

APPENDIX F

MEMORANDUM: LANDSCAPE CONTEXT SENSITIVITY CRITERIA

**Reata Wash
Flood Control Improvement Study**

Contract No. 2014-168-COS

Memorandum: Landscape Context Sensitivity Criteria

August 31, 2016

Prepared for:



Capital Project Management
7447 E. Indian School Rd. Suite 205
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WOOD/PATEL
MISSION: CLIENT SERVICE™



Technical Solutions



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EXPIRES: 3/31/17

1. Introduction

The Reata Wash Flood Control Improvement Study's (Reata Wash Study) drainage corridor proposes to follow an alignment starting just north of Pinnacle Peak Road south to McDowell Mountain Ranch Road at Westworld. The existing landscape along the entire alignment consists primarily of native upper Sonoran Desert plant materials typified by Foothill Palo Verde, Ironwood and Mesquite trees, saguaro, barrel, prickly pear and cholla cacti, Jojoba, Creosote, burr sage and brittlebush perennial shrubs and native grasses. It is anticipated that there will be areas adjacent to the proposed channel that may be disturbed if channel construction occurred. These disturbed areas would be revegetated to reestablish the natural desert conditions consistent with existing conditions.

The Reata Study implemented a Context Sensitive Design approach to integrate a potential project in harmony with the existing landscape and community context including:

- Landscape Methodology
- Compliance with City of Scottsdale Native Plant Ordinance requirements
- Revegetation Methodology
- Landscape summaries of each Reach

2. Context Sensitive Design

Should the Reata Wash Study be approved by council and move forward, it would utilize a Context Sensitive Design (CSD) approach. CSD is a collaborative, interdisciplinary approach that involves all stakeholders to develop a design that fits a project's physical setting and preserves scenic, aesthetic and environmental resources, while maintaining safety and full function of the flood control system. CSD is an approach that considers the total context within which the Reata Wash Study area would exist by incorporating community values, physical needs and natural environment as an integral part of any future design.

3. Landscape Methodology

The Context Sensitive Design approach to the overall landscape would be to restore areas disturbed by construction to native desert conditions, including natural densities of

native trees, cacti, shrubs and grasses, as well as the use of native topdressing materials. The goal will be to reestablish the native desert vegetation and appearance to facilitate landscape transitions that would blend into the adjacent undisturbed desert. This would be accomplished through a process of native revegetation including the planting and transplanting of native trees and cacti salvaged from onsite and the installation of a native hydroseed mix throughout the entire zone of disturbance.

4. Native Plant Ordinance Compliance

All proposed landscape would comply with the City of Scottsdale Native Plant Ordinance (Section 7.500) and Chapter 10 of the City of Scottsdale Design Standards and Policy Manual, under which a Native Plant Inventory would be conducted within the proposed disturbance limit. As required, all native trees and cacti would be surveyed to determine each plant's viability to remain in place, be salvaged prior to construction or be destroyed. Plants designated to remain would be protected during the construction process. All plant designated to be salvaged would be transplanted by an authorized salvage contractor and would be held and maintained in an onsite nursery until the revegetation process, at which time the plants would be relocated onsite to reestablish natural plant densities throughout the area of construction disturbance.

5. Revegetation Methodology

Trees and cacti salvaged per the Native Plant Ordinance would be transplanted from the onsite nursery into the revegetation areas to reestablish natural plant densities and distributions. Transplanted trees would receive temporary, supplemental irrigation until established. All areas of construction disturbance would be sprayed with a native hydroseed mulch containing native species of grasses, perennials, shrubs and trees as listed below. Hydroseeded area would be allowed to establish naturally without supplemental irrigation. It is suggested that a hydroseed mulch be used as shown in Table-1.

Table -1 Revegetation Hydroseed Mix

Botanical name	Common name	Pounds/Acre
Grasses		
Aristida purpurea	Purple Three Awn	1.0
Bouteloua aristidoides	Needle grama	0.5
Bouteloua rothrockii	Six Week's Grama	0.5
Bouteloua rothrockii	Rothrock Grama	0.5
Wildflowers/Forbs		
Baileya multiradiata	Desert Marigold	1.0
Cassia couesii	Desert Senna	1.0
Escholtzia mexicana	Mexican Poppy	2.0
Lesquerella gordonii	Gordons Bladderpod	1.0
Penstemon parryi	Parry's Penstemon	0.5
Phacelia crenulata	Desert Phacelia	1.0
Plantago ovata	Desert Indian Wheat	2.0
Sphaeralcea ambigua	Desert Globemallow	1.0
Shrubs (suffrutescent)		
Ambrosia deltoids	Triangle Leaf Bursage	4.0
Encelia farinosa	Brittlebush	0.5
Eriogonum fasciculatum var. polifolium	Flat-top Buckwheat	0.5
Woody Shrubs and Trees		
Acacia constricta	White Thorn Acacia	1.0
Atriplex canescens	Four Wing Saltbush	0.5
Larrea tridentata	Creosote Bush	3.0

6. Landscape Summary Reach 1 through 5

The following outlines the Context Sensitive Landscape methods for each Reach based on this study's recommended solution (See Exhibit 1 – Study Location Reach Map).

- **Reach 1 – Pinnacle Peak Road to 1,000 feet north**

The recommended solution creates a rough surfaced hard lined open channel using a “U” shaped channel within the existing corridor. As such, no landscape revegetation would be included within the drainage channel. Revegetation would be limited to only those areas necessarily disturbed during construction.

- **Reach 2 (north) – Pinnacle Peak Road to approximately 1,300 feet south**

The recommended solution consists of a concrete ‘U’ channel. Construction of the ‘U’ channel would require disturbance outside of the final channel structure. A construction disturbance boundary would be established prior to construction and all native trees and cacti would be inventoried and salvaged per the Native Plant Ordinance, as noted above. After construction of the channel is complete, salvaged trees and cacti would be replanted throughout the areas of construction disturbance and adjacent to drainage channel to reestablish native densities. All disturbed areas would be treated with the native hydroseed, as shown in Table -1.

- **Reach 2 (south) – Pinnacle Peak Road to Cross Canyon Way**

The recommended solution for the south portion of Reach 2 transitions from the ‘U’ channel design to a grouted rock trapezoidal channel. A construction disturbance boundary would be established prior to construction and all native trees and cacti would be inventoried and salvaged per the Native Plant Ordinance. After construction of the channel is complete, salvaged trees and cacti would be replanted throughout the areas of construction disturbance and adjacent to drainage channel to reestablish native densities. All disturbed areas would be treated with the native hydroseed, as shown in Table –1.

- **Reach 3 – Northern Segment**

The recommended solution is an incised grouted rock trapezoidal channel, similar to the south section of Reach 2. A construction disturbance boundary would be established prior to construction and all native trees and cacti would be inventoried and salvaged per the Native Plant Ordinance. After construction of the channel is complete, salvaged trees and cacti would be replanted throughout the areas of construction disturbance and adjacent to drainage channel to reestablish native densities. All disturbed areas would be treated with the native hydroseed, as shown in Table –1.

- **Reach 3 – Southern Segment**

Construction within the existing earthen channel would be limited to only those areas identified as requiring additional buried bank protection to achieve sufficient scour protection. Revegetation efforts would be limited to only those areas disturbed by construction of the additional buried bank protection.

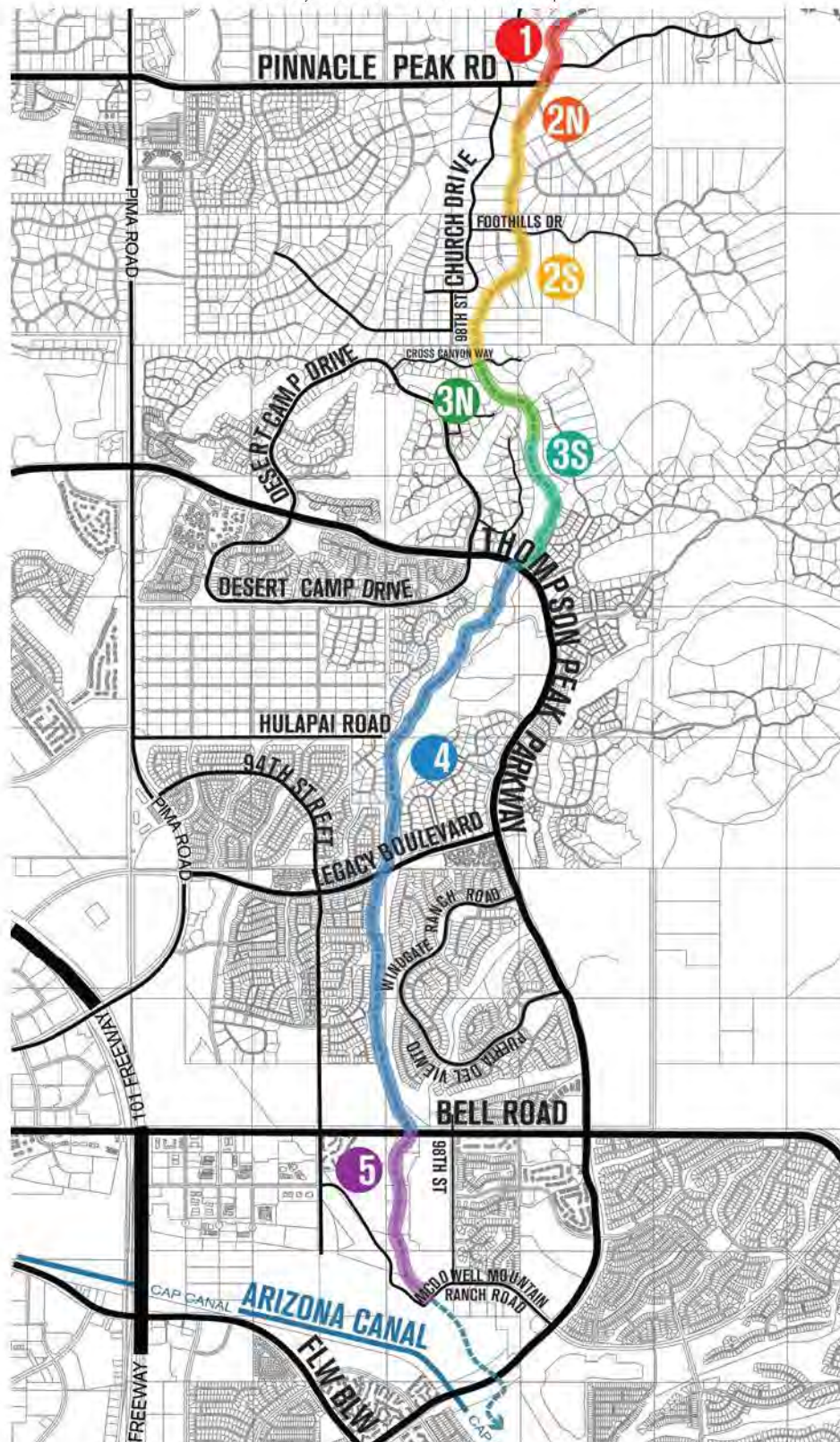
- **Reach 4 – Thompson Peak Parkway to Bell Road**

Similar to the southern portion of Reach 3, construction within Reach 4's existing earthen channel would be limited to only those areas that may require additional buried bank protection to achieve sufficient scour protection. Revegetation efforts would be limited to only those areas disturbed by construction of the additional buried bank protection.

- **Reach 5 – Bell Road to East McDowell Mountain Ranch Road**

The recommended solution is an incised earthen trapezoidal channel with buried bank protection, including a sediment basin immediately upstream of the McDowell Mountain Ranch Road bridge. The area contained within this Reach is adjacent to WestWorld, and these overbank areas could be used for future event parking. Revegetation will be limited in this reach, but all areas disturbed would, at a minimum be treated with a dust control palliative to meet Maricopa County requirements.

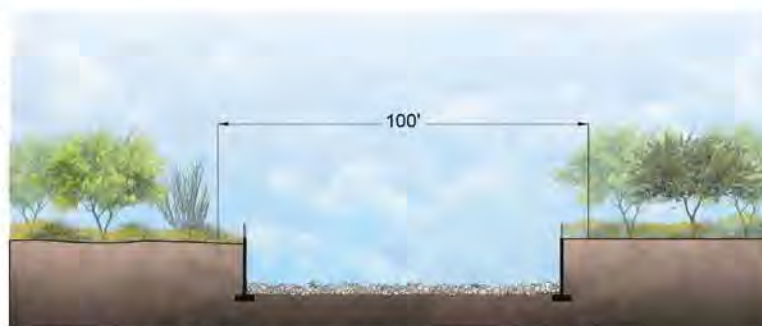
EXHIBIT -1
Study Location Reach Map



7. Landscape Graphics

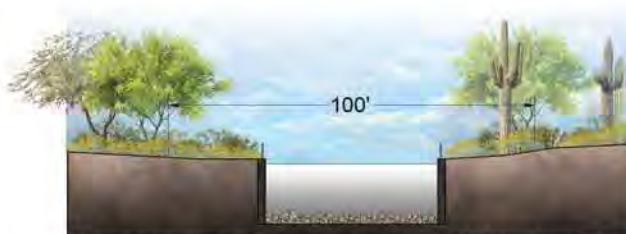
The following represent the typical context sensitive native plant vegetation proposed for each Reach for the three alternative solutions identified in this study: the Recommended Solution, Alternative B and Alternative C.

REACH 1

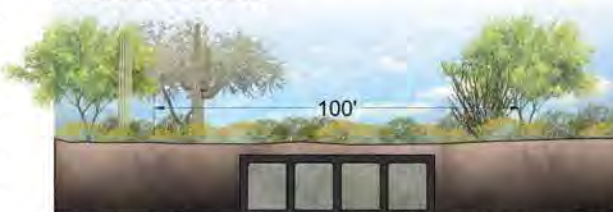


**RECOMMENDED SOLUTION:
U-CHANNEL WALL &
CONCRETE ROCK INVERT**

REACH 2 NORTH

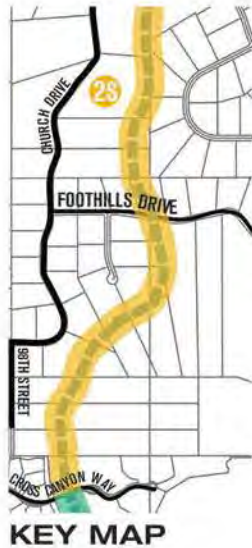


**RECOMMENDED SOLUTION:
U-CHANNEL**

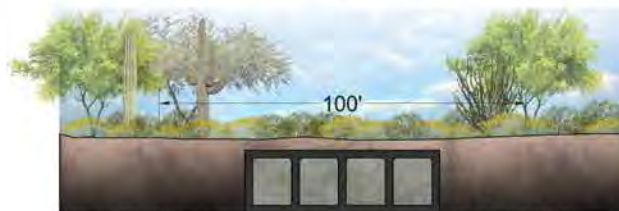


ALTERNATIVES B & C: BOX CULVERT

REACH 2 SOUTH

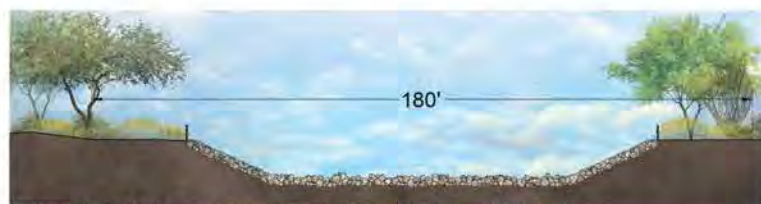
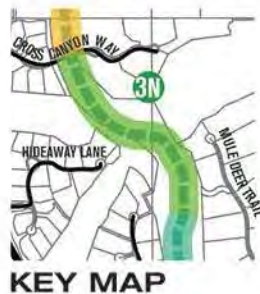


**RECOMMENDED SOLUTION &
ALTERNATIVE B: GROUTED ROCK CHANNEL**

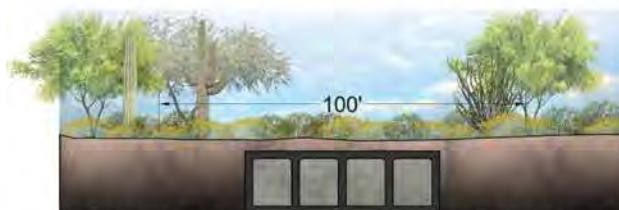


ALTERNATIVES C: BOX CULVERT

REACH 3 NORTH

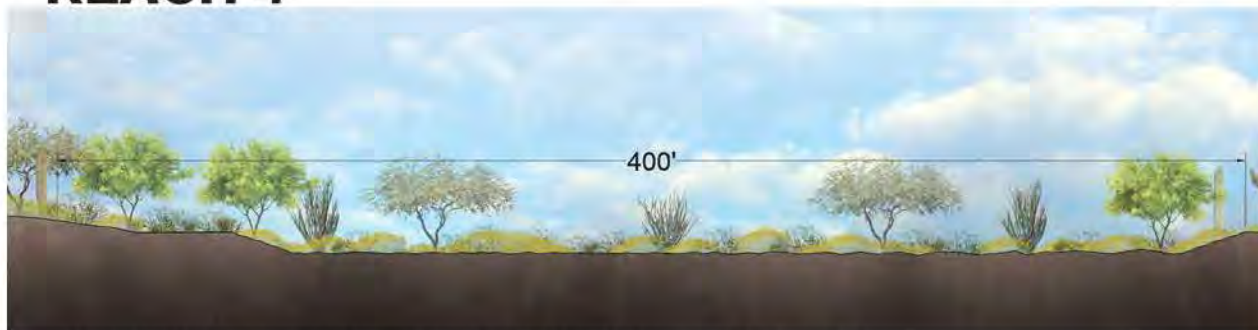


**RECOMMENDED SOLUTION &
ALTERNATIVE B: GROUTED ROCK CHANNEL**



ALTERNATIVES C: BOX CULVERT

REACH 4

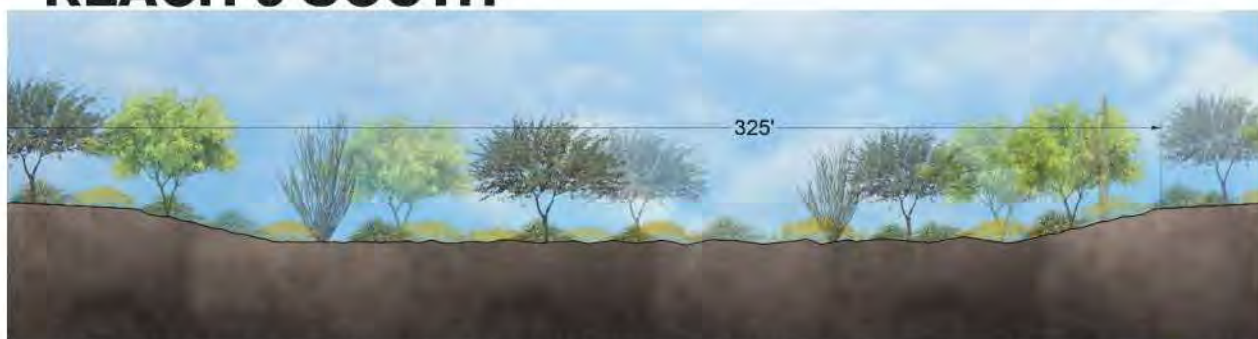


EXISTING EARTHEN CHANNEL TO REMAIN



KEY MAP

REACH 3 SOUTH

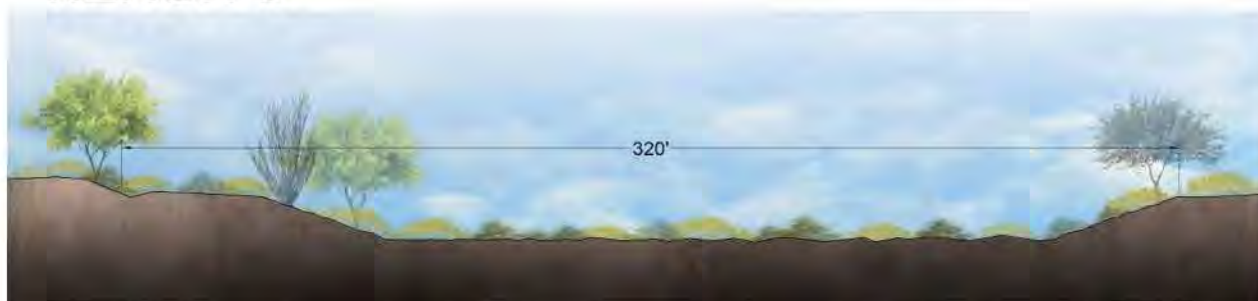


EXISTING EARTHEN CHANNEL TO REMAIN



KEY MAP

REACH 5



EARTHEN CHANNEL WITH REVEGETATION AND DUST CONTROL PALLIATIVE



APPENDIX G
MEMORANDUM: HYDROLOGIC REVIEW

**Reata Wash
Flood Control Improvement Study**

Contract No. 2014-168-COS

Memorandum: Hydrologic Review

August 31, 2016

Prepared for:



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EXPIRES: 9-30-17

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EXPIRES: 9-30-17

This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by JE Fuller Hydrology & Geomorphology, Inc., shall be without liability to JE Fuller Hydrology & Geomorphology, Inc.

1. Executive Summary

A review and assessment of existing hydrologic models and reports pertinent to the Reata Wash Flood Control Improvement Study area was conducted. The purpose of this review was to determine the applicability of the existing hydrologic models to the current study, as well as assess the need for alterations and updates. Although a large portion of the historical hydrologic models meet the minimal Federal Emergency Management Agency (FEMA) requirements, the Draft Pinnacle Peak South (PPS) Area Drainage Master Study (ADMS) Hydrology and Hydraulics (H&H) Report model, prepared by TY Lin International (TY Lin) in 2012, was evaluated and advanced as the most appropriate hydrologic model for the following reasons:

- Most recent hydrologic modeling effort within the Reata Wash watershed.
- Hydrologic model used current Flood Control District of Maricopa County (FCDMC) standards and methods. Model includes updated land use, soils and hydrologic basin boundaries accounting for existing watershed conditions.
- Hydrologic model and model input data reviewed extensively by FCDMC staff.
- Hydrologic model covers approximately 85% of the Reata Wash watershed and will require less effort to adjust for the Reata Wash corridor.

The following modifications will be incorporated into the Draft PPS ADMS hydrologic model for use in the Reata Wash Flood Control Improvement Study:

- Land use categories and boundaries within the model limits will be checked against project aeriels (2014) and flood control facilities not currently existing or under construction will be removed from the hydrologic model.
- The watershed boundaries will be extended to include the Reata Wash Corridor from Pinnacle Peak Road south to Bell Road. This area is approximately 1.6 square miles of the 2.0 square mile Reata Wash major basin.
- A full review of the input parameters will be conducted as part of the Reata Wash Flood Control Improvement Study Quality Control program.

The updates and adjustments to the Draft PPS ADMS hydrologic models described above will be documented in Reata Wash Flood Control Improvement Study, Hydrologic Modeling Memorandum. Refer to that memorandum for discussion of the results of the modeling effort recommended in this memorandum.

2. Overview

This memorandum documents the findings of the hydrologic Review and assessment conducted in support of the City of Scottsdale's (City) Reata Wash Flood Control Improvement Study. The assessment was performed by staff from JE Fuller/Hydrology & Geomorphology, Inc. (JE Fuller), as a subconsultant to Wood, Patel & Associates, Inc. (WPA), under Task 3 of City Contract # 2014-168-COS. The scope of services for Task 3 calls for a review of past hydrologic models and reports to assess their application and use to this project. The principal focus of the hydrologic model review will be addressing whether models are FEMA-compliant, and providing recommendations to eliminate any deficiencies. Recommendations may include updating the existing hydrologic model based on the findings of this review. Note that this memorandum was an initial project deliverable. The recommendations made in this memorandum were implemented after

authorization by City staff, and the results of the recommended modeling effort are described in the Hydrologic Modeling Memorandum, which was provided as a separate deliverable.

3. Study Area

The Reata Pass Alluvial Fan is located within the city limits of Scottsdale, Arizona along the western flank of the McDowell Mountains, and northeast of the Loop 101 Freeway and the Central Arizona Project (CAP) Canal (Figure 3-1).



4. Data Sources

Primary data sources include the City, FCDMC, and WPA. Full project data collection efforts were documented as part of Task 2 Data Collection. Relevant reports and hydrologic models are summarized in Section 5.

5. Existing Hydrologic Models

Table 5–1 is a listing of relevant reports and hydrologic modeling documentation within the Reata Wash watershed.

Table 5–1 Reata Wash Flood Control Improvement Study Hydrologic Report Summary				
⁽¹⁾ Study Document Number	Title	Author	Date	Note
RW0180	Final Hydrology Report Outer Loop Freeway, North of the CAP Aqueduct	Simons, Li & Associates, Inc. (SLA)	4/1/87	Base hydrology for north Scottsdale First reference to CP51.
RW0187	Draft General Drainage Plan for North Scottsdale, Arizona	Water Resources Associates, Inc. (WRA)	9/2/88	Minor Adjustments to base model (RW0180)
RW0007	Hydrologic Analysis of Scottsdale Alluvial Fans 1-6, Maricopa County, AZ	Cella Barr Associates	9/4/88	Original FEMA Fan Hydrology and Delineation, Established FEMA flows for fans 1-6. Short Geomorphology Section
RW0008	Hydrologic Analysis of Scottsdale Alluvial Fan Area	FCDMC	5/1/91	Flows substantially lower than the CB flows. Doesn't appear to be used for any of the subsequent studies.
RW0140	Sensitivity Analysis of Reata Pass Hydrology, Scottsdale, Arizona	WRA	11/8/91	Using the Upper Indian Bend Wash HEC-1 models, WRA ran 15 separate scenarios/model parameter permutations. Recommended Scenario 13 for hydrologic modeling for regional flood control.
RW0186	Final Report, Upper Indian Bend Wash Regional Drainage and Flood Control Plan Vol_I	WRA	7/6/92	Includes analysis on CAP detention basins with Reata Channel in-place

Table 5–1 Reata Wash Flood Control Improvement Study Hydrologic Report Summary

⁽¹⁾ Study Document Number	Title	Author	Date	Note
RW0185	HEC_1_InputOutputData_UpperIndianBendWash_RegionalDrainageandFloodControlPlan_Vol_II_IBW	WRA	7/6/92	Used hydrology from Draft General Drainage Plan for North Scottsdale, Arizona (RW0187). Suggested REAT4 HEC-1 model but Conditional Letter of Map Revision (CLOMR) used REAT3A.
RW0101	Scottsdale Desert Greenbelt Reata Pass/Beardsley Wash Hydrology Report	Greiner, Inc. and City	2/1/95	Project specific hydrology created from the WRA models used in RW0140. Also used as the basis for SLA design documents (RW0104, 0105, 0106, 0107, and 0110).
RW0073	City of Scottsdale Desert Greenbelt Project Reata Pass/Beardsley Wash CLOMR, Volume I, Preliminary Design and Analysis	Greiner, Inc.	5/1/95	Referenced RW0101
RW0017	North Scottsdale Drainage Area, Arizona, Reconnaissance Study Flood Control and Related Purposes, R-4 Package, Appendix A, B, and C.	United States Army Corps of Engineers (USACE)	2/1/96	First reference with Accepted FEMA discharges at Reata Apex. USACE review of existing and project hydrology.
RW0072	Scottsdale Desert Greenbelt Phase One Design Reata Pass Wash Supplemental CLOMR Report	Greiner, Inc.	5/1/96	Includes updated hydrology based on FEMA Comments.
RW0177	DC Ranch Planning Unit III, V & VI Addendum to Part 4 Drainage Plan Study	WPA	12/25/01	Hydrology and Hydraulics Report and calculations for local development.
RW0146	Preliminary Design Report, Basis of Design for Reata Drainage Corridor Between Union Hills Drive and Bell Road.	WPA	09/27/03	Pg 2. Not CLOMR study. Hydrology does not go below Union Hills. No backup data to Review.

Table 5–1 Reata Wash Flood Control Improvement Study Hydrologic Report Summary

⁽¹⁾ Study Document Number	Title	Author	Date	Note
RW0175	Drainage Report for DC Ranch Planning Unit 1 - North Flood Protection	WPA	11/23/03	Hydrology and Hydraulics Report and calculations for local development.
RW0176	Drainage Report for DC Ranch Planning Unit 1 - South Flood Protection	WPA	10/2/03	Hydrology and Hydraulics Report and calculations for local development.
RW0124	Review of Pima Road DCR, AZ101 to Thompson Peak Parkway, Final Hydrology & Preliminary Design Report	Robert L. Ward, P.E.	06/19/04	General review of local modeling efforts by various consultants.
RW0126	Addendum to Master Plan for DC Ranch PU III, V, & VI Addendum to Part 4 Drainage Plan Study (10-27-04) folder	WPA	10/24/04	Updated hydrology used in RW0146. Hydrology and Hydraulics Report and calculations for local development.
RW0178	Addendum to Master Plan for DC Ranch Planning Unit III, V & VI Addendum to Part 4 Drainage Plan Study	WPA	10/27/04	Hydrology and Hydraulics Report and calculations for local development.
RW0173	DC Ranch, Parcel T7, Reata Wash LOMR	WPA	12/8/04	Hydrology and Hydraulics Report and calculations for local development.
RW0174	Drainage Report for DC Ranch Parcel T7	WPA	12/8/04	Hydrology and Hydraulics Report and calculations for local development.
RW0064	Pinnacle Peak South Area Drainage Master Study, Hydrology and Hydraulics Report- Volume 1	TY Lin	4/26/12	Draft Unsealed Hydrology (HEC-1 modeling to current FCDMC standards above Reata Pass Fan Apex and contributing watershed east of Thompson Peak Parkway).

Notes:

(1) **RW####** = Study document number for Reata Wash Flood Control Improvement Study. RW for Reata Wash with 4 digits assigned to document. Documents collected as part of the Reata Wash Flood Control Improvement Study.

The nine (9) reports and accompanying hydrologic models in Table 6–1 could be directly correlated to the Reata Wash Flood Control Improvement Study area. Direct correlation included discussions of or direct inclusion of a concentration point for the hydrographic apex for the Reata Pass Fan. This concentration point is designated as either C51, CP51, C50, or CP22 depending on the particular hydrologic model. However, each of these points are in the same general location (as determined by report exhibit or discussion) and have a similar contributing drainage area. Refer to Figure 5–1 for a depiction of the location of this common concentration point.

The nine (9) hydrologic models, listed in Table 6-1, were broken out by hydrologic modeling methods and input variables for comparison purposes. They were then compared and assessed for FEMA compliance.

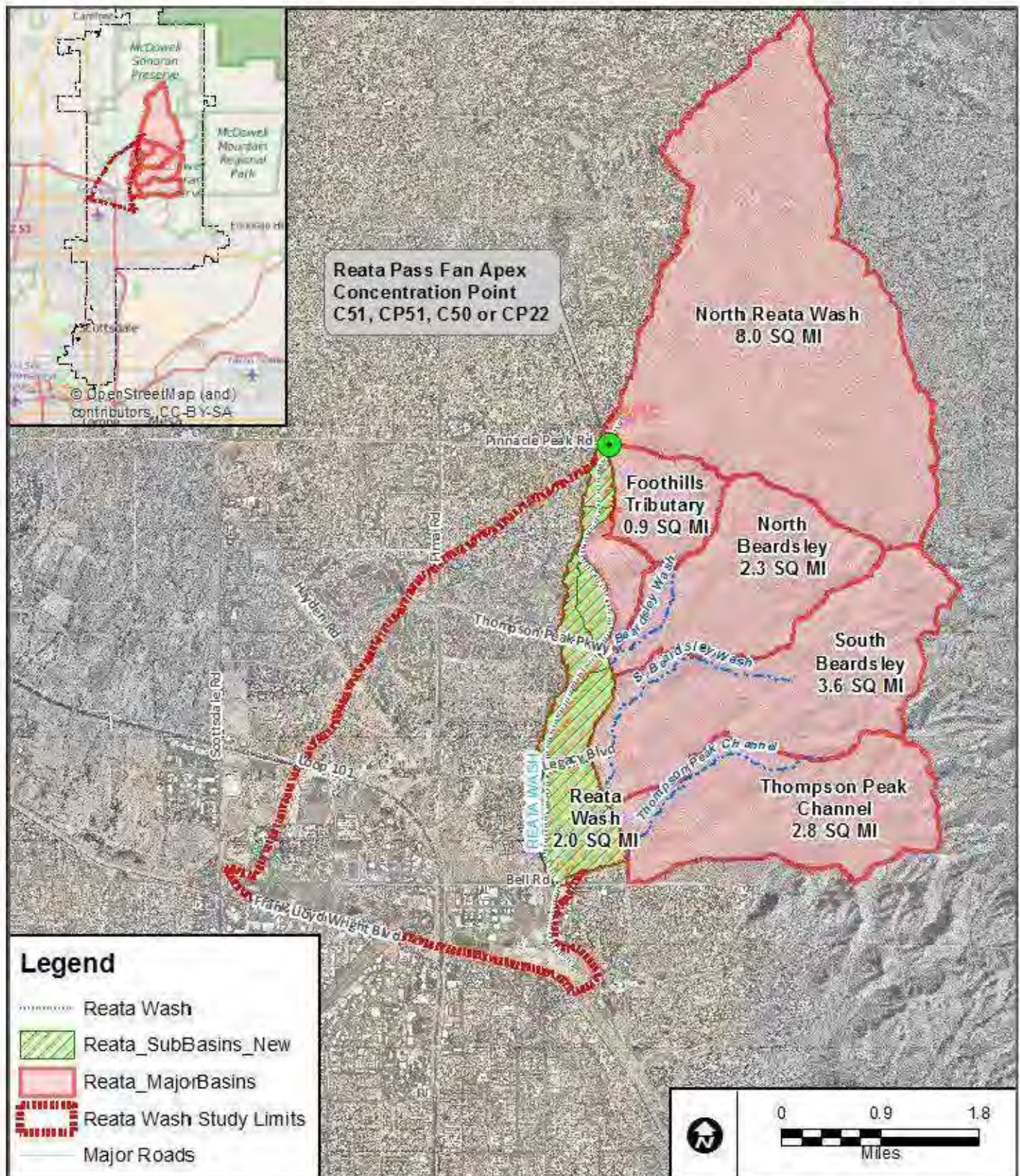


Figure 5-1 Location of Reata Pass Fan Apex within the Study Boundary

6. Criteria for Hydrologic Model Compliance

The following criteria were used to evaluate the level of compliance for the hydrologic models under review;

- Model methodology must meet current FEMA Standards. A list of FEMA-acceptable hydrologic models can be found on the following website;
<http://www.fema.gov/hydrologic-models-meeting-minimum-requirement-national-flood-insurance-program>
- Model methodology must meet current City guidelines as outlined in 2009 Design Standards & Policies Manual (Effective Date February 7th 2010).
- Model methodology must meet current FCDMC standards (FCDMC Drainage Design Manual. Hydrology 2013).

Table 6-1 Hydrologic Model Summary

Study Document Number	Title	Author	Date	Common Reata Pass Alluvial Fan Apex ID	Calculated Flow at Reata Apex ID (cfs)	Model Method	Rainfall Duration (hours)	Rainfall Distribution	Aerial Reduction	Loss Method	Unit Hydrograph	Routing	Analysis
RW0007	Hydrologic Analysis of Scottsdale Alluvial Fans 1-6, Maricopa County, AZ	Cella Barr Associates	9/4/88	C51	14,867	HEC-1	24	Type 2A	Point rainfall reduced in model	Curve Number (CN)	Kinematic Wave	Kinematic Wave	Meets minimal City and FEMA Standards
RW0008	Hydrologic Analysis of Scottsdale Alluvial Fan Area	FCDMC	5/1/91	CP51	5,370	HEC-1	24	Type 2A	No Data Available	Green & Ampt	S-Graph	Normal Depth	Meets minimal City and FEMA Standards
RW0140	Sensitivity Analysis of Reata Pass Hydrology, Scottsdale, Arizona	WRA	11/8/91	CP51	9,324	HEC-1 (Scenario 13)	6	Hypothetical Storms (PH)	Depth/Area Storm (JD)	CN	Kinematic Wave	Kinematic Plus Modified Puls 8-pt	Meets minimal City and FEMA Standards
RW0101	Scottsdale Desert Greenbelt Reata Pass/Beardsley Wash Hydrology Report	Greiner, Inc.	2/1/95	C50	11,236	HEC-1 (Model 4)	6	PH	JD	CN	Kinematic Wave	Modified Puls 8-pt	Meets minimal City and FEMA Standards
RW0073	City of Scottsdale Desert Greenbelt Project Reata Pass/Beardsley Wash CLOMR, Volume I, Preliminary Design and Analysis	Greiner, Inc.	5/1/95	C50	11,236	HEC-1 (Model 4)	6	PH	JD	CN	Kinematic Wave	Modified Puls 8-pt	Meets minimal City and FEMA Standards
RW0017	North Scottsdale Drainage Area, Arizona, Reconnaissance Study Flood Control and Related Purposes, R-4 Package, Appendix A, B, and C.	USACE	2/1/96	CP51	No Data Available	HEC-1	6	Local Storm	No Data Available	Exponential (LE)	No Data Available	Muskingum	Meets minimal City and FEMA Standards
RW0072	Scottsdale Desert Greenbelt Phase One Design Reata Pass Wash Supplemental CLOMR Report	Greiner, Inc.	5/1/96	C50	11,236	HEC-1	6	PH	JD	CN (LS)	Kinematic Wave	Modified Puls 8-pt	Meets minimal City and FEMA Standards
RW0126	Addendum to Master Plan for DC Ranch PU III, V, & VI Addendum to Part 4 Drainage Plan Study (10-27-04) folder	WPA	10/24/04	CP51	11,650	HEC-1	6	PH	JD	CN (LS)	Kinematic Wave	Kinematic Plus Modified Puls 8-pt	Meets minimal City and FEMA Standards
RW0064	Pinnacle Peak South Area Drainage Master Study, Hydrology and Hydraulics Report- Volume Un-sealed, 95% draft	TY Lin	4/26/12	CP22	13,065	HEC-1	24	Type 2	JD	Green & Ampt	S-Graph	Modified Puls 8-pt	Meets minimal City and FEMA Standards, Meets Current FCDMC Standards. Most recent watershed study.

7. Conclusions and Recommendations

All models in Table 6–1 meet the minimum FEMA requirements for hydrologic modeling within the Reata Wash Watershed. The Draft PPS ADMS H&H Report (hydrologic modeling) was advanced as the most appropriate model for the following reasons:

- Most recent hydrologic modeling effort within the Reata Wash watershed.
- Hydrologic model used current Flood Control District of Maricopa County (FCDMC) standards and methods. Model includes updated land use, soils and hydrologic basin boundaries accounting for existing watershed conditions.
- Hydrologic model and model input data reviewed extensively by FCDMC staff.
- Hydrologic model covers approximately 85% of the Reata Wash watershed and will require less effort to adjust for the Reata Wash corridor.

The following adjustments will be incorporated into the Draft PPS ADMS H&H Report hydrologic models for use in the Reata Wash Flood Control Improvement Study;

- Land use categories and boundaries within the model limits will be checked against project aeriels (2014) and flood control facilities not currently existing or under construction will be removed from the hydrologic model.
- The watershed boundaries will be extended to include the Reata Wash Corridor from Pinnacle Peak Road south to Bell Road. This area is approximately 1.6 square miles of the 2.0 square mile Reata Wash major basin.
- A full review of the input parameters will be conducted as part of the Reata Wash Flood Control Improvement Study Quality Control program.

Updates and adjustments to the Draft PPS ADMS, hydrologic models will be documented in Reata Wash Flood Control Improvement Study, Hydrologic Modeling Memorandum.

APPENDIX H
MEMORANDUM: HYDROLOGIC MODELING

**Reata Wash
Flood Control Improvement Study**

Contract No. 2014-168-COS

Memorandum: Hydrologic Modeling

August 31, 2016

Prepared for:



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EXPIRES: 9-30-17

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1. Introduction

1.1 Purpose of Hydrologic Study

This memorandum is prepared for the City of Scottsdale, Arizona (City) as part of the Reata Wash Flood Control Improvement Study. It summarizes the hydrologic modeling efforts for the Reata Wash Flood Control Improvement Study.

The purpose of the hydrologic modeling and documentation is to help establish a hydrologic model to be used as a basis for the Reata Wash Flood Control Improvement Study. This hydrologic information will be significant for the development of preliminary recommendations for corridor drainage alternatives.

1.2 Authority of Study

This study was authorized by the City under contract 2014-168-COS. JE Fuller/Hydrology & Geomorphology, Inc. (JE Fuller) is working as a subconsultant to Wood, Patel & Associates (WPA).

1.3 Location of Study

The Reata Wash Flood Control Improvement Study is located within the city limits of Scottsdale, Arizona along the western flank of the McDowell Mountains, and northeast of the Loop 101 Freeway and the Central Arizona Project (CAP) Canal (see Figure 1-1).

1.4 Methodology

As part of Task 3A of the Reata Wash Flood Control Improvement Study, a hydrologic review was performed. Based on this review, it was recommended that the Draft Pinnacle Peak South (PPS) Area Drainage Master Study (ADMS) Hydrology and Hydraulics (H&H) Report model prepared by TY Lin International (TY Lin) in 2012, be used as a base model for the hydrology of the Reata Wash Flood Control Improvement Study. The following modifications were recommended to the Draft PPS ADMS hydrologic model for use in the Reata Wash Flood Control Improvement Study:

- As stated in the Draft PPS ADMS H&H Report, the hydrologic model was developed for future land use conditions and included future flood control facilities, such as retention/detention basins utilized to attenuate the peak discharge and reduce the storm water runoff volume. For the Reata Wash Flood Control Improvement Study, land use categories and boundaries within the model limits will be checked against project aerials (2014), and features not currently existing or under construction will be removed from the hydrologic model.
- The watershed boundaries will be extended to include the Reata Wash Corridor from Pinnacle Peak Road south to Bell Road. This area is approximately 1.6 square miles of the 2.0 square mile Reata Wash major basin (see Figure 1-1).

The hydrologic modeling as originally prepared for the PPS ADMS, was completed using the Corps of Engineer's Hydrologic Engineering Center's HEC-1 modeling program version 4.1 (see Figure 1-1 for HEC-1 Study Area location).

1.5 Study Results

The study resulted in the development of rainfall-runoff models for the 2-year, 5-year, 10-year, 25-year, 50-year, and 100-year events of 24-hour duration for the watershed. This memorandum documents the results of these models for the 19.58 square mile watershed upstream of Bell Road.

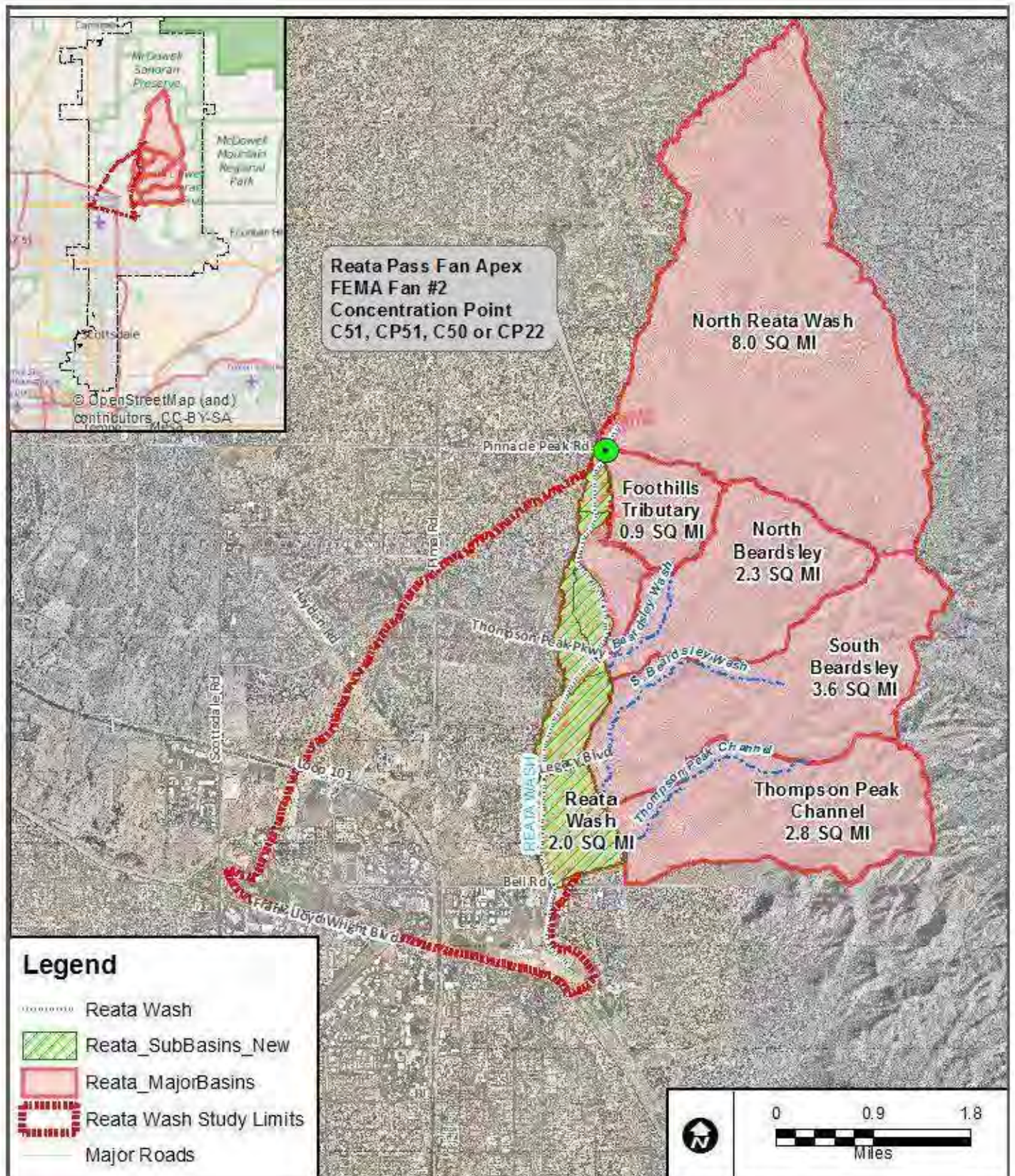


Figure 1-1 General Study Area Location

2. Mapping and Survey Information

2.1 Field Survey and Mapping Information¹

Topographic Mapping was provided by the Flood Control District of Maricopa County (FCDMC). Aerial photography was taken in 2007 and processed in 2010. Supplementary ground survey was conducted in certain areas in the watershed of special concern with respect to storm water conveyance. These areas included channels that were constructed after 2007. The details/results of aerial mapping and supplementary survey used for the project are provided in the PPS ADMS Data Collection Report.

3. Hydrology

3.1 Method Description

The hydrologic modeling from the PPS ADMS was used as a base for the development of the Reata Wash Flood Control Improvement Study hydrology. The hydrologic model for the watershed was completed using the Corps of Engineer's Hydrologic Engineering Center's HEC-1 modeling program version 4.1 (see Figure 1-1 for HEC-1 Study Area location). The HEC-1 input data was generated from topographic mapping, aerial photographs, Environmental Systems Research Institute (ESRI) ArcMap v10.2, and the FCDMC's Drainage Design Management System for Windows (DDMSW) version 4.8.2. The 2-year, 5-year, 10-year, 25-year, 50-year, and 100-year, 24-hour storm events were modeled. The S-graph method was selected as the unit hydrograph and Green-Ampt was used to calculate rainfall losses.

3.2 Flow Splits

No additional flow splits were modeled.

3.3 Diversion/Storage²

The Echo Ridge subdivision, located in the northern portion of the watershed, provides some on-site retention within the developed community. Though these retention areas are relatively small, they have been included within the HEC-1 modeling to account for development storage. At the outfall of the Echo Ridge subdivision, flow passes through two existing detention basins which are connected in series. The site with these two regional basins is owned by the City and is designated as Troon North Park. The existing basin (Troon North Park) has been redesigned to enlarge the basin's storage capacity, as well as to add recreation amenities. The second basin (FCD#1) will remain in its current configuration. The culvert connection between the two basins has an equalizing discharge greater than that of the culvert/spillway outlet of FCD#1. Therefore, the two basins were modeled together with a single stage-storage-discharge relationship having an outfall at concentration point CP6 (see tables in Draft PPS ADMS H&H Report).

A regional sedimentation basin is located at the intersection of Happy Valley Road and Alameda Road, noted as concentration point CP20 (FCD#2). This basin was modeled with a stage-storage-discharge relationship (see tables in Draft PPS ADMS H&H Report) and discharges flow into a downstream wash which runs west adjacent to Happy Valley Road.

¹ Pinnacle Peak South Area Drainage Master Study, Draft Hydrology and Hydraulics Report Volume 1, July 26.2013. Pg. 5.

² Pinnacle Peak South Area Drainage Master Study, Draft Hydrology and Hydraulics Report Volume 1, July 26.2013. Pg. 7-8.

Reata Wash Flood Control Improvement Study used the existing retention basins in the HEC-1 model with the exception of an as-yet unbuilt regional basin (i.e., future conditions) located east of Alma School Road just north of Pinnacle Vista Dr. (HEC-1 Model ID DET6). Table 3–1 is a summary of modeled retention/detention basins. As noted above, detailed information regarding each basin is included in the Draft PPS ADMS H&H Report.

Table 3–1 Modeled Retention/Detention Basins			
HEC-1 Model ID	Sub-Area	Retention/Detention Basin Designation	Note
RET1	01	LP002 LPC001	Aggregate from a series of small (2) upstream Basins. Very small and do not show up well on Topo.
RET2	02	LPC005 LPC006 LPC007 LPC009 LPC012 LPC013 LPC014 LPC13i	Aggregate from a series of small (8) upstream Basins. Very small and do not show up well on Topo. Upstream of road embankments in existing development.
RET3	03	LP022 LP023	Retention basin at basin outlet (Sub Area 3) upstream of roadway embankment.
RET4	04		Aggregate from a series of small (4) upstream Basins. Small but visible on topo through an existing development.
RET5	05	LP016	Unknown Location.
RET6	06	LPC024	Single basin visible on topo and aerial images.
RET7	07	LPC032	Small single basin within existing development. Upstream of road crossing.
DET20	20		Large area upstream of road crossing.

3.4 Parameter Estimation

3.4.1 Drainage Area Boundaries

The study area watershed and hydrologic subbasins are shown on Exhibit C. The watershed area is approximately 19.58 square miles, with 8.00 square miles contributing to the apex of the Reata Pass Alluvial Fan (Federal Emergency Management Agency (FEMA) Fan #2). The ultimate outfall for the study area is at the southern boundary of the watershed at Reata Wash and Bell Road.

3.4.2 Watershed Work Maps

The following maps have been prepared to document the HEC-1 modeling input and results. These exhibits include the original Draft PPS ADMS watershed as well as the additional sub-basins added for the Reata Wash Corridor:

Exhibit A - Soil Type Map – prepared from the FCDMC’s soils information - this exhibit shows the soils located within each sub-basin.

Exhibit B - Land Use Map – prepared from the City’s land use and zoning information. For areas outside of the Draft PPS ADMS hydrologic modeling area, new land use codes were converted to the applicable FCDMC’s codes within each sub-basin.

Exhibit C - Watershed Map – prepared using the topographic data provided by the FCDMC as a background. This map depicts the overall watershed boundary, sub-basin drainage boundaries, sub-basin identification nomenclature, longest flow path lengths and slopes, the length from the sub-basin centroid to the downstream concentration point along the longest flow path from a point perpendicular to the centroid, and the routing lengths. Nomenclature for the Reata Wash corridor hydrologic basins is consistent with the Draft PPS ADMS hydrologic modeling.

3.4.3 Gage Data

There have been several rain and stream gages (see Table 3–2 and Table 3–3) installed within the project watershed over the past 23 years. The stream and rainfall gages located within the watershed have a relatively short period of record. However, the following events have been identified from FCDMC telemetry data.

Table 3–2 Rainfall Data

Gage	Installed (Date)	Location	Storm (Date)	Largest Storm (inches)	Most Intense Duration (inches/time)
4585	5/15/01	1.6 miles east of Pima Rd. on Pinnacle Peak Rd.	9/08/14 1/27/08 9/3/06 7/31/05 3/4/04	2.28 1.97 1.02 1.65 2.20	2.28/24-hr 0.25/1-hr 0.98/17-min 1.53/1-hr 0.59/1-hr
4935	8/26/93	0.5 miles south of Dynamite Blvd. and 112 th St.	11/15/93 9/8/14 8/29/96 8/29/96	No Data Available	2.64/24-hrs 2.20/6-hrs 1.54/1-hr 0.91/15-min

Table 3–3 Stream Gages

Gage	Installed (Date)	Location	Largest Event (Date)	Peak Stage (feet)	Peak Q (cfs)
4588	5/15/01	1.6 miles east of Pima Rd. on Pinnacle Peak Rd.	9/08/14	2.08	1,197
4938	10/2/01	0.5 miles south of Dynamite Blvd. and 112 th St.	9/08/14	5.70	n/a

Abbreviations:
cfs – cubic feet per second

3.4.4 Statistical Parameters

The rain and stream gages located within this HEC-1 study area are of limited use due to their short history since installation. Therefore, the methods used in the Water Resources Council Bulletin 17B were

not used. Instead, the precipitation was predicted for the 10-year and 100-year, 24-hour storms using National Ocean and Atmospheric Administration (NOAA) Atlas 14 generated isopluvial maps. The FCDMC's DDMSW program uses Geographic Information System (GIS) to spatially average the NOAA Atlas 14 data to arrive at a representative point rainfall for the watershed.

3.4.5 Precipitation

NOAA Atlas 14, Precipitation Frequency Atlas of the Western United States, Arizona was utilized to obtain isopluvial maps evaluated to determine the values associated with the 10-year and 100-year, 24-hour rainfall events. Within the DDMSW program a shapefile of each the watershed was imported delineating the outer boundary of the project watershed. The FCDMC's program spatially averaged the isopluvials within the study boundary resulting in an area average rainfall. Table 3–4 summarizes these results.

Table 3–4 NOAA Atlas 14 Rainfall Data (in inches)						
Duration	2-year	5-year	10-year	25-year	50-year	100-year
5 Minute	0.300	0.404	0.482	0.585	0.663	0.741
10 Minute	0.456	0.615	0.734	0.890	1.008	1.127
15 Minute	0.566	0.762	0.910	1.104	1.250	1.397
30 Minute	0.762	1.026	1.225	1.487	1.684	1.882
1 Hour	0.943	1.270	1.516	1.840	2.084	2.329
2 Hour	1.079	1.431	1.700	2.061	2.334	2.614
3 Hour	1.149	1.497	1.773	2.156	2.458	2.771
6 Hour	1.362	1.730	2.024	2.425	2.737	3.060
12 Hour	1.618	2.035	2.365	2.812	3.155	3.508
24 Hour	1.986	2.582	3.062	3.740	4.283	4.857

3.4.6 Sub-basin Parameters

The following sections describe how the sub-basin parameters were determined. DDMSW output tables can be found in Appendix A. Development of sub-basin parameters for the Reata Wash corridor are consistent with the Draft PPS ADMS hydrologic modeling. For ease of comparison the following sections were taken directly from the Draft PPS ADMS H&H Report with small changes to reflect the inclusion of the Reata Wash corridor sub-basins.

Rainfall Losses

Rainfall infiltration losses were calculated using DDMSW. The rainfall loss method used was Green and Ampt. Soil parameters were taken from the Natural Resources Conservation Service (NRCS) soil surveys. The DDMSW model partially bases rainfall losses on both soils and land use data. The appendices include output tables for soils and land use data that documents parameter estimation for each sub-basin.

Surface retention losses include all rainfall losses not associated with infiltration. These losses include depression storage, interception and evaporation. For this study, these losses are based upon land use and surface cover. The FCDMC has a prepared table in their Drainage Design Manual for Maricopa County,

Arizona, Volume I, Hydrology covering land use and surface retention loss. These values, for the initial abstraction (IA), were applied to the sub-basins in the DDMSW program.

The percent impervious input data is based upon a combination of soils and land use data. The mountainous areas include areas of rock outcrop. However, these areas are not hydraulically connected. Therefore, the percent effective for the rock outcropping was set to a minimum value of 1 percent. For the other areas representative values are described within the FCDMC Drainage Design Manual and are included in the default parameters of the DDMSW program.

Soils

Soils data for the current study was taken from the NRCS soil survey, found within Book 645, entitled Aguila-Carefree Area, Arizona. Using soil GIS shapefiles provided by the FCDMC and the delineated sub-basin drainage boundaries, soil data was clipped for each sub-basin and imported to DDMSW. The soils data can be found in Appendix C and on Exhibit A.

Land Use/Vegetative Cover

Land use was assigned based upon the shapefiles in the City's GIS zoning database. These boundaries were inspected against the aerial photographs to confirm that existing development corresponded with the GIS zoning database. The zoning also included areas where undeveloped and partially developed conditions exist. The land use information was developed for individual sub-basins and then imported into DDMSW. Vegetative cover for sample areas in the watershed were evaluated by reviewing tree/bush cover. This included numbers of trees and estimated tree canopy diameter. A reduction factor was applied to the effective blockage of tree canopies. The Land Use data can be found in Appendix C and on Exhibit B.

Unit Hydrograph

The S-Graph method (Phoenix Mountain) was selected as the unit hydrograph for this study. The watershed that contributes to the Reata Pass Fan has a contributing drainage area of 8 square miles and the full contributing watershed is 19.58 square miles in area at Reata Wash and Bell Road. The watershed includes multiple sub-basins which vary in size from a fraction of a square mile up to approximately 1.5 square miles.

Lag

Basin lag was estimated from watershed characteristics using the following equation.

$$\text{Lag} = C \{ (L * L_{ca}) / S^{0.5} \}^m$$

where 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

C = 24Kn and m = 0.38 (US Army Corps of Engineers (USACE), 1982)

or C = 26Kn and m = 0.33 (United States Bureau of Reclamations (USBR), 1987)

and Kn = variable dependent upon the selection of S-Graph type and Land Use

Routing Steps (NSTPS)

Initially, the number of routing steps for each route was set to one within the HEC-1 model. The model was run and discharges determined for each route. The HEC-1 cross-section data along with the discharge

was then modeled in FlowMaster to obtain estimated velocities. A new number of routing steps for each channel route was then estimated using the following equation:

$$\text{NSTPS} = [\text{Length of Route (ft)} / (\text{Velocity}_{\text{avg}} (\text{ft/sec}) * 60 \text{ seconds} / \text{minute})] / \text{NMIN}$$

The routing lengths were measured in GIS, the velocities calculated within the FlowMaster worksheets, and the NMIN (HEC-1 model variable) was held constant at 3 minutes. Once new NSTPS were calculated, these values were replaced within the model and it was rerun. The process was repeated for as many iterations as was necessary to minimize fluctuation in the NSTPS. If the NSTPS value continually fluctuated between two numbers, the lower value was used. Routing information can be found in Appendix A.

3.5 Problems Encountered During the Study

3.5.1 Special Problems and Solutions

Directly south of the Reata Pass Fan Apex, Dobson Wash is capable of splitting away from the main channel of Reata Wash. In order to be compliant with agency environmental requirements concerning Dobson Wash, flood flows will be released at the Reata Pass Fan Apex. It is anticipated the Clean Water Act, Section 404 Permit will require the release of flows. For the purposes of this study, it was preliminarily assumed that a split flow of up to 2,000 cubic feet per second (100-year, 24-hour rainfall event) will be released from the main channel of Reata Wash to Dobson Wash. The final split flow release rate will be determined after further study, as well as consideration of Federal and State environmental requirements, as well as feedback from FEMA. Flood flow will otherwise be contained within the Reata Wash corridor south to the Reach 11, Dike 4 East basins behind the CAP canal. To model the split flow release, a diversion record was included in the HEC-1 models at this location and a rating table was developed to allow a maximum of 2,000 cubic feet per second. No other special problems were encountered. See Figure 3-1.

3.5.2 Modeling Warning and Error Messages

There were no error messages encountered in the Reata Wash Flood Control Improvement Study hydrologic modeling. This was consistent with the Draft PPS hydrologic models. A single warning was included in the model run. The warning: *Excess at ponding less than zero for period. Excess set to zero.* This warning indicates that for a specified period the rainfall excess was calculated to be less than zero and since it cannot be negative it was set to zero. This warning does not negatively or significantly affect the hydrologic model results.

3.6 Calibration

Stream gage data within the watershed are insufficient to extract for a direct comparison. As with the Draft PPS Hydrologic modeling, calibration of the current hydrologic model was conducted by comparison of the study results to Regional Regression equations, as well as two local independent studies. These studies are:

- Hydrologic Analysis of Scottsdale Alluvial Fans 1-6 was prepared for the FCDMC in August of 1988.
- Refinement of Methodology: Alluvial Fan Flood Hazard Identification & Mitigation Methods was prepared for the FCDMC in August of 2010.

The following table summarizes the results of these studies.

Table 3–5 Calibration of Peak Discharges at Reata Pass Fan Apex (8.0 square miles)

Study	Year	Concentration Point	Method				
			HEC-1	TR-55	Regional Regression		
			100-yr, 24-hr Peak Discharge (cfs)	Discharge (cfs)	Upper Limit (cfs)	Q100 (cfs)	Lower Limit (cfs)
Cella Barr (for FEMA)	1988	Reata Fan Apex FEMA Fan #2 (CP51)	14,867	8,986	13,170	7,934 ⁽²⁾	2,698
JE Fuller (for FCDMC)	2004	Reata Fan Apex FEMA Fan #2 (C60)	11,913	No Data Available	No Data Available	No Data Available	No Data Available
TY Lin/JE Fuller	2016	Reata Fan Apex FEMA Fan #2 (CP22)	13,015	No Data Available	9,355	6,730 ⁽¹⁾	4,105

Notes:

(1) Estimation based on FCDMC effective Hydrology Manual (Table 8.2) Arizona Region 12 – Standard Error (39%);

(2) Standard Error (66%) – Reference: "Methods for Estimating the Magnitude and Frequency of Floods in Arizona, ADOT-RS-15(121)," Arizona Department of Transportation (ADOT), September 1978.

Abbreviations:

cfs – cubic feet per second

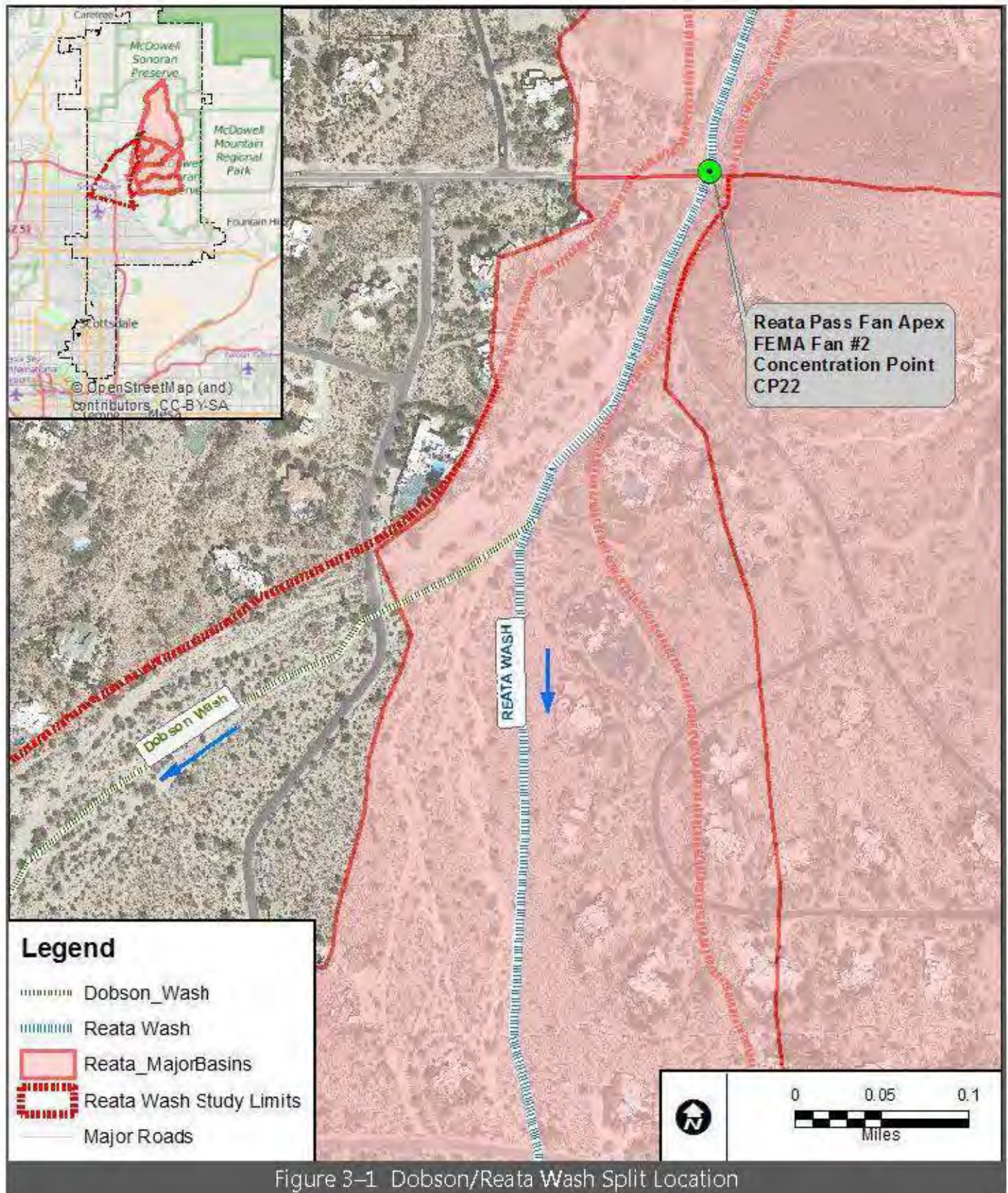


Figure 3-1 Dobson/Reata Wash Split Location

3.7 Final Results

3.7.1 Hydrologic Analysis Results

Table 3–6 and Table 3–7 summarize the output from the 2-year, 5-year, 10-year, 25-year, 50-year, and 100-year, 24-hour HEC-1 models. The HEC-1 model output data for the 100-year, 24-hour storm event can be found in Appendix B.

Subbasin	Area (square miles)	2-year (cfs)	5-year (cfs)	10-year (cfs)	25-year (cfs)	50-year (cfs)	100-year (cfs)
01	0.160	105	162	206	268	316	366
02	0.140	122	178	222	284	333	384
03	0.150	130	194	243	312	367	424
04	0.120	105	157	198	255	300	347
05	0.140	143	200	246	311	362	416
06	0.180	161	231	286	364	425	489
07	0.120	108	156	194	247	289	333
08	0.130	113	167	208	267	313	361
09	0.110	87	133	169	219	259	300
10	0.460	339	507	640	824	969	1,120
11	0.170	133	204	260	336	397	460
12	0.300	201	307	390	507	599	695
13	0.260	145	230	301	399	477	558
14	0.150	116	177	225	291	343	397
15	0.700	462	712	908	1,182	1,397	1,621
16	0.520	317	489	626	818	968	1,125
17	0.320	300	435	543	691	808	931
18	0.140	108	163	206	266	312	361
19	0.150	127	190	238	306	360	416
20	0.260	196	301	383	498	588	682
21	0.130	109	166	210	271	319	369
22	0.220	120	191	248	327	389	453
23	0.280	230	325	400	503	585	671
24	0.380	182	293	386	518	622	730
25	0.270	150	239	312	413	493	576
26	0.060	47	73	94	122	145	168
27	0.110	75	119	153	199	236	275
28	0.170	124	189	240	310	364	422
29	0.150	118	180	229	296	349	404
30	0.390	155	264	357	484	586	692
31	0.500	207	363	492	675	818	968
32	0.440	235	388	512	683	820	963
33	0.180	130	202	258	336	397	460
34	0.460	296	492	642	849	1,014	1,186

Table 3-6 Subbasin Peak Discharges

Subbasin	Area (square miles)	2-year (cfs)	5-year (cfs)	10-year (cfs)	25-year (cfs)	50-year (cfs)	100-year (cfs)
35	0.410	245	421	556	742	889	1,043
37	0.630	319	555	748	1,013	1,222	1,439
38	0.060	40	68	90	119	142	166
39	0.150	87	155	209	283	341	401
40	0.150	86	152	203	272	327	385
41	0.350	124	260	363	506	623	745
42	0.320	106	222	310	440	544	651
43	0.140	24	88	136	200	252	305
44	0.130	8	56	99	157	201	248
45	0.160	9	40	89	155	207	259
46	0.170	94	170	228	307	370	436
47	0.550	197	349	477	658	800	951
48	1.570	402	745	1,032	1,456	1,792	2,150
49	0.430	76	203	300	430	540	660
50	0.140	28	65	110	170	217	265
51	0.720	177	381	534	755	941	1,135
52	0.600	240	431	590	814	989	1,174
53	0.700	143	329	466	681	856	1,037
54	0.490	127	273	382	547	679	818
55	0.340	154	275	373	513	623	737
56	1.230	321	621	861	1,225	1,509	1,809
57	0.080	2	42	77	123	158	194
58	0.110	90	140	179	233	275	319
59	0.050	26	51	70	95	115	136
60	0.180	31	79	134	209	266	326
61	0.120	102	147	183	233	272	313
62	0.120	72	133	179	240	288	338
63	0.390	120	217	321	460	569	683
64	0.640	179	383	540	751	928	1,119

Abbreviations:
cfs – cubic feet per second

Table 3-7 Concentration Point Peak Discharges

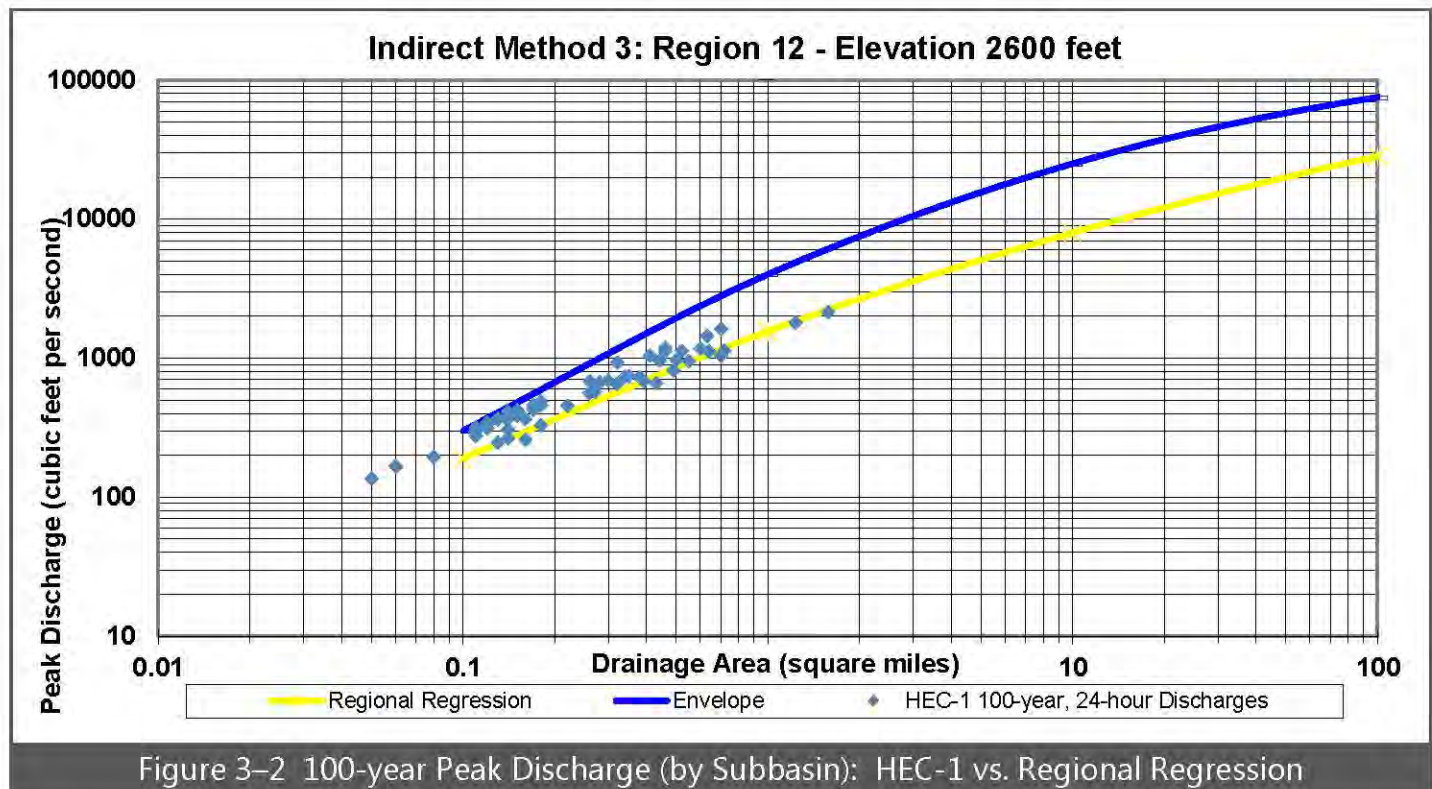
Concentration Points	Area (sq. mi.)	2-year (cfs)	5-year (cfs)	10-year (cfs)	25-year (cfs)	50-year (cfs)	100-year (cfs)
CP2	0.300	131	250	374	501	602	703
CP5	0.440	218	343	467	719	875	1,021
CP6	1.130	557	909	1,287	1,843	2,286	2,713
CP7	0.360	207	353	482	656	779	939
CP10	1.900	861	1,364	1,851	2,620	3,226	3,914
CP12	0.460	311	478	610	793	937	1,086
CP13	2.620	1,194	1,927	2,586	3,588	4,392	5,282
CP16	3.140	1,301	2,191	2,978	4,139	5,052	6,071
CP19	2.050	994	1,811	2,631	3,388	4,055	4,731
CP20	1.380	882	1,404	1,805	2,363	2,805	3,262
CP21	0.280	216	332	422	547	645	748
CP22	8.000	2,340	3,861	5,393	7,815	10,096	13,015
CP23	0.600	431	649	817	1,057	1,242	1,513
CP24	3.640	1,120	1,854	2,625	4,049	5,245	6,864
CP24A	4.240	1,316	2,220	3,133	4,701	6,154	8,015
CP25	3.260	1,404	2,459	3,569	4,858	5,848	6,863
CP26	1.900	947	1,849	2,393	3,155	3,756	4,387
CP28	0.450	261	423	552	732	873	1,038
CP31	0.940	378	677	921	1,271	1,548	1,836
CP34	0.870	470	822	1,108	1,471	1,757	2,057
CP41	2.390	566	1,196	1,814	2,626	3,249	3,950
CP42	1.790	585	1,130	1,613	2,273	2,784	3,352
CP45	0.250	9	40	89	155	207	264
CP46	0.720	266	478	654	903	1,097	1,302
CP49	1.910	353	726	1,054	1,528	1,902	2,337
CP50	2.910	396	874	1,301	1,999	2,547	3,158
CP53	1.300	279	600	873	1,291	1,619	2,027
CP54	2.140	373	804	1,165	1,753	2,229	2,841
CP54A	3.440	631	1,372	1,984	2,996	3,795	4,812
CP56	1.570	438	839	1,160	1,644	2,022	2,423
CP58	8.110	1,877	3,102	4,294	6,191	7,932	10,859
CP59	9.090	1,911	3,164	4,387	6,256	8,025	11,274
CP59A	9.240	1,905	3,166	4,375	6,228	8,039	11,214
CP60	9.580	1,779	3,065	4,250	6,102	7,837	10,990
CP62	12.210	1,891	3,434	4,819	6,952	8,992	12,119
CP63	12.590	1,751	3,228	4,618	6,784	8,766	11,652
CP64	19.580	2,027	4,149	6,193	9,499	12,370	15,618

Abbreviations:

cfs – cubic feet per second

3.7.2 Verification of Results

The HEC-1 watershed concentrates at the Reata Pass Fan Apex (CP22). Therefore, it is a key location to compare runoff values. The model results shown in Table 3–7 fall in between the two previous studies, lower than the Cella Barr study (1988, completed for FEMA) and slightly higher but close to the values from the JE Fuller study (2010, completed for FCDMC). Figure 3–2 is a comparison between the HEC-1 100-year peak discharges for each subbasin and the USGS regional regression discharges for the same subbasins.



4. Conclusion

Based on the findings presented in the Hydrologic Review Memorandum, a project specific hydrologic model was developed for the Reata Wash Flood Control Improvement Study. The Draft PPS ADMS H&H Report (hydrologic modeling) was advanced as the most appropriate model to meet study objectives.

The following adjustments were made to the Draft PPS ADMS HEC-1 model for use in the Reata Wash Flood Control Improvement Study;

- As stated in the Draft PPS ADMS H&H Report, the hydrologic model was developed for future land use conditions and included future flood control facilities such as retention/detention basins utilized to attenuate the peak discharge and reduce the storm water runoff volume. Land use categories and boundaries within the model limits will be checked against project aerals (2014) and flood control facilities not currently existing or under construction will be removed from the hydrologic model.
- The watershed boundaries were extended to include the Reata Wash Corridor from Pinnacle Peak Road south to Bell Road. This area is approximately 1.6 square miles.

- A full review of the input parameters was conducted as part of the Reata Wash Flood Control Improvement Study Quality Control program.

Based on the modifications listed above, a FEMA compliant hydrologic model was prepared for the Reata Wash Flood Control Improvement Study that is consistent with recent hydrologic models with in the watershed and updated with current FCDMC hydrologic modeling standards.

Appendix A DDMSW Tables

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Storage Basin ID:		DET20										
Spillway Characteristics (SS)			<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>
Spillway Crest Elevation:	-NA-	Volume (ac-ft)			0.6	3.2	7.1	7.1				
Spillway Length:	-NA-	Discharge (cfs)	0	220	443	664	886	10,000	0	0	0	0
Discharge Coefficient:	-NA-	Elevation (ft)	2,552.0	2,554.0	2,556.0	2,558.0	2,560.0	2,560.1	-	-	-	-
Weir Coefficient:	-NA-											
Low-Level Outlet (SL)			<u>11</u>	<u>12</u>	<u>13</u>	<u>14</u>	<u>15</u>	<u>16</u>	<u>17</u>	<u>18</u>	<u>19</u>	<u>20</u>
Centerline Elevation:	-NA-	Volume (ac-ft)	-	-	-	-	-	-	-	-	-	-
Cross-Section Area:	-NA-	Discharge (cfs)	0	0	0	0	0	0	0	0	0	0
Discharge Coefficient:	-NA-	Elevation (ft)	-	-	-	-	-	-	-	-	-	-
Orifice Equation Exponent:	-NA-											
Top of Dam Overflow (ST)			<u>2 Yr</u>	<u>5 Yr</u>	<u>10 Yr</u>	<u>25 Yr</u>	<u>50 Yr</u>	<u>100 Yr</u>	Data imported from HEC-1 file: ALL.DAT 02/25/2015			
Elevation Top of Dam:	-NA-	Peak Volume (ac-ft)	3.89	7.14	7.14	7.14	7.14	7.14				
Length of Dam:	-NA-	Peak Stage (ft)	2,558.35	2,560.01	2,560.01	2,560.02	2,560.02	2,560.03				
Discharge Coefficient:	-NA-	Peak Discharge (cfs)	703.00	1,404.00	1,805.00	2,363.00	2,805.00	3,262.00				
Weir Coefficient:	-NA-											
Storage Basin ID:		RET1										
Spillway Characteristics (SS)			<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>
Spillway Crest Elevation:	-NA-	Volume (ac-ft)		-	-	0.1	0.3	0.3				
Spillway Length:	-NA-	Discharge (cfs)	0	5	15	30	90	1,000	0	0	0	0
Discharge Coefficient:	-NA-	Elevation (ft)	-	-	-	-	-	-	-	-	-	-
Weir Coefficient:	-NA-											
Low-Level Outlet (SL)			<u>11</u>	<u>12</u>	<u>13</u>	<u>14</u>	<u>15</u>	<u>16</u>	<u>17</u>	<u>18</u>	<u>19</u>	<u>20</u>
Centerline Elevation:	-NA-	Volume (ac-ft)	-	-	-	-	-	-	-	-	-	-
Cross-Section Area:	-NA-	Discharge (cfs)	0	0	0	0	0	0	0	0	0	0
Discharge Coefficient:	-NA-	Elevation (ft)	-	-	-	-	-	-	-	-	-	-
Orifice Equation Exponent:	-NA-											
Top of Dam Overflow (ST)			<u>2 Yr</u>	<u>5 Yr</u>	<u>10 Yr</u>	<u>25 Yr</u>	<u>50 Yr</u>	<u>100 Yr</u>	Data imported from HEC-1 file: ALL.DAT 02/25/2015			
Elevation Top of Dam:	-NA-	Peak Volume (ac-ft)	0.25	0.25	0.25	0.25	0.25	0.25				
Length of Dam:	-NA-	Peak Stage (ft)	0.00	0.00	0.00	0.00	0.00	0.00				
Discharge Coefficient:	-NA-	Peak Discharge (cfs)	105.00	162.00	206.00	268.00	316.00	366.00				
Weir Coefficient:	-NA-											

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Storage Basin ID:		RET2										
Spillway Characteristics (SS)			<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>
Spillway Crest Elevation:	-NA-	Volume (ac-ft)	-	-	0.1	0.4	1.1	2.5	3.0	3.0		
Spillway Length:	-NA-	Discharge (cfs)	0	6	18	30	38	45	51	1,000	0	0
Discharge Coefficient:	-NA-	Elevation (ft)	1,000.0	1,001.0	1,002.0	1,003.0	1,004.0	1,005.0	1,006.0	1,006.1	-	-
Weir Coefficient:	-NA-											
Low-Level Outlet (SL)			<u>11</u>	<u>12</u>	<u>13</u>	<u>14</u>	<u>15</u>	<u>16</u>	<u>17</u>	<u>18</u>	<u>19</u>	<u>20</u>
Centerline Elevation:	-NA-	Volume (ac-ft)	-	-	-	-	-	-	-	-	-	-
Cross-Section Area:	-NA-	Discharge (cfs)	0	0	0	0	0	0	0	0	0	0
Discharge Coefficient:	-NA-	Elevation (ft)	-	-	-	-	-	-	-	-	-	-
Orifice Equation Exponent:	-NA-											
Top of Dam Overflow (ST)			<u>2 Yr</u>	<u>5 Yr</u>	<u>10 Yr</u>	<u>25 Yr</u>	<u>50 Yr</u>	<u>100 Yr</u>	Data imported from HEC-1 file: ALL.DAT 02/25/2015			
Elevation Top of Dam:	-NA-	Peak Volume (ac-ft)	1.93	2.97	2.97	2.97	2.97	2.97				
Length of Dam:	-NA-	Peak Stage (ft)	1,004.57	1,006.01	1,006.02	1,006.02	1,006.03	1,006.04				
Discharge Coefficient:	-NA-	Peak Discharge (cfs)	42.00	106.00	222.00	284.00	333.00	384.00				
Weir Coefficient:	-NA-											
Storage Basin ID:		RET3										
Spillway Characteristics (SS)			<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>
Spillway Crest Elevation:	-NA-	Volume (ac-ft)	-	-	0.2	0.6	1.2	1.3	1.4	1.4		
Spillway Length:	-NA-	Discharge (cfs)	0	15	48	80	97	113	127	1,000	0	0
Discharge Coefficient:	-NA-	Elevation (ft)	1,000.0	1,001.0	1,002.0	1,003.0	1,004.0	1,005.0	1,006.0	1,006.1	-	-
Weir Coefficient:	-NA-											
Low-Level Outlet (SL)			<u>11</u>	<u>12</u>	<u>13</u>	<u>14</u>	<u>15</u>	<u>16</u>	<u>17</u>	<u>18</u>	<u>19</u>	<u>20</u>
Centerline Elevation:	-NA-	Volume (ac-ft)	-	-	-	-	-	-	-	-	-	-
Cross-Section Area:	-NA-	Discharge (cfs)	0	0	0	0	0	0	0	0	0	0
Discharge Coefficient:	-NA-	Elevation (ft)	-	-	-	-	-	-	-	-	-	-
Orifice Equation Exponent:	-NA-											
Top of Dam Overflow (ST)			<u>2 Yr</u>	<u>5 Yr</u>	<u>10 Yr</u>	<u>25 Yr</u>	<u>50 Yr</u>	<u>100 Yr</u>	Data imported from HEC-1 file: ALL.DAT 02/25/2015			
Elevation Top of Dam:	-NA-	Peak Volume (ac-ft)	0.93	1.36	1.36	1.36	1.36	1.36				
Length of Dam:	-NA-	Peak Stage (ft)	1,003.53	1,006.01	1,006.01	1,006.02	1,006.03	1,006.03				
Discharge Coefficient:	-NA-	Peak Discharge (cfs)	89.00	192.00	243.00	312.00	367.00	424.00				
Weir Coefficient:	-NA-											

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Storage Basin ID:		RET4										
Spillway Characteristics (SS)			<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>
Spillway Crest Elevation:	-NA-	Volume (ac-ft)		0.2	0.5	0.9	1.3	1.4	1.5	1.5		
Spillway Length:	-NA-	Discharge (cfs)	0	13	20	26	31	35	38	1,000	0	0
Discharge Coefficient:	-NA-	Elevation (ft)	1,000.0	1,001.0	1,002.0	1,003.0	1,004.0	1,005.0	1,006.0	1,006.1	-	-
Weir Coefficient:	-NA-											
Low-Level Outlet (SL)			<u>11</u>	<u>12</u>	<u>13</u>	<u>14</u>	<u>15</u>	<u>16</u>	<u>17</u>	<u>18</u>	<u>19</u>	<u>20</u>
Centerline Elevation:	-NA-	Volume (ac-ft)	-	-	-	-	-	-	-	-	-	-
Cross-Section Area:	-NA-	Discharge (cfs)	0	0	0	0	0	0	0	0	0	0
Discharge Coefficient:	-NA-	Elevation (ft)	-	-	-	-	-	-	-	-	-	-
Orifice Equation Exponent:	-NA-											
Top of Dam Overflow (ST)			<u>2 Yr</u>	<u>5 Yr</u>	<u>10 Yr</u>	<u>25 Yr</u>	<u>50 Yr</u>	<u>100 Yr</u>	Data imported from HEC-1 file: ALL.DAT 02/25/2015			
Elevation Top of Dam:	-NA-	Peak Volume (ac-ft)	1.51	1.51	1.51	1.51	1.51	1.51				
Length of Dam:	-NA-	Peak Stage (ft)	1,006.00	1,006.01	1,006.02	1,006.02	1,006.03	1,006.03				
Discharge Coefficient:	-NA-	Peak Discharge (cfs)	53.00	157.00	198.00	255.00	300.00	347.00				
Weir Coefficient:	-NA-											

Storage Basin ID:		RET5										
Spillway Characteristics (SS)			<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>
Spillway Crest Elevation:	-NA-	Volume (ac-ft)		0.4	1.5	1.5						
Spillway Length:	-NA-	Discharge (cfs)	0	0	185	1,000	0	0	0	0	0	0
Discharge Coefficient:	-NA-	Elevation (ft)	1,000.0	1,001.0	1,002.0	1,002.1	-	-	-	-	-	-
Weir Coefficient:	-NA-											
Low-Level Outlet (SL)			<u>11</u>	<u>12</u>	<u>13</u>	<u>14</u>	<u>15</u>	<u>16</u>	<u>17</u>	<u>18</u>	<u>19</u>	<u>20</u>
Centerline Elevation:	-NA-	Volume (ac-ft)	-	-	-	-	-	-	-	-	-	-
Cross-Section Area:	-NA-	Discharge (cfs)	0	0	0	0	0	0	0	0	0	0
Discharge Coefficient:	-NA-	Elevation (ft)	-	-	-	-	-	-	-	-	-	-
Orifice Equation Exponent:	-NA-											
Top of Dam Overflow (ST)			<u>2 Yr</u>	<u>5 Yr</u>	<u>10 Yr</u>	<u>25 Yr</u>	<u>50 Yr</u>	<u>100 Yr</u>	Data imported from HEC-1 file: ALL.DAT 02/25/2015			
Elevation Top of Dam:	-NA-	Peak Volume (ac-ft)	1.17	1.47	1.48	1.48	1.48	1.48				
Length of Dam:	-NA-	Peak Stage (ft)	1,001.70	1,001.99	1,002.01	1,002.02	1,002.02	1,002.03				
Discharge Coefficient:	-NA-	Peak Discharge (cfs)	129.00	184.00	246.00	311.00	362.00	416.00				
Weir Coefficient:	-NA-											

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Storage Basin ID:		RET6										
Spillway Characteristics (SS)			<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>
Spillway Crest Elevation:	-NA-	Volume (ac-ft)		0.2	0.7	1.4	2.3	2.3				
Spillway Length:	-NA-	Discharge (cfs)	0	0	0	56	230	1,000	0	0	0	0
Discharge Coefficient:	-NA-	Elevation (ft)	1,000.0	1,001.0	1,002.0	1,003.0	1,004.0	1,004.1	-	-	-	-
Weir Coefficient:	-NA-											
Low-Level Outlet (SL)			<u>11</u>	<u>12</u>	<u>13</u>	<u>14</u>	<u>15</u>	<u>16</u>	<u>17</u>	<u>18</u>	<u>19</u>	<u>20</u>
Centerline Elevation:	-NA-	Volume (ac-ft)	-	-	-	-	-	-	-	-	-	-
Cross-Section Area:	-NA-	Discharge (cfs)	0	0	0	0	0	0	0	0	0	0
Discharge Coefficient:	-NA-	Elevation (ft)	-	-	-	-	-	-	-	-	-	-
Orifice Equation Exponent:	-NA-											
Top of Dam Overflow (ST)			<u>2 Yr</u>	<u>5 Yr</u>	<u>10 Yr</u>	<u>25 Yr</u>	<u>50 Yr</u>	<u>100 Yr</u>	Data imported from HEC-1 file: ALL.DAT 02/25/2015			
Elevation Top of Dam:	-NA-	Peak Volume (ac-ft)	1.44	1.67	1.89	2.27	2.28	2.28				
Length of Dam:	-NA-	Peak Stage (ft)	1,003.10	1,003.34	1,003.58	1,003.99	1,004.01	1,004.02				
Discharge Coefficient:	-NA-	Peak Discharge (cfs)	73.00	115.00	157.00	228.00	305.00	367.00				
Weir Coefficient:	-NA-											
Storage Basin ID:		RET7										
Spillway Characteristics (SS)			<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>
Spillway Crest Elevation:	-NA-	Volume (ac-ft)			-	0.1	0.3	0.3				
Spillway Length:	-NA-	Discharge (cfs)	0	11	22	46	63	1,000	0	0	0	0
Discharge Coefficient:	-NA-	Elevation (ft)	1,000.0	1,001.0	1,002.0	1,003.0	1,004.0	1,004.1	-	-	-	-
Weir Coefficient:	-NA-											
Low-Level Outlet (SL)			<u>11</u>	<u>12</u>	<u>13</u>	<u>14</u>	<u>15</u>	<u>16</u>	<u>17</u>	<u>18</u>	<u>19</u>	<u>20</u>
Centerline Elevation:	-NA-	Volume (ac-ft)	-	-	-	-	-	-	-	-	-	-
Cross-Section Area:	-NA-	Discharge (cfs)	0	0	0	0	0	0	0	0	0	0
Discharge Coefficient:	-NA-	Elevation (ft)	-	-	-	-	-	-	-	-	-	-
Orifice Equation Exponent:	-NA-											
Top of Dam Overflow (ST)			<u>2 Yr</u>	<u>5 Yr</u>	<u>10 Yr</u>	<u>25 Yr</u>	<u>50 Yr</u>	<u>100 Yr</u>	Data imported from HEC-1 file: ALL.DAT 02/25/2015			
Elevation Top of Dam:	-NA-	Peak Volume (ac-ft)	0.34	0.34	0.34	0.34	0.34	0.34				
Length of Dam:	-NA-	Peak Stage (ft)	1,004.00	1,004.01	1,004.01	1,004.02	1,004.02	1,004.03				
Discharge Coefficient:	-NA-	Peak Discharge (cfs)	108.00	156.00	194.00	247.00	289.00	333.00				
Weir Coefficient:	-NA-											

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Project Reference: REATA WITH DIVERT

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Route ID	LOB N	Chan N	ROB N	Length (ft)	Slope (ft/ft)	Max Elev (ft)		1.	2.	3.	4.	5.	6.	7.	8.
NORMAL DEPTH															
Major Basin 01															
RT1	0.055	0.040	0.055	1,133.00	0.0228	-	X:	-	24.00	37.00	134.00	193.00	240.00	276.00	303.00
							Y:	2,670.00	2,668.00	2,666.00	2,664.00	2,664.00	2,668.00	2,672.00	2,676.00
RT10	0.045	0.030	0.045	2,556.00	0.0248	-	X:	-	13.00	28.00	48.00	57.00	66.00	83.00	97.00
							Y:	2,490.00	2,488.00	2,486.00	2,484.00	2,484.00	2,486.00	2,488.00	2,490.00
RT11	0.045	0.030	0.045	5,219.00	0.0245	-	X:	-	19.00	82.00	107.00	117.00	144.00	160.00	181.00
							Y:	2,560.00	2,558.00	2,558.00	2,556.00	2,556.00	2,558.00	2,560.00	2,562.00
RT12A	0.050	0.035	0.050	2,242.00	0.0395	-	X:	-	10.00	19.00	37.00	62.00	69.00	83.00	97.00
							Y:	2,538.00	2,536.00	2,534.00	2,530.00	2,530.00	2,532.00	2,534.00	2,536.00
RT12B	0.045	0.030	0.045	2,457.00	0.0241	-	X:	-	13.00	28.00	48.00	57.00	66.00	83.00	97.00
							Y:	2,490.00	2,488.00	2,486.00	2,484.00	2,484.00	2,486.00	2,488.00	2,490.00
RT13	0.045	0.030	0.045	3,505.00	0.0273	-	X:	-	4.00	9.00	52.00	108.00	116.00	129.00	175.00
							Y:	2,440.00	2,438.00	2,436.00	2,434.00	2,434.00	2,436.00	2,438.00	2,440.00
RT15	0.045	0.030	0.045	2,462.00	0.0285	-	X:	-	4.00	8.00	12.00	57.00	65.00	69.00	117.00
							Y:	2,600.00	2,598.00	2,596.00	2,594.00	2,594.00	2,596.00	2,598.00	2,600.00
RT16	0.050	0.035	0.050	6,229.00	0.0295	-	X:	-	53.00	192.00	205.00	214.00	229.00	353.00	491.00
							Y:	2,260.00	2,258.00	2,256.00	2,254.00	2,254.00	2,256.00	2,258.00	2,260.00
RT17	0.050	0.040	0.050	5,785.00	0.0365	-	X:	-	4.00	22.00	43.00	50.00	64.00	80.00	93.00
							Y:	2,350.00	2,346.00	2,342.00	2,339.00	2,339.00	2,342.00	2,346.00	2,350.00
RT19	0.055	0.035	0.055	3,337.00	0.0347	-	X:	-	13.00	31.00	46.00	82.00	100.00	123.00	155.00
							Y:	2,508.00	2,504.00	2,498.00	2,496.00	2,496.00	2,500.00	2,504.00	2,508.00
RT2	0.045	0.035	0.045	2,221.00	0.0218	-	X:	-	39.00	53.00	61.00	71.00	74.00	84.00	106.00
							Y:	2,634.00	2,633.00	2,632.00	2,629.80	2,629.80	2,632.00	2,636.00	2,636.40

City of Scottsdale
Drainage Design Management System
HEC-1 ROUTING DATA
Project Reference: REATA WITH DIVERT

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Route ID	LOB N	Chan N	ROB N	Length (ft)	Slope (ft/ft)	Max Elev (ft)		1.	2.	3.	4.	5.	6.	7.	8.
RT21	0.045	0.030	0.045	2,993.00	0.0349	-	X: Y:	- 2,618.40	5.00 2,618.00	67.00 2,616.00	74.00 2,614.00	90.00 2,614.00	96.00 2,616.00	162.00 2,618.00	170.00 2,620.00
RT22A	0.055	0.040	0.055	1,543.40	0.0246	-	X: Y:	- 2,122.00	10.00 2,122.00	40.00 2,122.00	90.00 2,107.00	150.00 2,114.00	400.00 2,121.00	1,000.00 2,121.00	1,020.00 2,124.00
RT22B	0.055	0.040	0.055	1,802.90	0.0329	-	X: Y:	- 2,122.00	10.00 2,122.00	40.00 2,122.00	90.00 2,107.00	150.00 2,114.00	400.00 2,121.00	1,000.00 2,121.00	1,020.00 2,124.00
RT24A	0.050	0.030	0.050	1,545.00	0.0306	-	X: Y:	- 2,224.00	99.00 2,202.00	276.00 2,200.50	292.00 2,199.80	321.00 2,200.00	337.00 2,201.00	650.00 2,202.00	816.00 2,212.00
RT25	0.050	0.030	0.050	6,726.00	0.0267	-	X: Y:	- 2,330.00	74.00 2,308.00	105.00 2,306.00	368.00 2,304.00	415.00 2,304.00	422.00 2,306.00	428.00 2,308.00	520.00 2,340.00
RT26	0.050	0.035	0.050	1,139.00	0.0308	-	X: Y:	- 2,545.00	25.00 2,544.00	40.00 2,542.00	54.00 2,540.00	90.00 2,540.00	102.00 2,542.00	130.00 2,544.00	165.00 2,550.00
RT28	0.045	0.030	0.045	2,234.00	0.0368	-	X: Y:	- 2,580.00	11.00 2,578.00	27.00 2,576.00	49.00 2,574.00	81.00 2,574.00	98.00 2,576.00	188.00 2,576.00	197.00 2,578.00
RT29	0.050	0.035	0.050	1,372.00	0.0345	-	X: Y:	- 2,688.00	2.00 2,686.00	41.00 2,684.00	48.00 2,683.20	56.00 2,683.20	58.00 2,684.00	75.00 2,686.00	101.00 2,690.00
RT3	0.050	0.035	0.050	3,622.00	0.0228	-	X: Y:	- 2,642.00	22.00 2,640.00	94.00 2,638.00	97.00 2,636.00	104.00 2,636.00	110.00 2,638.00	124.00 2,640.00	136.00 2,642.00
RT31	0.055	0.035	0.055	599.00	0.0256	-	X: Y:	- 2,420.00	12.00 2,414.00	22.00 2,410.00	45.00 2,408.00	110.00 2,408.00	147.00 2,410.00	206.00 2,414.00	252.00 2,420.00
RT32	0.055	0.040	0.055	5,296.00	0.0517	-	X: Y:	- 2,460.00	25.00 2,444.00	69.00 2,442.00	77.00 2,438.00	89.00 2,438.00	94.00 2,440.00	112.00 2,450.00	127.00 2,460.00
RT33	0.050	0.035	0.050	3,766.00	0.0472	-	X: Y:	- 2,760.00	33.00 2,759.00	72.00 2,758.00	109.00 2,756.00	130.00 2,756.00	260.00 2,758.00	290.00 2,758.00	313.00 2,760.00

City of Scottsdale
Drainage Design Management System
HEC-1 ROUTING DATA
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Route ID	LOB N	Chan N	ROB N	Length (ft)	Slope (ft/ft)	Max Elev (ft)		1.	2.	3.	4.	5.	6.	7.	8.
RT34	0.055	0.040	0.055	3,084.00	0.0213	-	X: Y:	160.00 2,100.00	180.00 2,100.00	200.00 2,100.00	340.00 2,030.00	490.00 2,030.00	540.00 2,045.00	1,000.00 2,045.00	1,100.00 2,056.00
RT35	0.055	0.040	0.055	2,848.00	0.0211	-	X: Y:	- 2,087.00	35.00 2,085.00	58.00 2,085.00	69.00 2,082.00	78.00 2,082.00	89.00 2,085.00	129.00 2,086.00	157.00 2,087.00
RT37	0.050	0.040	0.050	4,195.00	0.0340	-	X: Y:	- 2,063.00	33.00 2,045.00	37.00 2,044.00	42.00 2,042.00	49.00 2,041.00	65.00 2,045.00	169.00 2,047.00	205.00 2,064.00
RT4	0.055	0.040	0.055	2,467.00	0.0235	-	X: Y:	- 2,672.00	2.00 2,670.00	16.00 2,668.00	28.00 2,666.00	65.00 2,666.00	80.00 2,668.00	99.00 2,668.50	114.00 2,669.00
RT41	0.050	0.035	0.050	2,454.00	0.0252	-	X: Y:	200.00 1,829.00	260.00 1,827.00	330.00 1,826.00	380.00 1,823.00	450.00 1,823.00	455.00 1,825.00	470.00 1,825.00	480.00 1,826.00
RT42	0.050	0.035	0.050	4,042.00	0.0304	-	X: Y:	- 1,945.00	15.00 1,944.00	29.00 1,943.00	41.00 1,940.00	60.00 1,940.00	73.00 1,943.00	81.00 1,944.00	87.00 1,945.00
RT45	0.050	0.035	0.050	2,935.00	0.0331	-	X: Y:	- 1,924.00	10.00 1,920.00	39.00 1,919.00	49.00 1,918.00	50.00 1,918.00	53.00 1,920.00	60.00 1,923.00	65.00 1,924.00
RT46	0.050	0.035	0.050	2,771.00	0.0424	-	X: Y:	- 2,060.00	7.00 2,057.00	49.00 2,055.00	60.00 2,052.00	62.00 2,052.00	75.00 2,055.00	83.00 2,057.00	147.00 2,058.00
RT48A	0.055	0.040	0.055	2,993.70	0.0470	-	X: Y:	- 1,972.00	73.00 1,970.00	78.00 1,967.00	82.00 1,962.00	91.00 1,961.00	114.00 1,965.00	125.00 1,971.00	133.00 1,972.00
RT48B	0.055	0.040	0.055	5,668.00	0.0422	-	X: Y:	- 1,972.00	73.00 1,970.00	78.00 1,967.00	82.00 1,962.00	91.00 1,961.00	114.00 1,965.00	125.00 1,971.00	133.00 1,972.00
RT49	0.045	0.035	0.045	3,915.00	0.0318	-	X: Y:	- 1,750.00	30.00 1,749.00	39.00 1,744.00	45.00 1,742.00	60.00 1,742.00	71.00 1,745.00	134.00 1,747.00	177.00 1,751.00
RT5	0.045	0.035	0.045	1,481.00	0.0187	-	X: Y:	- 2,616.00	10.00 2,614.00	20.00 2,612.00	28.00 2,610.00	52.00 2,610.00	64.00 2,612.00	88.00 2,612.00	96.00 2,614.00

City of Scottsdale
Drainage Design Management System
HEC-1 ROUTING DATA
Project Reference: REATA WITH DIVERT

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Route ID	LOB N	Chan N	ROB N	Length (ft)	Slope (ft/ft)	Max Elev (ft)		1.	2.	3.	4.	5.	6.	7.	8.
RT50	0.050	0.040	0.050	5,454.00	0.0168	-	X:	100.00	140.00	195.00	220.00	330.00	360.00	370.00	380.00
							Y:	1,609.00	1,608.50	1,608.50	1,602.50	1,602.50	1,608.00	1,608.00	1,609.00
RT52	0.055	0.040	0.055	8,331.00	0.0383	-	X:	-	37.00	65.00	71.00	81.00	91.00	237.00	270.00
							Y:	1,885.00	1,882.00	1,868.00	1,865.00	1,866.00	1,869.00	1,872.00	1,883.00
RT54	0.050	0.040	0.050	3,822.00	0.0200	-	X:	120.00	126.00	130.00	150.00	480.00	510.00	520.00	530.00
							Y:	1,622.00	1,621.00	1,621.00	1,615.00	1,613.00	1,618.00	1,618.00	1,619.00
RT56	0.050	0.040	0.050	7,162.00	0.0422	-	X:	-	13.00	71.00	114.00	132.00	154.00	189.00	224.00
							Y:	1,807.00	1,804.00	1,803.00	1,800.00	1,799.00	1,804.00	1,806.00	1,808.00
RT58	0.055	0.040	0.055	3,099.00	0.0276	-	X:	160.00	180.00	200.00	340.00	490.00	540.00	1,000.00	1,100.00
							Y:	2,100.00	2,100.00	2,100.00	2,030.00	2,030.00	2,045.00	2,045.00	2,056.00
RT59A	0.055	0.040	0.055	1,049.00	0.0454	-	X:	20.00	70.00	110.00	160.00	220.00	380.00	500.00	540.00
							Y:	1,970.00	1,965.00	1,964.00	1,961.00	1,961.00	1,966.00	1,968.00	1,969.00
RT59B	0.055	0.040	0.055	4,061.00	0.0267	-	X:	150.00	180.00	205.00	250.00	490.00	510.00	560.00	600.00
							Y:	1,924.00	1,921.00	1,918.00	1,904.00	1,904.00	1,910.00	1,913.00	1,915.00
RT6	0.050	0.035	0.050	3,706.00	0.0207	-	X:	-	19.00	82.00	107.00	117.00	144.00	160.00	181.00
							Y:	2,560.00	2,558.00	2,558.00	2,556.00	2,556.00	2,558.00	2,560.00	2,562.00
RT60	0.055	0.040	0.055	2,351.00	0.0243	-	X:	200.00	250.00	260.00	360.00	520.00	620.00	830.00	880.00
							Y:	1,835.00	1,833.00	1,830.00	1,825.00	1,825.00	1,830.00	1,830.00	1,835.00
RT61	0.050	0.035	0.050	2,458.00	0.0318	-	X:	240.00	270.00	300.00	310.00	325.00	335.00	380.00	390.00
							Y:	1,793.00	1,791.00	1,791.00	1,789.00	1,789.00	1,790.00	1,790.00	1,791.00
RT62	0.050	0.035	0.050	4,669.00	0.0240	-	X:	400.00	420.00	430.00	540.00	950.00	970.00	990.00	1,000.00
							Y:	1,727.00	1,725.00	1,723.00	1,720.00	1,722.00	1,726.00	1,726.00	1,727.00
RT63	0.050	0.035	0.050	5,520.00	0.0185	-	X:	130.00	210.00	500.00	540.00	630.00	660.00	670.00	680.00
							Y:	1,627.00	1,623.00	1,622.00	1,617.00	1,618.00	1,626.00	1,626.00	1,627.00

City of Scottsdale
 Drainage Design Management System
 HEC-1 ROUTING DATA
 Project Reference: REATA WITH DIVERT

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Route ID	LOB N	Chan N	ROB N	Length (ft)	Slope (ft/ft)	Max Elev (ft)		1.	2.	3.	4.	5.	6.	7.	8.
RT7	0.045	0.030	0.045	2,096.00	0.0191	-	X:	-	3.00	5.00	8.00	27.00	30.00	32.00	34.00
							Y:	2,630.00	2,628.00	2,626.00	2,624.00	2,624.00	2,626.00	2,628.00	2,630.00
RT8	0.050	0.035	0.050	3,543.00	0.0233	-	X:	-	18.00	28.00	48.00	57.00	66.00	83.00	97.00
							Y:	2,598.50	2,598.00	2,597.00	2,596.00	2,596.00	2,598.00	2,600.00	2,602.00
RTD48A	0.055	0.040	0.055	1,976.80	0.0415	-	X:	-	73.00	78.00	82.00	91.00	114.00	125.00	133.00
							Y:	1,972.00	1,970.00	1,967.00	1,962.00	1,961.00	1,965.00	1,971.00	1,972.00

City of Scottsdale
 Drainage Design Management System
 HEC-1 DIVERSIONS
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Diversion ID/ DT Card ID	Maximum Volume (ac-ft)	Maximum Diversion (cfs)	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
D22A		2,000										
DT22A												
		Inflow (cfs)		500	1,000	2,000	4,000	8,000	16,000			
		Diversion (cfs)		96	192	384	768	1,537	3,200			
D48A												
DT48A												
		Inflow (cfs)		1,000	2,000	3,000	3,500	4,083	4,500	5,000		
		Diversion (cfs)		1,000	1,880	2,530	2,870	3,373	3,440	3,600		

City of Scottsdale
Drainage Design Management System
SUB BASINS

Project Reference: REATA WITH DIVERT

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Area ID	Sub Basin Parameters								Rainfall Losses				
	Area (sq mi)	Length (mi)	Slope (ft/mi)	S-Graph	Lca (mi)	Lag (min)	Velocity (ft/s)	Kn	IA (in)	DTHETA	PSIF (in)	XKSAT (in/hr)	RTIMP (%)
Major Basin ID: 01													
01	0.159	1.04	130.6	Mountain	0.58	14.10	6.46	0.030	0.29	0.25	6.00	0.192	10
02	0.140	0.76	136.6	Mountain	0.28	9.40	7.09	0.030	0.26	0.25	6.00	0.212	26
03	0.149	0.71	169.0	Mountain	0.21	7.90	7.87	0.030	0.27	0.25	6.00	0.207	19
04	0.124	0.61	167.5	Mountain	0.27	8.20	6.54	0.030	0.29	0.25	6.00	0.195	13
05	0.145	0.57	118.9	Mountain	0.25	8.30	6.02	0.030	0.19	0.23	6.16	0.219	41
06	0.180	0.72	118.1	Mountain	0.30	10.10	6.30	0.031	0.22	0.24	6.16	0.211	33
07	0.124	0.69	125.0	Mountain	0.38	10.40	5.87	0.030	0.26	0.25	6.00	0.213	32
08	0.134	0.83	367.0	Mountain	0.42	10.00	7.25	0.032	0.23	0.27	6.00	0.213	26
09	0.114	0.79	219.0	Mountain	0.44	10.40	6.67	0.030	0.30	0.25	6.00	0.185	6
10	0.462	1.14	203.6	Mountain	0.48	12.90	7.75	0.031	0.25	0.26	5.85	0.217	26
11	0.174	0.75	139.3	Mountain	0.35	10.20	6.49	0.030	0.30	0.25	6.00	0.185	5
12	0.303	1.01	147.7	Mountain	0.63	14.10	6.30	0.030	0.27	0.26	6.00	0.205	16
13	0.259	1.45	636.1	Mountain	0.73	14.70	8.70	0.034	0.23	0.27	4.96	0.351	17
14	0.154	1.03	747.9	Mountain	0.48	11.00	8.27	0.035	0.26	0.29	5.85	0.200	15
15	0.700	1.11	118.4	Mountain	0.44	13.70	7.11	0.031	0.29	0.26	6.00	0.186	9
16	0.521	1.38	728.3	Mountain	0.83	16.10	7.59	0.037	0.23	0.30	6.00	0.200	15
17	0.324	0.81	1016.0	Mountain	0.25	8.00	8.93	0.038	0.25	0.28	6.34	0.160	21
18	0.141	1.04	670.3	Mountain	0.54	11.40	8.03	0.034	0.25	0.30	6.00	0.189	20
19	0.151	0.80	731.1	Mountain	0.32	8.80	7.97	0.036	0.25	0.30	5.85	0.204	19
20	0.264	0.76	257.8	Mountain	0.42	10.70	6.23	0.033	0.27	0.29	5.46	0.231	16
21	0.129	0.56	198.7	Mountain	0.26	7.60	6.48	0.030	0.30	0.25	6.00	0.185	6

* Non default value

(stSubBasSG rpt)

City of Scottsdale
Drainage Design Management System
SUB BASINS

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Project Reference: REATA WITH DIVERT

3/23/2016

Area ID	Sub Basin Parameters								Rainfall Losses				
	Area (sq mi)	Length (mi)	Slope (ft/mi)	S-Graph	Lca (mi)	Lag (min)	Velocity (ft/s)	Kn	IA (in)	DTHETA	PSIF (in)	XKSAT (in/hr)	RTIMP (%)
Major Basin ID: 01													
22	0.222	1.51	165.0	Mountain	0.79	17.50	7.60	0.030	0.29	0.27	5.71	0.212	8
23	0.279	1.20	184.2	Mountain	0.62	14.30	7.35	0.030	0.24	0.16	7.27	0.124	16
24	0.380	1.70	393.3	Mountain	1.01	18.20	8.21	0.032	0.27	0.29	4.87	0.316	15
25	0.274	1.24	438.9	Mountain	0.59	16.10	6.78	0.040	0.25	0.31	5.05	0.274	14
26	0.063	0.73	745.1	Mountain	0.33	9.10	7.09	0.038	0.27	0.32	5.24	0.238	12
27	0.108	0.86	334.6	Mountain	0.41	10.90	6.94	0.034	0.28	0.28	5.58	0.228	9
28	0.167	1.02	282.3	Mountain	0.54	11.80	7.62	0.030	0.30	0.23	6.16	0.180	8
29	0.151	0.88	261.2	Mountain	0.38	9.90	7.81	0.030	0.30	0.26	6.00	0.180	5
30	0.392	1.48	314.9	Mountain	0.75	20.60	6.32	0.041	0.26	0.32	4.72	0.285	2
31	0.496	1.58	838.1	Mountain	0.61	16.60	8.37	0.042	0.26	0.32	4.33	0.373	6
32	0.441	1.30	859.7	Mountain	0.43	13.80	8.33	0.043	0.24	0.33	4.65	0.301	6
33	0.176	0.98	969.8	Mountain	0.46	10.40	8.32	0.036	0.25	0.33	5.85	0.167	2
34	0.456	0.92	902.2	Mountain	0.29	8.90	9.15	0.037	0.28	0.29	4.72	0.310	3
35	0.410	0.78	986.4	Mountain	0.40	9.00	7.65	0.036	0.28	0.28	4.33	0.376	4
37	0.629	1.12	1368.8	Mountain	0.51	12.10	8.13	0.041	0.23	0.33	4.22	0.350	1
38	0.057	0.22	1843.7	Mountain	0.22	5.20	3.64	0.048	0.26	0.34	4.28	0.341	1
39	0.153	0.63	1476.2	Mountain	0.26	7.60	7.29	0.042	0.23	0.31	4.28	0.405	2
40	0.152	0.73	873.2	Mountain	0.45	8.30	7.69	0.032	0.28	0.27	3.90	0.519	13
41	0.349	1.21	688.8	Mountain	0.54	11.70	9.11	0.033	0.25	0.27	3.53	0.714	12
42	0.318	1.47	736.9	Mountain	0.47	12.80	10.06	0.036	0.28	0.29	3.56	0.599	4

* Non default value

(stSubBasSG rpt)

City of Scottsdale
Drainage Design Management System
SUB BASINS

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Project Reference: REATA WITH DIVERT

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Area ID	Sub Basin Parameters								Rainfall Losses				
	Area (sq mi)	Length (mi)	Slope (ft/mi)	S-Graph	Lca (mi)	Lag (min)	Velocity (ft/s)	Kn	IA (in)	DTHETA	PSIF (in)	XKSAT (in/hr)	RTIMP (%)
Major Basin ID: 01													
43	0.142	0.93	495.7	Mountain	0.41	9.50	8.62	0.031	0.31	0.34	3.18	0.760	1
44	0.126	0.81	372.4	Mountain	0.38	9.00	7.93	0.030	0.29	0.29	2.74	1.184	5
45	0.161	1.10	263.2	Mountain	0.46	11.60	8.38	0.030	0.21	0.29	2.75	1.418	5
46	0.175	0.83	1281.0	Mountain	0.39	8.90	8.20	0.037	0.28	0.28	4.08	0.450	4
47	0.547	1.74	1033.6	Mountain	1.04	19.80	7.73	0.041	0.27	0.30	4.17	0.392	3
48	1.570	2.55	653.5	Mountain	1.13	27.60	8.11	0.044	0.23	0.35	4.28	0.367	
49	0.433	1.93	282.4	Mountain	0.77	18.90	9.00	0.033	0.25	0.31	3.18	0.871	12
50	0.137	0.73	165.3	Mountain	0.44	10.30	6.25	0.029	0.30	0.31	2.75	1.256	17
51	0.721	1.90	416.5	Mountain	1.11	20.00	8.32	0.033	0.25	0.27	3.62	0.685	9
52	0.598	1.57	1216.7	Mountain	0.67	16.00	8.65	0.042	0.21	0.35	4.33	0.360	
53	0.700	2.29	536.7	Mountain	1.09	22.20	9.07	0.036	0.27	0.35	3.65	0.532	
54	0.488	1.50	754.7	Mountain	1.06	18.50	7.13	0.038	0.25	0.35	3.75	0.501	
55	0.341	1.16	1286.8	Mountain	0.46	13.10	7.77	0.045	0.22	0.35	4.33	0.363	
56	1.226	2.01	1011.2	Mountain	1.11	24.10	7.32	0.046	0.23	0.35	4.12	0.405	
57	0.084	0.54	208.0	Mountain	0.18	5.40	8.82	0.025	0.35	0.35	2.75	1.014	
58	0.112	0.63	165.3	Mountain	0.25	7.60	7.31	0.028	0.32	0.30	5.85	0.183	3
59	0.055	0.64	140.6	Mountain	0.37	8.80	6.38	0.027	0.33	0.30	4.03	0.449	2
60	0.182	0.97	163.3	Mountain	0.52	11.80	7.23	0.028	0.27	0.31	2.79	1.238	15
61	0.116	0.91	170.7	Mountain	0.33	10.30	7.77	0.030	0.23	0.21	6.34	0.202	26
62	0.122	0.47	168.3	Mountain	0.21	6.10	6.76	0.027	0.31	0.31	4.03	0.471	12
63	0.386	1.28	142.2	Mountain	0.58	14.50	7.74	0.029	0.26	0.31	2.79	1.243	30

* Non default value

(stSubBasSG rpt)

City of Scottsdale
 Drainage Design Management System
 SUB BASINS

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Project Reference: REATA WITH DIVERT

3/23/2016

Area ID	Sub Basin Parameters								Rainfall Losses				
	Area (sq mi)	Length (mi)	Slope (ft/mi)	S-Graph	Lca (mi)	Lag (min)	Velocity (ft/s)	Kn	IA (in)	DTHETA	PSIF (in)	XKSAT (in/hr)	RTIMP (%)
Major Basin ID: 01													
64	0.638	1.38	102.2	Mountain	0.63	16.50	7.40	0.029	0.28	0.29	3.22	0.870	22

* Non default value

(stSubBasSG rpt)

City of Scottsdale
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Project Reference: REATA WITH DIVERT

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Sub Basin	Land Use Code	Area (sq mi)	Area (%)	Initial Loss (IA)	Percent Impervious (RTIMP)	Vegetation Cover (%)	DTHETA	Kn	Description
Major Basin ID: 01									
01	120	0.1207	76.0	0.30	5	30.0	NORMAL	0.030	Estate Residential (1/5 du per acre to 1 du per acre)
	130	0.0101	6.4	0.30	15	50.0	NORMAL	0.030	Large Lot Residential - Single Family (1 du per acre to 2 du
	140	0.0280	17.6	0.25	30	50.0	NORMAL	0.030	Medium Lot Residential - Single Family (2-4 du per acre)
		0.1588	100.0						
02	120	0.0109	7.8	0.30	5	30.0	NORMAL	0.030	Estate Residential (1/5 du per acre to 1 du per acre)
	130	0.0181	12.9	0.30	15	50.0	NORMAL	0.030	Large Lot Residential - Single Family (1 du per acre to 2 du
	140	0.1109	79.2	0.25	30	50.0	NORMAL	0.030	Medium Lot Residential - Single Family (2-4 du per acre)
	200	0.0001	0.1	0.10	80	60.0	NORMAL	0.030	General Commercial (Commercial where no detail available)
		0.1400	100.0						
03	120	0.0460	31.0	0.30	5	30.0	NORMAL	0.030	Estate Residential (1/5 du per acre to 1 du per acre)
	130	0.0280	18.8	0.30	15	50.0	NORMAL	0.030	Large Lot Residential - Single Family (1 du per acre to 2 du
	140	0.0742	49.9	0.25	30	50.0	NORMAL	0.030	Medium Lot Residential - Single Family (2-4 du per acre)
	170	0.0004	0.3	0.25	45	50.0	NORMAL	0.030	Medium Density Residential - Multi Family (5-10 du per acre)
		0.1486	100.0						
04	120	0.0789	63.8	0.30	5	30.0	NORMAL	0.030	Estate Residential (1/5 du per acre to 1 du per acre)
	130	0.0110	8.9	0.30	15	50.0	NORMAL	0.030	Large Lot Residential - Single Family (1 du per acre to 2 du
	140	0.0331	26.8	0.25	30	50.0	NORMAL	0.030	Medium Lot Residential - Single Family (2-4 du per acre)
	150	0.0004	0.3	0.25	30	50.0	NORMAL	0.030	Small Lot Residential - Single Family (4-6 du per acre)
	170	0.0003	0.2	0.25	45	50.0	NORMAL	0.030	Medium Density Residential - Multi Family (5-10 du per acre)
		0.1237	100.0						
05	130	0.0001	0.1	0.30	15	50.0	NORMAL	0.030	Large Lot Residential - Single Family (1 du per acre to 2 du

* Non default value

(stLuDataSG.rpt)

City of Scottsdale
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Sub Basin	Land Use Code	Area (sq mi)	Area (%)	Initial Loss (IA)	Percent Impervious (RTIMP)	Vegetation Cover (%)	DTHETA	Kn	Description
Major Basin ID: 01									
05	140	0.0349	24.0	0.25	30	50.0	NORMAL	0.030	Medium Lot Residential - Single Family (2-4 du per acre)
	150	0.0163	11.2	0.25	30	50.0	NORMAL	0.030	Small Lot Residential - Single Family (4-6 du per acre)
	170	0.0333	22.9	0.25	45	50.0	NORMAL	0.030	Medium Density Residential - Multi Family (5-10 du per acre)
	200	0.0347	23.8	0.10	80	60.0	NORMAL	0.030	General Commercial (Commercial where no detail available)
	720	0.0262	18.0	0.10	5	90.0	NORMAL	0.030	Golf courses
		0.1455	100.0						
06	120	0.0053	2.9	0.30	5	30.0	NORMAL	0.030	Estate Residential (1/5 du per acre to 1 du per acre)
	150	0.0022	1.2	0.25	30	50.0	NORMAL	0.030	Small Lot Residential - Single Family (4-6 du per acre)
	170	0.1272	70.5	0.25	45	50.0	NORMAL	0.030	Medium Density Residential - Multi Family (5-10 du per acre)
	710	0.0396	22.0	0.10	5	90.0	NORMAL	0.030	Active Open Space (Includes parks)
	780	0.0060	3.3	0.25	0	3.5 *	DRY	0.050	Mountain Terrain Slopes > 10%
		0.1803	99.9						
07	120	0.0118	9.5	0.30	5	30.0	NORMAL	0.030	Estate Residential (1/5 du per acre to 1 du per acre)
	130	0.0197	15.9	0.30	15	50.0	NORMAL	0.030	Large Lot Residential - Single Family (1 du per acre to 2 du
	150	0.0377	30.5	0.25	30	50.0	NORMAL	0.030	Small Lot Residential - Single Family (4-6 du per acre)
	170	0.0546	44.1	0.25	45	50.0	NORMAL	0.030	Medium Density Residential - Multi Family (5-10 du per acre)
		0.1238	100.0						
08	130	0.0023	1.7	0.30	15	50.0	NORMAL	0.030	Large Lot Residential - Single Family (1 du per acre to 2 du
	140	0.0719	53.7	0.25	30	50.0	NORMAL	0.030	Medium Lot Residential - Single Family (2-4 du per acre)
	150	0.0001	0.1	0.25	30	50.0	NORMAL	0.030	Small Lot Residential - Single Family (4-6 du per acre)
	170	0.0259	19.3	0.25	45	50.0	NORMAL	0.030	Medium Density Residential - Multi Family (5-10 du per acre)

* Non default value

(stLuDataSG.rpt)

City of Scottsdale
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Sub Basin	Land Use Code	Area (sq mi)	Area (%)	Initial Loss (IA)	Percent Impervious (RTIMP)	Vegetation Cover (%)	DTHETA	Kn	Description
Major Basin ID: 01									
08	720	0.0180	13.4	0.10	5	90.0	NORMAL	0.030	Golf courses
	780	0.0158	11.8	0.25	0	3.5 *	DRY	0.050	Mountain Terrain Slopes > 10%
		0.1340	100.0						
09	120	0.1089	95.4	0.30	5	30.0	NORMAL	0.030	Estate Residential (1/5 du per acre to 1 du per acre)
	130	0.0048	4.2	0.30	15	50.0	NORMAL	0.030	Large Lot Residential - Single Family (1 du per acre to 2 du
	150	0.0001	0.1	0.25	30	50.0	NORMAL	0.030	Small Lot Residential - Single Family (4-6 du per acre)
	170	0.0003	0.3	0.25	45	50.0	NORMAL	0.030	Medium Density Residential - Multi Family (5-10 du per acre)
		0.1141	100.0						
10	120	0.2435	52.7	0.30	5	30.0	NORMAL	0.030	Estate Residential (1/5 du per acre to 1 du per acre)
	130	0.0021	0.5	0.30	15	50.0	NORMAL	0.030	Large Lot Residential - Single Family (1 du per acre to 2 du
	140	0.0004	0.1	0.25	30	50.0	NORMAL	0.030	Medium Lot Residential - Single Family (2-4 du per acre)
	150	0.0183	4.0	0.25	30	50.0	NORMAL	0.030	Small Lot Residential - Single Family (4-6 du per acre)
	170	0.0817	17.7	0.25	45	50.0	NORMAL	0.030	Medium Density Residential - Multi Family (5-10 du per acre)
	200	0.0781	16.9	0.10	80	60.0	NORMAL	0.030	General Commercial (Commercial where no detail available)
	710	0.0130	2.8	0.10	5	90.0	NORMAL	0.030	Active Open Space (Includes parks)
	720	0.0003	0.1	0.10	5	90.0	NORMAL	0.030	Golf courses
	780	0.0243	5.3	0.25	0	3.5 *	DRY	0.050	Mountain Terrain Slopes > 10%
		0.4617	100.1						
11	120	0.1666	95.5	0.30	5	30.0	NORMAL	0.030	Estate Residential (1/5 du per acre to 1 du per acre)
	130	0.0078	4.5	0.30	15	50.0	NORMAL	0.030	Large Lot Residential - Single Family (1 du per acre to 2 du
		0.1744	100.0						

* Non default value

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City of Scottsdale
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Sub Basin	Land Use Code	Area (sq mi)	Area (%)	Initial Loss (IA)	Percent Impervious (RTIMP)	Vegetation Cover (%)	DTHETA	Kn	Description
Major Basin ID: 01									
12	120	0.0852	28.1	0.30	5	30.0	NORMAL	0.030	Estate Residential (1/5 du per acre to 1 du per acre)
	130	0.1049	34.6	0.30	15	50.0	NORMAL	0.030	Large Lot Residential - Single Family (1 du per acre to 2 du
	140	0.0193	6.4	0.25	30	50.0	NORMAL	0.030	Medium Lot Residential - Single Family (2-4 du per acre)
	150	0.0723	23.9	0.25	30	50.0	NORMAL	0.030	Small Lot Residential - Single Family (4-6 du per acre)
	770	0.0213	7.0	0.15	0	3.5 *	DRY	0.030	Hillslopes, Sonoran Desert, Moderate Slopes 5% slope< 10%
		0.3030	100.0						
13	130	0.0423	16.3	0.30	15	50.0	NORMAL	0.030	Large Lot Residential - Single Family (1 du per acre to 2 du
	140	0.1148	44.3	0.25	30	50.0	NORMAL	0.030	Medium Lot Residential - Single Family (2-4 du per acre)
	720	0.0533	20.6	0.10	5	90.0	NORMAL	0.030	Golf courses
	780	0.0488	18.8	0.25	0	3.5 *	DRY	0.050	Mountain Terrain Slopes > 10%
		0.2592	100.0						
14	130	0.0593	38.5	0.30	15	50.0	NORMAL	0.030	Large Lot Residential - Single Family (1 du per acre to 2 du
	140	0.0457	29.7	0.25	30	50.0	NORMAL	0.030	Medium Lot Residential - Single Family (2-4 du per acre)
	150	0.0015	1.0	0.25	30	50.0	NORMAL	0.030	Small Lot Residential - Single Family (4-6 du per acre)
	770	0.0093	6.0	0.15	0	3.5 *	DRY	0.030	Hillslopes, Sonoran Desert, Moderate Slopes 5% slope< 10%
	780	0.0381	24.8	0.25	0	3.5 *	DRY	0.050	Mountain Terrain Slopes > 10%
		0.1539	100.0						
15	120	0.5485	78.4	0.30	5	30.0	NORMAL	0.030	Estate Residential (1/5 du per acre to 1 du per acre)
	140	0.0429	6.1	0.25	30	50.0	NORMAL	0.030	Medium Lot Residential - Single Family (2-4 du per acre)
	150	0.0313	4.5	0.25	30	50.0	NORMAL	0.030	Small Lot Residential - Single Family (4-6 du per acre)
	170	0.0284	4.1	0.25	45	50.0	NORMAL	0.030	Medium Density Residential - Multi Family (5-10 du per acre)

* Non default value

(stLuDataSG.rpt)

City of Scottsdale
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Sub Basin	Land Use Code	Area (sq mi)	Area (%)	Initial Loss (IA)	Percent Impervious (RTIMP)	Vegetation Cover (%)	DTHETA	Kn	Description
Major Basin ID: 01									
15	760	0.0032	0.5	0.35	0	3.5 *	DRY	0.025	Undeveloped Desert Rangeland, Slopes <5%
	770	0.0179	2.6	0.15	0	3.5 *	DRY	0.030	Hillslopes, Sonoran Desert, Moderate Slopes 5% slope< 10%
	780	0.0275	3.9	0.25	0	3.5 *	DRY	0.050	Mountain Terrain Slopes > 10%
		0.6997	100.1						
16	130	0.0456	8.8	0.30	15	50.0	NORMAL	0.030	Large Lot Residential - Single Family (1 du per acre to 2 du
	140	0.1684	32.3	0.25	30	50.0	NORMAL	0.030	Medium Lot Residential - Single Family (2-4 du per acre)
	150	0.0122	2.3	0.25	30	50.0	NORMAL	0.030	Small Lot Residential - Single Family (4-6 du per acre)
	170	0.0240	4.6	0.25	45	50.0	NORMAL	0.030	Medium Density Residential - Multi Family (5-10 du per acre)
	720	0.0931	17.9	0.10	5	90.0	NORMAL	0.030	Golf courses
	770	0.0050	1.0	0.15	0	3.5 *	DRY	0.030	Hillslopes, Sonoran Desert, Moderate Slopes 5% slope< 10%
	780	0.1723	33.1	0.25	0	3.5 *	DRY	0.050	Mountain Terrain Slopes > 10%
		0.5206	100.0						
17	130	0.0106	3.3	0.30	15	50.0	NORMAL	0.030	Large Lot Residential - Single Family (1 du per acre to 2 du
	140	0.0448	13.8	0.25	30	50.0	NORMAL	0.030	Medium Lot Residential - Single Family (2-4 du per acre)
	150	0.0483	14.9	0.25	30	50.0	NORMAL	0.030	Small Lot Residential - Single Family (4-6 du per acre)
	170	0.0831	25.7	0.25	45	50.0	NORMAL	0.030	Medium Density Residential - Multi Family (5-10 du per acre)
	720	0.0105	3.2	0.10	5	90.0	NORMAL	0.030	Golf courses
	780	0.1263	39.0	0.25	0	3.5 *	DRY	0.050	Mountain Terrain Slopes > 10%
		0.3236	99.9						
18	140	0.0271	19.2	0.25	30	50.0	NORMAL	0.030	Medium Lot Residential - Single Family (2-4 du per acre)
	150	0.0652	46.3	0.25	30	50.0	NORMAL	0.030	Small Lot Residential - Single Family (4-6 du per acre)

* Non default value

(stLuDataSG.rpt)

City of Scottsdale
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Sub Basin	Land Use Code	Area (sq mi)	Area (%)	Initial Loss (IA)	Percent Impervious (RTIMP)	Vegetation Cover (%)	DTHETA	Kn	Description
Major Basin ID: 01									
18	170	0.0020	1.4	0.25	45	50.0	NORMAL	0.030	Medium Density Residential - Multi Family (5-10 du per acre)
	760	0.0047	3.3	0.35	0	3.5 *	DRY	0.025	Undeveloped Desert Rangeland, Slopes <5%
	770	0.0094	6.7	0.15	0	3.5 *	DRY	0.030	Hillslopes, Sonoran Desert, Moderate Slopes 5% slope< 10%
	780	0.0324	23.0	0.25	0	3.5 *	DRY	0.050	Mountain Terrain Slopes > 10%
		0.1408	99.9						
19	130	0.0002	0.1	0.30	15	50.0	NORMAL	0.030	Large Lot Residential - Single Family (1 du per acre to 2 du
	140	0.0625	41.3	0.25	30	50.0	NORMAL	0.030	Medium Lot Residential - Single Family (2-4 du per acre)
	150	0.0350	23.1	0.25	30	50.0	NORMAL	0.030	Small Lot Residential - Single Family (4-6 du per acre)
	760	0.0069	4.6	0.35	0	3.5 *	DRY	0.025	Undeveloped Desert Rangeland, Slopes <5%
	770	0.0011	0.7	0.15	0	3.5 *	DRY	0.030	Hillslopes, Sonoran Desert, Moderate Slopes 5% slope< 10%
	780	0.0457	30.2	0.25	0	3.5 *	DRY	0.050	Mountain Terrain Slopes > 10%
		0.1514	100.0						
20	120	0.0480	18.2	0.30	5	30.0	NORMAL	0.030	Estate Residential (1/5 du per acre to 1 du per acre)
	130	0.0080	3.0	0.30	15	50.0	NORMAL	0.030	Large Lot Residential - Single Family (1 du per acre to 2 du
	140	0.1020	38.7	0.25	30	50.0	NORMAL	0.030	Medium Lot Residential - Single Family (2-4 du per acre)
	150	0.0243	9.2	0.25	30	50.0	NORMAL	0.030	Small Lot Residential - Single Family (4-6 du per acre)
	760	0.0316	12.0	0.35	0	7.0	DRY	0.025	Undeveloped Desert Rangeland, Slopes <5%
	770	0.0002	0.1	0.15	0	7.0	DRY	0.030	Hillslopes, Sonoran Desert, Moderate Slopes 5% slope< 10%
	780	0.0497	18.8	0.25	0	3.5 *	DRY	0.050	Mountain Terrain Slopes > 10%
		0.2638	100.0						
21	120	0.1222	95.0	0.30	5	30.0	NORMAL	0.030	Estate Residential (1/5 du per acre to 1 du per acre)

* Non default value

(stLuDataSG.rpt)

City of Scottsdale
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Sub Basin	Land Use Code	Area (sq mi)	Area (%)	Initial Loss (IA)	Percent Impervious (RTIMP)	Vegetation Cover (%)	DTHETA	Kn	Description
Major Basin ID: 01									
21	130	0.0059	4.6	0.30	15	50.0	NORMAL	0.030	Large Lot Residential - Single Family (1 du per acre to 2 du
	140	0.0004	0.3	0.25	30	50.0	NORMAL	0.030	Medium Lot Residential - Single Family (2-4 du per acre)
	780	0.0001	0.1	0.25	0	3.5 *	DRY	0.050	Mountain Terrain Slopes > 10%
		0.1286	100.0						
22	120	0.1106	49.7	0.30	5	30.0	NORMAL	0.030	Estate Residential (1/5 du per acre to 1 du per acre)
	130	0.0425	19.1	0.30	15	50.0	NORMAL	0.030	Large Lot Residential - Single Family (1 du per acre to 2 du
	140	0.0140	6.3	0.25	30	50.0	NORMAL	0.030	Medium Lot Residential - Single Family (2-4 du per acre)
	720	0.0157	7.1	0.10	5	90.0	NORMAL	0.030	Golf courses
	760	0.0360	16.2	0.35	0	7.0	DRY	0.025	Undeveloped Desert Rangeland, Slopes <5%
	780	0.0036	1.6	0.25	0	7.0	DRY	0.050	Mountain Terrain Slopes > 10%
		0.2224	100.0						
23	120	0.0789	28.3	0.30	5	30.0	NORMAL	0.030	Estate Residential (1/5 du per acre to 1 du per acre)
	130	0.0078	2.8	0.30	15	50.0	NORMAL	0.030	Large Lot Residential - Single Family (1 du per acre to 2 du
	140	0.1248	44.8	0.25	30	50.0	NORMAL	0.030	Medium Lot Residential - Single Family (2-4 du per acre)
	720	0.0577	20.7	0.10	5	90.0	NORMAL	0.030	Golf courses
	760	0.0096	3.4	0.35	0	7.0	DRY	0.025	Undeveloped Desert Rangeland, Slopes <5%
		0.2788	100.0						
24	120	0.0466	12.2	0.30	5	30.0	NORMAL	0.030	Estate Residential (1/5 du per acre to 1 du per acre)
	140	0.1045	27.5	0.25	30	50.0	NORMAL	0.030	Medium Lot Residential - Single Family (2-4 du per acre)
	170	0.0440	11.6	0.25	45	50.0	NORMAL	0.030	Medium Density Residential - Multi Family (5-10 du per acre)
	720	0.0323	8.5	0.10	5	90.0	NORMAL	0.030	Golf courses

* Non default value

(stLuDataSG.rpt)

City of Scottsdale
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Sub Basin	Land Use Code	Area (sq mi)	Area (%)	Initial Loss (IA)	Percent Impervious (RTIMP)	Vegetation Cover (%)	DTHETA	Kn	Description
Major Basin ID: 01									
24	760	0.0862	22.7	0.35	0	7.0	DRY	0.025	Undeveloped Desert Rangeland, Slopes <5%
	780	0.0669	17.6	0.25	0	7.0	DRY	0.050	Mountain Terrain Slopes > 10%
		0.3805	100.1						
25	140	0.1191	43.5	0.25	30	50.0	NORMAL	0.030	Medium Lot Residential - Single Family (2-4 du per acre)
	170	0.0015	0.5	0.25	45	50.0	NORMAL	0.030	Medium Density Residential - Multi Family (5-10 du per acre)
	720	0.0062	2.3	0.10	5	90.0	NORMAL	0.030	Golf courses
	760	0.0070	2.6	0.35	0	7.0	DRY	0.025	Undeveloped Desert Rangeland, Slopes <5%
	780	0.1399	51.1	0.25	0	7.0	DRY	0.050	Mountain Terrain Slopes > 10%
		0.2737	100.0						
26	130	0.0002	0.3	0.30	15	50.0	NORMAL	0.030	Large Lot Residential - Single Family (1 du per acre to 2 du
	140	0.0252	40.0	0.25	30	50.0	NORMAL	0.030	Medium Lot Residential - Single Family (2-4 du per acre)
	760	0.0108	17.1	0.35	0	7.0	DRY	0.025	Undeveloped Desert Rangeland, Slopes <5%
	780	0.0268	42.5	0.25	0	7.0	DRY	0.050	Mountain Terrain Slopes > 10%
		0.0630	99.9						
27	120	0.0469	43.4	0.30	5	30.0	NORMAL	0.030	Estate Residential (1/5 du per acre to 1 du per acre)
	130	0.0243	22.5	0.30	15	50.0	NORMAL	0.030	Large Lot Residential - Single Family (1 du per acre to 2 du
	140	0.0133	12.3	0.25	30	50.0	NORMAL	0.030	Medium Lot Residential - Single Family (2-4 du per acre)
	770	0.0008	0.7	0.15	0	7.0	DRY	0.030	Hillslopes, Sonoran Desert, Moderate Slopes 5% slope< 10%
	780	0.0228	21.1	0.25	0	7.0	DRY	0.050	Mountain Terrain Slopes > 10%
		0.1081	100.0						
28	120	0.1440	86.3	0.30	5	30.0	NORMAL	0.030	Estate Residential (1/5 du per acre to 1 du per acre)

* Non default value

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Sub Basin	Land Use Code	Area (sq mi)	Area (%)	Initial Loss (IA)	Percent Impervious (RTIMP)	Vegetation Cover (%)	DTHETA	Kn	Description
Major Basin ID: 01									
28	130	0.0099	5.9	0.30	15	50.0	NORMAL	0.030	Large Lot Residential - Single Family (1 du per acre to 2 du
	140	0.0130	7.8	0.25	30	50.0	NORMAL	0.030	Medium Lot Residential - Single Family (2-4 du per acre)
		0.1669	100.0						
29	120	0.1367	90.5	0.30	5	30.0	NORMAL	0.030	Estate Residential (1/5 du per acre to 1 du per acre)
	760	0.0144	9.5	0.35	0	7.0	DRY	0.025	Undeveloped Desert Rangeland, Slopes <5%
		0.1511	100.0						
30	120	0.1176	30.0	0.30	5	30.0	NORMAL	0.030	Estate Residential (1/5 du per acre to 1 du per acre)
	760	0.0101	2.6	0.35	0	7.0	DRY	0.025	Undeveloped Desert Rangeland, Slopes <5%
	770	0.0431	11.0	0.15	0	7.0	DRY	0.030	Hillslopes, Sonoran Desert, Moderate Slopes 5% slope< 10%
	780	0.2207	56.4	0.25	0	7.0	DRY	0.050	Mountain Terrain Slopes > 10%
		0.3915	100.0						
31	130	0.1570	31.6	0.30	15	50.0	NORMAL	0.030	Large Lot Residential - Single Family (1 du per acre to 2 du
	140	0.0123	2.5	0.25	30	50.0	NORMAL	0.030	Medium Lot Residential - Single Family (2-4 du per acre)
	770	0.0308	6.2	0.15	0	7.0	DRY	0.030	Hillslopes, Sonoran Desert, Moderate Slopes 5% slope< 10%
	780	0.2964	59.7	0.25	0	7.0	DRY	0.050	Mountain Terrain Slopes > 10%
		0.4965	100.0						
32	120	0.0115	2.6	0.30	5	30.0	NORMAL	0.030	Estate Residential (1/5 du per acre to 1 du per acre)
	130	0.0008	0.2	0.30	15	50.0	NORMAL	0.030	Large Lot Residential - Single Family (1 du per acre to 2 du
	140	0.0816	18.5	0.25	30	50.0	NORMAL	0.030	Medium Lot Residential - Single Family (2-4 du per acre)
	770	0.0707	16.0	0.15	0	7.0	DRY	0.030	Hillslopes, Sonoran Desert, Moderate Slopes 5% slope< 10%
	780	0.2767	62.7	0.25	0	7.0	DRY	0.050	Mountain Terrain Slopes > 10%

* Non default value

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Sub Basin	Land Use Code	Area (sq mi)	Area (%)	Initial Loss (IA)	Percent Impervious (RTIMP)	Vegetation Cover (%)	DTHETA	Kn	Description
Major Basin ID: 01									
		0.4413	100.0						
33	120	0.0777	44.3	0.30	5	30.0	NORMAL	0.030	Estate Residential (1/5 du per acre to 1 du per acre)
	140	0.0009	0.5	0.25	30	50.0	NORMAL	0.030	Medium Lot Residential - Single Family (2-4 du per acre)
	770	0.0463	26.4	0.15	0	7.0	DRY	0.030	Hillslopes, Sonoran Desert, Moderate Slopes 5% slope< 10%
	780	0.0506	28.8	0.25	0	7.0	DRY	0.050	Mountain Terrain Slopes > 10%
		0.1755	100.0						
34	120	0.2846	62.4	0.30	5	30.0	NORMAL	0.030	Estate Residential (1/5 du per acre to 1 du per acre)
	760	0.0003	0.1	0.35	0	7.0	DRY	0.025	Undeveloped Desert Rangeland, Slopes <5%
	780	0.1713	37.5	0.25	0	7.0	DRY	0.050	Mountain Terrain Slopes > 10%
		0.4562	100.0						
35	120	0.2850	69.5	0.30	5	30.0	NORMAL	0.030	Estate Residential (1/5 du per acre to 1 du per acre)
	780	0.1249	30.5	0.25	0	7.0	DRY	0.050	Mountain Terrain Slopes > 10%
		0.4099	100.0						
37	120	0.0931	14.8	0.30	5	30.0	NORMAL	0.030	Estate Residential (1/5 du per acre to 1 du per acre)
	130	0.0130	2.1	0.30	15	50.0	NORMAL	0.030	Large Lot Residential - Single Family (1 du per acre to 2 du
	760	0.0116	1.8	0.35	0	7.0	DRY	0.025	Undeveloped Desert Rangeland, Slopes <5%
	770	0.1775	28.2	0.15	0	7.0	DRY	0.030	Hillslopes, Sonoran Desert, Moderate Slopes 5% slope< 10%
	780	0.3340	53.1	0.25	0	7.0	DRY	0.050	Mountain Terrain Slopes > 10%
		0.6292	100.0						
38	120	0.0065	11.4	0.30	5	30.0	NORMAL	0.030	Estate Residential (1/5 du per acre to 1 du per acre)
	780	0.0507	88.6	0.25	0	7.0	DRY	0.050	Mountain Terrain Slopes > 10%

* Non default value

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Sub Basin	Land Use Code	Area (sq mi)	Area (%)	Initial Loss (IA)	Percent Impervious (RTIMP)	Vegetation Cover (%)	DTHETA	Kn	Description
Major Basin ID: 01									
		0.0572	100.0						
39	120	0.0244	15.9	0.30	5	30.0	NORMAL	0.030	Estate Residential (1/5 du per acre to 1 du per acre)
	720	0.0334	21.8	0.10	5	90.0	NORMAL	0.030	Golf courses
	760	0.0023	1.5	0.35	0	7.0	DRY	0.025	Undeveloped Desert Rangeland, Slopes <5%
	780	0.0931	60.8	0.25	0	7.0	DRY	0.050	Mountain Terrain Slopes > 10%
		0.1532	100.0						
40	120	0.0910	59.8	0.30	5	30.0	NORMAL	0.030	Estate Residential (1/5 du per acre to 1 du per acre)
	170	0.0337	22.1	0.25	45	50.0	NORMAL	0.030	Medium Density Residential - Multi Family (5-10 du per acre)
	760	0.0081	5.3	0.35	0	7.0	DRY	0.025	Undeveloped Desert Rangeland, Slopes <5%
	780	0.0194	12.7	0.25	0	7.0	DRY	0.050	Mountain Terrain Slopes > 10%
		0.1522	99.9						
41	120	0.1689	48.4	0.30	5	30.0	NORMAL	0.030	Estate Residential (1/5 du per acre to 1 du per acre)
	130	0.0132	3.8	0.30	15	50.0	NORMAL	0.030	Large Lot Residential - Single Family (1 du per acre to 2 du
	170	0.0604	17.3	0.25	45	50.0	NORMAL	0.030	Medium Density Residential - Multi Family (5-10 du per acre)
	720	0.0604	17.3	0.10	5	90.0	NORMAL	0.030	Golf courses
	780	0.0463	13.3	0.25	0	7.0	DRY	0.050	Mountain Terrain Slopes > 10%
		0.3492	100.1						
42	120	0.2192	68.8	0.30	5	30.0	NORMAL	0.030	Estate Residential (1/5 du per acre to 1 du per acre)
	720	0.0051	1.6	0.10	5	90.0	NORMAL	0.030	Golf courses
	780	0.0941	29.6	0.25	0	7.0	DRY	0.050	Mountain Terrain Slopes > 10%
		0.3184	100.0						

* Non default value

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Sub Basin	Land Use Code	Area (sq mi)	Area (%)	Initial Loss (IA)	Percent Impervious (RTIMP)	Vegetation Cover (%)	DTHETA	Kn	Description
Major Basin ID: 01									
43	170	0.0019	1.3	0.25	45	50.0	NORMAL	0.030	Medium Density Residential - Multi Family (5-10 du per acre)
	720	0.0072	5.1	0.10	5	90.0	NORMAL	0.030	Golf courses
	760	0.0987	69.7	0.35	0	18.0 *	DRY	0.025	Undeveloped Desert Rangeland, Slopes <5%
	780	0.0339	23.9	0.25	0	18.0 *	DRY	0.050	Mountain Terrain Slopes > 10%
		0.1417	100.0						
44	120	0.1188	94.5	0.30	5	30.0	NORMAL	0.030	Estate Residential (1/5 du per acre to 1 du per acre)
	720	0.0069	5.5	0.10	5	90.0	NORMAL	0.030	Golf courses
		0.1257	100.0						
45	120	0.0880	54.6	0.30	5	30.0	NORMAL	0.030	Estate Residential (1/5 du per acre to 1 du per acre)
	720	0.0724	44.9	0.10	5	90.0	NORMAL	0.030	Golf courses
	760	0.0008	0.5	0.35	0	18.0 *	DRY	0.025	Undeveloped Desert Rangeland, Slopes <5%
		0.1612	100.0						
46	120	0.1161	66.3	0.30	5	30.0	NORMAL	0.030	Estate Residential (1/5 du per acre to 1 du per acre)
	780	0.0591	33.7	0.25	0	18.0 *	DRY	0.050	Mountain Terrain Slopes > 10%
		0.1752	100.0						
47	120	0.2479	45.3	0.30	5	30.0	NORMAL	0.030	Estate Residential (1/5 du per acre to 1 du per acre)
	780	0.2996	54.7	0.25	0	7.0	DRY	0.050	Mountain Terrain Slopes > 10%
		0.5475	100.0						
48	120	0.0042	0.3	0.30	5	30.0	NORMAL	0.030	Estate Residential (1/5 du per acre to 1 du per acre)
	760	0.0710	4.5	0.35	0	18.0 *	DRY	0.025	Undeveloped Desert Rangeland, Slopes <5%
	770	0.3975	25.3	0.15	0	18.0 *	DRY	0.030	Hillslopes, Sonoran Desert, Moderate Slopes 5% slope< 10%

* Non default value

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Sub Basin	Land Use Code	Area (sq mi)	Area (%)	Initial Loss (IA)	Percent Impervious (RTIMP)	Vegetation Cover (%)	DTHETA	Kn	Description
Major Basin ID: 01									
48	780	1.0975	69.9	0.25	0	18.0 *	DRY	0.050	Mountain Terrain Slopes > 10%
		1.5702	100.0						
49	120	0.0147	3.4	0.30	5	30.0	NORMAL	0.030	Estate Residential (1/5 du per acre to 1 du per acre)
	130	0.0066	1.5	0.30	15	50.0	NORMAL	0.030	Large Lot Residential - Single Family (1 du per acre to 2 du
	150	0.0082	1.9	0.25	30	50.0	NORMAL	0.030	Small Lot Residential - Single Family (4-6 du per acre)
	170	0.0988	22.8	0.25	45	50.0	NORMAL	0.030	Medium Density Residential - Multi Family (5-10 du per acre)
	720	0.0620	14.3	0.10	5	90.0	NORMAL	0.030	Golf courses
	760	0.1105	25.5	0.35	0	18.0 *	DRY	0.025	Undeveloped Desert Rangeland, Slopes <5%
	770	0.0330	7.6	0.15	0	18.0 *	DRY	0.030	Hillslopes, Sonoran Desert, Moderate Slopes 5% slope< 10%
	780	0.0990	22.9	0.25	0	18.0 *	DRY	0.050	Mountain Terrain Slopes > 10%
		0.4328	99.9						
50	130	0.0734	53.5	0.30	15	50.0	NORMAL	0.030	Large Lot Residential - Single Family (1 du per acre to 2 du
	170	0.0265	19.3	0.25	45	50.0	NORMAL	0.030	Medium Density Residential - Multi Family (5-10 du per acre)
	760	0.0372	27.1	0.35	0	18.0 *	DRY	0.025	Undeveloped Desert Rangeland, Slopes <5%
		0.1371	99.9						
51	120	0.3433	47.6	0.30	5	30.0	NORMAL	0.030	Estate Residential (1/5 du per acre to 1 du per acre)
	130	0.0495	6.9	0.30	15	50.0	NORMAL	0.030	Large Lot Residential - Single Family (1 du per acre to 2 du
	170	0.0674	9.4	0.25	45	50.0	NORMAL	0.030	Medium Density Residential - Multi Family (5-10 du per acre)
	720	0.1468	20.4	0.10	5	90.0	NORMAL	0.030	Golf courses
	760	0.0109	1.5	0.35	0	18.0 *	DRY	0.025	Undeveloped Desert Rangeland, Slopes <5%
	780	0.1028	14.3	0.25	0	18.0 *	DRY	0.050	Mountain Terrain Slopes > 10%

* Non default value

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Sub Basin	Land Use Code	Area (sq mi)	Area (%)	Initial Loss (IA)	Percent Impervious (RTIMP)	Vegetation Cover (%)	DTHETA	Kn	Description
Major Basin ID: 01									
		0.7207	100.1						
52	770	0.2248	37.6	0.15	0	18.0 *	DRY	0.030	Hillslopes, Sonoran Desert, Moderate Slopes 5% slope< 10%
	780	0.3735	62.4	0.25	0	18.0 *	DRY	0.050	Mountain Terrain Slopes > 10%
		0.5983	100.0						
53	710	0.0170	2.4	0.10	5	12.0 *	NORMAL	0.030	Active Open Space (Includes parks)
	760	0.2789	39.8	0.35	0	18.0 *	DRY	0.025	Undeveloped Desert Rangeland, Slopes <5%
	770	0.1261	18.0	0.15	0	18.0 *	DRY	0.030	Hillslopes, Sonoran Desert, Moderate Slopes 5% slope< 10%
	780	0.2780	39.7	0.25	0	18.0 *	DRY	0.050	Mountain Terrain Slopes > 10%
		0.7000	99.9						
54	760	0.1225	25.1	0.35	0	18.0 *	DRY	0.025	Undeveloped Desert Rangeland, Slopes <5%
	770	0.1473	30.2	0.15	0	18.0 *	DRY	0.030	Hillslopes, Sonoran Desert, Moderate Slopes 5% slope< 10%
	780	0.2186	44.8	0.25	0	18.0 *	DRY	0.050	Mountain Terrain Slopes > 10%
		0.4884	100.1						
55	770	0.0912	26.8	0.15	0	18.0 *	DRY	0.030	Hillslopes, Sonoran Desert, Moderate Slopes 5% slope< 10%
	780	0.2493	73.2	0.25	0	18.0 *	DRY	0.050	Mountain Terrain Slopes > 10%
		0.3405	100.0						
56	130	0.0012	0.1	0.30	15	50.0	NORMAL	0.030	Large Lot Residential - Single Family (1 du per acre to 2 du
	770	0.2357	19.2	0.15	0	18.0 *	DRY	0.030	Hillslopes, Sonoran Desert, Moderate Slopes 5% slope< 10%
	780	0.9891	80.7	0.25	0	18.0 *	DRY	0.050	Mountain Terrain Slopes > 10%
		1.2260	100.0						
57	760	0.0838	100.0	0.35	0	18.0 *	DRY	0.025	Undeveloped Desert Rangeland, Slopes <5%

* Non default value

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Sub Basin	Land Use Code	Area (sq mi)	Area (%)	Initial Loss (IA)	Percent Impervious (RTIMP)	Vegetation Cover (%)	DTHETA	Kn	Description
Major Basin ID: 01									
58		0.0838	100.0						
	120	0.0692	61.6	0.30	5	30.0	NORMAL	0.030	Estate Residential (1/5 du per acre to 1 du per acre)
	760	0.0431	38.4	0.35	0	18.0 *	DRY	0.025	Undeveloped Desert Rangeland, Slopes <5%
59		0.1123	100.0						
	120	0.0259	46.8	0.30	5	30.0	NORMAL	0.030	Estate Residential (1/5 du per acre to 1 du per acre)
	130	0.0005	0.9	0.30	15	50.0	NORMAL	0.030	Large Lot Residential - Single Family (1 du per acre to 2 du
	760	0.0289	52.3	0.35	0	18.0 *	DRY	0.025	Undeveloped Desert Rangeland, Slopes <5%
60		0.0553	100.0						
	120	0.0031	1.7	0.30	5	30.0	NORMAL	0.030	Estate Residential (1/5 du per acre to 1 du per acre)
	130	0.0019	1.0	0.30	15	50.0	NORMAL	0.030	Large Lot Residential - Single Family (1 du per acre to 2 du
	140	0.0002	0.1	0.25	30	50.0	NORMAL	0.030	Medium Lot Residential - Single Family (2-4 du per acre)
	150	0.0674	37.0	0.25	30	50.0	NORMAL	0.030	Small Lot Residential - Single Family (4-6 du per acre)
	170	0.0137	7.5	0.25	45	50.0	NORMAL	0.030	Medium Density Residential - Multi Family (5-10 du per acre)
	720	0.0274	15.0	0.10	5	90.0	NORMAL	0.030	Golf courses
	760	0.0687	37.7	0.35	0	18.0 *	DRY	0.025	Undeveloped Desert Rangeland, Slopes <5%
61		0.1824	100.0						
	120	0.0014	1.2	0.30	5	30.0	NORMAL	0.030	Estate Residential (1/5 du per acre to 1 du per acre)
	130	0.0093	8.1	0.30	15	50.0	NORMAL	0.030	Large Lot Residential - Single Family (1 du per acre to 2 du
	140	0.0334	28.9	0.25	30	50.0	NORMAL	0.030	Medium Lot Residential - Single Family (2-4 du per acre)
	150	0.0398	34.5	0.25	30	50.0	NORMAL	0.030	Small Lot Residential - Single Family (4-6 du per acre)
	170	0.0116	10.0	0.25	45	50.0	NORMAL	0.030	Medium Density Residential - Multi Family (5-10 du per acre)

* Non default value

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Sub Basin	Land Use Code	Area (sq mi)	Area (%)	Initial Loss (IA)	Percent Impervious (RTIMP)	Vegetation Cover (%)	DTHETA	Kn	Description
Major Basin ID: 01									
61	720	0.0199	17.2	0.10	5	90.0	NORMAL	0.030	Golf courses
	760	0.0001	0.1	0.35	0	18.0 *	DRY	0.025	Undeveloped Desert Rangeland, Slopes <5%
		0.1155	100.0						
62	140	0.0402	32.9	0.25	30	50.0	NORMAL	0.030	Medium Lot Residential - Single Family (2-4 du per acre)
	170	0.0019	1.6	0.25	45	50.0	NORMAL	0.030	Medium Density Residential - Multi Family (5-10 du per acre)
	200	0.0015	1.2	0.10	80	60.0	NORMAL	0.030	General Commercial (Commercial where no detail available)
	760	0.0785	64.3	0.35	0	18.0 *	DRY	0.025	Undeveloped Desert Rangeland, Slopes <5%
		0.1221	100.0						
63	130	0.1565	40.5	0.30	15	50.0	NORMAL	0.030	Large Lot Residential - Single Family (1 du per acre to 2 du
	150	0.0114	3.0	0.25	30	50.0	NORMAL	0.030	Small Lot Residential - Single Family (4-6 du per acre)
	170	0.0030	0.8	0.25	45	50.0	NORMAL	0.030	Medium Density Residential - Multi Family (5-10 du per acre)
	200	0.1080	28.0	0.10	80	60.0	NORMAL	0.030	General Commercial (Commercial where no detail available)
	760	0.1074	27.8	0.35	0	18.0 *	DRY	0.025	Undeveloped Desert Rangeland, Slopes <5%
		0.3863	100.1						
64	130	0.0002		0.30	15	50.0	NORMAL	0.030	Large Lot Residential - Single Family (1 du per acre to 2 du
	150	0.4275	67.0	0.25	30	50.0	NORMAL	0.030	Small Lot Residential - Single Family (4-6 du per acre)
	170	0.0253	4.0	0.25	45	50.0	NORMAL	0.030	Medium Density Residential - Multi Family (5-10 du per acre)
	760	0.1848	29.0	0.35	0	18.0 *	DRY	0.025	Undeveloped Desert Rangeland, Slopes <5%
		0.6378	100.0						

* Non default value

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SOILS

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Area ID	Book Number	Map Unit	Soil ID	Area (sq mi)	Area (%)	XKSAT	Rock Percent (%)	Effective Rock (%)	Comments
Major Basin ID: 01									
01	645	61	64561	0.159	100.00	0.150	-	100	
02	645	61	64561	0.137	97.70	0.150	-	100	
	645	96	64596	0.003	2.30	0.070	-	100	
03	645	61	64561	0.148	99.80	0.150	-	100	
	645	96	64596	0.000	0.20	0.070	-	100	
04	645	61	64561	0.124	100.00	0.150	-	100	
05	645	61	64561	0.133	91.40	0.150	-	100	
	645	96	64596	0.013	8.60	0.070	-	100	
06	645	61	64561	0.167	92.80	0.150	-	100	
	645	63	64563	0.006	3.30	0.140	25.00	1	
	645	96	64596	0.002	1.30	0.070	-	100	
	645	126	645126	0.005	2.50	0.000	-	100	
07	645	61	64561	0.124	100.00	0.150	-	100	
08	645	61	64561	0.100	74.80	0.150	-	100	
	645	63	64563	0.034	25.20	0.140	25.00	1	
09	645	61	64561	0.112	98.20	0.150	-	100	
	645	63	64563	0.002	1.80	0.140	25.00	1	
10	645	6	6456	0.038	8.30	0.620	-	100	
	645	33	64533	0.037	8.10	0.230	-	100	
	645	61	64561	0.249	53.90	0.150	-	100	
	645	63	64563	0.102	22.00	0.140	25.00	1	
	645	96	64596	0.036	7.70	0.070	-	100	
11	645	61	64561	0.168	96.20	0.150	-	100	
	645	63	64563	0.007	3.80	0.140	25.00	1	
12	645	6	6456	0.003	1.10	0.620	-	100	
	645	61	64561	0.279	91.90	0.150	-	100	
	645	63	64563	0.021	7.00	0.140	25.00	1	
13	645	6	6456	0.103	39.90	0.620	-	100	
	645	61	64561	0.022	8.60	0.150	-	100	
	645	63	64563	0.058	22.40	0.140	25.00	1	
	645	121	645121	0.076	29.10	0.120	-	100	
14	645	6	6456	0.006	3.60	0.620	-	100	
	645	61	64561	0.101	65.90	0.150	-	100	
	645	63	64563	0.047	30.50	0.140	25.00	1	
15	645	6	6456	0.004	0.60	0.620	-	100	
	645	61	64561	0.667	95.30	0.150	-	100	
	645	63	64563	0.029	4.10	0.140	25.00	1	
16	645	6	6456	0.060	11.40	0.620	-	100	
	645	33	64533	0.001	0.30	0.230	-	100	
	645	61	64561	0.009	1.80	0.150	-	100	
	645	63	64563	0.186	35.70	0.140	25.00	1	
	645	96	64596	0.039	7.50	0.070	-	100	
	645	121	645121	0.226	43.40	0.120	-	100	
17	645	61	64561	0.116	35.90	0.150	-	100	
	645	63	64563	0.113	34.90	0.140	25.00	1	
	645	96	64596	0.052	16.10	0.070	-	100	
	645	121	645121	0.042	13.00	0.120	-	100	
18	645	6	6456	0.000	0.10	0.620	-	100	
	645	61	64561	0.109	77.30	0.150	-	100	
	645	63	64563	0.032	22.50	0.140	25.00	1	
19	645	6	6456	0.015	9.80	0.620	-	100	
	645	61	64561	0.055	36.50	0.150	-	100	
	645	63	64563	0.055	36.60	0.140	25.00	1	
	645	121	645121	0.026	17.10	0.120	-	100	
20	645	6	6456	0.039	14.90	0.620	-	100	
	645	61	64561	0.198	74.90	0.150	-	100	
	645	63	64563	0.027	10.20	0.140	25.00	1	
21	645	61	64561	0.129	100.00	0.150	-	100	

* Non default value

(stSIDataGA.rpt)

City of Scottsdale
Drainage Design Management System
SOILS

Page 2

Project Reference: REATA WITH DIVERT

3/23/2016

Area ID	Book Number	Map Unit	Soil ID	Area (sq mi)	Area (%)	XKSAT	Rock Percent (%)	Effective Rock (%)	Comments
Major Basin ID: 01									
22	645	6	6456	0.050	22.40	0.620	-	100	
	645	8	6458	0.019	8.40	0.960	-	100	
	645	31	64531	0.005	2.20	0.330	35.00	1	
	645	40	64540	0.013	5.70	0.170	-	100	
	645	93	64593	0.008	3.70	0.330	-	100	
	645	96	64596	0.125	56.30	0.070	-	100	
	645	121	645121	0.003	1.30	0.120	-	100	
23	645	6	6456	0.007	2.40	0.620	-	100	
	645	8	6458	0.001	0.50	0.960	-	100	
	645	40	64540	0.038	13.60	0.170	-	100	
	645	96	64596	0.232	83.30	0.070	-	100	
	645	121	645121	0.000	0.10	0.120	-	100	
24	645	8	6458	0.081	21.30	0.960	-	100	
	645	31	64531	0.066	17.20	0.330	35.00	1	
	645	40	64540	0.062	16.30	0.170	-	100	
	645	41	64541	0.016	4.20	0.170	-	100	
	645	61	64561	0.115	30.20	0.150	-	100	
	645	63	64563	0.021	5.60	0.140	25.00	1	
	645	96	64596	0.020	5.20	0.070	-	100	
25	645	6	6456	0.007	2.70	0.620	-	100	
	645	31	64531	0.134	48.80	0.330	35.00	1	
	645	61	64561	0.100	36.50	0.150	-	100	
	645	63	64563	0.033	12.00	0.140	25.00	1	
26	645	6	6456	0.002	3.70	0.620	-	100	
	645	31	64531	0.022	34.60	0.330	35.00	1	
	645	61	64561	0.025	39.80	0.150	-	100	
	645	63	64563	0.014	21.90	0.140	25.00	1	
27	645	31	64531	0.037	33.90	0.330	35.00	1	
	645	61	64561	0.040	36.70	0.150	-	100	
	645	121	645121	0.032	29.40	0.120	-	100	
28	645	61	64561	0.109	65.40	0.150	-	100	
	645	63	64563	0.031	18.60	0.140	25.00	1	
	645	121	645121	0.027	15.90	0.120	-	100	
29	645	61	64561	0.151	100.00	0.150	-	100	
30	645	31	64531	0.281	71.70	0.330	35.00	1	
	645	40	64540	0.111	28.30	0.170	-	100	
31	645	31	64531	0.497	100.00	0.330	35.00	1	
32	645	31	64531	0.360	81.60	0.330	35.00	1	
	645	61	64561	0.035	7.90	0.150	-	100	
	645	63	64563	0.046	10.40	0.140	25.00	1	
33	645	31	64531	0.015	8.40	0.330	35.00	1	
	645	61	64561	0.087	49.30	0.150	-	100	
	645	63	64563	0.068	38.70	0.140	25.00	1	
	645	121	645121	0.006	3.60	0.120	-	100	
34	645	8	6458	0.010	2.30	0.960	-	100	
	645	31	64531	0.297	65.00	0.330	35.00	1	
	645	93	64593	0.086	18.90	0.330	-	100	
	645	96	64596	0.063	13.80	0.070	-	100	
35	645	31	64531	0.388	94.70	0.330	35.00	1	
	645	93	64593	0.022	5.30	0.330	-	100	
37	645	8	6458	0.028	4.50	0.960	-	100	
	645	31	64531	0.601	95.50	0.330	35.00	1	
38	645	8	6458	0.002	2.80	0.960	-	100	
	645	31	64531	0.056	97.20	0.330	35.00	1	
39	645	8	6458	0.002	1.30	0.960	-	100	
	645	31	64531	0.151	98.70	0.330	35.00	1	
40	645	8	6458	0.005	3.10	0.960	-	100	
	645	31	64531	0.116	76.40	0.330	35.00	1	
	645	91	64591	0.031	20.50	0.930	-	100	

* Non default value

(stSIDataGA.rpt)

City of Scottsdale
Drainage Design Management System
SOILS

Page 3

Project Reference: REATA WITH DIVERT

3/23/2016

Area ID	Book Number	Map Unit	Soil ID	Area (sq mi)	Area (%)	XKSAT	Rock Percent (%)	Effective Rock (%)	Comments
Major Basin ID: 01									
41	645	8	6458	0.055	15.70	0.960	-	100	
	645	31	64531	0.192	55.00	0.330	35.00	1	
	645	91	64591	0.103	29.40	0.930	-	100	
42	645	8	6458	0.054	17.10	0.960	-	100	
	645	31	64531	0.183	57.40	0.330	35.00	1	
	645	91	64591	0.081	25.50	0.930	-	100	
43	645	31	64531	0.044	31.30	0.330	35.00	1	
	645	91	64591	0.097	68.70	0.930	-	100	
44	645	8	6458	0.039	30.90	0.960	-	100	
	645	91	64591	0.087	69.10	0.930	-	100	
45	645	8	6458	0.013	8.00	0.960	-	100	
	645	91	64591	0.148	92.00	0.930	-	100	
46	645	8	6458	0.001	0.60	0.960	-	100	
	645	31	64531	0.151	86.30	0.330	35.00	1	
	645	91	64591	0.023	13.20	0.930	-	100	
47	645	8	6458	0.048	8.80	0.960	-	100	
	645	31	64531	0.500	91.20	0.330	35.00	1	
48	645	8	6458	0.080	5.10	0.960	-	100	
	645	31	64531	1.426	90.80	0.330	35.00	1	
	645	63	64563	0.064	4.10	0.140	25.00	1	
	645	91	64591	0.001	0.10	0.930	-	100	
49	645	8	6458	0.039	9.00	0.960	-	100	
	645	31	64531	0.139	32.00	0.330	35.00	1	
	645	91	64591	0.255	59.00	0.930	-	100	
50	645	91	64591	0.137	100.00	0.930	-	100	
51	645	31	64531	0.433	60.00	0.330	35.00	1	
	645	91	64591	0.288	40.00	0.930	-	100	
52	645	31	64531	0.598	100.00	0.330	35.00	1	
53	645	31	64531	0.437	62.40	0.330	35.00	1	
	645	91	64591	0.263	37.60	0.930	-	100	
54	645	8	6458	0.031	6.40	0.960	-	100	
	645	31	64531	0.332	67.90	0.330	35.00	1	
	645	91	64591	0.123	25.20	0.930	-	100	
	645	98	64598	0.003	0.50	0.370	-	100	
55	645	8	6458	0.003	0.80	0.960	-	100	
	645	31	64531	0.338	99.20	0.330	35.00	1	
56	645	8	6458	0.134	10.90	0.960	-	100	
	645	31	64531	1.085	88.50	0.330	35.00	1	
	645	98	64598	0.007	0.50	0.370	-	100	
57	645	91	64591	0.084	100.00	0.930	-	100	
58	645	8	6458	0.030	26.50	0.960	-	100	
	645	31	64531	0.002	1.40	0.330	35.00	1	
	645	40	64540	0.003	2.60	0.170	-	100	
	645	96	64596	0.066	58.70	0.070	-	100	
	645	121	645121	0.012	10.80	0.120	-	100	
	645	8	6458	0.032	58.20	0.960	-	100	
59	645	31	64531	0.001	0.90	0.330	35.00	1	
	645	96	64596	0.004	8.00	0.070	-	100	
	645	121	645121	0.018	32.90	0.120	-	100	
	645	8	6458	0.176	96.40	0.960	-	100	
60	645	31	64531	0.002	1.00	0.330	35.00	1	
	645	91	64591	0.000	0.20	0.930	-	100	
	645	121	645121	0.004	2.40	0.120	-	100	
	645	8	6458	0.006	4.90	0.960	-	100	
61	645	121	645121	0.110	95.10	0.120	-	100	
	645	8	6458	0.059	48.00	0.960	-	100	
62	645	8	6458	0.059	48.00	0.960	-	100	
	645	91	64591	0.010	8.40	0.930	-	100	

* Non default value

(stSIDataGA.rpt)

City of Scottsdale
 Drainage Design Management System
 SOILS

Page 4

Project Reference: REATA WITH DIVERT

3/23/2016

Area ID	Book Number	Map Unit	Soil ID	Area (sq mi)	Area (%)	XKSAT	Rock Percent (%)	Effective Rock (%)	Comments
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Major Basin ID: 01

62	645	121	645121	0.053	43.70	0.120	-	100	
63	645	8	6458	0.090	23.40	0.960	-	100	
	645	90	64590	0.018	4.60	0.390	-	100	
	645	91	64591	0.278	72.00	0.930	-	100	
64	645	3	6453	0.103	16.20	0.580	-	100	
	645	90	64590	0.208	32.70	0.390	-	100	
	645	91	64591	0.326	51.10	0.930	-	100	

City of Scottsdale
 Drainage Design Management System
RAINFALL DATA
 Project Reference: REATA WITH DIVERT

Page 1

3/23/2016

ID	Method	Duration	2 Yr	5 Yr	10 Yr	25 Yr	50 Yr	100 Yr
DEFAULT	NOAA14	5 MIN	0.300	0.404	0.482	0.585	0.663	0.741
	NOAA14	10 MIN	0.456	0.615	0.734	0.890	1.008	1.127
	NOAA14	15 MIN	0.566	0.762	0.910	1.104	1.250	1.397
	NOAA14	30 MIN	0.762	1.026	1.225	1.487	1.684	1.882
	NOAA14	1 HOUR	0.943	1.270	1.516	1.840	2.084	2.329
	NOAA14	2 HOUR	1.079	1.431	1.700	2.061	2.334	2.614
	NOAA14	3 HOUR	1.149	1.497	1.773	2.156	2.458	2.771
	NOAA14	6 HOUR	1.362	1.730	2.024	2.425	2.737	3.060
	NOAA14	12 HOUR	1.618	2.035	2.365	2.812	3.155	3.508
	NOAA14	24 HOUR	1.986	2.582	3.062	3.740	4.283	4.857

Project

Reference	REATA WITH DIVERT
Title	Reata Wash Flood Control Improvement Study
Location	Scottsdale
Agency	City of Scottsdale

Project Defaults

Model	HEC1
Soils Agency	FCDMC
Land Use Agency	FCDMC
Rainfall	NOAA14
Roads Agency	MCDOT
Inlets Agency	MCDOT

HEC-1 Defaults

Unit Hydrograph	S-Graph
Loss Method	Green-Ampt
Duration	24 Hour
Tabulation Interval	3
No. Ordinates	2000
Output	5

Comments

Appendix B HEC-1 Models

```
*****
* FLOOD HYDROGRAPH PACKAGE (HEC-1)
* JUN 1998
* VERSION 4.1
* RUN DATE 23FEB16 TIME 08:47:18
*****

*****
* U.S. ARMY CORPS OF ENGINEERS
* HYDROLOGIC ENGINEERING CENTER
* 609 SECOND STREET
* DAVIS, CALIFORNIA 95616
* (916) 756-1104
*****
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X X XXXXXX XXXX X
X X X X X XX
X X X X X
XXXXXXX XXXX X XXXX X
X X X X X
X X X X X
X X XXXXXX XXXX XXX
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THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE, SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

1 HEC-1 INPUT PAGE 1

```
LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
1 ID City of Scottsdale
2 ID REATA - Reata Wash Flood Control Improvement Study
3 ID 100 YEAR
4 ID 24 Hour Storm
5 ID Unit Hydrograph: S-Graph
6 ID Storm: Multiple
7 ID 02/23/2016
8 ID City of Scottsdale
9 ID REATA - Reata Wash Flood Control Improvement Study
10 ID 100 YEAR
11 ID 24 Hour Storm
12 ID Unit Hydrograph: S-Graph
13 ID Storm: Multiple
14 ID 03/10/2015
15 ID Flood Control District of Maricopa County
16 ID REATA -
17 ID 100 YEAR
18 ID 24 Hour Storm
19 ID Unit Hydrograph: S-Graph
20 ID Storm: Single
21 ID 02/13/2015
22 ID * CROSSROADS EAST HEC-1 MODEL (BASINS 1-33), OUTFALL REATA PASS
23 ID
24 ID * FILE NAME: 100-24NORTH.IH1 LAV (01/23/12)
25 ID
26 ID * 100-Year, 24-Hour Storm, S-Graph, NOAA 14 Rainfall.
27 ID * HC CARDS INCLUDE TOTAL CONTRIBUTING AREA TO EACH CONCENTRATION POINT
28 ID * EXISTING RETENTION PROVIDED BY ECHO RIDGE SUBDIVISION INCLUDED IN MODEL
29 ID AND TAKEN FROM TROON NORTH PARK DRAINAGE REPORT.
30 ID * FUTURE CONDITIONS DETENTION BASIN FOR TROON NORTH PARK. DRAINAGE
31 ID REPORT PREPARED BY ARGUS CONSULTING (APRIL 23, 2010). NEW PARK BASIN
32 ID AND EXISTING FCD BASIN MODELED TOGETHER AS STAGE-STORAGE-DISCHARGE.
33 ID * EXISTING SEDIMENT BASIN AT HAPPY VALLEY ROAD AND ALAMEDA ROAD MODELED
34 ID AS STAGE STORAGE DISCHARGE.
35 ID
36 ID *DIAGRAM
37 IT 3 1JAN99 0 2000
38 IO 5
IN 15
*
39 JD 4.857 0.0001
40 PC 0.000 0.002 0.005 0.008 0.011 0.014 0.017 0.020 0.023 0.026
41 PC 0.029 0.032 0.035 0.038 0.041 0.044 0.048 0.052 0.056 0.060
42 PC 0.064 0.068 0.072 0.076 0.080 0.085 0.090 0.095 0.100 0.105
43 PC 0.110 0.115 0.120 0.126 0.133 0.140 0.147 0.155 0.163 0.172
44 PC 0.181 0.191 0.203 0.218 0.236 0.257 0.283 0.387 0.663 0.707
45 PC 0.735 0.758 0.776 0.791 0.804 0.815 0.825 0.834 0.842 0.849
46 PC 0.856 0.863 0.869 0.875 0.881 0.887 0.893 0.898 0.903 0.908
47 PC 0.913 0.918 0.922 0.926 0.930 0.934 0.938 0.942 0.946 0.950
48 PC 0.953 0.956 0.959 0.962 0.965 0.968 0.971 0.974 0.977 0.980
49 PC 0.983 0.986 0.989 0.992 0.995 0.998 1.000
50 JD 4.833 1.0
51 JD 4.736 5.0
52 JD 4.614 10.0
53 JD 4.459 20.0
*
*
* 24-Hour Storm (S-Graph)
*
*
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1

HEC-1 INPUT

PAGE 2

[illegible]

1

HEC-1 INPUT

PAGE 3

[illegible]

```

111 UI      0      0      0      0      0      0      0      0      0      0
112 UI      0      0      0      0      0      0      0      0      0      0
*
*
*
113 KK      RET5 STORAGE
114 KM      LOCAL RETENTION IN SUBBASIN SUB5. (LP016)
115 KM      SV,SE & SQ DERIVED FROM INFORMATION PROVIDED WITHIN TROON NORTH PARK
116 KM      DRAINAGE REPORT PREPARED BY ARGUS CONSULTING (4/23/10).
117 KO
118 RS      1      STOR
    
```

HEC-1 INPUT

PAGE 4

LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

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119 SV      0.44      1.48      1.48
120 SQ      185.00 1000.00
121 SE 1000.0 1001.00 1002.00 1002.10
*
*
*
122 KK      CP5 COMBINE
123 KM      CP LOCATED AT CULVERT UNDER ALMA SCHOOL ROAD, 1400 FEET NORTHEAST OF
124 KM      PINNACLE VISTA DRIVE. DISCHARGES TO TROON NORTH PARK.
125 KM      Combines RT2 and SUB5
126 HC      2
*
*
*
127 KK      RT5 ROUTE
128 KM      ROUTE FLOW FROM CP5 TO CP6
129 RS      1      FLOW
130 RC      0.045 0.035 0.045 1481 0.0187 0.00
131 RX      0.00 10.00 20.00 28.00 52.00 64.00 88.00 96.00
132 RY 2616.0 2614.00 2612.00 2610.00 2610.00 2612.00 2612.00 2614.00
*
*
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133 KK      04 BASIN
134 KM      CP LOCATED ALONG DYNAMITE ROAD, 410 FEET EAST OF 114TH STREET.
135 BA      0.124
136 LG      0.29 0.25 6.00 0.20 13
137 UI      0 94 339 454 260 169 109 65 43 26
138 UI      15 10 10 0 0 0 0 0 0 0
139 UI      0 0 0 0 0 0 0 0 0 0
140 UI      0 0 0 0 0 0 0 0 0 0
141 UI      0 0 0 0 0 0 0 0 0 0
*
*
*
    
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142 KK      RET4 STORAGE
143 KM      LOCAL RETENTION IN SUBBASIN SUB4. (LP026, LP028, LP030 & LPC029)
144 KM      SV,SE & SQ DERIVED FROM INFORMATION PROVIDED WITHIN TROON NORTH PARK
145 KM      DRAINAGE REPORT PREPARED BY ARGUS CONSULTING (4/23/10).
146 KO
147 RS      1      STOR
148 SV      0.21 0.52 0.93 1.25 1.39 1.51 1.51
149 SQ      13.00 20.00 26.00 31.00 35.00 38.00 1000.00
150 SE 1000.0 1001.00 1002.00 1003.00 1004.00 1005.00 1006.00 1006.10
*
*
*
    
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HEC-1 INPUT

PAGE 5

LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

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151 KK      RT4 ROUTE
152 KM      ROUTE FLOW FROM SUB4 TO CP7
153 RS      2      FLOW
154 RC      0.055 0.040 0.055 2467 0.0235 0.00
155 RX      0.00 2.00 16.00 28.00 65.00 80.00 99.00 114.00
156 RY 2672.0 2670.00 2668.00 2666.00 2666.00 2668.00 2668.50 2669.00
*
*
*
157 KK      09 BASIN
158 BA      0.114
159 LG      0.30 0.25 6.00 0.19 6
160 UI      0 51 193 340 274 185 134 90 64 44
161 UI      31 20 16 7 7 7 7 0 0 0
162 UI      0 0 0 0 0 0 0 0 0 0
163 UI      0 0 0 0 0 0 0 0 0 0
164 UI      0 0 0 0 0 0 0 0 0 0
*
*
*
    
```



```

165 KK      07  BASIN
166 BA      0.124
167 LG      0.26  0.25  6.00  0.21  32
168 UI      0    55  210  370  298  202  146  98  70  47
169 UI      33  22  18  8  8  8  8  8  0  0
170 UI      0    0  0  0  0  0  0  0  0  0
171 UI      0    0  0  0  0  0  0  0  0  0
172 UI      0    0  0  0  0  0  0  0  0  0
    *
    *
    *
    
```

```

173 KK      RET7 STORAGE
174 KM      LOCAL RETENTION IN SUBBASIN SUB7. (LPC032)
175 KM      SV,SE & SQ DERIVED FROM INFORMATION PROVIDED WITHIN TROON NORTH PARK
176 KM      DRAINAGE REPORT PREPARED BY ARGUS CONSULTING (4/23/10).
177 KO
178 RS      1  STOR
179 SV      0.04  0.14  0.34  0.34
180 SQ      11.00  22.00  46.00  63.00  100.00
181 SE      1000.0  1001.00  1002.00  1003.00  1004.00  1004.10
    *
    *
    *
    
```

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LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

```

182 KK      CP7 COMBINE
183 KM      DISCHARGES COMBINED FLOW INTO TROON NORTH PARK.
184 KM      Combines RT4, SUB9 & SUB7
185 HC      3
    *
    *
    *
    
```

```

186 KK      RT7 ROUTE
187 KM      ROUTE FLOW FROM CP7 TO CP6
188 RS      1  FLOW
189 RC      0.045  0.030  0.045  2096  0.0191  0.00
190 RX      0.00  3.00  5.00  8.00  27.00  30.00  32.00  34.00
191 RY      2630.0  2628.00  2626.00  2624.00  2624.00  2626.00  2628.00  2630.00
    *
    *
    *
    
```

```

192 KK      03  BASIN
193 KM      CP LOCATED ALONG DYNAMITE ROAD, 1600 FEET EAST OF ALMA SCHOOL ROAD.
194 BA      0.149
195 LG      0.27  0.25  6.00  0.21  19
196 UI      0    123  440  544  309  194  124  74  45  31
197 UI      12  12  12  0  0  0  0  0  0  0
198 UI      0    0  0  0  0  0  0  0  0  0
199 UI      0    0  0  0  0  0  0  0  0  0
200 UI      0    0  0  0  0  0  0  0  0  0
    *
    *
    *
    
```

```

201 KK      RET3 STORAGE
202 KM      LOCAL RETENTION IN SUBBASIN SUB3. (LP022 & LP023)
203 KM      SV,SE & SQ DERIVED FROM INFORMATION PROVIDED WITHIN TROON NORTH PARK
204 KM      DRAINAGE REPORT PREPARED BY ARGUS CONSULTING (4/23/10).
205 KO
206 RS      1  STOR
207 SV      0.02  0.18  0.59  1.23  1.27  1.36  1.36
208 SQ      15.00  48.00  80.00  97.00  113.00  127.00  100.00
209 SE      1000.0  1001.00  1002.00  1003.00  1004.00  1005.00  1006.00  1006.10
    *
    *
    *
    
```

```

210 KK      RT3 ROUTE
211 KM      ROUTE FLOW FROM SUB3 TO CP6
212 RS      2  FLOW
213 RC      0.050  0.035  0.050  3622  0.0228  0.00
214 RX      0.00  22.00  94.00  97.00  104.00  110.00  124.00  136.00
215 RY      2642.0  2640.00  2638.00  2636.00  2636.00  2638.00  2640.00  2642.00
    *
    *
    *
    
```

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LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

```

216 KK      RET6 STORAGE
217 KM      LOCAL RETENTION IN SUBBASIN SUB6. (LPC024)
218 KM      SV,SE & SQ DERIVED FROM INFORMATION PROVIDED WITHIN TROON NORTH PARK
219 KM      DRAINAGE REPORT PREPARED BY ARGUS CONSULTING (4/23/10).
220 KO
221 RS      1  STOR
    
```

```

222 SV      0.22  0.67  1.35  2.28  2.28
223 SQ      56.00 230.00 1000.00
224 SE 1000.0 1001.00 1002.00 1003.00 1004.00 1004.10
*
*
*

225 KK      06 BASIN
226 BA 0.180
227 LG 0.22  0.24  6.16  0.21  33
228 UI 0 85 324 573 413 289 203 140 94 67
229 UI 45 29 21 12 12 0 0 0 0 0
230 UI 0 0 0 0 0 0 0 0 0 0
231 UI 0 0 0 0 0 0 0 0 0 0
232 UI 0 0 0 0 0 0 0 0 0 0
*
*
*

233 KK CP6 COMBINE
234 KM Combines RT5, RT7, RT3 & SUB6
235 HC 4
*
*
*
*

236 KK RT6 ROUTE
237 KM ROUTE FLOW FROM CP6 TO CP10
238 RS 1 FLOW
239 RC 0.050 0.035 0.050 3706 0.0207 0.00
240 RX 0.00 19.00 82.00 107.00 117.00 144.00 160.00 181.00
241 RY 2560.0 2558.00 2558.00 2556.00 2556.00 2558.00 2560.00 2562.00
*
*
*

242 KK 11 BASIN
243 BA 0.174
244 LG 0.30 0.25 6.00 0.19 5
245 UI 0 81 307 543 405 281 198 136 93 66
246 UI 44 29 22 11 11 0 0 0 0 0
247 UI 0 0 0 0 0 0 0 0 0 0
*
*
*
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LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
248 UI 0 0 0 0 0 0 0 0 0 0
249 UI 0 0 0 0 0 0 0 0 0 0
*
*
*

250 KK RT11 ROUTE
251 KM ROUTE FLOW FROM SUB11 TO CP10
252 RS 2 FLOW
253 RC 0.045 0.030 0.045 5219 0.0245 0.00
254 RX 0.00 19.00 82.00 107.00 117.00 144.00 160.00 181.00
255 RY 2560.0 2558.00 2558.00 2556.00 2556.00 2558.00 2560.00 2562.00
*
*
*
*

256 KK 08 BASIN
257 KM CP LOCATED ALONG ALMA SCHOOL ROAD, 450 FEET NORTHEAST OF
258 KM PINNACLE VISTA DRIVE.
259 BA 0.134
260 LG 0.23 0.27 6.00 0.21 26
261 UI 0 65 246 434 303 214 149 104 68 48
262 UI 33 22 14 9 9 0 0 0 0 0
263 UI 0 0 0 0 0 0 0 0 0 0
264 UI 0 0 0 0 0 0 0 0 0 0
265 UI 0 0 0 0 0 0 0 0 0 0
*
*
*

266 KK RT8 ROUTE
267 KM ROUTE FLOW FROM SUB8 TO CP10
268 RS 1 FLOW
269 RC 0.050 0.035 0.050 3543 0.0233 0.00
270 RX 0.00 18.00 28.00 48.00 57.00 66.00 83.00 97.00
271 RY 2598.5 2598.00 2597.00 2596.00 2596.00 2598.00 2600.00 2602.00
*
*
*

272 KK 10 BASIN
273 BA 0.462
274 LG 0.25 0.26 5.85 0.22 26
275 UI 0 123 489 851 1246 796 617 480 343 272
276 UI 192 143 108 82 59 48 23 23 23 23
    
```

```

277      UI      0      0      0      0      0      0      0      0      0      0
278      UI      0      0      0      0      0      0      0      0      0      0
279      UI      0      0      0      0      0      0      0      0      0      0
*
*
*
    
```

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LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

```

280      KK      CP10 COMBINE
281      KM      CP LOCATED ALONG JOMAX ROAD 670 FEET EAST OF ALMA SCHOOL ROAD.
282      KM      Combines RT6, RT8, RT11 & SUB10
283      HC      4
*
*
*
    
```

```

284      KK      RT10 ROUTE
285      KM      ROUTE FLOW FROM CP10 TO CP13
286      RS      1 FLOW
287      RC      0.045 0.030 0.045 2556 0.0248 0.00
288      RX      0.00 13.00 28.00 48.00 57.00 66.00 83.00 97.00
289      RY      2490.0 2488.00 2486.00 2484.00 2484.00 2486.00 2488.00 2490.00
*
*
*
    
```

```

290      KK      14 BASIN
291      BA      0.154
292      LG      0.26 0.29 5.85 0.20 15
293      UI      0 61 231 396 407 254 190 130 97 65
294      UI      47 34 23 17 9 9 9 0 0 0
295      UI      0 0 0 0 0 0 0 0 0 0
296      UI      0 0 0 0 0 0 0 0 0 0
297      UI      0 0 0 0 0 0 0 0 0 0
*
*
*
    
```

```

298      KK      12 BASIN
299      BA      0.303
300      LG      0.27 0.26 6.00 0.21 16
301      UI      0 72 251 477 685 612 411 332 259 189
302      UI      157 109 85 66 53 35 35 15 14 14
303      UI      14 14 0 0 0 0 0 0 0 0
304      UI      0 0 0 0 0 0 0 0 0 0
305      UI      0 0 0 0 0 0 0 0 0 0
*
*
*
    
```

```

306      KK      CP12 COMBINE
307      HC      2
*
*
*
    
```

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LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

```

308      KK      RT12A ROUTE
309      KM      ROUTE FLOW FROM CP12 TO CP13
310      RS      1 FLOW
311      RC      0.050 0.035 0.050 2242 0.0395 0.00
312      RX      0.00 10.00 19.00 37.00 62.00 69.00 83.00 97.00
313      RY      2538.0 2536.00 2534.00 2530.00 2530.00 2532.00 2534.00 2536.00
*
*
*
    
```

```

314      KK      RT12B ROUTE
315      KM      ROUTE FLOW FROM CP12 TO CP13
316      RS      1 FLOW
317      RC      0.045 0.030 0.045 2457 0.0241 0.00
318      RX      0.00 13.00 28.00 48.00 57.00 66.00 83.00 97.00
319      RY      2490.0 2488.00 2486.00 2484.00 2484.00 2486.00 2488.00 2490.00
*
*
*
    
```

```

320      KK      13 BASIN
321      BA      0.259
322      LG      0.23 0.27 4.96 0.35 17
323      UI      0 59 192 377 523 561 354 289 231 171
324      UI      138 108 77 65 45 37 29 25 11 11
325      UI      11 11 11 0 0 0 0 0 0 0
326      UI      0 0 0 0 0 0 0 0 0 0
327      UI      0 0 0 0 0 0 0 0 0 0
*
*
*
    
```



```

*
*
328 KK CP13 COMBINE
329 KM CP LOCATED EAST OF ALMA SCHOOL ROAD IN NATURAL WASH ADJACENT TO
330 KM GOLF COURSE.
331 KM Combines RT10, RT12 & SUB13
332 HC 3
*
*
*
*
333 KK RT13 ROUTE
334 KM ROUTE FLOW FROM CP13 TO CP16
335 RS 1 FLOW
336 RC 0.045 0.030 0.045 3505 0.0273 0.00
337 RX 0.00 4.00 9.00 52.00 108.00 116.00 129.00 175.00
338 RY 2440.0 2438.00 2436.00 2434.00 2434.00 2436.00 2438.00 2440.00
*
*
*

```

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LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

```

339 KK 16 BASIN
340 BA 0.521
341 LG 0.23 0.30 6.00 0.20 15
342 UI 0 109 302 630 850 1172 737 595 493 397
343 UI 297 250 197 144 121 91 78 53 53 32
344 UI 21 21 21 21 21 0 0 0 0 0
345 UI 0 0 0 0 0 0 0 0 0 0
346 UI 0 0 0 0 0 0 0 0 0 0
*
*
*

```

```

347 KK CP16 COMBINE
348 KM CP LOCATED AT HAPPY VALLEY ROAD, 650 FEET EAST OF ALMA SCHOOL ROAD.
349 KM Combines RT13 & SUB16
350 HC 2
*
*
*

```

```

351 KK RT16 ROUTE
352 KM ROUTE FLOW FROM CP16 TO CP22
353 RS 3 FLOW
354 RC 0.050 0.035 0.050 6229 0.0295 0.00
355 RX 0.00 53.00 192.00 205.00 214.00 229.00 353.00 491.00
356 RY 2260.0 2258.00 2256.00 2254.00 2254.00 2256.00 2258.00 2260.00
*
*
*

```

```

357 KK 29 BASIN
358 KM CP LOCATED ALONG ALAMEDA ROAD AT 121ST PLACE.
359 BA 0.151
360 LG 0.30 0.26 6.00 0.18 5
361 UI 0 75 284 497 337 241 166 116 74 52
362 UI 36 25 14 10 10 10 0 0 0 0
363 UI 0 0 0 0 0 0 0 0 0 0
364 UI 0 0 0 0 0 0 0 0 0 0
365 UI 0 0 0 0 0 0 0 0 0 0
*
*
*

```

```

366 KK RT29 ROUTE
367 KM ROUTE FLOW FROM SUB29 TO CP21
368 RS 1 FLOW
369 RC 0.050 0.035 0.050 1372 0.0345 0.00
370 RX 0.00 2.00 41.00 48.00 56.00 58.00 75.00 101.00
371 RY 2688.0 2686.00 2684.00 2683.20 2683.20 2684.00 2686.00 2690.00
*
*
*

```

1

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PAGE 12

LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

```

372 KK 21 BASIN
373 BA 0.129
374 LG 0.30 0.25 6.00 0.19 6
375 UI 0 116 414 466 264 159 99 59 35 22
376 UI 11 11 0 0 0 0 0 0 0 0
377 UI 0 0 0 0 0 0 0 0 0 0
378 UI 0 0 0 0 0 0 0 0 0 0
379 UI 0 0 0 0 0 0 0 0 0 0
*
*
*

```

```

*
380 KK CP21 COMBINE
381 KM CP LOCATED ADJACENT TO PARKVIEW LANE, 650 FEET NORTH OF ALAMEDA ROAD.
382 KM Combines RT29 & SUB21
383 HC 2
*
*
*
384 KK RT21 ROUTE
385 KM ROUTE FLOW FROM SUB21 TO CP20
386 RS 1 FLOW
387 RC 0.045 0.030 0.045 2993 0.0349 0.00
388 RX 0.00 5.00 67.00 74.00 90.00 96.00 162.00 170.00
389 RY 2618.4 2618.00 2616.00 2614.00 2614.00 2616.00 2618.00 2620.00
*
*
*
390 KK 15 BASIN
391 KM CONCENTRATES IN NATURAL WASH ADJACENT TO HAPPY VALLEY ROAD, 2400 FEET
392 KM NORTHEAST OF ALAMEDA ROAD.
393 BA 0.700
394 LG 0.29 0.26 6.00 0.19 9
395 UI 0 172 632 1159 1722 1312 946 758 575 424
396 UI 342 240 193 138 107 84 65 33 33 33
397 UI 33 33 0 0 0 0 0 0 0 0
398 UI 0 0 0 0 0 0 0 0 0 0
399 UI 0 0 0 0 0 0 0 0 0 0
*
*
*
400 KK RT15 ROUTE
401 KM ROUTE FLOW FROM SUB15 TO CP20
402 RS 1 FLOW
403 RC 0.045 0.030 0.045 2462 0.0285 0.00
404 RX 0.00 4.00 8.00 12.00 57.00 65.00 69.00 117.00
405 RY 2600.0 2598.00 2596.00 2594.00 2594.00 2596.00 2598.00 2600.00
*
*
*
1 HEC-1 INPUT PAGE 13
LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
406 KK 18 BASIN
407 KM CONCENTRATES AT HAPPY VALLEY ROAD, ACROSS FROM THE ALAMEDA BASIN.
408 BA 0.141
409 LG 0.25 0.30 6.00 0.19 20
410 UI 0 51 196 333 385 233 179 125 94 63
411 UI 48 33 23 20 8 8 8 8 0 0
412 UI 0 0 0 0 0 0 0 0 0 0
413 UI 0 0 0 0 0 0 0 0 0 0
414 UI 0 0 0 0 0 0 0 0 0 0
*
*
*
415 KK 20 BASIN
416 BA 0.264
417 LG 0.27 0.29 5.46 0.23 16
418 UI 0 111 420 729 672 433 318 215 160 103
419 UI 76 53 41 21 16 16 16 0 0 0
420 UI 0 0 0 0 0 0 0 0 0 0
421 UI 0 0 0 0 0 0 0 0 0 0
422 UI 0 0 0 0 0 0 0 0 0 0
*
*
*
423 KK CP20 COMBINE
424 KM CP AT ALAMEDA BASIN, HAPPY VALLEY ROAD AND ALAMEDA ROAD.
425 KM Combines RT21, RT15, SUB18 & SUB20
426 HC 4
*
*
*
427 KK DET20 STORAGE
428 KM EXISTING DETENTION BASIN AT ALAMEDA & HAPPY VALLEY ROAD (2-10'X3' CBCs)
429 KM VOLUME DETERMINED FROM CONTOURS. DISCHARGE DETERMINED FROM
430 KM CULVERT AND WEIR CALCULATIONS. REFERENCE - EEC REPORT (MARCH 1998)
431 KO
432 RS 1 STOR
433 SV 0.64 3.20 7.14 7.14
434 SQ 220.00 443.00 664.00 886.00 1000.00
435 SE 2552.0 2554.00 2556.00 2558.00 2560.00 2560.10
*
*
*

```

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HEC-1 INPUT

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```

LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
466 KK      CP28 COMBINE
467 KM      CP IN NATURAL WASH ADJACENT TO ALAMEDA ROAD, 2300 FEET EAST OF HAPPY
468 KM      VALLEY ROAD.
469 KM      Combines RT33, SUB27 & SUB28
470 HC      3
    *
    *
    *
    *

471 KK      RT28 ROUTE
472 KM      ROUTE FLOW FROM CP28 TO CP26
473 RS      1 FLOW
474 RC      0.045 0.030 0.045 2234 0.0368 0.00
475 RX      0.00 11.00 27.00 49.00 81.00 98.00 188.00 197.00
476 RY      2580.0 2578.00 2576.00 2574.00 2574.00 2576.00 2576.00 2578.00
    *
    *
    *
    *

477 KK      26 BASIN
478 BA      0.063
479 LG      0.27 0.32 5.24 0.24 12
480 UI      0 38 140 223 136 96 61 42 27 18
481 UI      11 7 4 4 4 0 0 0 0 0
482 UI      0 0 0 0 0 0 0 0 0 0
483 UI      0 0 0 0 0 0 0 0 0 0
484 UI      0 0 0 0 0 0 0 0 0 0
    *
    *
    *
    *

485 KK      CP26 COMBINE
486 KM      CP LOCATED AT HAPPY VALLEY ROAD AND ALAMEDA ROAD, AT OUTLET OF ALAMEDA
487 KM      BASIN.
488 KM      Combines DET20, RT28 & SUB26
489 HC      3
    *
    *
    *
    *

```



```

*
490 KK RT26 ROUTE
491 KM ROUTE FLOW FROM CP26 TO CP19
492 RS 1 FLOW
493 RC 0.050 0.035 0.050 1139 0.0308 0.00
494 RX 0.00 25.00 40.00 54.00 90.00 102.00 130.00 165.00
495 RY 2545.0 2544.00 2542.00 2540.00 2540.00 2542.00 2544.00 2550.00
*
*
*
*
    
```

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LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

```

496 KK 19 BASIN
497 BA 0.151
498 LG 0.25 0.30 5.85 0.20 19
499 UI 0 98 359 544 322 224 142 93 61 39
500 UI 28 12 11 11 0 0 0 0 0 0
501 UI 0 0 0 0 0 0 0 0 0 0
502 UI 0 0 0 0 0 0 0 0 0 0
503 UI 0 0 0 0 0 0 0 0 0 0
*
*
*
*
    
```

```

504 KK CP19 COMBINE
505 KM CP LOCATED ALONG HAPPY VALLEY ROAD, 1100 FEET WEST OF ALAMEDA ROAD.
506 KM Combines RT26 & SUB19
507 HC 2
*
*
*
*
    
```

```

508 KK RT19 ROUTE
509 KM ROUTE FLOW FROM CP19 TO CP25
510 RS 1 FLOW
511 RC 0.055 0.035 0.055 3337 0.0347 0.00
512 RX 0.00 13.00 31.00 46.00 82.00 100.00 123.00 155.00
513 RY 2508.0 2504.00 2498.00 2496.00 2496.00 2500.00 2504.00 2508.00
*
*
*
*
    
```

```

514 KK 32 BASIN
515 BA 0.441
516 LG 0.24 0.33 4.65 0.30 6
517 UI 0 108 390 721 1067 839 596 479 367 267
518 UI 219 153 122 89 70 53 44 21 21 21
519 UI 21 21 0 0 0 0 0 0 0 0
520 UI 0 0 0 0 0 0 0 0 0 0
521 UI 0 0 0 0 0 0 0 0 0 0
*
*
*
*
    
```

```

522 KK RT32 ROUTE
523 KM ROUTE FLOW FROM SUB32 TO CP31
524 RS 1 FLOW
525 RC 0.055 0.040 0.055 5296 0.0517 0.00
526 RX 0.00 25.00 69.00 77.00 89.00 94.00 112.00 127.00
527 RY 2460.0 2444.00 2442.00 2438.00 2438.00 2440.00 2450.00 2460.00
*
*
*
*
    
```

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LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

```

528 KK 31 BASIN
529 BA 0.496
530 LG 0.26 0.32 4.33 0.37 6
531 UI 0 101 265 561 762 1091 726 569 475 389
532 UI 298 241 201 147 119 99 77 58 49 47
533 UI 19 19 19 19 19 19 0 0 0 0
534 UI 0 0 0 0 0 0 0 0 0 0
535 UI 0 0 0 0 0 0 0 0 0 0
*
*
*
*
    
```

```

536 KK CP31 COMBINE
537 KM Combines RT32 & SUB31
538 HC 2
*
*
*
*
    
```

```

539 KK RT31 ROUTE
540 KM ROUTE FLOW FROM CP31 TO CP25
    
```

```

541 RS      1      FLOW
542 RC 0.055 0.035 0.055 599 0.0256 0.00
543 RX 0.00 12.00 22.00 45.00 110.00 147.00 206.00 252.00
544 RY 2420.0 2414.00 2410.00 2408.00 2408.00 2410.00 2414.00 2420.00
*
*
*

545 KK      25      BASIN
546 BA 0.274
547 LG 0.25 0.31 5.05 0.27 14
548 UI 0 57 159 331 447 617 388 313 259 209
549 UI 156 131 104 76 64 48 41 28 28 17
550 UI 11 11 11 11 11 0 0 0 0 0
551 UI 0 0 0 0 0 0 0 0 0 0
552 UI 0 0 0 0 0 0 0 0 0 0
*
*
*

553 KK      CP25 COMBINE
554 KM CP IN NATURAL WASH AT BASE OF MOUNTAINS, LOCATED 1230 FEET WEST OF 112TH
555 KM PLACE AND ABOUT 1600 FEET SOUTH OF HAPPY VALLEY ROAD.
556 KM Combines RT19, RT31 & SUB25
557 HC      3
*
*
*
    
```

1 HEC-1 INPUT PAGE 18

LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

```

558 KK      RT25      ROUTE
559 KM ROUTE FLOW FROM CP25 TO CP24
560 RS      2      FLOW
561 RC 0.050 0.030 0.050 6726 0.0267 0.00
562 RX 0.00 74.00 105.00 368.00 415.00 422.00 428.00 520.00
563 RY 2330.0 2308.00 2306.00 2304.00 2304.00 2306.00 2308.00 2340.00
*
*
*

564 KK      24      BASIN
565 BA 0.380
566 LG 0.27 0.29 4.87 0.32 15
567 UI 0 70 158 351 494 654 691 443 375 316
568 UI 263 203 168 145 108 87 77 56 52 34
569 UI 34 29 13 13 13 13 13 13 13 0
570 UI 0 0 0 0 0 0 0 0 0 0
571 UI 0 0 0 0 0 0 0 0 0 0
*
*
*

572 KK      CP24 COMBINE
573 KM CP LOCATED AT CONFLUENCE OF MULTIPLE WASHES APPROXIMATELY 1500 FEET
574 KM UPSTREAM OF PINNACLE PEAK ROAD BRIDGE (REATA PASS WASH).
575 KM Combines RT25 & SUB24
576 HC      2
*
*
*
    
```

1 HEC-1 INPUT PAGE 19

LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

```

587 KK      RT17      ROUTE
588 KM ROUTE FLOW FROM SUB17 TO CP23
589 RS      2      FLOW
590 RC 0.050 0.040 0.050 5785 0.0365 0.00
591 RX 0.00 4.00 22.00 43.00 50.00 64.00 80.00 93.00
592 RY 2350.0 2346.00 2342.00 2339.00 2339.00 2342.00 2346.00 2350.00
*
*
*

593 KK      23      BASIN
    
```

594	BA	0.279								
595	LG	0.24	0.16	7.27	0.12	16				
596	UI	0	66	222	429	607	579	379	308	242
597	UI	146	106	80	64	50	33	32	18	13
598	UI	13	13	13	0	0	0	0	0	0
599	UI	0	0	0	0	0	0	0	0	0
600	UI	0	0	0	0	0	0	0	0	0

*
*
*
*

601	KK	CP23 COMBINE
602	KM	CP LOCATED AT CONFLUENCE OF MULTIPLE WASHES APPROXIMATELY 1500 FEET
603	KM	UPSTREAM OF PINNACLE PEAK ROAD BRIDGE (REATA PASS WASH).
604	KM	Combines RT17 & SUB23
605	HC	2

*
*
*
*

606	KK	CP24A COMBINE
607	KM	Combines CP23 & CP24
608	HC	2

*
*
*
*

609	KK	RT24A ROUTE
610	KM	ROUTE FLOW FROM CP24A TO CP22
611	RS	1 FLOW
612	RC	0.050 0.030 0.050 1545 0.0306 0.00
613	RX	0.00 99.00 276.00 292.00 321.00 337.00 650.00 816.00
614	RY	2224.0 2202.00 2200.50 2199.80 2200.00 2201.00 2202.00 2212.00

*
*
*
*

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LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

615	KK	30 BASIN
616	KM	CONCENTRATES FLOW ADJACENT TO MOUNTAIN. DISCHARGES TO REATA PASS WASH
617	KM	JUST UPSTREAM OF PINNACLE PEAK ROAD BRIDGE.
618	BA	0.392
619	LG	0.26 0.32 4.72 0.29 2
620	UI	0 64 115 269 408 500 698 534 393 341
621	UI	294 251 203 163 146 121 94 79 70 53
622	UI	49 36 31 31 22 12 12 12 12 12
623	UI	12 12 0 0 0 0 0 0 0 0
624	UI	0 0 0 0 0 0 0 0 0 0

*
*
*
*

625	KK	22 BASIN
626	BA	0.222
627	LG	0.29 0.27 5.71 0.21 8
628	UI	0 43 103 224 309 430 371 256 217 181
629	UI	146 111 97 77 57 49 39 33 23 21
630	UI	20 8 8 8 8 8 8 0 0 0
631	UI	0 0 0 0 0 0 0 0 0 0
632	UI	0 0 0 0 0 0 0 0 0 0

*
*
*
*

633	KK	CP22 COMBINE
634	KM	CP AT PINNACLE PEAK WASH BRIDGE JUST UPSTREAM OF REATA PASS WASH APEX.
635	KM	Combines RT16, RT24A, SUB30 & SUB22
636	HC	4

*
*
*
*

637	KK	RT22A ROUTE
638	KM	
639	RS	1 FLOW
640	RC	0.055 0.040 0.055 1543 0.0246 0.00
641	RX	0.00 10.00 40.00 90.00 150.00 400.00 1000.00 1020.00
642	RY	2122.0 2122.00 2122.00 2107.00 2114.00 2121.00 2121.00 2124.00

*
*
*
*

643	KK	D22A DIVERT
644	KM	
645	DT	D22A 0.0 2000.0
646	DI	0.0 500.0 1000.0 2000.0 4000.0 8000.0 16000.0 0.0 0.0 0.0
647	DQ	0.0 96.0 192.0 384.0 768.0 1537.0 3200.0 0.0 0.0 0.0

*
*
*
*

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[illegible]

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[illegible]

699 KK RT34 ROUTE

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半

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714	UI	0	0	0	0	0	0	0	0	0
-----	----	---	---	---	---	---	---	---	---	---

*
*
*

[illegible]

725	KK	CP59 COMBINE
726	KM	
727	HC	4

— — — — —

728	KK	RT59A	ROUTE						
729	KM								
730	RS	1	FLOW						
731	RC	0.055	0.040	0.055	1049	0.0454	0.00		
732	RX	20.00	70.00	110.00	160.00	220.00	380.00	500.00	540.00
733	RY	1970.0	1965.00	1964.00	1961.00	1961.00	1966.00	1968.00	1969.00

734	KK	39	BASIN						
735	KM	WESTERN BOUNDARY - UPSTREAM OF TOMPSON PEAK PARKWAY. DISCHARGE TO							
736	KM	REATA PASS WASH.							
737	BA	0.153							
738	LG	0.23	0.31	4.28	0.41	2			
739	UI	0	138	491	553	313	189	117	70
740	UI	13	13	0	0	0	0	0	0
741	UI	0	0	0	0	0	0	0	0
742	UI	0	0	0	0	0	0	0	0
743	UI	0	0	0	0	0	0	0	0

*
 *
 *
 *

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LINE	ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
------	---

744	KK	CP59A COMBINE
745	KM	
746	HC	2

747	KK	RT59B	ROUTE						
748	KM								
749	RS	2	FLOW						
750	RC	0.055	0.040	0.055	4061	0.0267	0.00		
751	RX	150.00	180.00	205.00	250.00	490.00	510.00	560.00	600.00
752	RY	1924.0	1921.00	1918.00	1904.00	1904.00	1910.00	1913.00	1915.00

✱
✱
✱
✱

```

753 KK      40 BASIN
754 KM WESTERN BOUNDARY - UPSTREAM OF TOMPSON PEAK PARKWAY. DISCHARGE TO
755 KM REATA PASS WASH.
756 BA 0.152
757 LG 0.28 0.27 3.90 0.52 13
758 UI 0 112 405 557 320 211 135 82 54 33
759 UI 20 12 12 0 0 0 0 0 0 0
760 UI 0 0 0 0 0 0 0 0 0 0
761 UI 0 0 0 0 0 0 0 0 0 0
762 UI 0 0 0 0 0 0 0 0 0 0
*
*
*

763 KK      60 BASIN
764 KM
765 KM
766 BA 0.182
767 LG 0.27 0.31 2.79 1.24 15
768 UI 0 61 234 399 504 304 235 170 124 91
769 UI 63 47 34 25 17 10 10 10 10 0
770 UI 0 0 0 0 0 0 0 0 0 0
771 UI 0 0 0 0 0 0 0 0 0 0
772 UI 0 0 0 0 0 0 0 0 0 0
*
*
*
    
```

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LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

```

773 KK CP60 COMBINE
774 KM
775 HC 3
*
*
*

776 KK RT60 ROUTE
777 KM
778 RS 1 FLOW
779 RC 0.055 0.040 0.055 2351 0.0243 0.00
780 RX 200.00 250.00 260.00 360.00 520.00 620.00 830.00 880.00
781 RY 1835.0 1833.00 1830.00 1825.00 1825.00 1830.00 1830.00 1835.00
*
*
*

782 KK 47 BASIN
783 BA 0.547
784 LG 0.27 0.30 4.17 0.39 3
785 UI 0 93 177 417 612 758 1044 675 545 470
786 UI 402 336 263 222 199 150 119 104 86 71
787 UI 58 46 46 34 18 18 18 18 18 18
788 UI 18 0 0 0 0 0 0 0 0 0
789 UI 0 0 0 0 0 0 0 0 0 0
*
*
*

790 KK 46 BASIN
791 BA 0.175
792 LG 0.28 0.28 4.08 0.45 4
793 UI 0 111 407 627 374 262 167 110 72 46
794 UI 32 16 13 13 0 0 0 0 0 0
795 UI 0 0 0 0 0 0 0 0 0 0
796 UI 0 0 0 0 0 0 0 0 0 0
797 UI 0 0 0 0 0 0 0 0 0 0
*
*
*

798 KK CP46 COMBINE
799 KM Combines SUB47 and SUB46
800 HC 2
*
*
*
    
```

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LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

```

801 KK RT46 ROUTE
802 KM ROUTE FLOW FROM CP46 TO CP42
803 RS 1 FLOW
804 RC 0.050 0.035 0.050 2771 0.0424 0.00
805 RX 0.00 7.00 49.00 60.00 62.00 75.00 83.00 147.00
806 RY 2060.0 2057.00 2055.00 2052.00 2052.00 2055.00 2057.00 2058.00
*
*
*
    
```



```

807 KK      37  BASIN
808 BA 0.629
809 LG 0.23 0.33 4.22 0.35 1
810 UI 0 199 766 1307 1745 1055 820 614 432 335
811 UI 226 174 129 86 75 34 34 34 34 0
812 UI 0 0 0 0 0 0 0 0 0 0
813 UI 0 0 0 0 0 0 0 0 0 0
814 UI 0 0 0 0 0 0 0 0 0 0
      *
      *
      *
    
```

```

815 KK      RT37  ROUTE
816 KM      ROUTE FLOW FROM SUB37 TO CP42
817 RS      2  FLOW
818 RC 0.050 0.040 0.050 4195 0.0340 0.00
819 RX 0.00 33.00 37.00 42.00 49.00 65.00 169.00 205.00
820 RY 2063.0 2045.00 2044.00 2042.00 2041.00 2045.00 2047.00 2064.00
      *
      *
      *
    
```

```

821 KK      44  BASIN
822 BA 0.126
823 LG 0.29 0.29 2.74 1.18 5
824 UI 0 78 286 449 270 191 122 82 54 34
825 UI 23 13 9 9 0 0 0 0 0 0
826 UI 0 0 0 0 0 0 0 0 0 0
827 UI 0 0 0 0 0 0 0 0 0 0
828 UI 0 0 0 0 0 0 0 0 0 0
      *
      *
      *
    
```

```

829 KK      42  BASIN
830 BA 0.318
831 LG 0.28 0.29 3.56 0.60 4
832 UI 0 87 343 594 863 545 424 328 233 187
833 UI 128 98 73 55 41 31 16 16 16 16
834 UI 0 0 0 0 0 0 0 0 0 0
    
```

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```

LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
835 UI 0 0 0 0 0 0 0 0 0 0
836 UI 0 0 0 0 0 0 0 0 0 0
      *
      *
      *
    
```

```

837 KK      CP42 COMBINE
838 KM      Combines SUB44, RT37, RT46 and SUB42
839 HC      4
      *
      *
      *
    
```

```

840 KK      RT42  ROUTE
841 KM      ROUTE FLOW FROM CP42 TO CP41
842 RS      1  FLOW
843 RC 0.050 0.035 0.050 4042 0.0304 0.00
844 RX 0.00 15.00 29.00 41.00 60.00 73.00 81.00 87.00
845 RY 1945.0 1944.00 1943.00 1940.00 1940.00 1943.00 1944.00 1945.00
      *
      *
      *
    
```

```

846 KK      45  BASIN
847 BA 0.161
848 LG 0.21 0.29 2.75 1.42 5
849 UI 0 56 215 366 444 267 206 147 108 76
850 UI 55 40 28 23 12 9 9 9 0 0
851 UI 0 0 0 0 0 0 0 0 0 0
852 UI 0 0 0 0 0 0 0 0 0 0
853 UI 0 0 0 0 0 0 0 0 0 0
      *
      *
      *
    
```

```

854 KK      48  BASIN
855 BA 1.570
856 LG 0.23 0.35 4.28 0.37 0
857 UI 0 192 192 536 852 1179 1389 1620 2178 1719
858 UI 1267 1118 1003 908 798 706 601 495 457 420
859 UI 358 300 245 225 210 171 147 147 101 94
860 UI 94 94 63 37 37 37 37 37 37 37
861 UI 37 37 37 0 0 0 0 0 0 0
      *
      *
      *
    
```

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```

LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

862      KK      RT48A  ROUTE
863      KM
864      RS      1      FLOW
865      RC      0.055  0.040  0.055  2994  0.0470  0.00
866      RX      0.00  73.00  78.00  82.00  91.00  114.00  125.00  133.00
867      RY      1972.0 1970.00 1967.00 1962.00 1961.00 1965.00 1971.00 1972.00
      *
      *
      *

868      KK      D48A  DIVERT
869      KM
870      DT      DT48A  0.0      0.0
871      DI      0.0  1000.0  2000.0  3000.0  4083.0  4500.0  5000.0  0.0  0.0
872      DQ      0.0  1000.0  1880.0  2530.0  2870.0  3373.0  3440.0  3600.0  0.0  0.0
      *
      *
      *

873      KK      RTD48A ROUTE
874      KM
875      RS      1      FLOW
876      RC      0.055  0.040  0.055  1977  0.0415  0.00
877      RX      0.00  73.00  78.00  82.00  91.00  114.00  125.00  133.00
878      RY      1972.0 1970.00 1967.00 1962.00 1961.00 1965.00 1971.00 1972.00
      *
      *
      *

879      KK      CP45 COMBINE
880      KM      WESTERN BOUNDARY - THOMPSON PEAK PARKWAY. DISCHARGE TO EXISTING NATURAL
881      KM      WASH 600 FEET NORTH OF WINDGATE PASS DRIVE.
882      KM      Combines SUB45, and D48A
883      HC      2      0.25
      *
      *
      *

884      KK      RT45  ROUTE
885      KM      ROUTE FLOW FROM SUB45 TO CP41
886      RS      2      FLOW
887      RC      0.050  0.035  0.050  2935  0.0331  0.00
888      RX      0.00  10.00  39.00  49.00  50.00  53.00  60.00  65.00
889      RY      1924.0 1920.00 1919.00 1918.00 1918.00 1920.00 1923.00 1924.00
      *
      *
      *
    
```

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```

LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

890      KK      41  BASIN
891      BA      0.349
892      LG      0.25  0.27  3.53  0.71  12
893      UI      0      120  458  779  964  580  448  323  236  170
894      UI      119  88  63  49  29  19  19  19  19  0
895      UI      0      0      0      0      0      0      0      0      0
896      UI      0      0      0      0      0      0      0      0      0
897      UI      0      0      0      0      0      0      0      0      0
      *
      *
      *

898      KK      CP41 COMBINE
899      KM      WESTERN BOUNDARY - THOMPSON PEAK PARKWAY. DISCHARGE TO EXISTING NATURAL
900      KM      WASH 600 FEET NORTH OF WINDGATE PASS DRIVE.
901      KM      Combines RT45, RT42 and SUB41
902      HC      3
      *
      *
      *

903      KK      RT41  ROUTE
904      KM
905      RS      1      FLOW
906      RC      0.050  0.035  0.050  2454  0.0252  0.00
907      RX      200.00 260.00 330.00 380.00 450.00 455.00 470.00 480.00
908      RY      1829.0 1827.00 1826.00 1823.00 1823.00 1825.00 1825.00 1826.00
      *
      *
      *

909      KK      61  BASIN
910      BA      0.116
911      LG      0.23  0.21  6.34  0.20  26
912      UI      0      53  200  354  274  188  134  91  64  44
913      UI      30  20  16  7  7  7  0  0  0  0
914      UI      0      0      0      0      0      0      0      0      0
915      UI      0      0      0      0      0      0      0      0      0
916      UI      0      0      0      0      0      0      0      0      0
    
```

```

*
*
*
*
917 KK RT61 ROUTE
918 KM
919 RS 1 FLOW
920 RC 0.050 0.035 0.050 2458 0.0318 0.00
921 RX 240.00 270.00 300.00 310.00 325.00 335.00 380.00 390.00
922 RY 1793.0 1791.00 1791.00 1789.00 1789.00 1790.00 1790.00 1791.00
*
*
*

```

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LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

```

923 KK 62 BASIN
924 BA 0.122
925 LG 0.31 0.31 4.03 0.47 12
926 UI 0 184 587 365 205 111 60 32 13 13
927 UI 0 0 0 0 0 0 0 0 0 0
928 UI 0 0 0 0 0 0 0 0 0 0
929 UI 0 0 0 0 0 0 0 0 0 0
930 UI 0 0 0 0 0 0 0 0 0 0
*
*
*

```

```

931 KK CP62 COMBINE
932 KM
933 KM
934 KM
935 HC 4
*
*
*

```

```

936 KK RT62 ROUTE
937 KM
938 RS 1 FLOW
939 RC 0.050 0.035 0.050 4669 0.0240 0.00
940 RX 400.00 420.00 430.00 540.00 950.00 970.00 990.00 1000.00
941 RY 1727.0 1725.00 1723.00 1720.00 1722.00 1726.00 1726.00 1727.00
*
*
*

```

```

942 KK 63 BASIN
943 BA 0.386
944 LG 0.26 0.31 2.79 1.24 30
945 UI 0 90 297 577 808 820 525 428 341 248
946 UI 204 155 111 93 69 50 44 31 17 17
947 UI 17 17 17 0 0 0 0 0 0 0
948 UI 0 0 0 0 0 0 0 0 0 0
949 UI 0 0 0 0 0 0 0 0 0 0
*
*
*

```

```

950 KK CP63 COMBINE
951 KM
952 KM
953 KM
954 HC 2
*
*
*

```

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LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

```

955 KK RT63 ROUTE
956 KM
957 RS 3 FLOW
958 RC 0.050 0.035 0.050 5520 0.0185 0.00
959 RX 130.00 210.00 500.00 540.00 630.00 660.00 670.00 680.00
960 RY 1627.0 1623.00 1622.00 1617.00 1618.00 1626.00 1626.00 1627.00
*
*
*

```

```

961 KK D48ARETRIEVE
962 KM
963 DR DT48A
*
*
*

```

```

964 KK RT48B ROUTE
965 RS 2 FLOW

```

```

966 RC 0.055 0.040 0.055 5668 0.0422 0.00
967 RX 0.00 73.00 78.00 82.00 91.00 114.00 125.00 133.00
968 RY 1972.0 1970.00 1967.00 1962.00 1961.00 1965.00 1971.00 1972.00
*
*
*
*
969 KK 49 BASIN
970 BA 0.433
971 LG 0.25 0.31 3.18 0.87 12
972 UI 0 77 160 369 526 670 822 514 430 367
973 UI 310 247 195 172 139 105 90 77 59 50
974 UI 38 38 27 15 15 15 15 15 15 15
975 UI 0 0 0 0 0 0 0 0 0 0
976 UI 0 0 0 0 0 0 0 0 0 0
*
*
*
*
977 KK CP49 COMBINE
978 KM Combines RT48 and SUB49
979 HC 2 1.91
*
*
*
*
    
```

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```

LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10.....

980 KK RT49 ROUTE
981 KM ROUTE FLOW FROM CP49 TO CP50
982 RS 2 FLOW
983 RC 0.045 0.035 0.045 3915 0.0318 0.00
984 RX 0.00 30.00 39.00 45.00 60.00 71.00 134.00 177.00
985 RY 1750.0 1749.00 1744.00 1742.00 1742.00 1745.00 1747.00 1751.00
*
*
*
*
986 KK 43 BASIN
987 BA 0.142
988 LG 0.31 0.34 3.18 0.76 1
989 UI 0 77 290 487 310 223 146 103 65 45
990 UI 29 22 10 10 10 0 0 0 0 0
991 UI 0 0 0 0 0 0 0 0 0 0
992 UI 0 0 0 0 0 0 0 0 0 0
993 UI 0 0 0 0 0 0 0 0 0 0
*
*
*
*
994 KK 51 BASIN
995 BA 0.721
996 LG 0.25 0.27 3.62 0.69 9
997 UI 0 121 228 535 791 977 1358 912 719 621
998 UI 533 450 352 295 264 207 158 139 120 93
999 UI 82 59 59 52 23 23 23 23 23 23
1000 UI 23 0 0 0 0 0 0 0 0 0
1001 UI 0 0 0 0 0 0 0 0 0 0
*
*
*
*
1002 KK 50 BASIN
1003 BA 0.137
1004 LG 0.30 0.31 2.75 1.26 17
1005 UI 0 62 237 419 324 222 159 108 75 52
1006 UI 36 24 18 9 9 9 0 0 0 0
1007 UI 0 0 0 0 0 0 0 0 0 0
1008 UI 0 0 0 0 0 0 0 0 0 0
1009 UI 0 0 0 0 0 0 0 0 0 0
*
*
*
*
    
```

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```

LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10.....

1010 KK CP50 COMBINE
1011 KM WESTERN BOUNDARY - THOMPSON PEAK PARKWAY. DISCHARGE TO EXISTING NATURAL
1012 KM WASH 1900 FEET SOUTH OF LEGACY BOULEVARD.
1013 KM Combines RT49, SUB43, SUB51 and SUB50
1014 HC 4
*
*
*
*
1015 KK RT50 ROUTE
1016 KM
    
```


[illegible]

[illegible]

SCHEMATIC DIAGRAM OF STREAM NETWORK		
INPUT LINE	(V) ROUTING	(--->) DIVERSION OR PUMP FLOW
NO.	(.) CONNECTOR	(<---) RETURN OF DIVERTED OR PUMPED FLOW
54	01 V	

62	V		
	RET1		
	V		
	V		
71	RT1		
	.		
	.		
77	.	02	
	.	V	
	.	V	
85	.	RET2	
	.	.	
	.	.	
95	CP2.....		
	V		
	V		
99	RT2		
	.		
	.		
105	.	05	
	.	V	
	.	V	
113	.	RET5	
	.	.	
	.	.	
122	CP5.....		
	V		
	V		
127	RT5		
	.		
	.		
133	.	04	
	.	V	
	.	V	
142	.	RET4	
	.	V	
	.	V	
151	.	RT4	
	.	.	
	.	.	
157	.	.	09
	.	.	.
	.	.	.
165	.	.	07
	.	.	V
	.	.	V
173	.	.	RET7
	.	.	.
	.	.	.
182	CP7.....		
	V		
	V		
186	RT7		
	.		
	.		
192	.	03	
	.	V	
	.	V	
201	.	RET3	
	.	V	
	.	V	
210	.	RT3	
	.	V	
	.	V	
216	.	RET6	
	.	.	
	.	.	
225	.	.	06
	.	.	.
	.	.	.
233	CP6.....		
	V		
	V		
236	RT6		
	.		
	.		
242	.	11	
	.	V	
	.	V	
250	.	RT11	
	.	.	
	.	.	
256	.	.	08
	.	.	V
	.	.	V
266	.	RT8	
	.	.	.
	.	.	.
272	.	.	10
	.	.	.
	.	.	.
280	CP10.....		
	V		
	V		
284	RT10		
	.		
	.		
290	.	14	
	.	.	
	.	.	
298	.	.	12

306	CP12.....		
	V		
	V		
308	RT12A		
	V		
	V		
314	RT12B		
320		13	
328	CP13.....		
	V		
	V		
333	RT13		
339		16	
347	CP16.....		
	V		
	V		
351	RT16		
357		29	
	V		
	V		
366	RT29		
372		21	
380	CP21.....		
	V		
	V		
384	RT21		
390		15	
		V	
		V	
400	RT15		
406		18	
415			20
423	CP20.....		
	V		
	V		
427	DET20		
436		33	
		V	
		V	
444	RT33		
450		27	
458			28
466	CP28.....		
	V		
	V		
471	RT28		
477		26	
485	CP26.....		
	V		
	V		
490	RT26		
496		19	
504	CP19.....		
	V		
	V		
508	RT19		
514		32	
		V	
		V	


```
522      .      .      RT32
      .      .      .
528      .      .      .      31
      .      .      .
536      .      .      CP31.....
      .      .      V
      .      .      V
539      .      .      RT31
      .      .      .
545      .      .      .      25
      .      .      .
553      .      .      CP25.....
      .      .      V
      .      .      V
558      .      .      RT25
      .      .      .
564      .      .      .      24
      .      .      .
572      .      .      CP24.....
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577      .      .      .      17
      .      .      V
      .      .      V
587      .      .      RT17
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593      .      .      .      23
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601      .      .      CP23.....
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606      .      .      CP24A.....
      .      .      V
      .      .      V
609      .      .      RT24A
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615      .      .      .      30
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625      .      .      .      22
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633      .      .      CP22.....
      .      .      V
      .      .      V
637      .      .      RT22A
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645      .      .      .      DT22A
643      .      .      D22A
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      .      .      V
648      .      .      RT22B
      .      .      .
654      .      .      .      58
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662      .      .      CP58.....
      .      .      V
      .      .      V
666      .      .      RT58
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672      .      .      .      35
      .      .      V
      .      .      V
680      .      .      RT35
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686      .      .      .      34
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694      .      .      CP34.....
      .      .      V
      .      .      V
699      .      .      RT34
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705      .      .      .      38
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715      .      .      .      59
      .      .      .
725      .      .      CP59.....
      .      .      V
      .      .      V
728      .      .      RT59A
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734      .      .      .      39
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744 CP59A.....
      V
747 RT59B
      V
753      40
      V
763      60
      V
773 CP60.....
      V
776 RT60
      V
782      47
      V
790      46
      V
798 CP46.....
      V
801 RT46
      V
807      37
      V
815 RT37
      V
821      44
      V
829      42
      V
837 CP42.....
      V
840 RT42
      V
846      45
      V
854      48
      V
862 RT48A
      V
870      DT48A
868 D48A
      V
873 RTD48A
      V
879 CP45.....
      V
884 RT45
      V
890      41
      V
898 CP41.....
      V
903 RT41
      V
909      61
      V
917 RT61
      V
923      62
      V
931 CP62.....
      V
936 RT62
      V
942      63
      V
950 CP63.....
      V
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V
955 RT63
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963 .<----- DT48A
961 D48A
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964 RT48B
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969 . 49
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977 CP49.....
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980 RT49
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986 . 43
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994 . 51
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1002 . 50
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1010 CP50.....
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1015 RT50
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1021 . 52
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1029 RT52
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1035 . 53
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1043 CP53.....
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1062 CP56.....
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1065 RT56
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1071 . 54
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1079 . 57
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1089 CP54.....
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1092 CP54A.....
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1097 RT54
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1103 . 64
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1113 CP64.....
    
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(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

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*****
*
* FLOOD HYDROGRAPH PACKAGE (HEC-1)
* JUN 1998
* VERSION 4.1
*
* RUN DATE 23FEB16 TIME 08:47:18
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*****
*
* U.S. ARMY CORPS OF ENGINEERS
* HYDROLOGIC ENGINEERING CENTER
* 609 SECOND STREET
* DAVIS, CALIFORNIA 95616
* (916) 756-1104
*
*****
    
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- * 100-Year, 24-Hour Storm, S-Graph, NOAA 14 Rainfall.
- * HC CARDS INCLUDE TOTAL CONTRIBUTING AREA TO EACH CONCENTRATION POINT
- * EXISTING RETENTION PROVIDED BY ECHO RIDGE SUBDIVISION INCLUDED IN MODEL AND TAKEN FROM TROON NORTH PARK DRAINAGE REPORT.
- * FUTURE CONDITIONS DETENTION BASIN FOR TROON NORTH PARK. DRAINAGE REPORT PREPARED BY ARGUS CONSULTING (APRIL 23, 2010). NEW PARK BASIN AND EXISTING FCD BASIN MODELED TOGETHER AS STAGE-STORAGE-DISCHARGE.
- * EXISTING SEDIMENT BASIN AT HAPPY VALLEY ROAD AND ALAMEDA ROAD MODELED AS STAGE STORAGE DISCHARGE.

COMPUTATION INTERVAL 0.05 HOURS
TOTAL TIME BASE 99.95 HOURS

[illegible]

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[illegible]

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466
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[illegible][illegible][illegible][illegible]

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177 KO      OUTPUT CONTROL VARIABLES
              IPRNT      5  PRINT CONTROL
              IPLQT      0  PLOT CONTROL

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205 KO      OUTPUT CONTROL VARIABLES
              IPRNT      5  PRINT CONTROL
              IPLOT      0  PLOT CONTROL
              OSCAL      0.  HYDROGRAPH PLOT SCALE

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[illegible]

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220 KO      OUTPUT CONTROL VARIABLES
              IPRNT      5  PRINT CONTROL
              IPLOT      0  PLOT CONTROL
              OSCAL      0.  HYDROGRAPH PLOT SCALE

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[illegible]

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431 KO      OUTPUT CONTROL VARIABLES
              IPRNT      5  PRINT CONTROL
              IPLOT      0  PLOT CONTROL
              OSCAL      0. HYDROGRAPH PLOT SCALE

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+		09	300.	12.10	23.	6.	2.	0.11
+	HYDROGRAPH AT	07	333.	12.10	31.	9.	3.	0.12
+	ROUTED TO	RET7	333.	12.10	31.	9.	3.	0.12
+	3 COMBINED AT	CP7	939.	12.10	80.	22.	7.	0.36
+	ROUTED TO	RT7	917.	12.15	80.	22.	7.	0.36
+	HYDROGRAPH AT	03	424.	12.05	33.	9.	3.	0.15
+	ROUTED TO	RET3	424.	12.05	33.	9.	3.	0.15
+	ROUTED TO	RT3	367.	12.15	33.	9.	3.	0.15
+	ROUTED TO	RET6	367.	12.15	33.	9.	3.	0.15
+	HYDROGRAPH AT	06	489.	12.10	45.	13.	4.	0.18
+	4 COMBINED AT	CP6	2713.	12.15	261.	75.	25.	1.13
+	ROUTED TO	RT6	2301.	12.20	261.	74.	25.	1.13
+	HYDROGRAPH AT	11	460.	12.10	35.	9.	3.	0.17
+	ROUTED TO	RT11	380.	12.20	35.	9.	3.	0.17
+	HYDROGRAPH AT	08	361.	12.10	31.	9.	3.	0.13
+	ROUTED TO	RT8	307.	12.15	31.	9.	3.	0.13
+	HYDROGRAPH AT	10	1120.	12.10	107.	31.	10.	0.46
+	4 COMBINED AT	CP10	3914.	12.20	430.	123.	41.	1.90
+	ROUTED TO	RT10	3779.	12.20	430.	123.	41.	1.90
+	HYDROGRAPH AT	14	397.	12.10	33.	9.	3.	0.15
+	HYDROGRAPH AT	12	695.	12.15	65.	18.	6.	0.30
+	2 COMBINED AT	CP12	1086.	12.10	98.	27.	9.	0.46
+	ROUTED TO	RT12A	1067.	12.15	98.	27.	9.	0.46
+	ROUTED TO	RT12B	1030.	12.20	98.	27.	9.	0.46
+	HYDROGRAPH AT	13	558.	12.15	52.	15.	5.	0.26
+	3 COMBINED AT	CP13	5282.	12.20	575.	163.	54.	2.62
+	ROUTED TO	RT13	5140.	12.25	575.	163.	54.	2.62
+	HYDROGRAPH AT	16	1125.	12.15	111.	31.	10.	0.52
+	2 COMBINED AT	CP16	6071.	12.25	682.	193.	64.	3.14
+	ROUTED TO	RT16	5377.	12.40	682.	193.	64.	3.14
+	HYDROGRAPH AT	29	404.	12.10	31.	8.	3.	0.15
+	ROUTED TO	RT29	388.	12.10	31.	8.	3.	0.15
+	HYDROGRAPH AT	21	369.	12.05	26.	7.	2.	0.13
+	2 COMBINED AT	CP21	748.	12.10	57.	15.	5.	0.28

+	ROUTED TO	RT21	702.	12.15	57.	15.	5.	0.28
+	HYDROGRAPH AT	15	1621.	12.15	145.	39.	13.	0.70
+	ROUTED TO	RT15	1611.	12.15	145.	39.	13.	0.70
+	HYDROGRAPH AT	18	361.	12.10	32.	9.	3.	0.14
+	HYDROGRAPH AT	20	682.	12.10	56.	16.	5.	0.26
+	4 COMBINED AT	CP20	3262.	12.15	288.	77.	26.	1.38
+	ROUTED TO	DET20	3262.	12.15	288.	78.	26.	1.38
+	HYDROGRAPH AT	33	460.	12.10	34.	9.	3.	0.18
+	ROUTED TO	RT33	399.	12.20	34.	9.	3.	0.18
+	HYDROGRAPH AT	27	275.	12.10	21.	6.	2.	0.11
+	HYDROGRAPH AT	28	422.	12.10	35.	9.	3.	0.17
+	3 COMBINED AT	CP28	1038.	12.15	91.	24.	8.	0.45
+	ROUTED TO	RT28	1007.	12.15	91.	24.	8.	0.45
+	HYDROGRAPH AT	26	168.	12.10	13.	3.	1.	0.06
+	3 COMBINED AT	CP26	4387.	12.15	389.	104.	35.	1.90
+	ROUTED TO	RT26	4388.	12.15	389.	104.	35.	1.90
+	HYDROGRAPH AT	19	416.	12.10	33.	9.	3.	0.15
+	2 COMBINED AT	CP19	4731.	12.15	421.	113.	38.	2.05
+	ROUTED TO	RT19	4555.	12.20	421.	113.	38.	2.05
+	HYDROGRAPH AT	32	963.	12.15	80.	21.	7.	0.44
+	ROUTED TO	RT32	894.	12.20	80.	21.	7.	0.44
+	HYDROGRAPH AT	31	968.	12.15	86.	23.	8.	0.50
+	2 COMBINED AT	CP31	1836.	12.15	165.	43.	14.	0.94
+	ROUTED TO	RT31	1836.	12.20	165.	43.	14.	0.94
+	HYDROGRAPH AT	25	576.	12.15	55.	15.	5.	0.27
+	3 COMBINED AT	CP25	6863.	12.20	633.	170.	57.	3.26
+	ROUTED TO	RT25	6266.	12.30	633.	170.	57.	3.26
+	HYDROGRAPH AT	24	730.	12.15	75.	21.	7.	0.38
+	2 COMBINED AT	CP24	6864.	12.25	705.	190.	63.	3.64
+	HYDROGRAPH AT	17	931.	12.05	76.	22.	7.	0.32
+	ROUTED TO	RT17	842.	12.15	76.	22.	7.	0.32
+	HYDROGRAPH AT	23	671.	12.15	71.	19.	6.	0.28
+	2 COMBINED AT	CP23	1513.	12.15	147.	41.	14.	0.60
+	2 COMBINED AT	CP24A	8015.	12.25	847.	229.	76.	4.24

+	ROUTED TO	RT24A	7839.	12.30	847.	229.	76.	4.24
+	HYDROGRAPH AT	30	692.	12.20	68.	17.	6.	0.39
+	HYDROGRAPH AT	22	453.	12.15	45.	12.	4.	0.22
+	4 COMBINED AT	CP22	13015.	12.35	1588.	437.	146.	8.00
+	ROUTED TO	RT22A	13016.	12.35	1588.	437.	146.	8.00
+	DIVERSION TO	DT22A	2000.	12.25	291.	80.	27.	8.00
+	HYDROGRAPH AT	D22A	11016.	12.35	1297.	356.	119.	8.00
+	ROUTED TO	RT22B	10831.	12.40	1297.	356.	119.	8.00
+	HYDROGRAPH AT	58	319.	12.05	22.	6.	2.	0.11
+	2 COMBINED AT	CP58	10859.	12.40	1316.	361.	121.	8.11
+	ROUTED TO	RT58	10627.	12.40	1316.	361.	121.	8.11
+	HYDROGRAPH AT	35	1043.	12.10	70.	18.	6.	0.41
+	ROUTED TO	RT35	908.	12.15	70.	18.	6.	0.41
+	HYDROGRAPH AT	34	1186.	12.10	80.	20.	7.	0.46
+	2 COMBINED AT	CP34	2057.	12.10	149.	38.	13.	0.87
+	ROUTED TO	RT34	1887.	12.15	149.	38.	13.	0.87
+	HYDROGRAPH AT	38	166.	12.05	9.	2.	1.	0.06
+	HYDROGRAPH AT	59	136.	12.10	9.	2.	1.	0.05
+	4 COMBINED AT	CP59	11274.	12.40	1464.	399.	133.	9.09
+	ROUTED TO	RT59A	11210.	12.45	1464.	399.	133.	9.09
+	HYDROGRAPH AT	39	401.	12.05	25.	6.	2.	0.15
+	2 COMBINED AT	CP59A	11214.	12.45	1486.	405.	135.	9.24
+	ROUTED TO	RT59B	10956.	12.50	1486.	405.	135.	9.24
+	HYDROGRAPH AT	40	385.	12.05	27.	7.	2.	0.15
+	HYDROGRAPH AT	60	326.	12.10	25.	7.	2.	0.18
+	3 COMBINED AT	CP60	10990.	12.50	1530.	417.	139.	9.58
+	ROUTED TO	RT60	10652.	12.55	1530.	417.	139.	9.58
+	HYDROGRAPH AT	47	951.	12.20	91.	23.	8.	0.55
+	HYDROGRAPH AT	46	436.	12.10	28.	7.	2.	0.17
+	2 COMBINED AT	CP46	1302.	12.15	119.	31.	10.	0.72
+	ROUTED TO	RT46	1242.	12.20	119.	31.	10.	0.72
+	HYDROGRAPH AT	37	1439.	12.10	104.	26.	9.	0.63
+	ROUTED TO	RT37	1334.	12.20	104.	26.	9.	0.63
+	HYDROGRAPH AT							

+		44	248.	12.10	14.	4.	1.	0.13
+	HYDROGRAPH AT	42	651.	12.10	47.	12.	4.	0.32
+	4 COMBINED AT	CP42	3352.	12.15	282.	72.	24.	1.79
+	ROUTED TO	RT42	3155.	12.20	282.	72.	24.	1.79
+	HYDROGRAPH AT	45	259.	12.10	17.	4.	1.	0.16
+	HYDROGRAPH AT	48	2150.	12.25	247.	62.	21.	1.57
+	ROUTED TO	RT48A	2134.	12.30	247.	62.	21.	1.57
+	DIVERSION TO	DT48A	1967.	12.30	239.	60.	20.	1.57
+	HYDROGRAPH AT	D48A	167.	12.30	8.	2.	1.	1.57
+	ROUTED TO	RTD48A	147.	12.35	8.	2.	1.	1.57
+	2 COMBINED AT	CP45	264.	12.15	25.	7.	2.	0.25
+	ROUTED TO	RT45	247.	12.25	25.	7.	2.	0.25
+	HYDROGRAPH AT	41	745.	12.10	56.	16.	5.	0.35
+	3 COMBINED AT	CP41	3950.	12.20	360.	94.	31.	2.39
+	ROUTED TO	RT41	3815.	12.25	360.	94.	31.	2.39
+	HYDROGRAPH AT	61	313.	12.10	28.	8.	3.	0.12
+	ROUTED TO	RT61	267.	12.15	28.	8.	3.	0.12
+	HYDROGRAPH AT	62	338.	12.05	21.	6.	2.	0.12
+	4 COMBINED AT	CP62	12119.	12.50	1882.	510.	170.	12.21
+	ROUTED TO	RT62	11574.	12.60	1882.	510.	170.	12.21
+	HYDROGRAPH AT	63	683.	12.15	68.	21.	7.	0.39
+	2 COMBINED AT	CP63	11652.	12.60	1940.	528.	177.	12.59
+	ROUTED TO	RT63	11281.	12.70	1940.	528.	177.	12.59
+	HYDROGRAPH AT	D48A	1967.	12.30	239.	60.	20.	1.57
+	ROUTED TO	RT48B	1933.	12.40	239.	60.	20.	1.57
+	HYDROGRAPH AT	49	660.	12.20	65.	18.	6.	0.43
+	2 COMBINED AT	CP49	2337.	12.30	302.	77.	26.	1.91
+	ROUTED TO	RT49	2298.	12.40	302.	77.	26.	1.91
+	HYDROGRAPH AT	43	305.	12.10	18.	5.	2.	0.14
+	HYDROGRAPH AT	51	1135.	12.20	112.	30.	10.	0.72
+	HYDROGRAPH AT	50	265.	12.10	19.	6.	2.	0.14
+	4 COMBINED AT	CP50	3158.	12.30	445.	117.	39.	2.91
+	ROUTED TO	RT50	3006.	12.45	445.	117.	39.	2.91
+	HYDROGRAPH AT	52	1174.	12.15	96.	24.	8.	0.60

+	ROUTED TO	RT52	1040.	12.30	96.	24.	8.	0.60
+	HYDROGRAPH AT	53	1037.	12.20	99.	25.	8.	0.70
+	2 COMBINED AT	CP53	2027.	12.25	194.	49.	16.	1.30
+	HYDROGRAPH AT	55	737.	12.10	55.	14.	5.	0.34
+	HYDROGRAPH AT	56	1809.	12.25	188.	47.	16.	1.23
+	2 COMBINED AT	CP56	2423.	12.20	241.	60.	20.	1.57
+	ROUTED TO	RT56	2194.	12.30	241.	60.	20.	1.57
+	HYDROGRAPH AT	54	818.	12.15	70.	18.	6.	0.49
+	HYDROGRAPH AT	57	194.	12.05	9.	2.	1.	0.08
+	3 COMBINED AT	CP54	2841.	12.25	318.	79.	26.	2.14
+	2 COMBINED AT	CP54A	4812.	12.25	505.	126.	42.	3.44
+	ROUTED TO	RT54	4572.	12.35	505.	126.	42.	3.44
+	HYDROGRAPH AT	64	1119.	12.15	111.	33.	11.	0.64
+	4 COMBINED AT	CP64	15618.	12.60	2828.	759.	254.	19.58

*** NORMAL END OF HEC-1 ***

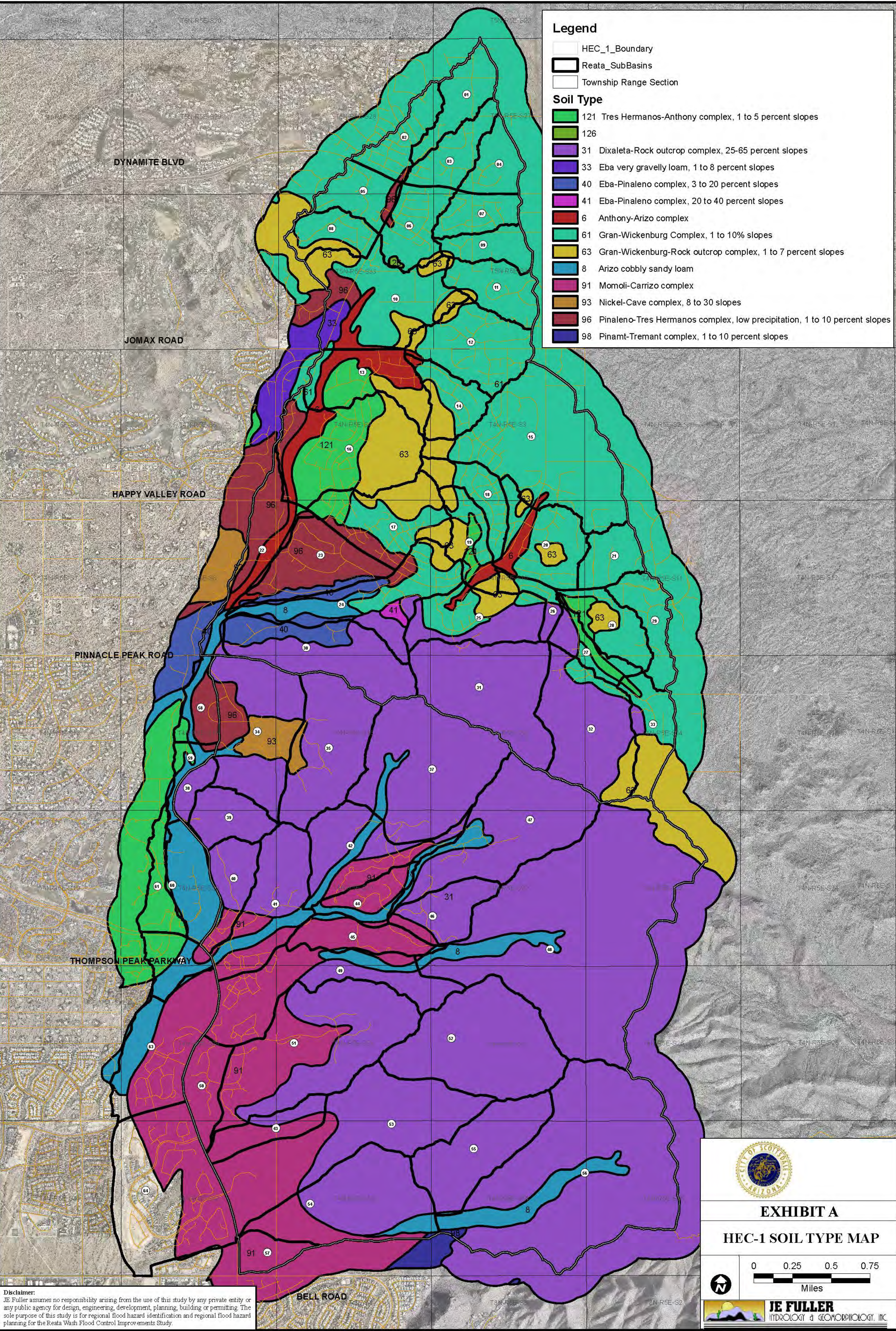
Appendix C Exhibits

Exhibit A – Soil Type Map

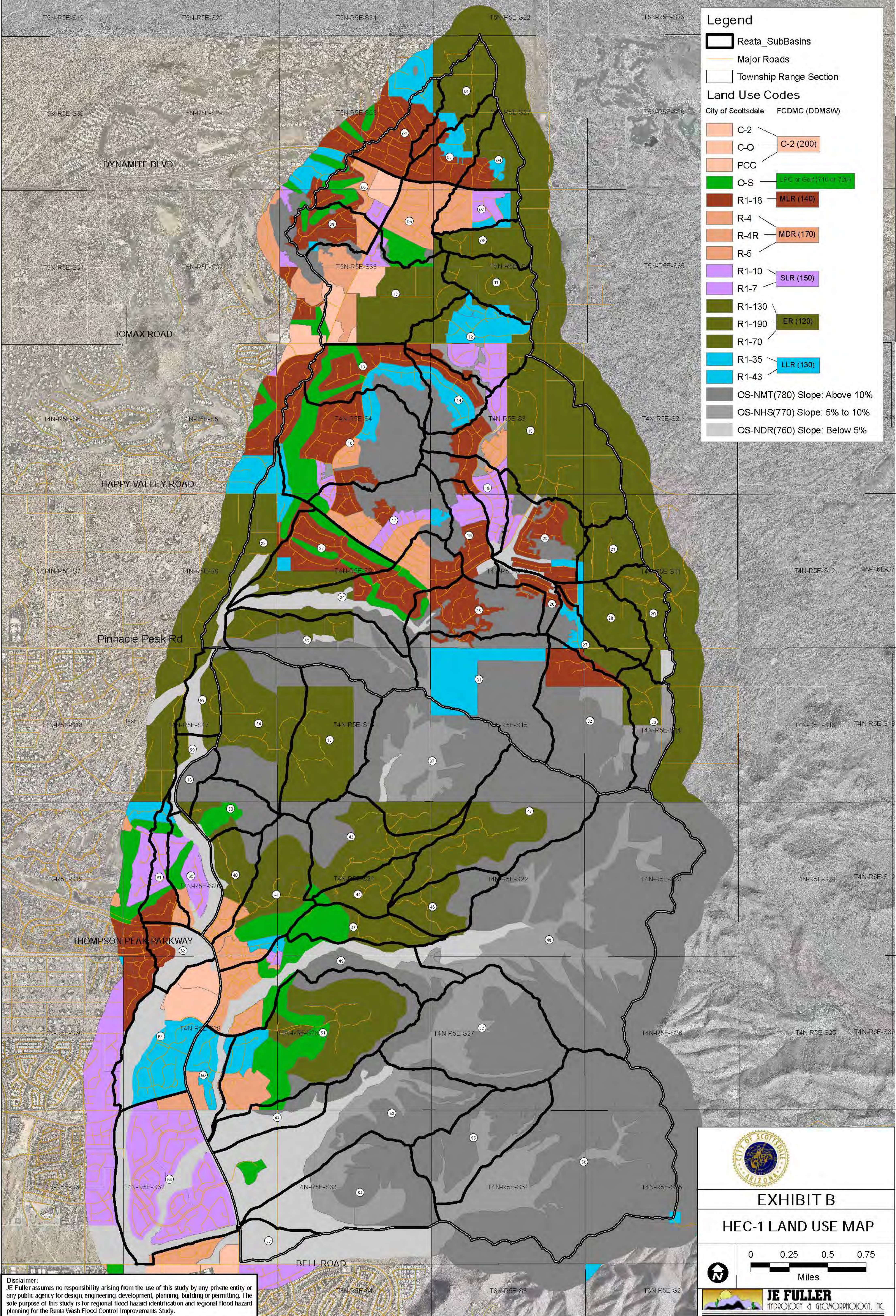
Exhibit B – Land Use Map

Exhibit C – Watershed Map

REATA WASH FLOOD CONTROL IMPROVEMENT STUDY



REATA WASH FLOOD CONTROL IMPROVEMENT STUDY



REATA WASH FLOOD CONTROL IMPROVEMENT STUDY

