
Monarch Wash	Reach 1	1.035 20	Floodway	5241.00	2005.92	2013.55	2013.55	2016.74	0.006453	14.65	399.59	65.62	0.99
Monarch Wash	Reach 1	0.928 21	100-Year	5241.00	1994.61	2002.09	2002.09	2004.89	0.007043	15.83	497.07	92.34	1.04
Monarch Wash	Reach 1	0.928 21	Floodway	5241.00	1994.61	2002.78	2002.78	2006.35	0.009076	16.76	393.78	54.17	1.06
Monarch Wash	Reach 1	0.831 48	100-Year	5241.00	1985.92	1991.99	1991.99	1994.23	0.009650	12.68	519.62	123.63	0.97
Monarch Wash	Reach 1	0.831 48	Floodway	5241.00	1985.92	1992.32	1992.32	1995.15	0.012024	13.50	388.19	68.57	1.00
Monarch Wash	Reach 1	0.739 22	100-Year	5241.00	1976.97	1982.33	1982.33	1983.36	0.008155	10.36	1051.10	503.05	0.87
Monarch Wash	Reach 1	0.739 22	Floodway	5241.00	1976.97	1982.48	1982.48	1984.35	0.011455	12.56	614.67	162.77	1.03
Monarch Wash	Reach 1	0.658 47	100-Year	5241.00	1968.04	1971.32	1971.32	1972.28	0.017746	10.41	897.10	438.10	1.16
Monarch Wash	Reach 1	0.658 47	Floodway	5241.00	1968.04	1972.27	1972.27	1973.56	0.012157	10.68	771.58	288.12	1.01
Monarch Wash	Reach 1	0.556 46	100-Year	5357.00	1956.55	1961.19	1961.19	1962.79	0.014222	12.41	686.90	209.66	1.11
Monarch Wash	Reach 1	0.556 46	Floodway	5357.00	1956.55	1962.09	1962.09	1964.21	0.012517	12.95	547.40	126.21	1.05
Monarch Wash	Reach 1	0.444 23	100-Year	5357.00	1945.37	1950.39	1950.39	1951.88	0.009370	11.57	785.03	257.66	0.94
Monarch Wash	Reach 1	0.444 23	Floodway	5357.00	1945.37	1950.99	1950.99	1953.47	0.011518	13.28	475.86	97.07	1.01
Monarch Wash	Reach 1	0.361 44	100-Year	5357.00	1933.83	1940.76	1940.76	1942.18	0.005557	12.72	934.10	287.13	0.91
Monarch Wash	Reach 1	0.361 44	Floodway	5357.00	1933.83	1941.46	1941.46	1943.66	0.007466	14.20	605.81	124.39	0.96
Monarch Wash	Reach 1	0.286 45	100-Year	5357.00	1928.28	1931.45	1931.45	1932.82	0.019207	14.02	702.14	264.23	1.48
Monarch Wash	Reach 1	0.286 45	Floodway	5357.00	1928.28	1932.41	1932.41	1934.05	0.013359	14.25	675.80	198.06	1.30
Monarch Wash	Reach 1	0.192 43	100-Year	5357.00	1919.51	1924.96	1924.96	1926.01	0.006657	12.74	1108.78	415.79	0.97
Monarch Wash	Reach 1	0.192 43	Floodway	5357.00	1919.51	1925.88	1925.88	1927.97	0.007802	15.32	666.39	145.37	1.08
Monarch Wash	Reach 1	0.076 39	100-Year	5357.00	1907.43	1914.19	1914.12	1916.21	0.006763	13.01	603.30	345.41	0.98
Monarch Wash	Reach 1	0.076 39	Floodway	5357.00	1907.43	1914.46	1914.33	1917.03	0.007293	13.95	490.74	90.00	1.03
Monarch Wash	Reach 1	0.065		Bridge									
Monarch Wash	Reach 1	0.06 40	100-Year	5357.00	1904.56	1913.58	1912.20	1915.05	0.002819	10.09	649.15	121.46	0.66
Monarch Wash	Reach 1	0.06 40	Floodway	5357.00	1904.56	1913.59	1912.20	1915.05	0.002817	10.09	649.31	121.46	0.66
Monarch Wash	Reach 1	0.055 41	100-Year	5357.00	1904.16	1913.66	1911.53	1914.84	0.001981	9.12	728.03	118.71	0.56
Monarch Wash	Reach 1	0.055 41	Floodway	5357.00	1904.16	1913.66	1911.53	1914.84	0.001978	9.11	728.19	118.33	0.56
Monarch Wash	Reach 1	0.05		Bridge									
Monarch Wash	Reach 1	0.042 42	100-Year	5357.00	1902.22	1910.83	1910.83	1913.55	0.004845	13.77	503.96	112.41	0.89
Monarch Wash	Reach 1	0.042 42	Floodway	5357.00	1902.22	1910.90	1910.90	1913.55	0.004665	13.60	512.10	112.41	0.88

HEC-RAS Plan: Plan 03

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Wash HT07	Reach 1	1.499 64	100-YR	1063.00	2069.05	2072.69	2072.69	2073.60	0.007657	8.94	204.37	124.08	0.89
Wash HT07	Reach 1	1.499 64	Floodway	1063.00	2069.05	2072.69	2072.69	2073.60	0.007657	8.94	204.37	124.08	0.89
Wash HT07	Reach 1	1.419 65	100-YR	1063.00	2061.66	2064.38	2064.38	2065.18	0.013771	9.80	199.80	123.72	1.14
Wash HT07	Reach 1	1.419 65	Floodway	1063.00	2061.66	2064.38	2064.38	2065.18	0.013771	9.80	199.80	123.72	1.14
Wash HT07	Reach 1	1.332 96	100-YR	1063.00	2052.35	2055.33	2055.33	2056.01	0.008885	8.51	242.90	169.62	0.93
Wash HT07	Reach 1	1.332 96	Floodway	1063.00	2052.35	2055.33	2055.33	2056.01	0.008885	8.51	242.90	169.62	0.93
Wash HT07	Reach 1	1.226 69	100-YR	1063.00	2042.99	2045.44	2045.44	2046.20	0.012668	8.84	197.48	126.79	1.07
Wash HT07	Reach 1	1.226 69	Floodway	1063.00	2042.99	2045.44	2045.44	2046.20	0.012668	8.84	197.48	126.79	1.07
Wash HT07	Reach 1	1.125 66	100-YR	1063.00	2031.04	2035.91	2035.91	2036.88	0.005583	9.04	207.77	124.91	0.78
Wash HT07	Reach 1	1.125 66	Floodway	1063.00	2031.04	2035.91	2035.91	2036.88	0.005583	9.04	207.77	124.91	0.78
Wash HT07	Reach 1	1.041 68	100-YR	1063.00	2025.05	2027.29	2027.29	2028.11	0.010574	7.39	158.93	113.19	0.96
Wash HT07	Reach 1	1.041 68	Floodway	1063.00	2025.05	2027.29	2027.29	2028.11	0.010574	7.39	158.93	113.19	0.96
Wash HT07	Reach 1	0.945 70	100-YR	1063.00	2016.70	2018.70	2018.70	2019.12	0.014886	8.06	292.71	298.73	1.11
Wash HT07	Reach 1	0.945 70	Floodway	1063.00	2016.70	2018.70	2018.70	2019.12	0.014886	8.06	292.71	298.73	1.11
Wash HT07	Reach 1	0.865 67	100-YR	1063.00	2008.24	2010.13	2010.13	2010.66	0.017216	8.00	236.42	220.18	1.17
Wash HT07	Reach 1	0.865 67	Floodway	1063.00	2008.24	2010.13	2010.13	2010.66	0.017216	8.00	236.42	220.18	1.17
Wash HT07	Reach 1	0.780 71	100-YR	1063.00	1997.51	2001.28	2001.28	2001.86	0.009499	7.13	244.19	227.84	0.91
Wash HT07	Reach 1	0.780 71	Floodway	1063.00	1997.51	2001.28	2001.28	2001.86	0.009499	7.13	244.19	227.84	0.91
Wash HT07	Reach 1	0.698 95	100-YR	1063.00	1989.94	1993.13	1993.13	1993.78	0.007392	7.97	258.82	198.85	0.85
Wash HT07	Reach 1	0.698 95	Floodway	1063.00	1989.94	1993.13	1993.13	1993.78	0.007392	7.97	258.82	198.85	0.85
Wash HT07	Reach 1	0.619 72	100-YR	1063.00	1982.27	1984.55	1984.55	1984.98	0.008295	7.10	311.71	309.82	0.87
Wash HT07	Reach 1	0.619 72	Floodway	1063.00	1982.27	1984.55	1984.55	1984.98	0.008295	7.10	311.71	309.82	0.87
Wash HT07	Reach 1	0.547 97	100-YR	1063.00	1974.76	1976.31	1976.27	1976.73	0.019785	8.23	250.18	259.05	1.35
Wash HT07	Reach 1	0.547 97	Floodway	1063.00	1974.76	1976.31	1976.27	1976.73	0.019785	8.23	250.18	259.05	1.35
Wash HT07	Reach 1	0.468 73	100-YR	1063.00	1961.90	1963.52	1963.52	1964.74	0.032086	12.01	129.69	69.54	1.77
Wash HT07	Reach 1	0.468 73	Floodway	1063.00	1961.90	1963.52	1963.52	1964.74	0.032086	12.01	129.69	69.54	1.77
Wash HT07	Reach 1	0.381 74	100-YR	1063.00	1925.42	1929.19	1929.19	1930.77	0.007045	10.61	127.75	45.29	0.98
Wash HT07	Reach 1	0.381 74	Floodway	1063.00	1925.42	1929.19	1929.19	1930.77	0.007045	10.61	127.75	45.29	0.98
Wash HT07	Reach 1	0.293 75	100-YR	1063.00	1909.69	1913.48	1913.48	1914.96	0.007229	10.09	126.98	50.46	0.97
Wash HT07	Reach 1	0.293 75	Floodway	1063.00	1909.69	1913.48	1913.48	1914.96	0.007229	10.09	126.98	50.46	0.97
Wash HT07	Reach 1	0.207 76	100-YR	1063.00	1887.30	1891.38	1891.38	1893.10	0.007736	11.06	118.99	38.64	1.02
Wash HT07	Reach 1	0.207 76	Floodway	1063.00	1887.30	1891.38	1891.38	1893.10	0.007736	11.06	118.99	38.64	1.02
Wash HT07	Reach 1	0.154 77	100-YR	1063.00	1882.41	1883.92	1883.92	1884.46	0.017699	8.93	253.58	237.03	1.32
Wash HT07	Reach 1	0.154 77	Floodway	1063.00	1882.41	1883.92	1883.92	1884.46	0.017699	8.93	253.58	237.03	1.32
Wash HT07	Reach 1	0.082 78	100-YR	1063.00	1871.93	1878.57	1875.67	1878.91	0.000804	5.12	338.87	109.56	0.36
Wash HT07	Reach 1	0.082 78	Floodway	1063.00	1871.93	1878.57	1875.67	1878.91	0.000804	5.12	338.87	109.56	0.36
Wash HT07	Reach 1	.071		Culvert									
Wash HT07	Reach 1	0.058 94	100-YR	1063.00	1863.17	1867.29	1867.29	1869.05	0.008240	10.67	102.17	31.29	0.99
Wash HT07	Reach 1	0.058 94	Floodway	1063.00	1863.17	1867.29	1867.29	1869.05	0.008240	10.67	102.17	31.29	0.99
Wash G	Reach 1	1.233 79	100-YR	620.00	2020.35	2023.57	2023.57	2024.37	0.007511	9.02	128.64	82.33	0.93
Wash G	Reach 1	1.233 79	Floodway	620.00	2020.35	2024.16	2024.16	2025.92	0.009139	11.24	68.18	20.33	1.06
Wash G	Reach 1	1.149 80	100-YR	620.00	2011.43	2014.57	2014.57	2015.47	0.007943	9.11	113.83	66.28	0.95
Wash G	Reach 1	1.149 80	Floodway	620.00	2011.43	2014.99	2014.99	2016.54	0.011120	10.56	68.29	22.13	1.03
Wash G	Reach 1	1.089 81	100-YR	620.00	2006.10	2008.38	2008.38	2009.11	0.009187	7.80	115.46	81.46	0.97
Wash G	Reach 1	1.089 81	Floodway	620.00	2006.10	2008.79	2008.79	2010.00	0.011083	8.84	70.12	29.02	1.00
Wash G	Reach 1	1.011 92	100-YR	620.00	1996.54	1999.71	1999.71	2000.68	0.007778	8.63	100.71	61.36	0.93
Wash G	Reach 1	1.011 92	Floodway	620.00	1996.54	1999.93	1999.93	2001.30	0.009595	9.45	68.09	25.66	0.98
Wash G	Reach 1	0.909 91	100-YR	620.00	1988.37	1990.57	1990.57	1991.30	0.009698	7.01	100.00	78.30	0.97
Wash G	Reach 1	0.909 91	Floodway	620.00	1988.37	1990.59	1990.59	1991.42	0.011323	7.34	84.50	51.19	1.01
Wash G	Reach 1	0.823 90	100-YR	620.00	1980.04	1983.77	1983.77	1984.76	0.006020	9.30	117.02	67.83	0.87
Wash G	Reach 1	0.823 90	Floodway	620.00	1980.04	1984.04	1984.04	1985.70	0.007480	10.87	69.76	22.04	0.98
Wash G	Reach 1	0.737 89	100-YR	620.00	1968.49	1972.26	1972.26	1973.75	0.007658	10.19	73.21	28.13	0.96
Wash G	Reach 1	0.737 89	Floodway	620.00	1968.49	1972.39	1972.39	1974.17	0.012296	10.71	57.89	16.06	0.99
Wash G	Reach 1	0.643 88	100-YR	620.00	1957.15	1960.55	1960.55	1961.87	0.007665	9.84	81.67	35.10	0.96
Wash G	Reach 1	0.643 88	Floodway	620.00	1957.15	1960.80	1960.80	1962.54	0.012336	10.57	58.66	16.68	0.99
Wash G	Reach 1	0.555 87	100-YR	620.00	1944.49	1948.11	1948.11	1949.70	0.008071	10.37	68.47	24.24	0.98
Wash G	Reach 1	0.555 87	Floodway	620.00	1944.49	1948.20	1948.20	1949.98	0.012536	10.71	57.89	16.34	1.00
Wash G	Reach 1	0.477 86	100-YR	620.00	1932.73	1935.66	1935.66	1936.75	0.009117	8.51	78.28	38.80	0.99
Wash G	Reach 1	0.477 86	Floodway	620.00	1932.73	1935.69	1935.69	1936.85	0.010724	8.66	71.62	30.61	1.00
Wash G	Reach 1	0.398 85	100-YR	620.00	1918.78	1922.25	1922.25	1923.67	0.008535	9.63	68.35	27.18	0.98
Wash G	Reach 1	0.398 85	Floodway	620.00	1918.78	1922.25	1922.25	1923.74	0.010525	9.81	63.22	20.93	0.99

HEC-RAS Plan: Plan 03 (Continued)

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Wash G	Reach 1	0.316 93	100-YR	620.00	1896.09	1899.09	1899.09	1900.38	0.008466	9.38	75.39	32.81	0.98
Wash G	Reach 1	0.316 93	Floodway	620.00	1896.09	1899.19	1899.19	1900.65	0.011246	9.71	63.87	21.78	1.00
Wash G	Reach 1	0.229 84	100-YR	620.00	1885.30	1895.18	1887.37	1895.19	0.000015	0.87	889.21	110.92	0.05
Wash G	Reach 1	0.229 84	Floodway	620.00	1885.30	1895.86	1887.40	1895.87	0.000016	0.93	727.75	74.37	0.05
Wash G	Reach 1	0.184 83	100-YR	620.00	1881.20	1895.16	1884.44	1895.18	0.000020	1.19	870.60	179.95	0.06
Wash G	Reach 1	0.184 83	Floodway	620.00	1881.20	1895.85	1884.43	1895.87	0.000019	1.20	692.35	74.74	0.06
Wash G	Reach 1	0.172		Culvert									
Wash G	Reach 1	0.151 82	100-YR	620.00	1880.98	1881.25	1880.93	1881.39	0.012001	1.95	214.55	314.23	0.76
Wash G	Reach 1	0.151 82	Floodway	620.00	1880.98	1882.06	1881.91	1882.42	0.012002	5.59	140.55	131.57	0.98
Wash F Trib 1	Reach 1	0.406 62	100-YR	218.00	1952.80	1954.45	1954.45	1955.02	0.009644	6.75	49.82	48.34	0.95
Wash F Trib 1	Reach 1	0.406 62	Floodway	218.00	1952.80	1954.68	1954.68	1955.56	0.012744	7.52	29.00	16.30	0.99
Wash F Trib 1	Reach 1	0.300 103	100-YR	218.00	1931.89	1933.97	1933.97	1934.66	0.009234	7.02	40.65	34.30	0.95
Wash F Trib 1	Reach 1	0.300 103	Floodway	218.00	1931.89	1934.03	1934.03	1934.94	0.012937	7.62	28.62	16.16	1.01
Wash F Trib 1	Reach 1	0.212 102	100-YR	218.00	1912.88	1914.57	1914.57	1915.13	0.011472	6.06	38.32	38.55	0.99
Wash F Trib 1	Reach 1	0.212 102	Floodway	218.00	1912.88	1914.58	1914.58	1915.16	0.012125	6.13	35.55	30.34	1.00
Wash F Trib 1	Reach 1	0.134 63	100-YR	218.00	1894.23	1896.83	1896.83	1897.69	0.009570	7.67	33.46	22.40	0.97
Wash F Trib 1	Reach 1	0.134 63	Floodway	218.00	1894.23	1896.87	1896.87	1897.69	0.008953	7.51	34.28	22.40	0.94
Wash F Trib 1	Reach 1	0.047 101	100-YR	218.00	1878.64	1879.54	1879.54	1879.87	0.019999	5.79	62.49	98.95	1.21
Wash F Trib 1	Reach 1	0.047 101	Floodway	218.00	1878.64	1879.93	1879.93	1880.48	0.012812	6.08	38.13	35.12	1.02
Wash F	Reach 1	1.094 51	100-YR	287.00	2027.34	2030.14	2030.14	2030.85	0.006879	7.13	52.60	42.95	0.87
Wash F	Reach 1	1.094 51	Floodway	287.00	2027.34	2030.16	2030.16	2030.85	0.006682	7.06	53.15	42.31	0.86
Wash F	Reach 1	1.021 52	100-YR	287.00	2021.28	2024.01	2024.01	2024.76	0.007283	7.84	57.26	46.26	0.91
Wash F	Reach 1	1.021 52	Floodway	287.00	2021.28	2024.03	2024.03	2024.74	0.006894	7.67	56.09	38.19	0.89
Wash F	Reach 1	0.940 105	100-YR	287.00	2014.94	2018.81	2017.14	2018.88	0.000577	3.04	188.88	89.44	0.28
Wash F	Reach 1	0.940 105	Floodway	287.00	2014.94	2019.55	2017.12	2019.63	0.000424	2.94	160.71	41.91	0.25
Wash F	Reach 1	0.920 104	100-YR	287.00	2013.20	2018.84	2015.59	2018.85	0.000051	1.16	535.63	180.94	0.09
Wash F	Reach 1	0.920 104	Floodway	287.00	2013.20	2019.56	2015.52	2019.59	0.000093	1.70	259.48	50.60	0.12
Wash F	Reach 1	.9165		Culvert									
Wash F	Reach 1	0.9101 53	100-YR	287.00	2011.90	2014.07	2012.85	2014.15	0.001483	3.11	154.07	99.97	0.39
Wash F	Reach 1	0.9101 53	Floodway	287.00	2011.90	2014.16	2013.46	2014.49	0.004061	5.15	69.72	33.24	0.64
Wash F	Reach 1	0.895 106	100-YR	287.00	2009.91	2012.85	2012.85	2013.65	0.007138	8.34	56.25	40.05	0.92
Wash F	Reach 1	0.895 106	Floodway	287.00	2009.91	2012.95	2012.95	2013.84	0.007066	8.52	49.19	27.07	0.92
Wash F	Reach 1	0.798 54	100-YR	287.00	2003.42	2006.05	2006.05	2006.64	0.006184	7.14	68.73	64.49	0.84
Wash F	Reach 1	0.798 54	Floodway	287.00	2003.42	2006.05	2006.05	2007.17	0.009618	8.91	38.30	18.21	1.05
Wash F	Reach 1	0.754 55	100-YR	287.00	1998.41	2000.65	2000.65	2001.18	0.008694	7.25	68.74	65.67	0.95
Wash F	Reach 1	0.754 55	Floodway	287.00	1998.41	2000.83	2000.83	2001.68	0.010087	8.32	47.01	28.41	1.04
Wash F	Reach 1	0.691 56	100-YR	287.00	1994.38	1996.06	1996.06	1996.48	0.015410	6.79	69.46	83.41	1.17
Wash F	Reach 1	0.691 56	Floodway	287.00	1994.38	1996.57	1996.57	1997.30	0.011673	7.46	45.50	30.72	1.05
Wash F	Reach 1	0.597 57	100-YR	287.00	1984.19	1987.60	1987.60	1988.11	0.006170	7.51	80.85	77.08	0.82
Wash F	Reach 1	0.597 57	Floodway	287.00	1984.19	1987.69	1987.69	1988.44	0.007511	8.47	56.87	34.57	0.91
Wash F	Reach 1	0.504 58	100-YR	287.00	1976.50	1979.19	1979.19	1979.82	0.006882	6.92	59.70	57.58	0.86
Wash F	Reach 1	0.504 58	Floodway	287.00	1976.50	1979.19	1979.19	1980.09	0.009687	7.81	39.95	22.19	0.97
Wash F	Reach 1	0.396 59	100-YR	287.00	1929.13	1932.57	1932.57	1933.57	0.008861	8.09	37.51	21.83	0.97
Wash F	Reach 1	0.396 59	Floodway	287.00	1929.13	1932.60	1932.60	1933.57	0.008480	7.99	38.10	21.84	0.95
Wash F	Reach 1	0.302 60	100-YR	287.00	1885.35	1888.60	1888.60	1889.68	0.008043	8.51	37.96	20.06	0.95
Wash F	Reach 1	0.302 60	Floodway	287.00	1885.35	1888.64	1888.64	1889.68	0.007672	8.38	38.61	20.06	0.93
Wash F	Reach 1	0.213 61	100-YR	287.00	1873.24	1874.57	1874.57	1875.03	0.011747	5.48	54.68	62.37	1.00
Wash F	Reach 1	0.213 61	Floodway	287.00	1873.24	1874.58	1874.58	1875.03	0.011612	5.46	54.88	62.37	1.00
Wash F	Reach 2	0.132 100	100-YR	577.00	1867.88	1874.82	1869.12	1874.83	0.000041	0.85	865.52	144.87	0.06
Wash F	Reach 2	0.132 100	Floodway	577.00	1867.88	1874.82	1869.12	1874.83	0.000041	0.85	865.52	144.86	0.06
Wash F	Reach 2	0.095 99	100-YR	577.00	1863.82	1874.54	1867.58	1874.75	0.000415	3.64	158.63	469.33	0.20
Wash F	Reach 2	0.095 99	Floodway	577.00	1863.82	1874.54	1867.58	1874.75	0.000415	3.64	158.63	298.02	0.20
Wash F	Reach 2	.079		Culvert									
Wash F	Reach 2	0.065 98	100-YR	577.00	1862.82	1864.29	1864.12	1864.74	0.016029	5.59	110.24	86.96	0.87
Wash F	Reach 2	0.065 98	Floodway	577.00	1862.82	1864.29	1864.11	1864.75	0.016031	5.58	109.59	83.12	0.86
San Domingo Wash	Reach 1	2.328 36	100-YR	12689.00	2019.03	2024.81	2024.81	2026.53	0.007203	12.40	1703.43	478.88	0.95
San Domingo Wash	Reach 1	2.328 36	Floodway	12689.00	2019.03	2025.57	2025.57	2028.10	0.007295	13.64	1195.56	242.64	0.97
San Domingo Wash	Reach 1	2.185 117	100-YR	12689.00	2009.39	2013.65	2013.65	2015.19	0.018250	16.31	1633.75	497.08	1.44
San Domingo Wash	Reach 1	2.185 117	Floodway	12689.00	2009.39	2014.10	2014.10	2015.81	0.016333	16.57	1572.60	424.54	1.38

HEC-RAS Plan: Plan 03 (Continued)

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
San Domingo Wash	Reach 1	2.059 116	100-YR	12689.00	1999.87	2007.43	2007.43	2009.37	0.005733	13.36	1756.82	449.67	0.89
San Domingo Wash	Reach 1	2.059 116	Floodway	12689.00	1999.87	2007.43	2007.43	2009.74	0.006440	14.16	1448.70	297.27	0.94
San Domingo Wash	Reach 1	1.951 115	100-YR	12689.00	1990.24	1998.18	1998.18	2000.16	0.005409	13.54	1730.83	415.11	0.87
San Domingo Wash	Reach 1	1.951 115	Floodway	12689.00	1990.24	1998.55	1998.55	2000.94	0.006279	14.21	1399.89	274.45	0.89
San Domingo Wash	Reach 1	1.834 38	100-YR	12689.00	1981.32	1988.20	1988.20	1989.66	0.006826	13.33	2084.10	604.78	0.94
San Domingo Wash	Reach 1	1.834 38	Floodway	12689.00	1981.32	1988.83	1988.83	1991.04	0.007432	14.85	1516.19	317.48	1.00
San Domingo Wash	Reach 1	1.719 39	100-YR	12689.00	1972.20	1975.76	1975.76	1976.98	0.022644	15.19	1758.32	719.64	1.53
San Domingo Wash	Reach 1	1.719 39	Floodway	12689.00	1972.20	1976.71	1976.71	1978.26	0.018226	16.31	1667.97	536.95	1.43
San Domingo Wash	Reach 1	1.582 37	100-YR	12689.00	1960.90	1967.33	1967.33	1968.94	0.007242	13.13	1924.26	555.83	0.96
San Domingo Wash	Reach 1	1.582 37	Floodway	12689.00	1960.90	1967.94	1967.94	1970.08	0.007750	13.99	1494.53	326.92	0.97
San Domingo Wash	Reach 1	1.455 40	100-YR	12689.00	1950.76	1957.65	1957.65	1959.52	0.009896	15.54	1695.96	439.48	1.13
San Domingo Wash	Reach 1	1.455 40	Floodway	12689.00	1950.76	1958.26	1958.26	1960.23	0.009719	15.28	1547.29	339.77	1.06
San Domingo Wash	Reach 1	1.353 41	100-YR	12689.00	1943.47	1949.14	1949.14	1950.51	0.011454	15.17	1946.86	599.92	1.18
San Domingo Wash	Reach 1	1.353 41	Floodway	12689.00	1943.47	1949.95	1949.95	1951.64	0.010071	15.69	1748.49	435.55	1.14
San Domingo Wash	Reach 1	1.248 42	100-YR	12689.00	1936.43	1941.25	1940.73	1942.44	0.010367	12.39	1817.46	492.65	1.09
San Domingo Wash	Reach 1	1.248 42	Floodway	12689.00	1936.43	1941.94	1941.92	1943.93	0.012527	14.56	1399.35	328.73	1.18
San Domingo Wash	Reach 1	1.148 43	100-YR	12689.00	1927.73	1933.28	1933.28	1934.69	0.012678	15.70	1871.50	568.66	1.24
San Domingo Wash	Reach 1	1.148 43	Floodway	12689.00	1927.73	1934.19	1934.19	1936.05	0.011410	16.65	1621.22	381.17	1.21
San Domingo Wash	Reach 1	1.039 114	100-YR	12949.00	1918.74	1924.05	1924.05	1925.66	0.009295	13.87	1835.90	509.46	1.07
San Domingo Wash	Reach 1	1.039 114	Floodway	12949.00	1918.74	1924.92	1924.92	1927.22	0.008849	15.01	1445.66	301.72	1.07
San Domingo Wash	Reach 1	0.934 44	100-YR	12949.00	1908.87	1915.23	1915.23	1917.00	0.010218	14.45	1673.26	433.39	1.11
San Domingo Wash	Reach 1	0.934 44	Floodway	12949.00	1908.87	1915.93	1915.93	1918.58	0.011286	15.96	1215.71	221.46	1.15
San Domingo Wash	Reach 1	0.826 45	100-YR	12949.00	1897.87	1906.90	1906.90	1908.82	0.005674	14.67	1945.67	453.64	0.90
San Domingo Wash	Reach 1	0.826 45	Floodway	12949.00	1897.87	1907.41	1907.41	1910.16	0.007632	16.16	1328.23	215.37	0.96
San Domingo Wash	Reach 1	0.741 113	100-YR	12949.00	1890.29	1898.80	1898.80	1900.56	0.007378	15.65	1925.14	461.35	1.00
San Domingo Wash	Reach 1	0.741 113	Floodway	12949.00	1890.29	1899.49	1899.49	1901.69	0.007273	16.47	1633.38	314.03	1.01
San Domingo Wash	Reach 1	0.663 46	100-YR	12949.00	1883.96	1890.41	1890.41	1891.69	0.007546	10.23	1812.89	801.20	0.82
San Domingo Wash	Reach 1	0.663 46	Floodway	12949.00	1883.96	1890.89	1890.89	1892.78	0.008440	11.45	1370.41	392.33	0.87
San Domingo Wash	Reach 1	0.566 112	100-YR	12949.00	1876.19	1880.75	1880.75	1882.15	0.010929	9.95	1531.20	571.60	0.98
San Domingo Wash	Reach 1	0.566 112	Floodway	12949.00	1876.19	1881.24	1880.93	1882.67	0.008550	9.60	1354.41	367.26	0.88
San Domingo Wash	Reach 1	0.470 47	100-YR	12949.00	1870.41	1875.03	1875.02	1876.62	0.010261	11.28	1545.17	486.01	0.99
San Domingo Wash	Reach 1	0.470 47	Floodway	12949.00	1870.41	1875.65	1875.65	1877.90	0.009976	12.24	1124.35	252.92	1.00
San Domingo Wash	Reach 1	0.389 111	100-YR	12949.00	1865.06	1873.31	1871.35	1874.18	0.003122	9.15	2307.29	506.03	0.60
San Domingo Wash	Reach 1	0.389 111	Floodway	12949.00	1865.06	1874.09	1871.83	1875.21	0.003271	9.67	1817.10	270.86	0.60
San Domingo Wash	Reach 1	0.298 48	100-YR	12949.00	1861.24	1869.84	1869.72	1871.97	0.006925	14.94	1550.41	303.00	0.91
San Domingo Wash	Reach 1	0.298 48	Floodway	12949.00	1861.24	1869.96	1869.96	1872.75	0.008115	16.32	1269.66	209.89	0.99
San Domingo Wash	Reach 1	0.203 49	100-YR	12949.00	1856.54	1870.87	1863.22	1871.00	0.000268	3.96	5620.43	543.79	0.19
San Domingo Wash	Reach 1	0.203 49	Floodway	12949.00	1856.54	1870.90	1863.56	1871.09	0.000422	4.61	4244.40	370.71	0.22
San Domingo Wash	Reach 1	0.114 110	100-YR	12949.00	1849.67	1870.01	1861.00	1870.62	0.000796	8.46	2616.39	299.09	0.34
San Domingo Wash	Reach 1	0.114 110	Floodway	12949.00	1849.67	1870.01	1861.00	1870.63	0.000801	8.48	2616.82	179.16	0.34
San Domingo Wash	Reach 1	0.078 108	100-YR	12949.00	1845.86	1863.79	1861.91	1868.93	0.006453	18.29	741.97	57.04	0.81
San Domingo Wash	Reach 1	0.078 108	Floodway	12949.00	1845.86	1863.87	1861.91	1868.95	0.006345	18.19	746.43	57.08	0.80
San Domingo Wash	Reach 1	.067		Bridge									
San Domingo Wash	Reach 1	0.057 107	100-YR	12949.00	1844.08	1860.48	1860.15	1867.34	0.006115	21.59	712.74	54.91	0.95
San Domingo Wash	Reach 1	0.057 107	Floodway	12949.00	1844.08	1860.48	1860.15	1867.34	0.006117	21.59	712.67	54.91	0.95
San Domingo Wash	Reach 1	0.042 109	100-YR	12949.00	1844.16	1860.91	1860.91	1865.96	0.005627	20.29	988.02	107.36	0.88
San Domingo Wash	Reach 1	0.042 109	Floodway	12949.00	1844.16	1860.99	1860.99	1865.89	0.005445	20.02	992.47	101.77	0.87
Ox Wash	Reach 1	2.186 20	100-YR	3319.00	1979.72	1985.26	1985.26	1986.12	0.008659	10.52	660.40	345.89	0.80
Ox Wash	Reach 1	2.186 20	Floodway	3319.00	1979.72	1985.75	1985.75	1987.19	0.012897	11.91	408.29	118.24	0.87
Ox Wash	Reach 1	2.068 123	100-YR	3319.00	1969.23	1975.85	1975.85	1977.66	0.015404	13.55	384.47	127.79	1.01
Ox Wash	Reach 1	2.068 123	Floodway	3319.00	1969.23	1975.96	1975.96	1977.59	0.013301	12.75	380.17	102.75	0.94
Ox Wash	Reach 1	1.968 21	100-YR	3319.00	1963.53	1969.59	1969.59	1970.71	0.007373	9.78	541.09	235.84	0.73
Ox Wash	Reach 1	1.968 21	Floodway	3319.00	1963.53	1969.59	1969.59	1970.80	0.007792	10.05	496.57	190.58	0.75
Ox Wash	Reach 1	1.856 22	100-YR	3319.00	1956.30	1963.01	1963.01	1964.09	0.006454	10.34	584.69	235.16	0.71
Ox Wash	Reach 1	1.856 22	Floodway	3319.00	1956.30	1963.13	1963.05	1965.14	0.009461	12.68	350.01	78.48	0.87
Ox Wash	Reach 1	1.746 122	100-YR	4722.00	1950.30	1954.74	1954.74	1955.74	0.015161	11.54	704.78	301.61	1.01
Ox Wash	Reach 1	1.746 122	Floodway	4722.00	1950.30	1954.78	1954.78	1955.94	0.016059	11.96	636.25	238.45	1.04
Ox Wash	Reach 1	1.630 23	100-YR	4722.00	1939.72	1945.89	1945.89	1947.07	0.008780	10.30	719.20	285.18	0.80
Ox Wash	Reach 1	1.630 23	Floodway	4722.00	1939.72	1946.20	1946.20	1947.86	0.009973	11.41	543.23	154.62	0.86
Ox Wash	Reach 1	1.519 121	100-YR	4722.00	1933.96	1937.28	1936.88	1937.95	0.011964	8.59	853.73	458.81	0.86
Ox Wash	Reach 1	1.519 121	Floodway	4722.00	1933.96	1937.47	1937.18	1938.37	0.012590	9.17	683.99	255.38	0.89

HEC-RAS Plan: Plan 03 (Continued)

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Ox Wash	Reach 1	1.402 120	100-YR	4722.00	1925.21	1928.46	1928.46	1929.10	0.018291	10.03	887.40	619.83	1.05
Ox Wash	Reach 1	1.402 120	Floodway	4722.00	1925.21	1928.79	1928.79	1929.55	0.016791	10.35	797.13	437.03	1.03
Ox Wash	Reach 1	1.280 119	100-YR	4722.00	1915.40	1920.88	1920.88	1921.79	0.010400	10.86	854.99	433.01	0.86
Ox Wash	Reach 1	1.280 119	Floodway	4722.00	1915.40	1920.88	1920.88	1921.87	0.011025	11.18	801.55	369.44	0.88
Ox Wash	Reach 1	1.175 24	100-YR	4722.00	1907.63	1911.68	1911.68	1912.35	0.012858	9.79	925.85	605.21	0.99
Ox Wash	Reach 1	1.175 24	Floodway	4722.00	1907.63	1912.17	1911.91	1912.81	0.009163	9.13	899.28	396.00	0.86
Ox Wash	Reach 1	1.073 118	100-YR	4722.00	1901.81	1903.36	1903.36	1903.99	0.011290	4.95	818.13	669.58	0.80
Ox Wash	Reach 1	1.073 118	Floodway	4722.00	1901.81	1904.21	1904.21	1905.06	0.017183	8.72	689.82	397.74	1.07
Ox Wash	Reach 1	0.979 25	100-YR	4722.00	1893.67	1900.71	1895.82	1900.73	0.000140	1.70	4305.23	744.72	0.12
Ox Wash	Reach 1	0.979 25	Floodway	4722.00	1893.67	1900.74	1897.26	1900.85	0.000576	3.46	2035.05	370.75	0.24
Ox Wash	Reach 1	0.872 26	100-YR	4722.00	1884.77	1900.19	1890.42	1900.51	0.000352	4.75	1088.81	426.29	0.21
Ox Wash	Reach 1	0.872 26	Floodway	4722.00	1884.77	1900.19	1890.42	1900.51	0.000352	4.75	1088.81	78.18	0.21
Ox Wash	Reach 1	.842		Culvert									
Ox Wash	Reach 1	0.812 27	100-YR	4726.00	1871.63	1879.84	1879.25	1882.90	0.007360	14.06	343.52	46.67	0.89
Ox Wash	Reach 1	0.812 27	Floodway	4726.00	1871.63	1879.90	1879.25	1882.91	0.007175	13.95	346.28	46.71	0.88
Ox Wash	Reach 1	0.757 28	100-YR	4726.00	1867.91	1876.88	1876.88	1880.46	0.008380	15.54	338.59	52.55	0.98
Ox Wash	Reach 1	0.757 28	Floodway	4726.00	1867.91	1876.96	1876.96	1880.46	0.008804	15.37	338.94	49.78	0.96
Ox Wash	Reach 1	0.669 29	100-YR	4726.00	1859.26	1869.21	1869.21	1872.19	0.008101	14.48	390.51	70.97	0.90
Ox Wash	Reach 1	0.669 29	Floodway	4726.00	1859.26	1869.30	1869.30	1872.74	0.009403	15.18	341.10	51.70	0.94
Ox Wash	Reach 1	0.576 50	100-YR	4726.00	1852.56	1858.89	1858.89	1861.43	0.009286	13.09	394.02	82.02	1.01
Ox Wash	Reach 1	0.576 50	Floodway	4726.00	1852.56	1859.04	1859.04	1861.71	0.010326	13.21	368.99	69.13	1.00
Ox Wash	Reach 1	0.496 30	100-YR	4726.00	1846.54	1852.55	1852.55	1855.02	0.009092	12.81	395.31	86.73	0.98
Ox Wash	Reach 1	0.496 30	Floodway	4726.00	1846.54	1853.03	1852.63	1855.33	0.008060	12.19	388.59	68.55	0.89
Ox Wash	Reach 1	0.413 31	100-YR	4726.00	1840.89	1847.66	1847.66	1849.90	0.010021	15.78	513.23	105.50	1.08
Ox Wash	Reach 1	0.413 31	Floodway	4726.00	1840.89	1848.49	1848.49	1851.40	0.009808	16.89	446.78	74.27	1.09
Ox Wash	Reach 1	0.373 32	100-YR	4726.00	1837.95	1846.11	1843.82	1847.19	0.002693	9.01	647.36	95.43	0.58
Ox Wash	Reach 1	0.373 32	Floodway	4726.00	1837.95	1846.86	1844.09	1848.06	0.002865	9.13	578.44	70.92	0.56
Ox Wash	Reach 1	.371		Bridge									
Ox Wash	Reach 1	0.368 33	100-YR	5734.00	1837.92	1844.41	1844.41	1847.05	0.007910	15.15	545.94	106.03	1.08
Ox Wash	Reach 1	0.368 33	Floodway	5734.00	1837.92	1844.74	1844.74	1847.74	0.007823	15.62	498.42	84.06	1.09
Ox Wash	Reach 1	0.335 34	100-YR	5734.00	1835.25	1841.73	1841.73	1843.47	0.005364	11.83	842.12	436.09	0.88
Ox Wash	Reach 1	0.335 34	Floodway	5734.00	1835.25	1841.78	1841.78	1844.59	0.007743	13.85	454.61	84.22	1.02
Ox Wash	Reach 1	0.248 35	100-YR	5734.00	1829.38	1836.17	1836.17	1837.18	0.003299	9.98	1317.34	640.82	0.70
Ox Wash	Reach 1	0.248 35	Floodway	5734.00	1829.38	1836.47	1835.93	1838.84	0.006004	13.05	513.11	83.20	0.90

HEC-RAS Plan: Basic Plan File

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Wash S2	Reach 1	0.514	100 YR	450.00	1850.57	1854.21	1854.21	1854.86	0.005478	6.73	95.44	125.71	0.73
Wash S2	Reach 1	0.514	FLOODWAY	450.00	1850.57	1854.21	1854.21	1854.86	0.005478	6.73	95.44	125.71	0.73
Wash S2	Reach 1	0.427	100 YR	461.00	1845.63	1848.53	1848.53	1849.23	0.008234	7.00	81.90	68.20	0.88
Wash S2	Reach 1	0.427	FLOODWAY	461.00	1845.63	1848.53	1848.53	1849.23	0.008234	7.00	81.90	68.20	0.88
Wash S2	Reach 1	0.319	100 YR	461.00	1837.55	1840.54	1840.54	1841.43	0.010965	7.58	61.48	35.94	0.99
Wash S2	Reach 1	0.319	FLOODWAY	461.00	1837.55	1840.54	1840.54	1841.43	0.010965	7.58	61.48	35.94	0.99
Wash S2	Reach 1	0.219	100 YR	461.00	1829.28	1831.81	1831.81	1832.42	0.017078	6.34	75.13	63.17	0.98
Wash S2	Reach 1	0.219	FLOODWAY	461.00	1829.28	1831.81	1831.81	1832.42	0.017078	6.34	75.13	63.17	0.98
LSD Tributary 1	Reach 1	2.131 214	100 YR	791.00	2014.13	2018.12	2018.12	2019.30	0.008883	9.60	119.26	55.54	0.91
LSD Tributary 1	Reach 1	2.131 214	FLOODWAY	791.00	2014.13	2018.12	2018.12	2019.30	0.008883	9.60	119.26	55.54	0.91
LSD Tributary 1	Reach 1	2.031 227	100 YR	791.00	2007.63	2011.30	2011.30	2012.32	0.008734	9.15	135.61	72.75	0.90
LSD Tributary 1	Reach 1	2.031 227	FLOODWAY	791.00	2007.63	2011.30	2011.30	2012.32	0.008734	9.15	135.61	72.75	0.90
LSD Tributary 1	Reach 1	1.918 228	100 YR	791.00	2000.80	2004.08	2004.08	2004.79	0.011341	8.50	165.97	111.92	0.96
LSD Tributary 1	Reach 1	1.918 228	FLOODWAY	791.00	2000.80	2004.08	2004.08	2004.79	0.011341	8.50	165.97	111.92	0.96
LSD Tributary 1	Reach 1	1.801 229	100 YR	791.00	1992.39	1995.70	1995.70	1996.47	0.010885	8.49	156.67	105.52	0.95
LSD Tributary 1	Reach 1	1.801 229	FLOODWAY	791.00	1992.39	1995.70	1995.70	1996.47	0.010885	8.49	156.67	105.52	0.95
LSD Tributary 1	Reach 1	1.682 230	100 YR	791.00	1983.25	1986.97	1986.97	1987.88	0.008224	8.69	147.34	84.68	0.87
LSD Tributary 1	Reach 1	1.682 230	FLOODWAY	791.00	1983.25	1986.97	1986.97	1987.88	0.008224	8.69	147.34	84.68	0.87
LSD Tributary 1	Reach 1	1.561 231	100 YR	791.00	1974.35	1978.38	1978.38	1979.59	0.007709	9.58	115.99	52.92	0.92
LSD Tributary 1	Reach 1	1.561 231	FLOODWAY	791.00	1974.35	1978.38	1978.38	1979.59	0.007709	9.58	115.99	52.92	0.92
LSD Tributary 1	Reach 1	1.444 232	100 YR	791.00	1964.01	1966.67	1966.67	1967.44	0.010301	8.53	152.92	97.18	1.01
LSD Tributary 1	Reach 1	1.444 232	FLOODWAY	791.00	1964.01	1966.67	1966.67	1967.44	0.010301	8.53	152.92	97.18	1.01
LSD Tributary 1	Reach 1	1.319 233	100 YR	791.00	1953.13	1956.98	1955.60	1957.18	0.001346	3.91	285.55	135.80	0.39
LSD Tributary 1	Reach 1	1.319 233	FLOODWAY	791.00	1953.13	1956.98	1955.60	1957.18	0.001346	3.91	285.55	135.80	0.39
LSD Tributary 1	Reach 1	1.225 256	100 YR	791.00	1944.72	1957.09	1948.69	1957.10	0.000018	0.99	1420.74	187.25	0.05
LSD Tributary 1	Reach 1	1.225 256	FLOODWAY	791.00	1944.72	1957.09	1948.69	1957.10	0.000018	0.99	1420.74	187.25	0.05
LSD Tributary 1	Reach 1	1.205 234	100 YR	791.00	1942.85	1957.09	1948.24	1957.09	0.000013	0.92	2089.25	324.91	0.04
LSD Tributary 1	Reach 1	1.205 234	FLOODWAY	791.00	1942.85	1957.09	1948.24	1957.09	0.000013	0.92	2089.25	324.91	0.04
LSD Tributary 1	Reach 1	1.195 3899		Culvert									
LSD Tributary 1	Reach 1	1.163 235	100 YR	999.00	1939.18	1944.20	1944.20	1946.66	0.009772	12.57	79.47	311.69	1.00
LSD Tributary 1	Reach 1	1.163 235	FLOODWAY	999.00	1939.18	1944.20	1944.20	1946.66	0.009772	12.57	79.47	311.69	1.00
LSD Tributary 1	Reach 1	1.113 236	100 YR	999.00	1934.05	1944.18	1936.34	1944.19	0.000026	1.04	1765.94	214.51	0.06
LSD Tributary 1	Reach 1	1.113 236	FLOODWAY	999.00	1934.05	1944.18	1936.34	1944.19	0.000026	1.04	1765.94	214.51	0.06
LSD Tributary 1	Reach 1	1.008 237	100 YR	999.00	1924.99	1944.18	1926.50	1944.18	0.000002	0.42	4422.12	287.95	0.02
LSD Tributary 1	Reach 1	1.008 237	FLOODWAY	999.00	1924.99	1944.18	1926.50	1944.18	0.000002	0.42	4422.12	287.95	0.02
LSD Tributary 1	Reach 1	0.933 257	100 YR	999.00	1917.32	1944.18	1920.89	1944.18	0.000001	0.29	7882.96	478.54	0.01
LSD Tributary 1	Reach 1	0.933 257	FLOODWAY	999.00	1917.32	1944.18	1920.89	1944.18	0.000001	0.29	7882.96	478.54	0.01
LSD Tributary 1	Reach 1	0.924 240	100 YR	999.00	1915.90	1944.18	1920.42	1944.18	0.000000	0.20	11270.45	571.10	0.01
LSD Tributary 1	Reach 1	0.924 240	FLOODWAY	999.00	1915.90	1944.18	1920.42	1944.18	0.000000	0.20	11270.45	571.10	0.01
LSD Tributary 1	Reach 1	0.913		Culvert									
LSD Tributary 1	Reach 1	0.902 241	100 YR	999.00	1910.98	1915.29	1915.29	1917.07	0.010401	10.91	96.73	83.86	1.00
LSD Tributary 1	Reach 1	0.902 241	FLOODWAY	999.00	1910.98	1915.29	1915.29	1917.07	0.010401	10.91	96.73	83.86	1.00
LSD Tributary 1	Reach 1	0.884 258	100 YR	999.00	1906.86	1910.91	1910.91	1911.70	0.008551	8.43	202.39	123.60	0.87
LSD Tributary 1	Reach 1	0.884 258	FLOODWAY	999.00	1906.86	1910.91	1910.91	1911.70	0.008551	8.43	202.39	123.60	0.87
LSD Tributary 1	Reach 1	0.794 242	100 YR	999.00	1898.43	1903.29	1903.29	1903.97	0.007021	8.97	259.69	168.90	0.80
LSD Tributary 1	Reach 1	0.794 242	FLOODWAY	999.00	1898.43	1903.29	1903.29	1903.97	0.007021	8.97	259.69	168.90	0.80
LSD Tributary 1	Reach 1	0.674 244	100 YR	999.00	1884.90	1888.88	1888.88	1889.43	0.008877	8.27	268.34	206.82	0.86
LSD Tributary 1	Reach 1	0.674 244	FLOODWAY	999.00	1884.90	1888.88	1888.88	1889.43	0.008877	8.27	268.34	206.82	0.86
LSD Tributary 1	Reach 1	0.555 243	100 YR	999.00	1874.07	1877.14	1877.14	1877.84	0.008541	7.43	207.87	160.00	0.84
LSD Tributary 1	Reach 1	0.555 243	FLOODWAY	999.00	1874.07	1877.14	1877.14	1877.84	0.008541	7.43	207.87	160.00	0.84
LSD Tributary 1	Reach 1	0.439 245	100 YR	999.00	1860.73	1865.21	1865.21	1865.82	0.008885	8.64	263.62	208.45	0.85
LSD Tributary 1	Reach 1	0.439 245	FLOODWAY	999.00	1860.73	1865.21	1865.21	1865.82	0.008885	8.64	263.62	208.45	0.85
LSD Tributary 1	Reach 1	0.314 246	100 YR	999.00	1850.08	1853.89	1853.89	1854.62	0.005305	7.60	234.56	193.20	0.71
LSD Tributary 1	Reach 1	0.314 246	FLOODWAY	999.00	1850.08	1853.89	1853.89	1854.62	0.005305	7.60	234.56	193.20	0.71
LSD Tributary 1	Reach 1	0.206 247	100 YR	999.00	1841.88	1845.51	1845.51	1846.30	0.007240	8.06	209.53	144.98	0.81
LSD Tributary 1	Reach 1	0.206 247	FLOODWAY	999.00	1841.88	1845.51	1845.51	1846.30	0.007240	8.06	209.53	144.98	0.81
LSanDomingo	Reach 1	4.599 192	100 YR	2882.00	2100.80	2105.57	2105.57	2106.61	0.006772	9.24	543.87	307.94	0.86
LSanDomingo	Reach 1	4.599 192	FLOODWAY	2882.00	2100.80	2105.57	2105.57	2106.61	0.006772	9.24	543.87	307.94	0.86
LSanDomingo	Reach 1	4.496 193	100 YR	2882.00	2092.42	2098.26	2098.26	2100.34	0.007326	12.37	316.73	89.25	0.94
LSanDomingo	Reach 1	4.496 193	FLOODWAY	2882.00	2092.42	2098.26	2098.26	2100.34	0.007326	12.37	316.73	89.25	0.94

HEC-RAS Plan: Basic Plan File (Continued)

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
LSanDomingo	Reach 1	4.387 194	100 YR	2882.00	2083.87	2088.34	2088.34	2089.72	0.013164	12.23	405.60	154.90	1.17
LSanDomingo	Reach 1	4.387 194	FLOODWAY	2882.00	2083.87	2088.34	2088.34	2089.72	0.013164	12.23	405.60	154.90	1.17
LSanDomingo	Reach 1	4.281 255	100 YR	2882.00	2077.13	2082.91	2082.91	2084.24	0.006542	11.49	520.36	212.17	0.89
LSanDomingo	Reach 1	4.281 255	FLOODWAY	2882.00	2077.13	2082.91	2082.91	2084.24	0.006542	11.49	520.36	212.17	0.89
LSanDomingo	Reach 1	4.170 195	100 YR	2882.00	2069.74	2075.35	2075.35	2077.03	0.007025	11.44	380.18	129.84	0.91
LSanDomingo	Reach 1	4.170 195	FLOODWAY	2882.00	2069.74	2075.35	2075.35	2077.03	0.007025	11.44	380.18	129.84	0.91
LSanDomingo	Reach 1	4.066 196	100 YR	2882.00	2064.72	2069.42	2069.42	2070.50	0.011267	12.24	510.87	206.91	1.07
LSanDomingo	Reach 1	4.066 196	FLOODWAY	2882.00	2064.72	2070.35	2070.35	2071.84	0.010760	12.87	398.70	112.38	1.01
LSanDomingo	Reach 1	3.972 197	100 YR	2882.00	2059.50	2064.54	2064.54	2065.81	0.006369	10.28	468.95	190.73	0.86
LSanDomingo	Reach 1	3.972 197	FLOODWAY	2882.00	2059.50	2064.90	2064.90	2067.28	0.008395	12.44	241.33	50.92	1.00
LSanDomingo	Reach 1	3.867 198	100 YR	2882.00	2052.22	2057.93	2057.93	2059.30	0.006456	9.94	404.38	174.59	0.85
LSanDomingo	Reach 1	3.867 198	FLOODWAY	2882.00	2052.22	2058.25	2057.81	2059.80	0.006570	10.13	303.16	72.04	0.84
LSanDomingo	Reach 1	3.753 199	100 YR	2882.00	2046.70	2051.98	2051.98	2053.45	0.007231	11.92	437.85	138.44	0.93
LSanDomingo	Reach 1	3.753 199	FLOODWAY	2882.00	2046.70	2052.60	2052.60	2055.17	0.008508	13.96	273.05	54.65	1.03
LSanDomingo	Reach 1	3.623 200	100 YR	2882.00	2038.73	2044.09	2044.09	2046.16	0.008264	11.81	274.12	73.26	0.97
LSanDomingo	Reach 1	3.623 200	FLOODWAY	2882.00	2038.73	2044.15	2044.15	2046.44	0.009187	12.16	239.76	52.24	1.00
LSanDomingo	Reach 1	3.497 201	100 YR	2882.00	2030.93	2036.58	2036.58	2038.75	0.007339	12.34	293.63	78.63	0.95
LSanDomingo	Reach 1	3.497 201	FLOODWAY	2882.00	2030.93	2036.64	2036.64	2039.24	0.009439	13.10	232.75	45.48	1.00
LSanDomingo	Reach 1	3.381 202	100 YR	2882.00	2024.12	2029.76	2029.76	2031.71	0.006453	11.90	335.02	101.51	0.90
LSanDomingo	Reach 1	3.381 202	FLOODWAY	2882.00	2024.12	2029.78	2029.60	2032.18	0.007377	12.75	258.20	51.00	0.96
LSanDomingo	Reach 1	3.268 203	100 YR	2882.00	2017.70	2024.72	2024.72	2026.92	0.006137	12.73	318.40	82.00	0.88
LSanDomingo	Reach 1	3.268 203	FLOODWAY	2882.00	2017.70	2024.77	2024.77	2027.74	0.007396	14.06	231.13	42.29	0.97
LSanDomingo	Reach 1	3.150 254	100 YR	2882.00	2011.66	2018.82	2018.18	2020.42	0.004270	11.50	411.51	98.34	0.76
LSanDomingo	Reach 1	3.150 254	FLOODWAY	2882.00	2011.66	2018.84	2018.10	2020.40	0.004179	11.40	397.85	82.74	0.75
LSanDomingo	Reach 1	3.093 251	100 YR	2882.00	2008.46	2019.28	2012.49	2019.52	0.000290	3.92	735.22	387.45	0.21
LSanDomingo	Reach 1	3.093 251	FLOODWAY	2882.00	2008.46	2019.28	2012.49	2019.52	0.000290	3.92	735.22	124.90	0.21
LSanDomingo	Reach 1	3.081		Culvert									
LSanDomingo	Reach 1	3.069 252	100 YR	2882.00	2004.05	2008.32	2008.32	2010.21	0.006793	11.12	275.59	79.44	0.97
LSanDomingo	Reach 1	3.069 252	FLOODWAY	2882.00	2004.05	2008.83	2008.33	2010.29	0.004511	9.81	316.34	79.44	0.81
LSanDomingo	Reach 1	3.022 253	100 YR	2986.00	2001.34	2006.45	2006.45	2008.28	0.006472	11.98	365.15	110.46	0.97
LSanDomingo	Reach 1	3.022 253	FLOODWAY	2986.00	2001.34	2006.63	2006.63	2008.77	0.006686	12.49	307.93	74.00	0.99
LSanDomingo	Reach 1	2.923 204	100 YR	2986.00	1994.83	2001.18	2001.18	2002.99	0.004681	11.47	377.73	124.44	0.84
LSanDomingo	Reach 1	2.923 204	FLOODWAY	2986.00	1994.83	2001.18	2001.18	2002.98	0.004646	11.43	376.03	118.32	0.84
LSanDomingo	Reach 1	2.817 205	100 YR	2986.00	1987.65	1994.07	1994.07	1996.42	0.005858	13.67	334.91	81.52	0.97
LSanDomingo	Reach 1	2.817 205	FLOODWAY	2986.00	1987.65	1994.48	1994.48	1997.67	0.008419	14.83	231.29	36.82	1.02
LSanDomingo	Reach 1	2.700 206	100 YR	2986.00	1980.78	1986.63	1986.63	1988.84	0.006055	12.58	311.53	83.90	0.95
LSanDomingo	Reach 1	2.700 206	FLOODWAY	2986.00	1980.78	1986.87	1986.87	1989.59	0.007337	13.30	233.06	44.36	0.98
LSanDomingo	Reach 1	2.594 250	100 YR	2986.00	1975.20	1981.42	1981.42	1983.62	0.005471	12.61	328.40	93.72	0.92
LSanDomingo	Reach 1	2.594 250	FLOODWAY	2986.00	1975.20	1981.46	1981.46	1984.35	0.006493	13.80	235.78	42.00	1.01
LSanDomingo	Reach 1	2.477 207	100 YR	3314.00	1969.09	1975.33	1975.33	1977.19	0.005141	11.91	417.58	123.32	0.87
LSanDomingo	Reach 1	2.477 207	FLOODWAY	3314.00	1969.09	1975.37	1975.37	1978.24	0.006827	13.78	260.13	46.80	1.01
LSanDomingo	Reach 1	2.374 208	100 YR	3314.00	1962.94	1969.00	1969.00	1970.94	0.005550	11.55	356.59	109.39	0.90
LSanDomingo	Reach 1	2.374 208	FLOODWAY	3314.00	1962.94	1969.04	1969.04	1970.94	0.005387	11.43	360.46	107.75	0.89
LSanDomingo	Reach 1	2.256 209	100 YR	3314.00	1956.38	1963.77	1962.47	1964.58	0.002187	8.58	702.80	177.88	0.58
LSanDomingo	Reach 1	2.256 209	FLOODWAY	3314.00	1956.38	1963.77	1962.43	1964.58	0.002187	8.58	662.02	145.15	0.58
LSanDomingo	Reach 1	2.208 210	100 YR	3314.00	1953.91	1963.43	1959.32	1964.19	0.000999	7.04	471.03	90.12	0.41
LSanDomingo	Reach 1	2.208 210	FLOODWAY	3314.00	1953.91	1963.43	1959.32	1964.19	0.000999	7.04	471.03	90.12	0.41
LSanDomingo	Reach 1	2.197		Culvert									
LSanDomingo	Reach 1	2.161 211	100 YR	3360.00	1942.55	1948.13	1947.68	1949.95	0.005514	10.82	314.05	65.80	0.86
LSanDomingo	Reach 1	2.161 211	FLOODWAY	3360.00	1942.55	1948.14	1947.68	1949.95	0.005484	10.80	314.58	65.80	0.86
LSanDomingo	Reach 1	2.083 212	100 YR	3360.00	1937.25	1944.06	1944.06	1947.09	0.006788	14.04	252.53	45.51	0.98
LSanDomingo	Reach 1	2.083 212	FLOODWAY	3360.00	1937.25	1944.06	1944.06	1947.09	0.006817	14.05	252.17	45.49	0.99
LSanDomingo	Reach 1	2.051 238	100 YR	3360.00	1936.22	1941.39	1940.16	1942.48	0.003286	8.40	409.68	88.36	0.66
LSanDomingo	Reach 1	2.051 238	FLOODWAY	3360.00	1936.22	1941.39	1940.16	1942.48	0.003286	8.40	409.71	88.35	0.66
LSanDomingo	Reach 1	2.0488		Bridge									
LSanDomingo	Reach 1	2.047 6696	100 YR	3360.00	1936.07	1940.00	1940.00	1941.95	0.008375	11.21	301.47	79.60	1.00
LSanDomingo	Reach 1	2.047 6696	FLOODWAY	3360.00	1936.07	1940.02	1940.02	1941.95	0.008237	11.15	303.01	79.60	0.99
LSanDomingo	Reach 1	2.0451 6697	100 YR	3360.00	1935.97	1939.82	1939.82	1941.70	0.009879	11.02	307.45	84.83	1.00
LSanDomingo	Reach 1	2.0451 6697	FLOODWAY	3360.00	1935.97	1939.85	1939.85	1941.70	0.009625	10.93	309.95	84.83	0.99
LSanDomingo	Reach 1	2.045 6695	100 YR	3360.00	1935.47	1939.19	1939.19	1940.99	0.009823	10.80	314.03	89.08	1.00

HEC-RAS Plan: Basic Plan File (Continued)

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
LSanDomingo	Reach 1	2.045 6695	FLOODWAY	3360.00	1935.47	1939.17	1939.17	1940.99	0.009936	10.84	312.93	89.05	1.00
LSanDomingo	Reach 1	2.044 6698	100 YR	3360.00	1935.17	1938.89	1938.89	1940.73	0.010135	10.89	309.64	86.36	1.00
LSanDomingo	Reach 1	2.044 6698	FLOODWAY	3360.00	1935.17	1938.89	1938.89	1940.73	0.010129	10.88	309.69	86.36	1.00
LSanDomingo	Reach 1	2.043 6699	100 YR	3360.00	1934.17	1937.89	1937.89	1939.72	0.010239	10.85	309.93	86.18	1.00
LSanDomingo	Reach 1	2.043 6699	FLOODWAY	3360.00	1934.17	1937.89	1937.89	1939.72	0.010253	10.86	309.80	86.18	1.00
LSanDomingo	Reach 1	2.039 6694	100 YR	3360.00	1932.77	1936.33	1936.33	1938.06	0.008088	10.57	327.64	101.67	0.99
LSanDomingo	Reach 1	2.039 6694	FLOODWAY	3360.00	1932.77	1936.37	1936.37	1938.06	0.007808	10.46	331.37	101.68	0.98
LSanDomingo	Reach 1	2.037 6700	100 YR	3360.00	1931.37	1935.16	1935.16	1936.92	0.007913	10.70	323.09	98.60	0.99
LSanDomingo	Reach 1	2.037 6700	FLOODWAY	3360.00	1931.37	1935.18	1935.18	1936.92	0.007768	10.64	325.04	98.60	0.98
LSanDomingo	Reach 1	2.004 213	100 YR	3360.00	1927.84	1932.57	1932.57	1934.48	0.007055	11.29	332.21	98.58	0.96
LSanDomingo	Reach 1	2.004 213	FLOODWAY	3360.00	1927.84	1932.60	1932.60	1934.48	0.006932	11.22	333.08	95.65	0.95
LSanDomingo	Reach 1	1.928 249	100 YR	3360.00	1921.81	1926.28	1926.28	1927.22	0.006927	9.64	700.31	422.88	0.92
LSanDomingo	Reach 1	1.928 249	FLOODWAY	3360.00	1921.81	1927.18	1927.18	1928.91	0.006689	11.06	381.77	120.00	0.94
LSanDomingo	Reach 1	1.782 215	100 YR	3360.00	1911.95	1916.05	1916.05	1917.71	0.008175	10.36	334.18	110.61	0.99
LSanDomingo	Reach 1	1.782 215	FLOODWAY	3360.00	1911.95	1916.04	1916.04	1917.71	0.008289	10.41	329.59	102.92	1.00
LSanDomingo	Reach 1	1.669 216	100 YR	3360.00	1901.83	1906.53	1906.53	1907.37	0.009054	10.80	707.48	354.12	1.03
LSanDomingo	Reach 1	1.669 216	FLOODWAY	3360.00	1901.83	1907.14	1907.14	1908.84	0.010666	13.06	414.28	118.23	1.14
LSanDomingo	Reach 1	1.564 248	100 YR	3360.00	1893.98	1897.65	1897.65	1898.66	0.008431	9.74	584.40	322.98	0.99
LSanDomingo	Reach 1	1.564 248	FLOODWAY	3360.00	1893.98	1898.15	1898.15	1899.92	0.009391	11.40	356.09	105.00	1.07
LSanDomingo	Reach 1	1.441 217	100 YR	3360.00	1883.99	1888.07	1888.07	1889.28	0.007507	10.57	542.47	215.93	0.97
LSanDomingo	Reach 1	1.441 217	FLOODWAY	3360.00	1883.99	1888.54	1888.54	1890.20	0.007402	11.38	412.31	124.00	0.98
LSanDomingo	Reach 1	1.321 226	100 YR	3360.00	1874.54	1876.65	1876.52	1877.36	0.017813	10.25	606.36	350.70	1.33
LSanDomingo	Reach 1	1.321 226	FLOODWAY	3360.00	1874.54	1877.61	1877.61	1878.86	0.013085	11.63	481.00	188.00	1.23
LSanDomingo	Reach 1	1.211 218	100 YR	3466.00	1866.02	1868.27	1868.08	1868.96	0.015272	8.51	604.58	358.08	1.20
LSanDomingo	Reach 1	1.211 218	FLOODWAY	3466.00	1866.02	1869.14	1869.14	1870.26	0.010227	9.36	488.90	221.67	1.06
LSanDomingo	Reach 1	1.085 225	100 YR	3466.00	1856.94	1858.81	1858.30	1859.16	0.013057	7.80	811.67	499.38	1.11
LSanDomingo	Reach 1	1.085 225	FLOODWAY	3466.00	1856.94	1859.74	1859.74	1860.94	0.018050	12.56	485.10	201.28	1.41
LSanDomingo	Reach 1	0.978 219	100 YR	3466.00	1848.85	1851.57	1851.30	1852.08	0.013827	8.82	828.39	622.86	1.16
LSanDomingo	Reach 1	0.978 219	FLOODWAY	3466.00	1848.85	1852.42	1852.42	1853.39	0.010886	10.13	597.28	282.00	1.10
LSanDomingo	Reach 1	.9779		Lat Struct									
LSanDomingo	Reach 1	0.896	100 YR	3466.00	1842.18	1846.80	1846.80	1848.19	0.006058	10.11	489.06	215.70	0.89
LSanDomingo	Reach 1	0.896	FLOODWAY	3466.00	1842.18	1846.85	1846.85	1848.43	0.006427	10.50	413.91	146.82	0.91
LSanDomingo	Reach 2	0.687	100 YR	4061.00	1826.69	1830.04	1829.85	1830.81	0.010955	7.26	587.96	310.21	0.86
LSanDomingo	Reach 2	0.687	FLOODWAY	4061.00	1826.69	1830.34	1830.29	1831.37	0.012336	8.38	503.86	249.13	0.94
LSanDomingo	Reach 2	0.597 220	100 YR	4456.00	1819.51	1822.80	1822.80	1823.78	0.019316	8.22	575.74	305.31	0.99
LSanDomingo	Reach 2	0.597 220	FLOODWAY	4456.00	1819.51	1822.99	1822.99	1824.11	0.018643	8.53	533.22	256.38	0.99
LSanDomingo	Reach 3	0.476 223	100 YR	4456.00	1809.26	1814.21	1814.21	1815.00	0.004493	9.24	1102.00	666.93	0.79
LSanDomingo	Reach 3	0.476 223	FLOODWAY	4456.00	1809.26	1815.18	1815.18	1816.22	0.003642	9.53	933.96	467.51	0.73
LSanDomingo	Reach 3	0.368 221	100 YR	4456.00	1801.69	1806.03	1806.03	1806.86	0.006716	9.94	1072.11	620.38	0.89
LSanDomingo	Reach 3	0.368 221	FLOODWAY	4456.00	1801.69	1807.03	1807.03	1807.99	0.004796	9.78	970.66	438.63	0.78
LSanDomingo	Reach 3	0.253 224	100 YR	4456.00	1793.51	1798.10	1798.10	1799.25	0.008280	10.60	745.45	319.47	0.98
LSanDomingo	Reach 3	0.253 224	FLOODWAY	4456.00	1793.51	1798.91	1798.91	1800.56	0.007301	11.37	564.34	182.32	0.95
LSanDomingo	Reach 3	0.145 222	100 YR	4456.00	1786.13	1790.75	1790.75	1791.96	0.006989	11.02	764.90	375.80	0.93
LSanDomingo	Reach 3	0.145 222	FLOODWAY	4456.00	1786.13	1791.42	1791.42	1793.34	0.007266	12.37	517.57	133.32	0.97

Appendix F: Erosion and Sediment Transportation Supporting Documentation

Note: Erosion and Sediment Transportation analysis is not covered by the scope of this study.

Appendix G: Field Reconnaissance Report

The *Wickenburg Area Drainage Master Study/Plan Phase 3 Field Reconnaissance Report*, prepared by Hoskin-Ryan Consultants, Inc. is included as Appendix G. ***(Included in CD)***