# Preliminary Drainage Report for

## SERENO CANYON – PHASE 4

Scottsdale, AZ

May 7, 2018

Plan #

Case # 51-DR-2017

Q-S #

☒ Accepted

☐ Corrections

N.Baronas 10-1-18

Reviewed By Date


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# 1. Introduction

## 1.1. *Report Purpose*

This report contains drainage data analyses to support the Preliminary Plat for the Sereno Canyon Phase 4 project in Scottsdale, Arizona. This report builds on a previous report prepared by Argus Consulting, P.C., and uses language developed previously for this Preliminary Drainage Report with permission from Argus.

## 1.2. *Location of Study*

Sereno Canyon is located in Section 11, Township 4, Range 5 East of the Gila and Salt River Base and Meridian. The site is bound to the west by the existing Sonoran Crest Development (122nd Street alignment), to the east by the 128th Street alignment, to the north by the Happy Valley Road alignment, and to the south by the McDowell Mountain Sonoran Preserve. A Vicinity Map is provided in **Appendix B**.

## 1.3. *Project Background and Description*

The Sereno Canyon development is a planned 350-acre development (Phase 1-4) that contains three different zoning categories: a Single-family Residential District, Environmentally Sensitive Lands (Rl-130/ESL) zoning designation; a Single-family Residential District, Environmentally Sensitive Lands (Rl-43/ESL) zoning designation; and a Resort/Townhouse Residential, Environmentally Sensitive Lands (R-4R/ESL) zoning. The City Council approved, through cases 10-GP-2011, 1-ZN-2005#2, and 16-ZN-2011, a low density, master planned resort community complete with residential and guest services on the site.

In 2012, Sereno Canyon was approved for a Non-Major General Plan Amendment and Rezoning that allowed for increased residential density and a resort/townhouse use. The rezoning modified the existing Rl-130 ESL on approximately 227 acres of the overall property to a combination of Rl-43 ESL and R-4R. The approved Case No. 19-PP-2013 provided Phases 1-3 with 98 single-family lots and Phase 4 with a 299-unit Resort/Townhouse portion of the development.

Currently, Sereno Canyon contains an existing network of private internal streets that can be accessed via Ranch Gate Road through an existing gate and guardhouse. A majority of the property (Phase 1-3) was platted in 2008 and Crown Community Development subsequently improved the Phase 1 area, as well as an extensive off-site network of roadways and utilities as required by the City.

It is important to note that the herein presented study utilizes information previously approved by the City of Scottsdale for Sereno Canyon project as listed following:

- *Sereno Canyon Master Drainage Plan* (Approved MDP) – November 15, 2006
- *Sereno Canyon Master Drainage Plan Amendment I* (Amendment I) – January 9, 2012
- *Sereno Canyon Master Drainage Plan Amendment II* (Amendment II) – September 18, 2012

It should be noted that the hydrologic modeling, computational approaches and drainage concepts presented herein adhere significantly to those discussed in the above listed approved reports. It should also be noted that the Preliminary Drainage Report (Phase 4) is an amendment to Amendment II; therefore, the reader is encouraged to reference the listed report above for additional details regarding currently approved drainage concepts and facilities. Digital copies of the approved documents have been provided on a separate CD with this report.

The Federal Emergency Management Agency (FEMA), under the National Flood Insurance Program (NFIP), has issued on October 16, 2013, Flood Insurance Rate Map (Map Number: 04013C1330L), indicating that a portion of the Sereno Canyon Phase 4 is within designated 'Other Flood Areas' Zones X. Zone X is defined as "Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood". FEMA has also issued on November 4, 2015, Flood Insurance Rate Maps (Map Number: 04013C1335M) indicating that a portion of the Sereno Canyon Phase 4 is within designated 'Other Flood Areas' Zones D. Zone D is defined as "Areas in which flood hazards are undetermined, but possible". Please see the floodplain map, provided in **Appendix B**, for reference to the FEMA designated flood zones.

The Sereno Canyon plan provides 176 acres of NAOS; more than 50% of the project area. The required NAOS for Phase 1-3 (approximately 120 Acres) has been dedicated through previous plat approval. Phase 4 is required to provide 54 acres with final plat, as shown on the NAOS map provided in **Appendix B**.

## 1.4. *Proposed Land Use Plan Description*

Sereno Canyon is intended to be a low-impact development that maintains and incorporates natural Sonoran Desert landscape. This study has been prepared in support of this land use. Four primary land-use types are being proposed within the Sereno Canyon Phase 4 development: Estate Lot Residential, Villa Lot Residential, Resort Residential Townhomes, and a Lodge House (Resort & Spa). General Transportation sections have been placed throughout the perimeter of Sereno Canyon Phase 4 as access roads are proposed surrounding the residential areas. The proposed land use plan for the Sereno Canyon Phase 4 can be found in **Appendix E**, and a general development layout can be found in **Appendix A**. The proposed gross density for Phase 4 is 2.32 Du/Ac. The Sereno Canyon Land Use Map contains a table with IA, RTIMP, Vegetation Cover, DTHETA, and Kb values for each of the land use zoning categories, and a summary table has been duplicated below as **Table 1.1**. Standard values as outlined in the *City of Scottsdale Design Standards and Policies Manual* (DS&PM), as well as the *Flood Control District of Maricopa County's Hydrology Manual* and DDMSW program defaults, were maintained for the proposed conditions hydrologic modeling. **Table 1.1** below identifies the values associated with each of the Green and Ampt parameters associated with the hydrology model, discussed further in Section 4 of this report.

**Table 1.1 – Land Use Summary Table**

| Land Use Description | Associated City Land Use Code | FCDMC Land Use Code | IA (inches) | RTIMP (%) | Vegetation Cover (%) | DTHETA (-) | Kb (-) |
|---|---|---|---|---|---|---|---|
| Resort Residential (2 DU/Ac.) Average Lot = 1/2 Acre | R1-18 | 140 | 0.25 | 30 | 50 | Normal | Min. |
| Villa Lot Average Lot = 1 Acres | R1-43 | 130 | 0.30 | 15 | 50 | Normal | Min. |
| Estate Lot Average Lot = 3 Acres | R1-130 | 120 | 0.30 | 5 | 30 | Normal | Min. |
| Resort & Spa | R-4R | 510 | 0.10 | 80 | 75 | Normal | Min. |
| General Transportation | Road | 605 (Custom) | 0.10 | 100 | 0 | Normal | Min. |

### 1.4.1. Estate Lot Residential

Estate Lot Residential land-use will consist of single family residence located on lots that are typically two to three acres or greater in size. The City land-use code associated with this development is R1-130.

### 1.4.2. Villa Lot Residential

Villa Lot Residential land-use will consist of single family residences located on lots that are one acre or greater in size. The City land-use code associated with this development is R1-43.

### 1.4.3. Resort Lot Residential

Resort Residential units will be a combination of attached and detached housing types at an average density of approximately two units per acre. The City land-use code associated with this development is R1-18 although the actual underlying zoning district for the Resort Residential area is R1-18.

### 1.4.4. Resort & Spa

The Sereno Canyon Lodge House property will be a low-intensity, experiential resort that integrates within the surrounding natural desert. The City land use code associated with this development is R-4R.

## 1.5. Special Conditions

Several stipulations were previously identified and approved for the Sereno Canyon development and are applicable to Phase 4. The stipulations that relate to this drainage report are included below.

### 1.5.1. Project Stipulations

- Submit a final drainage report that demonstrates consistency with the DSPM and the case drainage report (19-PP-2013) accepted in concept by the Director, or designee, of the Stormwater Management Division of the Municipal Services Department.
- Demonstrate consistency with the accepted master drainage plan and report. For any design that modifies the accepted master drainage report, the owner shall submit a site-specific addendum to the final drainage report and plan, subject to review and acceptance by the Stormwater Management Division's Director or designee.
- An addendum generated by the final drainage analysis for this site shall be added to the appendix of the final drainage report.

### 1.5.2. Existing and Proposed Site Conditions

Existing condition analyses were based on natural Sonoran Desert landscape. Proposed condition analyses include the land use plan components (buildings, roads, drainage structures, etc.). Onsite infrastructure improvements include several in-line storage basins. Flow in excess of storage basin capacity is typically conveyed downstream via a designated overflow area. Further discussion regarding storage basins and outlet structures is provided in Section 5. Additionally, discussion regarding drainage structures is provided in Section 3.5 of the Approved MDP.

### *1.5.3. CWA Section 404 Washes*

A jurisdictional delineation of Waters of the U.S. (WUS) and Section 404 Permit was granted for Phase 1-3 (USCOE File No. 2005-01561-AP). All permitted activities for Phase 1-3 have been completed.

An application for a jurisdictional delineation of WUS is currently being submitted for Sereno Canyon Phase 4. The proposed 404 Washes are depicted in the Preliminary Grading and Drainage Plan as part of this submittal.

# 2. Description of Area Study

## 2.1. *Existing Site Conditions*

For this Preliminary Drainage Plan (Phase 4) amendment, the existing site conditions is undeveloped, natural Sonoran Desert as discussed in the Approved MDP, Amendment I, and Amendment II reports. Please refer to Amendment II for detailed discussion regarding the most recent existing condition hydrologic modeling and results.

## 2.2. *Proposed Site Conditions*

The proposed Preliminary Drainage Plan for Sereno Canyon Phase 4 allows existing drainage ways to be maintained in their natural location and condition where possible. Under the preliminary plan, flow enters and exits the project site at historic locations. In addition, flow exiting the project site will not adversely impact downstream property owners. Detailed discussion regarding the Sereno Canyon Master Drainage Plan is provided in the Approved MDP, Amendment I, and Amendment II reports.

# 3. Site Mapping Information

The available mapping utilized in this study was developed by Vertical Mapping (Flight Date: 4/21/17) as follows:

1. Topographic Map: A digital topographic map was developed for the project site with a contour interval of 1-foot. This data was utilized for on-site grading and drainage design. Map Scale 1"=40'.

2. Aerial Photo: Aerial photograph, used in conjunction with the topographic mapping, was utilized to provide vegetation cover patterns and identify existing improvements, flow paths, and rock outcrop locations. Photo Scale 1:3600.

# 4. Hydrologic Analysis

Existing condition HEC-1 modeling is presented and discussed in detail in the Amendment I (January 2012) report and approved by City of Scottsdale. A digital copy of the existing conditions HEC-1 model is included in **Appendix A**.

Hydrologic calculations in this report were prepared only for Proposed Conditions (Post-Development) to update the previously approved Amendment II (September 2012) HEC-1 model using the proposed land use.

The proposed conditions HEC-1 models (2-, 10-, and 100-year) presented in Amendment II report are utilized in this study and modified as needed to represent Phase 4 development therefore maintaining the integrity of the previously approved analyses. When subbasin data was modified due to revisions within the Phase 4 development, the original 'E' (east) and 'W' (west) letters on the subbasin names were removed (for example: SBE01A to SB01A or SBW07B to SB07B). Additionally, when 'new' sub basins were created due to subdividing drainage areas, the original 'E' (east) and 'W' (west) letters were again removed and a numerical identification was added at the end of the name (for example: SBE02A to SB02A1).

Rainfall runoff modeling of the proposed developed condition was accomplished using the U.S. Army Corps of Engineers HEC-1 computer program, version 4.1. HEC-1 models were developed based on guidelines presented in the City of Scottsdale's Design Standards and Policy Manual (DS&PM, 2018) and Flood Control District of Maricopa County's Hydrology Drainage Design Manual for Maricopa County, Arizona (FCD Hydrology Manual, 2013). In addition, the Drainage Design Management System (DDMSW, version 5.3.0) program provided by FCDMC was used to develop hydrologic modeling parameters.

HEC-1 models were developed for the 2-, 10-, and 100-year, 6-hour storm events. HEC-1 model identification is provided below in **Table 4.1**.

**Table 4.1 – HEC-1 Model Identification**

| HEC-1 Model | Condition and Storm Event |
|---|---|
| SerenoPrelPh4_DEV_2yr.dat | Developed Condition 2-Yr/6-Hr |
| SerenoPrelPh4_DEV_10yr.dat | Developed Condition 10-Yr/6-Hr |
| SerenoPrelPh4_DEV_100yr.dat | Developed Condition 100-Yr/6-Hr |

## 4.1. *Design Rainfall*

Per the City's DS&PM, hydrologic modeling was completed for the 2-, 10-, and 100-year, 6-hour design storm events. Maximum rainfall values for the project area were determined in the previous project studies using DDMSW and are listed following in **Table 4.2**.

A GIS-based approach was used for determining design rainfall depths derived from NOAA Atlas 14 point precipitation estimates. A shapefile is included with the digital files accompanying this report (Rainfall_Basin.shp) which was used in DDMSW to determine rainfall depths for the Sereno Canyon development.

**Table 4.2 – Design Rainfall Depth Values**

| Design Rainfall | Rainfall Depth [inch] |
|---|---|
| 2-Year, 6-Hour | 1.42 |
| 10-Year, 6-Hour | 2.11 |
| 100-Year, 6-Hour | 3.18 |

The developed condition HEC-1 model uses the depth/area record (JD record) and cumulative precipitation time series (PC record) to simulate the rainfall depths, area reduction, and rainfall distribution. Rainfall distribution and depth/area values were computed using DDMSW.

## 4.2. *Rainfall Losses*

Rainfall losses are generally considered to be the result of evaporation of water from the land surface, interception of rainfall by vegetal cover, depression storage on the land surface (paved or unpaved), and the infiltration of water into the soil matrix. Detailed discussion regarding soil information for the Sereno Canyon project is provided in the Amendment I report.

The selection of parameters to simulate rainfall losses was performed using the DDMSW computer program available through the FCDMC. Soil data was used with the DDMSW software to calculate Green and Ampt parameters. Urban development was represented by the proposed land use, accompanied by adding a percentage of impervious cover to the drainage subbasin. HEC-1 computes 100% of runoff from the percent of a subbasin area indicated in the LG record (impervious area). Output tables for rainfall loss parameters are provided in **Appendix C**. Please note that the current DDMSW software program outputs do not display the initial abstraction (IA) values properly within the PDF summary report; however, the IA values have been checked in individual subbasins as well as the HEC-1 models and is accurate based on the subbasin characteristics. It is simply an output display issue that could not be addressed within DDMSW.

It should be noted that the existing conditions HEC-1 model remains unchanged from the previously approved models as part of the Amendment I report. Differences between the previously approved existing conditions hydrologic model parameters and the current proposed parameters are a result of utilizing the default values within the DDMSW program and City and District guidelines for land use codes. The proposed conditions model uses equivalent proposed land use values based on the proposed site plan for the Phase 4 development to alter the HEC-1 records according to the proposed development.

## 4.3. *Unit Hygrograph*

The Clark Unit Hydrograph method, per the City's DS&PM and FCDMC Hydrology Manual, was utilized to compute developed condition peak discharges and runoff volumes at select concentration points. Clark Unit Hydrograph parameters include the time of concentration (Tc), storage coefficient (R), and a time-area relation. Tc and R values were computed using the DDMSW program.

## 4.4. *Time of Concentration (Tc)*

The time of concentration (Tc) for use with the Clark Unit Hydrograph is estimated using the following equation from the FCDMC Hydrology Manual:

$$T_c = 11.4\ L^{0.5} K_b^{0.52} S^{-0.31} i^{-0.38}$$

where:

$T_c$ = time of concentration, in hours

L = length of the hydraulically longest flow path, in miles

$K_b$ = watershed resistance coefficient (Figure 5.5 or Table 5.3 FCD Hydrology Manual)

S = watercourse slope, in feet/mile

i = the average rainfall excess intensity, in inches/hour

The solution for the Tc equation is an iterative process that was accomplished using the DDMSW computer program. Developed conditions subbasin Tc values are provided in output tables contained in **Appendix C**. Values of Tc that are indicated as non-default or out-of-range values within DDMSW output tables are due to the NMIN parameter selected for the hydrologic model. Due to the varying subbasin sizes and hillside slopes of the terrain in and around the development, some subbasins will result in out-of-range values for the time of concentration according to the requirements of the FCDMC's Hydrology Manual. However, this does not significantly affect the output results.

## 4.5. *Flood Hydrograph Routing*

### *4.5.1. Channel*

Hydrograph routing was simulated using the Normal-Depth method (Modified Puls) as recommended by the City's DS&PM and FCD Hydrology Manual. The HEC-1 Routing Data Table is included in **Appendix C**.

### *4.5.2. Reservoir*

Flood hydrograph routing through proposed detention basins was simulated using the HEC-1 reservoir routing routine through a stage-storage-discharge relationship (SV, SE, SQ). The HEC-1 model in **Appendix C** contains the SV, SE, and SQ records used for each storage basin, and the peak stages and discharges can be viewed in the HEC-1 results.

**Appendix C** contains the hydrologic parameters summary tables for rainfall, soils, and land use developed within DDMSW and utilized in the HEC-1 model for proposed conditions. Drainage areas are shown in Map B in **Appendix E**.

## 4.6. *Hydrologic Analysis Results (HEC-1 Model)*

Existing condition and proposed condition peak discharges (2-, 10-, and 100-year, 6-hour) at identified locations along the project site boundary are provided in table format in **Appendix C** after each of the separate HEC-1 model output files.

## 4.7. *Discussion of Flow Increases from Pre- to Post-Development*

CE065A has increased by 2 cfs in the 100-year event and 9 cfs in the 10-year event from the existing conditions hydrologic model. This natural wash reach where the flow has been slightly increased is currently undeveloped natural desert. At the property boundary where the flow increase happens, the wash has sufficient capacity to maintain the flows within the channel banks, and equates to an approximate water surface elevation increase of 0.02 feet in the 100-year event and 0.08 feet in the 10-year event. Furthermore, the overall depth within the natural wash channel banks is approximately 10 feet, whereas the flow depth is under 2 feet for both the 10- and 100-year events. Therefore, this flow increase is insignificant and will not adversely impact the natural wash conditions.

Other increases throughout the site (SB08A, SB10A, SBE16A, SBE21A, and SBW04A) were present in the approved Amendment II report. They occur in areas where the 100-year peak discharge is relatively small, no greater than 7cfs, as documented in the approved Amendment II report. Additionally, the 100-year increases were all limited to 1 cfs at these locations.

In the 10-year event, increases occur at similar locations (CE065A, SB10A, SBE16A, SBE21A, and SBW04A), but also occur at two other locations (SBE20A and SBW13A). While not explicitly documented in the Amendment II report, the hydrologic parameters were not altered from the Amendment II hydrology for these subbasin areas. Furthermore, these subbasins do not receive flows from the Phase 4 development area and are not within the limits of development for Phase 4.

Please refer to the HEC-1 output summary tables for documentation of flow increases at the above described locations in **Appendix C**.

# 5. Stormwater Storage

Additional discussion regarding the approach to stormwater storage within the Sereno Canyon Development is provided in Section 3.3 and Section 3.5 of the Approved MDP, Section 6 of Amendment I, and in Section 4 of Amendment II. Stormwater storage basins will continue to be further assessed during subsequent, more detailed, final design phase of the Sereno Canyon Development. The stormwater storage volumes and basin configurations and locations presented within this report have been estimated using the proposed land use and the preliminary grading and drainage plan.

## 5.1. *Stormwater Storage Volume*

Stormwater storage areas were identified at several locations throughout Sereno Canyon Phase 4. These storage basins are all in-line basins which discharge to natural wash areas throughout the development. A list of each 'new' basin identified in Phase 4 with the associated stormwater storage volume can be found in **Appendix C**. Because the Phase 4 development is within an ESLO zoning district, the stormawater storage approach was a pre-development vs. post-development analysis and storage basins were generally designed to attenuate post-development peak discharge rates for the 10- and 100-year events. Please refer to section 4.7 above for a discussion of any increases in post-development peak discharges.

Detention basin outlet structures will be further designed to manage the multi-frequency event peak flow discharges (2-, 10-, and 100-yr) based on final grading and design. General culvert outlet structures were modeled in HY-8, and output summaries are included in **Appendix D**.

## 5.2. *First Flush*

Numerous discharge locations located throughout the Sereno Canyon Phase 4 development makes a First Flush approach impractical for the site, especially when trying to preserve the natural habitat of the environment where possible. The development is located in an area which is not at a high risk for pollutant discharges as the majority of Phase 4 will be Estate and Villa lots, coupled with Resort and Resort Residential areas. The relatively upscale development will be designed and constructed to fit into the natural environment, and significant natural washes have been intentionally avoided to maintain the integrity of the washes.

The critical period for sedimentation and pollutants to enter the natural washes will be during the construction of the development. During the construction period, a Stormwater Pollution Prevention Plan (SWPPP) and an Arizona Pollutant Discharge Elimination System (AZPDES) will be developed and enacted. Additionally, disturbances for the construction of first flush basins would potentially increase the turbidity during construction as they would be numerous and likely placed adjacent to or within natural wash corridors.

# 6. Hydraulic Analysis

## *6.1 General*

The City of Scottsdale's Environmentally Sensitive Lands Ordinance (ESLO) regulates the location and design of residential in the project's area. The ordinance requires that specific environmental features, such natural washes, be preserved in their native locations and conditions.

The ESLO is seeking to minimize modifications of the flow and natural features of "significant washes", which are defined as having a 100-year storm flow of 50 cfs or more. Based on the results of the hydrologic analysis presented herein, three ephemeral washes have been identified as having a 100-year storm flow of 50 cfs or more. A reach boundary condition using normal depths and channel slopes of existing conditions topography was used for the hydraulic analysis. The topography will remain unchanged at the downstream extent of the reaches beyond property boundaries. A subcritical flow regime was used for the proposed conditions hydraulic assessment. This was done in order to establish pad elevations and finished floor elevations of lots adjacent to washes as the subcritical flow regime will produce the most conservative channel depths within wash sections. In final design, a mixed flow regime will be used to further evaluate channel hydraulics for velocities and scour potential. The levee function of HEC-RAS was used to identify natural ineffective flow areas. This is not a physical man-made levee, but a representation of a natural high point modeled within HEC-RAS. A floodplain delineation was prepared utilizing a proposed conditions HEC-RAS model, and results for significant washes throughout the proposed development can be found in **Appendix D**. The preliminary grading and drainage plan and Map E show the floodplain limits.

Curb openings and culverts were placed at locations necessary to maintain hydrologic boundaries and drain sump locations throughout the proposed development. They have been preliminarily designed to remove runoff from road pavement and to convey flows under street corridors to discharge to storage basins and washes. Hydraulic calculations can be found in **Appendix D**.

# 7. Erosion, Sedimentation and Maintenance

## 7.1. *Erosion and Setbacks*

Erosion protection components are proposed throughout the project to prevent scour by using rock riprap, concrete, and slope compaction/revegetation. The soil classification for the site is Gran-Wickenburg Complex. Field investigation revealed a surface covered with pebbles, cobbles and rock outcrops, which are indicators of surface armoring (erosion hazard slight).

Following the guidelines by the Arizona Department of Water Resources (ADWR) in the State Standard No.5-96, an erosion setback line was establish along those channels with floodplains (Map E). Watercourses in Sereno Canyon Phase 4 are under the category of "watercourses with minor curvature". For such watercourses which have drainage areas of less than 30 square miles, the recommended erosion setback allowance is calculated as follows:

Setback = $1.0\ (Q_{100})^{0.5}$
where setback is in feet and $Q_{100}$ is in cubic feet per second.

In all cases, the "minimum" setback for a watercourse with "minor" curvature shall be 20 feet, measured from the 100-yr floodway or the top of the channel bank. No on-site washes convey flows in excess of the minimum value required to surpass the 20-foot minimum erosion hazard setback, thus the 20-foot minimum setback will be implemented for all on-site washes.

## 7.2. *Sedimentation*

Vertical roadway alignments proposed in Final Design will consider the use of modified culvert inlets to maintain the natural wash/channel velocities through the culvert crossing, and will maintain existing sediment transport conditions of the natural wash. Channel hydraulics from the previously approved Master Drainage Report and Amendments I and II were utilized for this report and remain unchanged. The results are included in **Appendix D**.

## 7.3. *Maintenance*

Ongoing maintenance of the drainage systems are required to preserve their design integrity and function. Failure to provide adequate maintenance can prevent the drainage systems from performing in accordance with their design intent. It is the responsibility of the owner of the facilities to provide maintenance and to ensure the drainage structures are functioning as intended. A regular maintenance program is required for the drainage system to function and maintain the level of protection provided with the intent of the design presented herein.

Per the approved Sereno Canyon Master Drainage Plan Amendment, a Facility Maintenance Plan will accompany final design of facilities. Maintenance activities will include, but not be limited to, the following:

- Removal of sediment accumulation within stormwater storage basins
- Repairing of basin sideslopes that have been impacted by rilling from local runoff
- Maintaining a clear bleed-off pipe at outlet structures
- Maintain grated inlets at outlet structures
- Maintaining channel plan, profile, and cross-sectional geometry to mitigate against development of unstable channels

## Appendix A: References

**List of References**

**Digital Copies of Reference Materials (See CD included)**

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## *Appendix A Referenced Documents*

1. Wood, Patel &, Inc., *Master Drainage Report for McDowell Mountain Back Bowl.* Revised May 12, 2005.
2. Wood, Patel &, Inc., *Master Drainage Report for Sereno Canyon.* November 15, 2006.
3. JE Fuller/Hydrology & Geomorphology, Inc., *Master Drainage Plan for Sereno Canyon (Amendment I).* January 9, 2012.
4. JE Fuller/Hydrology & Geomorphology, Inc., *Master Drainage Plan for Sereno Canyon (Amendment II).* September 18, 2012.
5. City of Scottsdale, *Design Standards & Policies Manual*, 2018.
6. Flood Control District of Maricopa County, *Drainage Design Manual for Maricopa County, Volume I Hydrology*. August 15, 2013.
7. Flood Control District of Maricopa County, *Drainage Design Manual for Maricopa County, Volume II Hydraulics*. August 15, 2013.
8. Arizona Department of Water Resources, *State Standard for Watercourse System Sediment Balance (SS 5-96).* September 1996.
9. U.S. Army Corps of Engineers, HEC-*RAS River Analysis System, Version 4.1.0.* January, 2010.
10. Flood Control District of Maricopa County, *Drainage Design Management System for Windows (DDMSW), Version 5.3.0.*

## Appendix B: General Documentation

**Vicinity Map**

**Floodplain Map**

**General Site Plan**

**NAOS Exhibit**

**Site Data Sheet**

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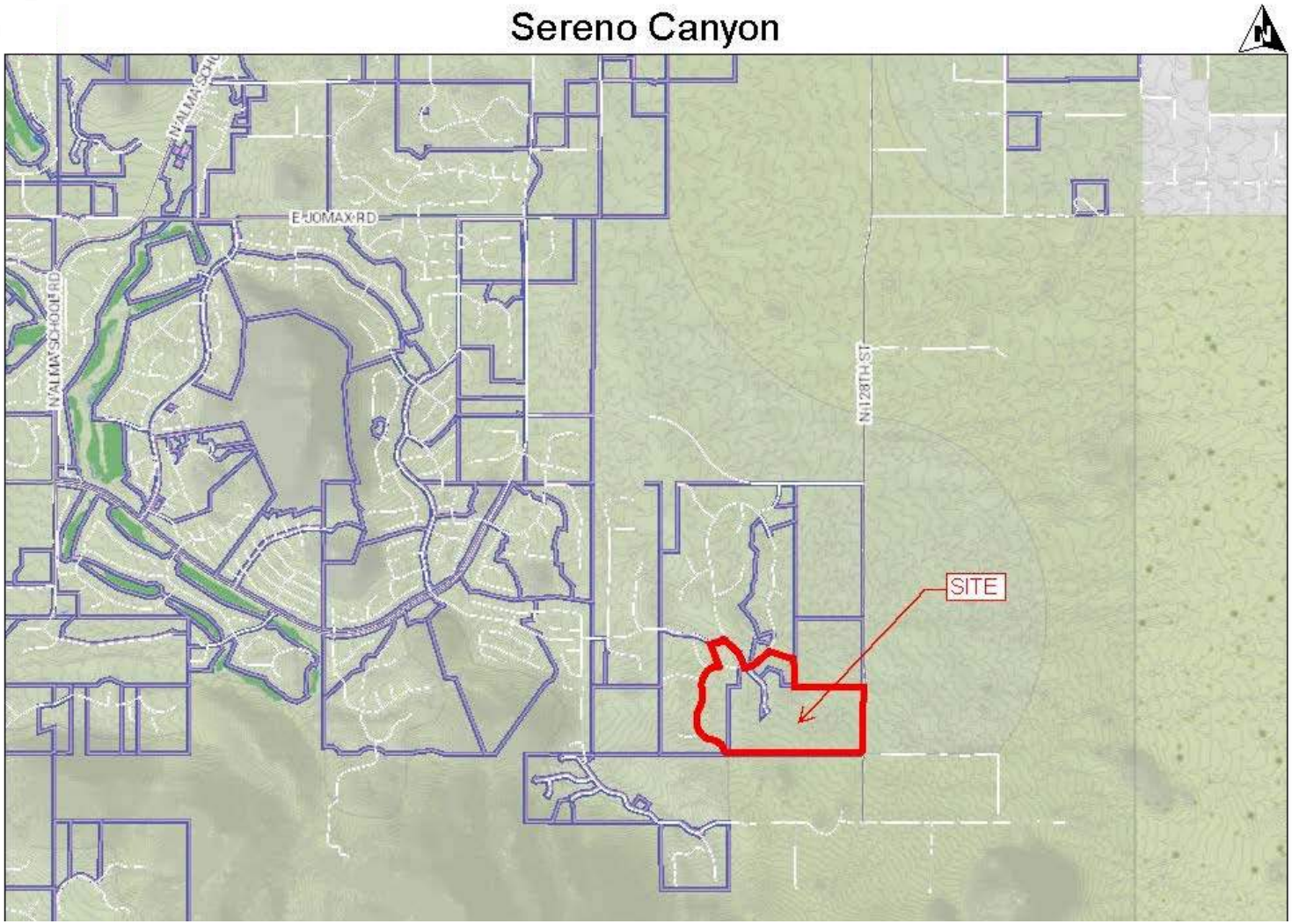


Exhibit A – Vicinity Map
Project Name: Sereno Canyon
Project Number: AC# 385-17

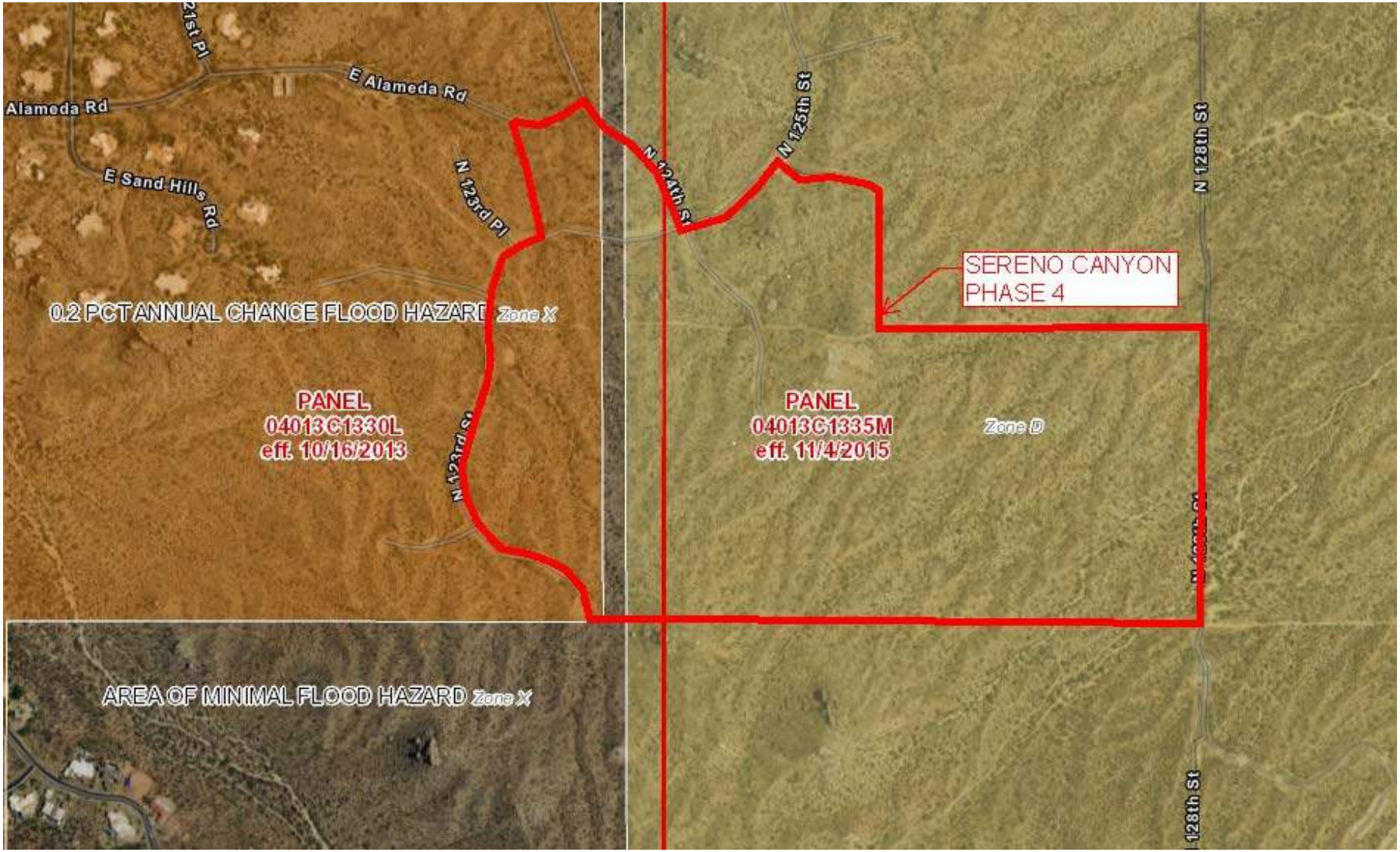


Exhibit B – Floodplain Map
Project Name: Sereno Canyon
Project Number: AC# 385-17

# RESORT CLUB SITE PLAN


*Note: Layout locations shown are conceptual and may change during final design phases*

0 60 120 240 480

SWABACK PARTNERS pllc
Planning, Architecture, and Interior Design
Scottsdale, Arizona | 480.367.2100

Toll Brothers®

## SERENO CANYON PHASE 4

RESORT CLUB DRB Package

SITE PLAN

12.22.2017 | D.R.B. REVIEW

# Sereno Canyon - Phase 4

## NATURAL AREA OPEN SPACE EXHIBIT

N

0 60 120 240 360

1" = 120 HORIZ.

| TRACT TABLE | | | |
|---|---|---|---|
| TRACT NO. | AREA (SF) | AREA (AC) | USE |
| TRACT A | 442553 | 10.16 | PRIVATE STREET, W.S.F.E., P.U.E., E.S.V.A.E. |
| TRACT B | 30377 | 0.70 | PRIVATE STREET, W.S.F.E., P.U.E., E.S.V.A.E. |
| TRACT C | 23823 | 0.55 | PRIVATE STREET, W.S.F.E., P.U.E., E.S.V.A.E. |
| TRACT D | 95317 | 2.19 | PRIVATE STREET, W.S.F.E., P.U.E., E.S.V.A.E. |
| TRACT E | 3659 | 0.08 | PRIVATE STREET, W.S.F.E., P.U.E., E.S.V.A.E. |
| TRACT F | 57164 | 1.31 | PRIVATE STREET, W.S.F.E., P.U.E., E.S.V.A.E. |
| TRACT G | 364349 | 8.36 | P.N.M.A.E., MOUNTAIN HOUSE LODGE, MOUNTAIN HOUSE COTTAGES, W.S.F.E., D.E., OPEN SPACE |
| TRACT H | 147790 | 3.39 | D.E., P.N.M.A.E., W.S.F.E., OPEN SPACE |
| TRACT I | 83167 | 1.91 | D.E., OPEN SPACE |
| TRACT J | 70329 | 1.61 | D.E., OPEN SPACE |
| TRACT K | 606649 | 13.93 | P.N.M.A.E., OPEN SPACE, D.E. |
| TRACT L | 49321 | 1.13 | D.E., OPEN SPACE |
| TRACT LIFT | 1600 | 0.04 | LIFT STATION |
| TRACT M | 431261 | 9.90 | P.N.M.A.E., P.U.E., D.E., SCENIC CORRIDOR, OPEN SPACE |
| TRACT N | 99150 | 2.28 | D.E., OPEN SPACE |
| TRACT O | 38282 | 0.88 | P.N.M.A.E., OPEN SPACE, D.E. |
| TRACT P | 759388 | 17.43 | W.S.F.E., P.N.M.A.E., OPEN SPACE, D.E., SCENIC CORRIDOR, P.U.E. |
| TOTAL | 3,304,179 | 75.85 | |

| SITE DATA | | |
|---|---|---|
| GROSS AREA: | 129.03 ACRES | |
| NET AREA: | 127.82 ACRES | |
| EXISTING ZONING: | R-4R/ESL | |
| PROPOSED ZONING: | UNCHANGED | |
| LOT COUNTS: | ESTATE VACATION HOMES | 5 |
| | LODGE COTTAGES | 29 |
| | RESORT VILLAS | 129 |
| | RESORT PAIRED VILLAS | 44 |
| | RESORT TOWNHOMES | 90 |
| | TOTAL | 297 |
| GROSS DENSITY: | 2.32 DU/AC | |

APNs: 217-01-010, 217-01-011A, 217-01-011C, 217-01-011D, 217-01-016F, 217-01-016K, 217-01-016L, 217-01-161, 217-01-162, 217-01-180 TO 217-01-189, 217-01-194 TO 217-01-199, 217-01-216, 217-01-217

**GROSS OPEN SPACE: 75.85 AC/129.03 AC = 58.8%**

NAOS UNDISTURBED AREA

NAOS RE-VEGETATED AREA

**N.A.O.S. DATA TABLE**

| PHASE | GROSS AREA | REQUIRED NAOS | PROVIDED UNDISTURBED | PROVIDED REVEGETATED | TOTAL |
|---|---|---|---|---|---|
| PHASE 1 | 134 | - | | | |
| PHASE 2 | 47 | - | 122.8 | | 122.8 |
| PHASE 3 | 40 | - | | | |
| **PHASE 1-3 TOTAL** | **221** | **-** | **122.8** | | **122.8** |
| | | | | | |
| PHASE 4 | 129 | - | 32.6 | 21.3 | 53.9 |
| | | | | | |
| **PHASE 1-4 TOTAL** | **350** | **176** | **176.7** | | **176.7** |

SLATER HANIFAN GROUP

TRACT 'A' TRACT 'B' TRACT 'C' TRACT 'D' TRACT 'E' TRACT 'F' TRACT 'G' TRACT 'H' TRACT 'I' TRACT 'J' TRACT 'K' TRACT 'L' TRACT 'M' TRACT 'N' TRACT LIFT

# SITE DATA

| | | |
|---|---|---|
| GROSS AREA: | 129.03 ACRES | |
| NET AREA: | 127.82 ACRES | |
| EXISTING ZONING: | R-4R/ESL | |
| PROPOSED ZONING: | UNCHANGED | |
| LOT COUNTS: | ESTATE VACATION HOMES | 5 |
| | LODGE COTTAGES | 29 |
| | RESORT VILLAS | 129 |
| | RESORT PAIRED VILLAS | 44 |
| | RESORT TOWNHOMES | 90 |
| | TOTAL | 297 |
| GROSS DENSITY: | 2.32 DU/AC | |

APNs: 217-01-010, 217-01-011A, 217-01-011C, 217-01-011D, 217-01-016F, 217-01-016K, 217-01-016L, 217-01-161, 217-01-162, 217-01-180 TO 217-01-189, 217-01-194 TO 217-01-199, 217-01-216, 217-01-217



Slater Hanifan Group, Inc. | 11201 N. Tatum Blvd., Suite 250 | Phoenix, AZ 85028 | 602.687.9664 | www.shg-inc.com

# Appendix C: Hydrology

**DDMSW Summary Tables**

**USGS Soils Data**

**HEC-1 Model Outputs**

**HEC-1 Summary Tables**

**Basin Stage-Storage Calculations**

SLATER HANIFAN GROUP

*"The Benchmark of Our Profession."*

| ID | Method | Duration | 2 Yr | 5 Yr | 10 Yr | 25 Yr | 50 Yr | 100 Yr |
|---|---|---|---|---|---|---|---|---|
| **DEFAULT** | NOAA14 | 5 MIN | 0.315 | 0.424 | 0.505 | 0.611 | 0.690 | 0.769 |
| | NOAA14 | 10 MIN | 0.479 | 0.645 | 0.768 | 0.929 | 1.050 | 1.170 |
| | NOAA14 | 15 MIN | 0.594 | 0.799 | 0.952 | 1.152 | 1.301 | 1.451 |
| | NOAA14 | 30 MIN | 0.800 | 1.076 | 1.282 | 1.552 | 1.753 | 1.953 |
| | NOAA14 | 1 HOUR | 0.990 | 1.332 | 1.587 | 1.920 | 2.169 | 2.418 |
| | NOAA14 | 2 HOUR | 1.125 | 1.492 | 1.769 | 2.142 | 2.421 | 2.707 |
| | NOAA14 | 3 HOUR | 1.194 | 1.554 | 1.840 | 2.235 | 2.547 | 2.866 |
| | NOAA14 | 6 HOUR | 1.421 | 1.803 | 2.108 | 2.523 | 2.845 | 3.178 |
| | NOAA14 | 12 HOUR | 1.706 | 2.144 | 2.491 | 2.962 | 3.324 | 3.695 |
| | NOAA14 | 24 HOUR | 2.118 | 2.755 | 3.268 | 3.995 | 4.579 | 5.196 |

SEE SHAPE FILE "RAINFALL_BASIN" FOR LOCATION.

SOURCE: MDP, AMENDMENTS I & II

| Area ID | Sub Basin Parameters | | | | | | Rainfall Losses | | | | | | Return Period Parameters | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Area (sq mi) | Length (mi) | Slope (ft/mi) | Adj Slope | Time-Area | Kb | IA (in) | DTHETA | PSIF (in) | XKSAT (in/hr) | RTIMP (%) | | 2 Yr | 5 Yr | 10 Yr | 25 Yr | 50 Yr | 100 Yr |
| **Major Basin ID: 01** | | | | | | | | | | | | | | | | | | |
| SB01A | 0.119 | 0.97 | 410.1 | 290.3 | NATURAL | 0.103 | 0.10 | 0.25 | 6.00 | 0.284 | 1 | **Tc (Hrs)** | 0.709* | 0.667* | 0.600* | 0.532* | 0.491* | 0.460 * |
| | | | | | | | | | | | | **Vel (f/s)** | 2.01 | 2.13 | 2.37 | 2.67 | 2.90 | 3.09 |
| | | | | | | | | | | | | **R (Hrs)** | 0.830 | 0.775 | 0.689 | 0.603 | 0.552 | 0.513 |
| SB02A1 | 0.059 | 0.73 | 425.9 | 292.9 | NATURAL | 0.111 | 0.10 | 0.25 | 6.00 | 0.284 | | **Tc (Hrs)** | 0.641* | 0.602* | 0.541* | 0.479* | 0.442* | 0.414 * |
| | | | | | | | | | | | | **Vel (f/s)** | 1.67 | 1.78 | 1.98 | 2.24 | 2.42 | 2.59 |
| | | | | | | | | | | | | **R (Hrs)** | 0.881 | 0.822 | 0.730 | 0.638 | 0.584 | 0.543 |
| SB02A2 | 0.003 | 0.14 | 219.6 | 217.9 | URBAN | 0.038 | 0.25 | 0.25 | 6.00 | 0.216 | 30 | **Tc (Hrs)** | 0.154 | 0.147 | 0.135 | 0.122 | 0.114 | 0.108 |
| | | | | | | | | | | | | **Vel (f/s)** | 1.33 | 1.40 | 1.52 | 1.68 | 1.80 | 1.90 |
| | | | | | | | | | | | | **R (Hrs)** | 0.265 | 0.251 | 0.228 | 0.204 | 0.189 | 0.178 |
| SB02A3 | 0.003 | 0.14 | 264.5 | 248.1 | NATURAL | 0.143 | 0.10 | 0.25 | 6.00 | 0.284 | | **Tc (Hrs)** | 0.337* | 0.317* | 0.284* | 0.252* | 0.233 | 0.218 |
| | | | | | | | | | | | | **Vel (f/s)** | 0.61 | 0.65 | 0.72 | 0.81 | 0.88 | 0.94 |
| | | | | | | | | | | | | **R (Hrs)** | 0.629 | 0.587 | 0.521 | 0.456 | 0.417 | 0.388 |
| SB03A | 0.003 | 0.09 | 288.9 | 259.2 | NATURAL | 0.143 | 0.10 | 0.25 | 6.00 | 0.284 | | **Tc (Hrs)** | 0.266* | 0.250* | 0.225 | 0.199 | 0.184 | 0.172 |
| | | | | | | | | | | | | **Vel (f/s)** | 0.50 | 0.53 | 0.59 | 0.66 | 0.72 | 0.77 |
| | | | | | | | | | | | | **R (Hrs)** | 0.340 | 0.318 | 0.282 | 0.247 | 0.226 | 0.210 |
| SB03A1 | 0.002 | 0.16 | 195.0 | 195.0 | NATURAL | 0.147 | 0.10 | 0.25 | 6.00 | 0.284 | | **Tc (Hrs)** | 0.394* | 0.370* | 0.332* | 0.294* | 0.272* | 0.255 * |
| | | | | | | | | | | | | **Vel (f/s)** | 0.60 | 0.63 | 0.71 | 0.80 | 0.86 | 0.92 |
| | | | | | | | | | | | | **R (Hrs)** | 1.048 | 0.979 | 0.869 | 0.760 | 0.695 | 0.646 |
| SB04A | 0.008 | 0.17 | 241.4 | 234.3 | URBAN | 0.036 | 0.25 | 0.25 | 6.00 | 0.216 | 30 | **Tc (Hrs)** | 0.162 | 0.154 | 0.141 | 0.128 | 0.120 | 0.113 |
| | | | | | | | | | | | | **Vel (f/s)** | 1.54 | 1.62 | 1.77 | 1.95 | 2.08 | 2.21 |
| | | | | | | | | | | | | **R (Hrs)** | 0.186 | 0.176 | 0.160 | 0.143 | 0.133 | 0.125 |
| SB04B | 0.011 | 0.26 | 246.1 | 237.4 | URBAN | 0.035 | 0.25 | 0.25 | 6.00 | 0.216 | 30 | **Tc (Hrs)** | 0.196 | 0.187 | 0.172 | 0.155 | 0.145 | 0.137 |
| | | | | | | | | | | | | **Vel (f/s)** | 1.95 | 2.04 | 2.22 | 2.46 | 2.63 | 2.78 |
| | | | | | | | | | | | | **R (Hrs)** | 0.270 | 0.256 | 0.233 | 0.208 | 0.193 | 0.182 |
| SB04C | 0.002 | 0.13 | 278.1 | 254.6 | NATURAL | 0.137 | 0.10 | 0.25 | 6.00 | 0.269 | 10 | **Tc (Hrs)** | 0.298* | 0.282* | 0.256* | 0.228 | 0.212 | 0.200 |
| | | | | | | | | | | | | **Vel (f/s)** | 0.64 | 0.68 | 0.74 | 0.84 | 0.90 | 0.95 |
| | | | | | | | | | | | | **R (Hrs)** | 0.652 | 0.613 | 0.550 | 0.485 | 0.447 | 0.418 |

| Area ID | Sub Basin Parameters | | | | | | Rainfall Losses | | | | | | Return Period Parameters | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Area (sq mi) | Length (mi) | Slope (ft/mi) | Adj Slope | Time-Area | Kb | IA (in) | DTHETA | PSIF (in) | XKSAT (in/hr) | RTIMP (%) | | 2 Yr | 5 Yr | 10 Yr | 25 Yr | 50 Yr | 100 Yr |
| **Major Basin ID: 01** | | | | | | | | | | | | | | | | | | |
| SB05A | 0.004 | 0.25 | 203.2 | 203.0 | NATURAL | 0.140 | 0.10 | 0.25 | 6.00 | 0.284 | | **Tc (Hrs)** | 0.474* | 0.445* | 0.400* | 0.354* | 0.327* | 0.306 * |
| | | | | | | | | | | | | **Vel (f/s)** | 0.77 | 0.82 | 0.92 | 1.04 | 1.12 | 1.20 |
| | | | | | | | | | | | | **R (Hrs)** | 1.240 | 1.157 | 1.028 | 0.898 | 0.822 | 0.764 |
| SB05B1 | 0.007 | 0.15 | 1154.5 | 313.0 | NATURAL | 0.134 | 0.10 | 0.25 | 6.00 | 0.284 | | **Tc (Hrs)** | 0.314* | 0.295* | 0.265* | 0.235 | 0.217 | 0.203 |
| | | | | | | | | | | | | **Vel (f/s)** | 0.70 | 0.75 | 0.83 | 0.94 | 1.01 | 1.08 |
| | | | | | | | | | | | | **R (Hrs)** | 0.379 | 0.354 | 0.314 | 0.274 | 0.251 | 0.234 |
| SB05B2 | 0.006 | 0.21 | 913.7 | 313.0 | NATURAL | 0.135 | 0.10 | 0.25 | 6.00 | 0.284 | | **Tc (Hrs)** | 0.373* | 0.350* | 0.315* | 0.279* | 0.257* | 0.241 |
| | | | | | | | | | | | | **Vel (f/s)** | 0.83 | 0.88 | 0.98 | 1.10 | 1.20 | 1.28 |
| | | | | | | | | | | | | **R (Hrs)** | 0.655 | 0.612 | 0.543 | 0.475 | 0.434 | 0.404 |
| SB05B3 | 0.004 | 0.16 | 201.3 | 201.2 | URBAN | 0.037 | 0.25 | 0.25 | 6.00 | 0.216 | 30 | **Tc (Hrs)** | 0.167 | 0.159 | 0.146 | 0.132 | 0.123 | 0.117 |
| | | | | | | | | | | | | **Vel (f/s)** | 1.41 | 1.48 | 1.61 | 1.78 | 1.91 | 2.01 |
| | | | | | | | | | | | | **R (Hrs)** | 0.272 | 0.258 | 0.234 | 0.210 | 0.195 | 0.183 |
| SB05B4 | 0.004 | 0.11 | 263.6 | 247.6 | URBAN | 0.089 | 0.18 | 0.25 | 6.00 | 0.251 | 15 | **Tc (Hrs)** | 0.218 | 0.206 | 0.187 | 0.168 | 0.156 | 0.147 |
| | | | | | | | | | | | | **Vel (f/s)** | 0.74 | 0.78 | 0.86 | 0.96 | 1.03 | 1.10 |
| | | | | | | | | | | | | **R (Hrs)** | 0.271 | 0.255 | 0.230 | 0.203 | 0.187 | 0.175 |
| SB06A | 0.006 | 0.12 | 247.5 | 238.3 | URBAN | 0.036 | 0.25 | 0.25 | 6.00 | 0.216 | 30 | **Tc (Hrs)** | 0.135 | 0.129 | 0.118 | 0.107 | 0.100 | 0.095 |
| | | | | | | | | | | | | **Vel (f/s)** | 1.30 | 1.36 | 1.49 | 1.64 | 1.76 | 1.85 |
| | | | | | | | | | | | | **R (Hrs)** | 0.136 | 0.129 | 0.117 | 0.105 | 0.097 | 0.091 |
| SB06B | 0.004 | 0.24 | 169.5 | 169.5 | NATURAL | 0.140 | 0.10 | 0.25 | 6.00 | 0.284 | | **Tc (Hrs)** | 0.491* | 0.461* | 0.415* | 0.367* | 0.339* | 0.318 * |
| | | | | | | | | | | | | **Vel (f/s)** | 0.72 | 0.76 | 0.85 | 0.96 | 1.04 | 1.11 |
| | | | | | | | | | | | | **R (Hrs)** | 1.248 | 1.165 | 1.035 | 0.904 | 0.827 | 0.769 |
| SB06B1 | 0.003 | 0.13 | 423.3 | 292.5 | URBAN | 0.091 | 0.18 | 0.25 | 6.00 | 0.251 | 15 | **Tc (Hrs)** | 0.227 | 0.215 | 0.196 | 0.175 | 0.163 | 0.153 |
| | | | | | | | | | | | | **Vel (f/s)** | 0.84 | 0.89 | 0.97 | 1.09 | 1.17 | 1.25 |
| | | | | | | | | | | | | **R (Hrs)** | 0.383 | 0.361 | 0.324 | 0.287 | 0.265 | 0.248 |
| SB06C1 | 0.015 | 0.31 | 317.3 | 269.1 | NATURAL | 0.080 | 0.10 | 0.25 | 6.00 | 0.272 | 40 | **Tc (Hrs)** | 0.307* | 0.294* | 0.271* | 0.247 | 0.232 | 0.220 |
| | | | | | | | | | | | | **Vel (f/s)** | 1.48 | 1.55 | 1.68 | 1.84 | 1.96 | 2.07 |
| | | | | | | | | | | | | **R (Hrs)** | 0.428 | 0.408 | 0.373 | 0.336 | 0.314 | 0.296 |

| Area ID | Sub Basin Parameters | | | | | | Rainfall Losses | | | | | | Return Period Parameters | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Area (sq mi) | Length (mi) | Slope (ft/mi) | Adj Slope | Time-Area | Kb | IA (in) | DTHETA | PSIF (in) | XKSAT (in/hr) | RTIMP (%) | | 2 Yr | 5 Yr | 10 Yr | 25 Yr | 50 Yr | 100 Yr |
| **Major Basin ID: 01** | | | | | | | | | | | | | | | | | | |
| SB06C2 | 0.020 | 0.51 | 328.4 | 272.3 | NATURAL | 0.122 | 0.10 | 0.25 | 6.00 | 0.284 | | **Tc (Hrs)** | 0.575* | 0.541* | 0.486* | 0.430* | 0.397* | 0.372 * |
| | | | | | | | | | | | | **Vel (f/s)** | 1.30 | 1.38 | 1.54 | 1.74 | 1.88 | 2.01 |
| | | | | | | | | | | | | **R (Hrs)** | 1.087 | 1.014 | 0.901 | 0.787 | 0.720 | 0.670 |
| SB06C3 | 0.005 | 0.13 | 200.0 | 199.9 | URBAN | 0.037 | 0.25 | 0.25 | 6.00 | 0.216 | 30 | **Tc (Hrs)** | 0.151 | 0.144 | 0.132 | 0.119 | 0.111 | 0.105 |
| | | | | | | | | | | | | **Vel (f/s)** | 1.26 | 1.32 | 1.44 | 1.60 | 1.72 | 1.82 |
| | | | | | | | | | | | | **R (Hrs)** | 0.181 | 0.172 | 0.156 | 0.140 | 0.130 | 0.122 |
| SB06D1 | 0.004 | 0.18 | 483.5 | 300.6 | URBAN | 0.109 | 0.10 | 0.25 | 6.00 | 0.276 | 24 | **Tc (Hrs)** | 0.281* | 0.267* | 0.244 | 0.221 | 0.206 | 0.195 |
| | | | | | | | | | | | | **Vel (f/s)** | 0.94 | 0.99 | 1.08 | 1.19 | 1.28 | 1.35 |
| | | | | | | | | | | | | **R (Hrs)** | 0.533 | 0.505 | 0.457 | 0.408 | 0.378 | 0.355 |
| SB06D2 | 0.009 | 0.22 | 203.7 | 203.5 | URBAN | 0.035 | 0.25 | 0.25 | 6.00 | 0.216 | 30 | **Tc (Hrs)** | 0.189 | 0.181 | 0.165 | 0.150 | 0.140 | 0.132 |
| | | | | | | | | | | | | **Vel (f/s)** | 1.71 | 1.78 | 1.96 | 2.15 | 2.30 | 2.44 |
| | | | | | | | | | | | | **R (Hrs)** | 0.255 | 0.242 | 0.219 | 0.196 | 0.182 | 0.171 |
| SB08A | 0.001 | 0.04 | 476.2 | 299.7 | NATURAL | 0.155 | 0.10 | 0.25 | 6.00 | 0.284 | | **Tc (Hrs)** | 0.177 | 0.166 | 0.150 | 0.132 | 0.122 | 0.115 |
| | | | | | | | | | | | | **Vel (f/s)** | 0.33 | 0.35 | 0.39 | 0.44 | 0.48 | 0.51 |
| | | | | | | | | | | | | **R (Hrs)** | 0.212 | 0.197 | 0.175 | 0.153 | 0.140 | 0.130 |
| SB09A | 0.001 | 0.05 | 1047.2 | 313.0 | NATURAL | 0.155 | 0.10 | 0.25 | 6.00 | 0.284 | | **Tc (Hrs)** | 0.195 | 0.184 | 0.165 | 0.146 | 0.135 | 0.126 |
| | | | | | | | | | | | | **Vel (f/s)** | 0.38 | 0.40 | 0.44 | 0.50 | 0.54 | 0.58 |
| | | | | | | | | | | | | **R (Hrs)** | 0.282 | 0.263 | 0.234 | 0.204 | 0.187 | 0.174 |
| SB10A | 0.001 | 0.03 | 233.3 | 228.7 | NATURAL | 0.155 | 0.10 | 0.25 | 6.00 | 0.284 | | **Tc (Hrs)** | 0.167 | 0.157 | 0.141 | 0.125 | 0.115 | 0.108 |
| | | | | | | | | | | | | **Vel (f/s)** | 0.26 | 0.28 | 0.31 | 0.35 | 0.38 | 0.41 |
| | | | | | | | | | | | | **R (Hrs)** | 0.157 | 0.147 | 0.130 | 0.114 | 0.104 | 0.097 |
| SB11A | 0.007 | 0.18 | 288.9 | 259.2 | NATURAL | 0.134 | 0.10 | 0.25 | 6.00 | 0.284 | | **Tc (Hrs)** | 0.364* | 0.342* | 0.308* | 0.273* | 0.252* | 0.236 |
| | | | | | | | | | | | | **Vel (f/s)** | 0.73 | 0.77 | 0.86 | 0.97 | 1.05 | 1.12 |
| | | | | | | | | | | | | **R (Hrs)** | 0.518 | 0.483 | 0.429 | 0.375 | 0.343 | 0.319 |
| SB11A1 | 0.003 | 0.12 | 491.9 | 301.6 | URBAN | 0.091 | 0.18 | 0.25 | 6.00 | 0.251 | 15 | **Tc (Hrs)** | 0.216 | 0.205 | 0.186 | 0.167 | 0.155 | 0.146 |
| | | | | | | | | | | | | **Vel (f/s)** | 0.81 | 0.86 | 0.95 | 1.05 | 1.14 | 1.21 |
| | | | | | | | | | | | | **R (Hrs)** | 0.340 | 0.320 | 0.288 | 0.255 | 0.235 | 0.220 |

| Area ID | Sub Basin Parameters | | | | | | Rainfall Losses | | | | | | Return Period Parameters | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Area (sq mi) | Length (mi) | Slope (ft/mi) | Adj Slope | Time-Area | Kb | IA (in) | DTHETA | PSIF (in) | XKSAT (in/hr) | RTIMP (%) | | 2 Yr | 5 Yr | 10 Yr | 25 Yr | 50 Yr | 100 Yr |
| **Major Basin ID: 01** | | | | | | | | | | | | | | | | | | |
| SB11B | 0.013 | 0.28 | 165.5 | 165.5 | URBAN | 0.076 | 0.18 | 0.25 | 6.00 | 0.246 | 17 | **Tc (Hrs)** | 0.359* | 0.340* | 0.310* | 0.277* | 0.258* | 0.243 |
| | | | | | | | | | | | | **Vel (f/s)** | 1.14 | 1.21 | 1.32 | 1.48 | 1.59 | 1.69 |
| | | | | | | | | | | | | **R (Hrs)** | 0.509 | 0.480 | 0.432 | 0.383 | 0.354 | 0.331 |
| SBE12A | 0.002 | 0.08 | 353.3 | 278.7 | URBAN | 0.039 | 0.23 | 0.25 | 6.00 | 0.206 | 40 | **Tc (Hrs)** | 0.106 | 0.101 | 0.093 | 0.085 | 0.080 | 0.075 |
| | | | | | | | | | | | | **Vel (f/s)** | 1.11 | 1.16 | 1.26 | 1.38 | 1.47 | 1.56 |
| | | | | | | | | | | | | **R (Hrs)** | 0.140 | 0.133 | 0.121 | 0.109 | 0.102 | 0.096 |
| SBE13A | 0.003 | 0.09 | 379.3 | 284.5 | URBAN | 0.038 | 0.25 | 0.25 | 6.00 | 0.216 | 30 | **Tc (Hrs)** | 0.114 | 0.109 | 0.100 | 0.090 | 0.084 | 0.080 |
| | | | | | | | | | | | | **Vel (f/s)** | 1.16 | 1.21 | 1.32 | 1.47 | 1.57 | 1.65 |
| | | | | | | | | | | | | **R (Hrs)** | 0.133 | 0.126 | 0.114 | 0.102 | 0.095 | 0.089 |
| SBE16A | 0.001 | 0.06 | 428.6 | 293.3 | URBAN | 0.041 | 0.30 | 0.25 | 6.00 | 0.216 | 15 | **Tc (Hrs)** | 0.102 | 0.097 | 0.088 | 0.079 | 0.073 | 0.069 |
| | | | | | | | | | | | | **Vel (f/s)** | 0.86 | 0.91 | 1.00 | 1.11 | 1.21 | 1.28 |
| | | | | | | | | | | | | **R (Hrs)** | 0.159 | 0.150 | 0.134 | 0.119 | 0.109 | 0.102 |
| SBE17A | 0.018 | 0.31 | 296.2 | 262.0 | URBAN | 0.033 | 0.26 | 0.25 | 6.00 | 0.207 | 29 | **Tc (Hrs)** | 0.202 | 0.192 | 0.176 | 0.159 | 0.149 | 0.141 |
| | | | | | | | | | | | | **Vel (f/s)** | 2.25 | 2.37 | 2.58 | 2.86 | 3.05 | 3.22 |
| | | | | | | | | | | | | **R (Hrs)** | 0.242 | 0.230 | 0.208 | 0.186 | 0.173 | 0.163 |
| SB17B | 0.015 | 0.23 | 237.1 | 231.4 | URBAN | 0.040 | 0.24 | 0.25 | 6.00 | 0.200 | 29 | **Tc (Hrs)** | 0.199 | 0.189 | 0.173 | 0.157 | 0.147 | 0.139 |
| | | | | | | | | | | | | **Vel (f/s)** | 1.70 | 1.78 | 1.95 | 2.15 | 2.29 | 2.43 |
| | | | | | | | | | | | | **R (Hrs)** | 0.208 | 0.197 | 0.179 | 0.160 | 0.149 | 0.140 |
| SBE18A | 0.001 | 0.05 | 293.5 | 261.0 | URBAN | 0.041 | 0.30 | 0.25 | 6.00 | 0.216 | 15 | **Tc (Hrs)** | 0.097 | 0.092 | 0.083 | 0.074 | 0.069 | 0.065 |
| | | | | | | | | | | | | **Vel (f/s)** | 0.76 | 0.80 | 0.88 | 0.99 | 1.06 | 1.13 |
| | | | | | | | | | | | | **R (Hrs)** | 0.129 | 0.122 | 0.109 | 0.096 | 0.089 | 0.083 |
| SBE19A | 0.001 | 0.04 | 385.7 | 285.8 | URBAN | 0.041 | 0.30 | 0.25 | 6.00 | 0.216 | 15 | **Tc (Hrs)** | 0.084 | 0.080 | 0.072 | 0.065 | 0.060 | 0.056 |
| | | | | | | | | | | | | **Vel (f/s)** | 0.70 | 0.73 | 0.81 | 0.90 | 0.98 | 1.05 |
| | | | | | | | | | | | | **R (Hrs)** | 0.093 | 0.087 | 0.078 | 0.069 | 0.064 | 0.059 |
| SBE20A | 0.001 | 0.04 | 425.0 | 292.8 | URBAN | 0.041 | 0.30 | 0.25 | 6.00 | 0.216 | 15 | **Tc (Hrs)** | 0.084 | 0.079 | 0.072 | 0.064 | 0.060 | 0.056 |
| | | | | | | | | | | | | **Vel (f/s)** | 0.70 | 0.74 | 0.81 | 0.92 | 0.98 | 1.05 |
| | | | | | | | | | | | | **R (Hrs)** | 0.092 | 0.087 | 0.078 | 0.068 | 0.063 | 0.059 |

* Non default value or value out of range

| Area ID | Sub Basin Parameters | | | | | | Rainfall Losses | | | | | | Return Period Parameters | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Area (sq mi) | Length (mi) | Slope (ft/mi) | Adj Slope | Time-Area | Kb | IA (in) | DTHETA | PSIF (in) | XKSAT (in/hr) | RTIMP (%) | | 2 Yr | 5 Yr | 10 Yr | 25 Yr | 50 Yr | 100 Yr |
| **Major Basin ID: 01** | | | | | | | | | | | | | | | | | | |
| SBE21A | 0.001 | 0.05 | 397.9 | 288.1 | URBAN | 0.041 | 0.30 | 0.25 | 6.00 | 0.216 | 15 | **Tc (Hrs)** | 0.094 | 0.089 | 0.081 | 0.072 | 0.067 | 0.063 |
| | | | | | | | | | | | | **Vel (f/s)** | 0.78 | 0.82 | 0.91 | 1.02 | 1.09 | 1.16 |
| | | | | | | | | | | | | **R (Hrs)** | 0.125 | 0.118 | 0.106 | 0.093 | 0.086 | 0.080 |
| SBE22A | 0.007 | 0.18 | 263.7 | 247.6 | URBAN | 0.036 | 0.30 | 0.25 | 6.00 | 0.216 | 15 | **Tc (Hrs)** | 0.175 | 0.165 | 0.150 | 0.134 | 0.124 | 0.117 |
| | | | | | | | | | | | | **Vel (f/s)** | 1.51 | 1.60 | 1.76 | 1.97 | 2.13 | 2.26 |
| | | | | | | | | | | | | **R (Hrs)** | 0.229 | 0.215 | 0.193 | 0.170 | 0.157 | 0.147 |
| SBE23A | 0.006 | 0.14 | 146.0 | 146.0 | URBAN | 0.036 | 0.29 | 0.25 | 6.00 | 0.212 | 21 | **Tc (Hrs)** | 0.176 | 0.168 | 0.153 | 0.137 | 0.128 | 0.120 |
| | | | | | | | | | | | | **Vel (f/s)** | 1.17 | 1.22 | 1.34 | 1.50 | 1.60 | 1.71 |
| | | | | | | | | | | | | **R (Hrs)** | 0.207 | 0.195 | 0.176 | 0.156 | 0.144 | 0.135 |
| SBE23B | 0.004 | 0.12 | 230.8 | 226.8 | URBAN | 0.037 | 0.27 | 0.25 | 6.00 | 0.204 | 28 | **Tc (Hrs)** | 0.140 | 0.133 | 0.122 | 0.110 | 0.103 | 0.097 |
| | | | | | | | | | | | | **Vel (f/s)** | 1.26 | 1.32 | 1.44 | 1.60 | 1.71 | 1.81 |
| | | | | | | | | | | | | **R (Hrs)** | 0.178 | 0.169 | 0.153 | 0.136 | 0.127 | 0.119 |
| SBE23C | 0.053 | 0.54 | 186.0 | 186.0 | URBAN | 0.030 | 0.28 | 0.25 | 6.00 | 0.185 | 13 | **Tc (Hrs)** | 0.297* | 0.281* | 0.254* | 0.227 | 0.211 | 0.199 |
| | | | | | | | | | | | | **Vel (f/s)** | 2.67 | 2.82 | 3.12 | 3.49 | 3.75 | 3.98 |
| | | | | | | | | | | | | **R (Hrs)** | 0.313 | 0.295 | 0.263 | 0.232 | 0.215 | 0.201 |
| SBE23D | 0.041 | 0.47 | 159.5 | 159.5 | URBAN | 0.031 | 0.28 | 0.25 | 6.00 | 0.189 | 15 | **Tc (Hrs)** | 0.294* | 0.278* | 0.252* | 0.226 | 0.210 | 0.198 |
| | | | | | | | | | | | | **Vel (f/s)** | 2.34 | 2.48 | 2.74 | 3.05 | 3.28 | 3.48 |
| | | | | | | | | | | | | **R (Hrs)** | 0.321 | 0.302 | 0.271 | 0.239 | 0.221 | 0.207 |
| SBE23E | 0.005 | 0.17 | 707.8 | 313.0 | URBAN | 0.037 | 0.29 | 0.25 | 6.00 | 0.204 | 19 | **Tc (Hrs)** | 0.156 | 0.148 | 0.135 | 0.121 | 0.113 | 0.106 |
| | | | | | | | | | | | | **Vel (f/s)** | 1.60 | 1.68 | 1.85 | 2.06 | 2.21 | 2.35 |
| | | | | | | | | | | | | **R (Hrs)** | 0.234 | 0.221 | 0.199 | 0.176 | 0.163 | 0.152 |
| SBE24A | 0.007 | 0.19 | 172.0 | 172.0 | URBAN | 0.036 | 0.27 | 0.25 | 6.00 | 0.203 | 29 | **Tc (Hrs)** | 0.188 | 0.179 | 0.164 | 0.148 | 0.139 | 0.131 |
| | | | | | | | | | | | | **Vel (f/s)** | 1.48 | 1.56 | 1.70 | 1.88 | 2.00 | 2.13 |
| | | | | | | | | | | | | **R (Hrs)** | 0.260 | 0.246 | 0.223 | 0.199 | 0.185 | 0.174 |
| SBE24B | 0.005 | 0.17 | 190.8 | 190.8 | URBAN | 0.037 | 0.28 | 0.25 | 6.00 | 0.179 | 15 | **Tc (Hrs)** | 0.182 | 0.173 | 0.156 | 0.140 | 0.131 | 0.123 |
| | | | | | | | | | | | | **Vel (f/s)** | 1.37 | 1.44 | 1.60 | 1.78 | 1.90 | 2.03 |
| | | | | | | | | | | | | **R (Hrs)** | 0.278 | 0.262 | 0.234 | 0.207 | 0.192 | 0.180 |

| Area ID | Sub Basin Parameters | | | | | | Rainfall Losses | | | | | | Return Period Parameters | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Area (sq mi) | Length (mi) | Slope (ft/mi) | Adj Slope | Time-Area | Kb | IA (in) | DTHETA | PSIF (in) | XKSAT (in/hr) | RTIMP (%) | | 2 Yr | 5 Yr | 10 Yr | 25 Yr | 50 Yr | 100 Yr |
| **Major Basin ID: 01** | | | | | | | | | | | | | | | | | | |
| SBE24C | 0.015 | 0.26 | 175.1 | 175.1 | URBAN | 0.034 | 0.28 | 0.25 | 6.00 | 0.188 | 17 | **Tc (Hrs)** | 0.221 | 0.209 | 0.190 | 0.170 | 0.159 | 0.150 |
| | | | | | | | | | | | | **Vel (f/s)** | 1.73 | 1.82 | 2.01 | 2.24 | 2.40 | 2.54 |
| | | | | | | | | | | | | **R (Hrs)** | 0.258 | 0.243 | 0.218 | 0.193 | 0.179 | 0.168 |
| SBE24D | 0.010 | 0.15 | 198.6 | 198.6 | URBAN | 0.035 | 0.30 | 0.25 | 6.00 | 0.186 | 6 | **Tc (Hrs)** | 0.172 | 0.162 | 0.145 | 0.129 | 0.120 | 0.113 |
| | | | | | | | | | | | | **Vel (f/s)** | 1.28 | 1.36 | 1.52 | 1.71 | 1.83 | 1.95 |
| | | | | | | | | | | | | **R (Hrs)** | 0.158 | 0.148 | 0.132 | 0.115 | 0.106 | 0.099 |
| SBE25A | 0.003 | 0.10 | 252.5 | 241.4 | URBAN | 0.038 | 0.25 | 0.25 | 6.00 | 0.195 | 38 | **Tc (Hrs)** | 0.122 | 0.117 | 0.107 | 0.098 | 0.092 | 0.087 |
| | | | | | | | | | | | | **Vel (f/s)** | 1.20 | 1.25 | 1.37 | 1.50 | 1.59 | 1.69 |
| | | | | | | | | | | | | **R (Hrs)** | 0.156 | 0.148 | 0.135 | 0.122 | 0.113 | 0.107 |
| SBE25B | 0.006 | 0.17 | 178.4 | 178.4 | URBAN | 0.036 | 0.29 | 0.25 | 6.00 | 0.212 | 20 | **Tc (Hrs)** | 0.183 | 0.174 | 0.158 | 0.142 | 0.132 | 0.125 |
| | | | | | | | | | | | | **Vel (f/s)** | 1.36 | 1.43 | 1.58 | 1.76 | 1.89 | 1.99 |
| | | | | | | | | | | | | **R (Hrs)** | 0.252 | 0.238 | 0.214 | 0.190 | 0.175 | 0.164 |
| SBE25C | 0.005 | 0.12 | 229.5 | 225.8 | URBAN | 0.037 | 0.27 | 0.25 | 6.00 | 0.177 | 17 | **Tc (Hrs)** | 0.144 | 0.136 | 0.124 | 0.111 | 0.104 | 0.098 |
| | | | | | | | | | | | | **Vel (f/s)** | 1.22 | 1.29 | 1.42 | 1.59 | 1.69 | 1.80 |
| | | | | | | | | | | | | **R (Hrs)** | 0.162 | 0.152 | 0.136 | 0.121 | 0.112 | 0.105 |
| SBE26A | 0.010 | 0.24 | 205.5 | 205.2 | URBAN | 0.035 | 0.26 | 0.25 | 6.00 | 0.200 | 31 | **Tc (Hrs)** | 0.196 | 0.187 | 0.171 | 0.155 | 0.145 | 0.137 |
| | | | | | | | | | | | | **Vel (f/s)** | 1.80 | 1.88 | 2.06 | 2.27 | 2.43 | 2.57 |
| | | | | | | | | | | | | **R (Hrs)** | 0.267 | 0.253 | 0.230 | 0.205 | 0.191 | 0.180 |
| SBE27A | 0.002 | 0.08 | 275.6 | 253.5 | URBAN | 0.039 | 0.30 | 0.25 | 6.00 | 0.216 | 15 | **Tc (Hrs)** | 0.120 | 0.114 | 0.103 | 0.092 | 0.086 | 0.081 |
| | | | | | | | | | | | | **Vel (f/s)** | 0.98 | 1.03 | 1.14 | 1.28 | 1.36 | 1.45 |
| | | | | | | | | | | | | **R (Hrs)** | 0.162 | 0.152 | 0.137 | 0.121 | 0.111 | 0.104 |
| SBE28A | 0.013 | 0.22 | 194.4 | 194.4 | URBAN | 0.034 | 0.29 | 0.25 | 6.00 | 0.200 | 17 | **Tc (Hrs)** | 0.198 | 0.188 | 0.171 | 0.153 | 0.142 | 0.134 |
| | | | | | | | | | | | | **Vel (f/s)** | 1.63 | 1.72 | 1.89 | 2.11 | 2.27 | 2.41 |
| | | | | | | | | | | | | **R (Hrs)** | 0.217 | 0.205 | 0.184 | 0.163 | 0.150 | 0.141 |
| SBE29A | 0.015 | 0.21 | 195.1 | 195.1 | URBAN | 0.075 | 0.20 | 0.25 | 6.00 | 0.228 | 10 | **Tc (Hrs)** | 0.300* | 0.283* | 0.257* | 0.229 | 0.212 | 0.200 |
| | | | | | | | | | | | | **Vel (f/s)** | 1.03 | 1.09 | 1.20 | 1.34 | 1.45 | 1.54 |
| | | | | | | | | | | | | **R (Hrs)** | 0.305 | 0.287 | 0.257 | 0.226 | 0.208 | 0.195 |

* Non default value or value out of range

| Area ID | Sub Basin Parameters | | | | | | Rainfall Losses | | | | | | Return Period Parameters | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Area (sq mi) | Length (mi) | Slope (ft/mi) | Adj Slope | Time-Area | Kb | IA (in) | DTHETA | PSIF (in) | XKSAT (in/hr) | RTIMP (%) | | 2 Yr | 5 Yr | 10 Yr | 25 Yr | 50 Yr | 100 Yr |
| **Major Basin ID: 01** | | | | | | | | | | | | | | | | | | |
| SBW01 A | 0.002 | 0.08 | 1020.0 | 313.0 | URBAN | 0.127 | 0.14 | 0.25 | 6.00 | 0.264 | 1 | **Tc (Hrs)** | 0.221 | 0.208 | 0.187 | 0.165 | 0.153 | 0.143 |
| | | | | | | | | | | | | **Vel (f/s)** | 0.53 | 0.56 | 0.63 | 0.71 | 0.77 | 0.82 |
| | | | | | | | | | | | | **R (Hrs)** | 0.317 | 0.296 | 0.263 | 0.230 | 0.210 | 0.196 |
| SBW02 A | 0.007 | 0.18 | 565.6 | 310.6 | URBAN | 0.094 | 0.18 | 0.25 | 6.00 | 0.243 | 2 | **Tc (Hrs)** | 0.281* | 0.265* | 0.238 | 0.211 | 0.195 | 0.183 |
| | | | | | | | | | | | | **Vel (f/s)** | 0.94 | 1.00 | 1.11 | 1.25 | 1.35 | 1.44 |
| | | | | | | | | | | | | **R (Hrs)** | 0.388 | 0.363 | 0.323 | 0.282 | 0.259 | 0.241 |
| SBW04 A | 0.002 | 0.07 | 746.4 | 313.0 | URBAN | 0.039 | 0.30 | 0.25 | 6.00 | 0.183 | 5 | **Tc (Hrs)** | 0.108 | 0.102 | 0.091 | 0.081 | 0.075 | 0.071 |
| | | | | | | | | | | | | **Vel (f/s)** | 0.95 | 1.01 | 1.13 | 1.27 | 1.37 | 1.45 |
| | | | | | | | | | | | | **R (Hrs)** | 0.129 | 0.121 | 0.107 | 0.094 | 0.086 | 0.080 |
| SBW05 A | 0.010 | 0.20 | 430.0 | 293.5 | URBAN | 0.035 | 0.29 | 0.25 | 6.00 | 0.191 | 11 | **Tc (Hrs)** | 0.172 | 0.163 | 0.147 | 0.131 | 0.122 | 0.115 |
| | | | | | | | | | | | | **Vel (f/s)** | 1.71 | 1.80 | 2.00 | 2.24 | 2.40 | 2.55 |
| | | | | | | | | | | | | **R (Hrs)** | 0.200 | 0.188 | 0.168 | 0.148 | 0.136 | 0.127 |
| SBW06 A | 0.004 | 0.12 | 442.1 | 295.3 | URBAN | 0.037 | 0.29 | 0.25 | 6.00 | 0.185 | 11 | **Tc (Hrs)** | 0.137 | 0.129 | 0.116 | 0.104 | 0.097 | 0.091 |
| | | | | | | | | | | | | **Vel (f/s)** | 1.28 | 1.36 | 1.52 | 1.69 | 1.81 | 1.93 |
| | | | | | | | | | | | | **R (Hrs)** | 0.173 | 0.163 | 0.145 | 0.128 | 0.118 | 0.110 |
| SBW07 A | 0.013 | 0.30 | 289.8 | 259.6 | URBAN | 0.034 | 0.27 | 0.25 | 6.00 | 0.197 | 22 | **Tc (Hrs)** | 0.207 | 0.196 | 0.179 | 0.161 | 0.150 | 0.142 |
| | | | | | | | | | | | | **Vel (f/s)** | 2.13 | 2.24 | 2.46 | 2.73 | 2.93 | 3.10 |
| | | | | | | | | | | | | **R (Hrs)** | 0.292 | 0.276 | 0.249 | 0.221 | 0.205 | 0.192 |
| SB07B | 0.007 | 0.22 | 563.4 | 310.3 | NATURAL | 0.134 | 0.10 | 0.25 | 6.00 | 0.284 | | **Tc (Hrs)** | 0.381* | 0.358* | 0.322* | 0.285* | 0.263* | 0.246 |
| | | | | | | | | | | | | **Vel (f/s)** | 0.85 | 0.90 | 1.00 | 1.13 | 1.23 | 1.31 |
| | | | | | | | | | | | | **R (Hrs)** | 0.639 | 0.596 | 0.529 | 0.463 | 0.423 | 0.394 |
| SBW07 C | 0.005 | 0.16 | 609.0 | 313.0 | URBAN | 0.084 | 0.21 | 0.25 | 6.00 | 0.230 | 3 | **Tc (Hrs)** | 0.248 | 0.233 | 0.210 | 0.186 | 0.172 | 0.162 |
| | | | | | | | | | | | | **Vel (f/s)** | 0.95 | 1.01 | 1.12 | 1.26 | 1.36 | 1.45 |
| | | | | | | | | | | | | **R (Hrs)** | 0.372 | 0.348 | 0.310 | 0.270 | 0.248 | 0.231 |
| SBW08 A | 0.009 | 0.17 | 514.5 | 304.2 | URBAN | 0.035 | 0.27 | 0.25 | 6.00 | 0.185 | 21 | **Tc (Hrs)** | 0.150 | 0.143 | 0.130 | 0.117 | 0.109 | 0.103 |
| | | | | | | | | | | | | **Vel (f/s)** | 1.66 | 1.74 | 1.92 | 2.13 | 2.29 | 2.42 |
| | | | | | | | | | | | | **R (Hrs)** | 0.160 | 0.151 | 0.136 | 0.121 | 0.112 | 0.105 |

* Non default value or value out of range

| Area ID | Sub Basin Parameters: Area (sq mi) | Length (mi) | Slope (ft/mi) | Adj Slope | Time-Area | Kb | Rainfall Losses: IA (in) | DTHETA | PSIF (in) | XKSAT (in/hr) | RTIMP (%) | | Return Period Parameters: 2 Yr | 5 Yr | 10 Yr | 25 Yr | 50 Yr | 100 Yr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Major Basin ID: 01** | | | | | | | | | | | | | | | | | | |
| SBW09A | 0.008 | 0.22 | 255.8 | 243.3 | URBAN | 0.036 | 0.27 | 0.25 | 6.00 | 0.197 | 24 | **Tc (Hrs)** | 0.185 | 0.176 | 0.160 | 0.144 | 0.135 | 0.127 |
| | | | | | | | | | | | | **Vel (f/s)** | 1.74 | 1.83 | 2.02 | 2.24 | 2.39 | 2.54 |
| | | | | | | | | | | | | **R (Hrs)** | 0.265 | 0.251 | 0.226 | 0.201 | 0.187 | 0.176 |
| SBW09B | 0.005 | 0.11 | 367.0 | 281.9 | URBAN | 0.037 | 0.27 | 0.25 | 6.00 | 0.204 | 29 | **Tc (Hrs)** | 0.125 | 0.119 | 0.109 | 0.098 | 0.092 | 0.087 |
| | | | | | | | | | | | | **Vel (f/s)** | 1.29 | 1.36 | 1.48 | 1.65 | 1.75 | 1.85 |
| | | | | | | | | | | | | **R (Hrs)** | 0.129 | 0.122 | 0.111 | 0.099 | 0.092 | 0.086 |
| SB09C | 0.036 | 0.53 | 309.9 | 266.8 | NATURAL | 0.116 | 0.10 | 0.25 | 6.00 | 0.284 | | **Tc (Hrs)** | 0.575* | 0.540* | 0.486* | 0.430* | 0.397* | 0.372 * |
| | | | | | | | | | | | | **Vel (f/s)** | 1.35 | 1.44 | 1.60 | 1.81 | 1.96 | 2.09 |
| | | | | | | | | | | | | **R (Hrs)** | 0.801 | 0.748 | 0.664 | 0.580 | 0.531 | 0.494 |
| SB09D1 | 0.009 | 0.18 | 373.6 | 283.3 | URBAN | 0.035 | 0.25 | 0.25 | 6.00 | 0.216 | 30 | **Tc (Hrs)** | 0.155 | 0.147 | 0.135 | 0.122 | 0.114 | 0.108 |
| | | | | | | | | | | | | **Vel (f/s)** | 1.70 | 1.80 | 1.96 | 2.16 | 2.32 | 2.44 |
| | | | | | | | | | | | | **R (Hrs)** | 0.173 | 0.164 | 0.149 | 0.133 | 0.124 | 0.116 |
| SB09D2 | 0.005 | 0.22 | 189.5 | 189.5 | URBAN | 0.037 | 0.25 | 0.25 | 6.00 | 0.216 | 30 | **Tc (Hrs)** | 0.199 | 0.190 | 0.174 | 0.157 | 0.147 | 0.139 |
| | | | | | | | | | | | | **Vel (f/s)** | 1.62 | 1.70 | 1.85 | 2.06 | 2.20 | 2.32 |
| | | | | | | | | | | | | **R (Hrs)** | 0.377 | 0.357 | 0.324 | 0.290 | 0.269 | 0.253 |
| SB09E | 0.005 | 0.18 | 445.1 | 295.7 | NATURAL | 0.137 | 0.10 | 0.25 | 6.00 | 0.284 | | **Tc (Hrs)** | 0.354* | 0.333* | 0.299* | 0.265* | 0.244 | 0.229 |
| | | | | | | | | | | | | **Vel (f/s)** | 0.75 | 0.79 | 0.88 | 1.00 | 1.08 | 1.15 |
| | | | | | | | | | | | | **R (Hrs)** | 0.607 | 0.567 | 0.503 | 0.440 | 0.402 | 0.374 |
| SB10AW | 0.029 | 0.31 | 176.8 | 176.8 | URBAN | 0.032 | 0.26 | 0.25 | 6.00 | 0.189 | 28 | **Tc (Hrs)** | 0.224 | 0.213 | 0.195 | 0.176 | 0.165 | 0.156 |
| | | | | | | | | | | | | **Vel (f/s)** | 2.03 | 2.13 | 2.33 | 2.58 | 2.76 | 2.91 |
| | | | | | | | | | | | | **R (Hrs)** | 0.207 | 0.196 | 0.177 | 0.158 | 0.147 | 0.139 |
| SB10A1 | 0.005 | 0.14 | 243.5 | 235.7 | URBAN | 0.037 | 0.25 | 0.25 | 6.00 | 0.216 | 30 | **Tc (Hrs)** | 0.149 | 0.142 | 0.130 | 0.117 | 0.110 | 0.104 |
| | | | | | | | | | | | | **Vel (f/s)** | 1.38 | 1.45 | 1.58 | 1.75 | 1.87 | 1.97 |
| | | | | | | | | | | | | **R (Hrs)** | 0.190 | 0.180 | 0.163 | 0.146 | 0.135 | 0.127 |
| SB10B | 0.009 | 0.23 | 221.7 | 219.6 | URBAN | 0.035 | 0.26 | 0.25 | 6.00 | 0.195 | 33 | **Tc (Hrs)** | 0.186 | 0.178 | 0.163 | 0.148 | 0.138 | 0.131 |
| | | | | | | | | | | | | **Vel (f/s)** | 1.81 | 1.90 | 2.07 | 2.28 | 2.44 | 2.58 |
| | | | | | | | | | | | | **R (Hrs)** | 0.259 | 0.246 | 0.223 | 0.200 | 0.186 | 0.175 |

| Area ID | Sub Basin Parameters | | | | | | Rainfall Losses | | | | | | Return Period Parameters | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Area (sq mi) | Length (mi) | Slope (ft/mi) | Adj Slope | Time-Area | Kb | IA (in) | DTHETA | PSIF (in) | XKSAT (in/hr) | RTIMP (%) | | 2 Yr | 5 Yr | 10 Yr | 25 Yr | 50 Yr | 100 Yr |
| **Major Basin ID: 01** | | | | | | | | | | | | | | | | | | |
| SB10C1 | 0.009 | 0.23 | 179.4 | 179.4 | URBAN | 0.035 | 0.25 | 0.25 | 6.00 | 0.216 | 30 | **Tc (Hrs)** | 0.201 | 0.192 | 0.176 | 0.159 | 0.149 | 0.141 |
| | | | | | | | | | | | | **Vel (f/s)** | 1.68 | 1.76 | 1.92 | 2.12 | 2.26 | 2.39 |
| | | | | | | | | | | | | **R (Hrs)** | 0.283 | 0.268 | 0.243 | 0.217 | 0.202 | 0.190 |
| SB10C2 | 0.008 | 0.22 | 144.2 | 144.2 | URBAN | 0.036 | 0.25 | 0.25 | 6.00 | 0.216 | 30 | **Tc (Hrs)** | 0.214 | 0.204 | 0.187 | 0.169 | 0.158 | 0.150 |
| | | | | | | | | | | | | **Vel (f/s)** | 1.51 | 1.58 | 1.73 | 1.91 | 2.04 | 2.15 |
| | | | | | | | | | | | | **R (Hrs)** | 0.312 | 0.296 | 0.268 | 0.240 | 0.223 | 0.210 |
| SB10C3 | 0.004 | 0.14 | 156.5 | 156.5 | NATURAL | 0.119 | 0.10 | 0.25 | 6.00 | 0.254 | 20 | **Tc (Hrs)** | 0.319* | 0.303* | 0.277* | 0.249 | 0.233 | 0.220 |
| | | | | | | | | | | | | **Vel (f/s)** | 0.64 | 0.68 | 0.74 | 0.82 | 0.88 | 0.93 |
| | | | | | | | | | | | | **R (Hrs)** | 0.503 | 0.475 | 0.429 | 0.382 | 0.354 | 0.332 |
| SBW11A | 0.001 | 0.03 | 741.9 | 313.0 | URBAN | 0.041 | 0.30 | 0.25 | 6.00 | 0.183 | 5 | **Tc (Hrs)** | 0.073 | 0.068 | 0.061 | 0.054 | 0.051 | 0.048 |
| | | | | | | | | | | | | **Vel (f/s)** | 0.60 | 0.65 | 0.72 | 0.81 | 0.86 | 0.92 |
| | | | | | | | | | | | | **R (Hrs)** | 0.062 | 0.058 | 0.052 | 0.045 | 0.042 | 0.039 |
| SBW12A | 0.017 | 0.19 | 275.1 | 253.3 | URBAN | 0.034 | 0.29 | 0.25 | 6.00 | 0.191 | 13 | **Tc (Hrs)** | 0.172 | 0.162 | 0.147 | 0.131 | 0.122 | 0.115 |
| | | | | | | | | | | | | **Vel (f/s)** | 1.62 | 1.72 | 1.90 | 2.13 | 2.28 | 2.42 |
| | | | | | | | | | | | | **R (Hrs)** | 0.141 | 0.133 | 0.119 | 0.105 | 0.097 | 0.091 |
| SBW13A | 0.001 | 0.04 | 607.1 | 313.0 | URBAN | 0.041 | 0.30 | 0.25 | 6.00 | 0.183 | 5 | **Tc (Hrs)** | 0.084 | 0.079 | 0.071 | 0.063 | 0.058 | 0.055 |
| | | | | | | | | | | | | **Vel (f/s)** | 0.70 | 0.74 | 0.83 | 0.93 | 1.01 | 1.07 |
| | | | | | | | | | | | | **R (Hrs)** | 0.092 | 0.086 | 0.077 | 0.067 | 0.062 | 0.058 |
| SBW14A | 0.009 | 0.12 | 286.3 | 258.1 | URBAN | 0.047 | 0.28 | 0.25 | 6.00 | 0.197 | 4 | **Tc (Hrs)** | 0.167 | 0.157 | 0.141 | 0.125 | 0.116 | 0.109 |
| | | | | | | | | | | | | **Vel (f/s)** | 1.05 | 1.12 | 1.25 | 1.41 | 1.52 | 1.61 |
| | | | | | | | | | | | | **R (Hrs)** | 0.136 | 0.128 | 0.113 | 0.099 | 0.091 | 0.085 |

| Area ID | Book Number | Map Unit | Soil ID | Area (sq mi) | Area (%) | XKSAT | Rock Percent (%) | Effective Rock (%) | Comments |
|---|---|---|---|---|---|---|---|---|---|
| **Major Basin ID: 01** | | | | | | | | | |
| **SB01A** | 645 | 61 | 64561 | 0.112 | 94.10 | 0.150 | - | 100 | |
| | 645 | 63 | 64563 | 0.007 | 5.90 | 0.140 | 25.00 | 100 | |
| **SB02A1** | 645 | 61 | 64561 | 0.059 | 100.00 | 0.150 | - | 100 | |
| **SB02A2** | 645 | 61 | 64561 | 0.003 | 100.00 | 0.150 | - | 100 | |
| **SB02A3** | 645 | 61 | 64561 | 0.003 | 100.00 | 0.150 | - | 100 | |
| **SB03A** | 645 | 61 | 64561 | 0.003 | 100.00 | 0.150 | - | 100 | |
| **SB03A1** | 645 | 61 | 64561 | 0.002 | 100.00 | 0.150 | - | 100 | |
| **SB04A** | 645 | 61 | 64561 | 0.008 | 100.00 | 0.150 | - | 100 | |
| **SB04B** | 645 | 61 | 64561 | 0.011 | 100.00 | 0.150 | - | 100 | |
| **SB04C** | 645 | 61 | 64561 | 0.002 | 100.00 | 0.150 | - | 100 | |
| **SB05A** | 645 | 61 | 64561 | 0.004 | 100.00 | 0.150 | - | 100 | |
| **SB05B1** | 645 | 61 | 64561 | 0.007 | 100.00 | 0.150 | - | 100 | |
| **SB05B2** | 645 | 61 | 64561 | 0.006 | 100.00 | 0.150 | - | 100 | |
| **SB05B3** | 645 | 61 | 64561 | 0.004 | 100.00 | 0.150 | - | 100 | |
| **SB05B4** | 645 | 61 | 64561 | 0.004 | 100.00 | 0.150 | - | 100 | |
| **SB06A** | 645 | 61 | 64561 | 0.006 | 100.00 | 0.150 | - | 100 | |
| **SB06B** | 645 | 61 | 64561 | 0.004 | 100.00 | 0.150 | - | 100 | |
| **SB06B1** | 645 | 61 | 64561 | 0.003 | 100.00 | 0.150 | - | 100 | |
| **SB06C1** | 645 | 61 | 64561 | 0.015 | 100.00 | 0.150 | - | 100 | |
| **SB06C2** | 645 | 61 | 64561 | 0.020 | 100.00 | 0.150 | - | 100 | |
| **SB06C3** | 645 | 61 | 64561 | 0.005 | 100.00 | 0.150 | - | 100 | |
| **SB06D1** | 645 | 61 | 64561 | 0.004 | 100.00 | 0.150 | - | 100 | |
| **SB06D2** | 645 | 61 | 64561 | 0.009 | 100.00 | 0.150 | - | 100 | |
| **SB07B** | 645 | 61 | 64561 | 0.007 | 100.00 | 0.150 | - | 100 | |
| **SB08A** | 645 | 61 | 64561 | 0.001 | 100.00 | 0.150 | - | 100 | |
| **SB09A** | 645 | 61 | 64561 | 0.001 | 100.00 | 0.150 | - | 100 | |
| **SB09C** | 645 | 61 | 64561 | 0.036 | 100.00 | 0.150 | - | 100 | |
| **SB09D1** | 645 | 61 | 64561 | 0.009 | 100.00 | 0.150 | - | 100 | |
| **SB09D2** | 645 | 61 | 64561 | 0.005 | 100.00 | 0.150 | - | 100 | |
| **SB09E** | 645 | 61 | 64561 | 0.005 | 100.00 | 0.150 | - | 100 | |
| **SB10A** | 645 | 61 | 64561 | 0.001 | 100.00 | 0.150 | - | 100 | |
| **SB10A1** | 645 | 61 | 64561 | 0.005 | 100.00 | 0.150 | - | 100 | |
| **SB10AW** | 645 | 61 | 64561 | 0.029 | 100.00 | 0.150 | - | 100 | |
| **SB10B** | 645 | 61 | 64561 | 0.009 | 100.00 | 0.150 | - | 100 | |
| **SB10C1** | 645 | 61 | 64561 | 0.009 | 100.00 | 0.150 | - | 100 | |
| **SB10C2** | 645 | 61 | 64561 | 0.008 | 100.00 | 0.150 | - | 100 | |
| **SB10C3** | 645 | 61 | 64561 | 0.004 | 100.00 | 0.150 | - | 100 | |
| **SB11A** | 645 | 61 | 64561 | 0.007 | 100.00 | 0.150 | - | 100 | |
| **SB11A1** | 645 | 61 | 64561 | 0.003 | 100.00 | 0.150 | - | 100 | |
| **SB11B** | 645 | 61 | 64561 | 0.013 | 100.00 | 0.150 | - | 100 | |
| **SB17B** | 645 | 61 | 64561 | 0.015 | 100.00 | 0.150 | - | 100 | |
| **SBE01A** | 645 | 61 | 64561 | 0.112 | 94.20 | 0.150 | - | 100 | |
| | 645 | 63 | 64563 | 0.007 | 5.80 | 0.140 | 25.00 | 100 | |
| **SBE12A** | 645 | 61 | 64561 | 0.002 | 100.00 | 0.150 | - | 100 | |
| **SBE13A** | 645 | 61 | 64561 | 0.003 | 100.00 | 0.150 | - | 100 | |
| **SBE16A** | 645 | 61 | 64561 | 0.001 | 100.00 | 0.150 | - | 100 | |
| **SBE17A** | 645 | 61 | 64561 | 0.018 | 100.00 | 0.150 | - | 100 | |

| Area ID | Book Number | Map Unit | Soil ID | Area (sq mi) | Area (%) | XKSAT | Rock Percent (%) | Effective Rock (%) | Comments |
|---|---|---|---|---|---|---|---|---|---|
| **Major Basin ID: 01** | | | | | | | | | |
| **SBE18A** | 645 | 61 | 64561 | 0.001 | 100.00 | 0.150 | - | 100 | |
| **SBE19A** | 645 | 61 | 64561 | 0.001 | 100.00 | 0.150 | - | 100 | |
| **SBE20A** | 645 | 61 | 64561 | 0.001 | 100.00 | 0.150 | - | 100 | |
| **SBE21A** | 645 | 61 | 64561 | 0.001 | 100.00 | 0.150 | - | 100 | |
| **SBE22A** | 645 | 61 | 64561 | 0.007 | 100.00 | 0.150 | - | 100 | |
| **SBE23A** | 645 | 61 | 64561 | 0.006 | 100.00 | 0.150 | - | 100 | |
| **SBE23B** | 645 | 61 | 64561 | 0.004 | 100.00 | 0.150 | - | 100 | |
| **SBE23C** | 645 | 61 | 64561 | 0.053 | 100.00 | 0.150 | - | 100 | |
| **SBE23D** | 645 | 61 | 64561 | 0.041 | 100.00 | 0.150 | - | 100 | |
| **SBE23E** | 645 | 61 | 64561 | 0.005 | 100.00 | 0.150 | - | 100 | |
| **SBE24A** | 645 | 61 | 64561 | 0.007 | 100.00 | 0.150 | - | 100 | |
| **SBE24B** | 645 | 61 | 64561 | 0.005 | 100.00 | 0.150 | - | 100 | |
| **SBE24C** | 645 | 61 | 64561 | 0.015 | 100.00 | 0.150 | - | 100 | |
| **SBE24D** | 645 | 61 | 64561 | 0.010 | 100.00 | 0.150 | - | 100 | |
| **SBE25A** | 645 | 61 | 64561 | 0.003 | 100.00 | 0.150 | - | 100 | |
| **SBE25B** | 645 | 61 | 64561 | 0.006 | 100.00 | 0.150 | - | 100 | |
| **SBE25C** | 645 | 61 | 64561 | 0.005 | 100.00 | 0.150 | - | 100 | |
| **SBE26A** | 645 | 61 | 64561 | 0.011 | 100.00 | 0.150 | - | 100 | |
| **SBE27A** | 645 | 61 | 64561 | 0.002 | 100.00 | 0.150 | - | 100 | |
| **SBE28A** | 645 | 61 | 64561 | 0.013 | 100.00 | 0.150 | - | 100 | |
| **SBE29A** | 645 | 61 | 64561 | 0.015 | 100.00 | 0.150 | - | 100 | |
| **SBW01A** | 645 | 61 | 64561 | 0.002 | 100.00 | 0.150 | - | 100 | |
| **SBW02A** | 645 | 61 | 64561 | 0.007 | 100.00 | 0.150 | - | 100 | |
| **SBW04A** | 645 | 61 | 64561 | 0.002 | 100.00 | 0.150 | - | 100 | |
| **SBW05A** | 645 | 61 | 64561 | 0.010 | 100.00 | 0.150 | - | 100 | |
| **SBW06A** | 645 | 61 | 64561 | 0.004 | 100.00 | 0.150 | - | 100 | |
| **SBW07A** | 645 | 61 | 64561 | 0.013 | 100.00 | 0.150 | - | 100 | |
| **SBW07C** | 645 | 61 | 64561 | 0.005 | 100.00 | 0.150 | - | 100 | |
| **SBW08A** | 645 | 61 | 64561 | 0.009 | 100.00 | 0.150 | - | 100 | |
| **SBW09A** | 645 | 61 | 64561 | 0.008 | 100.00 | 0.150 | - | 100 | |
| **SBW09B** | 645 | 61 | 64561 | 0.005 | 100.00 | 0.150 | - | 100 | |
| **SBW11A** | 645 | 61 | 64561 | 0.001 | 100.00 | 0.150 | - | 100 | |
| **SBW12A** | 645 | 61 | 64561 | 0.017 | 100.00 | 0.150 | - | 100 | |
| **SBW13A** | 645 | 61 | 64561 | 0.001 | 100.00 | 0.150 | - | 100 | |
| **SBW14A** | 645 | 61 | 64561 | 0.009 | 100.00 | 0.150 | - | 100 | |

Flood Control District of Maricopa County
Drainage Design Management System
LAND USE
Project Reference: SERENO CANYON PH.4



| Sub Basin | Land Use Code | Area (sq mi) | Area (%) | Initial Loss (IA) | Percent Impervious (RTIMP) | Vegetation Cover (%) | DTHETA | Kb | Description |
|---|---|---|---|---|---|---|---|---|---|
| **Major Basin ID: 01** | | | | | | | | | |
| SB01A | 730 | 0.1190 | 100.0 | 0.10 | 0 | 90.0 | NORMAL | 0.103 | Passive Open Space (Includes mountain preserves and washes) |
| | | **0.1190** | **100.0** | | | | | | |
| SB02A1 | 730 | 0.0590 | 100.0 | 0.10 | 0 | 90.0 | NORMAL | 0.111 | Passive Open Space (Includes mountain preserves and washes) |
| | | **0.0590** | **100.0** | | | | | | |
| SB02A2 | 140 | 0.0030 | 100.0 | 0.25 | 30 | 50.0 | NORMAL | 0.038 | Medium Lot Residential - Single Family (2-4 du per acre) |
| | | **0.0030** | **100.0** | | | | | | |
| SB02A3 | 730 | 0.0030 | 100.0 | 0.10 | 0 | 90.0 | NORMAL | 0.143 | Passive Open Space (Includes mountain preserves and washes) |
| | | **0.0030** | **100.0** | | | | | | |
| SB03A | 730 | 0.0030 | 100.0 | 0.10 | 0 | 90.0 | NORMAL | 0.143 | Passive Open Space (Includes mountain preserves and washes) |
| | | **0.0030** | **100.0** | | | | | | |
| SB03A1 | 730 | 0.0020 | 100.0 | 0.10 | 0 | 90.0 | NORMAL | 0.147 | Passive Open Space (Includes mountain preserves and washes) |
| | | **0.0020** | **100.0** | | | | | | |
| SB04A | 140 | 0.0080 | 100.0 | 0.25 | 30 | 50.0 | NORMAL | 0.036 | Medium Lot Residential - Single Family (2-4 du per acre) |
| | | **0.0080** | **100.0** | | | | | | |
| SB04B | 140 | 0.0110 | 100.0 | 0.25 | 30 | 50.0 | NORMAL | 0.035 | Medium Lot Residential - Single Family (2-4 du per acre) |
| | | **0.0110** | **100.0** | | | | | | |
| SB04C | 605 | 0.0001 | 10.0 | 0.10 | 100 | 0.0 | NORMAL | 0.039 | Road-General Transportation-Residential Road |
| | 730 | 0.0009 | 90.0 | 0.10 | 0 | 90.0 | NORMAL | 0.147 | Passive Open Space (Includes mountain preserves and washes) |
| | | **0.0010** | **100.0** | | | | | | |
| SB05A | 730 | 0.0040 | 100.0 | 0.10 | 0 | 90.0 | NORMAL | 0.140 | Passive Open Space (Includes mountain preserves and washes) |

* Non default value

Flood Control District of Maricopa County
Drainage Design Management System
LAND USE
Project Reference: SERENO CANYON PH.4



| Sub Basin | Land Use Code | Area (sq mi) | Area (%) | Initial Loss (IA) | Percent Impervious (RTIMP) | Vegetation Cover (%) | DTHETA | Kb | Description |
|---|---|---|---|---|---|---|---|---|---|
| **Major Basin ID: 01** | | | | | | | | | |
| | | **0.0040** | **100.0** | | | | | | |
| SB05B1 | 730 | 0.0070 | 100.0 | 0.10 | 0 | 90.0 | NORMAL | 0.134 | Passive Open Space (Includes mountain preserves and washes) |
| | | **0.0070** | **100.0** | | | | | | |
| SB05B2 | 730 | 0.0060 | 100.0 | 0.10 | 0 | 90.0 | NORMAL | 0.135 | Passive Open Space (Includes mountain preserves and washes) |
| | | **0.0060** | **100.0** | | | | | | |
| SB05B3 | 140 | 0.0040 | 100.0 | 0.25 | 30 | 50.0 | NORMAL | 0.037 | Medium Lot Residential - Single Family (2-4 du per acre) |
| | | **0.0040** | **100.0** | | | | | | |
| SB05B4 | 140 | 0.0020 | 50.0 | 0.25 | 30 | 50.0 | NORMAL | 0.037 | Medium Lot Residential - Single Family (2-4 du per acre) |
| | 730 | 0.0020 | 50.0 | 0.10 | 0 | 90.0 | NORMAL | 0.140 | Passive Open Space (Includes mountain preserves and washes) |
| | | **0.0040** | **100.0** | | | | | | |
| SB06A | 140 | 0.0060 | 100.0 | 0.25 | 30 | 50.0 | NORMAL | 0.036 | Medium Lot Residential - Single Family (2-4 du per acre) |
| | | **0.0060** | **100.0** | | | | | | |
| SB06B | 730 | 0.0040 | 100.0 | 0.10 | 0 | 90.0 | NORMAL | 0.140 | Passive Open Space (Includes mountain preserves and washes) |
| | | **0.0040** | **100.0** | | | | | | |
| SB06B1 | 140 | 0.0015 | 50.0 | 0.25 | 30 | 50.0 | NORMAL | 0.038 | Medium Lot Residential - Single Family (2-4 du per acre) |
| | 730 | 0.0015 | 50.0 | 0.10 | 0 | 90.0 | NORMAL | 0.143 | Passive Open Space (Includes mountain preserves and washes) |
| | | **0.0030** | **100.0** | | | | | | |
| SB06C1 | 510 | 0.0075 | 50.0 | 0.10 | 80 | 75.0 | NORMAL | 0.034 | Tourist and Visitor Accommodations (Hotels, motels, resorts) |
| | 730 | 0.0075 | 50.0 | 0.10 | 0 | 90.0 | NORMAL | 0.125 | Passive Open Space (Includes mountain preserves and washes) |
| | | **0.0150** | **100.0** | | | | | | |
| SB06C2 | 730 | 0.0200 | 100.0 | 0.10 | 0 | 90.0 | NORMAL | 0.122 | Passive Open Space (Includes mountain preserves and washes) |

* Non default value

Flood Control District of Maricopa County
Drainage Design Management System
LAND USE
Project Reference: SERENO CANYON PH.4



| Sub Basin | Land Use Code | Area (sq mi) | Area (%) | Initial Loss (IA) | Percent Impervious (RTIMP) | Vegetation Cover (%) | DTHETA | Kb | Description |
|---|---|---|---|---|---|---|---|---|---|
| **Major Basin ID: 01** | | | | | | | | | |
| | | **0.0200** | **100.0** | | | | | | |
| SB06C3 | 140 | 0.0050 | 100.0 | 0.25 | 30 | 50.0 | NORMAL | 0.037 | Medium Lot Residential - Single Family (2-4 du per acre) |
| | | **0.0050** | **100.0** | | | | | | |
| SB06D1 | 510 | 0.0012 | 30.0 | 0.10 | 80 | 75.0 | NORMAL | 0.037 | Tourist and Visitor Accommodations (Hotels, motels, resorts) |
| | 730 | 0.0028 | 70.0 | 0.10 | 0 | 90.0 | NORMAL | 0.140 | Passive Open Space (Includes mountain preserves and washes) |
| | | **0.0040** | **100.0** | | | | | | |
| SB06D2 | 140 | 0.0090 | 100.0 | 0.25 | 30 | 50.0 | NORMAL | 0.035 | Medium Lot Residential - Single Family (2-4 du per acre) |
| | | **0.0090** | **100.0** | | | | | | |
| SB07B | 730 | 0.0070 | 100.0 | 0.10 | 0 | 90.0 | NORMAL | 0.134 | Passive Open Space (Includes mountain preserves and washes) |
| | | **0.0070** | **100.0** | | | | | | |
| SB08A | 730 | 0.0010 | 100.0 | 0.10 | 0 | 90.0 | NORMAL | 0.155 | Passive Open Space (Includes mountain preserves and washes) |
| | | **0.0010** | **100.0** | | | | | | |
| SB09A | 730 | 0.0010 | 100.0 | 0.10 | 0 | 90.0 | NORMAL | 0.155 | Passive Open Space (Includes mountain preserves and washes) |
| | | **0.0010** | **100.0** | | | | | | |
| SB09C | 730 | 0.0360 | 100.0 | 0.10 | 0 | 90.0 | NORMAL | 0.116 | Passive Open Space (Includes mountain preserves and washes) |
| | | **0.0360** | **100.0** | | | | | | |
| SB09D1 | 140 | 0.0090 | 100.0 | 0.25 | 30 | 50.0 | NORMAL | 0.035 | Medium Lot Residential - Single Family (2-4 du per acre) |
| | | **0.0090** | **100.0** | | | | | | |
| SB09D2 | 140 | 0.0050 | 100.0 | 0.25 | 30 | 50.0 | NORMAL | 0.037 | Medium Lot Residential - Single Family (2-4 du per acre) |
| | | **0.0050** | **100.0** | | | | | | |

* Non default value

Flood Control District of Maricopa County
Drainage Design Management System
LAND USE
Project Reference: SERENO CANYON PH.4



| Sub Basin | Land Use Code | Area (sq mi) | Area (%) | Initial Loss (IA) | Percent Impervious (RTIMP) | Vegetation Cover (%) | DTHETA | Kb | Description |
|---|---|---|---|---|---|---|---|---|---|
| **Major Basin ID: 01** | | | | | | | | | |
| SB09E | 730 | 0.0050 | 100.0 | 0.10 | 0 | 90.0 | NORMAL | 0.137 | Passive Open Space (Includes mountain preserves and washes) |
| | | **0.0050** | **100.0** | | | | | | |
| SB10A | 730 | 0.0010 | 100.0 | 0.10 | 0 | 90.0 | NORMAL | 0.155 | Passive Open Space (Includes mountain preserves and washes) |
| | | **0.0010** | **100.0** | | | | | | |
| SB10A1 | 140 | 0.0050 | 100.0 | 0.25 | 30 | 50.0 | NORMAL | 0.037 | Medium Lot Residential - Single Family (2-4 du per acre) |
| | | **0.0050** | **100.0** | | | | | | |
| SB10AW | 120 | 0.0110 | 39.3 | 0.30 | 5 | 30.0 | NORMAL | 0.032 | Estate Residential (1/5 du per acre to 1 du per acre) |
| | 130 | 0.0080 | 28.6 | 0.30 | 15 | 50.0 | NORMAL | 0.032 | Large Lot Residential - Single Family (1-2 du per acre) |
| | 140 | 0.0040 | 14.3 | 0.25 | 30 | 50.0 | NORMAL | 0.032 | Medium Lot Residential - Single Family (2-4 du per acre) |
| | 605 | 0.0050 | 17.9 | 0.10 | 100 | 0.0 | NORMAL | 0.032 | Road-General Transportation-Residential Road |
| | | **0.0280** | **100.1** | | | | | | |
| SB10B | 120 | 0.0010 | 11.1 | 0.30 | 5 | 30.0 | NORMAL | 0.035 | Estate Residential (1/5 du per acre to 1 du per acre) |
| | 130 | 0.0060 | 66.7 | 0.30 | 15 | 50.0 | NORMAL | 0.035 | Large Lot Residential - Single Family (1-2 du per acre) |
| | 605 | 0.0020 | 22.2 | 0.10 | 100 | 0.0 | NORMAL | 0.035 | Road-General Transportation-Residential Road |
| | | **0.0090** | **100.0** | | | | | | |
| SB10C1 | 140 | 0.0090 | 100.0 | 0.25 | 30 | 50.0 | NORMAL | 0.035 | Medium Lot Residential - Single Family (2-4 du per acre) |
| | | **0.0090** | **100.0** | | | | | | |
| SB10C2 | 140 | 0.0080 | 100.0 | 0.25 | 30 | 50.0 | NORMAL | 0.036 | Medium Lot Residential - Single Family (2-4 du per acre) |
| | | **0.0080** | **100.0** | | | | | | |
| SB10C3 | 605 | 0.0008 | 20.0 | 0.10 | 100 | 0.0 | NORMAL | 0.037 | Road-General Transportation-Residential Road |
| | 730 | 0.0032 | 80.0 | 0.10 | 0 | 90.0 | NORMAL | 0.140 | Passive Open Space (Includes mountain preserves and washes) |

* Non default value

Flood Control District of Maricopa County
Drainage Design Management System
LAND USE
Project Reference: SERENO CANYON PH.4



| Sub Basin | Land Use Code | Area (sq mi) | Area (%) | Initial Loss (IA) | Percent Impervious (RTIMP) | Vegetation Cover (%) | DTHETA | Kb | Description |
|---|---|---|---|---|---|---|---|---|---|
| **Major Basin ID: 01** | | | | | | | | | |
| | | **0.0040** | **100.0** | | | | | | |
| SB11A | 730 | 0.0070 | 100.0 | 0.10 | 0 | 90.0 | NORMAL | 0.134 | Passive Open Space (Includes mountain preserves and washes) |
| | | **0.0070** | **100.0** | | | | | | |
| SB11A1 | 140 | 0.0015 | 50.0 | 0.25 | 30 | 50.0 | NORMAL | 0.038 | Medium Lot Residential - Single Family (2-4 du per acre) |
| | 730 | 0.0015 | 50.0 | 0.10 | 0 | 90.0 | NORMAL | 0.143 | Passive Open Space (Includes mountain preserves and washes) |
| | | **0.0030** | **100.0** | | | | | | |
| SB11B | 140 | 0.0071 | 55.0 | 0.25 | 30 | 50.0 | NORMAL | 0.034 | Medium Lot Residential - Single Family (2-4 du per acre) |
| | 730 | 0.0058 | 45.0 | 0.10 | 0 | 90.0 | NORMAL | 0.127 | Passive Open Space (Includes mountain preserves and washes) |
| | | **0.0129** | **100.0** | | | | | | |
| SB17B | 120 | 0.0050 | 33.3 | 0.30 | 5 | 30.0 | NORMAL | 0.034 | Estate Residential (1/5 du per acre to 1 du per acre) |
| | 140 | 0.0070 | 46.7 | 0.25 | 30 | 50.0 | NORMAL | 0.034 | Medium Lot Residential - Single Family (2-4 du per acre) |
| | 605 | 0.0020 | 13.3 | 0.10 | 100 | 0.0 | NORMAL | 0.034 | Road-General Transportation-Residential Road |
| | 730 | 0.0010 | 6.7 | 0.10 | 0 | 90.0 | NORMAL | 0.125 | Passive Open Space (Includes mountain preserves and washes) |
| | | **0.0150** | **100.0** | | | | | | |
| SBE12A | 140 | 0.0018 | 85.7 | 0.25 | 30 | 50.0 | NORMAL | 0.039 | Medium Lot Residential - Single Family (2-4 du per acre) |
| | 605 | 0.0003 | 14.3 | 0.10 | 100 | 0.0 | NORMAL | 0.039 | Road-General Transportation-Residential Road |
| | | **0.0021** | **100.0** | | | | | | |
| SBE13A | 140 | 0.0026 | 100.0 | 0.25 | 30 | 50.0 | NORMAL | 0.038 | Medium Lot Residential - Single Family (2-4 du per acre) |
| | | **0.0026** | **100.0** | | | | | | |
| SBE16A | 130 | 0.0012 | 100.0 | 0.30 | 15 | 50.0 | NORMAL | 0.041 | Large Lot Residential - Single Family (1-2 du per acre) |

* Non default value

Flood Control District of Maricopa County
Drainage Design Management System
LAND USE
Project Reference: SERENO CANYON PH.4



| Sub Basin | Land Use Code | Area (sq mi) | Area (%) | Initial Loss (IA) | Percent Impervious (RTIMP) | Vegetation Cover (%) | DTHETA | Kb | Description |
|---|---|---|---|---|---|---|---|---|---|
| **Major Basin ID: 01** | | | | | | | | | |
| | | **0.0012** | **100.0** | | | | | | |
| SBE17A | 120 | 0.0004 | 2.2 | 0.30 | 5 | 30.0 | NORMAL | 0.033 | Estate Residential (1/5 du per acre to 1 du per acre) |
| | 130 | 0.0105 | 58.0 | 0.30 | 15 | 50.0 | NORMAL | 0.033 | Large Lot Residential - Single Family (1-2 du per acre) |
| | 140 | 0.0051 | 28.2 | 0.25 | 30 | 50.0 | NORMAL | 0.033 | Medium Lot Residential - Single Family (2-4 du per acre) |
| | 605 | 0.0021 | 11.6 | 0.10 | 100 | 0.0 | NORMAL | 0.033 | Road-General Transportation-Residential Road |
| | | **0.0181** | **100.0** | | | | | | |
| SBE18A | 130 | 0.0010 | 100.0 | 0.30 | 15 | 50.0 | NORMAL | 0.041 | Large Lot Residential - Single Family (1-2 du per acre) |
| | | **0.0010** | **100.0** | | | | | | |
| SBE19A | 130 | 0.0007 | 100.0 | 0.30 | 15 | 50.0 | NORMAL | 0.041 | Large Lot Residential - Single Family (1-2 du per acre) |
| | | **0.0007** | **100.0** | | | | | | |
| SBE20A | 130 | 0.0006 | 100.0 | 0.30 | 15 | 50.0 | NORMAL | 0.041 | Large Lot Residential - Single Family (1-2 du per acre) |
| | | **0.0006** | **100.0** | | | | | | |
| SBE21A | 130 | 0.0007 | 100.0 | 0.30 | 15 | 50.0 | NORMAL | 0.041 | Large Lot Residential - Single Family (1-2 du per acre) |
| | | **0.0007** | **100.0** | | | | | | |
| SBE22A | 130 | 0.0070 | 100.0 | 0.30 | 15 | 50.0 | NORMAL | 0.036 | Large Lot Residential - Single Family (1-2 du per acre) |
| | | **0.0070** | **100.0** | | | | | | |
| SBE23A | 130 | 0.0058 | 93.5 | 0.30 | 15 | 50.0 | NORMAL | 0.036 | Large Lot Residential - Single Family (1-2 du per acre) |
| | 605 | 0.0004 | 6.5 | 0.10 | 100 | 0.0 | NORMAL | 0.036 | Road-General Transportation-Residential Road |
| | | **0.0062** | **100.0** | | | | | | |
| SBE23B | 130 | 0.0033 | 84.6 | 0.30 | 15 | 50.0 | NORMAL | 0.037 | Large Lot Residential - Single Family (1-2 du per acre) |
| | 605 | 0.0006 | 15.4 | 0.10 | 100 | 0.0 | NORMAL | 0.037 | Road-General Transportation-Residential Road |

* Non default value

Flood Control District of Maricopa County
Drainage Design Management System
LAND USE
Project Reference: SERENO CANYON PH.4



| Sub Basin | Land Use Code | Area (sq mi) | Area (%) | Initial Loss (IA) | Percent Impervious (RTIMP) | Vegetation Cover (%) | DTHETA | Kb | Description |
|---|---|---|---|---|---|---|---|---|---|
| **Major Basin ID: 01** | | | | | | | | | |
| | | **0.0039** | **100.0** | | | | | | |
| SBE23C | 120 | 0.0421 | 80.2 | 0.30 | 5 | 30.0 | NORMAL | 0.030 | Estate Residential (1/5 du per acre to 1 du per acre) |
| | 130 | 0.0055 | 10.5 | 0.30 | 15 | 50.0 | NORMAL | 0.030 | Large Lot Residential - Single Family (1-2 du per acre) |
| | 140 | 0.0011 | 2.1 | 0.25 | 30 | 50.0 | NORMAL | 0.030 | Medium Lot Residential - Single Family (2-4 du per acre) |
| | 605 | 0.0038 | 7.2 | 0.10 | 100 | 0.0 | NORMAL | 0.030 | Road-General Transportation-Residential Road |
| | | **0.0525** | **100.0** | | | | | | |
| SBE23D | 120 | 0.0268 | 65.4 | 0.30 | 5 | 30.0 | NORMAL | 0.031 | Estate Residential (1/5 du per acre to 1 du per acre) |
| | 130 | 0.0110 | 26.8 | 0.30 | 15 | 50.0 | NORMAL | 0.031 | Large Lot Residential - Single Family (1-2 du per acre) |
| | 605 | 0.0032 | 7.8 | 0.10 | 100 | 0.0 | NORMAL | 0.031 | Road-General Transportation-Residential Road |
| | | **0.0410** | **100.0** | | | | | | |
| SBE23E | 120 | 0.0010 | 18.5 | 0.30 | 5 | 30.0 | NORMAL | 0.037 | Estate Residential (1/5 du per acre to 1 du per acre) |
| | 130 | 0.0040 | 74.1 | 0.30 | 15 | 50.0 | NORMAL | 0.037 | Large Lot Residential - Single Family (1-2 du per acre) |
| | 605 | 0.0004 | 7.4 | 0.10 | 100 | 0.0 | NORMAL | 0.037 | Road-General Transportation-Residential Road |
| | | **0.0054** | **100.0** | | | | | | |
| SBE24A | 130 | 0.0059 | 83.1 | 0.30 | 15 | 50.0 | NORMAL | 0.036 | Large Lot Residential - Single Family (1-2 du per acre) |
| | 605 | 0.0012 | 16.9 | 0.10 | 100 | 0.0 | NORMAL | 0.036 | Road-General Transportation-Residential Road |
| | | **0.0071** | **100.0** | | | | | | |
| SBE24B | 120 | 0.0044 | 89.8 | 0.30 | 5 | 30.0 | NORMAL | 0.037 | Estate Residential (1/5 du per acre to 1 du per acre) |
| | 605 | 0.0005 | 10.2 | 0.10 | 100 | 0.0 | NORMAL | 0.037 | Road-General Transportation-Residential Road |
| | | **0.0049** | **100.0** | | | | | | |

* Non default value

Flood Control District of Maricopa County
Drainage Design Management System
LAND USE
Project Reference: SERENO CANYON PH.4



| Sub Basin | Land Use Code | Area (sq mi) | Area (%) | Initial Loss (IA) | Percent Impervious (RTIMP) | Vegetation Cover (%) | DTHETA | Kb | Description |
|---|---|---|---|---|---|---|---|---|---|
| **Major Basin ID: 01** | | | | | | | | | |
| SBE24C | 120 | 0.0095 | 64.2 | 0.30 | 5 | 30.0 | NORMAL | 0.034 | Estate Residential (1/5 du per acre to 1 du per acre) |
| | 130 | 0.0038 | 25.7 | 0.30 | 15 | 50.0 | NORMAL | 0.034 | Large Lot Residential - Single Family (1-2 du per acre) |
| | 605 | 0.0015 | 10.1 | 0.10 | 100 | 0.0 | NORMAL | 0.034 | Road-General Transportation-Residential Road |
| | | **0.0148** | **100.0** | | | | | | |
| SBE24D | 120 | 0.0089 | 93.7 | 0.30 | 5 | 30.0 | NORMAL | 0.035 | Estate Residential (1/5 du per acre to 1 du per acre) |
| | 130 | 0.0006 | 6.3 | 0.30 | 15 | 50.0 | NORMAL | 0.035 | Large Lot Residential - Single Family (1-2 du per acre) |
| | | **0.0095** | **100.0** | | | | | | |
| SBE25A | 130 | 0.0025 | 73.5 | 0.30 | 15 | 50.0 | NORMAL | 0.038 | Large Lot Residential - Single Family (1-2 du per acre) |
| | 605 | 0.0009 | 26.5 | 0.10 | 100 | 0.0 | NORMAL | 0.038 | Road-General Transportation-Residential Road |
| | | **0.0034** | **100.0** | | | | | | |
| SBE25B | 130 | 0.0060 | 93.8 | 0.30 | 15 | 50.0 | NORMAL | 0.036 | Large Lot Residential - Single Family (1-2 du per acre) |
| | 605 | 0.0004 | 6.3 | 0.10 | 100 | 0.0 | NORMAL | 0.036 | Road-General Transportation-Residential Road |
| | | **0.0064** | **100.1** | | | | | | |
| SBE25C | 120 | 0.0040 | 87.0 | 0.30 | 5 | 30.0 | NORMAL | 0.037 | Estate Residential (1/5 du per acre to 1 du per acre) |
| | 605 | 0.0006 | 13.0 | 0.10 | 100 | 0.0 | NORMAL | 0.037 | Road-General Transportation-Residential Road |
| | | **0.0046** | **100.0** | | | | | | |
| SBE26A | 120 | 0.0005 | 4.8 | 0.30 | 5 | 30.0 | NORMAL | 0.035 | Estate Residential (1/5 du per acre to 1 du per acre) |
| | 130 | 0.0080 | 76.2 | 0.30 | 15 | 50.0 | NORMAL | 0.035 | Large Lot Residential - Single Family (1-2 du per acre) |
| | 605 | 0.0020 | 19.0 | 0.10 | 100 | 0.0 | NORMAL | 0.035 | Road-General Transportation-Residential Road |
| | | **0.0105** | **100.0** | | | | | | |
| SBE27A | 130 | 0.0020 | 100.0 | 0.30 | 15 | 50.0 | NORMAL | 0.039 | Large Lot Residential - Single Family (1-2 du per acre) |

* Non default value

Flood Control District of Maricopa County
Drainage Design Management System
LAND USE
Project Reference: SERENO CANYON PH.4



| Sub Basin | Land Use Code | Area (sq mi) | Area (%) | Initial Loss (IA) | Percent Impervious (RTIMP) | Vegetation Cover (%) | DTHETA | Kb | Description |
|---|---|---|---|---|---|---|---|---|---|
| **Major Basin ID: 01** | | | | | | | | | |
| | | **0.0020** | **100.0** | | | | | | |
| SBE28A | 120 | 0.0046 | 36.2 | 0.30 | 5 | 30.0 | NORMAL | 0.034 | Estate Residential (1/5 du per acre to 1 du per acre) |
| | 130 | 0.0073 | 57.5 | 0.30 | 15 | 50.0 | NORMAL | 0.034 | Large Lot Residential - Single Family (1-2 du per acre) |
| | 605 | 0.0008 | 6.3 | 0.10 | 100 | 0.0 | NORMAL | 0.034 | Road-General Transportation-Residential Road |
| | | **0.0127** | **100.0** | | | | | | |
| SBE29A | 120 | 0.0060 | 39.2 | 0.30 | 5 | 30.0 | NORMAL | 0.034 | Estate Residential (1/5 du per acre to 1 du per acre) |
| | 130 | 0.0013 | 8.5 | 0.30 | 15 | 50.0 | NORMAL | 0.034 | Large Lot Residential - Single Family (1-2 du per acre) |
| | 605 | 0.0011 | 7.2 | 0.10 | 100 | 0.0 | NORMAL | 0.034 | Road-General Transportation-Residential Road |
| | 730 | 0.0069 | 45.1 | 0.10 | 0 | 90.0 | NORMAL | 0.125 | Passive Open Space (Includes mountain preserves and washes) |
| | | **0.0153** | **100.0** | | | | | | |
| SBW01A | 120 | 0.0003 | 18.8 | 0.30 | 5 | 30.0 | NORMAL | 0.039 | Estate Residential (1/5 du per acre to 1 du per acre) |
| | 730 | 0.0013 | 81.3 | 0.10 | 0 | 90.0 | NORMAL | 0.147 | Passive Open Space (Includes mountain preserves and washes) |
| | | **0.0016** | **100.1** | | | | | | |
| SBW02A | 120 | 0.0027 | 40.3 | 0.30 | 5 | 30.0 | NORMAL | 0.036 | Estate Residential (1/5 du per acre to 1 du per acre) |
| | 730 | 0.0040 | 59.7 | 0.10 | 0 | 90.0 | NORMAL | 0.134 | Passive Open Space (Includes mountain preserves and washes) |
| | | **0.0067** | **100.0** | | | | | | |
| SBW04A | 120 | 0.0022 | 100.0 | 0.30 | 5 | 30.0 | NORMAL | 0.039 | Estate Residential (1/5 du per acre to 1 du per acre) |
| | | **0.0022** | **100.0** | | | | | | |
| SBW05A | 120 | 0.0071 | 68.3 | 0.30 | 5 | 30.0 | NORMAL | 0.035 | Estate Residential (1/5 du per acre to 1 du per acre) |
| | 130 | 0.0029 | 27.9 | 0.30 | 15 | 50.0 | NORMAL | 0.035 | Large Lot Residential - Single Family (1-2 du per acre) |

Flood Control District of Maricopa County
Drainage Design Management System
LAND USE
Project Reference: SERENO CANYON PH.4



| Sub Basin | Land Use Code | Area (sq mi) | Area (%) | Initial Loss (IA) | Percent Impervious (RTIMP) | Vegetation Cover (%) | DTHETA | Kb | Description |
|---|---|---|---|---|---|---|---|---|---|
| **Major Basin ID: 01** | | | | | | | | | |
| SBW05A | 605 | 0.0004 | 3.8 | 0.10 | 100 | 0.0 | NORMAL | 0.035 | Road-General Transportation-Residential Road |
| | | **0.0104** | **100.0** | | | | | | |
| SBW06A | 120 | 0.0032 | 82.1 | 0.30 | 5 | 30.0 | NORMAL | 0.037 | Estate Residential (1/5 du per acre to 1 du per acre) |
| | 130 | 0.0005 | 12.8 | 0.30 | 15 | 50.0 | NORMAL | 0.037 | Large Lot Residential - Single Family (1-2 du per acre) |
| | 605 | 0.0002 | 5.1 | 0.10 | 100 | 0.0 | NORMAL | 0.037 | Road-General Transportation-Residential Road |
| | | **0.0039** | **100.0** | | | | | | |
| SBW07A | 120 | 0.0049 | 36.3 | 0.30 | 5 | 30.0 | NORMAL | 0.034 | Estate Residential (1/5 du per acre to 1 du per acre) |
| | 130 | 0.0057 | 42.2 | 0.30 | 15 | 50.0 | NORMAL | 0.034 | Large Lot Residential - Single Family (1-2 du per acre) |
| | 140 | 0.0015 | 11.1 | 0.25 | 30 | 50.0 | NORMAL | 0.034 | Medium Lot Residential - Single Family (2-4 du per acre) |
| | 605 | 0.0014 | 10.4 | 0.10 | 100 | 0.0 | NORMAL | 0.034 | Road-General Transportation-Residential Road |
| | | **0.0135** | **100.0** | | | | | | |
| SBW07C | 120 | 0.0026 | 53.1 | 0.30 | 5 | 30.0 | NORMAL | 0.037 | Estate Residential (1/5 du per acre to 1 du per acre) |
| | 730 | 0.0023 | 46.9 | 0.10 | 0 | 90.0 | NORMAL | 0.137 | Passive Open Space (Includes mountain preserves and washes) |
| | | **0.0049** | **100.0** | | | | | | |
| SBW08A | 120 | 0.0057 | 62.6 | 0.30 | 5 | 30.0 | NORMAL | 0.035 | Estate Residential (1/5 du per acre to 1 du per acre) |
| | 130 | 0.0021 | 23.1 | 0.30 | 15 | 50.0 | NORMAL | 0.035 | Large Lot Residential - Single Family (1-2 du per acre) |
| | 605 | 0.0013 | 14.3 | 0.10 | 100 | 0.0 | NORMAL | 0.035 | Road-General Transportation-Residential Road |
| | | **0.0091** | **100.0** | | | | | | |
| SBW09A | 120 | 0.0023 | 28.0 | 0.30 | 5 | 30.0 | NORMAL | 0.036 | Estate Residential (1/5 du per acre to 1 du per acre) |
| | 130 | 0.0048 | 58.5 | 0.30 | 15 | 50.0 | NORMAL | 0.036 | Large Lot Residential - Single Family (1-2 du per acre) |
| | 605 | 0.0011 | 13.4 | 0.10 | 100 | 0.0 | NORMAL | 0.036 | Road-General Transportation-Residential Road |

* Non default value

Flood Control District of Maricopa County
Drainage Design Management System
LAND USE
Project Reference: SERENO CANYON PH.4



| Sub Basin | Land Use Code | Area (sq mi) | Area (%) | Initial Loss (IA) | Percent Impervious (RTIMP) | Vegetation Cover (%) | DTHETA | Kb | Description |
|---|---|---|---|---|---|---|---|---|---|
| **Major Basin ID: 01** | | | | | | | | | |
| | | **0.0082** | **99.9** | | | | | | |
| SBW09B | 130 | 0.0042 | 84.0 | 0.30 | 15 | 50.0 | NORMAL | 0.037 | Large Lot Residential - Single Family (1-2 du per acre) |
| | 605 | 0.0008 | 16.0 | 0.10 | 100 | 0.0 | NORMAL | 0.037 | Road-General Transportation-Residential Road |
| | | **0.0050** | **100.0** | | | | | | |
| SBW11A | 120 | 0.0007 | 100.0 | 0.30 | 5 | 30.0 | NORMAL | 0.041 | Estate Residential (1/5 du per acre to 1 du per acre) |
| | | **0.0007** | **100.0** | | | | | | |
| SBW12A | 120 | 0.0107 | 63.7 | 0.30 | 5 | 30.0 | NORMAL | 0.034 | Estate Residential (1/5 du per acre to 1 du per acre) |
| | 130 | 0.0052 | 31.0 | 0.30 | 15 | 50.0 | NORMAL | 0.034 | Large Lot Residential - Single Family (1-2 du per acre) |
| | 605 | 0.0009 | 5.4 | 0.10 | 100 | 0.0 | NORMAL | 0.034 | Road-General Transportation-Residential Road |
| | | **0.0168** | **100.1** | | | | | | |
| SBW13A | 120 | 0.0010 | 100.0 | 0.30 | 5 | 30.0 | NORMAL | 0.041 | Estate Residential (1/5 du per acre to 1 du per acre) |
| | | **0.0010** | **100.0** | | | | | | |
| SBW14A | 120 | 0.0077 | 87.5 | 0.30 | 5 | 30.0 | NORMAL | 0.035 | Estate Residential (1/5 du per acre to 1 du per acre) |
| | 730 | 0.0011 | 12.5 | 0.10 | 0 | 90.0 | NORMAL | 0.131 | Passive Open Space (Includes mountain preserves and washes) |
| | | **0.0088** | **100.0** | | | | | | |

Flood Control District of Maricopa County
Drainage Design Management System
HEC-1 ROUTING DATA
**Project Reference: SERENO CANYON PH.4**



| 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** | | | | | | | | | | | | | | | |
| RE01B | 0.060 | 0.060 | 0.060 | 5,189.00 | 0.0788 | 2,910.00 | X: | - | 23.00 | 87.00 | 103.00 | 111.00 | 119.00 | 158.00 | 178.00 |
| | | | | | | | Y: | 2,910.00 | 2,908.00 | 2,906.00 | 2,905.50 | 2,904.40 | 2,905.50 | 2,907.00 | 2,910.00 |
| Route flow from SBE01B through Basin SBE01A | | | | | | | | | | | | | | | |
| RE04B | 0.060 | 0.060 | 0.060 | 449.00 | 0.0367 | 2,755.00 | X: | - | 15.00 | 24.00 | 28.00 | 30.00 | 33.00 | 46.00 | 62.00 |
| | | | | | | | Y: | 2,754.90 | 2,752.60 | 2,750.80 | 2,750.00 | 2,750.00 | 2,751.00 | 2,752.90 | 2,755.00 |
| Route flow from SBE04B into SBE04A | | | | | | | | | | | | | | | |
| RE04C | 0.060 | 0.060 | 0.060 | 455.00 | 0.0363 | 2,755.00 | X: | - | 17.00 | 22.00 | 27.00 | 32.00 | 44.00 | 61.00 | 88.00 |
| | | | | | | | Y: | 2,755.00 | 2,753.00 | 2,751.90 | 2,750.00 | 2,750.00 | 2,751.90 | 2,753.20 | 2,754.90 |
| Route flow from SBE04C into SBE04A | | | | | | | | | | | | | | | |
| RE04CB | 0.060 | 0.060 | 0.060 | 247.00 | 0.0344 | 2,744.90 | X: | - | 11.00 | 21.00 | 31.00 | 34.00 | 50.00 | 69.00 | 88.00 |
| | | | | | | | Y: | 2,744.90 | 2,742.70 | 2,741.40 | 2,740.00 | 2,740.00 | 2,741.80 | 2,743.00 | 2,743.90 |
| Route flow from CE04AI through rest of Basin SBE04A | | | | | | | | | | | | | | | |
| RE05B | 0.060 | 0.060 | 0.060 | 907.00 | 0.0435 | 2,760.30 | X: | - | 11.00 | 26.00 | 40.00 | 47.00 | 56.00 | 76.00 | 89.00 |
| | | | | | | | Y: | 2,760.10 | 2,759.00 | 2,757.70 | 2,757.00 | 2,757.00 | 2,757.40 | 2,758.80 | 2,760.30 |
| Route flow from SBE05B through SBE05A | | | | | | | | | | | | | | | |
| RE06B | 0.060 | 0.060 | 0.060 | 814.00 | 0.0319 | 2,761.00 | X: | - | 21.00 | 55.00 | 63.00 | 82.00 | 92.00 | 104.00 | 113.00 |
| | | | | | | | Y: | 2,761.00 | 2,758.90 | 2,758.50 | 2,758.00 | 2,758.00 | 2,758.50 | 2,759.70 | 2,760.80 |
| Route flow from CE06B through Basin SBE06A | | | | | | | | | | | | | | | |
| RE06C | 0.060 | 0.060 | 0.060 | 591.00 | 0.0431 | 2,786.60 | X: | - | 6.00 | 16.00 | 26.00 | 36.00 | 40.00 | 41.00 | 44.00 |
| | | | | | | | Y: | 2,786.60 | 2,786.00 | 2,785.00 | 2,784.00 | 2,784.00 | 2,785.00 | 2,785.50 | 2,786.40 |
| Route flow from SBE06C through Basin SBE06B | | | | | | | | | | | | | | | |
| RE06D | 0.060 | 0.060 | 0.060 | 677.00 | 0.0369 | 2,785.90 | X: | - | 15.00 | 27.00 | 34.00 | 41.00 | 45.00 | 52.00 | 59.00 |
| | | | | | | | Y: | 2,785.80 | 2,784.00 | 2,783.00 | 2,782.00 | 2,782.00 | 2,782.70 | 2,784.20 | 2,785.90 |
| Route flow from SBE06D through Basin SBE06B | | | | | | | | | | | | | | | |
| RE11B | 0.060 | 0.060 | 0.060 | 914.00 | 0.0334 | 2,770.20 | X: | - | 10.00 | 16.00 | 23.00 | 25.00 | 34.00 | 48.00 | 64.00 |
| | | | | | | | Y: | 2,770.20 | 2,767.10 | 2,765.30 | 2,762.00 | 2,762.00 | 2,765.00 | 2,766.60 | 2,768.30 |
| Route flow from SBE11B through SBE11A | | | | | | | | | | | | | | | |
| RE17B | 0.060 | 0.060 | 0.060 | 1,169.00 | 0.0265 | 2,740.10 | X: | - | 9.00 | 22.00 | 33.00 | 44.00 | 54.00 | 62.00 | 69.00 |
| | | | | | | | Y: | 2,740.10 | 2,738.60 | 2,737.00 | 2,736.10 | 2,736.00 | 2,737.00 | 2,738.40 | 2,740.10 |
| Route flow from SBE17B through SBE 17A | | | | | | | | | | | | | | | |
| RE23B | 0.060 | 0.060 | 0.060 | 112.00 | 0.0267 | 2,685.90 | X: | - | 8.00 | 12.00 | 14.00 | 24.00 | 30.00 | 32.00 | 49.00 |
| | | | | | | | Y: | 2,685.60 | 2,684.80 | 2,684.20 | 2,684.00 | 2,684.00 | 2,684.70 | 2,685.00 | 2,685.90 |
| Route flow from CE23B into SBE23A to intermediate combine | | | | | | | | | | | | | | | |

| Route ID | LOB N | Chan N | ROB N | Length (ft) | Slope (ft/ft) | Max Elev (ft) | | 1. | 2. | 3. | 4. | 5. | 6. | 7. | 8. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RE23BD | 0.060 | 0.060 | 0.060 | 238.00 | 0.0242 | 2,685.00 | X: | - | 21.00 | 62.00 | 74.00 | 82.00 | 86.00 | 101.00 | 141.00 |
| | | | | | | | Y: | 2,684.90 | 2,682.70 | 2,681.00 | 2,679.00 | 2,679.00 | 2,680.10 | 2,681.90 | 2,685.00 |
| Route Intermediate combined flow from CE23AI through SBE23A | | | | | | | | | | | | | | | |
| RE23C | 0.060 | 0.060 | 0.060 | 457.00 | 0.0235 | 2,693.90 | X: | - | 15.00 | 28.00 | 35.00 | 35.10 | 45.00 | 86.00 | 114.00 |
| | | | | | | | Y: | 2,693.80 | 2,692.20 | 2,691.00 | 2,690.00 | 2,690.00 | 2,690.90 | 2,692.90 | 2,693.90 |
| Route flow from CE23C through SBE23B | | | | | | | | | | | | | | | |
| RE23D | 0.060 | 0.060 | 0.060 | 465.00 | 0.0269 | 2,688.30 | X: | - | 14.00 | 27.00 | 32.00 | 40.00 | 44.00 | 55.00 | 68.00 |
| | | | | | | | Y: | 2,688.30 | 2,687.30 | 2,685.00 | 2,684.10 | 2,684.00 | 2,685.00 | 2,686.10 | 2,686.70 |
| Route flow from SBE23D through Basin SBE23A | | | | | | | | | | | | | | | |
| RE23E | 0.060 | 0.060 | 0.060 | 1,112.00 | 0.0261 | 2,720.00 | X: | - | 20.00 | 57.00 | 64.00 | 65.00 | 70.00 | 90.00 | 114.00 |
| | | | | | | | Y: | 2,720.00 | 2,716.50 | 2,712.10 | 2,711.00 | 2,711.00 | 2,713.20 | 2,716.60 | 2,719.90 |
| Route flow from SBE23E through Basin SBE23C | | | | | | | | | | | | | | | |
| RE24B | 0.060 | 0.060 | 0.060 | 873.00 | 0.0229 | 2,690.20 | X: | - | 10.00 | 16.00 | 23.00 | 27.00 | 35.00 | 49.00 | 67.00 |
| | | | | | | | Y: | 2,689.80 | 2,688.70 | 2,687.90 | 2,687.00 | 2,687.00 | 2,687.90 | 2,688.80 | 2,690.20 |
| Route flow from CE24B through Basin SBE24A | | | | | | | | | | | | | | | |
| RE24C | 0.060 | 0.060 | 0.060 | 624.00 | 0.0232 | 2,706.80 | X: | 10.00 | 25.00 | 45.00 | 49.00 | 55.00 | 62.00 | 75.00 | 103.00 |
| | | | | | | | Y: | 2,706.80 | 2,705.20 | 2,702.10 | 2,701.00 | 2,701.00 | 2,702.00 | 2,703.30 | 2,706.70 |
| Route flow from CE24C through Basin SBE24B | | | | | | | | | | | | | | | |
| RE24D | 0.060 | 0.060 | 0.060 | 634.00 | 0.0252 | 2,725.50 | X: | - | 16.00 | 24.00 | 27.00 | 31.00 | 34.00 | 44.00 | 60.00 |
| | | | | | | | Y: | 2,725.50 | 2,723.20 | 2,721.80 | 2,721.00 | 2,721.00 | 2,722.00 | 2,723.00 | 2,726.10 |
| Route runoff from basin SBE24D through Basin SBE24C | | | | | | | | | | | | | | | |
| RE25B | 0.060 | 0.060 | 0.060 | 412.00 | 0.0279 | 2,680.70 | X: | - | 16.00 | 29.00 | 32.00 | 32.10 | 36.00 | 47.00 | 67.00 |
| | | | | | | | Y: | 2,680.30 | 2,678.70 | 2,677.10 | 2,676.00 | 2,676.00 | 2,676.90 | 2,678.00 | 2,680.70 |
| Route runoff from CE25B through Basin SBE25A | | | | | | | | | | | | | | | |
| RE25C | 0.060 | 0.060 | 0.060 | 709.00 | 0.0268 | 2,694.40 | X: | - | 21.00 | 53.00 | 58.00 | 63.00 | 70.00 | 90.00 | 99.00 |
| | | | | | | | Y: | 2,694.30 | 2,691.90 | 2,688.00 | 2,687.00 | 2,687.00 | 2,689.00 | 2,693.30 | 2,694.40 |
| Route runoff from SBE25C through Basin SBE25B | | | | | | | | | | | | | | | |
| RW07BC | 0.060 | 0.060 | 0.060 | 1,452.00 | 0.0465 | 2,800.10 | X: | - | 6.00 | 20.00 | 26.00 | 29.00 | 38.00 | 50.00 | 68.00 |
| | | | | | | | Y: | 2,800.10 | 2,799.00 | 2,796.00 | 2,793.00 | 2,793.00 | 2,796.00 | 2,797.00 | 2,798.40 |
| Route flow from CW07BC through SBW07A | | | | | | | | | | | | | | | |
| RW09B | 0.060 | 0.060 | 0.060 | 1,036.00 | 0.0415 | 2,765.60 | X: | - | 8.00 | 49.00 | 58.00 | 67.00 | 72.00 | 85.00 | 104.00 |
| | | | | | | | Y: | 2,764.90 | 2,764.80 | 2,764.00 | 2,763.00 | 2,763.00 | 2,764.00 | 2,765.10 | 2,765.60 |
| Route flow from CW09B through Basin SBW09A | | | | | | | | | | | | | | | |
| RW09D | 0.060 | 0.060 | 0.060 | 367.00 | 0.0368 | 2,782.10 | X: | - | 11.00 | 27.00 | 31.00 | 38.00 | 42.00 | 73.00 | 90.00 |
| | | | | | | | Y: | 2,782.10 | 2,780.10 | 2,780.00 | 2,779.00 | 2,779.00 | 2,779.50 | 2,780.90 | 2,781.30 |
| Route flow from CW09D through Basin SBW09B | | | | | | | | | | | | | | | |

| Route ID | LOB N | Chan N | ROB N | Length (ft) | Slope (ft/ft) | Max Elev (ft) | | 1. | 2. | 3. | 4. | 5. | 6. | 7. | 8. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RW09E | 0.060 | 0.060 | 0.060 | 985.00 | 0.0442 | 2,805.10 | X: | - | 10.00 | 12.00 | 14.00 | 17.00 | 23.00 | 29.00 | 48.00 |
| | | | | | | | Y: | 2,805.30 | 2,803.10 | 2,802.10 | 2,800.70 | 2,800.70 | 2,802.00 | 2,802.90 | 2,805.10 |
| Route flow from SBW09E through Basin SBW09D | | | | | | | | | | | | | | | |
| RW10B | 0.060 | 0.060 | 0.060 | 653.00 | 0.0276 | 2,732.00 | X: | - | 68.00 | 75.00 | 79.00 | 86.00 | 92.00 | 106.00 | 150.00 |
| | | | | | | | Y: | 2,732.00 | 2,728.10 | 2,721.10 | 2,726.10 | 2,726.00 | 2,726.60 | 2,727.00 | 2,732.00 |
| Route flow from CE10WB through Basin SBW10A | | | | | | | | | | | | | | | |
| RW10C | 0.060 | 0.060 | 0.060 | 952.00 | 0.0310 | 2,757.80 | X: | - | 34.00 | 47.00 | 62.00 | 62.10 | 68.00 | 73.00 | 78.00 |
| | | | | | | | Y: | 2,757.80 | 2,754.40 | 2,754.00 | 2,752.10 | 2,752.00 | 2,753.70 | 2,755.70 | 2,757.50 |
| Route flow from SBW10C through Basin SBW10B | | | | | | | | | | | | | | | |

# Engineering Properties

Aguila-Carefree Area, Arizona, Parts of Maricopa and Pinal Counties

[Absence of an entry indicates that the data were not estimated. This report shows only the major soils in each map unit]

| Map symbol and soil name | Depth | USDA texture | Classification | | Fragments | | Percent passing sieve number-- | | | | Liquid limit | Plasticity index |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Unified | AASHTO | >10 Inches | 3-10 Inches | 4 | 10 | 40 | 200 | | |
| | *In* | | | | *Pct* | *Pct* | | | | | *Pct* | |
| 61: | | | | | | | | | | | | |
| Gran | 0-1 | Very gravelly sandy loam | SC-SM, SM, SP-SM | A-1 | 0 | 0 | 90-100 | 30-50 | 20-35 | 10-20 | 10-20 | NP-5 |
| | 1-12 | Very gravelly clay, very gravelly sandy clay, extremely gravelly sandy clay | SC | A-2 | 0 | 0 | 90-100 | 20-50 | 20-40 | 15-30 | 45-55 | 20-30 |
| | 12-36 | Bedrock | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 36-60 | Bedrock | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Wickenburg | 0-1 | Gravelly sandy loam | SM | A-1, A-2, A-4 | 0 | 0 | 60-100 | 50-100 | 30-70 | 15-40 | 15-20 | NP-5 |
| | 1-12 | Very gravelly loam, very gravelly sandy clay loam, very gravelly sandy loam | GC-GM | A-2 | 0 | 0 | 40-60 | 30-50 | 25-45 | 10-35 | 20-30 | 5-10 |
| | 12-60 | Bedrock | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 63: | | | | | | | | | | | | |
| Gran | 0-1 | Very gravelly sandy loam | SC-SM, SM, SP-SM | A-1 | 0 | 0 | 90-100 | 30-50 | 20-35 | 10-20 | 10-20 | NP-5 |
| | 1-12 | Very gravelly clay, very gravelly sandy clay, extremely gravelly sandy clay | SC | A-2 | 0 | 0 | 90-100 | 20-50 | 20-40 | 15-30 | 45-55 | 20-30 |
| | 12-36 | Bedrock | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 36-60 | Bedrock | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Rock outcrop | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |

# Engineering Properties

Aguila-Carefree Area, Arizona, Parts of Maricopa and Pinal Counties

| Map symbol and soil name | Depth | USDA texture | Classification | | Fragments | | Percent passing sieve number-- | | | | Liquid limit | Plasticity index |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Unified | AASHTO | >10 Inches | 3-10 Inches | 4 | 10 | 40 | 200 | | |
| | *In* | | | | *Pct* | *Pct* | | | | | *Pct* | |
| 63: | | | | | | | | | | | | |
| Wickenburg | 0-1 | Gravelly sandy loam | GM, SM | A-1, A-2, A-4 | 0 | 0 | 60-100 | 50-100 | 30-70 | 15-40 | 15-20 | NP-5 |
| | 1-12 | Very gravelly loam, very gravelly sandy clay loam, very gravelly sandy loam | GC-GM | A-2 | 0 | 0 | 40-60 | 30-50 | 25-45 | 10-35 | 20-30 | 5-10 |
| | 12-60 | Bedrock | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |

```
1*****************************************
 *                                       *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
 *              JUN   1998               *
 *            VERSION 4.1                *
 *                                       *
 *  RUN DATE   07MAY18  TIME  09:27:39   *
 *                                       *
 *****************************************
```

100-Year 6-Hour Model

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

```
X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X              X
XXXXXXX  XXXX     X        XXXXX  X
X     X  X        X              X
X     X  X        X     X        X
X     X  XXXXXXX   XXXXX         XXX
```

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        SERENO CANYON (PHASE 4) - DEVELOPED CONDITIONS
            2   ID        STORM EVENT: 100-YR, 6-HOUR
            3   ID        05/04/2018
            4   ID        PREPARED BY: SLATER HANIFAN GROUP
            5   ID       **********************************************************************
            6   ID       **********************************************************************
            7   ID        Flood Control District of Maricopa County
            8   ID        Sereno Canyon Developed Conditions
            9   ID        100 YEAR
           10   ID        6 Hour  Storm
           11   ID        Unit Hydrograph: Clark
           12   ID        09/18/2012
           13   ID        Sereno Canyon-Developed Conditions
           14   ID        100-Year, 6-Hour Storm Event
           15   ID        Prepared By: JE Fuller Hydrology and Geomorphology
           16   ID        Modeled By: Brian Schalk P.E., CFM and Nathan Logan P.E., CFM
           17   ID        Submitted To: City of Scottsdale
           18   ID       **********************************************************************
           19   ID       **********************************************************************
           20   IT       1 01DEC11       0    2000
           21   IO       5
           22   IN      15
                *DIAGRAM
                *
                *

           23   KK  SBE29A   BASIN
           24   KM        SBE29A Basin Runoff
           25   BA   0.015
           26   PB   3.178
           27   PC   0.000   0.008   0.016   0.025   0.033   0.041   0.050   0.058   0.066   0.074
           28   PC   0.087   0.099   0.118   0.138   0.216   0.377   0.834   0.911   0.931   0.950
           29   PC   0.962   0.972   0.983   0.991   1.000
           30   LG    0.20    0.25    6.00    0.23      10
           31   UC   0.200   0.195
           32   UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
           33   UA     100
                *

           34   KK  DBE29A STORAGE
           35   KM    Retention Basin Storage/Outflow rating curve for Basin DBE29A
           36   RS       1    STOR       0
           37   SV    0.01    0.05    0.10    0.15    0.20    0.26    0.32    0.38    0.45    0.51
           38   SV    0.59    0.66    0.74    0.83    0.92    0.97
           39   SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.49
           40   SQ    3.46    8.43   14.56   21.75   29.86   33.07
           41   SE    0.10    0.40    0.80    1.20    1.60    2.00    2.40    2.80    3.20    3.60
           42   SE    4.00    4.40    4.80    5.20    5.60    5.80
                *
```

1 HEC-1 INPUT PAGE 2

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

           43   KK  SBE28A   BASIN
           44   KM        SBE28A Basin Runoff
           45   BA   0.013
           46   LG    0.29    0.25    6.00    0.20      17
```

```
 47          UC   0.134   0.141
 48          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 49          UA     100
             *

 50          KK  DBE28A STORAGE
 51          KM    Retention Basin Storage/Outflow rating curve for Basin DBE28A
 52          RS       1    STOR       0
 53          SV    0.01    0.07    0.13    0.21    0.28    0.36    0.45    0.54    0.64    0.74
 54          SV    0.84    0.95    1.08
 55          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
 56          SQ    6.93   19.60   36.01
 57          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
 58          SE    5.00    5.50    6.00
             *

 59          KK  SBE27A   BASIN
 60          KM        SBE27A Basin Runoff
 61          BA   0.002
 62          LG    0.30    0.25    6.00    0.22      15
 63          UC   0.081   0.104
 64          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 65          UA     100
             *

 66          KK  DBE27A STORAGE
 67          KM    Retention Basin Storage/Outflow rating curve for Basin DBE27A
 68          RS       1    STOR       0
 69          SV    0.01    0.01    0.02    0.03    0.04    0.06    0.07    0.08    0.10    0.11
 70          SV    0.12    0.14    0.16    0.17    0.19    0.21
 71          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
 72          SQ    0.01    0.96    2.64    4.81    7.38   10.29
 73          SE    0.10    0.30    0.60    0.90    1.20    1.50    1.80    2.10    2.40    2.70
 74          SE    3.00    3.30    3.60    3.90    4.20    4.50
             *

 75          KK  SBE26A   BASIN
 76          KM        SBE26A Basin Runoff
 77          BA   0.010
 78          LG    0.26    0.25    6.00    0.20      31
 79          UC   0.137   0.180
 80          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 81          UA     100
             *
1                                        HEC-1 INPUT                                        PAGE  3

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

 82          KK  DBE26A STORAGE
 83          KM    Retention Basin Storage/Outflow rating curve for Basin DBE26A
 84          RS       1    STOR       0
 85          SV    0.01    0.06    0.12    0.19    0.26    0.33    0.41    0.49    0.58    0.67
 86          SV    0.76    0.87    0.98    1.11
 87          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
 88          SQ    0.01    5.94   16.80   30.86
 89          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
 90          SE    5.00    5.50    6.00    6.50
             *

 91          KK  SBE25C   BASIN
 92          KM        SBE25C Basin Runoff
 93          BA   0.005
 94          LG    0.27    0.25    6.00    0.18      17
 95          UC   0.098   0.105
 96          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 97          UA     100
             *

 98          KK  DBE25C STORAGE
 99          KM    Retention Basin Storage/Outflow rating curve for Basin DBE25C
100          RS       1    STOR       0
101          SV    0.01    0.02    0.05    0.07    0.10    0.13    0.16    0.19    0.22    0.25
102          SV    0.28    0.31    0.35    0.39    0.43    0.47    0.47
103          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
104          SQ    2.87    8.53   15.86   24.66   34.72   45.79   47.52
105          SE    0.10    0.30    0.70    1.00    1.30    1.70    2.00    2.30    2.60    3.00
106          SE    3.30    3.60    4.00    4.30    4.60    5.00    5.00
             *

107          KK   RE25C   ROUTE
108          KM        Route runoff from SBE25C through Basin SBE25B
109          RS       1    FLOW
110          RC   0.060   0.060   0.060     709  0.0268 2694.40
111          RX    0.00   21.00   53.00   58.00   63.00   70.00   90.00   99.00
112          RY  2694.3 2691.90 2688.00 2687.00 2687.00 2689.00 2693.30 2694.40
             *

113          KK  SBE25B   BASIN
114          KM        SBE25B Basin Runoff
115          BA   0.006
116          LG    0.29    0.25    6.00    0.21      20
117          UC   0.125   0.164
118          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
119          UA     100
             *
```

```
 120          KK   CE25B COMBINE
 121          KM        Combine Route RE25C and Basin SBE25B
 122          HC       2
              *
1                                        HEC-1 INPUT                                                    PAGE  4

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


 123          KK  DBE25B STORAGE
 124          KM    Retention Basin Storage/Outflow rating curve for Basin DBE25B
 125          RS       1    STOR       0
 126          SV    0.01    0.05    0.09    0.14    0.19    0.25    0.30    0.36    0.42    0.49
 127          SV    0.55    0.62    0.70    0.78    0.84
 128          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    1.68    7.93
 129          SQ   16.80   27.91   40.62   54.86   56.70
 130          SE    0.10    0.40    0.80    1.20    1.60    2.00    2.40    2.80    3.20    3.60
 131          SE    4.00    4.40    4.80    5.20    5.50
              *

 132          KK   RE25B   ROUTE
 133          KM        Route runoff from CE25B through Basin SBE25A
 134          RS       1    FLOW
 135          RC   0.060   0.060   0.060     412  0.0279 2680.70
 136          RX    0.00   16.00   29.00   32.00   32.10   36.00   47.00   67.00
 137          RY  2680.3 2678.70 2677.10 2676.00 2676.00 2676.90 2678.00 2680.70
              *

 138          KK  SBE25A   BASIN
 139          KM        SBE25A Basin Runoff
 140          BA   0.003
 141          LG    0.25    0.25    6.00    0.20      38
 142          UC   0.087   0.107
 143          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 144          UA     100
              *

 145          KK   CE25A COMBINE
 146          KM        Combine Route RE25B and Basin SBE25A
 147          HC       2
              *

 148          KK  DBE25A STORAGE
 149          KM    Retention Basin Storage/Outflow rating curve for Basin DBE25A
 150          RS       1    STOR       0
 151          SV    0.01    0.02    0.04    0.06    0.08    0.10    0.12    0.14    0.16    0.18
 152          SV    0.21    0.23    0.26    0.29    0.31    0.34    0.37    0.39
 153          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
 154          SQ    0.01    0.01    1.12    5.87   13.22   22.40   33.27   41.15
 155          SE    0.10    0.30    0.60    0.90    1.20    1.50    1.80    2.10    2.40    2.70
 156          SE    3.00    3.30    3.60    3.90    4.20    4.50    4.80    5.00
              *

 157          KK   CLEAR COMBINE
 158          KM        Clear Hydrograph Stack
 159          HC       5
              *
1                                        HEC-1 INPUT                                                    PAGE  5

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


 160          KK  SBE24D   BASIN
 161          KM        SBE254D Basin Runoff
 162          BA   0.010
 163          LG    0.30    0.25    6.00    0.19       6
 164          UC   0.113   0.099
 165          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 166          UA     100
              *

 167          KK  DBE24D STORAGE
 168          KM    Retention Basin Storage/Outflow rating curve for Basin DBE24D
 169          RS       1    STOR       0
 170          SV    0.01    0.06    0.13    0.20    0.28    0.36    0.44    0.53    0.63    0.73
 171          SV    0.83
 172          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    5.94   16.80   30.86
 173          SQ   47.52
 174          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
 175          SE    5.00
              *

 176          KK   RE24D   ROUTE
 177          KM        Route runoff from basin SBE24D through Basin SBE24C
 178          RS       1    FLOW
 179          RC   0.060   0.060   0.060     634  0.0252 2725.50
 180          RX    0.00   16.00   24.00   27.00   31.00   34.00   44.00   60.00
 181          RY  2725.5 2723.20 2721.80 2721.00 2721.00 2722.00 2723.00 2726.10
              *

 182          KK  SBE24C   BASIN
 183          KM        SBE24C Basin Runoff
 184          BA   0.015
 185          LG    0.28    0.25    6.00    0.19      17
 186          UC   0.150   0.168
```

```
          187          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          188          UA     100
                       *

          189          KK   CE24C COMBINE
          190          KM        Combine RE24D and SBE24C
          191          HC       2
                       *

          192          KK  DBE24C STORAGE
          193          KM    Retention Basin Storage/Outflow rating curve for Basin DBE24C
          194          RS       1    STOR       0
          195          SV    0.01    0.08    0.17    0.25    0.35    0.45    0.55    0.66    0.77    0.89
          196          SV    1.02    1.15    1.17
          197          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    1.63   10.24   23.43
          198          SQ   39.87   59.15   61.38
          199          SE    0.10    0.50    0.90    1.40    1.80    2.30    2.70    3.20    3.60    4.10
          200          SE    4.50    5.00    5.00
                       *
1                                          HEC-1 INPUT                                                PAGE  6

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


          201          KK   RE24C   ROUTE
          202          KM        Route flow from CE24C through Basin SBE24B
          203          RS       1    FLOW
          204          RC   0.060   0.060   0.060     624  0.0232 2706.80
          205          RX   10.00   25.00   45.00   49.00   55.00   62.00   75.00  103.00
          206          RY  2706.8 2705.20 2702.10 2701.00 2701.00 2702.00 2703.30 2706.70
                       *

          207          KK  SBE24B   BASIN
          208          KM        SBE24B Basin Runoff
          209          BA   0.005
          210          LG    0.28    0.25    6.00    0.18      15
          211          UC   0.123   0.180
          212          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          213          UA     100
                       *

          214          KK   CE24B COMBINE
          215          KM        Combine RE24C and SBE24B
          216          HC       2
                       *

          217          KK  DBE24B STORAGE
          218          KM    Retention Basin Storage/Outflow rating curve for Basin DBE24B
          219          RS       1    STOR       0
          220          SV    0.01    0.06    0.13    0.20    0.27    0.35    0.43    0.51    0.60    0.70
          221          SV    0.80    0.91    1.02    1.15    1.20
          222          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    1.63   10.24   23.43
          223          SQ   39.87   59.15   80.76   73.24   73.24
          224          SE    0.10    0.50    0.90    1.40    1.80    2.30    2.70    3.20    3.60    4.10
          225          SE    4.50    5.00    5.40    5.90    6.00
                       *

          226          KK   RE24B   ROUTE
          227          KM        Route flow from CE24B through Basin SBE24A
          228          RS       1    FLOW
          229          RC   0.060   0.060   0.060     873  0.0229 2690.20
          230          RX    0.00   10.00   16.00   23.00   27.00   35.00   49.00   67.00
          231          RY  2689.8 2688.70 2687.90 2687.00 2687.00 2687.90 2688.80 2690.20
                       *

          232          KK  SBE24A   BASIN
          233          KM        SBE24A Basin Runoff
          234          BA   0.007
          235          LG    0.27    0.25    6.00    0.20      29
          236          UC   0.131   0.174
          237          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          238          UA     100
                       *
1                                          HEC-1 INPUT                                                PAGE  7

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


          239          KK   CE24A COMBINE
          240          KM        Combine RE24B and SBE24A
          241          HC       2
                       *

          242          KK  DBE24A STORAGE
          243          KM    Retention Basin Storage/Outflow rating curve for Basin DBE24A
          244          RS       1    STOR       0
          245          SV    0.01    0.06    0.13    0.20    0.27    0.35    0.44    0.52    0.62    0.71
          246          SV    0.82    0.93
          247          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    6.93   19.60
          248          SQ   36.01   55.44
          249          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
          250          SE    5.00    5.50
                       *

          251          KK  SBE23D   BASIN
          252          KM        SBE23D Basin Runoff
```

```
 253          BA   0.041
 254          LG    0.28    0.25    6.00    0.19      15
 255          UC   0.198   0.207
 256          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 257          UA     100
              *

 258          KK  DBE23D STORAGE
 259          KM    Retention Basin Storage/Outflow rating curve for Basin DBE23D
 260          RS       1    STOR       0
 261          SV    0.01    0.11    0.22    0.34    0.47    0.61    0.76    0.92    1.10    1.30
 262          SV    1.52    1.75    2.01    2.30    2.61    2.61
 263          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
 264          SQ    0.01    0.01    0.01    0.01   15.51   80.61
 265          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
 266          SE    5.00    5.50    6.00    6.50    7.00    8.00
              *

 267          KK   RE23D   ROUTE
 268          KM        Route flow from SBE23D through Basin SBE23A
 269          RS       1    FLOW
 270          RC   0.060   0.060   0.060     465  0.0269 2688.30
 271          RX    0.00   14.00   27.00   32.00   40.00   44.00   55.00   68.00
 272          RY  2688.3 2687.30 2685.00 2684.10 2684.00 2685.00 2686.10 2686.70
              *

 273          KK  SBE23E   BASIN
 274          KM        SBE23E Basin Runoff
 275          BA   0.005
 276          LG    0.29    0.25    6.00    0.20      19
 277          UC   0.106   0.152
 278          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 279          UA     100
              *
1                                        HEC-1 INPUT                                        PAGE  8

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

 280          KK  DBE23E STORAGE
 281          KM    Retention Basin Storage/Outflow rating curve for Basin DBE23E
 282          RS       1    STOR       0
 283          SV    0.01    0.04    0.09    0.14    0.19    0.24    0.29    0.35    0.41    0.48
 284          SV    0.55
 285          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.63    3.96    9.07
 286          SQ   15.43
 287          SE    0.10    0.50    0.90    1.40    1.80    2.30    2.70    3.20    3.60    4.10
 288          SE    4.50
              *

 289          KK   RE23E   ROUTE
 290          KM        Route flow from SBE23E through Basin SBE23C
 291          RS       2    FLOW
 292          RC   0.060   0.060   0.060    1112  0.0261 2720.00
 293          RX    0.00   20.00   57.00   64.00   65.00   70.00   90.00  114.00
 294          RY  2720.0 2716.50 2712.10 2711.00 2711.00 2713.20 2716.60 2719.90
              *

 295          KK  SBE23C   BASIN
 296          KM        SBE23C Basin Runoff
 297          BA   0.053
 298          LG    0.28    0.25    6.00    0.18      13
 299          UC   0.199   0.201
 300          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 301          UA     100
              *

 302          KK   CE23C COMBINE
 303          KM        Combine RE23E and SBE23C
 304          HC       2
              *

 305          KK  DBE23C STORAGE
 306          KM    Retention Basin Storage/Outflow rating curve for Basin DBE23C
 307          RS       1    STOR       0
 308          SV    0.01    0.15    0.31    0.47    0.65    0.84    1.03    1.24    1.46    1.69
 309          SV    1.93    2.19    2.46    2.76    3.08
 310          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
 311          SQ    0.01    0.01   27.72   78.40  144.03
 312          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
 313          SE    5.00    5.50    6.00    6.50    7.00
              *

 314          KK   RE23C   ROUTE
 315          KM        Route flow from CE23C through SBE23B
 316          RS       1    FLOW
 317          RC   0.060   0.060   0.060     457  0.0235 2693.90
 318          RX    0.00   15.00   28.00   35.00   35.10   45.00   86.00  114.00
 319          RY  2693.8 2692.20 2691.00 2690.00 2690.00 2690.90 2692.90 2693.90
              *
1                                        HEC-1 INPUT                                        PAGE  9

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

 320          KK  SBE23B   BASIN
```

```
321          KM        SBE23B Basin Runoff
322          BA   0.004
323          LG    0.27    0.25    6.00    0.20      28
324          UC   0.097   0.119
325          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
326          UA     100
             *

327          KK   CE23B COMBINE
328          KM        Combine flow from RE23C and SBE23B
329          HC       2
             *

330          KK   RE23B   ROUTE
331          KM        Route flow from CE23B into SBE23A to intermediate combine
332          RS       1    FLOW
333          RC   0.060   0.060   0.060     112  0.0267 2685.90
334          RX    0.00    8.00   12.00   14.00   24.00   30.00   32.00   49.00
335          RY  2685.6 2684.80 2684.20 2684.00 2684.00 2684.70 2685.00 2685.90
             *

336          KK  CE23AI COMBINE
337          KM        Intermediate combine of RE23D and RE23B to route through SBE23A
338          HC       2
             *

339          KK  RE23BD   ROUTE
340          KM        Route Intermediate combined flow from CE23AI through SBE23A
341          RS       1    FLOW
342          RC   0.060   0.060   0.060     238  0.0242 2685.00
343          RX    0.00   21.00   62.00   74.00   82.00   86.00  101.00  141.00
344          RY  2684.9 2682.70 2681.00 2679.00 2679.00 2680.10 2681.90 2685.00
             *

345          KK  SBE23A   BASIN
346          KM        SBE23A Basin Runoff
347          BA   0.006
348          LG    0.29    0.25    6.00    0.21      21
349          UC   0.120   0.135
350          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
351          UA     100
             *

352          KK   CE23A COMBINE
353          KM        Combine flow from SBE23A and RE23BD
354          HC       2
             *
1                                        HEC-1 INPUT                                        PAGE 10

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

355          KK  DBE23A STORAGE
356          KM    Retention Basin Storage/Outflow rating curve for Basin DBE23A
357          RS       1    STOR       0
358          SV    0.01    0.09    0.18    0.28    0.38    0.49    0.61    0.73    0.86    0.99
359          SV    1.13    1.29    1.45    1.62    1.80    2.00    2.21    2.45
360          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
361          SQ    0.01    0.01    0.01    0.01    0.01   49.50  140.00  257.20
362          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
363          SE    5.00    5.50    6.00    6.50    7.00    7.50    8.00    8.50
             *

364          KK   CLEAR COMBINE
365          HC       3
             *

366          KK  SBE22A   BASIN
367          KM        SBE22A Basin Runoff
368          BA   0.007
369          LG    0.30    0.25    6.00    0.22      15
370          UC   0.117   0.147
371          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
372          UA     100
             *

373          KK  DBE22A STORAGE
374          KM    Retention Basin Storage/Outflow rating curve for Basin DBE22A
375          RS       1    STOR       0
376          SV    0.01    0.03    0.07    0.12    0.16    0.21    0.27    0.33    0.39    0.47
377          SV    0.55    0.63
378          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    3.96
379          SQ   11.20   20.58
380          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
381          SE    5.00    5.50
             *

382          KK  SBE21A   BASIN
383          KM        SBE21A Basin Runoff
384          BA   0.001
385          LG    0.30    0.25    6.00    0.22      15
386          UC   0.063   0.080
387          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
388          UA     100
             *
```

```
 389          KK  SBE20A   BASIN
 390          KM        SBE20A Basin Runoff
 391          BA   0.001
 392          LG    0.30    0.25    6.00    0.22      15
 393          UC   0.056   0.059
 394          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 395          UA     100
              *
1                                        HEC-1 INPUT                                          PAGE 11

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

 396          KK  SBE19A   BASIN
 397          KM        SBE19A Basin Runoff
 398          BA   0.001
 399          LG    0.30    0.25    6.00    0.22      15
 400          UC   0.057   0.060
 401          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 402          UA     100
              *

 403          KK  SBE18A   BASIN
 404          KM        SBE18A Basin Runoff
 405          BA   0.001
 406          LG    0.30    0.25    6.00    0.22      15
 407          UC   0.065   0.083
 408          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 409          UA     100
              *

 410          KK  DBE18A STORAGE
 411          KM    Retention Basin Storage/Outflow rating curve for Basin DBE18A
 412          RS       1    STOR       0
 413          SV    0.01    0.01    0.02    0.02    0.03    0.04    0.05    0.06    0.07    0.08
 414          SV    0.09    0.10    0.12    0.13    0.14    0.16    0.17
 415          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
 416          SQ    0.01    0.35    0.99    1.82    2.80    3.91    5.14
 417          SE    0.10    0.30    0.50    0.80    1.00    1.30    1.50    1.80    2.00    2.30
 418          SE    2.50    2.80    3.00    3.30    3.50    3.80    4.00
              *

 419          KK   CLEAR COMBINE
 420          KM        Clear Hydrograph Stack
 421          HC       6
              *

 422          KK   SB17B   BASIN
 423          KM        SB17B Basin Runoff
 424          BA   0.015
 425          LG    0.24    0.25    6.00    0.20      29
 426          UC   0.139   0.140
 427          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 428          UA     100
              *

 429          KK  DBE17B STORAGE
 430          KM    Retention Basin Storage/Outflow rating curve for Basin DBE17B
 431          RS       1    STOR       0
 432          SV    0.01    0.08    0.17    0.26    0.35    0.46    0.56    0.68    0.80    0.92
 433          SV    1.06    1.20    1.35    1.51    1.68
 434          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
 435          SQ    0.01    0.01    9.90   28.00   51.44
 436          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
 437          SE    5.00    5.50    6.00    6.50    7.00
              *
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        LINE  ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 438          KK   RE17B   ROUTE
 439          KM         Route flow from SBE17B through SBE 17A
 440          RS       2    FLOW
 441          RC   0.060   0.060   0.060    1169  0.0265 2740.10
 442          RX    0.00    9.00   22.00   33.00   44.00   54.00   62.00   69.00
 443          RY  2740.1 2738.60 2737.00 2736.10 2736.00 2737.00 2738.40 2740.10
              *

 444          KK  SBE17A   BASIN
 445          KM        SBE17A Basin Runoff
 446          BA   0.018
 447          LG    0.26    0.25    6.00    0.21      29
 448          UC   0.141   0.163
 449          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 450          UA     100
              *

 451          KK   CE17A COMBINE
 452          KM         Combine flow from RE17B and SBE17A
 453          HC       2
              *

 454          KK  DBE17A STORAGE
 455          KM    Retention Basin Storage/Outflow rating curve for Basin DBE17A
 456          RS       1    STOR       0
```

```
 457          SV    0.01    0.09    0.19    0.29    0.41    0.54    0.68    0.84    1.01    1.19
 458          SV    1.39    1.62    1.86    2.13
 459          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
 460          SQ    0.01   17.82   50.40   92.59
 461          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
 462          SE    5.00    5.50    6.00    6.50
              *

 463          KK  SBE16A   BASIN
 464          KM        SBE16A Basin Runoff
 465          BA   0.001
 466          LG    0.30    0.25    6.00    0.22      15
 467          UC   0.069   0.102
 468          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 469          UA     100
              *

 470          KK  SBE13A   BASIN
 471          KM        SBE13A Basin Runoff
 472          BA   0.003
 473          LG    0.25    0.25    6.00    0.22      30
 474          UC   0.080   0.089
 475          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 476          UA     100
              *
1                                        HEC-1 INPUT                                        PAGE 13

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

 477          KK  DBE13A STORAGE
 478          KM    Retention Basin Storage/Outflow rating curve for Basin DBE13A
 479          RS       1    STOR       0
 480          SV    0.01    0.02    0.04    0.06    0.08    0.10    0.13    0.16    0.19    0.23
 481          SV    0.27    0.31    0.35
 482          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
 483          SQ    1.98    5.60   10.29
 484          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
 485          SE    5.00    5.50    6.00
              *

 486          KK  SBE12A   BASIN
 487          KM        SBE12A Basin Runoff
 488          BA   0.002
 489          LG    0.23    0.25    6.00    0.21      40
 490          UC   0.076   0.096
 491          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 492          UA     100
              *

 493          KK  DBE12A STORAGE
 494          KM    Retention Basin Storage/Outflow rating curve for Basin DBE12A
 495          RS       1    STOR       0
 496          SV    0.01    0.02    0.03    0.05    0.07    0.09    0.10    0.12    0.14    0.17
 497          SV    0.19    0.21    0.24    0.26    0.28
 498          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
 499          SQ    0.96    2.84    5.29    8.22   10.29
 500          SE    0.10    0.30    0.70    1.00    1.30    1.70    2.00    2.30    2.60    3.00
 501          SE    3.30    3.60    4.00    4.30    4.50
              *

 502          KK   SB11B   BASIN
 503          KM        SB11B Basin Runoff
 504          BA   0.013
 505          LG    0.18    0.25    6.00   0.246      17
 506          UC   0.243   0.331
 507          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 508          UA     100
              *

 509          KK   DB11B STORAGE
 510          KM    Retention Basin Storage/Outflow rating curve for Basin DB11B
 511          RS       1    STOR       0
 512          SV    0.01    0.05    0.16    0.28    0.43    0.61    0.80
 513          SQ    0.01       4      11      22      33      41      50
 514          SE  2777.5    2778    2779    2780    2781    2782    2783
              *

 515          KK   RE11B   ROUTE
 516          KM        Route flow from SBE11B through SBE11A
 517          RS       1    FLOW
 518          RC   0.060   0.060   0.060     914  0.0334 2770.20
 519          RX    0.00   10.00   16.00   23.00   25.00   34.00   48.00   64.00
 520          RY  2770.2 2767.10 2765.30 2762.00 2762.00 2765.00 2766.60 2768.30
              *
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       LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 521          KK   SB11A   BASIN
 522          KM        SB11A Basin Runoff
 523          BA   0.007
 524          LG    0.10    0.25    6.00   0.284
 525          UC   0.236   0.319
 526          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
```

```
 527          UA     100
              *

 528          KK  SB11A1   BASIN
 529          KM        SB11A1 Basin Runoff
 530          BA   0.003
 531          LG    0.18    0.25    6.00   0.251      15
 532          UC   0.146   0.220
 533          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 534          UA     100
              *

 535          KK   CE11A COMBINE
 536          KM        Combine flow from RE11B, SB11A and SB11A1
 537          HC       3
              *

 538          KK   CLEAR COMBINE
 539          KM        Clear Hydrograph Stack
 540          HC       6
              *

 541          KK   SB10A   BASIN
 542          KM        SB10A Basin Runoff
 543          BA   0.001
 544          LG    0.10    0.25    6.00   0.284
 545          UC   0.108   0.097
 546          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 547          UA     100
              *

 548          KK   SB09A   BASIN
 549          KM        SB09A Basin Runoff
 550          BA   0.001
 551          LG    0.10    0.25    6.00   0.284
 552          UC   0.126   0.174
 553          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 554          UA     100
              *

 555          KK   SB08A   BASIN
 556          KM        SB08A Basin Runoff
 557          BA   0.001
 558          LG    0.10    0.25    6.00   0.284
 559          UC   0.115   0.130
 560          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 561          UA     100
              *
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            LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 562          KK   CLEAR COMBINE
 563          KM        Clear Hydrograph Stack
 564          HC       4
              *
              *

 565          KK  SB06D1   BASIN
 566          KM        SB06D1 Basin Runoff
 567          BA   0.004
 568          LG    0.10    0.25    6.00   0.276      24
 569          UC   0.195   0.355
 570          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 571          UA     100
              *

 572          KK  SB06D2   BASIN
 573          KM        SB06D2 Basin Runoff
 574          BA   0.009
 575          LG    0.25    0.25    6.00   0.216      30
 576          UC   0.132   0.171
 577          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 578          UA     100
              *

 579          KK   CE06D COMBINE
 580          KM        Combine flow from SB06D1 and SB06D2
 581          HC       2
              *

 582          KK  DB06D1 STORAGE
 583          KM    Retention Basin Storage/Outflow rating curve for Basin DBE06D
 584          RS       1    STOR       0
 585          SV    0.01    0.12    0.26    0.44    0.64    0.64
 586          SQ    0.01       3       9      12      15      31
 587          SE    2795    2796    2797    2798    2799  2799.3
              *

 588          KK  SB06C1   BASIN
 589          KM        SB06C1 Basin Runoff
 590          BA   0.015
 591          LG    0.10    0.25    6.00   0.272      40
 592          UC   0.220   0.296
 593          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
```

```
 594          UA     100
              *

 595          KK  CE06CD COMBINE
 596          KM        Combine flow from DB06D1 and SB06C1
 597          HC       2
              *
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


 598          KK  DB06C1 STORAGE
 599          KM    Retention Basin Storage/Outflow rating curve for Basin DB06C1
 600          RS       1    STOR       0
 601          SV    0.01    0.10    0.23    0.41
 602          SQ    0.01       9      24      41
 603          SE    2792    2793    2794    2795
              *

 604          KK  SB06C2   BASIN
 605          KM        SB06C2 Basin Runoff
 606          BA   0.020
 607          LG    0.10    0.25    6.00   0.284
 608          UC   0.372   0.670
 609          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 610          UA     100
              *

 611          KK  SB06C3   BASIN
 612          KM        SB06C3 Basin Runoff
 613          BA   0.005
 614          LG    0.25    0.25    6.00   0.216      30
 615          UC   0.105   0.122
 616          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 617          UA     100
              *

 618          KK   CE06C COMBINE
 619          KM        Combine flow from SB06C2 and SB06C3
 620          HC       2
              *

 621          KK  DB06C2 STORAGE
 622          KM    Retention Basin Storage/Outflow rating curve for Basin DBE06C
 623          RS       1    STOR       0
 624          SV    0.01    0.08    0.19    0.32    0.49
 625          SQ    0.01       4      13      20      22
 626          SE    2788    2789    2790    2791    2792
              *

 627          KK  CE06CI COMBINE
 628          KM        Combine flow from DB06C2 and DB06C1
 629          HC       2
              *

 630          KK   RE06C   ROUTE
 631          KM        Route flow from CE06CI through Basin SBE06B
 632          RS       1    FLOW
 633          RC   0.060   0.060   0.060     591  0.0431 2786.60
 634          RX    0.00    6.00   16.00   26.00   36.00   40.00   41.00   44.00
 635          RY  2786.6 2786.00 2785.00 2784.00 2784.00 2785.00 2785.50 2786.40
              *
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


 636          KK  SB06B1   BASIN
 637          KM        SB06B1 Basin Runoff
 638          BA   0.003
 639          LG    0.18    0.25    6.00   0.251      15
 640          UC   0.153   0.248
 641          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 642          UA     100
              *

 643          KK  CE06CI COMBINE
 644          KM        Combine flow from SB06B1 and RE06C
 645          HC       2
              *

 646          KK   RE06B   ROUTE
 647          KM        Route flow from CE06CI through Basin SB06B
 648          RS       1    FLOW
 649          RC   0.060   0.060   0.060     814  0.0319 2761.00
 650          RX    0.00   21.00   55.00   63.00   82.00   92.00  104.00  113.00
 651          RY  2761.0 2758.90 2758.50 2758.00 2758.00 2758.50 2759.70 2760.80
              *

 652          KK   SB06B   BASIN
 653          KM        SB06B Basin Runoff
 654          BA   0.004
 655          LG    0.10    0.25    6.00   0.284
 656          UC   0.318   0.769
 657          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
```

```
 658          UA     100
              *

 659          KK   SB06A   BASIN
 660          KM        SB06A Basin Runoff
 661          BA   0.006
 662          LG    0.25    0.25    6.00   0.216      30
 663          UC   0.095   0.091
 664          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 665          UA     100
              *

 666          KK   DB06A STORAGE
 667          KM    Retention Basin Storage/Outflow rating curve for Basin DB06A
 668          RS       1    STOR       0
 669          SV    0.01    0.02    0.08    0.16    0.26
 670          SQ    0.01       1       6      11      14
 671          SE  2752.5    2753    2754    2755    2756
              *

 672          KK   CE06A COMBINE
 673          KM        Combine flow from DB06A, SB06B and RE06B
 674          HC       3
              *
1                                        HEC-1 INPUT                                        PAGE 18

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

 675          KK  SB05B1   BASIN
 676          KM        SB05B1 Basin Runoff
 677          BA   0.007
 678          LG    0.10    0.25    6.00   0.284
 679          UC   0.203   0.234
 680          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 681          UA     100
              *

 682          KK  DB05B1 STORAGE
 683          KM    Retention Basin Storage/Outflow rating curve for Basin DBE05B
 684          KM    Outlet control structure
 685          RS       1    STOR       0
 686          SV    0.01    0.02    0.06    0.11
 687          SQ    0.01    0.01       9      13
 688          SE    2810    2811    2812    2813
              *

 689          KK  SB05B2   BASIN
 690          KM        SB05B2 Basin Runoff
 691          BA   0.006
 692          LG    0.10    0.25    6.00   0.284
 693          UC   0.241   0.404
 694          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 695          UA     100
              *

 696          KK   CE05B COMBINE
 697          KM        Combine flow from DB05B1 and Basin SBE05B2
 698          HC       2
              *

 699          KK  DB05B2 STORAGE
 700          KM    Retention Basin Storage/Outflow rating curve for Basin DB05B2
 701          RS       1    STOR       0
 702          SV    0.01    0.01    0.02   0.044
 703          SQ    0.01    0.01      18      24
 704          SE    2800    2801    2802    2803
              *

 705          KK   RE05B   ROUTE
 706          KM        Route flow from SBE05B through SBE05A
 707          RS       1    FLOW
 708          RC   0.060   0.060   0.060     907  0.0435 2760.30
 709          RX    0.00   11.00   26.00   40.00   47.00   56.00   76.00   89.00
 710          RY  2760.1 2759.00 2757.70 2757.00 2757.00 2757.40 2758.80 2760.30
              *

 711          KK  SB05B3   BASIN
 712          KM        SB05B3 Basin Runoff
 713          BA   0.004
 714          LG    0.25    0.25    6.00   0.216      30
 715          UC   0.117   0.183
 716          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
1                                        HEC-1 INPUT                                        PAGE 19

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

 717          UA     100
              *

 718          KK  SB05B4   BASIN
 719          KM        SB05B4 Basin Runoff
 720          BA   0.004
 721          LG    0.18    0.25    6.00   0.251      15
 722          UC   0.147   0.175
 723          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
```

```
            724           UA     100
                          *

            725           KK  CE05B3 COMBINE
            726           KM        Combine flow from SB05B4, SB05B3 and RE05B
            727           HC       3
                          *

            728           KK  DB05B3 STORAGE
            729           KM    Retention Basin Storage/Outflow rating curve for Basin DB05B3
            730           RS       1    STOR       0
            731           SV    0.01    0.01    0.03   0.084
            732           SQ    0.01       8      25      41
            733           SE    2782    2783    2784    2785
                          *

            734           KK  RE05B3   ROUTE
            735           KM        Route flow from DB05B3 through SBE05A
            736           RS       1    FLOW
            737           RC   0.060   0.060   0.060     907  0.0435 2760.30
            738           RX    0.00   11.00   26.00   40.00   47.00   56.00   76.00   89.00
            739           RY  2760.1 2759.00 2757.70 2757.00 2757.00 2757.40 2758.80 2760.30
                          *

            740           KK   SB05A   BASIN
            741           KM        SB05A Basin Runoff
            742           BA   0.004
            743           LG    0.10    0.25    6.00   0.284
            744           UC   0.306   0.764
            745           UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
            746           UA     100
                          *

            747           KK  CE065A COMBINE
            748           KM        Combine flow from SB05A, RE05B3 and CE06A
            749           HC       3
                          *

            750           KK   SB04C   BASIN
            751           KM        SB04C Basin Runoff
            752           BA   0.002
            753           LG    0.10    0.25    6.00   0.269      10
            754           UC   0.200   0.418
            755           UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
            756           UA     100
                          *
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          LINE            ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

            757           KK   SB04B   BASIN
            758           KM        SB04B Basin Runoff
            759           BA   0.011
            760           LG    0.25    0.25    6.00   0.216      30
            761           UC   0.137   0.182
            762           UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
            763           UA     100
                          *

            764           KK   CE04B COMBINE
            765           KM        Combine flow from SB04C and SB04B
            766           HC       2
                          *

            767           KK   DB04B STORAGE
            768           KM    Retention Basin Storage/Outflow rating curve for Basin DBE04C
            769           RS       1    STOR       0
            770           SV    0.01    0.06    0.15   0.261  0.0262
            771           SQ    0.01       5      13      21      27
            772           SE    2755    2756    2757    2758  2758.2
                          *

            773           KK   RE04C   ROUTE
            774           KM        Route flow from DB04B into SBE04A
            775           RS       1    FLOW
            776           RC   0.060   0.060   0.060     455  0.0363 2755.00
            777           RX    0.00   17.00   22.00   27.00   32.00   44.00   61.00   88.00
            778           RY  2755.0 2753.00 2751.90 2750.00 2750.00 2751.90 2753.20 2754.90
                          *

            779           KK   SB04A   BASIN
            780           KM        SB04A Basin Runoff
            781           BA   0.008
            782           LG    0.25    0.25    6.00   0.216      30
            783           UC   0.113   0.125
            784           UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
            785           UA     100
                          *

            786           KK   CE04A COMBINE
            787           KM        Combine Flows from RE04C and SB04A
            788           HC       2
                          *

            789           KK   DB04A STORAGE
```

```
 790          KM    Retention Basin Storage/Outflow rating curve for Basin DB04A
 791          RS       1    STOR       0
 792          SV    0.01    0.05    0.16    0.30    0.47    0.67
 793          SQ    0.01       2      10      17      22      28
 794          SE  2738.5    2739    2740    2741    2742    2743
              *
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         LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 795          KK  SB03A1   BASIN
 796          KM        SB03A1 Basin Runoff
 797          BA   0.002
 798          LG    0.10    0.25    6.00   0.284
 799          UC   0.255   0.646
 800          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 801          UA     100
              *

 802          KK  DB03A1 STORAGE
 803          KM    Retention Basin Storage/Outflow rating curve for Basin DB03A1
 804          RS       1    STOR       0
 805          SV    0.01    0.07    0.16    0.27    0.40
 806          SQ    0.01       3       7      13      20
 807          SE    2750    2751    2752    2753    2754
              *

 808          KK   SB03A   BASIN
 809          KM        SB03A Basin Runoff
 810          BA   0.003
 811          LG    0.10    0.25    6.00   0.284
 812          UC   0.172   0.210
 813          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 814          UA     100
              *

 815          KK   CE03A COMBINE
 816          KM        Combine Flows from DB03A and SB03A
 817          HC       2
              *

 818          KK  SB02A1   BASIN
 819          KM        SB02A1 Basin Runoff
 820          BA   0.059
 821          LG    0.10    0.25    6.00   0.284
 822          UC   0.414   0.543
 823          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 824          UA     100
              *

 825          KK  DB02A1 STORAGE
 826          KM    Retention Basin Storage/Outflow rating curve for Basin DB02A1
 827          RS       1    STOR       0
 828          SV    0.01    0.04    0.14    0.25    0.26
 829          SQ    0.01       6      21      48      70
 830          SE  2789.5    2790    2791    2792    2793
              *

 831          KK   R02A1   ROUTE
 832          KM        Route flow from DB02A1 into SB02A3
 833          RS       1    FLOW
 834          RC   0.060   0.060   0.060     455  0.0363 2755.00
 835          RX    0.00   17.00   22.00   27.00   32.00   44.00   61.00   88.00
 836          RY  2755.0 2753.00 2751.90 2750.00 2750.00 2751.90 2753.20 2754.90
              *
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         LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 837          KK  SB02A2   BASIN
 838          KM        SB02A2 Basin Runoff
 839          BA   0.003
 840          LG    0.25    0.25    6.00   0.216      30
 841          UC   0.108   0.178
 842          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 843          UA     100
              *

 844          KK  DB02A2 STORAGE
 845          KM    Retention Basin Storage/Outflow rating curve for Basin DB02A2
 846          RS       1    STOR       0
 847          SV    0.01    0.14    0.32    0.53
 848          SQ    0.01    0.01    0.01       4
 849          SE    2762    2763    2764    2765
              *

 850          KK  SB02A3   BASIN
 851          KM        SB02A3 Basin Runoff
 852          BA   0.003
 853          LG    0.10    0.25    6.00   0.284
 854          UC   0.218   0.388
 855          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 856          UA     100
              *
```

```
 857          KK   CE02A COMBINE
 858          KM        Combine Flows from R02A1, DB02A2 and SB02A3
 859          HC       3
              *

 860          KK   SB01A   BASIN
 861          KM        SB01A Basin Runoff
 862          BA   0.119
 863          LG    0.10    0.25    6.00    0.28       1
 864          UC   0.460   0.513
 865          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 866          UA     100
              *

 867          KK   CLEAR COMBINE
 868          KM        Clear Hydrograph Stack
 869          HC       6
              *

 870          KK  SBW14A   BASIN
 871          KM        SBW14A Basin Runoff
 872          BA   0.009
 873          LG    0.28    0.25    6.00    0.20       4
 874          UC   0.109   0.085
 875          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 876          UA     100
              *
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        LINE  ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 877          KK  DBW14A STORAGE
 878          KM    Retention Basin Storage/Outflow rating curve for Basin DBW14A
 879          RS       1    STOR       0
 880          SV    0.01    0.04    0.07    0.11    0.15    0.19    0.23    0.28    0.32    0.37
 881          SV    0.42    0.47    0.52    0.58    0.63    0.70
 882          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.84
 883          SQ    2.97    6.04    9.74   13.95   18.64   23.76
 884          SE    0.10    0.30    0.60    0.90    1.20    1.50    1.80    2.10    2.40    2.70
 885          SE    3.00    3.30    3.60    3.90    4.20    4.50
              *

 886          KK  SBW13A   BASIN
 887          KM        SBW13A Basin Runoff
 888          BA   0.001
 889          LG    0.30    0.25    6.00    0.18       5
 890          UC   0.055   0.058
 891          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 892          UA     100
              *

 893          KK  SBW12A   BASIN
 894          KM        SBW12A Basin Runoff
 895          BA   0.017
 896          LG    0.29    0.25    6.00    0.19      13
 897          UC   0.115   0.091
 898          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 899          UA     100
              *

 900          KK  DBW12A STORAGE
 901          KM    Retention Basin Storage/Outflow rating curve for Basin DBW12A
 902          RS       1    STOR       0
 903          SV    0.01    0.08    0.16    0.24    0.33    0.43    0.53    0.64    0.75    0.87
 904          SV    0.99    1.13    1.27    1.43
 905          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
 906          SQ    5.94   16.80   30.86   47.52
 907          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
 908          SE    5.00    5.50    6.00    6.50
              *

 909          KK  SBW11A   BASIN
 910          KM        SBW11A Basin Runoff
 911          BA   0.001
 912          LG    0.30    0.25    6.00    0.18       5
 913          UC   0.047   0.039
 914          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 915          UA     100
              *
1                                        HEC-1 INPUT                                          PAGE 24

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

 916          KK   CLEAR COMBINE
 917          KM        Clear Hydrograph Stack
 918          HC       5
              *

 919          KK  SB10C1   BASIN
 920          KM        SB10C1 Basin Runoff
 921          BA   0.009
 922          LG    0.25    0.25    6.00   0.216      30
 923          UC   0.141   0.190
```

```
 924          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 925          UA     100
              *

 926          KK  SB10C2   BASIN
 927          KM        SB10C2 Basin Runoff
 928          BA   0.008
 929          LG    0.25    0.25    6.00   0.216      30
 930          UC   0.150   0.210
 931          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 932          UA     100
              *

 933          KK  SB10C3   BASIN
 934          KM        SB10C3 Basin Runoff
 935          BA   0.004
 936          LG    0.10    0.25    6.00   0.254      20
 937          UC   0.220   0.332
 938          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 939          UA     100
              *

 940          KK   CW10C COMBINE
 941          KM        Combine flow from SB10C1, SB10C2 and SB10C3
 942          HC       3
              *

 943          KK   DB10C STORAGE
 944          KM    Retention Basin Storage/Outflow rating curve for Basin DB10C
 945          RS       1    STOR       0
 946          SV    0.01    0.15    0.34    0.57    0.83
 947          SQ    0.01      10      33      47      65
 948          SE    2767    2768    2769    2770    2771
              *

 949          KK   RW10C   ROUTE
 950          KM         Route flow from SBW10C through Basin SBW10B
 951          RS       2    FLOW
 952          RC   0.060   0.060   0.060     952  0.0310 2757.80
 953          RX    0.00   34.00   47.00   62.00   62.10   68.00   73.00   78.00
 954          RY  2757.8 2754.40 2754.00 2752.10 2752.00 2753.70 2755.70 2757.50
              *
```



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

 955          KK   SB10B   BASIN
 956          KM        SB10B Basin Runoff
 957          BA   0.009
 958          LG    0.26    0.25    6.00   0.195      33
 959          UC   0.131   0.175
 960          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 961          UA     100
              *

 962          KK   CW10B COMBINE
 963          KM        Combine flow from RW10C and SBW10B
 964          HC       2
              *

 965          KK  DBW10B STORAGE
 966          KM    Retention Basin Storage/Outflow rating curve for Basin DBW10B
 967          RS       1    STOR       0
 968          SV    0.01    0.06    0.13    0.20    0.27    0.35    0.44    0.53    0.62    0.73
 969          SV    0.84    0.95    1.08    1.22    1.30
 970          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
 971          SQ    0.01    0.01    2.27   46.37    71.0
 972          SE    0.10    0.60    1.20    1.80    2.40    3.00    3.60    4.20    4.80    5.40
 973          SE    6.00    6.60    7.20    7.80    8.20
              *

 974          KK   RW10B   ROUTE
 975          KM         Route flow from CE10WB through Basin SBW10A
 976          RS       1    FLOW
 977          RC   0.060   0.060   0.060     653  0.0276 2732.00
 978          RX    0.00   68.00   75.00   79.00   86.00   92.00  106.00  150.00
 979          RY  2732.0 2728.10 2721.10 2726.10 2726.00 2726.60 2727.00 2732.00
              *

 980          KK  SB10AW   BASIN
 981          KM        SB10AW Basin Runoff
 982          BA   0.029
 983          LG    0.26    0.25    6.00   0.189      28
 984          UC   0.156   0.139
 985          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 986          UA     100
              *

 987          KK   CW10A COMBINE
 988          KM        Combine flow from RW10B and SBW10A
 989          HC       2
              *

 990          KK  DBW10A STORAGE
 991          KM    Retention Basin Storage/Outflow rating curve for Basin DBW10A
```

```
 992          RS       1    STOR       0
 993          SV    0.01    0.20    0.41    0.63    0.87    1.12    1.40    1.69    2.00    2.33
 994          SV    2.68    3.07    3.50    3.98    4.15
 995          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01   14.68
 996          SQ   56.00  113.58  182.88  189.00  189.00
1                                        HEC-1 INPUT                                          PAGE 26

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

 997          SE    0.10    0.60    1.20    1.80    2.40    3.00    3.60    4.20    4.80    5.40
 998          SE    6.00    6.60    7.20    7.80    8.00
              *

 999          KK   SB09E   BASIN
1000          KM        SB09E Basin Runoff
1001          BA   0.005
1002          LG    0.10    0.25    6.00   0.284
1003          UC   0.229   0.374
1004          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
1005          UA     100
              *

1006          KK   DB09E STORAGE
1007          KM    Retention Basin Storage/Outflow rating curve for Basin DB09E
1008          RS       1    STOR       0
1009          SV    0.01    0.06    0.14    0.24    0.37    0.52
1010          SQ    0.01       3       9      13      16      19
1011          SE    2826    2827    2828    2829    2830    2831
              *

1012          KK   RW09E   ROUTE
1013          KM        Route flow from SBW09E through Basin SBW09D
1014          RS       1    FLOW
1015          RC   0.060   0.060   0.060     985  0.0442 2805.10
1016          RX    0.00   10.00   12.00   14.00   17.00   23.00   29.00   48.00
1017          RY  2805.3 2803.10 2802.10 2800.70 2800.70 2802.00 2802.90 2805.10
              *

1018          KK  SB09D1   BASIN
1019          KM        SB09D1 Basin Runoff
1020          BA   0.009
1021          LG    0.24    0.25    6.00   0.216      30
1022          UC   0.108   0.116
1023          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
1024          UA     100
              *

1025          KK  SB09D2   BASIN
1026          KM        SB09D2 Basin Runoff
1027          BA   0.005
1028          LG    0.25    0.25    6.00   0.216      30
1029          UC   0.139   0.253
1030          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
1031          UA     100
              *

1032          KK  CW09DI COMBINE
1033          HC       3
              *
1                                        HEC-1 INPUT                                          PAGE 27

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

1034          KK   SB09C   BASIN
1035          KM        SB09C Basin Runoff
1036          BA   0.036
1037          LG    0.10    0.25    6.00   0.284
1038          UC   0.372   0.494
1039          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
1040          UA     100
              *

1041          KK   CW09D COMBINE
1042          KM        Combine flow from CW09DI and SBW09C
1043          HC       2
              *

1044          KK  DBW09C STORAGE
1045          KM    Retention Basin Storage/Outflow rating curve for Basin DBW09C
1046          RS       1    STOR       0
1047          SV    0.01    0.21    0.43    0.66    0.90    1.16    1.44    1.73    2.05    2.41
1048          SV    2.79
1049          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01   19.80   56.00
1050          SQ  102.88
1051          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
1052          SE    5.00
              *

1053          KK   RW09D   ROUTE
1054          KM        Route flow from CW09D through Basin SBW09B
1055          RS       1    FLOW
1056          RC   0.060   0.060   0.060     367  0.0368 2782.10
1057          RX    0.00   11.00   27.00   31.00   38.00   42.00   73.00   90.00
1058          RY  2782.1 2780.10 2780.00 2779.00 2779.00 2779.50 2780.90 2781.30
              *
```

```
1059          KK  SBW09B   BASIN
1060          KM        SBW09B Basin Runoff
1061          BA   0.005
1062          LG    0.27    0.25    6.00    0.20      29
1063          UC   0.087   0.086
1064          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
1065          UA     100
              *

1066          KK   CW09B COMBINE
1067          KM        Combine flow from RW09D and SBW09B
1068          HC       2
              *

1069          KK  DBW09B STORAGE
1070          KM    Retention Basin Storage/Outflow rating curve for Basin DBW09B
1071          RS       1    STOR       0
1072          SV    0.01    0.05    0.10    0.15    0.21    0.27    0.34    0.40    0.48    0.55
1073          SV    0.63    0.72
1074          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01   20.79
1075          SQ   58.80  108.02
1                                       HEC-1 INPUT                                          PAGE 28

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

1076          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
1077          SE    5.00    5.50
              *

1078          KK   RW09B   ROUTE
1079          KM        Route flow from CW09B through Basin SBW09A
1080          RS       1    FLOW
1081          RC   0.060   0.060   0.060    1036  0.0415 2765.60
1082          RX    0.00    8.00   49.00   58.00   67.00   72.00   85.00  104.00
1083          RY  2764.9 2764.80 2764.00 2763.00 2763.00 2764.00 2765.10 2765.60
              *

1084          KK  SBW09A   BASIN
1085          KM        SBW09A Basin Runoff
1086          BA   0.008
1087          LG    0.27    0.25    6.00    0.20      24
1088          UC   0.128   0.176
1089          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
1090          UA     100
              *

1091          KK   CW09A COMBINE
1092          KM        Combine flow from RW09B and SBW09A
1093          HC       2
              *

1094          KK  DBW09A STORAGE
1095          KM    Retention Basin Storage/Outflow rating curve for Basin DBW09A
1096          RS       1    STOR       0
1097          SV    0.01    0.04    0.08    0.12    0.17    0.21    0.26    0.32    0.37    0.43
1098          SV    0.50    0.57    0.64
1099          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
1100          SQ   22.77   64.40  118.31
1101          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
1102          SE    5.00    5.50    6.00
              *

1103          KK  SBW08A   BASIN
1104          KM        SBW08A Basin Runoff
1105          BA   0.009
1106          LG    0.27    0.25    6.00    0.18      21
1107          UC   0.103   0.105
1108          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
1109          UA     100
              *

1110          KK  DBW08A STORAGE
1111          KM    Retention Basin Storage/Outflow rating curve for Basin DBW08A
1112          RS       1    STOR       0
1113          SV    0.01    0.04    0.09    0.14    0.18    0.24    0.29    0.34    0.40    0.46
1114          SV    0.52    0.58    0.65    0.71    0.79    0.86    0.87
1115          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
1116          SQ    0.01    1.09    5.33   11.85   20.01   29.39   30.86
1117          SE    0.10    0.30    0.70    1.00    1.30    1.70    2.00    2.30    2.60    3.00
1118          SE    3.30    3.60    4.00    4.30    4.60    5.00    5.00
              *
1                                       HEC-1 INPUT                                          PAGE 29

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

1119          KK  SBW07C   BASIN
1120          KM        SBW07C Basin Runoff
1121          BA   0.005
1122          LG    0.21    0.25    6.00    0.23       3
1123          UC   0.162   0.231
1124          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
1125          UA     100
              *
```

```
1126          KK  DBW07C STORAGE
1127          KM    Retention Basin Storage/Outflow rating curve for Basin DBW07C
1128          RS       1    STOR       0
1129          SV    0.01    0.01    0.02    0.03    0.04    0.05    0.07    0.08    0.09    0.11
1130          SV    0.12    0.14    0.16    0.18    0.20    0.22    0.22
1131          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
1132          SQ    0.01    0.55    2.66    5.93   10.00   14.69   15.43
1133          SE    0.10    0.30    0.70    1.00    1.30    1.70    2.00    2.30    2.60    3.00
1134          SE    3.30    3.60    4.00    4.30    4.60    5.00    5.00
              *

1135          KK   SB07B   BASIN
1136          KM        SB07B Basin Runoff
1137          BA   0.007
1138          LG    0.10    0.25    6.00   0.284
1139          UC   0.246   0.394
1140          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
1141          UA     100
              *

1142          KK  DBW07B STORAGE
1143          KM    Retention Basin Storage/Outflow rating curve for Basin DBW07B
1144          RS       1    STOR       0
1145          SV    0.01    0.01    0.03    0.04    0.05    0.07    0.09    0.10    0.12    0.14
1146          SV    0.17    0.19    0.21    0.24    0.27    0.29    0.30
1147          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
1148          SQ    0.01    0.55    2.66    5.93   10.00   14.69   15.43
1149          SE    0.10    0.30    0.70    1.00    1.30    1.70    2.00    2.30    2.60    3.00
1150          SE    3.30    3.60    4.00    4.30    4.60    5.00    5.00
              *

1151          KK  CW07BC COMBINE
1152          KM       Combine flow from SBW07C andSBW07B
1153          HC       2
              *

1154          KK  RW07BC   ROUTE
1155          KM       Route flow from CW07BC through SBW07A
1156          RS       1    FLOW
1157          RC   0.060   0.060   0.060    1452  0.0465 2800.10
1158          RX    0.00    6.00   20.00   26.00   29.00   38.00   50.00   68.00
1159          RY  2800.1 2799.00 2796.00 2793.00 2793.00 2796.00 2797.00 2798.40
              *
```



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

1160          KK  SBW07A   BASIN
1161          KM       SBW07A Basin Runoff
1162          BA   0.013
1163          LG    0.28    0.25    6.00    0.20      22
1164          UC   0.142   0.193
1165          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
1166          UA     100
              *

1167          KK   CW07A COMBINE
1168          KM        Combine flow from RW07BC and SBW07A
1169          HC       2
              *

1170          KK  DBW07A STORAGE
1171          KM    Retention Basin Storage/Outflow rating curve for Basin DBW07A
1172          RS       1    STOR       0
1173          SV    0.01    0.09    0.18    0.28    0.39    0.50    0.62    0.74    0.88    1.01
1174          SV    1.16    1.32
1175          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01   10.89
1176          SQ   30.80   56.58
1177          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
1178          SE    5.00    5.50
              *

1179          KK   CLEAR COMBINE
1180          HC       5
              *

1181          KK  SBW06A   BASIN
1182          KM       SBW06A Basin Runoff
1183          BA   0.004
1184          LG    0.29    0.25    6.00    0.18      11
1185          UC   0.091   0.110
1186          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
1187          UA     100
              *

1188          KK  DBW06A STORAGE
1189          KM    Retention Basin Storage/Outflow rating curve for Basin DBW06A
1190          RS       1    STOR       0
1191          SV    0.01    0.02    0.03    0.05    0.07    0.09    0.11    0.14    0.16    0.19
1192          SV    0.21    0.24    0.28    0.31    0.34    0.38    0.39
1193          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
1194          SQ    0.01    0.55    2.66    5.93   10.00   14.69   15.43
1195          SE    0.10    0.30    0.70    1.00    1.30    1.70    2.00    2.30    2.60    3.00
1196          SE    3.30    3.60    4.00    4.30    4.60    5.00    5.00
              *
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1                                          HEC-1 INPUT                                          PAGE 31

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


          1197           KK  SBW05A   BASIN
          1198           KM        SBW05A Basin Runoff
          1199           BA   0.010
          1200           LG    0.29    0.25    6.00    0.19      11
          1201           UC   0.115   0.127
          1202           UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          1203           UA     100
                         *

          1204           KK  DBW05A STORAGE
          1205           KM    Retention Basin Storage/Outflow rating curve for Basin DBW05A
          1206           RS       1    STOR       0
          1207           SV    0.01    0.05    0.09    0.15    0.20    0.26    0.32    0.38    0.45    0.52
          1208           SV    0.59    0.67    0.76
          1209           SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
          1210           SQ    5.94   16.80   30.86
          1211           SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
          1212           SE    5.00    5.50    6.00
                         *

          1213           KK  SBW04A   BASIN
          1214           KM        SBW04A Basin Runoff
          1215           BA   0.002
          1216           LG    0.30    0.25    6.00    0.18       5
          1217           UC   0.071   0.080
          1218           UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          1219           UA     100
                         *

          1220           KK  SBW02A   BASIN
          1221           KM        SBW02A Basin Runoff
          1222           BA   0.007
          1223           LG    0.18    0.25    6.00    0.24       2
          1224           UC   0.183   0.241
          1225           UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          1226           UA     100
                         *

          1227           KK  DBW02A STORAGE
          1228           KM    Retention Basin Storage/Outflow rating curve for Basin DBW02A
          1229           RS       1    STOR       0
          1230           SV    0.01    0.01    0.03    0.05    0.06    0.08    0.10    0.12    0.14    0.16
          1231           SV    0.18    0.20    0.22    0.25    0.27
          1232           SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
          1233           SQ    0.01    2.20    6.04   11.07   15.43
          1234           SE    0.10    0.40    0.80    1.20    1.60    2.00    2.40    2.80    3.20    3.60
          1235           SE    4.00    4.40    4.80    5.20    5.50
                         *
1                                          HEC-1 INPUT                                          PAGE 32

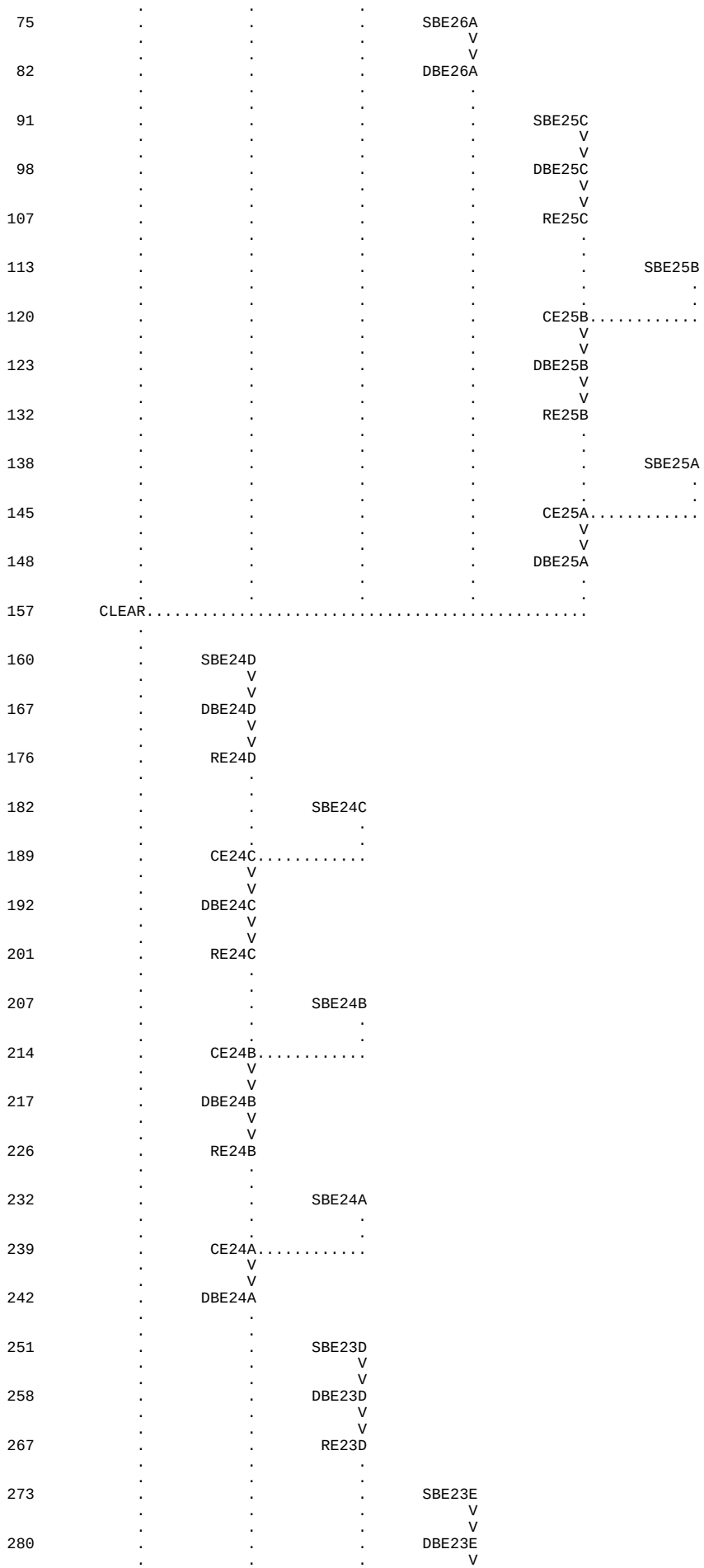
          LINE           ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

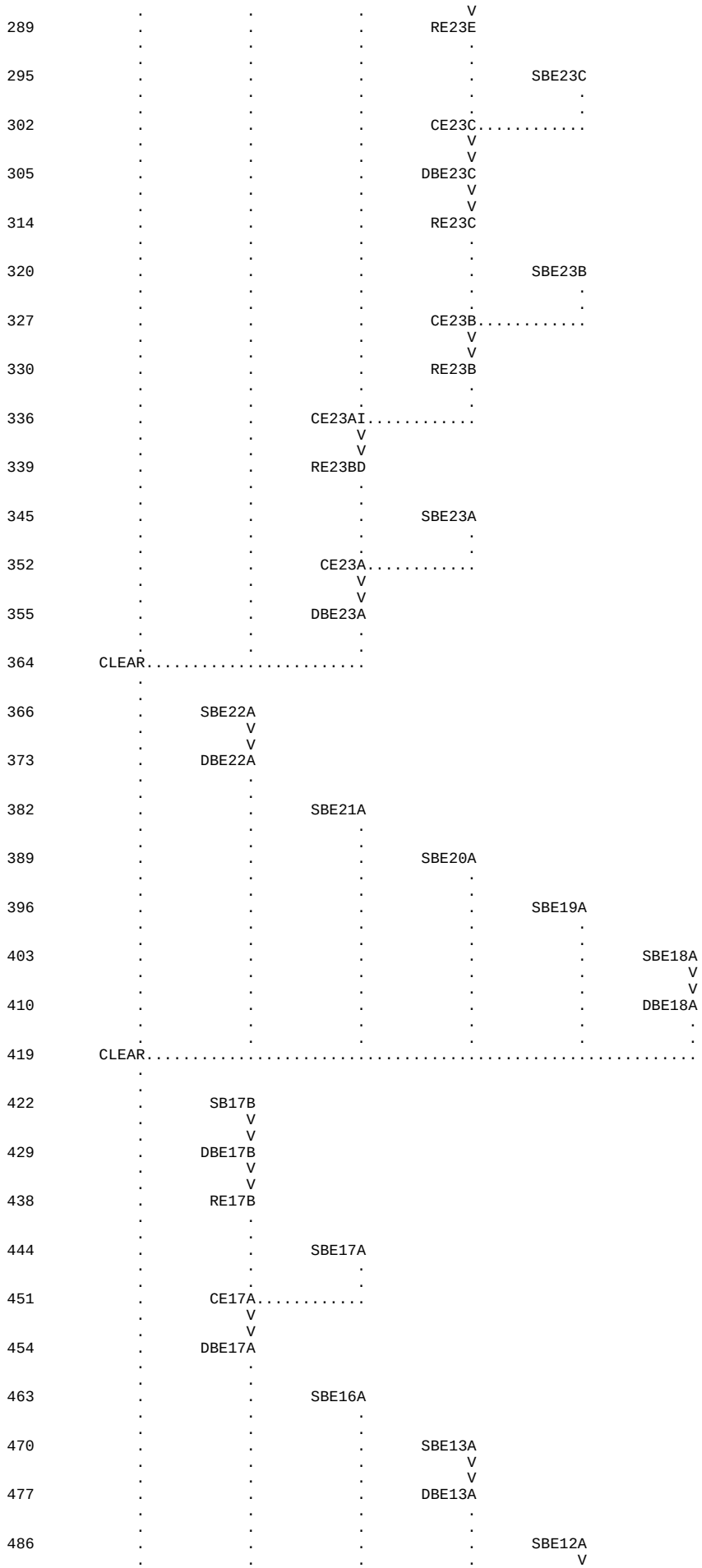

          1236           KK  SBW01A   BASIN
          1237           KM        SBW01A Basin Runoff
          1238           BA   0.002
          1239           LG    0.14    0.25    6.00    0.26       1
          1240           UC   0.143   0.196
          1241           UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          1242           UA     100
                         *

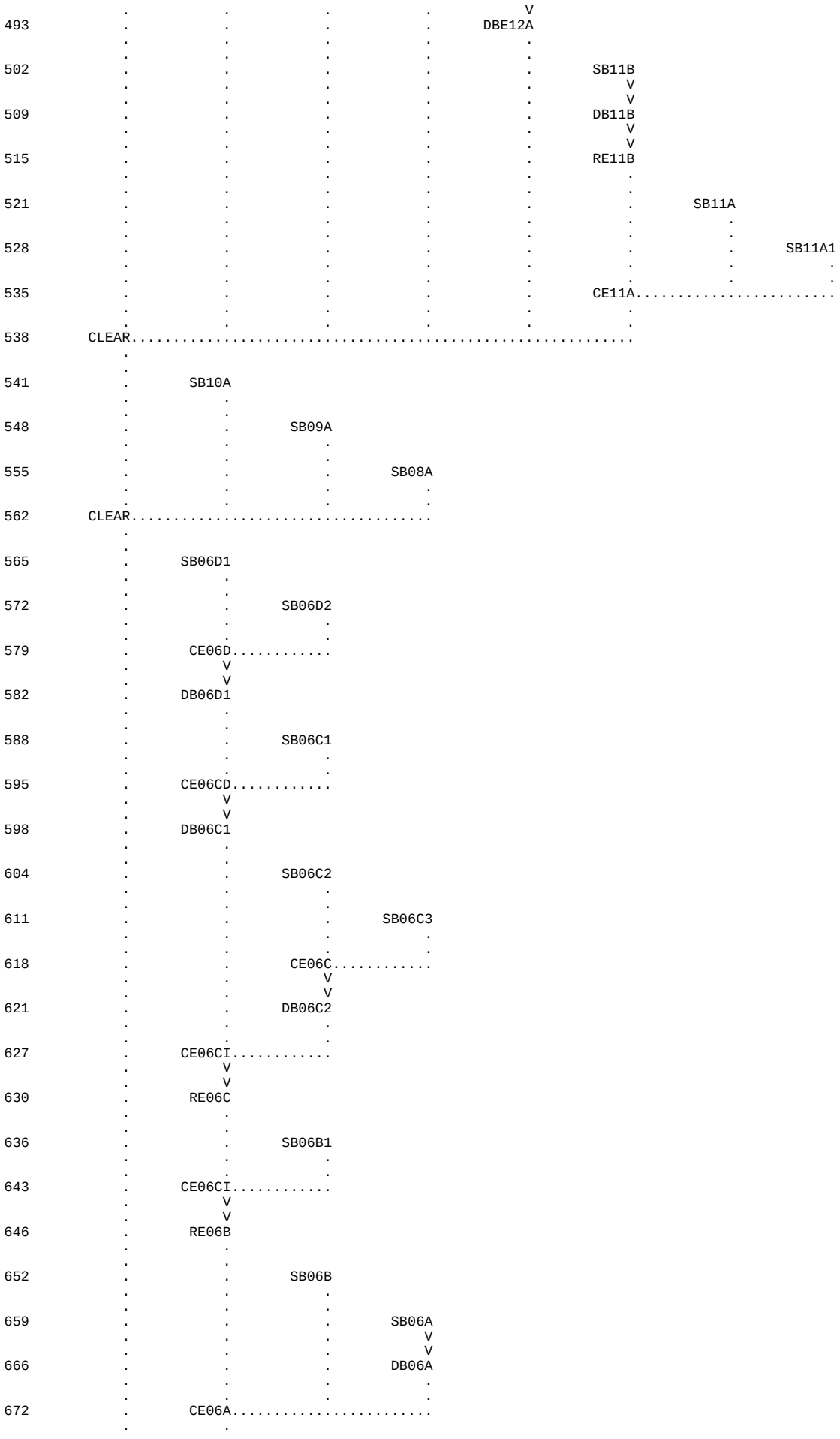
          1243           KK   CLEAR COMBINE
          1244           KM        Clear Hydrograph Stack
          1245           HC       6
                         *
          1246           ZZ
1
               SCHEMATIC DIAGRAM OF STREAM NETWORK
 INPUT
  LINE      (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

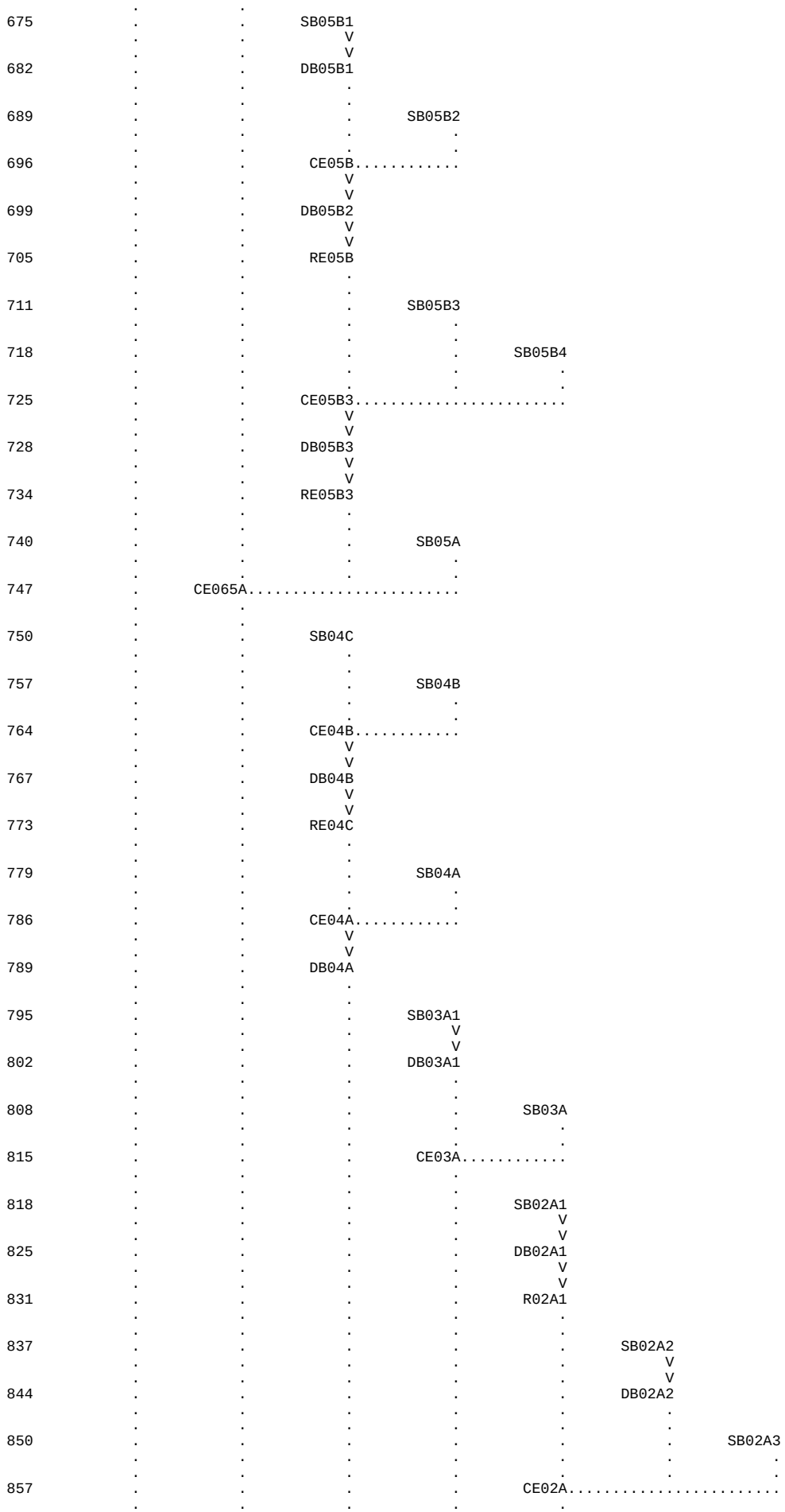
   NO.      (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW

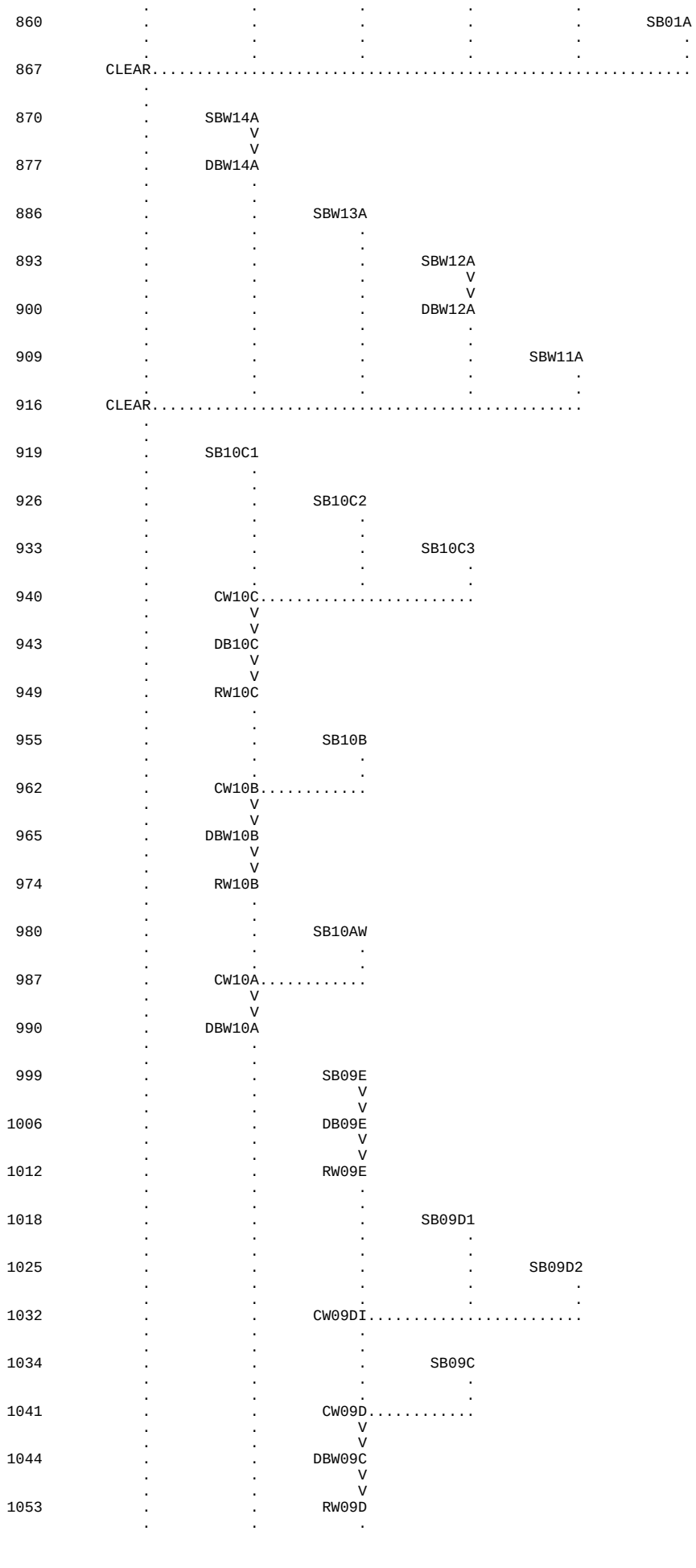
    23      SBE29A
                 V
                 V
    34      DBE29A
                 .
                 .
    43           .      SBE28A
                 .           V
                 .           V
    50           .      DBE28A
                 .           .
                 .           .
    59           .           .      SBE27A
                 .           .           V
                 .           .           V
    66           .           .      DBE27A
                 .           .           .
```

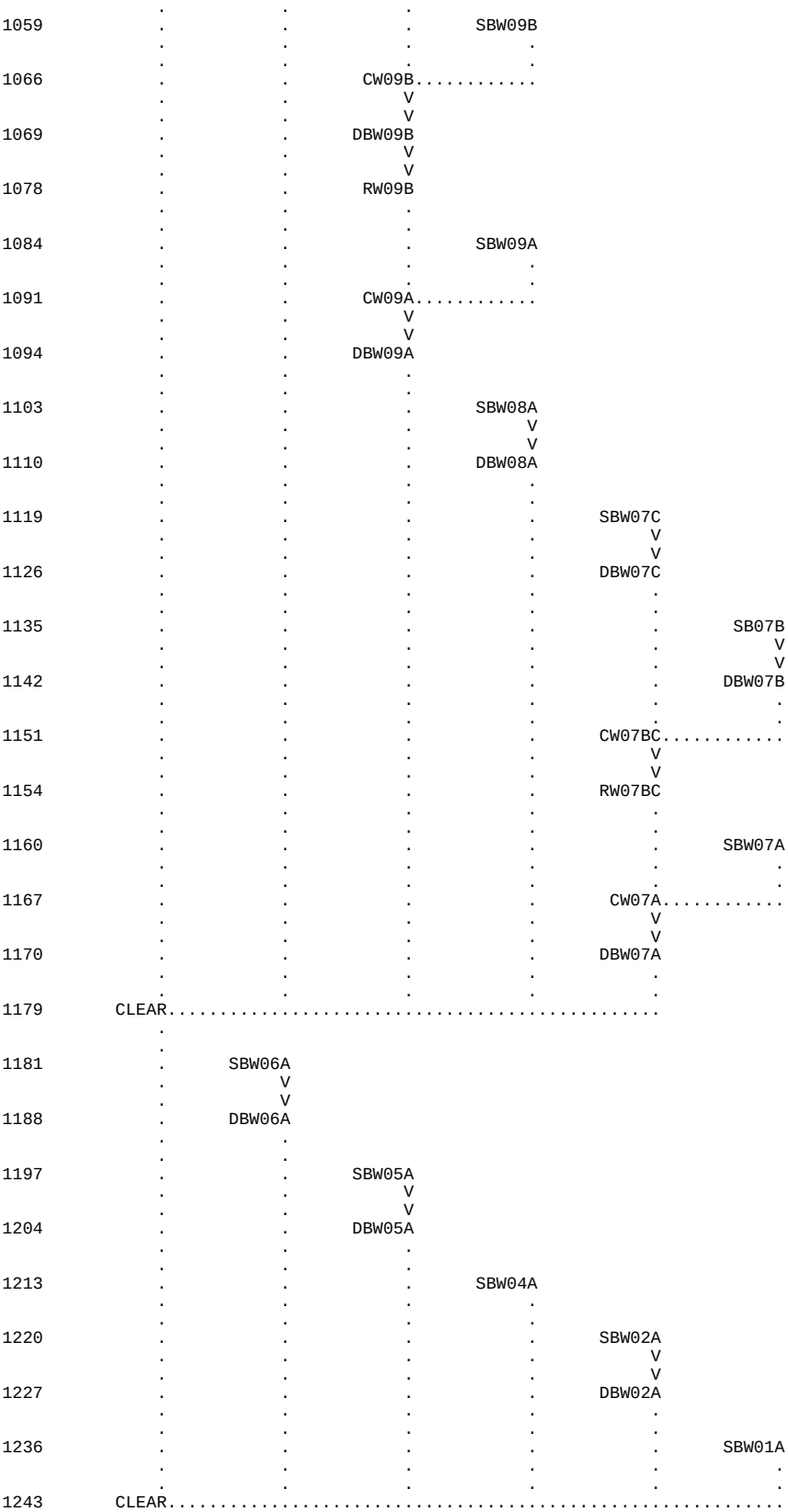

75 SBE26A
82 DBE26A
91 SBE25C
98 DBE25C
107 RE25C
113 SBE25B
120 CE25B
123 DBE25B
132 RE25B
138 SBE25A
145 CE25A
148 DBE25A
157 CLEAR
160 SBE24D
167 DBE24D
176 RE24D
182 SBE24C
189 CE24C
192 DBE24C
201 RE24C
207 SBE24B
214 CE24B
217 DBE24B
226 RE24B
232 SBE24A
239 CE24A
242 DBE24A
251 SBE23D
258 DBE23D
267 RE23D
273 SBE23E
280 DBE23E


RE23E
SBE23C
CE23C
DBE23C
RE23C
SBE23B
CE23B
RE23B
CE23AI
RE23BD
SBE23A
CE23A
DBE23A
CLEAR
SBE22A
DBE22A
SBE21A
SBE20A
SBE19A
SBE18A
DBE18A
CLEAR
SB17B
DBE17B
RE17B
SBE17A
CE17A
DBE17A
SBE16A
SBE13A
DBE13A
SBE12A


493 DBE12A
502 SB11B
509 DB11B
515 RE11B
521 SB11A
528 SB11A1
535 CE11A
538 CLEAR
541 SB10A
548 SB09A
555 SB08A
562 CLEAR
565 SB06D1
572 SB06D2
579 CE06D
582 DB06D1
588 SB06C1
595 CE06CD
598 DB06C1
604 SB06C2
611 SB06C3
618 CE06C
621 DB06C2
627 CE06CI
630 RE06C
636 SB06B1
643 CE06CI
646 RE06B
652 SB06B
659 SB06A
666 DB06A
672 CE06A


675 SB05B1
682 DB05B1
689 SB05B2
696 CE05B
699 DB05B2
705 RE05B
711 SB05B3
718 SB05B4
725 CE05B3
728 DB05B3
734 RE05B3
740 SB05A
747 CE065A
750 SB04C
757 SB04B
764 CE04B
767 DB04B
773 RE04C
779 SB04A
786 CE04A
789 DB04A
795 SB03A1
802 DB03A1
808 SB03A
815 CE03A
818 SB02A1
825 DB02A1
831 R02A1
837 SB02A2
844 DB02A2
850 SB02A3
857 CE02A


860 SB01A
867 CLEAR
870 SBW14A
877 DBW14A
886 SBW13A
893 SBW12A
900 DBW12A
909 SBW11A
916 CLEAR
919 SB10C1
926 SB10C2
933 SB10C3
940 CW10C
943 DB10C
949 RW10C
955 SB10B
962 CW10B
965 DBW10B
974 RW10B
980 SB10AW
987 CW10A
990 DBW10A
999 SB09E
1006 DB09E
1012 RW09E
1018 SB09D1
1025 SB09D2
1032 CW09DI
1034 SB09C
1041 CW09D
1044 DBW09C
1053 RW09D




(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

1**********

* *

* FLOOD HYDROGRAPH PACKAGE (HEC-1) *

* JUN 1998 *

* VERSION 4.1 *

* *

* RUN DATE 07MAY18 TIME 09:27:39 *

* *

**********

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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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```
                          SERENO CANYON (PHASE 4) - DEVELOPED CONDITIONS
                          STORM EVENT: 100-YR, 6-HOUR
                          05/04/2018
                          PREPARED BY: SLATER HANIFAN GROUP
                         ********************************************************************************
                         ********************************************************************************
                          Flood Control District of Maricopa County
                          Sereno Canyon Developed Conditions
                          100 YEAR
                          6 Hour  Storm
                          Unit Hydrograph: Clark
                          09/18/2012
                          Sereno Canyon-Developed Conditions
                          100-Year, 6-Hour Storm Event
                          Prepared By: JE Fuller Hydrology and Geomorphology
                          Modeled By: Brian Schalk P.E., CFM and Nathan Logan P.E., CFM
                          Submitted To: City of Scottsdale
                         ********************************************************************************
                         ********************************************************************************

  21 IO          OUTPUT CONTROL VARIABLES
                      IPRNT          5  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL         0.  HYDROGRAPH PLOT SCALE

     IT          HYDROGRAPH TIME DATA
                      NMIN          1  MINUTES IN COMPUTATION INTERVAL
                     IDATE      1DEC11  STARTING DATE
                     ITIME        0000  STARTING TIME
                        NQ        2000  NUMBER OF HYDROGRAPH ORDINATES
                    NDDATE      2DEC11  ENDING DATE
                    NDTIME        0919  ENDING TIME
                    ICENT          19  CENTURY MARK

                  COMPUTATION INTERVAL    0.02 HOURS
                       TOTAL TIME BASE   33.32 HOURS

          ENGLISH UNITS
               DRAINAGE AREA         SQUARE MILES
               PRECIPITATION DEPTH   INCHES
               LENGTH, ELEVATION     FEET
               FLOW                  CUBIC FEET PER SECOND
               STORAGE VOLUME        ACRE-FEET
               SURFACE AREA          ACRES
               TEMPERATURE           DEGREES FAHRENHEIT
1
                                                RUNOFF SUMMARY
                                           FLOW IN CUBIC FEET PER SECOND
                                         TIME IN HOURS,  AREA IN SQUARE MILES

                                    PEAK   TIME OF     AVERAGE FLOW FOR MAXIMUM PERIOD      BASIN     MAXIMUM     TIME OF
          OPERATION       STATION   FLOW     PEAK                                           AREA      STAGE     MAX STAGE
+                                                                 6-HOUR     24-HOUR     72-HOUR

          HYDROGRAPH AT
+                         SBE29A      36.    4.05           3.          1.          1.       0.01

          ROUTED TO
+                         DBE29A      21.    4.23           2.          1.          0.       0.01
+                                                                                                      5.15        4.23

          HYDROGRAPH AT
+                         SBE28A      37.    4.03           3.          1.          0.       0.01

          ROUTED TO
+                         DBE28A      17.    4.18           1.          0.          0.       0.01
+                                                                                                      5.41        4.18

          HYDROGRAPH AT
+                         SBE27A       6.    4.02           0.          0.          0.       0.00

          ROUTED TO
+                         DBE27A       2.    4.17           0.          0.          0.       0.00
+                                                                                                      3.49        4.17

          HYDROGRAPH AT
+                         SBE26A      27.    4.03           2.          1.          0.       0.01

          ROUTED TO
+                         DBE26A       8.    4.33           1.          0.          0.       0.01
+                                                                                                      5.61        4.33

          HYDROGRAPH AT
+                         SBE25C      16.    4.02           1.          0.          0.       0.00

          ROUTED TO
+                         DBE25C      11.    4.08           1.          0.          0.       0.00
+                                                                                                      3.74        4.08

          ROUTED TO
+                          RE25C       9.    4.17           1.          0.          0.       0.00
+                                                                                                   2687.51        4.17
```

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          HYDROGRAPH AT
+                      SBE25B        16.    4.03          1.          0.          0.       0.01
          2 COMBINED AT
+                       CE25B        20.    4.10          2.          0.          0.       0.01
          ROUTED TO
+                      DBE25B        14.    4.25          1.          0.          0.       0.01
+                                                                                          3.85       4.25
          ROUTED TO
+                       RE25B        13.    4.28          1.          0.          0.       0.01
+                                                                                       2677.09       4.28
          HYDROGRAPH AT
+                      SBE25A        10.    4.02          1.          0.          0.       0.00
          2 COMBINED AT
+                       CE25A        15.    4.27          2.          0.          0.       0.01
          ROUTED TO
+                      DBE25A        15.    4.32          1.          0.          0.       0.01
+                                                                                          4.24       4.32
          5 COMBINED AT
+                       CLEAR        59.    4.27          6.          1.          1.       0.05
          HYDROGRAPH AT
+                      SBE24D        31.    4.02          2.          0.          0.       0.01
          ROUTED TO
+                      DBE24D        17.    4.12          1.          0.          0.       0.01
+                                                                                          4.02       4.12
          ROUTED TO
+                       RE24D        16.    4.18          1.          0.          0.       0.01
+                                                                                       2721.82       4.18
          HYDROGRAPH AT
+                      SBE24C        40.    4.03          3.          1.          1.       0.01
          2 COMBINED AT
+                       CE24C        45.    4.08          4.          1.          1.       0.02
          ROUTED TO
+                      DBE24C        36.    4.22          3.          1.          1.       0.02
+                                                                                          4.40       4.22
          ROUTED TO
+                       RE24C        34.    4.27          3.          1.          1.       0.02
+                                                                                       2702.00       4.27
          HYDROGRAPH AT
+                      SBE24B        13.    4.03          1.          0.          0.       0.00
          2 COMBINED AT
+                       CE24B        40.    4.25          4.          1.          1.       0.03
          ROUTED TO
+                      DBE24B        33.    4.37          3.          1.          1.       0.03
+                                                                                          4.34       4.37
          ROUTED TO
+                       RE24B        30.    4.45          3.          1.          1.       0.03
+                                                                                       2687.95       4.45
          HYDROGRAPH AT
+                      SBE24A        19.    4.03          2.          0.          0.       0.01
          2 COMBINED AT
+                       CE24A        34.    4.43          5.          1.          1.       0.04
          ROUTED TO
+                      DBE24A        30.    4.52          4.          1.          1.       0.04
+                                                                                          4.83       4.52
          HYDROGRAPH AT
+                      SBE23D        98.    4.07          9.          2.          2.       0.04
          ROUTED TO
+                      DBE23D        75.    4.17          4.          1.          1.       0.04
+                                                                                          7.88       4.17
          ROUTED TO
+                       RE23D        60.    4.23          4.          1.          1.       0.04
+                                                                                       2685.21       4.23
          HYDROGRAPH AT
+                      SBE23E        14.    4.02          1.          0.          0.       0.00
          ROUTED TO
+                      DBE23E         4.    4.30          0.          0.          0.       0.00
+                                                                                          3.60       4.30
          ROUTED TO
+                       RE23E         4.    4.45          0.          0.          0.       0.00
```

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| + | | | | | | | | 2711.52 | 4.45 |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SBE23C | 128. | 4.05 | 11. | 3. | 2. | 0.05 | |
| | 2 COMBINED AT | | | | | | | | |
| + | | CE23C | 128. | 4.05 | 11. | 3. | 2. | 0.06 | |
| | ROUTED TO | | | | | | | | |
| + | | DBE23C | 94. | 4.18 | 7. | 2. | 1. | 0.06 | |
| + | | | | | | | | 6.62 | 4.18 |
| | ROUTED TO | | | | | | | | |
| + | | RE23C | 91. | 4.22 | 7. | 2. | 1. | 0.06 | |
| + | | | | | | | | 2691.59 | 4.22 |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SBE23B | 12. | 4.02 | 1. | 0. | 0. | 0.00 | |
| | 2 COMBINED AT | | | | | | | | |
| + | | CE23B | 95. | 4.22 | 8. | 2. | 1. | 0.06 | |
| | ROUTED TO | | | | | | | | |
| + | | RE23B | 95. | 4.22 | 8. | 2. | 1. | 0.06 | |
| + | | | | | | | | 2685.22 | 4.22 |
| | 2 COMBINED AT | | | | | | | | |
| + | | CE23AI | 155. | 4.22 | 12. | 3. | 2. | 0.10 | |
| | ROUTED TO | | | | | | | | |
| + | | RE23BD | 154. | 4.23 | 12. | 3. | 2. | 0.10 | |
| + | | | | | | | | 2680.91 | 4.23 |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SBE23A | 17. | 4.02 | 1. | 0. | 0. | 0.01 | |
| | 2 COMBINED AT | | | | | | | | |
| + | | CE23A | 160. | 4.23 | 13. | 3. | 2. | 0.11 | |
| | ROUTED TO | | | | | | | | |
| + | | DBE23A | 137. | 4.32 | 10. | 2. | 2. | 0.11 | |
| + | | | | | | | | 7.98 | 4.32 |
| | 3 COMBINED AT | | | | | | | | |
| + | | CLEAR | 208. | 4.32 | 19. | 5. | 3. | 0.20 | |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SBE22A | 19. | 4.03 | 1. | 0. | 0. | 0.01 | |
| | ROUTED TO | | | | | | | | |
| + | | DBE22A | 7. | 4.23 | 1. | 0. | 0. | 0.01 | |
| + | | | | | | | | 4.74 | 4.23 |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SBE21A | 3. | 4.00 | 0. | 0. | 0. | 0.00 | |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SBE20A | 3. | 4.00 | 0. | 0. | 0. | 0.00 | |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SBE19A | 3. | 4.00 | 0. | 0. | 0. | 0.00 | |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SBE18A | 3. | 4.00 | 0. | 0. | 0. | 0.00 | |
| | ROUTED TO | | | | | | | | |
| + | | DBE18A | 0. | 4.38 | 0. | 0. | 0. | 0.00 | |
| + | | | | | | | | 2.59 | 4.40 |
| | 6 COMBINED AT | | | | | | | | |
| + | | CLEAR | 215. | 4.32 | 20. | 5. | 4. | 0.21 | |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SB17B | 43. | 4.03 | 3. | 1. | 1. | 0.01 | |
| | ROUTED TO | | | | | | | | |
| + | | DBE17B | 12. | 4.30 | 1. | 0. | 0. | 0.01 | |
| + | | | | | | | | 6.07 | 4.30 |
| | ROUTED TO | | | | | | | | |
| + | | RE17B | 10. | 4.47 | 1. | 0. | 0. | 0.01 | |
| + | | | | | | | | 2736.41 | 4.47 |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SBE17A | 49. | 4.03 | 4. | 1. | 1. | 0.02 | |
| | 2 COMBINED AT | | | | | | | | |
| + | | CE17A | 49. | 4.03 | 5. | 1. | 1. | 0.03 | |
| | ROUTED TO | | | | | | | | |
| + | | DBE17A | 18. | 4.42 | 2. | 1. | 0. | 0.03 | |
| + | | | | | | | | 5.50 | 4.42 |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SBE16A | 3. | 4.00 | 0. | 0. | 0. | 0.00 | |

```
         HYDROGRAPH AT
+                     SBE13A        10.    4.00          1.          0.          0.       0.00
         ROUTED TO
+                     DBE13A         2.    4.20          0.          0.          0.       0.00
+                                                                                          5.07        4.20
         HYDROGRAPH AT
+                     SBE12A         6.    4.00          0.          0.          0.       0.00
         ROUTED TO
+                     DBE12A         2.    4.22          0.          0.          0.       0.00
+                                                                                          3.41        4.22
         HYDROGRAPH AT
+                      SB11B        24.    4.08          3.          1.          0.       0.01
         ROUTED TO
+                      DB11B        20.    4.22          3.          1.          0.       0.01
+                                                                                       2779.78        4.22
         ROUTED TO
+                      RE11B        19.    4.28          3.          1.          0.       0.01
+                                                                                       2763.10        4.28
         HYDROGRAPH AT
+                      SB11A        12.    4.08          1.          0.          0.       0.01
         HYDROGRAPH AT
+                     SB11A1         7.    4.05          1.          0.          0.       0.00
         3 COMBINED AT
+                      CE11A        33.    4.17          4.          1.          1.       0.02
         6 COMBINED AT
+                      CLEAR       265.    4.32         28.          7.          5.       0.27
         HYDROGRAPH AT
+                      SB10A         3.    4.02          0.          0.          0.       0.00
         HYDROGRAPH AT
+                      SB09A         2.    4.03          0.          0.          0.       0.00
         HYDROGRAPH AT
+                      SB08A         3.    4.02          0.          0.          0.       0.00
         4 COMBINED AT
+                      CLEAR       266.    4.32         28.          7.          5.       0.28
         HYDROGRAPH AT
+                     SB06D1         7.    4.07          1.          0.          0.       0.00
         HYDROGRAPH AT
+                     SB06D2        24.    4.03          2.          1.          0.       0.01
         2 COMBINED AT
+                      CE06D        31.    4.03          3.          1.          1.       0.01
         ROUTED TO
+                     DB06D1        14.    4.28          3.          1.          1.       0.01
+                                                                                       2798.76        4.28
         HYDROGRAPH AT
+                     SB06C1        31.    4.08          4.          1.          1.       0.01
         2 COMBINED AT
+                     CE06CD        44.    4.08          6.          2.          1.       0.03
         ROUTED TO
+                     DB06C1        38.    4.22          6.          2.          1.       0.03
+                                                                                       2794.84        4.22
         HYDROGRAPH AT
+                     SB06C2        21.    4.17          3.          1.          1.       0.02
         HYDROGRAPH AT
+                     SB06C3        15.    4.02          1.          0.          0.       0.00
         2 COMBINED AT
+                      CE06C        31.    4.05          5.          1.          1.       0.02
         ROUTED TO
+                     DB06C2        21.    4.33          5.          1.          1.       0.02
+                                                                                       2791.63        4.33
         2 COMBINED AT
+                     CE06CI        59.    4.23         11.          3.          2.       0.05
         ROUTED TO
+                      RE06C        59.    4.27         11.          3.          2.       0.05
+                                                                                       2784.92        4.25
         HYDROGRAPH AT
+                     SB06B1         7.    4.05          1.          0.          0.       0.00
         2 COMBINED AT
```

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| + | | CE06CI | 63. | 4.23 | 12. | 3. | 2. | 0.06 | |
| | ROUTED TO | | | | | | | | |
| + | | RE06B | 62. | 4.30 | 12. | 3. | 2. | 0.06 | |
| + | | | | | | | | | 2758.67 4.30 |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SB06B | 4. | 4.15 | 1. | 0. | 0. | 0.00 | |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SB06A | 19. | 4.02 | 1. | 0. | 0. | 0.01 | |
| | ROUTED TO | | | | | | | | |
| + | | DB06A | 13. | 4.08 | 1. | 0. | 0. | 0.01 | |
| + | | | | | | | | | 2755.52 4.08 |
| | 3 COMBINED AT | | | | | | | | |
| + | | CE06A | 75. | 4.25 | 14. | 3. | 3. | 0.07 | |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SB05B1 | 15. | 4.07 | 1. | 0. | 0. | 0.01 | |
| | ROUTED TO | | | | | | | | |
| + | | DB05B1 | 12. | 4.15 | 1. | 0. | 0. | 0.01 | |
| + | | | | | | | | | 2812.84 4.15 |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SB05B2 | 9. | 4.08 | 1. | 0. | 0. | 0.01 | |
| | 2 COMBINED AT | | | | | | | | |
| + | | CE05B | 21. | 4.12 | 2. | 1. | 0. | 0.01 | |
| | ROUTED TO | | | | | | | | |
| + | | DB05B2 | 21. | 4.17 | 2. | 1. | 0. | 0.01 | |
| + | | | | | | | | | 2802.48 4.17 |
| | ROUTED TO | | | | | | | | |
| + | | RE05B | 20. | 4.25 | 2. | 1. | 0. | 0.01 | |
| + | | | | | | | | | 2757.47 4.25 |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SB05B3 | 11. | 4.03 | 1. | 0. | 0. | 0.00 | |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SB05B4 | 10. | 4.03 | 1. | 0. | 0. | 0.00 | |
| | 3 COMBINED AT | | | | | | | | |
| + | | CE05B3 | 34. | 4.07 | 4. | 1. | 1. | 0.02 | |
| | ROUTED TO | | | | | | | | |
| + | | DB05B3 | 33. | 4.12 | 4. | 1. | 1. | 0.02 | |
| + | | | | | | | | | 2784.52 4.12 |
| | ROUTED TO | | | | | | | | |
| + | | RE05B3 | 32. | 4.20 | 4. | 1. | 1. | 0.02 | |
| + | | | | | | | | | 2757.58 4.20 |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SB05A | 4. | 4.15 | 1. | 0. | 0. | 0.00 | |
| | 3 COMBINED AT | | | | | | | | |
| + | | CE065A | 110. | 4.23 | 18. | 5. | 3. | 0.09 | |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SB04C | 3. | 4.08 | 0. | 0. | 0. | 0.00 | |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SB04B | 29. | 4.03 | 3. | 1. | 0. | 0.01 | |
| | 2 COMBINED AT | | | | | | | | |
| + | | CE04B | 32. | 4.03 | 3. | 1. | 1. | 0.01 | |
| | ROUTED TO | | | | | | | | |
| + | | DB04B | 21. | 4.03 | 3. | 1. | 1. | 0.01 | |
| + | | | | | | | | | 2758.00 4.05 |
| | ROUTED TO | | | | | | | | |
| + | | RE04C | 20. | 4.38 | 3. | 1. | 1. | 0.01 | |
| + | | | | | | | | | 2750.77 4.38 |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SB04A | 24. | 4.02 | 2. | 0. | 0. | 0.01 | |
| | 2 COMBINED AT | | | | | | | | |
| + | | CE04A | 43. | 4.03 | 5. | 1. | 1. | 0.02 | |
| | ROUTED TO | | | | | | | | |
| + | | DB04A | 26. | 4.27 | 5. | 1. | 1. | 0.02 | |
| + | | | | | | | | | 2742.61 4.27 |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SB03A1 | 2. | 4.12 | 0. | 0. | 0. | 0.00 | |
| | ROUTED TO | | | | | | | | |
| + | | DB03A1 | 2. | 4.40 | 0. | 0. | 0. | 0.00 | |
| + | | | | | | | | | 2750.55 4.40 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | HYDROGRAPH AT | | | | | | | | |
| + | | SB03A | 7. | 4.05 | 1. | 0. | 0. | 0.00 | |
| | 2 COMBINED AT | | | | | | | | |
| + | | CE03A | 7. | 4.07 | 1. | 0. | 0. | 0.00 | |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SB02A1 | 70. | 4.17 | 10. | 3. | 2. | 0.06 | |
| | ROUTED TO | | | | | | | | |
| + | | DB02A1 | 70. | 4.18 | 10. | 3. | 2. | 0.06 | |
| + | | | | | | | | | 2792.99 4.18 |
| | ROUTED TO | | | | | | | | |
| + | | R02A1 | 69. | 4.22 | 10. | 3. | 2. | 0.06 | |
| + | | | | | | | | | 2751.40 4.22 |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SB02A2 | 8. | 4.03 | 1. | 0. | 0. | 0.00 | |
| | ROUTED TO | | | | | | | | |
| + | | DB02A2 | 0. | 4.95 | 0. | 0. | 0. | 0.00 | |
| + | | | | | | | | | 2764.03 4.95 |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SB02A3 | 5. | 4.08 | 1. | 0. | 0. | 0.00 | |
| | 3 COMBINED AT | | | | | | | | |
| + | | CE02A | 73. | 4.20 | 11. | 3. | 2. | 0.06 | |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SB01A | 144. | 4.18 | 21. | 5. | 4. | 0.12 | |
| | 6 COMBINED AT | | | | | | | | |
| + | | CLEAR | 608. | 4.30 | 84. | 21. | 15. | 0.58 | |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SBW14A | 28. | 4.02 | 2. | 0. | 0. | 0.01 | |
| | ROUTED TO | | | | | | | | |
| + | | DBW14A | 14. | 4.12 | 1. | 0. | 0. | 0.01 | |
| + | | | | | | | | | 3.90 4.12 |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SBW13A | 3. | 4.00 | 0. | 0. | 0. | 0.00 | |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SBW12A | 54. | 4.02 | 3. | 1. | 1. | 0.02 | |
| | ROUTED TO | | | | | | | | |
| + | | DBW12A | 26. | 4.13 | 2. | 0. | 0. | 0.02 | |
| + | | | | | | | | | 5.83 4.13 |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SBW11A | 3. | 4.00 | 0. | 0. | 0. | 0.00 | |
| | 5 COMBINED AT | | | | | | | | |
| + | | CLEAR | 633. | 4.30 | 87. | 22. | 16. | 0.61 | |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SB10C1 | 23. | 4.03 | 2. | 1. | 0. | 0.01 | |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SB10C2 | 20. | 4.05 | 2. | 0. | 0. | 0.01 | |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SB10C3 | 8. | 4.08 | 1. | 0. | 0. | 0.00 | |
| | 3 COMBINED AT | | | | | | | | |
| + | | CW10C | 50. | 4.05 | 5. | 1. | 1. | 0.02 | |
| | ROUTED TO | | | | | | | | |
| + | | DB10C | 40. | 4.13 | 5. | 1. | 1. | 0.02 | |
| + | | | | | | | | | 2769.49 4.13 |
| | ROUTED TO | | | | | | | | |
| + | | RW10C | 39. | 4.20 | 5. | 1. | 1. | 0.02 | |
| + | | | | | | | | | 2753.47 4.20 |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SB10B | 24. | 4.03 | 2. | 1. | 0. | 0.01 | |
| | 2 COMBINED AT | | | | | | | | |
| + | | CW10B | 56. | 4.08 | 7. | 2. | 1. | 0.03 | |
| | ROUTED TO | | | | | | | | |
| + | | DBW10B | 52. | 4.20 | 5. | 1. | 1. | 0.03 | |
| + | | | | | | | | | 7.90 4.20 |
| | ROUTED TO | | | | | | | | |
| + | | RW10B | 51. | 4.25 | 5. | 1. | 1. | 0.03 | |
| + | | | | | | | | | 2724.61 4.25 |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SB10AW | 83. | 4.03 | 7. | 2. | 1. | 0.03 | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 2 COMBINED AT | | | | | | | | |
| + | | CW10A | 92. | 4.17 | 11. | 3. | 2. | 0.06 | |
| | ROUTED TO | | | | | | | | |
| + | | DBW10A | 73. | 4.30 | 8. | 2. | 1. | 0.06 | |
| + | | | | | | | | | 6.18 4.30 |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SB09E | 8. | 4.08 | 1. | 0. | 0. | 0.00 | |
| | ROUTED TO | | | | | | | | |
| + | | DB09E | 6. | 4.23 | 1. | 0. | 0. | 0.00 | |
| + | | | | | | | | | 2827.55 4.23 |
| | ROUTED TO | | | | | | | | |
| + | | RW09E | 6. | 4.33 | 1. | 0. | 0. | 0.00 | |
| + | | | | | | | | | 2801.20 4.33 |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SB09D1 | 27. | 4.02 | 2. | 1. | 0. | 0.01 | |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SB09D2 | 11. | 4.05 | 1. | 0. | 0. | 0.00 | |
| | 3 COMBINED AT | | | | | | | | |
| + | | CW09DI | 40. | 4.03 | 4. | 1. | 1. | 0.02 | |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SB09C | 46. | 4.15 | 6. | 2. | 1. | 0.04 | |
| | 2 COMBINED AT | | | | | | | | |
| + | | CW09D | 77. | 4.05 | 10. | 3. | 2. | 0.05 | |
| | ROUTED TO | | | | | | | | |
| + | | DBW09C | 52. | 4.35 | 7. | 2. | 1. | 0.05 | |
| + | | | | | | | | | 4.44 4.35 |
| | ROUTED TO | | | | | | | | |
| + | | RW09D | 51. | 4.38 | 7. | 2. | 1. | 0.05 | |
| + | | | | | | | | | 2779.98 4.38 |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SBW09B | 16. | 4.00 | 1. | 0. | 0. | 0.00 | |
| | 2 COMBINED AT | | | | | | | | |
| + | | CW09B | 52. | 4.37 | 8. | 2. | 1. | 0.06 | |
| | ROUTED TO | | | | | | | | |
| + | | DBW09B | 52. | 4.40 | 7. | 2. | 1. | 0.06 | |
| + | | | | | | | | | 4.91 4.40 |
| | ROUTED TO | | | | | | | | |
| + | | RW09B | 50. | 4.48 | 7. | 2. | 1. | 0.06 | |
| + | | | | | | | | | 2763.88 4.48 |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SBW09A | 21. | 4.03 | 2. | 0. | 0. | 0.01 | |
| | 2 COMBINED AT | | | | | | | | |
| + | | CW09A | 53. | 4.47 | 9. | 2. | 2. | 0.07 | |
| | ROUTED TO | | | | | | | | |
| + | | DBW09A | 53. | 4.48 | 8. | 2. | 1. | 0.07 | |
| + | | | | | | | | | 5.36 4.48 |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SBW08A | 28. | 4.02 | 2. | 0. | 0. | 0.01 | |
| | ROUTED TO | | | | | | | | |
| + | | DBW08A | 12. | 4.15 | 1. | 0. | 0. | 0.01 | |
| + | | | | | | | | | 4.32 4.15 |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SBW07C | 11. | 4.05 | 1. | 0. | 0. | 0.00 | |
| | ROUTED TO | | | | | | | | |
| + | | DBW07C | 9. | 4.15 | 1. | 0. | 0. | 0.00 | |
| + | | | | | | | | | 4.52 4.15 |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SB07B | 11. | 4.10 | 1. | 0. | 0. | 0.01 | |
| | ROUTED TO | | | | | | | | |
| + | | DBW07B | 8. | 4.30 | 1. | 0. | 0. | 0.01 | |
| + | | | | | | | | | 4.44 4.30 |
| | 2 COMBINED AT | | | | | | | | |
| + | | CW07BC | 15. | 4.23 | 2. | 0. | 0. | 0.01 | |
| | ROUTED TO | | | | | | | | |
| + | | RW07BC | 13. | 4.35 | 2. | 0. | 0. | 0.01 | |
| + | | | | | | | | | 2793.76 4.35 |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SBW07A | 33. | 4.03 | 3. | 1. | 1. | 0.01 | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 2 COMBINED AT | | | | | | | | |
| + | | CW07A | 34. | 4.05 | 4. | 1. | 1. | 0.03 | |
| | ROUTED TO | | | | | | | | |
| + | | DBW07A | 23. | 4.35 | 3. | 1. | 0. | 0.03 | |
| + | | | | | | | | | 4.81 4.35 |
| | 5 COMBINED AT | | | | | | | | |
| + | | CLEAR | 766. | 4.32 | 106. | 27. | 19. | 0.77 | |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SBW06A | 12. | 4.02 | 1. | 0. | 0. | 0.00 | |
| | ROUTED TO | | | | | | | | |
| + | | DBW06A | 5. | 4.17 | 0. | 0. | 0. | 0.00 | |
| + | | | | | | | | | 4.20 4.17 |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SBW05A | 29. | 4.02 | 2. | 1. | 0. | 0.01 | |
| | ROUTED TO | | | | | | | | |
| + | | DBW05A | 16. | 4.15 | 1. | 0. | 0. | 0.01 | |
| + | | | | | | | | | 5.46 4.15 |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SBW04A | 6. | 4.00 | 0. | 0. | 0. | 0.00 | |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SBW02A | 15. | 4.05 | 1. | 0. | 0. | 0.01 | |
| | ROUTED TO | | | | | | | | |
| + | | DBW02A | 12. | 4.15 | 1. | 0. | 0. | 0.01 | |
| + | | | | | | | | | 5.28 4.15 |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SBW01A | 5. | 4.03 | 0. | 0. | 0. | 0.00 | |
| | 6 COMBINED AT | | | | | | | | |
| + | | CLEAR | 791. | 4.30 | 109. | 27. | 20. | 0.79 | |

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

SLATER HANIFAN GROUP
CONSULTING ENGINEERS & PLANNERS

Project: SERENO CANYON PHASE 4
Project No.: TOL1702.000
Location: SCOTTSDALE, AZ

# HEC-1 Results - Proposed Conditions 100-yr, 6-hr

| HEC-1 ID | | Existing Condition Peak Discharge (A) | Developed Condition Peak Discharge (B) | (B) – (A) |
|---|---|---|---|---|
| Ex.Cond. | Prop.Cond. | [cfs] | [cfs] | [cfs] |
| CE01A | SB01A | 201 | 144 | -57 |
| CE04A | DB04A | 46 | 26 | -20 |
| CE065A | CE065A | 108 | 110 | 2 |
| CE11A | CE11A | 49 | 33 | -16 |
| CE17A | DBE17A | 57 | 18 | -39 |
| CE23A | DBE23A | 148 | 137 | -11 |
| CE24A | DBE24A | 60 | 30 | -30 |
| CE25A | DBE25A | 25 | 15 | -10 |
| CW07A | DBW07A | 39 | 23 | -16 |
| CW09A | DBW09A | 101 | 53 | -48 |
| CW10A | DBW10A | 107 | 73 | -34 |
| SBE02A | CE02A | 75 | 73 | -2 |
| SBE03A | CE03A | 14 | 7 | -7 |
| SBE08A | SB08A | 2 | 3 | 1 |
| SBE09A | SB09A | 6 | 2 | -4 |
| SBE10A | SB10A | 2 | 3 | 1 |
| SBE12A | DBE12A | 4 | 2 | -2 |
| SBE13A | DBE13A | 7 | 2 | -5 |
| SBE16A | SBE16A | 2 | 3 | 1 |
| SBE18A | DBE18A | 2 | 0 | -2 |
| SBE19A | SBE19A | 3 | 3 | 0 |
| SBE20A | SBE20A | 3 | 3 | 0 |
| SBE21A | SBE21A | 2 | 3 | 1 |
| SBE26A | DBE26A | 15 | 8 | -7 |
| SBE27A | DBE27A | 4 | 2 | -2 |
| SBE28A | DBE28A | 23 | 17 | -6 |
| SBE29A | DBE29A | 29 | 21 | -8 |
| SBW01A | SBW01A | 5 | 5 | 0 |
| SBW02A | DBW02A | 13 | 12 | -1 |
| SBW04A | SBW04A | 5 | 6 | 1 |
| SBW05A | DBW05A | 19 | 16 | -3 |
| SBW06A | DBW06A | 8 | 5 | -3 |
| SBW08A | DBW08A | 19 | 12 | -7 |
| SBW11A | SBW11A | 3 | 3 | 0 |
| SBW12A | DBW12A | 38 | 26 | -12 |
| SBW13A | SBW13A | 3 | 3 | 0 |
| SBW14A | DBW14A | 23 | 14 | -9 |

```
1*****************************************
 *                                       *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
 *              JUN   1998               *
 *            VERSION 4.1                *
 *                                       *
 *  RUN DATE   07MAY18  TIME  09:27:22   *
 *                                       *
 *****************************************
```

10-Year 6-Hour Model

```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*          609 SECOND STREET            *
*       DAVIS, CALIFORNIA 95616         *
*           (916) 756-1104              *
*                                       *
*****************************************
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```
X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X              X
XXXXXXX  XXXX     X        XXXXX  X
X     X  X        X              X
X     X  X        X     X        X
X     X  XXXXXXX   XXXXX         XXX
```

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        SERENO CANYON (PHASE 4) - DEVELOPED CONDITIONS
            2       ID        STORM EVENT: 10-YR, 6-HOUR
            3       ID        05/04/2018
            4       ID        PREPARED BY: SLATER HANIFAN GROUP
            5       ID       ********************************************************************************
            6       ID       ********************************************************************************
            7       ID        Flood Control District of Maricopa County
            8       ID        Sereno Canyon Developed Conditions
            9       ID        10 YEAR
           10       ID        6 Hour  Storm
           11       ID        Unit Hydrograph: Clark
           12       ID        09/18/2012
           13       ID        Sereno Canyon-Developed Conditions
           14       ID        10-Year, 6-Hour Storm Event
           15       ID        Prepared By: JE Fuller Hydrology and Geomorphology
           16       ID        Modeled By: Brian Schalk P.E., CFM and Nathan Logan P.E., CFM
           17       ID        Submitted To: City of Scottsdale
           18       ID       ********************************************************************************
           19       ID       ********************************************************************************
           20       IT       1 01DEC11       0    2000
           21       IO       5
           22       IN      15
                    *DIAGRAM
                    *
                    *

           23       KK  SBE29A   BASIN
           24       KM        SBE29A Basin Runoff
           25       BA   0.015
           26       PB   2.108
           27       PC   0.000   0.008   0.016   0.025   0.033   0.041   0.050   0.058   0.066   0.074
           28       PC   0.087   0.099   0.118   0.138   0.216   0.377   0.834   0.911   0.931   0.950
           29       PC   0.962   0.972   0.983   0.991   1.000
           30       LG    0.20    0.25    6.00    0.23      10
           31       UC   0.257   0.257
           32       UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
           33       UA     100
                    *

           34       KK  DBE29A STORAGE
           35       KM    Retention Basin Storage/Outflow rating curve for Basin DBE29A
           36       RS       1    STOR       0
           37       SV    0.01    0.05    0.10    0.15    0.20    0.26    0.32    0.38    0.45    0.51
           38       SV    0.59    0.66    0.74    0.83    0.92    0.97
           39       SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.49
           40       SQ    3.46    8.43   14.56   21.75   29.86   33.07
           41       SE    0.10    0.40    0.80    1.20    1.60    2.00    2.40    2.80    3.20    3.60
           42       SE    4.00    4.40    4.80    5.20    5.60    5.80
                    *
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1 HEC-1 INPUT PAGE 2

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

           43       KK  SBE28A   BASIN
           44       KM        SBE28A Basin Runoff
           45       BA   0.013
           46       LG    0.29    0.25    6.00    0.20      17
```

```
 47          UC   0.171   0.184
 48          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 49          UA     100
             *

 50          KK  DBE28A STORAGE
 51          KM    Retention Basin Storage/Outflow rating curve for Basin DBE28A
 52          RS       1    STOR       0
 53          SV    0.01    0.07    0.13    0.21    0.28    0.36    0.45    0.54    0.64    0.74
 54          SV    0.84    0.95    1.08
 55          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
 56          SQ    6.93   19.60   36.01
 57          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
 58          SE    5.00    5.50    6.00
             *

 59          KK  SBE27A   BASIN
 60          KM        SBE27A Basin Runoff
 61          BA   0.002
 62          LG    0.30    0.25    6.00    0.22      15
 63          UC   0.104   0.137
 64          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 65          UA     100
             *

 66          KK  DBE27A STORAGE
 67          KM    Retention Basin Storage/Outflow rating curve for Basin DBE27A
 68          RS       1    STOR       0
 69          SV    0.01    0.01    0.02    0.03    0.04    0.06    0.07    0.08    0.10    0.11
 70          SV    0.12    0.14    0.16    0.17    0.19    0.21
 71          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
 72          SQ    0.01    0.96    2.64    4.81    7.38   10.29
 73          SE    0.10    0.30    0.60    0.90    1.20    1.50    1.80    2.10    2.40    2.70
 74          SE    3.00    3.30    3.60    3.90    4.20    4.50
             *

 75          KK  SBE26A   BASIN
 76          KM        SBE26A Basin Runoff
 77          BA   0.010
 78          LG    0.26    0.25    6.00    0.20      31
 79          UC   0.171   0.230
 80          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 81          UA     100
             *
1                                        HEC-1 INPUT                                        PAGE  3

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

 82          KK  DBE26A STORAGE
 83          KM    Retention Basin Storage/Outflow rating curve for Basin DBE26A
 84          RS       1    STOR       0
 85          SV    0.01    0.06    0.12    0.19    0.26    0.33    0.41    0.49    0.58    0.67
 86          SV    0.76    0.87    0.98    1.11
 87          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
 88          SQ    0.01    5.94   16.80   30.86
 89          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
 90          SE    5.00    5.50    6.00    6.50
             *

 91          KK  SBE25C   BASIN
 92          KM        SBE25C Basin Runoff
 93          BA   0.005
 94          LG    0.27    0.25    6.00    0.18      17
 95          UC   0.124   0.137
 96          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 97          UA     100
             *

 98          KK  DBE25C STORAGE
 99          KM    Retention Basin Storage/Outflow rating curve for Basin DBE25C
100          RS       1    STOR       0
101          SV    0.01    0.02    0.05    0.07    0.10    0.13    0.16    0.19    0.22    0.25
102          SV    0.28    0.31    0.35    0.39    0.43    0.47    0.47
103          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
104          SQ    2.87    8.53   15.86   24.66   34.72   45.79   47.52
105          SE    0.10    0.30    0.70    1.00    1.30    1.70    2.00    2.30    2.60    3.00
106          SE    3.30    3.60    4.00    4.30    4.60    5.00    5.00
             *

107          KK   RE25C   ROUTE
108          KM        Route runoff from SBE25C through Basin SBE25B
109          RS       1    FLOW
110          RC   0.060   0.060   0.060     709  0.0268 2694.40
111          RX    0.00   21.00   53.00   58.00   63.00   70.00   90.00   99.00
112          RY  2694.3 2691.90 2688.00 2687.00 2687.00 2689.00 2693.30 2694.40
             *

113          KK  SBE25B   BASIN
114          KM        SBE25B Basin Runoff
115          BA   0.006
116          LG    0.29    0.25    6.00    0.21      20
117          UC   0.158   0.214
118          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
119          UA     100
             *
```

```
 120          KK   CE25B COMBINE
 121          KM        Combine Route RE25C and Basin SBE25B
 122          HC       2
              *
1                                        HEC-1 INPUT                                                PAGE  4

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


 123          KK  DBE25B STORAGE
 124          KM    Retention Basin Storage/Outflow rating curve for Basin DBE25B
 125          RS       1    STOR       0
 126          SV    0.01    0.05    0.09    0.14    0.19    0.25    0.30    0.36    0.42    0.49
 127          SV    0.55    0.62    0.70    0.78    0.84
 128          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    1.68    7.93
 129          SQ   16.80   27.91   40.62   54.86   56.70
 130          SE    0.10    0.40    0.80    1.20    1.60    2.00    2.40    2.80    3.20    3.60
 131          SE    4.00    4.40    4.80    5.20    5.50
              *

 132          KK   RE25B   ROUTE
 133          KM        Route runoff from CE25B through Basin SBE25A
 134          RS       1    FLOW
 135          RC   0.060   0.060   0.060     412  0.0279 2680.70
 136          RX    0.00   16.00   29.00   32.00   32.10   36.00   47.00   67.00
 137          RY  2680.3 2678.70 2677.10 2676.00 2676.00 2676.90 2678.00 2680.70
              *

 138          KK  SBE25A   BASIN
 139          KM        SBE25A Basin Runoff
 140          BA   0.003
 141          LG    0.25    0.25    6.00    0.20      38
 142          UC   0.108   0.135
 143          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 144          UA     100
              *

 145          KK   CE25A COMBINE
 146          KM        Combine Route RE25B and Basin SBE25A
 147          HC       2
              *

 148          KK  DBE25A STORAGE
 149          KM    Retention Basin Storage/Outflow rating curve for Basin DBE25A
 150          RS       1    STOR       0
 151          SV    0.01    0.02    0.04    0.06    0.08    0.10    0.12    0.14    0.16    0.18
 152          SV    0.21    0.23    0.26    0.29    0.31    0.34    0.37    0.39
 153          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
 154          SQ    0.01    0.01    1.12    5.87   13.22   22.40   33.27   41.15
 155          SE    0.10    0.30    0.60    0.90    1.20    1.50    1.80    2.10    2.40    2.70
 156          SE    3.00    3.30    3.60    3.90    4.20    4.50    4.80    5.00
              *

 157          KK   CLEAR COMBINE
 158          KM        Clear Hydrograph Stack
 159          HC       5
              *
1                                        HEC-1 INPUT                                                PAGE  5

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


 160          KK  SBE24D   BASIN
 161          KM        SBE24D Basin Runoff
 162          BA   0.010
 163          LG    0.30    0.25    6.00    0.19       6
 164          UC   0.146   0.132
 165          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 166          UA     100
              *

 167          KK  DBE24D STORAGE
 168          KM    Retention Basin Storage/Outflow rating curve for Basin DBE24D
 169          RS       1    STOR       0
 170          SV    0.01    0.06    0.13    0.20    0.28    0.36    0.44    0.53    0.63    0.73
 171          SV    0.83
 172          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    5.94   16.80   30.86
 173          SQ   47.52
 174          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
 175          SE    5.00
              *

 176          KK   RE24D   ROUTE
 177          KM        Route runoff from basin SBE24D through Basin SBE24C
 178          RS       1    FLOW
 179          RC   0.060   0.060   0.060     634  0.0252 2725.50
 180          RX    0.00   16.00   24.00   27.00   31.00   34.00   44.00   60.00
 181          RY  2725.5 2723.20 2721.80 2721.00 2721.00 2722.00 2723.00 2726.10
              *

 182          KK  SBE24C   BASIN
 183          KM        SBE24C Basin Runoff
 184          BA   0.015
 185          LG    0.28    0.25    6.00    0.19      17
 186          UC   0.190   0.219
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```
 187          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 188          UA     100
              *

 189          KK   CE24C COMBINE
 190          KM        Combine RE24D and SBE24C
 191          HC       2
              *

 192          KK  DBE24C STORAGE
 193          KM    Retention Basin Storage/Outflow rating curve for Basin DBE24C
 194          RS       1    STOR       0
 195          SV    0.01    0.08    0.17    0.25    0.35    0.45    0.55    0.66    0.77    0.89
 196          SV    1.02    1.15    1.17
 197          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    1.63   10.24   23.43
 198          SQ   39.87   59.15   61.38
 199          SE    0.10    0.50    0.90    1.40    1.80    2.30    2.70    3.20    3.60    4.10
 200          SE    4.50    5.00    5.00
              *
1                                       HEC-1 INPUT                                          PAGE  6

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

 201          KK   RE24C   ROUTE
 202          KM        Route flow from CE24C through Basin SBE24B
 203          RS       1    FLOW
 204          RC   0.060   0.060   0.060     624  0.0232 2706.80
 205          RX   10.00   25.00   45.00   49.00   55.00   62.00   75.00  103.00
 206          RY  2706.8 2705.20 2702.10 2701.00 2701.00 2702.00 2703.30 2706.70
              *

 207          KK  SBE24B   BASIN
 208          KM        SBE24B Basin Runoff
 209          BA   0.005
 210          LG    0.28    0.25    6.00    0.18      15
 211          UC   0.156   0.234
 212          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 213          UA     100
              *

 214          KK   CE24B COMBINE
 215          KM        Combine RE24C and SBE24B
 216          HC       2
              *

 217          KK  DBE24B STORAGE
 218          KM    Retention Basin Storage/Outflow rating curve for Basin DBE24B
 219          RS       1    STOR       0
 220          SV    0.01    0.06    0.13    0.20    0.27    0.35    0.43    0.51    0.60    0.70
 221          SV    0.80    0.91    1.02    1.15    1.20
 222          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    1.63   10.24   23.43
 223          SQ   39.87   59.15   80.76   73.24   73.24
 224          SE    0.10    0.50    0.90    1.40    1.80    2.30    2.70    3.20    3.60    4.10
 225          SE    4.50    5.00    5.40    5.90    6.00
              *

 226          KK   RE24B   ROUTE
 227          KM        Route flow from CE24B through Basin SBE24A
 228          RS       1    FLOW
 229          RC   0.060   0.060   0.060     873  0.0229 2690.20
 230          RX    0.00   10.00   16.00   23.00   27.00   35.00   49.00   67.00
 231          RY  2689.8 2688.70 2687.90 2687.00 2687.00 2687.90 2688.80 2690.20
              *

 232          KK  SBE24A   BASIN
 233          KM        SBE24A Basin Runoff
 234          BA   0.007
 235          LG    0.27    0.25    6.00    0.20      29
 236          UC   0.164   0.223
 237          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 238          UA     100
              *
1                                       HEC-1 INPUT                                          PAGE  7

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

 239          KK   CE24A COMBINE
 240          KM        Combine RE24B and SBE24A
 241          HC       2
              *

 242          KK  DBE24A STORAGE
 243          KM    Retention Basin Storage/Outflow rating curve for Basin DBE24A
 244          RS       1    STOR       0
 245          SV    0.01    0.06    0.13    0.20    0.27    0.35    0.44    0.52    0.62    0.71
 246          SV    0.82    0.93
 247          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    6.93   19.60
 248          SQ   36.01   55.44
 249          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
 250          SE    5.00    5.50
              *

 251          KK  SBE23D   BASIN
 252          KM        SBE23D Basin Runoff
```

```
 253          BA   0.041
 254          LG    0.28    0.25    6.00    0.19      15
 255          UC   0.252   0.271
 256          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 257          UA     100
              *

 258          KK  DBE23D STORAGE
 259          KM    Retention Basin Storage/Outflow rating curve for Basin DBE23D
 260          RS       1    STOR       0
 261          SV    0.01    0.11    0.22    0.34    0.47    0.61    0.76    0.92    1.10    1.30
 262          SV    1.52    1.75    2.01    2.30    2.61    2.61
 263          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
 264          SQ    0.01    0.01    0.01    0.01   15.51   80.61
 265          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
 266          SE    5.00    5.50    6.00    6.50    7.00    8.00
              *

 267          KK   RE23D   ROUTE
 268          KM        Route flow from SBE23D through Basin SBE23A
 269          RS       1    FLOW
 270          RC   0.060   0.060   0.060     465  0.0269 2688.30
 271          RX    0.00   14.00   27.00   32.00   40.00   44.00   55.00   68.00
 272          RY  2688.3 2687.30 2685.00 2684.10 2684.00 2685.00 2686.10 2686.70
              *

 273          KK  SBE23E   BASIN
 274          KM        SBE23E Basin Runoff
 275          BA   0.005
 276          LG    0.29    0.25    6.00    0.20      19
 277          UC   0.135   0.198
 278          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 279          UA     100
              *
1                                        HEC-1 INPUT                                        PAGE  8

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

 280          KK  DBE23E STORAGE
 281          KM    Retention Basin Storage/Outflow rating curve for Basin DBE23E
 282          RS       1    STOR       0
 283          SV    0.01    0.04    0.09    0.14    0.19    0.24    0.29    0.35    0.41    0.48
 284          SV    0.55
 285          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.63    3.96    9.07
 286          SQ   15.43
 287          SE    0.10    0.50    0.90    1.40    1.80    2.30    2.70    3.20    3.60    4.10
 288          SE    4.50
              *

 289          KK   RE23E   ROUTE
 290          KM        Route flow from SBE23E through Basin SBE23C
 291          RS       2    FLOW
 292          RC   0.060   0.060   0.060    1112  0.0261 2720.00
 293          RX    0.00   20.00   57.00   64.00   65.00   70.00   90.00  114.00
 294          RY  2720.0 2716.50 2712.10 2711.00 2711.00 2713.20 2716.60 2719.90
              *

 295          KK  SBE23C   BASIN
 296          KM        SBE23C Basin Runoff
 297          BA   0.053
 298          LG    0.28    0.25    6.00    0.18      13
 299          UC   0.253   0.262
 300          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 301          UA     100
              *

 302          KK   CE23C COMBINE
 303          KM        Combine RE23E and SBE23C
 304          HC       2
              *

 305          KK  DBE23C STORAGE
 306          KM    Retention Basin Storage/Outflow rating curve for Basin DBE23C
 307          RS       1    STOR       0
 308          SV    0.01    0.15    0.31    0.47    0.65    0.84    1.03    1.24    1.46    1.69
 309          SV    1.93    2.19    2.46    2.76    3.08
 310          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
 311          SQ    0.01    0.01   27.72   78.40  144.03
 312          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
 313          SE    5.00    5.50    6.00    6.50    7.00
              *

 314          KK   RE23C   ROUTE
 315          KM        Route flow from CE23C through SBE23B
 316          RS       1    FLOW
 317          RC   0.060   0.060   0.060     457  0.0235 2693.90
 318          RX    0.00   15.00   28.00   35.00   35.10   45.00   86.00  114.00
 319          RY  2693.8 2692.20 2691.00 2690.00 2690.00 2690.90 2692.90 2693.90
              *
1                                        HEC-1 INPUT                                        PAGE  9

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

 320          KK  SBE23B   BASIN
```

```
321          KM        SBE23B Basin Runoff
322          BA   0.004
323          LG    0.27    0.25    6.00    0.20      28
324          UC   0.122   0.152
325          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
326          UA     100
             *

327          KK   CE23B COMBINE
328          KM        Combine flow from RE23C and SBE23B
329          HC       2
             *

330          KK   RE23B   ROUTE
331          KM        Route flow from CE23B into SBE23A to intermediate combine
332          RS       1    FLOW
333          RC   0.060   0.060   0.060     112  0.0267 2685.90
334          RX    0.00    8.00   12.00   14.00   24.00   30.00   32.00   49.00
335          RY  2685.6 2684.80 2684.20 2684.00 2684.00 2684.70 2685.00 2685.90
             *

336          KK  CE23AI COMBINE
337          KM        Intermediate combine of RE23D and RE23B to route through SBE23A
338          HC       2
             *

339          KK  RE23BD   ROUTE
340          KM        Route Intermediate combined flow from CE23AI through SBE23A
341          RS       1    FLOW
342          RC   0.060   0.060   0.060     238  0.0242 2685.00
343          RX    0.00   21.00   62.00   74.00   82.00   86.00  101.00  141.00
344          RY  2684.9 2682.70 2681.00 2679.00 2679.00 2680.10 2681.90 2685.00
             *

345          KK  SBE23A   BASIN
346          KM        SBE23A Basin Runoff
347          BA   0.006
348          LG    0.29    0.25    6.00    0.21      21
349          UC   0.152   0.176
350          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
351          UA     100
             *

352          KK   CE23A COMBINE
353          KM        Combine flow from SBE23A and RE23BD
354          HC       2
             *
1                                        HEC-1 INPUT                                        PAGE 10

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

355          KK  DBE23A STORAGE
356          KM    Retention Basin Storage/Outflow rating curve for Basin DBE23A
357          RS       1    STOR       0
358          SV    0.01    0.09    0.18    0.28    0.38    0.49    0.61    0.73    0.86    0.99
359          SV    1.13    1.29    1.45    1.62    1.80    2.00    2.21    2.45
360          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
361          SQ    0.01    0.01    0.01    0.01    0.01   49.50  140.00  257.20
362          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
363          SE    5.00    5.50    6.00    6.50    7.00    7.50    8.00    8.50
             *

364          KK   CLEAR COMBINE
365          HC       3
             *

366          KK  SBE22A   BASIN
367          KM        SBE22A Basin Runoff
368          BA   0.007
369          LG    0.30    0.25    6.00    0.22      15
370          UC   0.150   0.194
371          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
372          UA     100
             *

373          KK  DBE22A STORAGE
374          KM    Retention Basin Storage/Outflow rating curve for Basin DBE22A
375          RS       1    STOR       0
376          SV    0.01    0.03    0.07    0.12    0.16    0.21    0.27    0.33    0.39    0.47
377          SV    0.55    0.63
378          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    3.96
379          SQ   11.20   20.58
380          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
381          SE    5.00    5.50
             *

382          KK  SBE21A   BASIN
383          KM        SBE21A Basin Runoff
384          BA   0.001
385          LG    0.30    0.25    6.00    0.22      15
386          UC   0.081   0.106
387          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
388          UA     100
             *
```

```
 389          KK  SBE20A   BASIN
 390          KM        SBE20A Basin Runoff
 391          BA   0.001
 392          LG    0.30    0.25    6.00    0.22      15
 393          UC   0.072   0.078
 394          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 395          UA     100
              *
1                                       HEC-1 INPUT                                          PAGE 11

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

 396          KK  SBE19A   BASIN
 397          KM        SBE19A Basin Runoff
 398          BA   0.001
 399          LG    0.30    0.25    6.00    0.22      15
 400          UC   0.073   0.079
 401          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 402          UA     100
              *

 403          KK  SBE18A   BASIN
 404          KM        SBE18A Basin Runoff
 405          BA   0.001
 406          LG    0.30    0.25    6.00    0.22      15
 407          UC   0.083   0.110
 408          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 409          UA     100
              *

 410          KK  DBE18A STORAGE
 411          KM    Retention Basin Storage/Outflow rating curve for Basin DBE18A
 412          RS       1    STOR       0
 413          SV    0.01    0.01    0.02    0.02    0.03    0.04    0.05    0.06    0.07    0.08
 414          SV    0.09    0.10    0.12    0.13    0.14    0.16    0.17
 415          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
 416          SQ    0.01    0.35    0.99    1.82    2.80    3.91    5.14
 417          SE    0.10    0.30    0.50    0.80    1.00    1.30    1.50    1.80    2.00    2.30
 418          SE    2.50    2.80    3.00    3.30    3.50    3.80    4.00
              *

 419          KK   CLEAR COMBINE
 420          KM        Clear Hydrograph Stack
 421          HC       6
              *

 422          KK   SB17B   BASIN
 423          KM        SB17B Basin Runoff
 424          BA   0.016
 425          LG    0.24    0.25    6.00    0.20      29
 426          UC   0.159   0.157
 427          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 428          UA     100
              *

 429          KK  DBE17B STORAGE
 430          KM    Retention Basin Storage/Outflow rating curve for Basin DBE17B
 431          RS       1    STOR       0
 432          SV    0.01    0.08    0.17    0.26    0.35    0.46    0.56    0.68    0.80    0.92
 433          SV    1.06    1.20    1.35    1.51    1.68
 434          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
 435          SQ    0.01    0.01    9.90   28.00   51.44
 436          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
 437          SE    5.00    5.50    6.00    6.50    7.00
              *
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        LINE  ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 438          KK   RE17B   ROUTE
 439          KM         Route flow from SBE17B through SBE 17A
 440          RS       2    FLOW
 441          RC   0.060   0.060   0.060    1169  0.0265 2740.10
 442          RX    0.00    9.00   22.00   33.00   44.00   54.00   62.00   69.00
 443          RY  2740.1 2738.60 2737.00 2736.10 2736.00 2737.00 2738.40 2740.10
              *

 444          KK  SBE17A   BASIN
 445          KM        SBE17A Basin Runoff
 446          BA   0.018
 447          LG    0.26    0.25    6.00    0.21      29
 448          UC   0.176   0.208
 449          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 450          UA     100
              *

 451          KK   CE17A COMBINE
 452          KM         Combine flow from RE17B and SBE17A
 453          HC       2
              *

 454          KK  DBE17A STORAGE
 455          KM    Retention Basin Storage/Outflow rating curve for Basin DBE17A
 456          RS       1    STOR       0
```

```
 457          SV    0.01    0.09    0.19    0.29    0.41    0.54    0.68    0.84    1.01    1.19
 458          SV    1.39    1.62    1.86    2.13
 459          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
 460          SQ    0.01   17.82   50.40   92.59
 461          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
 462          SE    5.00    5.50    6.00    6.50
              *

 463          KK  SBE16A   BASIN
 464          KM        SBE16A Basin Runoff
 465          BA   0.001
 466          LG    0.30    0.25    6.00    0.22      15
 467          UC   0.088   0.135
 468          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 469          UA     100
              *

 470          KK  SBE13A   BASIN
 471          KM        SBE13A Basin Runoff
 472          BA   0.003
 473          LG    0.25    0.25    6.00    0.22      30
 474          UC   0.100   0.114
 475          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 476          UA     100
              *
1                                        HEC-1 INPUT                                        PAGE 13

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

 477          KK  DBE13A STORAGE
 478          KM    Retention Basin Storage/Outflow rating curve for Basin DBE13A
 479          RS       1    STOR       0
 480          SV    0.01    0.02    0.04    0.06    0.08    0.10    0.13    0.16    0.19    0.23
 481          SV    0.27    0.31    0.35
 482          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
 483          SQ    1.98    5.60   10.29
 484          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
 485          SE    5.00    5.50    6.00
              *

 486          KK  SBE12A   BASIN
 487          KM        SBE12A Basin Runoff
 488          BA   0.002
 489          LG    0.23    0.25    6.00    0.21      40
 490          UC   0.093   0.121
 491          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 492          UA     100
              *

 493          KK  DBE12A STORAGE
 494          KM    Retention Basin Storage/Outflow rating curve for Basin DBE12A
 495          RS       1    STOR       0
 496          SV    0.01    0.02    0.03    0.05    0.07    0.09    0.10    0.12    0.14    0.17
 497          SV    0.19    0.21    0.24    0.26    0.28
 498          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
 499          SQ    0.96    2.84    5.29    8.22   10.29
 500          SE    0.10    0.30    0.70    1.00    1.30    1.70    2.00    2.30    2.60    3.00
 501          SE    3.30    3.60    4.00    4.30    4.50
              *

 502          KK   SB11B   BASIN
 503          KM        SB11B Basin Runoff
 504          BA   0.013
 505          LG    0.18    0.25    6.00   0.246      17
 506          UC   0.310   0.432
 507          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 508          UA     100
              *

 509          KK   DB11B STORAGE
 510          KM    Retention Basin Storage/Outflow rating curve for Basin DB11B
 511          RS       1    STOR       0
 512          SV    0.01    0.05    0.16    0.28    0.43    0.61    0.80
 513          SQ    0.01       4      11      22      33      41      50
 514          SE  2777.5    2778    2779    2780    2781    2782    2783
              *

 515          KK   RE11B   ROUTE
 516          KM        Route flow from SBE11B through SBE11A
 517          RS       1    FLOW
 518          RC   0.060   0.060   0.060     914  0.0334 2770.20
 519          RX    0.00   10.00   16.00   23.00   25.00   34.00   48.00   64.00
 520          RY  2770.2 2767.10 2765.30 2762.00 2762.00 2765.00 2766.60 2768.30
              *
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       LINE   ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 521          KK   SB11A   BASIN
 522          KM        SB11A Basin Runoff
 523          BA   0.007
 524          LG    0.10    0.25    6.00   0.284
 525          UC   0.308   0.429
 526          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
```

```
 527          UA     100
              *

 528          KK  SB11A1   BASIN
 529          KM        SB11A1 Basin Runoff
 530          BA   0.003
 531          LG    0.18    0.25    6.00   0.251      15
 532          UC   0.186   0.288
 533          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 534          UA     100
              *

 535          KK   CE11A COMBINE
 536          KM        Combine flow from RE11B, SB11A and SB11A1
 537          HC       3
              *

 538          KK   CLEAR COMBINE
 539          KM        Clear Hydrograph Stack
 540          HC       6
              *

 541          KK   SB10A   BASIN
 542          KM        SB10A Basin Runoff
 543          BA   0.001
 544          LG    0.10    0.25    6.00   0.284
 545          UC   0.141   0.130
 546          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 547          UA     100
              *

 548          KK   SB09A   BASIN
 549          KM        SB09A Basin Runoff
 550          BA   0.001
 551          LG    0.10    0.25    6.00   0.284
 552          UC   0.165   0.234
 553          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 554          UA     100
              *

 555          KK   SB08A   BASIN
 556          KM        SB08A Basin Runoff
 557          BA   0.001
 558          LG    0.10    0.25    6.00   0.284
 559          UC   0.150   0.175
 560          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 561          UA     100
              *
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         LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 562          KK   CLEAR COMBINE
 563          KM        Clear Hydrograph Stack
 564          HC       4
              *
              *

 565          KK  SB06D1   BASIN
 566          KM        SB06D1 Basin Runoff
 567          BA   0.004
 568          LG    0.10    0.25    6.00   0.276      24
 569          UC   0.244   0.457
 570          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 571          UA     100
              *

 572          KK  SB06D2   BASIN
 573          KM        SB06D2 Basin Runoff
 574          BA   0.009
 575          LG    0.25    0.25    6.00   0.216      30
 576          UC   0.165   0.269
 577          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 578          UA     100
              *

 579          KK   CE06D COMBINE
 580          KM        Combine flow from SB06D1 and SB06D2
 581          HC       2
              *

 582          KK  DB06D1 STORAGE
 583          KM    Retention Basin Storage/Outflow rating curve for Basin DB06D1
 584          RS       1    STOR       0
 585          SV    0.01    0.12    0.26    0.44    0.64    0.64
 586          SQ    0.01       3       9      12      15      31
 587          SE    2795    2796    2797    2798    2799  2799.3
              *

 588          KK  SB06C1   BASIN
 589          KM        SB06C1 Basin Runoff
 590          BA   0.015
 591          LG    0.10    0.25    6.00   0.272      40
 592          UC   0.271   0.373
 593          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
```

```
 594          UA     100
              *

 595          KK  CE06CD COMBINE
 596          KM        Combine flow from DB06D1 and SB06C1
 597          HC       2
              *
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 598          KK  DB06C1 STORAGE
 599          KM    Retention Basin Storage/Outflow rating curve for Basin DBE06C
 600          RS       1    STOR       0
 601          SV    0.01    0.10    0.23    0.41
 602          SQ    0.01       9      24      41
 603          SE    2792    2793    2794    2795
              *

 604          KK  SB06C2   BASIN
 605          KM        SB06C2 Basin Runoff
 606          BA   0.020
 607          LG    0.10    0.25    6.00   0.284
 608          UC   0.486   0.901
 609          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 610          UA     100
              *

 611          KK  SB06C3   BASIN
 612          KM        SB06C3 Basin Runoff
 613          BA   0.005
 614          LG    0.25    0.25    6.00   0.216      30
 615          UC   0.132   0.156
 616          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 617          UA     100
              *

 618          KK   CE06C COMBINE
 619          KM        Combine flow from SB06C2 and SB06C3
 620          HC       2
              *

 621          KK  DB06C2 STORAGE
 622          KM    Retention Basin Storage/Outflow rating curve for Basin DBE06C
 623          RS       1    STOR       0
 624          SV    0.01    0.08    0.19    0.32    0.49
 625          SQ    0.01       4      13      20      22
 626          SE    2788    2789    2790    2791    2792
              *

 627          KK  CE06CI COMBINE
 628          KM        Combine flow from DB06C2 and DB06C1
 629          HC       2
              *

 630          KK   RE06C   ROUTE
 631          KM        Route flow from CE06CI through Basin SBE06B
 632          RS       1    FLOW
 633          RC   0.060   0.060   0.060     591  0.0431 2786.60
 634          RX    0.00    6.00   16.00   26.00   36.00   40.00   41.00   44.00
 635          RY  2786.6 2786.00 2785.00 2784.00 2784.00 2785.00 2785.50 2786.40
              *
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 636          KK  SB06B1   BASIN
 637          KM        SB06B1 Basin Runoff
 638          BA   0.003
 639          LG    0.18    0.25    6.00   0.251      15
 640          UC   0.196   0.324
 641          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 642          UA     100
              *

 643          KK  CE06CI COMBINE
 644          KM        Combine flow from SB06B1 and RE06C
 645          HC       2
              *

 646          KK   RE06B   ROUTE
 647          KM        Route flow from CE06CI through Basin SB06B
 648          RS       1    FLOW
 649          RC   0.060   0.060   0.060     814  0.0319 2761.00
 650          RX    0.00   21.00   55.00   63.00   82.00   92.00  104.00  113.00
 651          RY  2761.0 2758.90 2758.50 2758.00 2758.00 2758.50 2759.70 2760.80
              *

 652          KK   SB06B   BASIN
 653          KM        SB06B Basin Runoff
 654          BA   0.004
 655          LG    0.10    0.25    6.00   0.284
 656          UC   0.415   1.035
 657          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
```

```
 658          UA     100
              *

 659          KK   SB06A   BASIN
 660          KM        SB06A Basin Runoff
 661          BA   0.006
 662          LG    0.25    0.25    6.00   0.216      30
 663          UC   0.118   0.117
 664          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 665          UA     100
              *

 666          KK   DB06A STORAGE
 667          KM    Retention Basin Storage/Outflow rating curve for Basin DB06A
 668          RS       1    STOR       0
 669          SV    0.01    0.02    0.08    0.16    0.26
 670          SQ    0.01       1       6      11      14
 671          SE  2752.5    2753    2754    2755    2756
              *

 672          KK   CE06A COMBINE
 673          KM        Combine flow from DB06A, SB06B and RE06B
 674          HC       3
              *
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         LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 675          KK  SB05B1   BASIN
 676          KM        SB05B1 Basin Runoff
 677          BA   0.007
 678          LG    0.10    0.25    6.00   0.284
 679          UC   0.265   0.314
 680          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 681          UA     100
              *

 682          KK  DB05B1 STORAGE
 683          KM    Retention Basin Storage/Outflow rating curve for Basin DBE05B
 684          KM    Outlet control structure
 685          RS       1    STOR       0
 686          SV    0.01    0.02    0.06    0.11
 687          SQ    0.01    0.01       9      13
 688          SE    2810    2811    2812    2813
              *

 689          KK  SB05B2   BASIN
 690          KM        SB05B2 Basin Runoff
 691          BA   0.006
 692          LG    0.10    0.25    6.00   0.284
 693          UC   0.315   0.543
 694          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 695          UA     100
              *

 696          KK   CE05B COMBINE
 697          KM        Combine flow from DB05B1 and Basin SBE05B2
 698          HC       2
              *

 699          KK  DB05B2 STORAGE
 700          KM    Retention Basin Storage/Outflow rating curve for Basin DBE05B
 701          RS       1    STOR       0
 702          SV    0.01    0.01    0.02   0.044
 703          SQ    0.01    0.01      18      24
 704          SE    2800    2801    2802    2803
              *

 705          KK   RE05B   ROUTE
 706          KM        Route flow from SBE05B through SBE05A
 707          RS       1    FLOW
 708          RC   0.060   0.060   0.060     907  0.0435 2760.30
 709          RX    0.00   11.00   26.00   40.00   47.00   56.00   76.00   89.00
 710          RY  2760.1 2759.00 2757.70 2757.00 2757.00 2757.40 2758.80 2760.30
              *

 711          KK  SB05B3   BASIN
 712          KM        SB05B3 Basin Runoff
 713          BA   0.004
 714          LG    0.25    0.25    6.00   0.216      30
 715          UC   0.146   0.234
 716          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
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         LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 717          UA     100
              *

 718          KK  SB05B4   BASIN
 719          KM        SB05B4 Basin Runoff
 720          BA   0.004
 721          LG    0.18    0.25    6.00   0.251      15
 722          UC   0.187   0.230
 723          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
```

```
            724           UA     100
                          *

            725           KK  CE05B3 COMBINE
            726           KM        Combine flow from SB05B4, SB05B3 and RE05B
            727           HC       3
                          *

            728           KK  DB05B3 STORAGE
            729           KM    Retention Basin Storage/Outflow rating curve for Basin DB05B3
            730           RS       1    STOR       0
            731           SV    0.01    0.01    0.03   0.084
            732           SQ    0.01       8      25      36
            733           SE    2782    2783    2784    2785
                          *

            734           KK  RE05B3   ROUTE
            735           KM        Route flow from DB05B3 through SBE05A
            736           RS       1    FLOW
            737           RC   0.060   0.060   0.060     907  0.0435 2760.30
            738           RX    0.00   11.00   26.00   40.00   47.00   56.00   76.00   89.00
            739           RY  2760.1 2759.00 2757.70 2757.00 2757.00 2757.40 2758.80 2760.30
                          *

            740           KK   SB05A   BASIN
            741           KM        SB05A Basin Runoff
            742           BA   0.004
            743           LG    0.10    0.25    6.00   0.284
            744           UC   0.400   1.028
            745           UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
            746           UA     100
                          *

            747           KK  CE065A COMBINE
            748           KM        Combine flow from SB05A, RE05B3 and CE06A
            749           HC       3
                          *

            750           KK   SB04C   BASIN
            751           KM        SB04C Basin Runoff
            752           BA   0.002
            753           LG    0.10    0.25    6.00   0.269      10
            754           UC   0.256   0.550
            755           UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
            756           UA     100
                          *
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          LINE            ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

            757           KK   SB04B   BASIN
            758           KM        SB04B Basin Runoff
            759           BA   0.011
            760           LG    0.25    0.25    6.00   0.216      30
            761           UC   0.172   0.233
            762           UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
            763           UA     100
                          *

            764           KK   CE04B COMBINE
            765           KM        Combine flow from SB04C and SB04B
            766           HC       2
                          *

            767           KK   DB04B STORAGE
            768           KM    Retention Basin Storage/Outflow rating curve for Basin DBE04C
            769           RS       1    STOR       0
            770           SV    0.01    0.06    0.15   0.261  0.0262
            771           SQ    0.01       5      13      21      27
            772           SE    2755    2756    2757    2758  2758.2
                          *

            773           KK   RE04C   ROUTE
            774           KM        Route flow from DB04B into SBE04A
            775           RS       1    FLOW
            776           RC   0.060   0.060   0.060     455  0.0363 2755.00
            777           RX    0.00   17.00   22.00   27.00   32.00   44.00   61.00   88.00
            778           RY  2755.0 2753.00 2751.90 2750.00 2750.00 2751.90 2753.20 2754.90
                          *

            779           KK   SB04A   BASIN
            780           KM        SB04A Basin Runoff
            781           BA   0.008
            782           LG    0.25    0.25    6.00   0.216      30
            783           UC   0.141   0.160
            784           UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
            785           UA     100
                          *

            786           KK   CE04A COMBINE
            787           KM        Combine Flows from RE04C and SB04A
            788           HC       2
                          *

            789           KK   DB04A STORAGE
```

```
 790          KM    Retention Basin Storage/Outflow rating curve for Basin DB04A
 791          RS       1    STOR       0
 792          SV    0.01    0.05    0.16    0.30    0.47    0.67
 793          SQ    0.01       2      10      17      22      28
 794          SE  2738.5    2739    2740    2741    2742    2743
              *
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         LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


 795          KK  SB03A1   BASIN
 796          KM        SB03A1 Basin Runoff
 797          BA   0.002
 798          LG    0.10    0.25    6.00   0.284
 799          UC   0.332   0.869
 800          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 801          UA     100
              *

 802          KK  DB03A1 STORAGE
 803          KM    Retention Basin Storage/Outflow rating curve for Basin DBE03A1
 804          RS       1    STOR       0
 805          SV    0.01    0.07    0.16    0.27    0.40
 806          SQ    0.01       3       7      13      20
 807          SE    2750    2751    2752    2753    2754
              *

 808          KK   SB03A   BASIN
 809          KM         SB03A Basin Runoff
 810          BA   0.003
 811          LG    0.10    0.25    6.00   0.284
 812          UC   0.225   0.282
 813          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 814          UA     100
              *

 815          KK   CE03A COMBINE
 816          KM        Combine Flows from DB03A and SB03A
 817          HC       2
              *

 818          KK  SB02A1   BASIN
 819          KM        SB02A1 Basin Runoff
 820          BA   0.059
 821          LG    0.10    0.25    6.00   0.284
 822          UC   0.541   0.730
 823          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 824          UA     100
              *

 825          KK  DB02A1 STORAGE
 826          KM    Retention Basin Storage/Outflow rating curve for Basin DB02A1
 827          RS       1    STOR       0
 828          SV    0.01    0.04    0.14    0.25    0.26
 829          SQ    0.01       6      21      48      70
 830          SE  2789.5    2790    2791    2792    2793
              *

 831          KK   R02A1   ROUTE
 832          KM        Route flow from DB02A1 into SB02A3
 833          RS       1    FLOW
 834          RC   0.060   0.060   0.060     455  0.0363 2755.00
 835          RX    0.00   17.00   22.00   27.00   32.00   44.00   61.00   88.00
 836          RY  2755.0 2753.00 2751.90 2750.00 2750.00 2751.90 2753.20 2754.90
              *
1                                      HEC-1 INPUT                                      PAGE 22

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


 837          KK  SB02A2   BASIN
 838          KM        SB02A2 Basin Runoff
 839          BA   0.003
 840          LG    0.25    0.25    6.00   0.216      30
 841          UC   0.135   0.228
 842          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 843          UA     100
              *

 844          KK  DB02A2 STORAGE
 845          KM    Retention Basin Storage/Outflow rating curve for Basin DB02A2
 846          KM    Outlet control structure
 847          RS       1    STOR       0
 848          SV    0.01    0.14    0.32    0.53
 849          SQ    0.01    0.01    0.01       4
 850          SE    2762    2763    2764    2765
              *

 851          KK  SB02A3   BASIN
 852          KM        SB02A3 Basin Runoff
 853          BA   0.003
 854          LG    0.10    0.25    6.00   0.284
 855          UC   0.284   0.521
 856          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 857          UA     100
```

```
                *
 858            KK   CE02A COMBINE
 859            KM        Combine Flows from R02A1, DB02A2 and SB02A3
 860            HC       3
                *
 861            KK   SB01A   BASIN
 862            KM        SB01A Basin Runoff
 863            BA   0.119
 864            LG    0.10    0.25    6.00    0.28       1
 865            UC   0.600   0.689
 866            UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 867            UA     100
                *
 868            KK   CLEAR COMBINE
 869            KM        Clear Hydrograph Stack
 870            HC       6
                *
 871            KK  SBW14A   BASIN
 872            KM        SBW14A Basin Runoff
 873            BA   0.009
 874            LG    0.28    0.25    6.00    0.20       4
 875            UC   0.141   0.113
 876            UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 877            UA     100
                *
1                                       HEC-1 INPUT                                          PAGE 23

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

 878            KK  DBW14A STORAGE
 879            KM    Retention Basin Storage/Outflow rating curve for Basin DBW14A
 880            RS       1    STOR       0
 881            SV    0.01    0.04    0.07    0.11    0.15    0.19    0.23    0.28    0.32    0.37
 882            SV    0.42    0.47    0.52    0.58    0.63    0.70
 883            SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.84
 884            SQ    2.97    6.04    9.74   13.95   18.64   23.76
 885            SE    0.10    0.30    0.60    0.90    1.20    1.50    1.80    2.10    2.40    2.70
 886            SE    3.00    3.30    3.60    3.90    4.20    4.50
                *
 887            KK  SBW13A   BASIN
 888            KM        SBW13A Basin Runoff
 889            BA   0.001
 890            LG    0.30    0.25    6.00    0.18       5
 891            UC   0.071   0.076
 892            UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 893            UA     100
                *
 894            KK  SBW12A   BASIN
 895            KM        SBW12A Basin Runoff
 896            BA   0.017
 897            LG    0.29    0.25    6.00    0.19      13
 898            UC   0.147   0.119
 899            UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 900            UA     100
                *
 901            KK  DBW12A STORAGE
 902            KM    Retention Basin Storage/Outflow rating curve for Basin DBW12A
 903            RS       1    STOR       0
 904            SV    0.01    0.08    0.16    0.24    0.33    0.43    0.53    0.64    0.75    0.87
 905            SV    0.99    1.13    1.27    1.43
 906            SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
 907            SQ    5.94   16.80   30.86   47.52
 908            SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
 909            SE    5.00    5.50    6.00    6.50
                *
 910            KK  SBW11A   BASIN
 911            KM        SBW11A Basin Runoff
 912            BA   0.001
 913            LG    0.30    0.25    6.00    0.18       5
 914            UC   0.061   0.052
 915            UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 916            UA     100
                *
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          LINE  ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 917            KK   CLEAR COMBINE
 918            KM        Clear Hydrograph Stack
 919            HC       5
                *
 920            KK  SB10C1   BASIN
 921            KM        SB10C1 Basin Runoff
 922            BA   0.009
 923            LG    0.25    0.25    6.00   0.216      30
```

```
            924          UC   0.176   0.243
            925          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
            926          UA     100
                         *

            927          KK  SB10C2   BASIN
            928          KM        SB10C2 Basin Runoff
            929          BA   0.008
            930          LG    0.25    0.25    6.00   0.216      30
            931          UC   0.187   0.268
            932          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
            933          UA     100
                         *

            934          KK  SB10C3   BASIN
            935          KM        SB10C3 Basin Runoff
            936          BA   0.004
            937          LG    0.10    0.25    6.00   0.254      20
            938          UC   0.277   0.429
            939          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
            940          UA     100
                         *

            941          KK   CW10C COMBINE
            942          KM        Combine flow from SB10C1, SB10C2 and SB10C3
            943          HC       3
                         *

            944          KK   DB10C STORAGE
            945          KM    Retention Basin Storage/Outflow rating curve for Basin DB10C
            946          RS       1    STOR       0
            947          SV    0.01    0.15    0.34    0.57    0.83
            948          SQ    0.01      10      33      47      65
            949          SE    2767    2768    2769    2770    2771
                         *

            950          KK   RW10C   ROUTE
            951          KM        Route flow from SBW10C through Basin SBW10B
            952          RS       2    FLOW
            953          RC   0.060   0.060   0.060     952  0.0310 2757.80
            954          RX    0.00   34.00   47.00   62.00   62.10   68.00   73.00   78.00
            955          RY  2757.8 2754.40 2754.00 2752.10 2752.00 2753.70 2755.70 2757.50
                         *
1                                                HEC-1 INPUT                                                PAGE 25

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

            956          KK   SB10B   BASIN
            957          KM        SB10B Basin Runoff
            958          BA   0.009
            959          LG    0.26    0.25    6.00   0.195      33
            960          UC   0.163   0.223
            961          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
            962          UA     100
                         *

            963          KK   CW10B COMBINE
            964          KM        Combine flow from RW10C and SBW10B
            965          HC       2
                         *

            966          KK  DBW10B STORAGE
            967          KM    Retention Basin Storage/Outflow rating curve for Basin DBW10B
            968          RS       1    STOR       0
            969          SV    0.01    0.06    0.13    0.20    0.27    0.35    0.44    0.53    0.62    0.73
            970          SV    0.84    0.95    1.08    1.22    1.30
            971          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
            972          SQ    0.01    0.01    2.27   46.37    71.0
            973          SE    0.10    0.60    1.20    1.80    2.40    3.00    3.60    4.20    4.80    5.40
            974          SE    6.00    6.60    7.20    7.80    8.20
                         *

            975          KK   RW10B   ROUTE
            976          KM        Route flow from CE10WB through Basin SBW10A
            977          RS       1    FLOW
            978          RC   0.060   0.060   0.060     653  0.0276 2732.00
            979          RX    0.00   68.00   75.00   79.00   86.00   92.00  106.00  150.00
            980          RY  2732.0 2728.10 2721.10 2726.10 2726.00 2726.60 2727.00 2732.00
                         *

            981          KK  SB10AW   BASIN
            982          KM        SB10AW Basin Runoff
            983          BA   0.029
            984          LG    0.26    0.25    6.00   0.189      28
            985          UC   0.195   0.177
            986          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
            987          UA     100
                         *

            988          KK   CW10A COMBINE
            989          KM        Combine flow from RW10B and SBW10A
            990          HC       2
                         *

            991          KK  DBW10A STORAGE
```

```
 992          KM    Retention Basin Storage/Outflow rating curve for Basin DBW10A
 993          RS       1    STOR       0
 994          SV    0.01    0.20    0.41    0.63    0.87    1.12    1.40    1.69    2.00    2.33
 995          SV    2.68    3.07    3.50    3.98    4.15
 996          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01   14.68
 997          SQ   56.00  113.58  182.88  189.00  189.00
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      LINE    ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 998          SE    0.10    0.60    1.20    1.80    2.40    3.00    3.60    4.20    4.80    5.40
 999          SE    6.00    6.60    7.20    7.80    8.00
              *

1000          KK   SB09E   BASIN
1001          KM        SB09E Basin Runoff
1002          BA   0.005
1003          LG    0.10    0.25    6.00   0.284
1004          UC   0.299   0.503
1005          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
1006          UA     100
              *

1007          KK   DB09E STORAGE
1008          KM    Retention Basin Storage/Outflow rating curve for Basin DB09E
1009          RS       1    STOR       0
1010          SV    0.01    0.06    0.14    0.24    0.37    0.52
1011          SQ    0.01       3       9      13      16      19
1012          SE    2826    2827    2828    2829    2830    2831
              *

1013          KK   RW09E   ROUTE
1014          KM        Route flow from SBW09E through Basin SBW09D
1015          RS       1    FLOW
1016          RC   0.060   0.060   0.060     985  0.0442 2805.10
1017          RX    0.00   10.00   12.00   14.00   17.00   23.00   29.00   48.00
1018          RY  2805.3 2803.10 2802.10 2800.70 2800.70 2802.00 2802.90 2805.10
              *

1019          KK  SB09D1   BASIN
1020          KM        SB09D1 Basin Runoff
1021          BA   0.009
1022          LG    0.24    0.25    6.00   0.216      30
1023          UC   0.135   0.149
1024          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
1025          UA     100
              *

1026          KK  SB09D2   BASIN
1027          KM        SB09D2 Basin Runoff
1028          BA   0.005
1029          LG    0.25    0.25    6.00   0.216      30
1030          UC   0.174   0.324
1031          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
1032          UA     100
              *

1033          KK  CW09DI COMBINE
1034          HC       3
              *
1                                      HEC-1 INPUT                                          PAGE 27

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

1035          KK   SB09C   BASIN
1036          KM        SB09C Basin Runoff
1037          BA   0.036
1038          LG    0.10    0.25    6.00   0.284
1039          UC   0.486   0.664
1040          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
1041          UA     100
              *

1042          KK   CW09D COMBINE
1043          KM        Combine flow from CW09DI and SBW09C
1044          HC       2
              *

1045          KK  DBW09C STORAGE
1046          KM    Retention Basin Storage/Outflow rating curve for Basin DBW09C
1047          RS       1    STOR       0
1048          SV    0.01    0.21    0.43    0.66    0.90    1.16    1.44    1.73    2.05    2.41
1049          SV    2.79
1050          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01   19.80   56.00
1051          SQ  102.88
1052          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
1053          SE    5.00
              *

1054          KK   RW09D   ROUTE
1055          KM        Route flow from CW09D through Basin SBW09B
1056          RS       1    FLOW
1057          RC   0.060   0.060   0.060     367  0.0368 2782.10
1058          RX    0.00   11.00   27.00   31.00   38.00   42.00   73.00   90.00
1059          RY  2782.1 2780.10 2780.00 2779.00 2779.00 2779.50 2780.90 2781.30
```

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                *

1060            KK  SBW09B   BASIN
1061            KM        SBW09B Basin Runoff
1062            BA   0.005
1063            LG    0.27    0.25    6.00    0.20      29
1064            UC   0.109   0.110
1065            UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
1066            UA     100
                *

1067            KK   CW09B COMBINE
1068            KM        Combine flow from RW09D and SBW09B
1069            HC       2
                *

1070            KK  DBW09B STORAGE
1071            KM    Retention Basin Storage/Outflow rating curve for Basin DBW09B
1072            RS       1    STOR       0
1073            SV    0.01    0.05    0.10    0.15    0.21    0.27    0.34    0.40    0.48    0.55
1074            SV    0.63    0.72
1075            SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01   20.79
1076            SQ   58.80  108.02
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                LINE            ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

1077            SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
1078            SE    5.00    5.50
                *

1079            KK   RW09B   ROUTE
1080            KM        Route flow from CW09B through Basin SBW09A
1081            RS       1    FLOW
1082            RC   0.060   0.060   0.060    1036  0.0415 2765.60
1083            RX    0.00    8.00   49.00   58.00   67.00   72.00   85.00  104.00
1084            RY  2764.9 2764.80 2764.00 2763.00 2763.00 2764.00 2765.10 2765.60
                *

1085            KK  SBW09A   BASIN
1086            KM        SBW09A Basin Runoff
1087            BA   0.008
1088            LG    0.27    0.25    6.00    0.20      24
1089            UC   0.161   0.227
1090            UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
1091            UA     100
                *

1092            KK   CW09A COMBINE
1093            KM        Combine flow from RW09B and SBW09A
1094            HC       2
                *

1095            KK  DBW09A STORAGE
1096            KM    Retention Basin Storage/Outflow rating curve for Basin DBW09A
1097            RS       1    STOR       0
1098            SV    0.01    0.04    0.08    0.12    0.17    0.21    0.26    0.32    0.37    0.43
1099            SV    0.50    0.57    0.64
1100            SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
1101            SQ   22.77   64.40  118.31
1102            SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
1103            SE    5.00    5.50    6.00
                *

1104            KK  SBW08A   BASIN
1105            KM        SBW08A Basin Runoff
1106            BA   0.009
1107            LG    0.27    0.25    6.00    0.18      21
1108            UC   0.129   0.136
1109            UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
1110            UA     100
                *

1111            KK  DBW08A STORAGE
1112            KM    Retention Basin Storage/Outflow rating curve for Basin DBW08A
1113            RS       1    STOR       0
1114            SV    0.01    0.04    0.09    0.14    0.18    0.24    0.29    0.34    0.40    0.46
1115            SV    0.52    0.58    0.65    0.71    0.79    0.86    0.87
1116            SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
1117            SQ    0.01    1.09    5.33   11.85   20.01   29.39   30.86
1118            SE    0.10    0.30    0.70    1.00    1.30    1.70    2.00    2.30    2.60    3.00
1119            SE    3.30    3.60    4.00    4.30    4.60    5.00    5.00
                *
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                LINE            ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

1120            KK  SBW07C   BASIN
1121            KM        SBW07C Basin Runoff
1122            BA   0.005
1123            LG    0.21    0.25    6.00    0.23       3
1124            UC   0.210   0.310
1125            UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
1126            UA     100
                *
```

```
1127          KK  DBW07C STORAGE
1128          KM    Retention Basin Storage/Outflow rating curve for Basin DBW07C
1129          RS       1    STOR       0
1130          SV    0.01    0.01    0.02    0.03    0.04    0.05    0.07    0.08    0.09    0.11
1131          SV    0.12    0.14    0.16    0.18    0.20    0.22    0.22
1132          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
1133          SQ    0.01    0.55    2.66    5.93   10.00   14.69   15.43
1134          SE    0.10    0.30    0.70    1.00    1.30    1.70    2.00    2.30    2.60    3.00
1135          SE    3.30    3.60    4.00    4.30    4.60    5.00    5.00
              *

1136          KK   SB07B   BASIN
1137          KM        SB07B Basin Runoff
1138          BA   0.007
1139          LG    0.10    0.25    6.00   0.284
1140          UC   0.322   0.529
1141          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
1142          UA     100
              *

1143          KK  DBW07B STORAGE
1144          KM    Retention Basin Storage/Outflow rating curve for Basin DBW07B
1145          RS       1    STOR       0
1146          SV    0.01    0.01    0.03    0.04    0.05    0.07    0.09    0.10    0.12    0.14
1147          SV    0.17    0.19    0.21    0.24    0.27    0.29    0.30
1148          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
1149          SQ    0.01    0.55    2.66    5.93   10.00   14.69   15.43
1150          SE    0.10    0.30    0.70    1.00    1.30    1.70    2.00    2.30    2.60    3.00
1151          SE    3.30    3.60    4.00    4.30    4.60    5.00    5.00
              *

1152          KK  CW07BC COMBINE
1153          KM        Combine flow from SBW07C andSBW07B
1154          HC       2
              *

1155          KK  RW07BC   ROUTE
1156          KM       Route flow from CW07BC through SBW07A
1157          RS       1    FLOW
1158          RC   0.060   0.060   0.060    1452  0.0465 2800.10
1159          RX    0.00    6.00   20.00   26.00   29.00   38.00   50.00   68.00
1160          RY  2800.1 2799.00 2796.00 2793.00 2793.00 2796.00 2797.00 2798.40
              *
1                                        HEC-1 INPUT                                        PAGE 30

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

1161          KK  SBW07A   BASIN
1162          KM        SBW07A Basin Runoff
1163          BA   0.013
1164          LG    0.28    0.25    6.00    0.20      22
1165          UC   0.180   0.249
1166          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
1167          UA     100
              *

1168          KK   CW07A COMBINE
1169          KM        Combine flow from RW07BC and SBW07A
1170          HC       2
              *

1171          KK  DBW07A STORAGE
1172          KM    Retention Basin Storage/Outflow rating curve for Basin DBW07A
1173          RS       1    STOR       0
1174          SV    0.01    0.09    0.18    0.28    0.39    0.50    0.62    0.74    0.88    1.01
1175          SV    1.16    1.32
1176          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01   10.89
1177          SQ   30.80   56.58
1178          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
1179          SE    5.00    5.50
              *

1180          KK   CLEAR COMBINE
1181          HC       5
              *

1182          KK  SBW06A   BASIN
1183          KM        SBW06A Basin Runoff
1184          BA   0.004
1185          LG    0.29    0.25    6.00    0.18      11
1186          UC   0.116   0.145
1187          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
1188          UA     100
              *

1189          KK  DBW06A STORAGE
1190          KM    Retention Basin Storage/Outflow rating curve for Basin DBW06A
1191          RS       1    STOR       0
1192          SV    0.01    0.02    0.03    0.05    0.07    0.09    0.11    0.14    0.16    0.19
1193          SV    0.21    0.24    0.28    0.31    0.34    0.38    0.39
1194          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
1195          SQ    0.01    0.55    2.66    5.93   10.00   14.69   15.43
1196          SE    0.10    0.30    0.70    1.00    1.30    1.70    2.00    2.30    2.60    3.00
1197          SE    3.30    3.60    4.00    4.30    4.60    5.00    5.00
```

```
                    *
1                                          HEC-1 INPUT                                                  PAGE 31

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


          1198      KK  SBW05A   BASIN
          1199      KM        SBW05A Basin Runoff
          1200      BA   0.010
          1201      LG    0.29    0.25    6.00    0.19      11
          1202      UC   0.147   0.168
          1203      UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          1204      UA     100
                    *

          1205      KK  DBW05A STORAGE
          1206      KM    Retention Basin Storage/Outflow rating curve for Basin DBW05A
          1207      RS       1    STOR       0
          1208      SV    0.01    0.05    0.09    0.15    0.20    0.26    0.32    0.38    0.45    0.52
          1209      SV    0.59    0.67    0.76
          1210      SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
          1211      SQ    5.94   16.80   30.86
          1212      SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
          1213      SE    5.00    5.50    6.00
                    *

          1214      KK  SBW04A   BASIN
          1215      KM        SBW04A Basin Runoff
          1216      BA   0.002
          1217      LG    0.30    0.25    6.00    0.18       5
          1218      UC   0.091   0.107
          1219      UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          1220      UA     100
                    *

          1221      KK  SBW02A   BASIN
          1222      KM        SBW02A Basin Runoff
          1223      BA   0.007
          1224      LG    0.18    0.25    6.00    0.24       2
          1225      UC   0.238   0.322
          1226      UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          1227      UA     100
                    *

          1228      KK  DBW02A STORAGE
          1229      KM    Retention Basin Storage/Outflow rating curve for Basin DBW02A
          1230      RS       1    STOR       0
          1231      SV    0.01    0.01    0.03    0.05    0.06    0.08    0.10    0.12    0.14    0.16
          1232      SV    0.18    0.20    0.22    0.25    0.27
          1233      SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
          1234      SQ    0.01    2.20    6.04   11.07   15.43
          1235      SE    0.10    0.40    0.80    1.20    1.60    2.00    2.40    2.80    3.20    3.60
          1236      SE    4.00    4.40    4.80    5.20    5.50
                    *
1                                          HEC-1 INPUT                                                  PAGE 32

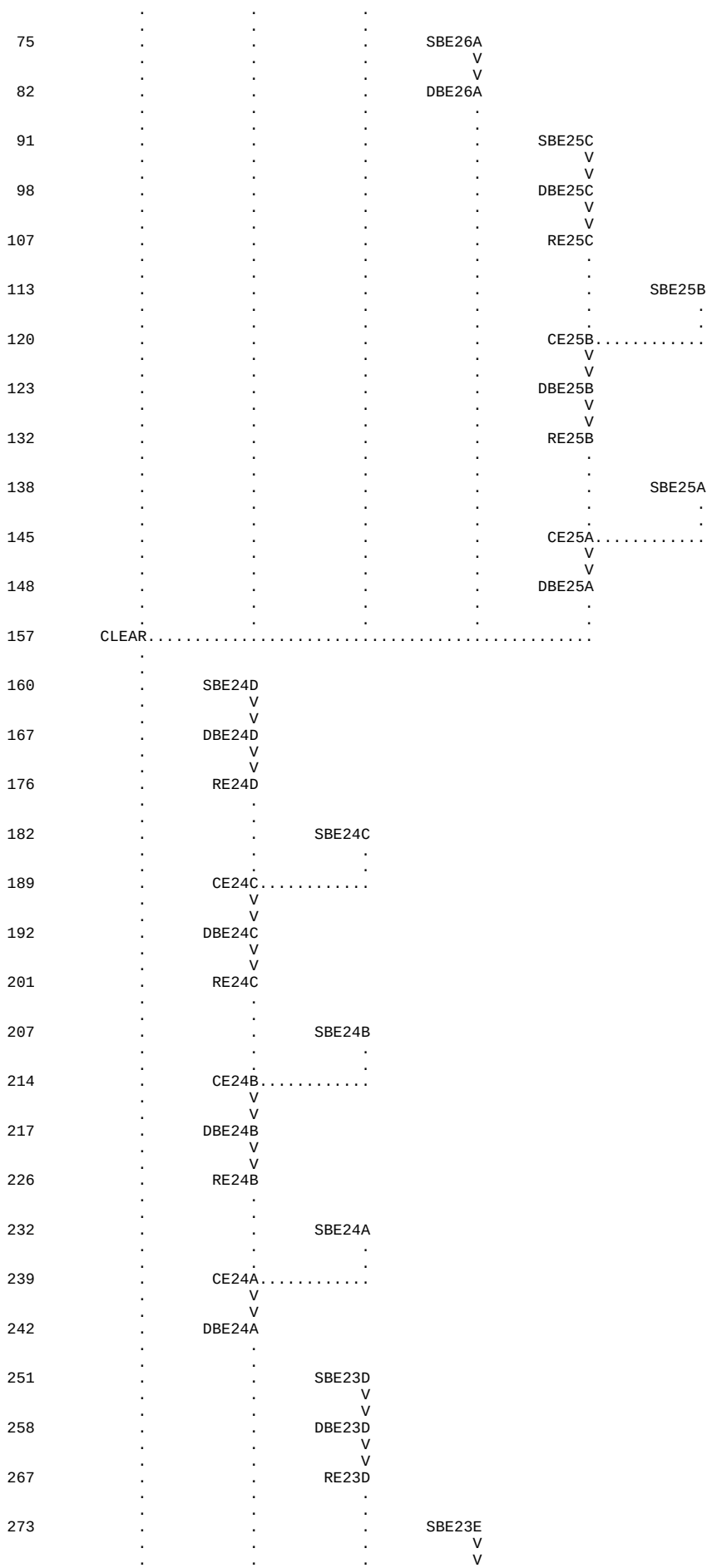
          LINE      ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

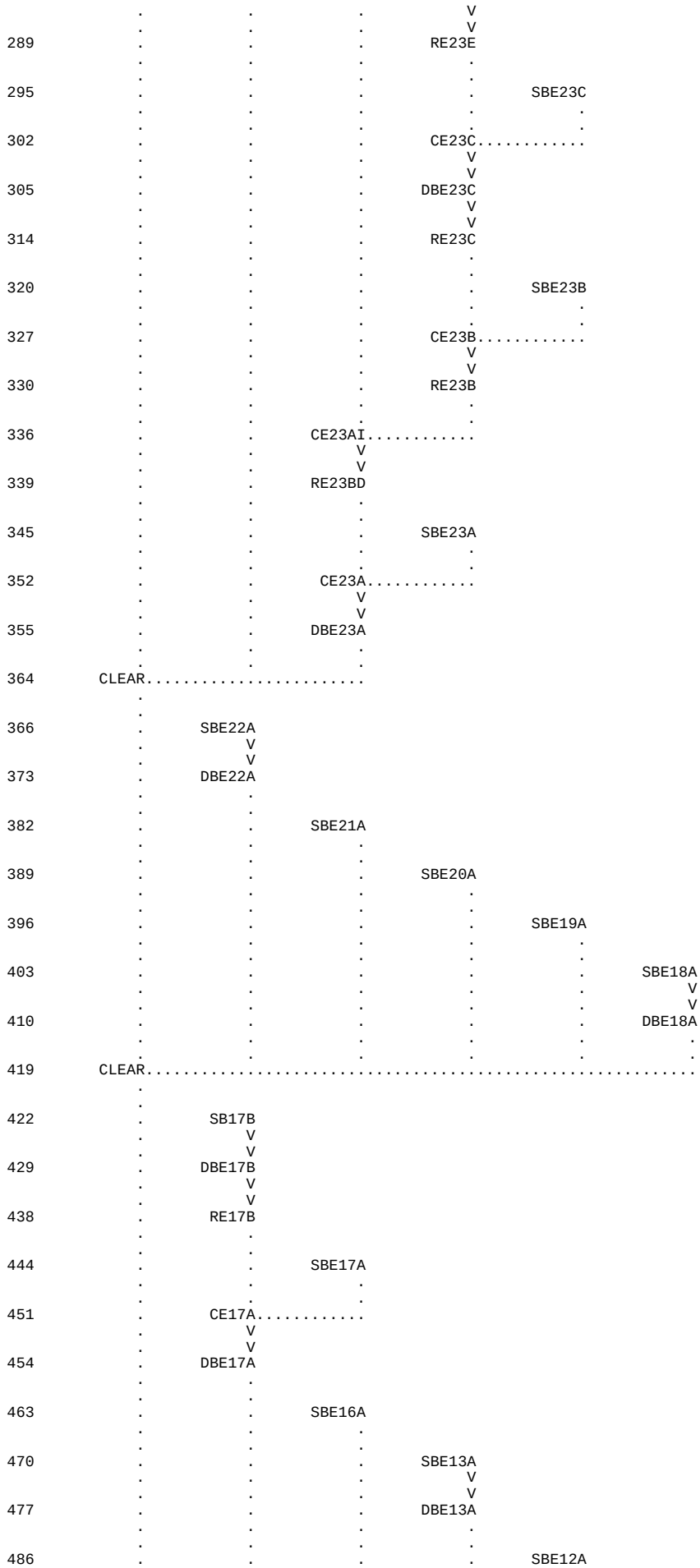

          1237      KK  SBW01A   BASIN
          1238      KM        SBW01A Basin Runoff
          1239      BA   0.002
          1240      LG    0.14    0.25    6.00    0.26       1
          1241      UC   0.186   0.262
          1242      UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          1243      UA     100
                    *

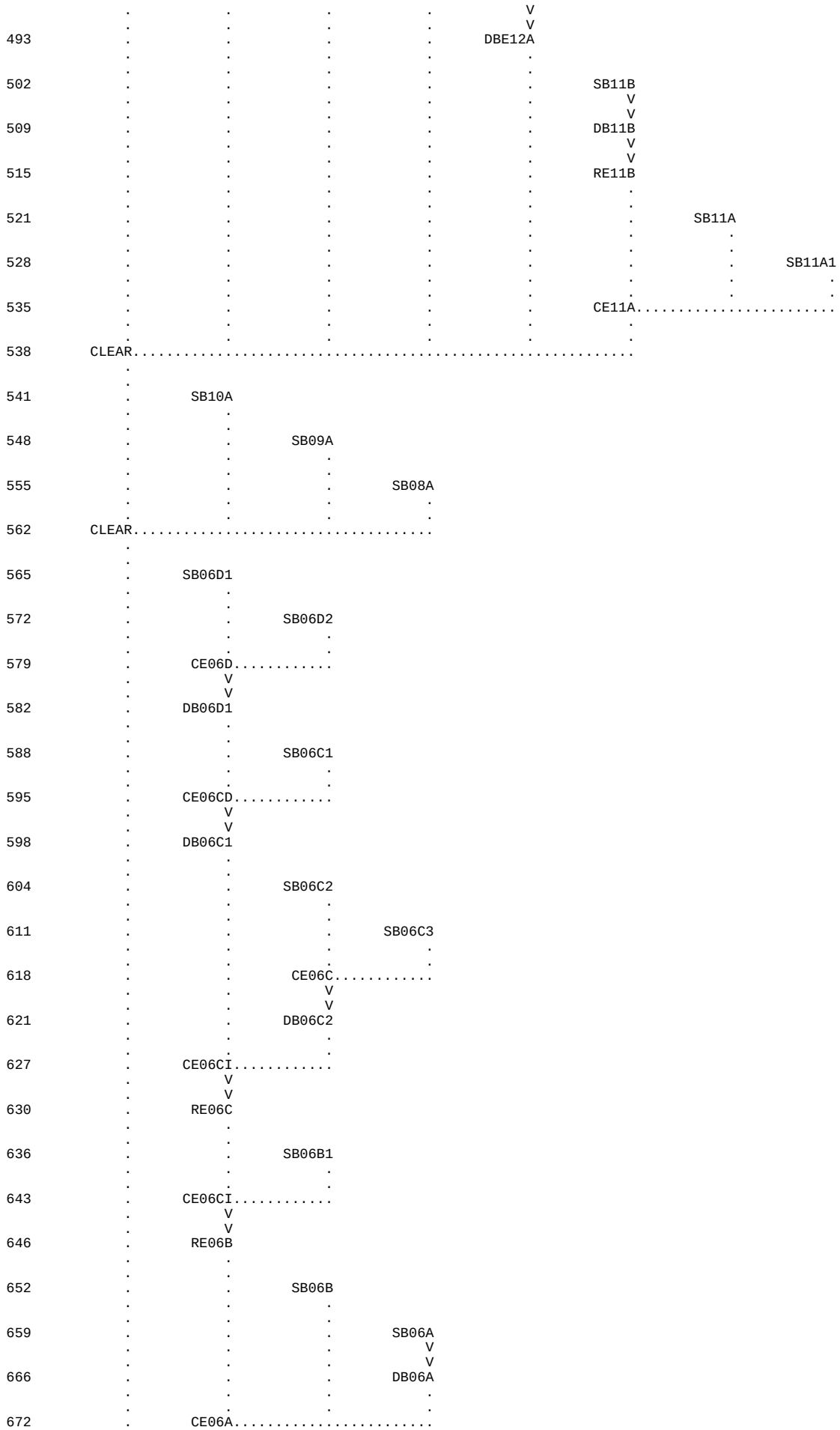
          1244      KK   CLEAR COMBINE
          1245      KM        Clear Hydrograph Stack
          1246      HC       6
                    *
          1247      ZZ
1
               SCHEMATIC DIAGRAM OF STREAM NETWORK
 INPUT
  LINE      (V) ROUTING          (---->) DIVERSION OR PUMP FLOW

   NO.      (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW

    23      SBE29A
                 V
                 V
    34      DBE29A
                 .
                 .
    43           .      SBE28A
                 .           V
                 .           V
    50           .      DBE28A
                 .           .
                 .           .
    59           .           .      SBE27A
                 .           .           V
                 .           .           V
    66           .           .      DBE27A
```


75 SBE26A
82 DBE26A
91 SBE25C
98 DBE25C
107 RE25C
113 SBE25B
120 CE25B
123 DBE25B
132 RE25B
138 SBE25A
145 CE25A
148 DBE25A
157 CLEAR
160 SBE24D
167 DBE24D
176 RE24D
182 SBE24C
189 CE24C
192 DBE24C
201 RE24C
207 SBE24B
214 CE24B
217 DBE24B
226 RE24B
232 SBE24A
239 CE24A
242 DBE24A
251 SBE23D
258 DBE23D
267 RE23D
273 SBE23E
280 DBE23E


289 RE23E
295 SBE23C
302 CE23C
305 DBE23C
314 RE23C
320 SBE23B
327 CE23B
330 RE23B
336 CE23AI
339 RE23BD
345 SBE23A
352 CE23A
355 DBE23A
364 CLEAR
366 SBE22A
373 DBE22A
382 SBE21A
389 SBE20A
396 SBE19A
403 SBE18A
410 DBE18A
419 CLEAR
422 SB17B
429 DBE17B
438 RE17B
444 SBE17A
451 CE17A
454 DBE17A
463 SBE16A
470 SBE13A
477 DBE13A
486 SBE12A


493 DBE12A
502 SB11B
509 DB11B
515 RE11B
521 SB11A
528 SB11A1
535 CE11A
538 CLEAR
541 SB10A
548 SB09A
555 SB08A
562 CLEAR
565 SB06D1
572 SB06D2
579 CE06D
582 DB06D1
588 SB06C1
595 CE06CD
598 DB06C1
604 SB06C2
611 SB06C3
618 CE06C
621 DB06C2
627 CE06CI
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636 SB06B1
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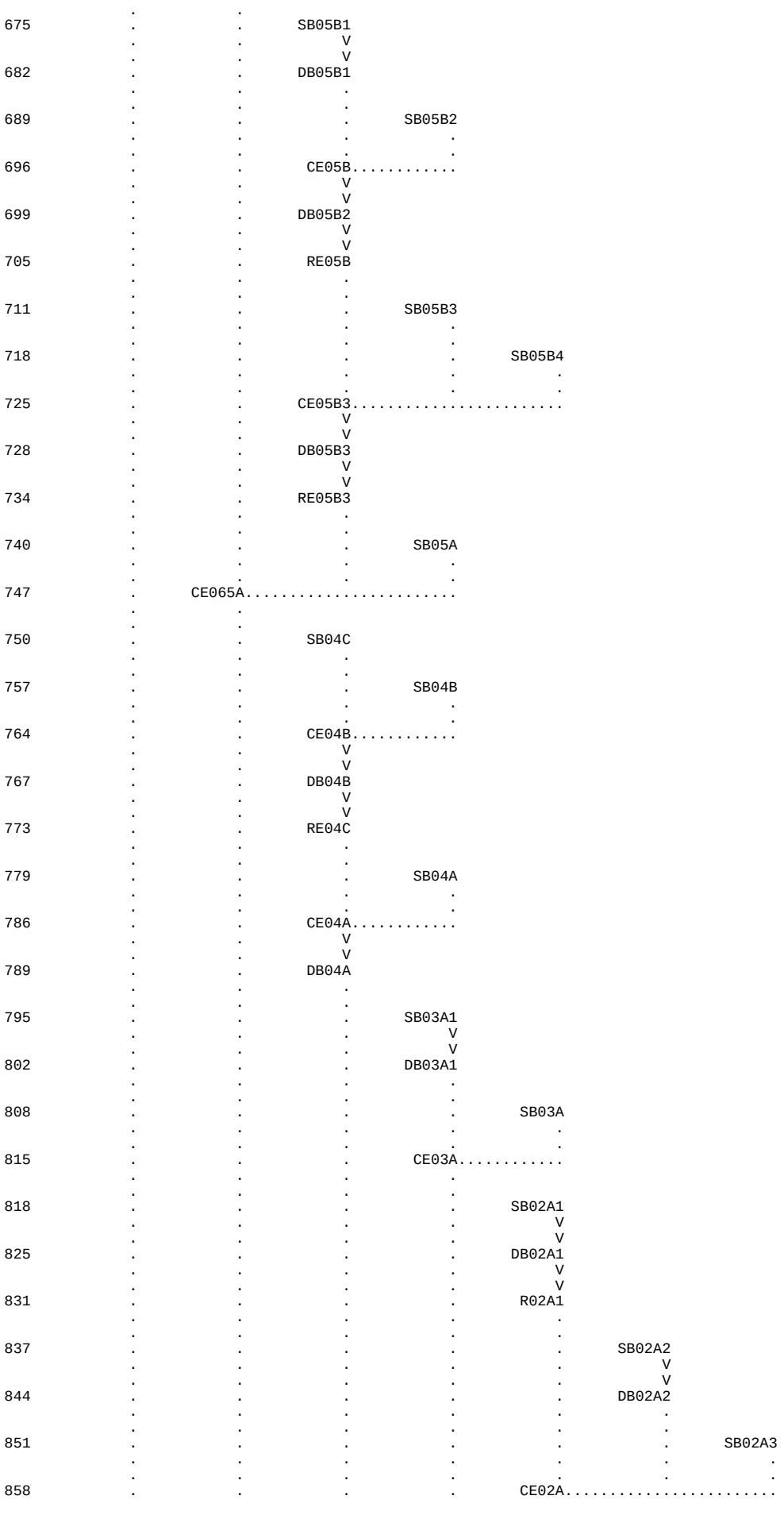
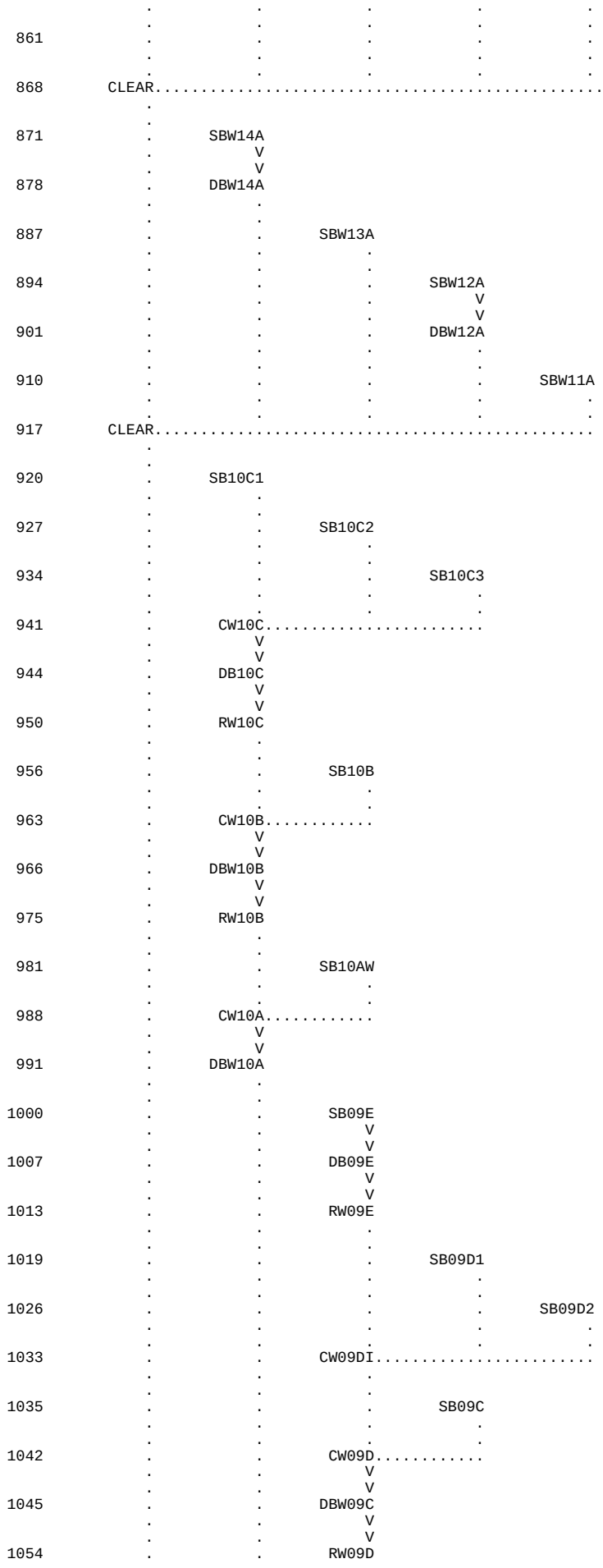
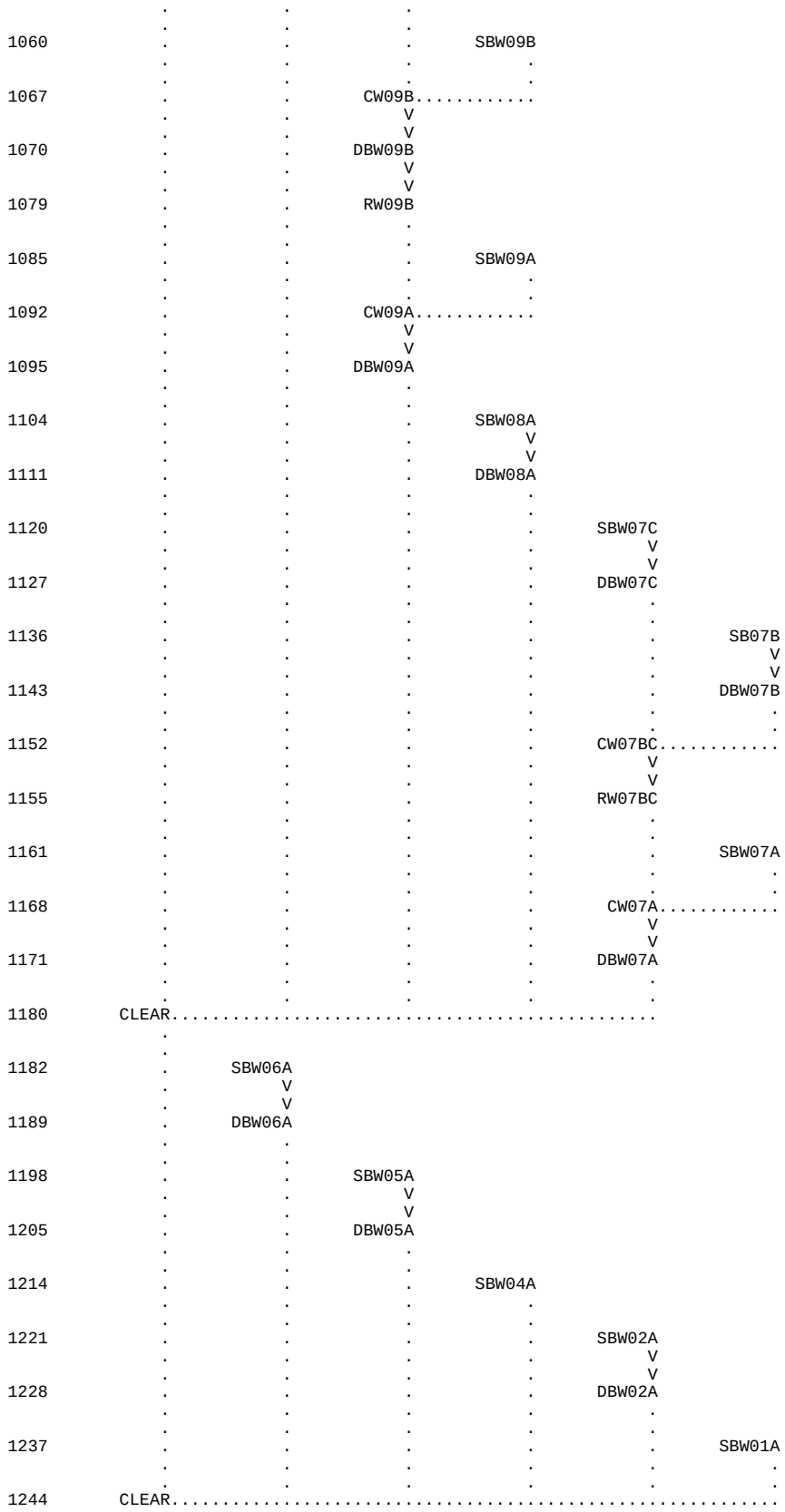
646 RE06B
652 SB06B
659 SB06A
666 DB06A
672 CE06A


675 SB05B1
682 DB05B1
689 SB05B2
696 CE05B
699 DB05B2
705 RE05B
711 SB05B3
718 SB05B4
725 CE05B3
728 DB05B3
734 RE05B3
740 SB05A
747 CE065A
750 SB04C
757 SB04B
764 CE04B
767 DB04B
773 RE04C
779 SB04A
786 CE04A
789 DB04A
795 SB03A1
802 DB03A1
808 SB03A
815 CE03A
818 SB02A1
825 DB02A1
831 R02A1
837 SB02A2
844 DB02A2
851 SB02A3
858 CE02A


861 SB01A
868 CLEAR
871 SBW14A
878 DBW14A
887 SBW13A
894 SBW12A
901 DBW12A
910 SBW11A
917 CLEAR
920 SB10C1
927 SB10C2
934 SB10C3
941 CW10C
944 DB10C
950 RW10C
956 SB10B
963 CW10B
966 DBW10B
975 RW10B
981 SB10AW
988 CW10A
991 DBW10A
1000 SB09E
1007 DB09E
1013 RW09E
1019 SB09D1
1026 SB09D2
1033 CW09DI
1035 SB09C
1042 CW09D
1045 DBW09C
1054 RW09D




(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
1*****************************************
 *                                       *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
 *              JUN   1998               *
 *           VERSION 4.1                 *
 *                                       *
 *  RUN DATE   07MAY18  TIME  09:27:22   *
 *                                       *
 *****************************************
```

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

```
                          SERENO CANYON (PHASE 4) - DEVELOPED CONDITIONS
                          STORM EVENT: 10-YR, 6-HOUR
                          05/04/2018
                          PREPARED BY: SLATER HANIFAN GROUP
                         ********************************************************************************
                         ********************************************************************************
                          Flood Control District of Maricopa County
                          Sereno Canyon Developed Conditions
                          10 YEAR
                          6 Hour  Storm
                          Unit Hydrograph: Clark
                          09/18/2012
                          Sereno Canyon-Developed Conditions
                          10-Year, 6-Hour Storm Event
                          Prepared By: JE Fuller Hydrology and Geomorphology
                          Modeled By: Brian Schalk P.E., CFM and Nathan Logan P.E., CFM
                          Submitted To: City of Scottsdale
                         ********************************************************************************
                         ********************************************************************************

   21 IO          OUTPUT CONTROL VARIABLES
                       IPRNT           5  PRINT CONTROL
                       IPLOT           0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE

      IT          HYDROGRAPH TIME DATA
                        NMIN           1  MINUTES IN COMPUTATION INTERVAL
                       IDATE      1DEC11  STARTING DATE
                       ITIME        0000  STARTING TIME
                          NQ        2000  NUMBER OF HYDROGRAPH ORDINATES
                      NDDATE      2DEC11  ENDING DATE
                      NDTIME        0919  ENDING TIME
                      ICENT          19  CENTURY MARK

                    COMPUTATION INTERVAL    0.02 HOURS
                         TOTAL TIME BASE   33.32 HOURS

           ENGLISH UNITS
                DRAINAGE AREA         SQUARE MILES
                PRECIPITATION DEPTH   INCHES
                LENGTH, ELEVATION     FEET
                FLOW                  CUBIC FEET PER SECOND
                STORAGE VOLUME        ACRE-FEET
                SURFACE AREA          ACRES
                TEMPERATURE           DEGREES FAHRENHEIT
          WARNING EXCESS AT PONDING LESS THAN ZERO FOR PERIOD. EXCESS SET TO ZERO
          WARNING EXCESS AT PONDING LESS THAN ZERO FOR PERIOD. EXCESS SET TO ZERO
1
                                                  RUNOFF SUMMARY
                                              FLOW IN CUBIC FEET PER SECOND
                                            TIME IN HOURS,  AREA IN SQUARE MILES

                                     PEAK   TIME OF     AVERAGE FLOW FOR MAXIMUM PERIOD       BASIN     MAXIMUM     TIME OF
          OPERATION       STATION    FLOW     PEAK                                            AREA      STAGE     MAX STAGE
+                                                                 6-HOUR     24-HOUR     72-HOUR

          HYDROGRAPH AT
+                          SBE29A      18.    4.08           2.          0.          0.       0.01

          ROUTED TO
+                          DBE29A       4.    4.53           1.          0.          0.       0.01
+                                                                                                      4.05        4.53

          HYDROGRAPH AT
+                          SBE28A      19.    4.05           1.          0.          0.       0.01

          ROUTED TO
+                          DBE28A       0.    0.00           0.          0.          0.       0.01
+                                                                                                      4.41        6.50

          HYDROGRAPH AT
+                          SBE27A       3.    4.02           0.          0.          0.       0.00

          ROUTED TO
+                          DBE27A       0.    0.00           0.          0.          0.       0.00
+                                                                                                      2.42        6.10

          HYDROGRAPH AT
+                          SBE26A      14.    4.05           1.          0.          0.       0.01

          ROUTED TO
+                          DBE26A       0.    0.00           0.          0.          0.       0.01
+                                                                                                      4.41        6.68

          HYDROGRAPH AT
+                          SBE25C       9.    4.03           1.          0.          0.       0.00

          ROUTED TO
+                          DBE25C       1.    4.40           0.          0.          0.       0.00
+                                                                                                      3.11        4.40

          ROUTED TO
```

```
+                    RE25C         1.    4.50          0.          0.          0.       0.00
+                                                                                    2687.07        4.50

          HYDROGRAPH AT
+                    SBE25B        8.    4.05          1.          0.          0.       0.01

          2 COMBINED AT
+                    CE25B         8.    4.05          1.          0.          0.       0.01

          ROUTED TO
+                    DBE25B        0.    5.17          0.          0.          0.       0.01
+                                                                                       2.84        5.20

          ROUTED TO
+                    RE25B         0.    5.33          0.          0.          0.       0.01
+                                                                                    2676.17        5.37

          HYDROGRAPH AT
+                    SBE25A        6.    4.02          0.          0.          0.       0.00

          2 COMBINED AT
+                    CE25A         6.    4.02          0.          0.          0.       0.01

          ROUTED TO
+                    DBE25A        0.    7.10          0.          0.          0.       0.01
+                                                                                       3.31        7.18

          5 COMBINED AT
+                    CLEAR         4.    4.53          1.          0.          0.       0.05

          HYDROGRAPH AT
+                    SBE24D       17.    4.03          1.          0.          0.       0.01

          ROUTED TO
+                    DBE24D        1.    4.43          0.          0.          0.       0.01
+                                                                                       3.11        4.43

          ROUTED TO
+                    RE24D         1.    4.57          0.          0.          0.       0.01
+                                                                                    2721.16        4.57

          HYDROGRAPH AT
+                    SBE24C       21.    4.07          2.          0.          0.       0.01

          2 COMBINED AT
+                    CE24C        21.    4.07          2.          0.          0.       0.02

          ROUTED TO
+                    DBE24C        5.    4.50          1.          0.          0.       0.02
+                                                                                       3.35        4.50

          ROUTED TO
+                    RE24C         5.    4.60          1.          0.          0.       0.02
+                                                                                    2701.34        4.60

          HYDROGRAPH AT
+                    SBE24B        7.    4.05          1.          0.          0.       0.00

          2 COMBINED AT
+                    CE24B         7.    4.05          1.          0.          0.       0.03

          ROUTED TO
+                    DBE24B        1.    5.48          0.          0.          0.       0.03
+                                                                                       3.08        5.52

          ROUTED TO
+                    RE24B         1.    5.72          0.          0.          0.       0.03
+                                                                                    2687.19        5.72

          HYDROGRAPH AT
+                    SBE24A       10.    4.05          1.          0.          0.       0.01

          2 COMBINED AT
+                    CE24A        10.    4.05          1.          0.          0.       0.04

          ROUTED TO
+                    DBE24A        1.    6.35          0.          0.          0.       0.04
+                                                                                       3.57        6.37

          HYDROGRAPH AT
+                    SBE23D       49.    4.08          5.          1.          1.       0.04

          ROUTED TO
+                    DBE23D        0.    0.00          0.          0.          0.       0.04
+                                                                                       6.47        6.98

          ROUTED TO
+                    RE23D         0.    0.25          0.          0.          0.       0.04
+                                                                                    2684.00        0.27

          HYDROGRAPH AT
+                    SBE23E        7.    4.03          1.          0.          0.       0.00

          ROUTED TO
+                    DBE23E        0.    0.00          0.          0.          0.       0.00
+                                                                                       2.63        6.35
```

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | ROUTED TO | | | | | | | | |
| + | | RE23E | 0. | 0.42 | 0. | 0. | 0. | 0.00 | |
| + | | | | | | | | 2711.00 | 0.43 |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SBE23C | 65. | 4.08 | 6. | 1. | 1. | 0.05 | |
| | 2 COMBINED AT | | | | | | | | |
| + | | CE23C | 65. | 4.08 | 6. | 1. | 1. | 0.06 | |
| | ROUTED TO | | | | | | | | |
| + | | DBE23C | 17. | 4.52 | 2. | 0. | 0. | 0.06 | |
| + | | | | | | | | 5.80 | 4.52 |
| | ROUTED TO | | | | | | | | |
| + | | RE23C | 16. | 4.58 | 2. | 0. | 0. | 0.06 | |
| + | | | | | | | | 2690.88 | 4.58 |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SBE23B | 7. | 4.03 | 1. | 0. | 0. | 0.00 | |
| | 2 COMBINED AT | | | | | | | | |
| + | | CE23B | 17. | 4.58 | 2. | 1. | 0. | 0.06 | |
| | ROUTED TO | | | | | | | | |
| + | | RE23B | 17. | 4.58 | 2. | 1. | 0. | 0.06 | |
| + | | | | | | | | 2684.51 | 4.58 |
| | 2 COMBINED AT | | | | | | | | |
| + | | CE23AI | 17. | 4.58 | 2. | 1. | 0. | 0.10 | |
| | ROUTED TO | | | | | | | | |
| + | | RE23BD | 16. | 4.62 | 2. | 1. | 0. | 0.10 | |
| + | | | | | | | | 2679.62 | 4.62 |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SBE23A | 9. | 4.03 | 1. | 0. | 0. | 0.01 | |
| | 2 COMBINED AT | | | | | | | | |
| + | | CE23A | 17. | 4.60 | 3. | 1. | 1. | 0.11 | |
| | ROUTED TO | | | | | | | | |
| + | | DBE23A | 0. | 0.00 | 0. | 0. | 0. | 0.11 | |
| + | | | | | | | | 5.77 | 33.32 |
| | 3 COMBINED AT | | | | | | | | |
| + | | CLEAR | 4. | 4.53 | 1. | 0. | 0. | 0.20 | |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SBE22A | 10. | 4.05 | 1. | 0. | 0. | 0.01 | |
| | ROUTED TO | | | | | | | | |
| + | | DBE22A | 0. | 0.00 | 0. | 0. | 0. | 0.01 | |
| + | | | | | | | | 3.79 | 6.37 |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SBE21A | 2. | 4.02 | 0. | 0. | 0. | 0.00 | |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SBE20A | 2. | 4.00 | 0. | 0. | 0. | 0.00 | |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SBE19A | 2. | 4.00 | 0. | 0. | 0. | 0.00 | |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SBE18A | 2. | 4.02 | 0. | 0. | 0. | 0.00 | |
| | ROUTED TO | | | | | | | | |
| + | | DBE18A | 0. | 0.00 | 0. | 0. | 0. | 0.00 | |
| + | | | | | | | | 1.47 | 5.05 |
| | 6 COMBINED AT | | | | | | | | |
| + | | CLEAR | 6. | 4.00 | 1. | 0. | 0. | 0.21 | |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SB17B | 27. | 4.03 | 2. | 1. | 0. | 0.02 | |
| | ROUTED TO | | | | | | | | |
| + | | DBE17B | 0. | 0.00 | 0. | 0. | 0. | 0.02 | |
| + | | | | | | | | 4.91 | 6.53 |
| | ROUTED TO | | | | | | | | |
| + | | RE17B | 0. | 0.57 | 0. | 0. | 0. | 0.02 | |
| + | | | | | | | | 2736.00 | 0.70 |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SBE17A | 27. | 4.05 | 2. | 1. | 0. | 0.02 | |
| | 2 COMBINED AT | | | | | | | | |
| + | | CE17A | 27. | 4.05 | 2. | 1. | 0. | 0.03 | |
| | ROUTED TO | | | | | | | | |
| + | | DBE17A | 0. | 0.00 | 0. | 0. | 0. | 0.03 | |
| + | | | | | | | | 4.39 | 7.17 |

```
          HYDROGRAPH AT
+                      SBE16A         2.    4.02          0.          0.          0.       0.00
          HYDROGRAPH AT
+                      SBE13A         6.    4.02          0.          0.          0.       0.00
          ROUTED TO
+                      DBE13A         0.    0.00          0.          0.          0.       0.00
+                                                                                          3.96        6.20
          HYDROGRAPH AT
+                      SBE12A         4.    4.02          0.          0.          0.       0.00
          ROUTED TO
+                      DBE12A         0.    0.00          0.          0.          0.       0.00
+                                                                                          2.58        6.20
          HYDROGRAPH AT
+                       SB11B        11.    4.12          1.          0.          0.       0.01
          ROUTED TO
+                       DB11B         9.    4.30          1.          0.          0.       0.01
+                                                                                       2778.70        4.30
          ROUTED TO
+                       RE11B         9.    4.38          1.          0.          0.       0.01
+                                                                                       2762.74        4.38
          HYDROGRAPH AT
+                       SB11A         5.    4.12          1.          0.          0.       0.01
          HYDROGRAPH AT
+                      SB11A1         3.    4.07          0.          0.          0.       0.00
          3 COMBINED AT
+                       CE11A        15.    4.23          2.          1.          0.       0.02
          6 COMBINED AT
+                       CLEAR        18.    4.05          4.          1.          1.       0.27
          HYDROGRAPH AT
+                       SB10A         2.    4.03          0.          0.          0.       0.00
          HYDROGRAPH AT
+                       SB09A         1.    4.05          0.          0.          0.       0.00
          HYDROGRAPH AT
+                       SB08A         1.    4.03          0.          0.          0.       0.00
          4 COMBINED AT
+                       CLEAR        22.    4.05          4.          1.          1.       0.28
          HYDROGRAPH AT
+                      SB06D1         4.    4.10          0.          0.          0.       0.00
          HYDROGRAPH AT
+                      SB06D2        12.    4.05          1.          0.          0.       0.01
          2 COMBINED AT
+                       CE06D        15.    4.07          2.          0.          0.       0.01
          ROUTED TO
+                      DB06D1         9.    4.28          2.          0.          0.       0.01
+                                                                                       2797.05        4.28
          HYDROGRAPH AT
+                      SB06C1        16.    4.10          2.          1.          0.       0.01
          2 COMBINED AT
+                      CE06CD        24.    4.13          4.          1.          1.       0.03
          ROUTED TO
+                      DB06C1        22.    4.27          4.          1.          1.       0.03
+                                                                                       2793.86        4.27
          HYDROGRAPH AT
+                      SB06C2         8.    4.25          2.          0.          0.       0.02
          HYDROGRAPH AT
+                      SB06C3         8.    4.03          1.          0.          0.       0.00
          2 COMBINED AT
+                       CE06C        14.    4.07          2.          1.          0.       0.02
          ROUTED TO
+                      DB06C2        11.    4.27          2.          1.          0.       0.02
+                                                                                       2789.80        4.27
          2 COMBINED AT
+                      CE06CI        33.    4.27          6.          2.          1.       0.05
          ROUTED TO
+                       RE06C        33.    4.30          6.          2.          1.       0.05
+                                                                                       2784.68        4.30
          HYDROGRAPH AT
```

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| + | | SB06B1 | 3. | 4.07 | 0. | 0. | 0. | 0.00 | |
| | 2 COMBINED AT | | | | | | | | |
| + | | CE06CI | 35. | 4.28 | 6. | 2. | 1. | 0.06 | |
| | ROUTED TO | | | | | | | | |
| + | | RE06B | 34. | 4.37 | 6. | 2. | 1. | 0.06 | |
| + | | | | | | | | | 2758.50 4.37 |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SB06B | 2. | 4.22 | 0. | 0. | 0. | 0.00 | |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SB06A | 11. | 4.02 | 1. | 0. | 0. | 0.01 | |
| | ROUTED TO | | | | | | | | |
| + | | DB06A | 8. | 4.10 | 1. | 0. | 0. | 0.01 | |
| + | | | | | | | | | 2754.40 4.10 |
| | 3 COMBINED AT | | | | | | | | |
| + | | CE06A | 39. | 4.32 | 7. | 2. | 1. | 0.07 | |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SB05B1 | 7. | 4.10 | 1. | 0. | 0. | 0.01 | |
| | ROUTED TO | | | | | | | | |
| + | | DB05B1 | 6. | 4.15 | 1. | 0. | 0. | 0.01 | |
| + | | | | | | | | | 2811.71 4.15 |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SB05B2 | 4. | 4.13 | 1. | 0. | 0. | 0.01 | |
| | 2 COMBINED AT | | | | | | | | |
| + | | CE05B | 10. | 4.15 | 1. | 0. | 0. | 0.01 | |
| | ROUTED TO | | | | | | | | |
| + | | DB05B2 | 10. | 4.15 | 1. | 0. | 0. | 0.01 | |
| + | | | | | | | | | 2801.57 4.15 |
| | ROUTED TO | | | | | | | | |
| + | | RE05B | 9. | 4.28 | 1. | 0. | 0. | 0.01 | |
| + | | | | | | | | | 2757.32 4.28 |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SB05B3 | 6. | 4.05 | 1. | 0. | 0. | 0.00 | |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SB05B4 | 5. | 4.07 | 0. | 0. | 0. | 0.00 | |
| | 3 COMBINED AT | | | | | | | | |
| + | | CE05B3 | 15. | 4.15 | 2. | 1. | 0. | 0.02 | |
| | ROUTED TO | | | | | | | | |
| + | | DB05B3 | 15. | 4.15 | 2. | 1. | 0. | 0.02 | |
| + | | | | | | | | | 2782.08 4.15 |
| | ROUTED TO | | | | | | | | |
| + | | RE05B3 | 14. | 4.25 | 2. | 1. | 0. | 0.02 | |
| + | | | | | | | | | 2757.40 4.25 |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SB05A | 2. | 4.22 | 0. | 0. | 0. | 0.00 | |
| | 3 COMBINED AT | | | | | | | | |
| + | | CE065A | 55. | 4.30 | 10. | 2. | 2. | 0.09 | |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SB04C | 1. | 4.10 | 0. | 0. | 0. | 0.00 | |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SB04B | 15. | 4.05 | 1. | 0. | 0. | 0.01 | |
| | 2 COMBINED AT | | | | | | | | |
| + | | CE04B | 17. | 4.05 | 2. | 0. | 0. | 0.01 | |
| | ROUTED TO | | | | | | | | |
| + | | DB04B | 13. | 4.15 | 2. | 0. | 0. | 0.01 | |
| + | | | | | | | | | 2757.04 4.15 |
| | ROUTED TO | | | | | | | | |
| + | | RE04C | 13. | 4.20 | 2. | 0. | 0. | 0.01 | |
| + | | | | | | | | | 2750.60 4.20 |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SB04A | 13. | 4.03 | 1. | 0. | 0. | 0.01 | |
| | 2 COMBINED AT | | | | | | | | |
| + | | CE04A | 23. | 4.07 | 3. | 1. | 0. | 0.02 | |
| | ROUTED TO | | | | | | | | |
| + | | DB04A | 17. | 4.27 | 3. | 1. | 0. | 0.02 | |
| + | | | | | | | | | 2741.00 4.27 |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SB03A1 | 1. | 4.17 | 0. | 0. | 0. | 0.00 | |

```
          ROUTED TO
+                    DB03A1         1.    4.52          0.          0.          0.       0.00
+                                                                                        2750.21        4.53

          HYDROGRAPH AT
+                     SB03A         3.    4.08          0.          0.          0.       0.00

          2 COMBINED AT
+                     CE03A         3.    4.08          0.          0.          0.       0.00

          HYDROGRAPH AT
+                    SB02A1        28.    4.25          5.          1.          1.       0.06

          ROUTED TO
+                    DB02A1        28.    4.33          5.          1.          1.       0.06
+                                                                                        2791.25        4.33

          ROUTED TO
+                     R02A1        28.    4.37          5.          1.          1.       0.06
+                                                                                        2750.89        4.37

          HYDROGRAPH AT
+                    SB02A2         4.    4.03          0.          0.          0.       0.00

          ROUTED TO
+                    DB02A2         0.    0.00          0.          0.          0.       0.00
+                                                                                        2763.27        6.35

          HYDROGRAPH AT
+                    SB02A3         2.    4.12          0.          0.          0.       0.00

          3 COMBINED AT
+                     CE02A        29.    4.35          5.          1.          1.       0.06

          HYDROGRAPH AT
+                     SB01A        59.    4.27         10.          3.          2.       0.12

          6 COMBINED AT
+                     CLEAR       179.    4.30         33.          8.          6.       0.58

          HYDROGRAPH AT
+                    SBW14A        16.    4.03          1.          0.          0.       0.01

          ROUTED TO
+                    DBW14A         2.    4.35          0.          0.          0.       0.01
+                                                                                           2.81        4.35

          HYDROGRAPH AT
+                    SBW13A         2.    4.00          0.          0.          0.       0.00

          HYDROGRAPH AT
+                    SBW12A        30.    4.03          2.          0.          0.       0.02

          ROUTED TO
+                    DBW12A         1.    4.55          0.          0.          0.       0.02
+                                                                                           4.57        4.55

          HYDROGRAPH AT
+                    SBW11A         2.    4.00          0.          0.          0.       0.00

          5 COMBINED AT
+                     CLEAR       181.    4.30         33.          8.          6.       0.61

          HYDROGRAPH AT
+                    SB10C1        12.    4.05          1.          0.          0.       0.01

          HYDROGRAPH AT
+                    SB10C2        10.    4.07          1.          0.          0.       0.01

          HYDROGRAPH AT
+                    SB10C3         4.    4.10          0.          0.          0.       0.00

          3 COMBINED AT
+                     CW10C        26.    4.07          3.          1.          0.       0.02

          ROUTED TO
+                     DB10C        22.    4.15          3.          1.          0.       0.02
+                                                                                        2768.52        4.15

          ROUTED TO
+                     RW10C        21.    4.23          3.          1.          0.       0.02
+                                                                                        2753.18        4.23

          HYDROGRAPH AT
+                     SB10B        13.    4.05          1.          0.          0.       0.01

          2 COMBINED AT
+                     CW10B        29.    4.18          4.          1.          1.       0.03

          ROUTED TO
+                    DBW10B        20.    4.42          2.          0.          0.       0.03
+                                                                                           7.44        4.42

          ROUTED TO
+                     RW10B        18.    4.48          2.          0.          0.       0.03
+                                                                                        2723.47        4.48
```

```
          HYDROGRAPH AT
+                    SB10AW      46.   4.05        4.        1.        1.      0.03
          2 COMBINED AT
+                     CW10A      46.   4.05        6.        1.        1.      0.06
          ROUTED TO
+                    DBW10A       9.   4.87        2.        0.        0.      0.06
+                                                                              5.17      4.87
          HYDROGRAPH AT
+                     SB09E       3.   4.12        0.        0.        0.      0.00
          ROUTED TO
+                     DB09E       3.   4.33        0.        0.        0.      0.00
+                                                                           2826.86      4.33
          ROUTED TO
+                     RW09E       2.   4.47        0.        0.        0.      0.00
+                                                                           2800.99      4.45
          HYDROGRAPH AT
+                    SB09D1      15.   4.03        1.        0.        0.      0.01
          HYDROGRAPH AT
+                    SB09D2       6.   4.07        1.        0.        0.      0.00
          3 COMBINED AT
+                    CW09DI      21.   4.03        2.        1.        0.      0.02
          HYDROGRAPH AT
+                     SB09C      19.   4.22        3.        1.        1.      0.04
          2 COMBINED AT
+                     CW09D      34.   4.08        5.        1.        1.      0.05
          ROUTED TO
+                    DBW09C      10.   4.90        2.        0.        0.      0.05
+                                                                              3.76      4.90
          ROUTED TO
+                     RW09D      10.   4.95        2.        0.        0.      0.05
+                                                                           2779.44      4.93
          HYDROGRAPH AT
+                    SBW09B      10.   4.02        1.        0.        0.      0.00
          2 COMBINED AT
+                     CW09B      10.   4.93        2.        1.        0.      0.06
          ROUTED TO
+                    DBW09B      10.   5.07        2.        0.        0.      0.06
+                                                                              4.24      5.07
          ROUTED TO
+                     RW09B       9.   5.25        2.        0.        0.      0.06
+                                                                           2763.34      5.25
          HYDROGRAPH AT
+                    SBW09A      11.   4.05        1.        0.        0.      0.01
          2 COMBINED AT
+                     CW09A      11.   4.05        2.        1.        0.      0.07
          ROUTED TO
+                    DBW09A       9.   5.28        2.        0.        0.      0.07
+                                                                              4.69      5.28
          HYDROGRAPH AT
+                    SBW08A      16.   4.03        1.        0.        0.      0.01
          ROUTED TO
+                    DBW08A       0.   4.90        0.        0.        0.      0.01
+                                                                              3.34      4.92
          HYDROGRAPH AT
+                    SBW07C       5.   4.07        0.        0.        0.      0.00
          ROUTED TO
+                    DBW07C       2.   4.42        0.        0.        0.      0.00
+                                                                              3.87      4.42
          HYDROGRAPH AT
+                     SB07B       5.   4.13        1.        0.        0.      0.01
          ROUTED TO
+                    DBW07B       2.   4.73        0.        0.        0.      0.01
+                                                                              3.82      4.73
          2 COMBINED AT
+                    CW07BC       3.   4.67        0.        0.        0.      0.01
          ROUTED TO
+                    RW07BC       2.   4.82        0.        0.        0.      0.01
+                                                                           2793.27      4.82
```

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | HYDROGRAPH AT | | | | | | | | |
| + | | SBW07A | 17. | 4.05 | 2. | 0. | 0. | 0.01 | | |
| | 2 COMBINED AT | | | | | | | | |
| + | | CW07A | 17. | 4.05 | 2. | 1. | 0. | 0.03 | | |
| | ROUTED TO | | | | | | | | |
| + | | DBW07A | 2. | 5.35 | 0. | 0. | 0. | 0.03 | | |
| + | | | | | | | | | 4.07 | 5.35 |
| | 5 COMBINED AT | | | | | | | | |
| + | | CLEAR | 181. | 4.30 | 37. | 9. | 7. | 0.77 | | |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SBW06A | 7. | 4.03 | 0. | 0. | 0. | 0.00 | | |
| | ROUTED TO | | | | | | | | |
| + | | DBW06A | 0. | 0.00 | 0. | 0. | 0. | 0.00 | | |
| + | | | | | | | | | 3.30 | 6.15 |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SBW05A | 16. | 4.03 | 1. | 0. | 0. | 0.01 | | |
| | ROUTED TO | | | | | | | | |
| + | | DBW05A | 0. | 5.67 | 0. | 0. | 0. | 0.01 | | |
| + | | | | | | | | | 4.50 | 5.68 |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SBW04A | 4. | 4.02 | 0. | 0. | 0. | 0.00 | | |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SBW02A | 7. | 4.08 | 1. | 0. | 0. | 0.01 | | |
| | ROUTED TO | | | | | | | | |
| + | | DBW02A | 3. | 4.40 | 0. | 0. | 0. | 0.01 | | |
| + | | | | | | | | | 4.49 | 4.40 |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SBW01A | 2. | 4.07 | 0. | 0. | 0. | 0.00 | | |
| | 6 COMBINED AT | | | | | | | | |
| + | | CLEAR | 184. | 4.32 | 37. | 10. | 7. | 0.79 | | |

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

SLATER HANIFAN GROUP
CONSULTING ENGINEERS & PLANNERS

Project: SERENO CANYON PHASE 4
Project No.: TOL1702.000
Location: SCOTTSDALE, AZ

## HEC-1 Results - Proposed Conditions 10-yr, 6-hr

| HEC-1 ID | | Existing Condition Peak Discharge (A) | Developed Condition Peak Discharge (B) | (B) – (A) |
|---|---|---|---|---|
| Ex.Cond. | Prop.Cond. | [cfs] | [cfs] | [cfs] |
| CE01A | SB01A | 92 | 59 | -33 |
| CE04A | DB04A | 19 | 17 | -2 |
| CE065A | CE065A | 46 | 55 | 9 |
| CE11A | CE11A | 22 | 15 | -7 |
| CE17A | DBE17A | 25 | 0 | -25 |
| CE23A | DBE23A | 62 | 0 | -62 |
| CE24A | DBE24A | 26 | 1 | -25 |
| CE25A | DBE25A | 11 | 0 | -11 |
| CW07A | DBW07A | 17 | 2 | -15 |
| CW09A | DBW09A | 43 | 9 | -34 |
| CW10A | DBW10A | 48 | 9 | -39 |
| SBE02A | CE02A | 31 | 29 | -2 |
| SBE03A | CE03A | 6 | 3 | -3 |
| SBE08A | SB08A | 1 | 1 | 0 |
| SBE09A | SB09A | 3 | 1 | -2 |
| SBE10A | SB10A | 1 | 2 | 1 |
| SBE12A | DBE12A | 2 | 0 | -2 |
| SBE13A | DBE13A | 3 | 0 | -3 |
| SBE16A | SBE16A | 1 | 2 | 1 |
| SBE18A | DBE18A | 1 | 0 | -1 |
| SBE19A | SBE19A | 1 | 2 | 1 |
| SBE20A | SBE20A | 1 | 2 | 1 |
| SBE21A | SBE21A | 1 | 2 | 1 |
| SBE26A | DBE26A | 7 | 0 | -7 |
| SBE27A | DBE27A | 2 | 0 | -2 |
| SBE28A | DBE28A | 10 | 0 | -10 |
| SBE29A | DBE29A | 13 | 4 | -9 |
| SBW01A | SBW01A | 2 | 2 | 0 |
| SBW02A | DBW02A | 6 | 3 | -3 |
| SBW04A | SBW04A | 2 | 4 | 2 |
| SBW05A | DBW05A | 9 | 0 | -9 |
| SBW06A | DBW06A | 4 | 0 | -4 |
| SBW08A | DBW08A | 9 | 0 | -9 |
| SBW11A | SBW11A | 2 | 2 | 0 |
| SBW12A | DBW12A | 18 | 1 | -17 |
| SBW13A | SBW13A | 1 | 2 | 1 |
| SBW14A | DBW14A | 11 | 2 | -9 |

```
1****************************************                    ****************************************
 *                                      *                    *                                      *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *                    *    U.S. ARMY CORPS OF ENGINEERS      *
 *              JUN   1998              *                    *    HYDROLOGIC ENGINEERING CENTER     *
 *            VERSION 4.1               *                    *         609 SECOND STREET            *
 *                                      *                    *       DAVIS, CALIFORNIA 95616        *
 *  RUN DATE   07MAY18  TIME  09:26:59  *                    *          (916) 756-1104              *
 *                                      *                    *                                      *
 ****************************************                    ****************************************
```

2-Year 6-Hour Model

```
X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X              X
XXXXXXX  XXXX     X        XXXXX  X
X     X  X        X              X
X     X  X        X     X        X
X     X  XXXXXXX   XXXXX         XXX
```

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        SERENO CANYON (PHASE 4) - DEVELOPED CONDITIONS
            2       ID        STORM EVENT: 2-YR, 6-HOUR
            3       ID        05/04/2018
            4       ID        PREPARED BY: SLATER HANIFAN GROUP
            5       ID       ********************************************************************************
            6       ID       ********************************************************************************
            7       ID        Flood Control District of Maricopa County
            8       ID        Sereno Canyon Developed Conditions
            9       ID        2 YEAR
           10       ID        6 Hour  Storm
           11       ID        Unit Hydrograph: Clark
           12       ID        09/18/2012
           13       ID        Sereno Canyon-Developed Conditions
           14       ID        2-Year, 6-Hour Storm Event
           15       ID        Prepared By: JE Fuller Hydrology and Geomorphology
           16       ID        Modeled By: Brian Schalk P.E., CFM and Nathan Logan P.E., CFM
           17       ID        Submitted To: City of Scottsdale
           18       ID       ********************************************************************************
           19       ID       ********************************************************************************
           20       IT       1 01DEC11       0    2000
           21       IO       5
           22       IN      15
                    *DIAGRAM
                    *
                    *

           23       KK  SBE29A   BASIN
           24       KM        SBE29A Basin Runoff
           25       BA   0.015
           26       PB   1.421
           27       PC   0.000   0.008   0.016   0.025   0.033   0.041   0.050   0.058   0.066   0.074
           28       PC   0.087   0.099   0.118   0.138   0.216   0.377   0.834   0.911   0.931   0.950
           29       PC   0.962   0.972   0.983   0.991   1.000
           30       LG    0.20    0.25    6.00    0.23      10
           31       UC   0.300   0.306
           32       UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
           33       UA     100
                    *

           34       KK  DBE29A STORAGE
           35       KM    Retention Basin Storage/Outflow rating curve for Basin DBE29A
           36       RS       1    STOR       0
           37       SV    0.01    0.05    0.10    0.15    0.20    0.26    0.32    0.38    0.45    0.51
           38       SV    0.59    0.66    0.74    0.83    0.92    0.97
           39       SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.49
           40       SQ    3.46    8.43   14.56   21.75   29.86   33.07
           41       SE    0.10    0.40    0.80    1.20    1.60    2.00    2.40    2.80    3.20    3.60
           42       SE    4.00    4.40    4.80    5.20    5.60    5.80
                    *
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1 HEC-1 INPUT PAGE 2

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

           43       KK  SBE28A   BASIN
           44       KM        SBE28A Basin Runoff
           45       BA   0.013
           46       LG    0.29    0.25    6.00    0.20      17
```

```
 47          UC   0.198   0.217
 48          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 49          UA     100
             *

 50          KK  DBE28A STORAGE
 51          KM    Retention Basin Storage/Outflow rating curve for Basin DBE28A
 52          RS       1    STOR       0
 53          SV    0.01    0.07    0.13    0.21    0.28    0.36    0.45    0.54    0.64    0.74
 54          SV    0.84    0.95    1.08
 55          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
 56          SQ    6.93   19.60   36.01
 57          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
 58          SE    5.00    5.50    6.00
             *

 59          KK  SBE27A   BASIN
 60          KM        SBE27A Basin Runoff
 61          BA   0.002
 62          LG    0.30    0.25    6.00    0.22      15
 63          UC   0.121   0.162
 64          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 65          UA     100
             *

 66          KK  DBE27A STORAGE
 67          KM    Retention Basin Storage/Outflow rating curve for Basin DBE27A
 68          RS       1    STOR       0
 69          SV    0.01    0.01    0.02    0.03    0.04    0.06    0.07    0.08    0.10    0.11
 70          SV    0.12    0.14    0.16    0.17    0.19    0.21
 71          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
 72          SQ    0.01    0.96    2.64    4.81    7.38   10.29
 73          SE    0.10    0.30    0.60    0.90    1.20    1.50    1.80    2.10    2.40    2.70
 74          SE    3.00    3.30    3.60    3.90    4.20    4.50
             *

 75          KK  SBE26A   BASIN
 76          KM        SBE26A Basin Runoff
 77          BA   0.010
 78          LG    0.26    0.25    6.00    0.20      31
 79          UC   0.196   0.267
 80          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 81          UA     100
             *
1                                        HEC-1 INPUT                                        PAGE  3

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

 82          KK  DBE26A STORAGE
 83          KM    Retention Basin Storage/Outflow rating curve for Basin DBE26A
 84          RS       1    STOR       0
 85          SV    0.01    0.06    0.12    0.19    0.26    0.33    0.41    0.49    0.58    0.67
 86          SV    0.76    0.87    0.98    1.11
 87          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
 88          SQ    0.01    5.94   16.80   30.86
 89          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
 90          SE    5.00    5.50    6.00    6.50
             *

 91          KK  SBE25C   BASIN
 92          KM        SBE25C Basin Runoff
 93          BA   0.005
 94          LG    0.27    0.25    6.00    0.18      17
 95          UC   0.144   0.162
 96          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 97          UA     100
             *

 98          KK  DBE25C STORAGE
 99          KM    Retention Basin Storage/Outflow rating curve for Basin DBE25C
100          RS       1    STOR       0
101          SV    0.01    0.02    0.05    0.07    0.10    0.13    0.16    0.19    0.22    0.25
102          SV    0.28    0.31    0.35    0.39    0.43    0.47    0.47
103          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
104          SQ    2.87    8.53   15.86   24.66   34.72   45.79   47.52
105          SE    0.10    0.30    0.70    1.00    1.30    1.70    2.00    2.30    2.60    3.00
106          SE    3.30    3.60    4.00    4.30    4.60    5.00    5.00
             *

107          KK   RE25C   ROUTE
108          KM        Route runoff from SBE25C through Basin SBE25B
109          RS       1    FLOW
110          RC   0.060   0.060   0.060     709  0.0268 2694.40
111          RX    0.00   21.00   53.00   58.00   63.00   70.00   90.00   99.00
112          RY  2694.3 2691.90 2688.00 2687.00 2687.00 2689.00 2693.30 2694.40
             *

113          KK  SBE25B   BASIN
114          KM        SBE25B Basin Runoff
115          BA   0.006
116          LG    0.29    0.25    6.00    0.21      20
117          UC   0.183   0.252
118          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
119          UA     100
             *
```

```
 120          KK   CE25B COMBINE
 121          KM        Combine Route RE25C and Basin SBE25B
 122          HC       2
              *
1                                        HEC-1 INPUT                                                PAGE  4

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


 123          KK  DBE25B STORAGE
 124          KM    Retention Basin Storage/Outflow rating curve for Basin DBE25B
 125          RS       1    STOR       0
 126          SV    0.01    0.05    0.09    0.14    0.19    0.25    0.30    0.36    0.42    0.49
 127          SV    0.55    0.62    0.70    0.78    0.84
 128          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    1.68    7.93
 129          SQ   16.80   27.91   40.62   54.86   56.70
 130          SE    0.10    0.40    0.80    1.20    1.60    2.00    2.40    2.80    3.20    3.60
 131          SE    4.00    4.40    4.80    5.20    5.50
              *

 132          KK   RE25B   ROUTE
 133          KM        Route runoff from CE25B through Basin SBE25A
 134          RS       1    FLOW
 135          RC   0.060   0.060   0.060     412  0.0279 2680.70
 136          RX    0.00   16.00   29.00   32.00   32.10   36.00   47.00   67.00
 137          RY  2680.3 2678.70 2677.10 2676.00 2676.00 2676.90 2678.00 2680.70
              *

 138          KK  SBE25A   BASIN
 139          KM        SBE25A Basin Runoff
 140          BA   0.003
 141          LG    0.25    0.25    6.00    0.20      38
 142          UC   0.122   0.156
 143          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 144          UA     100
              *

 145          KK   CE25A COMBINE
 146          KM        Combine Route RE25B and Basin SBE25A
 147          HC       2
              *

 148          KK  DBE25A STORAGE
 149          KM    Retention Basin Storage/Outflow rating curve for Basin DBE25A
 150          RS       1    STOR       0
 151          SV    0.01    0.02    0.04    0.06    0.08    0.10    0.12    0.14    0.16    0.18
 152          SV    0.21    0.23    0.26    0.29    0.31    0.34    0.37    0.39
 153          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
 154          SQ    0.01    0.01    1.12    5.87   13.22   22.40   33.27   41.15
 155          SE    0.10    0.30    0.60    0.90    1.20    1.50    1.80    2.10    2.40    2.70
 156          SE    3.00    3.30    3.60    3.90    4.20    4.50    4.80    5.00
              *

 157          KK   CLEAR COMBINE
 158          KM        Clear Hydrograph Stack
 159          HC       5
              *
1                                        HEC-1 INPUT                                                PAGE  5

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


 160          KK  SBE24D   BASIN
 161          KM        SBE24D Basin Runoff
 162          BA   0.010
 163          LG    0.30    0.25    6.00    0.19       6
 164          UC   0.172   0.159
 165          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 166          UA     100
              *

 167          KK  DBE24D STORAGE
 168          KM    Retention Basin Storage/Outflow rating curve for Basin DBE24D
 169          RS       1    STOR       0
 170          SV    0.01    0.06    0.13    0.20    0.28    0.36    0.44    0.53    0.63    0.73
 171          SV    0.83
 172          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    5.94   16.80   30.86
 173          SQ   47.52
 174          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
 175          SE    5.00
              *

 176          KK   RE24D   ROUTE
 177          KM        Route runoff from basin SBE24D through Basin SBE24C
 178          RS       1    FLOW
 179          RC   0.060   0.060   0.060     634  0.0252 2725.50
 180          RX    0.00   16.00   24.00   27.00   31.00   34.00   44.00   60.00
 181          RY  2725.5 2723.20 2721.80 2721.00 2721.00 2722.00 2723.00 2726.10
              *

 182          KK  SBE24C   BASIN
 183          KM        SBE24C Basin Runoff
 184          BA   0.015
 185          LG    0.28    0.25    6.00    0.19      17
 186          UC   0.221   0.259
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```
 187          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 188          UA     100
              *

 189          KK   CE24C COMBINE
 190          KM        Combine RE24D and SBE24C
 191          HC       2
              *

 192          KK  DBE24C STORAGE
 193          KM    Retention Basin Storage/Outflow rating curve for Basin DBE24C
 194          RS       1    STOR       0
 195          SV    0.01    0.08    0.17    0.25    0.35    0.45    0.55    0.66    0.77    0.89
 196          SV    1.02    1.15    1.17
 197          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    1.63   10.24   23.43
 198          SQ   39.87   59.15   61.38
 199          SE    0.10    0.50    0.90    1.40    1.80    2.30    2.70    3.20    3.60    4.10
 200          SE    4.50    5.00    5.00
              *
1                                       HEC-1 INPUT                                          PAGE  6

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


 201          KK   RE24C   ROUTE
 202          KM        Route flow from CE24C through Basin SBE24B
 203          RS       1    FLOW
 204          RC   0.060   0.060   0.060     624  0.0232 2706.80
 205          RX   10.00   25.00   45.00   49.00   55.00   62.00   75.00  103.00
 206          RY  2706.8 2705.20 2702.10 2701.00 2701.00 2702.00 2703.30 2706.70
              *

 207          KK  SBE24B   BASIN
 208          KM        SBE24B Basin Runoff
 209          BA   0.005
 210          LG    0.28    0.25    6.00    0.18      15
 211          UC   0.182   0.278
 212          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 213          UA     100
              *

 214          KK   CE24B COMBINE
 215          KM        Combine RE24C and SBE24B
 216          HC       2
              *

 217          KK  DBE24B STORAGE
 218          KM    Retention Basin Storage/Outflow rating curve for Basin DBE24B
 219          RS       1    STOR       0
 220          SV    0.01    0.06    0.13    0.20    0.27    0.35    0.43    0.51    0.60    0.70
 221          SV    0.80    0.91    1.02    1.15    1.20
 222          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    1.63   10.24   23.43
 223          SQ   39.87   59.15   80.76   73.24   73.24
 224          SE    0.10    0.50    0.90    1.40    1.80    2.30    2.70    3.20    3.60    4.10
 225          SE    4.50    5.00    5.40    5.90    6.00
              *

 226          KK   RE24B   ROUTE
 227          KM        Route flow from CE24B through Basin SBE24A
 228          RS       1    FLOW
 229          RC   0.060   0.060   0.060     873  0.0229 2690.20
 230          RX    0.00   10.00   16.00   23.00   27.00   35.00   49.00   67.00
 231          RY  2689.8 2688.70 2687.90 2687.00 2687.00 2687.90 2688.80 2690.20
              *

 232          KK  SBE24A   BASIN
 233          KM        SBE24A Basin Runoff
 234          BA   0.007
 235          LG    0.27    0.25    6.00    0.20      29
 236          UC   0.188   0.260
 237          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 238          UA     100
              *
1                                       HEC-1 INPUT                                          PAGE  7

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


 239          KK   CE24A COMBINE
 240          KM        Combine RE24B and SBE24A
 241          HC       2
              *

 242          KK  DBE24A STORAGE
 243          KM    Retention Basin Storage/Outflow rating curve for Basin DBE24A
 244          RS       1    STOR       0
 245          SV    0.01    0.06    0.13    0.20    0.27    0.35    0.44    0.52    0.62    0.71
 246          SV    0.82    0.93
 247          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    6.93   19.60
 248          SQ   36.01   55.44
 249          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
 250          SE    5.00    5.50
              *

 251          KK  SBE23D   BASIN
 252          KM        SBE23D Basin Runoff
```

```
 253          BA   0.041
 254          LG    0.28    0.25    6.00    0.19      15
 255          UC   0.294   0.321
 256          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 257          UA     100
              *

 258          KK  DBE23D STORAGE
 259          KM    Retention Basin Storage/Outflow rating curve for Basin DBE23D
 260          RS       1    STOR       0
 261          SV    0.01    0.11    0.22    0.34    0.47    0.61    0.76    0.92    1.10    1.30
 262          SV    1.52    1.75    2.01    2.30    2.61    2.61
 263          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
 264          SQ    0.01    0.01    0.01    0.01   15.51   80.61
 265          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
 266          SE    5.00    5.50    6.00    6.50    7.00    8.00
              *

 267          KK   RE23D   ROUTE
 268          KM        Route flow from SBE23D through Basin SBE23A
 269          RS       1    FLOW
 270          RC   0.060   0.060   0.060     465  0.0269 2688.30
 271          RX    0.00   14.00   27.00   32.00   40.00   44.00   55.00   68.00
 272          RY  2688.3 2687.30 2685.00 2684.10 2684.00 2685.00 2686.10 2686.70
              *

 273          KK  SBE23E   BASIN
 274          KM        SBE23E Basin Runoff
 275          BA   0.005
 276          LG    0.29    0.25    6.00    0.20      19
 277          UC   0.156   0.234
 278          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 279          UA     100
              *
1                                        HEC-1 INPUT                                        PAGE  8

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

 280          KK  DBE23E STORAGE
 281          KM    Retention Basin Storage/Outflow rating curve for Basin DBE23E
 282          RS       1    STOR       0
 283          SV    0.01    0.04    0.09    0.14    0.19    0.24    0.29    0.35    0.41    0.48
 284          SV    0.55
 285          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.63    3.96    9.07
 286          SQ   15.43
 287          SE    0.10    0.50    0.90    1.40    1.80    2.30    2.70    3.20    3.60    4.10
 288          SE    4.50
              *

 289          KK   RE23E   ROUTE
 290          KM        Route flow from SBE23E through Basin SBE23C
 291          RS       2    FLOW
 292          RC   0.060   0.060   0.060    1112  0.0261 2720.00
 293          RX    0.00   20.00   57.00   64.00   65.00   70.00   90.00  114.00
 294          RY  2720.0 2716.50 2712.10 2711.00 2711.00 2713.20 2716.60 2719.90
              *

 295          KK  SBE23C   BASIN
 296          KM        SBE23C Basin Runoff
 297          BA   0.053
 298          LG    0.28    0.25    6.00    0.18      13
 299          UC   0.296   0.312
 300          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 301          UA     100
              *

 302          KK   CE23C COMBINE
 303          KM        Combine RE23E and SBE23C
 304          HC       2
              *

 305          KK  DBE23C STORAGE
 306          KM    Retention Basin Storage/Outflow rating curve for Basin DBE23C
 307          RS       1    STOR       0
 308          SV    0.01    0.15    0.31    0.47    0.65    0.84    1.03    1.24    1.46    1.69
 309          SV    1.93    2.19    2.46    2.76    3.08
 310          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
 311          SQ    0.01    0.01   27.72   78.40  144.03
 312          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
 313          SE    5.00    5.50    6.00    6.50    7.00
              *

 314          KK   RE23C   ROUTE
 315          KM        Route flow from CE23C through SBE23B
 316          RS       1    FLOW
 317          RC   0.060   0.060   0.060     457  0.0235 2693.90
 318          RX    0.00   15.00   28.00   35.00   35.10   45.00   86.00  114.00
 319          RY  2693.8 2692.20 2691.00 2690.00 2690.00 2690.90 2692.90 2693.90
              *
1                                        HEC-1 INPUT                                        PAGE  9

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

 320          KK  SBE23B   BASIN
```

```
 321          KM        SBE23B Basin Runoff
 322          BA   0.004
 323          LG    0.27    0.25    6.00    0.20      28
 324          UC   0.140   0.178
 325          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 326          UA     100
              *

 327          KK   CE23B COMBINE
 328          KM        Combine flow from RE23C and SBE23B
 329          HC       2
              *

 330          KK   RE23B   ROUTE
 331          KM        Route flow from CE23B into SBE23A to intermediate combine
 332          RS       1    FLOW
 333          RC   0.060   0.060   0.060     112  0.0267 2685.90
 334          RX    0.00    8.00   12.00   14.00   24.00   30.00   32.00   49.00
 335          RY  2685.6 2684.80 2684.20 2684.00 2684.00 2684.70 2685.00 2685.90
              *

 336          KK  CE23AI COMBINE
 337          KM        Intermediate combine of RE23D and RE23B to route through SBE23A
 338          HC       2
              *

 339          KK  RE23BD   ROUTE
 340          KM        Route Intermediate combined flow from CE23AI through SBE23A
 341          RS       1    FLOW
 342          RC   0.060   0.060   0.060     238  0.0242 2685.00
 343          RX    0.00   21.00   62.00   74.00   82.00   86.00  101.00  141.00
 344          RY  2684.9 2682.70 2681.00 2679.00 2679.00 2680.10 2681.90 2685.00
              *

 345          KK  SBE23A   BASIN
 346          KM        SBE23A Basin Runoff
 347          BA   0.006
 348          LG    0.29    0.25    6.00    0.21      21
 349          UC   0.176   0.206
 350          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 351          UA     100
              *

 352          KK   CE23A COMBINE
 353          KM        Combine flow from SBE23A and RE23BD
 354          HC       2
              *
1                                        HEC-1 INPUT                                        PAGE 10

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

 355          KK  DBE23A STORAGE
 356          KM    Retention Basin Storage/Outflow rating curve for Basin DBE23A
 357          RS       1    STOR       0
 358          SV    0.01    0.09    0.18    0.28    0.38    0.49    0.61    0.73    0.86    0.99
 359          SV    1.13    1.29    1.45    1.62    1.80    2.00    2.21    2.45
 360          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
 361          SQ    0.01    0.01    0.01    0.01    0.01   49.50  140.00  257.20
 362          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
 363          SE    5.00    5.50    6.00    6.50    7.00    7.50    8.00    8.50
              *

 364          KK   CLEAR COMBINE
 365          HC       3
              *

 366          KK  SBE22A   BASIN
 367          KM        SBE22A Basin Runoff
 368          BA   0.007
 369          LG    0.30    0.25    6.00    0.22      15
 370          UC   0.175   0.229
 371          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 372          UA     100
              *

 373          KK  DBE22A STORAGE
 374          KM    Retention Basin Storage/Outflow rating curve for Basin DBE22A
 375          RS       1    STOR       0
 376          SV    0.01    0.03    0.07    0.12    0.16    0.21    0.27    0.33    0.39    0.47
 377          SV    0.55    0.63
 378          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    3.96
 379          SQ   11.20   20.58
 380          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
 381          SE    5.00    5.50
              *

 382          KK  SBE21A   BASIN
 383          KM        SBE21A Basin Runoff
 384          BA   0.001
 385          LG    0.30    0.25    6.00    0.22      15
 386          UC   0.094   0.125
 387          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 388          UA     100
              *
```

```
 389          KK  SBE20A   BASIN
 390          KM        SBE20A Basin Runoff
 391          BA   0.001
 392          LG    0.30    0.25    6.00    0.22      15
 393          UC   0.084   0.092
 394          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 395          UA     100
              *
1                                       HEC-1 INPUT                                          PAGE 11

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

 396          KK  SBE19A   BASIN
 397          KM        SBE19A Basin Runoff
 398          BA   0.001
 399          LG    0.30    0.25    6.00    0.22      15
 400          UC   0.084   0.093
 401          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 402          UA     100
              *

 403          KK  SBE18A   BASIN
 404          KM        SBE18A Basin Runoff
 405          BA   0.001
 406          LG    0.30    0.25    6.00    0.22      15
 407          UC   0.097   0.130
 408          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 409          UA     100
              *

 410          KK  DBE18A STORAGE
 411          KM    Retention Basin Storage/Outflow rating curve for Basin DBE18A
 412          RS       1    STOR       0
 413          SV    0.01    0.01    0.02    0.02    0.03    0.04    0.05    0.06    0.07    0.08
 414          SV    0.09    0.10    0.12    0.13    0.14    0.16    0.17
 415          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
 416          SQ    0.01    0.35    0.99    1.82    2.80    3.91    5.14
 417          SE    0.10    0.30    0.50    0.80    1.00    1.30    1.50    1.80    2.00    2.30
 418          SE    2.50    2.80    3.00    3.30    3.50    3.80    4.00
              *

 419          KK   CLEAR COMBINE
 420          KM        Clear Hydrograph Stack
 421          HC       6
              *

 422          KK   SB17B   BASIN
 423          KM        SB17B Basin Runoff
 424          BA   0.016
 425          LG    0.24    0.25    6.00    0.20      29
 426          UC   0.199   0.208
 427          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 428          UA     100
              *

 429          KK  DBE17B STORAGE
 430          KM    Retention Basin Storage/Outflow rating curve for Basin DBE17B
 431          RS       1    STOR       0
 432          SV    0.01    0.08    0.17    0.26    0.35    0.46    0.56    0.68    0.80    0.92
 433          SV    1.06    1.20    1.35    1.51    1.68
 434          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
 435          SQ    0.01    0.01    9.90   28.00   51.44
 436          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
 437          SE    5.00    5.50    6.00    6.50    7.00
              *
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        LINE  ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 438          KK   RE17B   ROUTE
 439          KM         Route flow from SBE17B through SBE 17A
 440          RS       2    FLOW
 441          RC   0.060   0.060   0.060    1169  0.0265 2740.10
 442          RX    0.00    9.00   22.00   33.00   44.00   54.00   62.00   69.00
 443          RY  2740.1 2738.60 2737.00 2736.10 2736.00 2737.00 2738.40 2740.10
              *

 444          KK  SBE17A   BASIN
 445          KM        SBE17A Basin Runoff
 446          BA   0.018
 447          LG    0.26    0.25    6.00    0.21      29
 448          UC   0.202   0.243
 449          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 450          UA     100
              *

 451          KK   CE17A COMBINE
 452          KM         Combine flow from RE17B and SBE17A
 453          HC       2
              *

 454          KK  DBE17A STORAGE
 455          KM    Retention Basin Storage/Outflow rating curve for Basin DBE17A
 456          RS       1    STOR       0
```

```
 457          SV    0.01    0.09    0.19    0.29    0.41    0.54    0.68    0.84    1.01    1.19
 458          SV    1.39    1.62    1.86    2.13
 459          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
 460          SQ    0.01   17.82   50.40   92.59
 461          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
 462          SE    5.00    5.50    6.00    6.50
              *

 463          KK  SBE16A   BASIN
 464          KM        SBE16A Basin Runoff
 465          BA   0.001
 466          LG    0.30    0.25    6.00    0.22      15
 467          UC   0.102   0.159
 468          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 469          UA     100
              *

 470          KK  SBE13A   BASIN
 471          KM        SBE13A Basin Runoff
 472          BA   0.003
 473          LG    0.25    0.25    6.00    0.22      30
 474          UC   0.114   0.133
 475          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 476          UA     100
              *
1                                        HEC-1 INPUT                                        PAGE 13

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

 477          KK  DBE13A STORAGE
 478          KM    Retention Basin Storage/Outflow rating curve for Basin DBE13A
 479          RS       1    STOR       0
 480          SV    0.01    0.02    0.04    0.06    0.08    0.10    0.13    0.16    0.19    0.23
 481          SV    0.27    0.31    0.35
 482          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
 483          SQ    1.98    5.60   10.29
 484          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
 485          SE    5.00    5.50    6.00
              *

 486          KK  SBE12A   BASIN
 487          KM        SBE12A Basin Runoff
 488          BA   0.002
 489          LG    0.23    0.25    6.00    0.21      40
 490          UC   0.106   0.140
 491          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 492          UA     100
              *

 493          KK  DBE12A STORAGE
 494          KM    Retention Basin Storage/Outflow rating curve for Basin DBE12A
 495          RS       1    STOR       0
 496          SV    0.01    0.02    0.03    0.05    0.07    0.09    0.10    0.12    0.14    0.17
 497          SV    0.19    0.21    0.24    0.26    0.28
 498          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
 499          SQ    0.96    2.84    5.29    8.22   10.29
 500          SE    0.10    0.30    0.70    1.00    1.30    1.70    2.00    2.30    2.60    3.00
 501          SE    3.30    3.60    4.00    4.30    4.50
              *

 502          KK   SB11B   BASIN
 503          KM        SB11B Basin Runoff
 504          BA   0.013
 505          LG    0.18    0.25    6.00   0.246      17
 506          UC   0.359   0.509
 507          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 508          UA     100
              *

 509          KK  DBE11B STORAGE
 510          KM    Retention Basin Storage/Outflow rating curve for Basin DBE11B
 511          RS       1    STOR       0
 512          SV    0.01    0.05    0.16    0.28    0.43    0.61    0.80
 513          SQ    0.01       4      11      22      33      41      50
 514          SE  2777.5    2778    2779    2780    2781    2782    2783
              *

 515          KK   RE11B   ROUTE
 516          KM        Route flow from SBE11B through SBE11A
 517          RS       1    FLOW
 518          RC   0.060   0.060   0.060     914  0.0334 2770.20
 519          RX    0.00   10.00   16.00   23.00   25.00   34.00   48.00   64.00
 520          RY  2770.2 2767.10 2765.30 2762.00 2762.00 2765.00 2766.60 2768.30
              *
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        LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 521          KK   SB11A   BASIN
 522          KM        SB11A Basin Runoff
 523          BA   0.007
 524          LG    0.10    0.25    6.00   0.284
 525          UC   0.364   0.518
 526          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
```

```
 527          UA     100
              *

 528          KK  SB11A1   BASIN
 529          KM        SB11A1 Basin Runoff
 530          BA   0.003
 531          LG    0.18    0.25    6.00   0.251      15
 532          UC   0.216   0.340
 533          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 534          UA     100
              *

 535          KK   CE11A COMBINE
 536          KM        Combine flow from RE11B, SB11A and SB11A1
 537          HC       3
              *

 538          KK   CLEAR COMBINE
 539          KM        Clear Hydrograph Stack
 540          HC       6
              *

 541          KK   SB10A   BASIN
 542          KM        SB10A Basin Runoff
 543          BA   0.001
 544          LG    0.10    0.25    6.00   0.284
 545          UC   0.167   0.157
 546          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 547          UA     100
              *

 548          KK   SB09A   BASIN
 549          KM        SB09A Basin Runoff
 550          BA   0.001
 551          LG    0.10    0.25    6.00   0.284
 552          UC   0.195   0.282
 553          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 554          UA     100
              *

 555          KK   SB08A   BASIN
 556          KM        SB08A Basin Runoff
 557          BA   0.001
 558          LG    0.10    0.25    6.00   0.284
 559          UC   0.177   0.212
 560          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 561          UA     100
              *
1                                        HEC-1 INPUT                                        PAGE 15

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

 562          KK   CLEAR COMBINE
 563          KM        Clear Hydrograph Stack
 564          HC       4
              *
              *

 565          KK  SB06D1   BASIN
 566          KM        SB06D1 Basin Runoff
 567          BA   0.004
 568          LG    0.10    0.25    6.00   0.276      24
 569          UC   0.281   0.533
 570          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 571          UA     100
              *

 572          KK  SB06D2   BASIN
 573          KM        SB06D2 Basin Runoff
 574          BA   0.009
 575          LG    0.25    0.25    6.00   0.216      30
 576          UC   0.189   0.255
 577          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 578          UA     100
              *

 579          KK   CE06D COMBINE
 580          KM        Combine flow from SB06D1 and SB06D2
 581          HC       2
              *

 582          KK  DB06D1 STORAGE
 583          KM    Retention Basin Storage/Outflow rating curve for Basin DBE06D
 584          RS       1    STOR       0
 585          SV    0.01    0.12    0.26    0.44    0.64    0.64
 586          SQ    0.01       3       9      12      15      31
 587          SE    2795    2796    2797    2798    2799  2799.3
              *

 588          KK  SB06C1   BASIN
 589          KM        SB06C1 Basin Runoff
 590          BA   0.015
 591          LG    0.10    0.25    6.00   0.272      40
 592          UC   0.307   0.428
 593          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
```

```
 594          UA     100
              *

 595          KK  CE06CD COMBINE
 596          KM        Combine flow from DB06D1 and SB06C1
 597          HC       2
              *
1                                    HEC-1 INPUT                                    PAGE 16

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


 598          KK  DB06C1 STORAGE
 599          KM    Retention Basin Storage/Outflow rating curve for Basin DBE06C
 600          RS       1    STOR       0
 601          SV    0.01    0.10    0.23    0.41
 602          SQ    0.01       9      24      41
 603          SE    2792    2793    2794    2795
              *

 604          KK  SB06C2   BASIN
 605          KM        SB06C2 Basin Runoff
 606          BA   0.020
 607          LG    0.10    0.25    6.00   0.284
 608          UC   0.575   1.087
 609          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 610          UA     100
              *

 611          KK  SB06C3   BASIN
 612          KM        SB06C3 Basin Runoff
 613          BA   0.005
 614          LG    0.25    0.25    6.00   0.216      30
 615          UC   0.151   0.181
 616          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 617          UA     100
              *

 618          KK   CE06C COMBINE
 619          KM        Combine flow from SB06C2 and SB06C3
 620          HC       2
              *

 621          KK  DB06C2 STORAGE
 622          KM    Retention Basin Storage/Outflow rating curve for Basin DBE06C
 623          RS       1    STOR       0
 624          SV    0.01    0.08    0.19    0.32    0.49
 625          SQ    0.01       4      13      20      22
 626          SE    2788    2789    2790    2791    2792
              *

 627          KK  CE06CI COMBINE
 628          KM        Combine flow from DB06C2 and DB06C1
 629          HC       2
              *

 630          KK   RE06C   ROUTE
 631          KM        Route flow from CE06CI through Basin SBE06B
 632          RS       1    FLOW
 633          RC   0.060   0.060   0.060     591  0.0431 2786.60
 634          RX    0.00    6.00   16.00   26.00   36.00   40.00   41.00   44.00
 635          RY  2786.6 2786.00 2785.00 2784.00 2784.00 2785.00 2785.50 2786.40
              *
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


 636          KK  SB06B1   BASIN
 637          KM        SB06B1 Basin Runoff
 638          BA   0.003
 639          LG    0.18    0.25    6.00   0.251      15
 640          UC   0.227   0.383
 641          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 642          UA     100
              *

 643          KK  CE06CI COMBINE
 644          KM        Combine flow from SB06B1 and RE06C
 645          HC       2
              *

 646          KK   RE06B   ROUTE
 647          KM        Route flow from CE06CI through Basin SB06B
 648          RS       1    FLOW
 649          RC   0.060   0.060   0.060     814  0.0319 2761.00
 650          RX    0.00   21.00   55.00   63.00   82.00   92.00  104.00  113.00
 651          RY  2761.0 2758.90 2758.50 2758.00 2758.00 2758.50 2759.70 2760.80
              *

 652          KK   SB06B   BASIN
 653          KM        SB06B Basin Runoff
 654          BA   0.004
 655          LG    0.10    0.25    6.00   0.284
 656          UC   0.491   1.248
 657          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
```

```
 658          UA     100
              *

 659          KK   SB06A   BASIN
 660          KM        SB06A Basin Runoff
 661          BA   0.006
 662          LG    0.25    0.25    6.00   0.216      30
 663          UC   0.135   0.136
 664          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 665          UA     100
              *

 666          KK   DB06A STORAGE
 667          KM    Retention Basin Storage/Outflow rating curve for Basin DBE06A
 668          RS       1    STOR       0
 669          SV    0.01    0.02    0.08    0.16    0.26
 670          SQ    0.01       1       6      11      14
 671          SE  2752.5    2753    2754    2755    2756
              *

 672          KK   CE06A COMBINE
 673          KM        Combine flow from DB06A, SB06B and RE06B
 674          HC       3
              *
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        LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 675          KK  SB05B1   BASIN
 676          KM        SB05B1 Basin Runoff
 677          BA   0.007
 678          LG    0.10    0.25    6.00   0.284
 679          UC   0.314   0.379
 680          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 681          UA     100
              *

 682          KK  DB05B1 STORAGE
 683          KM    Retention Basin Storage/Outflow rating curve for Basin DBE05B
 684          KM    Outlet control structure
 685          RS       1    STOR       0
 686          SV    0.01    0.02    0.06    0.11
 687          SQ    0.01    0.01       9      13
 688          SE    2810    2811    2812    2813
              *

 689          KK  SB05B2   BASIN
 690          KM        SB05B2 Basin Runoff
 691          BA   0.006
 692          LG    0.10    0.25    6.00   0.284
 693          UC   0.373   0.655
 694          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 695          UA     100
              *

 696          KK   CE05B COMBINE
 697          KM        Combine flow from DB05B1 and Basin SBE05B2
 698          HC       2
              *

 699          KK  DB05B2 STORAGE
 700          KM    Retention Basin Storage/Outflow rating curve for Basin DBE05B
 701          RS       1    STOR       0
 702          SV    0.01    0.01    0.02   0.044
 703          SQ    0.01    0.01      18      24
 704          SE    2800    2801    2802    2803
              *

 705          KK   RE05B   ROUTE
 706          KM        Route flow from SBE05B through SBE05A
 707          RS       1    FLOW
 708          RC   0.060   0.060   0.060     907  0.0435 2760.30
 709          RX    0.00   11.00   26.00   40.00   47.00   56.00   76.00   89.00
 710          RY  2760.1 2759.00 2757.70 2757.00 2757.00 2757.40 2758.80 2760.30
              *

 711          KK  SB05B3   BASIN
 712          KM        SB05B3 Basin Runoff
 713          BA   0.004
 714          LG    0.25    0.25    6.00   0.216      30
 715          UC   0.167   0.272
 716          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
1                                        HEC-1 INPUT                                        PAGE 19

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

 717          UA     100
              *

 718          KK  SB05B4   BASIN
 719          KM        SB05B4 Basin Runoff
 720          BA   0.004
 721          LG    0.18    0.25    6.00   0.251      15
 722          UC   0.218   0.271
 723          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
```

```
 724          UA     100
              *

 725          KK  CE05B3 COMBINE
 726          KM        Combine flow from SB05B4, SB05B3 and RE05B
 727          HC       3
              *

 728          KK  DB05B3 STORAGE
 729          KM    Retention Basin Storage/Outflow rating curve for Basin DBE06A
 730          RS       1    STOR       0
 731          SV    0.01    0.01    0.03   0.084
 732          SQ    0.01       8      25      36
 733          SE    2782    2783    2784    2785
              *

 734          KK  RE05B3   ROUTE
 735          KM        Route flow from DB05B3 through SBE05A
 736          RS       1    FLOW
 737          RC   0.060   0.060   0.060     907  0.0435 2760.30
 738          RX    0.00   11.00   26.00   40.00   47.00   56.00   76.00   89.00
 739          RY  2760.1 2759.00 2757.70 2757.00 2757.00 2757.40 2758.80 2760.30
              *

 740          KK   SB05A   BASIN
 741          KM        SB05A Basin Runoff
 742          BA   0.004
 743          LG    0.10    0.25    6.00   0.284
 744          UC   0.474   1.240
 745          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 746          UA     100
              *

 747          KK  CE065A COMBINE
 748          KM        Combine flow from SB05A, RE05B3 and CE06A
 749          HC       3
              *

 750          KK   SB04C   BASIN
 751          KM        SB04C Basin Runoff
 752          BA   0.002
 753          LG    0.10    0.25    6.00   0.269      10
 754          UC   0.298   0.652
 755          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 756          UA     100
              *
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         LINE        ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 757          KK   SB04B   BASIN
 758          KM        SB04B Basin Runoff
 759          BA   0.011
 760          LG    0.25    0.25    6.00   0.216      30
 761          UC   0.196   0.270
 762          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 763          UA     100
              *

 764          KK   CE04B COMBINE
 765          KM        Combine flow from SB04C and SB04B
 766          HC       2
              *

 767          KK   DB04B STORAGE
 768          KM    Retention Basin Storage/Outflow rating curve for Basin DBE04C
 769          RS       1    STOR       0
 770          SV    0.01    0.06    0.15   0.261  0.0262
 771          SQ    0.01       5      13      21      27
 772          SE    2755    2756    2757    2758  2758.2
              *

 773          KK   RE04C   ROUTE
 774          KM        Route flow from DB04B into SBE04A
 775          RS       1    FLOW
 776          RC   0.060   0.060   0.060     455  0.0363 2755.00
 777          RX    0.00   17.00   22.00   27.00   32.00   44.00   61.00   88.00
 778          RY  2755.0 2753.00 2751.90 2750.00 2750.00 2751.90 2753.20 2754.90
              *

 779          KK   SB04A   BASIN
 780          KM        SB04A Basin Runoff
 781          BA   0.008
 782          LG    0.25    0.25    6.00   0.216      30
 783          UC   0.162   0.186
 784          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 785          UA     100
              *

 786          KK   CE04A COMBINE
 787          KM        Combine Flows from RE04C and SB04A
 788          HC       2
              *

 789          KK  DBE04A STORAGE
```

```
 790          KM    Retention Basin Storage/Outflow rating curve for Basin DB04A
 791          RS       1    STOR       0
 792          SV    0.01    0.05    0.16    0.30    0.47    0.67
 793          SQ    0.01       2      10      17      22      28
 794          SE  2738.5    2739    2740    2741    2742    2743
              *
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         LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


 795          KK  SB03A1   BASIN
 796          KM        SB03A1 Basin Runoff
 797          BA   0.002
 798          LG    0.10    0.25    6.00   0.284
 799          UC   0.394   1.048
 800          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 801          UA     100
              *

 802          KK  DB03A1 STORAGE
 803          KM    Retention Basin Storage/Outflow rating curve for Basin DBE03A1
 804          RS       1    STOR       0
 805          SV    0.01    0.07    0.16    0.27    0.40
 806          SQ    0.01       3       7      13      20
 807          SE    2750    2751    2752    2753    2754
              *

 808          KK   SB03A   BASIN
 809          KM        SB03A Basin Runoff
 810          BA   0.003
 811          LG    0.10    0.25    6.00   0.284
 812          UC   0.266   0.340
 813          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 814          UA     100
              *

 815          KK   CE03A COMBINE
 816          KM        Combine Flows from DB03A and SB03A
 817          HC       2
              *

 818          KK  SB02A1   BASIN
 819          KM        SB02A1 Basin Runoff
 820          BA   0.059
 821          LG    0.10    0.25    6.00   0.284
 822          UC   0.641   0.881
 823          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 824          UA     100
              *

 825          KK  DB02A1 STORAGE
 826          KM    Retention Basin Storage/Outflow rating curve for Basin DB02A1
 827          RS       1    STOR       0
 828          SV    0.01    0.04    0.14    0.25    0.26
 829          SQ    0.01       6      21      48      70
 830          SE  2789.5    2790    2791    2792    2793
              *

 831          KK   R02A1   ROUTE
 832          KM        Route flow from SB02A1 into SB02A3
 833          RS       1    FLOW
 834          RC   0.060   0.060   0.060     455  0.0363 2755.00
 835          RX    0.00   17.00   22.00   27.00   32.00   44.00   61.00   88.00
 836          RY  2755.0 2753.00 2751.90 2750.00 2750.00 2751.90 2753.20 2754.90
              *
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         LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


 837          KK  SB02A2   BASIN
 838          KM        SB02A2 Basin Runoff
 839          BA   0.003
 840          LG    0.25    0.25    6.00   0.216      30
 841          UC   0.154   0.265
 842          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 843          UA     100
              *

 844          KK  DB02A2 STORAGE
 845          KM    Retention Basin Storage/Outflow rating curve for Basin DB02A2
 846          KM    Outlet control structure
 847          RS       1    STOR       0
 848          SV    0.01    0.14    0.32    0.53
 849          SQ    0.01    0.01    0.01       4
 850          SE    2762    2763    2764    2765
              *

 851          KK  SB02A3   BASIN
 852          KM        SB02A3 Basin Runoff
 853          BA   0.003
 854          LG    0.10    0.25    6.00   0.284
 855          UC   0.337   0.629
 856          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 857          UA     100
```

```
                *
 858            KK   CE02A COMBINE
 859            KM        Combine Flows from R02A1, DB02A2 and SB02A3
 860            HC       3
                *
 861            KK   SB01A   BASIN
 862            KM        SB01A Basin Runoff
 863            BA   0.119
 864            LG    0.10    0.25    6.00    0.28       1
 865            UC   0.709   0.830
 866            UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 867            UA     100
                *
 868            KK   CLEAR COMBINE
 869            KM        Clear Hydrograph Stack
 870            HC       6
                *
 871            KK  SBW14A   BASIN
 872            KM        SBW14A Basin Runoff
 873            BA   0.009
 874            LG    0.28    0.25    6.00    0.20       4
 875            UC   0.167   0.137
 876            UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 877            UA     100
                *
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          LINE  ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 878            KK  DBW14A STORAGE
 879            KM    Retention Basin Storage/Outflow rating curve for Basin DBW14A
 880            RS       1    STOR       0
 881            SV    0.01    0.04    0.07    0.11    0.15    0.19    0.23    0.28    0.32    0.37
 882            SV    0.42    0.47    0.52    0.58    0.63    0.70
 883            SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.84
 884            SQ    2.97    6.04    9.74   13.95   18.64   23.76
 885            SE    0.10    0.30    0.60    0.90    1.20    1.50    1.80    2.10    2.40    2.70
 886            SE    3.00    3.30    3.60    3.90    4.20    4.50
                *
 887            KK  SBW13A   BASIN
 888            KM        SBW13A Basin Runoff
 889            BA   0.001
 890            LG    0.30    0.25    6.00    0.18       5
 891            UC   0.084   0.092
 892            UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 893            UA     100
                *
 894            KK  SBW12A   BASIN
 895            KM        SBW12A Basin Runoff
 896            BA   0.017
 897            LG    0.29    0.25    6.00    0.19      13
 898            UC   0.172   0.141
 899            UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 900            UA     100
                *
 901            KK  DBW12A STORAGE
 902            KM    Retention Basin Storage/Outflow rating curve for Basin DBW12A
 903            RS       1    STOR       0
 904            SV    0.01    0.08    0.16    0.24    0.33    0.43    0.53    0.64    0.75    0.87
 905            SV    0.99    1.13    1.27    1.43
 906            SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
 907            SQ    5.94   16.80   30.86   47.52
 908            SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
 909            SE    5.00    5.50    6.00    6.50
                *
 910            KK  SBW11A   BASIN
 911            KM        SBW11A Basin Runoff
 912            BA   0.001
 913            LG    0.30    0.25    6.00    0.18       5
 914            UC   0.072   0.062
 915            UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
 916            UA     100
                *
1                                       HEC-1 INPUT                                          PAGE 24

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

 917            KK   CLEAR COMBINE
 918            KM        Clear Hydrograph Stack
 919            HC       5
                *
 920            KK  SB10C1   BASIN
 921            KM        SB10C1 Basin Runoff
 922            BA   0.009
 923            LG    0.25    0.25    6.00   0.216      30
```

```
            924          UC   0.201   0.283
            925          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
            926          UA     100
                         *

            927          KK  SB10C2   BASIN
            928          KM        SB10C2 Basin Runoff
            929          BA   0.008
            930          LG    0.25    0.25    6.00   0.216      30
            931          UC   0.214   0.312
            932          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
            933          UA     100
                         *

            934          KK  SB10C3   BASIN
            935          KM        SB10C3 Basin Runoff
            936          BA   0.004
            937          LG    0.10    0.25    6.00   0.254      20
            938          UC   0.319   0.503
            939          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
            940          UA     100
                         *

            941          KK   CW10C COMBINE
            942          KM        Combine flow from SB10C1, SB10C2 and SB10C3
            943          HC       3
                         *

            944          KK   DB10C STORAGE
            945          KM    Retention Basin Storage/Outflow rating curve for Basin DB10C
            946          RS       1    STOR       0
            947          SV    0.01    0.15    0.34    0.57    0.83
            948          SQ    0.01      10      33      47      65
            949          SE    2767    2768    2769    2770    2771
                         *

            950          KK   RW10C   ROUTE
            951          KM        Route flow from SBW10C through Basin SBW10B
            952          RS       2    FLOW
            953          RC   0.060   0.060   0.060     952  0.0310 2757.80
            954          RX    0.00   34.00   47.00   62.00   62.10   68.00   73.00   78.00
            955          RY  2757.8 2754.40 2754.00 2752.10 2752.00 2753.70 2755.70 2757.50
                         *
1                                                HEC-1 INPUT                                                PAGE 25

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

            956          KK   SB10B   BASIN
            957          KM        SB10B Basin Runoff
            958          BA   0.009
            959          LG    0.26    0.25    6.00   0.195      33
            960          UC   0.186   0.259
            961          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
            962          UA     100
                         *

            963          KK   CW10B COMBINE
            964          KM        Combine flow from RW10C and SBW10B
            965          HC       2
                         *

            966          KK  DBW10B STORAGE
            967          KM    Retention Basin Storage/Outflow rating curve for Basin DBW10B
            968          RS       1    STOR       0
            969          SV    0.01    0.06    0.13    0.20    0.27    0.35    0.44    0.53    0.62    0.73
            970          SV    0.84    0.95    1.08    1.22    1.30
            971          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
            972          SQ    0.01    0.01    0.01    2.27   12.37
            973          SE    0.10    0.60    1.20    1.80    2.40    3.00    3.60    4.20    4.80    5.40
            974          SE    6.00    6.60    7.20    7.80    8.20
                         *

            975          KK   RW10B   ROUTE
            976          KM        Route flow from CE10WB through Basin SBW10A
            977          RS       1    FLOW
            978          RC   0.060   0.060   0.060     653  0.0276 2732.00
            979          RX    0.00   68.00   75.00   79.00   86.00   92.00  106.00  150.00
            980          RY  2732.0 2728.10 2721.10 2726.10 2726.00 2726.60 2727.00 2732.00
                         *

            981          KK  SB10AW   BASIN
            982          KM        SB10AW Basin Runoff
            983          BA   0.029
            984          LG    0.26    0.25    6.00   0.189      28
            985          UC   0.224   0.207
            986          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
            987          UA     100
                         *

            988          KK   CW10A COMBINE
            989          KM        Combine flow from RW10B and SBW10A
            990          HC       2
                         *

            991          KK  DBW10A STORAGE
```

```
 992          KM    Retention Basin Storage/Outflow rating curve for Basin DBW10A
 993          RS       1    STOR       0
 994          SV    0.01    0.20    0.41    0.63    0.87    1.12    1.40    1.69    2.00    2.33
 995          SV    2.68    3.07    3.50    3.98    4.15
 996          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01   14.68
 997          SQ   56.00  113.58  182.88  189.00  189.00
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        LINE  ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 998          SE    0.10    0.60    1.20    1.80    2.40    3.00    3.60    4.20    4.80    5.40
 999          SE    6.00    6.60    7.20    7.80    8.00
              *

1000          KK   SB09E   BASIN
1001          KM        SB09E Basin Runoff
1002          BA   0.005
1003          LG    0.10    0.25    6.00   0.284
1004          UC   0.354   0.607
1005          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
1006          UA     100
              *

1007          KK   DB09E STORAGE
1008          KM    Retention Basin Storage/Outflow rating curve for Basin DB09E
1009          RS       1    STOR       0
1010          SV    0.01    0.06    0.14    0.24    0.37    0.52
1011          SQ    0.01       3       9      13      16      19
1012          SE    2826    2827    2828    2829    2830    2831
              *

1013          KK   RW09E   ROUTE
1014          KM        Route flow from SBW09E through Basin SBW09D
1015          RS       1    FLOW
1016          RC   0.060   0.060   0.060     985  0.0442 2805.10
1017          RX    0.00   10.00   12.00   14.00   17.00   23.00   29.00   48.00
1018          RY  2805.3 2803.10 2802.10 2800.70 2800.70 2802.00 2802.90 2805.10
              *

1019          KK  SB09D1   BASIN
1020          KM        SB09D1 Basin Runoff
1021          BA   0.009
1022          LG    0.24    0.25    6.00   0.216      30
1023          UC   0.155   0.173
1024          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
1025          UA     100
              *

1026          KK  SB09D2   BASIN
1027          KM        SB09D2 Basin Runoff
1028          BA   0.005
1029          LG    0.25    0.25    6.00   0.216      30
1030          UC   0.199   0.377
1031          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
1032          UA     100
              *

1033          KK  CW09DI COMBINE
1034          HC       3
              *
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        LINE  ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

1035          KK   SB09C   BASIN
1036          KM        SB09C Basin Runoff
1037          BA   0.036
1038          LG    0.10    0.25    6.00   0.284
1039          UC   0.575   0.801
1040          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
1041          UA     100
              *

1042          KK   CW09D COMBINE
1043          KM        Combine flow from CW09DI and SBW09C
1044          HC       2
              *

1045          KK  DBW09C STORAGE
1046          KM    Retention Basin Storage/Outflow rating curve for Basin DBW09C
1047          RS       1    STOR       0
1048          SV    0.01    0.21    0.43    0.66    0.90    1.16    1.44    1.73    2.05    2.41
1049          SV    2.79
1050          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01   19.80   56.00
1051          SQ  102.88
1052          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
1053          SE    5.00
              *

1054          KK   RW09D   ROUTE
1055          KM        Route flow from CW09D through Basin SBW09B
1056          RS       1    FLOW
1057          RC   0.060   0.060   0.060     367  0.0368 2782.10
1058          RX    0.00   11.00   27.00   31.00   38.00   42.00   73.00   90.00
1059          RY  2782.1 2780.10 2780.00 2779.00 2779.00 2779.50 2780.90 2781.30
```

```
                *

1060            KK  SBW09B   BASIN
1061            KM        SBW09B Basin Runoff
1062            BA   0.005
1063            LG    0.27    0.25    6.00    0.20      29
1064            UC   0.125   0.129
1065            UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
1066            UA     100
                *

1067            KK   CW09B COMBINE
1068            KM        Combine flow from RW09D and SBW09B
1069            HC       2
                *

1070            KK  DBW09B STORAGE
1071            KM    Retention Basin Storage/Outflow rating curve for Basin DBW09B
1072            RS       1    STOR       0
1073            SV    0.01    0.05    0.10    0.15    0.21    0.27    0.34    0.40    0.48    0.55
1074            SV    0.63    0.72
1075            SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01   20.79
1076            SQ   58.80  108.02
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                LINE            ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

1077            SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
1078            SE    5.00    5.50
                *

1079            KK   RW09B   ROUTE
1080            KM        Route flow from CW09B through Basin SBW09A
1081            RS       1    FLOW
1082            RC   0.060   0.060   0.060    1036  0.0415 2765.60
1083            RX    0.00    8.00   49.00   58.00   67.00   72.00   85.00  104.00
1084            RY  2764.9 2764.80 2764.00 2763.00 2763.00 2764.00 2765.10 2765.60
                *

1085            KK  SBW09A   BASIN
1086            KM        SBW09A Basin Runoff
1087            BA   0.008
1088            LG    0.27    0.25    6.00    0.20      24
1089            UC   0.185   0.266
1090            UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
1091            UA     100
                *

1092            KK   CW09A COMBINE
1093            KM        Combine flow from RW09B and SBW09A
1094            HC       2
                *

1095            KK  DBW09A STORAGE
1096            KM    Retention Basin Storage/Outflow rating curve for Basin DBW09A
1097            RS       1    STOR       0
1098            SV    0.01    0.04    0.08    0.12    0.17    0.21    0.26    0.32    0.37    0.43
1099            SV    0.50    0.57    0.64
1100            SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
1101            SQ   22.77   64.40  118.31
1102            SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
1103            SE    5.00    5.50    6.00
                *

1104            KK  SBW08A   BASIN
1105            KM        SBW08A Basin Runoff
1106            BA   0.009
1107            LG    0.27    0.25    6.00    0.18      21
1108            UC   0.150   0.160
1109            UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
1110            UA     100
                *

1111            KK  DBW08A STORAGE
1112            KM    Retention Basin Storage/Outflow rating curve for Basin DBW08A
1113            RS       1    STOR       0
1114            SV    0.01    0.04    0.09    0.14    0.18    0.24    0.29    0.34    0.40    0.46
1115            SV    0.52    0.58    0.65    0.71    0.79    0.86    0.87
1116            SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
1117            SQ    0.01    1.09    5.33   11.85   20.01   29.39   30.86
1118            SE    0.10    0.30    0.70    1.00    1.30    1.70    2.00    2.30    2.60    3.00
1119            SE    3.30    3.60    4.00    4.30    4.60    5.00    5.00
                *
1                                       HEC-1 INPUT                                             PAGE 29

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

1120            KK  SBW07C   BASIN
1121            KM        SBW07C Basin Runoff
1122            BA   0.005
1123            LG    0.21    0.25    6.00    0.23       3
1124            UC   0.248   0.372
1125            UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
1126            UA     100
                *
```
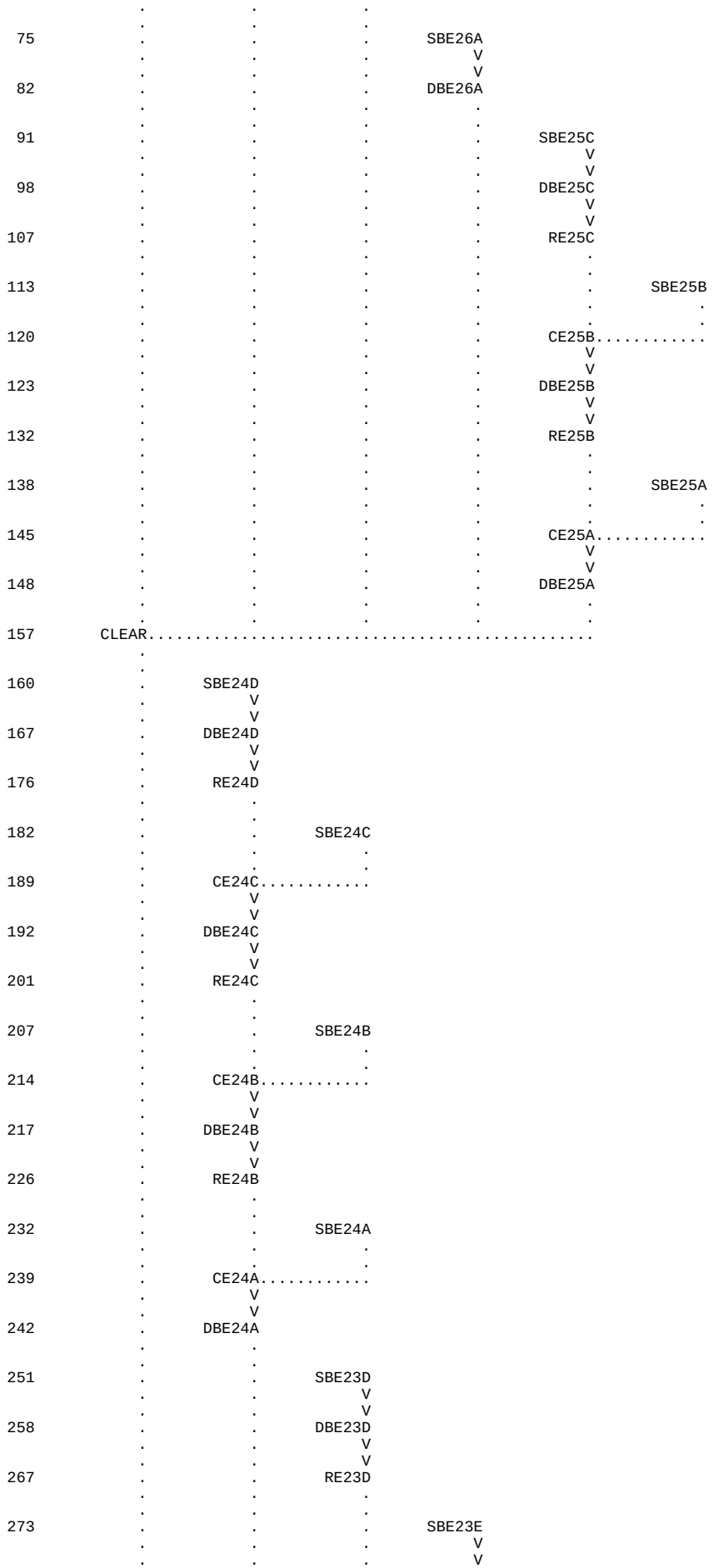
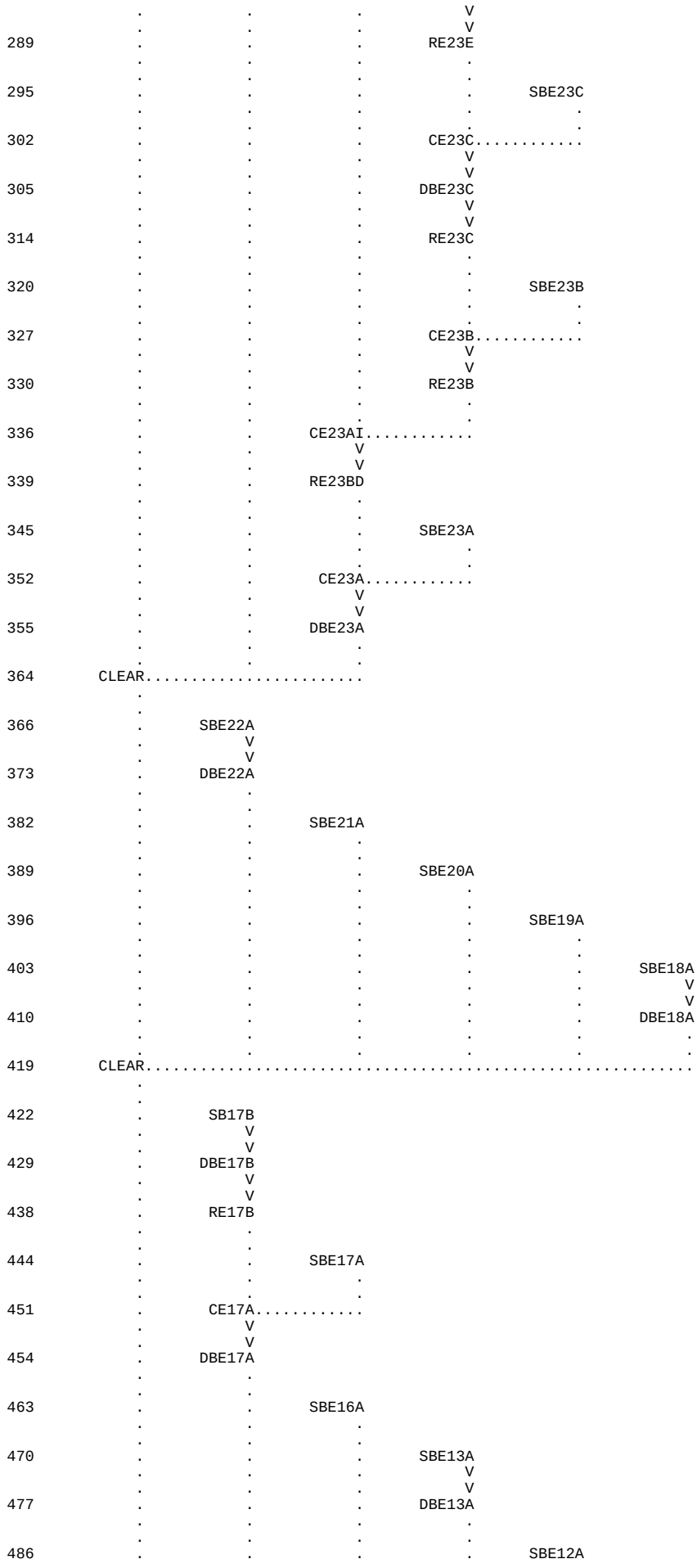
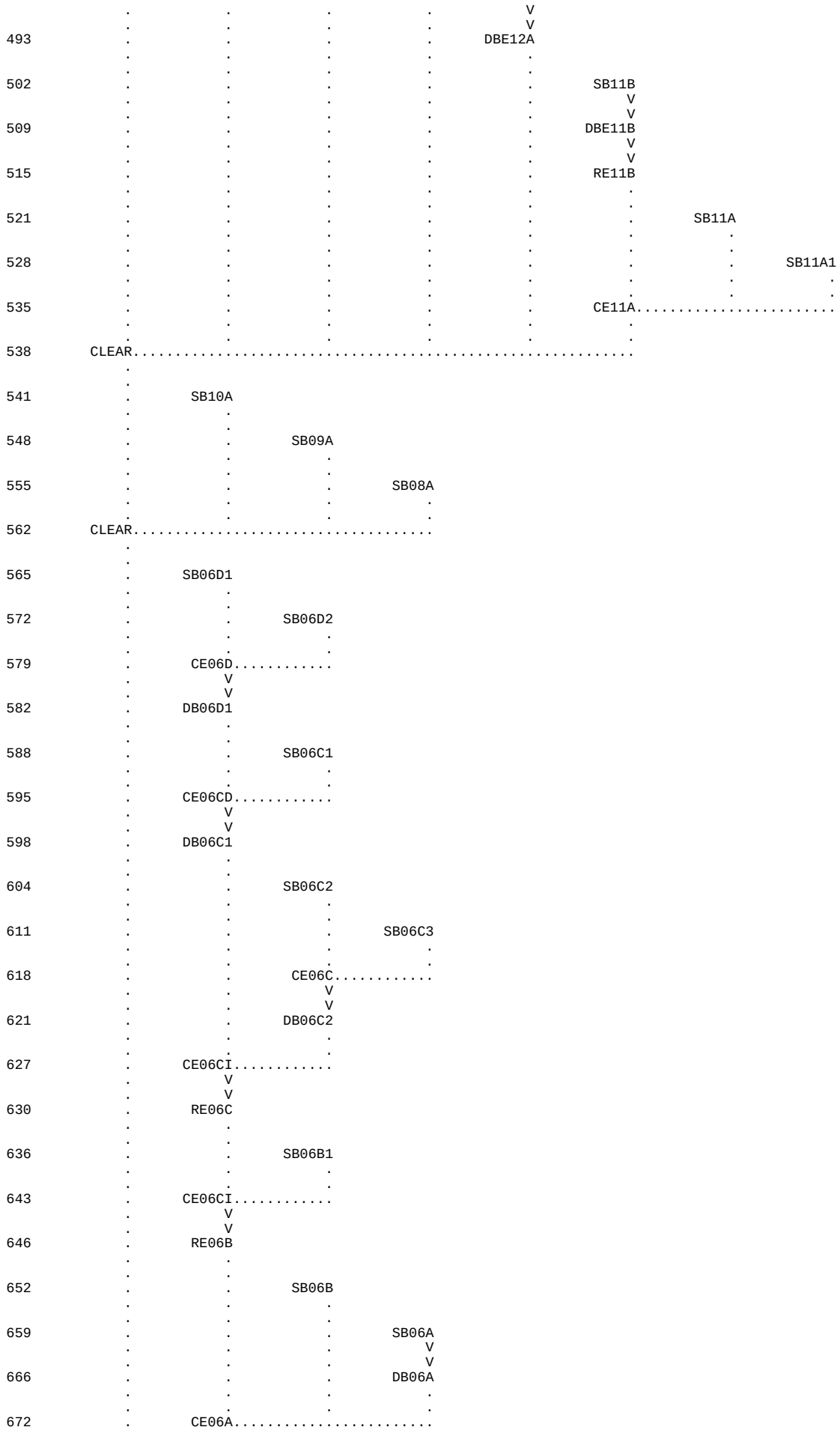
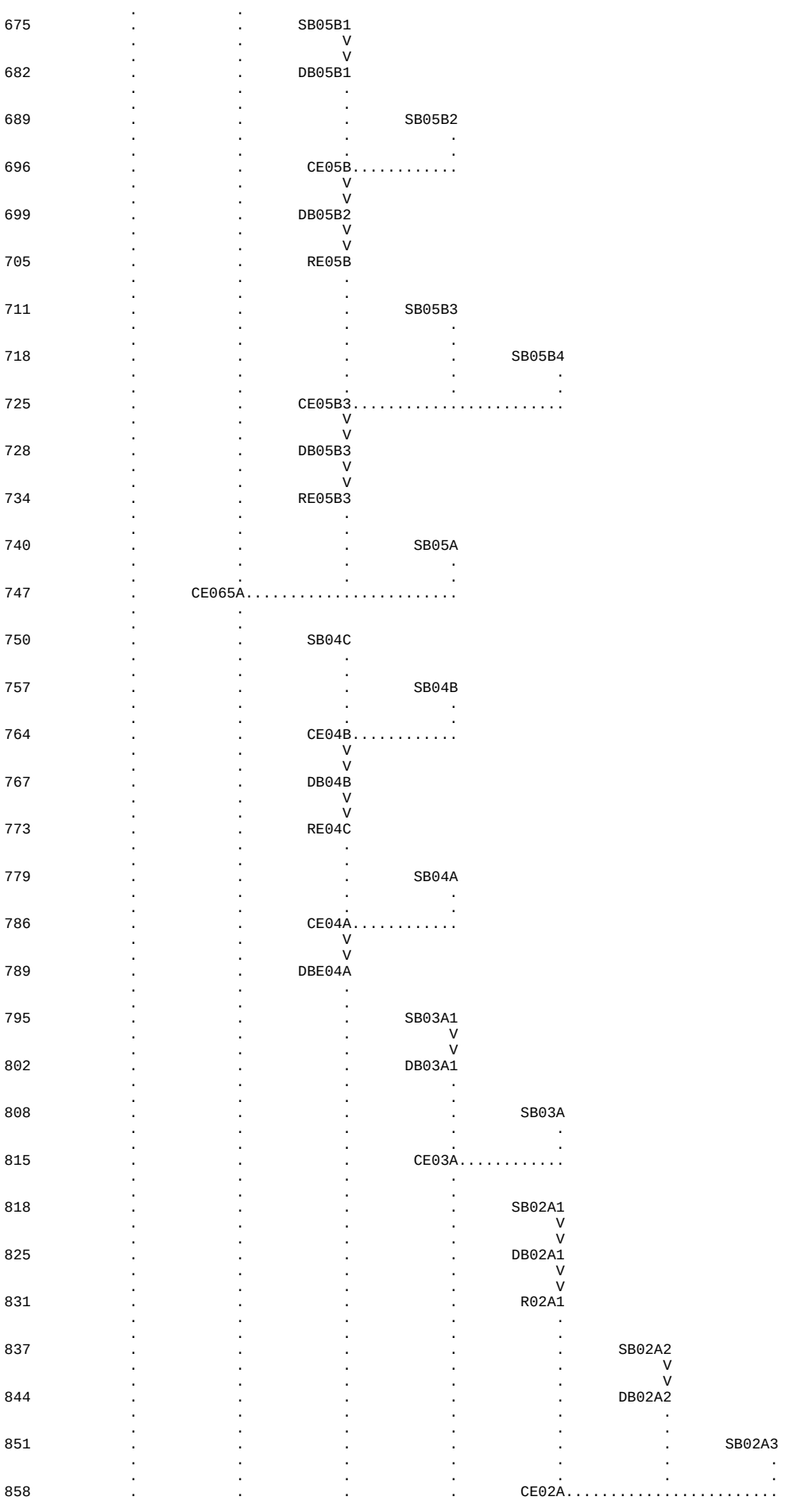

```
1127          KK  DBW07C STORAGE
1128          KM    Retention Basin Storage/Outflow rating curve for Basin DBW07C
1129          RS       1    STOR       0
1130          SV    0.01    0.01    0.02    0.03    0.04    0.05    0.07    0.08    0.09    0.11
1131          SV    0.12    0.14    0.16    0.18    0.20    0.22    0.22
1132          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
1133          SQ    0.01    0.55    2.66    5.93   10.00   14.69   15.43
1134          SE    0.10    0.30    0.70    1.00    1.30    1.70    2.00    2.30    2.60    3.00
1135          SE    3.30    3.60    4.00    4.30    4.60    5.00    5.00
              *

1136          KK   SB07B   BASIN
1137          KM        SB07B Basin Runoff
1138          BA   0.007
1139          LG    0.10    0.25    6.00   0.284
1140          UC   0.381   0.639
1141          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
1142          UA     100
              *

1143          KK  DBW07B STORAGE
1144          KM    Retention Basin Storage/Outflow rating curve for Basin DBW07B
1145          RS       1    STOR       0
1146          SV    0.01    0.01    0.03    0.04    0.05    0.07    0.09    0.10    0.12    0.14
1147          SV    0.17    0.19    0.21    0.24    0.27    0.29    0.30
1148          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
1149          SQ    0.01    0.55    2.66    5.93   10.00   14.69   15.43
1150          SE    0.10    0.30    0.70    1.00    1.30    1.70    2.00    2.30    2.60    3.00
1151          SE    3.30    3.60    4.00    4.30    4.60    5.00    5.00
              *

1152          KK  CW07BC COMBINE
1153          KM        Combine flow from SBW07C andSBW07B
1154          HC       2
              *

1155          KK  RW07BC   ROUTE
1156          KM       Route flow from CW07BC through SBW07A
1157          RS       1    FLOW
1158          RC   0.060   0.060   0.060    1452  0.0465 2800.10
1159          RX    0.00    6.00   20.00   26.00   29.00   38.00   50.00   68.00
1160          RY  2800.1 2799.00 2796.00 2793.00 2793.00 2796.00 2797.00 2798.40
              *
1                                        HEC-1 INPUT                                        PAGE 30

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

1161          KK  SBW07A   BASIN
1162          KM        SBW07A Basin Runoff
1163          BA   0.013
1164          LG    0.28    0.25    6.00    0.20      22
1165          UC   0.207   0.293
1166          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
1167          UA     100
              *

1168          KK   CW07A COMBINE
1169          KM        Combine flow from RW07BC and SBW07A
1170          HC       2
              *

1171          KK  DBW07A STORAGE
1172          KM    Retention Basin Storage/Outflow rating curve for Basin DBW07A
1173          RS       1    STOR       0
1174          SV    0.01    0.09    0.18    0.28    0.39    0.50    0.62    0.74    0.88    1.01
1175          SV    1.16    1.32
1176          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01   10.89
1177          SQ   30.80   56.58
1178          SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
1179          SE    5.00    5.50
              *

1180          KK   CLEAR COMBINE
1181          HC       5
              *

1182          KK  SBW06A   BASIN
1183          KM        SBW06A Basin Runoff
1184          BA   0.004
1185          LG    0.29    0.25    6.00    0.18      11
1186          UC   0.136   0.173
1187          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
1188          UA     100
              *

1189          KK  DBW06A STORAGE
1190          KM    Retention Basin Storage/Outflow rating curve for Basin DBW06A
1191          RS       1    STOR       0
1192          SV    0.01    0.02    0.03    0.05    0.07    0.09    0.11    0.14    0.16    0.19
1193          SV    0.21    0.24    0.28    0.31    0.34    0.38    0.39
1194          SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
1195          SQ    0.01    0.55    2.66    5.93   10.00   14.69   15.43
1196          SE    0.10    0.30    0.70    1.00    1.30    1.70    2.00    2.30    2.60    3.00
1197          SE    3.30    3.60    4.00    4.30    4.60    5.00    5.00
```

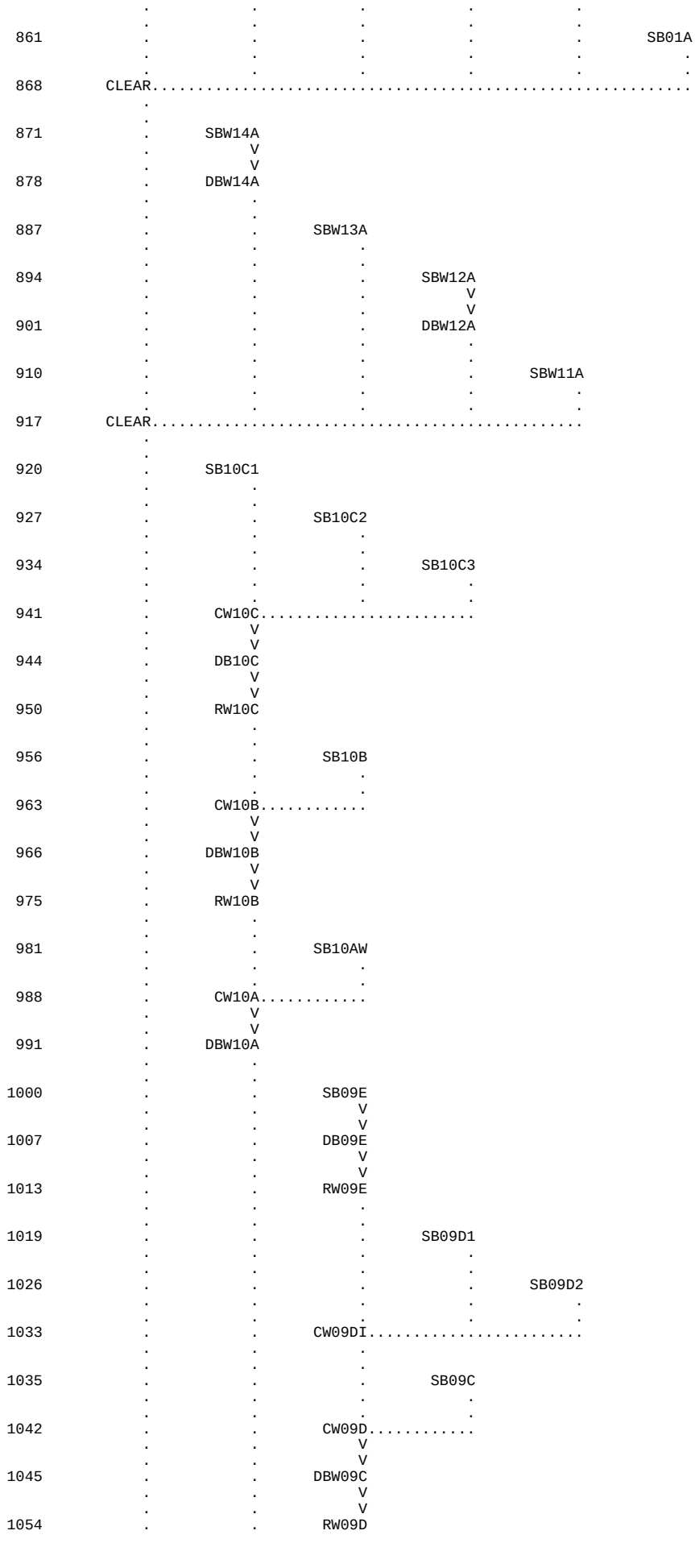
```
                     *
1                                          HEC-1 INPUT                                                    PAGE 31

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


          1198       KK  SBW05A   BASIN
          1199       KM        SBW05A Basin Runoff
          1200       BA   0.010
          1201       LG    0.29    0.25    6.00    0.19      11
          1202       UC   0.172   0.200
          1203       UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          1204       UA     100
                     *

          1205       KK  DBW05A STORAGE
          1206       KM    Retention Basin Storage/Outflow rating curve for Basin DBW05A
          1207       RS       1    STOR       0
          1208       SV    0.01    0.05    0.09    0.15    0.20    0.26    0.32    0.38    0.45    0.52
          1209       SV    0.59    0.67    0.76
          1210       SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
          1211       SQ    5.94   16.80   30.86
          1212       SE    0.10    0.50    1.00    1.50    2.00    2.50    3.00    3.50    4.00    4.50
          1213       SE    5.00    5.50    6.00
                     *

          1214       KK  SBW04A   BASIN
          1215       KM        SBW04A Basin Runoff
          1216       BA   0.002
          1217       LG    0.30    0.25    6.00    0.18       5
          1218       UC   0.108   0.128
          1219       UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          1220       UA     100
                     *

          1221       KK  SBW02A   BASIN
          1222       KM        SBW02A Basin Runoff
          1223       BA   0.007
          1224       LG    0.18    0.25    6.00    0.24       2
          1225       UC   0.281   0.387
          1226       UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          1227       UA     100
                     *

          1228       KK  DBW02A STORAGE
          1229       KM    Retention Basin Storage/Outflow rating curve for Basin DBW02A
          1230       RS       1    STOR       0
          1231       SV    0.01    0.01    0.03    0.05    0.06    0.08    0.10    0.12    0.14    0.16
          1232       SV    0.18    0.20    0.22    0.25    0.27
          1233       SQ    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
          1234       SQ    0.01    2.20    6.04   11.07   15.43
          1235       SE    0.10    0.40    0.80    1.20    1.60    2.00    2.40    2.80    3.20    3.60
          1236       SE    4.00    4.40    4.80    5.20    5.50
                     *
1                                          HEC-1 INPUT                                                    PAGE 32

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


          1237       KK  SBW01A   BASIN
          1238       KM        SBW01A Basin Runoff
          1239       BA   0.002
          1240       LG    0.14    0.25    6.00    0.26       1
          1241       UC   0.220   0.316
          1242       UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
          1243       UA     100
                     *

          1244       KK   CLEAR COMBINE
          1245       KM        Clear Hydrograph Stack
          1246       HC       6
                     *
          1247       ZZ
1
               SCHEMATIC DIAGRAM OF STREAM NETWORK
 INPUT
  LINE      (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

   NO.      (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW

    23      SBE29A
                 V
                 V
    34      DBE29A
                 .
                 .
    43           .      SBE28A
                 .           V
                 .           V
    50           .      DBE28A
                 .           .
                 .           .
    59           .           .      SBE27A
                 .           .           V
                 .           .           V
    66           .           .      DBE27A
```

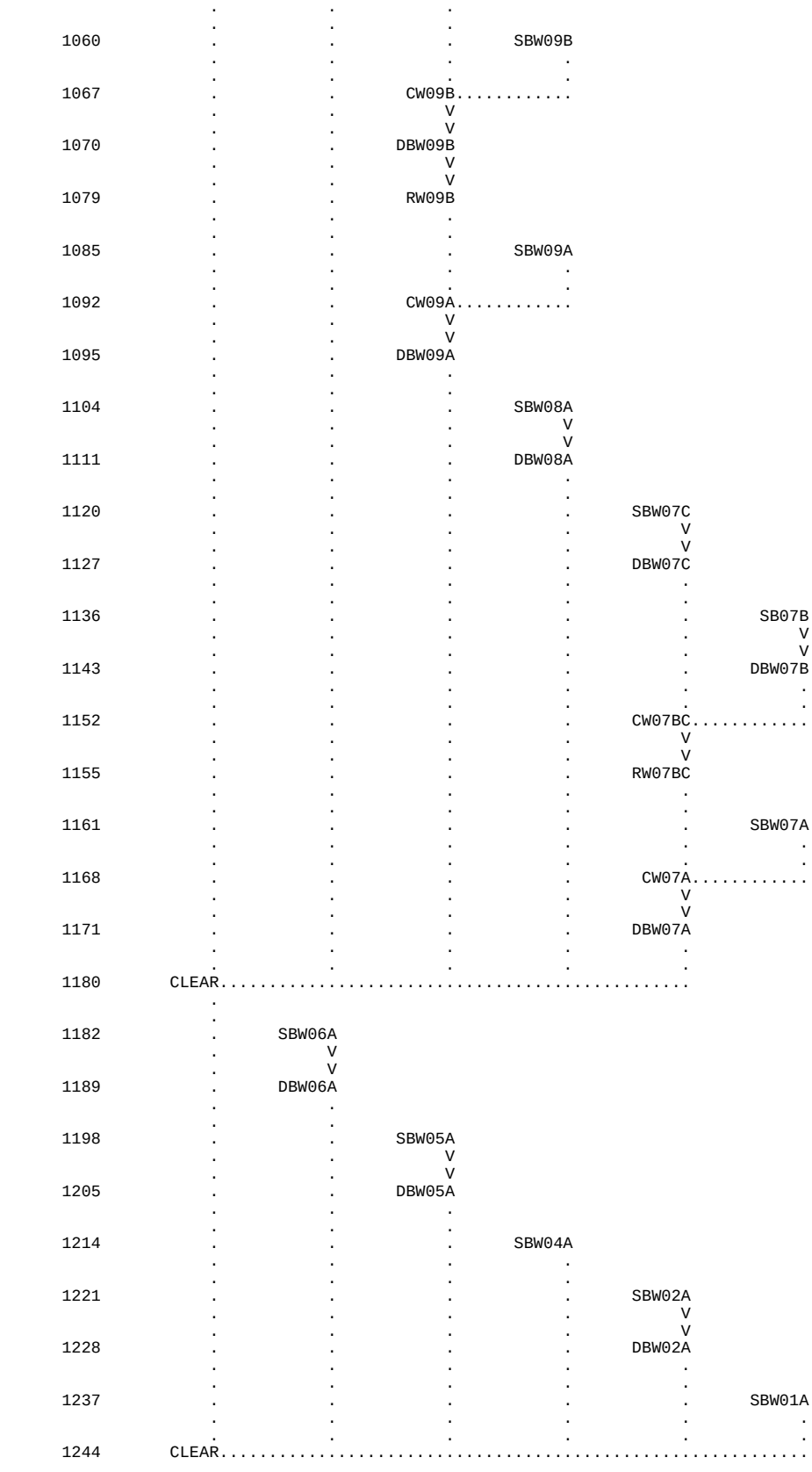

75 SBE26A
82 DBE26A
91 SBE25C
98 DBE25C
107 RE25C
113 SBE25B
120 CE25B
123 DBE25B
132 RE25B
138 SBE25A
145 CE25A
148 DBE25A
157 CLEAR
160 SBE24D
167 DBE24D
176 RE24D
182 SBE24C
189 CE24C
192 DBE24C
201 RE24C
207 SBE24B
214 CE24B
217 DBE24B
226 RE24B
232 SBE24A
239 CE24A
242 DBE24A
251 SBE23D
258 DBE23D
267 RE23D
273 SBE23E
280 DBE23E


289 RE23E
295 SBE23C
302 CE23C
305 DBE23C
314 RE23C
320 SBE23B
327 CE23B
330 RE23B
336 CE23AI
339 RE23BD
345 SBE23A
352 CE23A
355 DBE23A
364 CLEAR
366 SBE22A
373 DBE22A
382 SBE21A
389 SBE20A
396 SBE19A
403 SBE18A
410 DBE18A
419 CLEAR
422 SB17B
429 DBE17B
438 RE17B
444 SBE17A
451 CE17A
454 DBE17A
463 SBE16A
470 SBE13A
477 DBE13A
486 SBE12A


493 DBE12A
502 SB11B
509 DBE11B
515 RE11B
521 SB11A
528 SB11A1
535 CE11A
538 CLEAR
541 SB10A
548 SB09A
555 SB08A
562 CLEAR
565 SB06D1
572 SB06D2
579 CE06D
582 DB06D1
588 SB06C1
595 CE06CD
598 DB06C1
604 SB06C2
611 SB06C3
618 CE06C
621 DB06C2
627 CE06CI
630 RE06C
636 SB06B1
643 CE06CI
646 RE06B
652 SB06B
659 SB06A
666 DB06A
672 CE06A


675 SB05B1
682 DB05B1
689 SB05B2
696 CE05B
699 DB05B2
705 RE05B
711 SB05B3
718 SB05B4
725 CE05B3
728 DB05B3
734 RE05B3
740 SB05A
747 CE065A
750 SB04C
757 SB04B
764 CE04B
767 DB04B
773 RE04C
779 SB04A
786 CE04A
789 DBE04A
795 SB03A1
802 DB03A1
808 SB03A
815 CE03A
818 SB02A1
825 DB02A1
831 R02A1
837 SB02A2
844 DB02A2
851 SB02A3
858 CE02A


861 SB01A
868 CLEAR
871 SBW14A
878 DBW14A
887 SBW13A
894 SBW12A
901 DBW12A
910 SBW11A
917 CLEAR
920 SB10C1
927 SB10C2
934 SB10C3
941 CW10C
944 DB10C
950 RW10C
956 SB10B
963 CW10B
966 DBW10B
975 RW10B
981 SB10AW
988 CW10A
991 DBW10A
1000 SB09E
1007 DB09E
1013 RW09E
1019 SB09D1
1026 SB09D2
1033 CW09DI
1035 SB09C
1042 CW09D
1045 DBW09C
1054 RW09D




(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
1*****************************************
 *                                       *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
 *              JUN   1998               *
 *           VERSION 4.1                 *
 *                                       *
 *  RUN DATE   07MAY18  TIME  09:26:59   *
 *                                       *
 *****************************************
```

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

```
                          SERENO CANYON (PHASE 4) - DEVELOPED CONDITIONS
                          STORM EVENT: 2-YR, 6-HOUR
                          05/04/2018
                          PREPARED BY: SLATER HANIFAN GROUP
                         ********************************************************************************
                         ********************************************************************************
                          Flood Control District of Maricopa County
                          Sereno Canyon Developed Conditions
                          2 YEAR
                          6 Hour  Storm
                          Unit Hydrograph: Clark
                          09/18/2012
                          Sereno Canyon-Developed Conditions
                          2-Year, 6-Hour Storm Event
                          Prepared By: JE Fuller Hydrology and Geomorphology
                          Modeled By: Brian Schalk P.E., CFM and Nathan Logan P.E., CFM
                          Submitted To: City of Scottsdale
                         ********************************************************************************
                         ********************************************************************************

   21 IO          OUTPUT CONTROL VARIABLES
                       IPRNT           5  PRINT CONTROL
                       IPLOT           0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE

      IT          HYDROGRAPH TIME DATA
                        NMIN           1  MINUTES IN COMPUTATION INTERVAL
                       IDATE      1DEC11  STARTING DATE
                       ITIME        0000  STARTING TIME
                          NQ        2000  NUMBER OF HYDROGRAPH ORDINATES
                      NDDATE      2DEC11  ENDING DATE
                      NDTIME        0919  ENDING TIME
                      ICENT          19  CENTURY MARK

                    COMPUTATION INTERVAL    0.02 HOURS
                         TOTAL TIME BASE   33.32 HOURS

           ENGLISH UNITS
                DRAINAGE AREA         SQUARE MILES
                PRECIPITATION DEPTH   INCHES
                LENGTH, ELEVATION     FEET
                FLOW                  CUBIC FEET PER SECOND
                STORAGE VOLUME        ACRE-FEET
                SURFACE AREA          ACRES
                TEMPERATURE           DEGREES FAHRENHEIT
1
                                                RUNOFF SUMMARY
                                           FLOW IN CUBIC FEET PER SECOND
                                         TIME IN HOURS,  AREA IN SQUARE MILES

                                    PEAK   TIME OF     AVERAGE FLOW FOR MAXIMUM PERIOD      BASIN     MAXIMUM     TIME OF
           OPERATION       STATION      FLOW     PEAK                                        AREA      STAGE     MAX STAGE
+                                                                6-HOUR     24-HOUR     72-HOUR

           HYDROGRAPH AT
+                          SBE29A         8.    4.12           1.          0.          0.       0.01
           ROUTED TO
+                          DBE29A         0.    0.00           0.          0.          0.       0.01
+                                                                                                          2.89        6.60

           HYDROGRAPH AT
+                          SBE28A        10.    4.07           1.          0.          0.       0.01
           ROUTED TO
+                          DBE28A         0.    0.00           0.          0.          0.       0.01
+                                                                                                          2.66        6.50

           HYDROGRAPH AT
+                          SBE27A         2.    4.03           0.          0.          0.       0.00
           ROUTED TO
+                          DBE27A         0.    0.00           0.          0.          0.       0.00
+                                                                                                          1.37        5.70

           HYDROGRAPH AT
+                          SBE26A         8.    4.07           1.          0.          0.       0.01
           ROUTED TO
+                          DBE26A         0.    0.00           0.          0.          0.       0.01
+                                                                                                          2.80        6.68

           HYDROGRAPH AT
+                          SBE25C         5.    4.03           0.          0.          0.       0.00
           ROUTED TO
+                          DBE25C         0.    0.00           0.          0.          0.       0.00
+                                                                                                          1.93        6.22

           ROUTED TO
+                           RE25C         0.    0.25           0.          0.          0.       0.00
+                                                                                                       2687.00        0.15
```

```
         HYDROGRAPH AT
+                     SBE25B         4.    4.07          0.          0.          0.       0.01
         2 COMBINED AT
+                      CE25B         4.    4.07          0.          0.          0.       0.01
         ROUTED TO
+                     DBE25B         0.    0.00          0.          0.          0.       0.01
+                                                                                          1.59        7.40
         ROUTED TO
+                      RE25B         0.    0.65          0.          0.          0.       0.01
+                                                                                       2676.01        0.42
         HYDROGRAPH AT
+                     SBE25A         3.    4.03          0.          0.          0.       0.00
         2 COMBINED AT
+                      CE25A         3.    4.03          0.          0.          0.       0.01
         ROUTED TO
+                     DBE25A         0.    0.00          0.          0.          0.       0.01
+                                                                                          1.90        6.88
         5 COMBINED AT
+                      CLEAR         0.    0.00          0.          0.          0.       0.05
         HYDROGRAPH AT
+                     SBE24D         8.    4.05          0.          0.          0.       0.01
         ROUTED TO
+                     DBE24D         0.    0.00          0.          0.          0.       0.01
+                                                                                          1.75        6.18
         ROUTED TO
+                      RE24D         0.    0.47          0.          0.          0.       0.01
+                                                                                       2721.00        0.27
         HYDROGRAPH AT
+                     SBE24C        10.    4.08          1.          0.          0.       0.01
         2 COMBINED AT
+                      CE24C        10.    4.08          1.          0.          0.       0.02
         ROUTED TO
+                     DBE24C         0.    0.00          0.          0.          0.       0.02
+                                                                                          2.35        7.45
         ROUTED TO
+                      RE24C         0.    0.40          0.          0.          0.       0.02
+                                                                                       2701.00        0.45
         HYDROGRAPH AT
+                     SBE24B         3.    4.07          0.          0.          0.       0.00
         2 COMBINED AT
+                      CE24B         3.    4.07          0.          0.          0.       0.03
         ROUTED TO
+                     DBE24B         0.    0.00          0.          0.          0.       0.03
+                                                                                          1.05        7.53
         ROUTED TO
+                      RE24B         0.    0.65          0.          0.          0.       0.03
+                                                                                       2687.00        0.88
         HYDROGRAPH AT
+                     SBE24A         5.    4.07          1.          0.          0.       0.01
         2 COMBINED AT
+                      CE24A         5.    4.07          1.          0.          0.       0.04
         ROUTED TO
+                     DBE24A         0.    0.00          0.          0.          0.       0.04
+                                                                                          1.93        7.47
         HYDROGRAPH AT
+                     SBE23D        23.    4.12          2.          1.          0.       0.04
         ROUTED TO
+                     DBE23D         0.    0.00          0.          0.          0.       0.04
+                                                                                          4.29        7.05
         ROUTED TO
+                      RE23D         0.    0.25          0.          0.          0.       0.04
+                                                                                       2684.00        0.27
         HYDROGRAPH AT
+                     SBE23E         4.    4.05          0.          0.          0.       0.00
         ROUTED TO
+                     DBE23E         0.    0.00          0.          0.          0.       0.00
+                                                                                          1.49        6.33
         ROUTED TO
```

```
+                    RE23E         0.    0.42          0.          0.          0.       0.00
+                                                                                    2711.00        0.43

         HYDROGRAPH AT
+                    SBE23C       31.    4.12          3.          1.          1.       0.05

         2 COMBINED AT
+                    CE23C        31.    4.12          3.          1.          1.       0.06

         ROUTED TO
+                    DBE23C        0.    0.00          0.          0.          0.       0.06
+                                                                                       4.19        7.77

         ROUTED TO
+                    RE23C         0.    0.73          0.          0.          0.       0.06
+                                                                                    2690.01        0.65

         HYDROGRAPH AT
+                    SBE23B        4.    4.03          0.          0.          0.       0.00

         2 COMBINED AT
+                    CE23B         4.    4.03          0.          0.          0.       0.06

         ROUTED TO
+                    RE23B         4.    4.05          0.          0.          0.       0.06
+                                                                                    2684.22        4.05

         2 COMBINED AT
+                    CE23AI        4.    4.05          0.          0.          0.       0.10

         ROUTED TO
+                    RE23BD        3.    4.08          0.          0.          0.       0.10
+                                                                                    2679.22        4.08

         HYDROGRAPH AT
+                    SBE23A        5.    4.05          0.          0.          0.       0.01

         2 COMBINED AT
+                    CE23A         8.    4.07          1.          0.          0.       0.11

         ROUTED TO
+                    DBE23A        0.    0.00          0.          0.          0.       0.11
+                                                                                       1.93       33.32

         3 COMBINED AT
+                    CLEAR         0.    0.00          0.          0.          0.       0.20

         HYDROGRAPH AT
+                    SBE22A        5.    4.07          0.          0.          0.       0.01

         ROUTED TO
+                    DBE22A        0.    0.00          0.          0.          0.       0.01
+                                                                                       2.31        6.35

         HYDROGRAPH AT
+                    SBE21A        1.    4.02          0.          0.          0.       0.00

         HYDROGRAPH AT
+                    SBE20A        1.    4.02          0.          0.          0.       0.00

         HYDROGRAPH AT
+                    SBE19A        1.    4.02          0.          0.          0.       0.00

         HYDROGRAPH AT
+                    SBE18A        1.    4.02          0.          0.          0.       0.00

         ROUTED TO
+                    DBE18A        0.    0.00          0.          0.          0.       0.00
+                                                                                       0.89        4.82

         6 COMBINED AT
+                    CLEAR         3.    4.02          0.          0.          0.       0.21

         HYDROGRAPH AT
+                    SB17B        13.    4.07          1.          0.          0.       0.02

         ROUTED TO
+                    DBE17B        0.    0.00          0.          0.          0.       0.02
+                                                                                       3.15        6.63

         ROUTED TO
+                    RE17B         0.    0.57          0.          0.          0.       0.02
+                                                                                    2736.00        0.70

         HYDROGRAPH AT
+                    SBE17A       14.    4.07          1.          0.          0.       0.02

         2 COMBINED AT
+                    CE17A        14.    4.07          1.          0.          0.       0.03

         ROUTED TO
+                    DBE17A        0.    0.00          0.          0.          0.       0.03
+                                                                                       2.94        7.37

         HYDROGRAPH AT
+                    SBE16A        1.    4.03          0.          0.          0.       0.00
```

```
+          HYDROGRAPH AT
+                        SBE13A         3.    4.03          0.          0.          0.       0.00
+          ROUTED TO
+                        DBE13A         0.    0.00          0.          0.          0.       0.00
+                                                                                            2.61        6.18
+          HYDROGRAPH AT
+                        SBE12A         2.    4.02          0.          0.          0.       0.00
+          ROUTED TO
+                        DBE12A         0.    0.00          0.          0.          0.       0.00
+                                                                                            1.53        6.18
+          HYDROGRAPH AT
+                         SB11B         5.    4.15          1.          0.          0.       0.01
+          ROUTED TO
+                        DBE11B         5.    4.32          1.          0.          0.       0.01
+                                                                                         2778.08        4.32
+          ROUTED TO
+                         RE11B         4.    4.42          1.          0.          0.       0.01
+                                                                                         2762.52        4.42
+          HYDROGRAPH AT
+                         SB11A         2.    4.15          0.          0.          0.       0.01
+          HYDROGRAPH AT
+                        SB11A1         2.    4.08          0.          0.          0.       0.00
+          3 COMBINED AT
+                         CE11A         7.    4.30          1.          0.          0.       0.02
+          6 COMBINED AT
+                         CLEAR         8.    4.05          2.          0.          0.       0.27
+          HYDROGRAPH AT
+                         SB10A         1.    4.05          0.          0.          0.       0.00
+          HYDROGRAPH AT
+                         SB09A         1.    4.07          0.          0.          0.       0.00
+          HYDROGRAPH AT
+                         SB08A         1.    4.05          0.          0.          0.       0.00
+          4 COMBINED AT
+                         CLEAR        10.    4.05          2.          1.          0.       0.28
+          HYDROGRAPH AT
+                        SB06D1         2.    4.12          0.          0.          0.       0.00
+          HYDROGRAPH AT
+                        SB06D2         7.    4.07          1.          0.          0.       0.01
+          2 COMBINED AT
+                         CE06D         8.    4.07          1.          0.          0.       0.01
+          ROUTED TO
+                        DB06D1         5.    4.30          1.          0.          0.       0.01
+                                                                                         2796.32        4.30
+          HYDROGRAPH AT
+                        SB06C1         9.    4.12          1.          0.          0.       0.01
+          2 COMBINED AT
+                        CE06CD        13.    4.18          2.          1.          0.       0.03
+          ROUTED TO
+                        DB06C1        12.    4.32          2.          1.          0.       0.03
+                                                                                         2793.19        4.32
+          HYDROGRAPH AT
+                        SB06C2         3.    4.33          1.          0.          0.       0.02
+          HYDROGRAPH AT
+                        SB06C3         4.    4.05          0.          0.          0.       0.00
+          2 COMBINED AT
+                         CE06C         6.    4.07          1.          0.          0.       0.02
+          ROUTED TO
+                        DB06C2         5.    4.30          1.          0.          0.       0.02
+                                                                                         2789.11        4.30
+          2 COMBINED AT
+                        CE06CI        17.    4.32          3.          1.          1.       0.05
+          ROUTED TO
+                         RE06C        17.    4.37          3.          1.          1.       0.05
+                                                                                         2784.46        4.37
+          HYDROGRAPH AT
+                        SB06B1         2.    4.08          0.          0.          0.       0.00
```

```
          2 COMBINED AT
+                      CE06CI        18.    4.35          4.          1.          1.       0.06
          ROUTED TO
+                       RE06B        17.    4.45          4.          1.          1.       0.06
+                                                                                        2758.35        4.43
          HYDROGRAPH AT
+                       SB06B         1.    4.28          0.          0.          0.       0.00
          HYDROGRAPH AT
+                       SB06A         6.    4.03          0.          0.          0.       0.01
          ROUTED TO
+                       DB06A         5.    4.10          0.          0.          0.       0.01
+                                                                                        2753.70        4.10
          3 COMBINED AT
+                       CE06A        19.    4.40          4.          1.          1.       0.07
          HYDROGRAPH AT
+                      SB05B1         3.    4.12          0.          0.          0.       0.01
          ROUTED TO
+                      DB05B1         3.    4.22          0.          0.          0.       0.01
+                                                                                        2811.29        4.22
          HYDROGRAPH AT
+                      SB05B2         2.    4.18          0.          0.          0.       0.01
          2 COMBINED AT
+                       CE05B         4.    4.20          1.          0.          0.       0.01
          ROUTED TO
+                      DB05B2         4.    4.22          0.          0.          0.       0.01
+                                                                                        2801.24        4.22
          ROUTED TO
+                       RE05B         3.    4.38          0.          0.          0.       0.01
+                                                                                        2757.20        4.38
          HYDROGRAPH AT
+                      SB05B3         3.    4.05          0.          0.          0.       0.00
          HYDROGRAPH AT
+                      SB05B4         3.    4.08          0.          0.          0.       0.00
          3 COMBINED AT
+                      CE05B3         6.    4.30          1.          0.          0.       0.02
          ROUTED TO
+                      DB05B3         6.    4.30          1.          0.          0.       0.02
+                                                                                        2782.00        0.00
          ROUTED TO
+                      RE05B3         6.    4.37          1.          0.          0.       0.02
+                                                                                        2757.25        4.37
          HYDROGRAPH AT
+                       SB05A         1.    4.28          0.          0.          0.       0.00
          3 COMBINED AT
+                      CE065A        26.    4.38          5.          1.          1.       0.09
          HYDROGRAPH AT
+                       SB04C         1.    4.13          0.          0.          0.       0.00
          HYDROGRAPH AT
+                       SB04B         8.    4.07          1.          0.          0.       0.01
          2 COMBINED AT
+                       CE04B         9.    4.07          1.          0.          0.       0.01
          ROUTED TO
+                       DB04B         7.    4.18          1.          0.          0.       0.01
+                                                                                        2756.25        4.18
          ROUTED TO
+                       RE04C         7.    4.22          1.          0.          0.       0.01
+                                                                                        2750.42        4.22
          HYDROGRAPH AT
+                       SB04A         7.    4.05          1.          0.          0.       0.01
          2 COMBINED AT
+                       CE04A        12.    4.08          2.          0.          0.       0.02
          ROUTED TO
+                      DBE04A        10.    4.27          1.          0.          0.       0.02
+                                                                                        2739.97        4.27
          HYDROGRAPH AT
+                      SB03A1         0.    4.22          0.          0.          0.       0.00
          ROUTED TO
+                      DB03A1         0.    4.78          0.          0.          0.       0.00
```

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| + | | | | | | | | 2750.07 | 4.80 |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SB03A | 1. | 4.10 | 0. | 0. | 0. | 0.00 | |
| | 2 COMBINED AT | | | | | | | | |
| + | | CE03A | 1. | 4.10 | 0. | 0. | 0. | 0.00 | |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SB02A1 | 12. | 4.33 | 2. | 1. | 0. | 0.06 | |
| | ROUTED TO | | | | | | | | |
| + | | DB02A1 | 11. | 4.45 | 2. | 1. | 0. | 0.06 | |
| + | | | | | | | | 2790.35 | 4.45 |
| | ROUTED TO | | | | | | | | |
| + | | R02A1 | 11. | 4.48 | 2. | 1. | 0. | 0.06 | |
| + | | | | | | | | 2750.56 | 4.48 |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SB02A2 | 2. | 4.05 | 0. | 0. | 0. | 0.00 | |
| | ROUTED TO | | | | | | | | |
| + | | DB02A2 | 0. | 0.00 | 0. | 0. | 0. | 0.00 | |
| + | | | | | | | | 2762.74 | 6.23 |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SB02A3 | 1. | 4.15 | 0. | 0. | 0. | 0.00 | |
| | 3 COMBINED AT | | | | | | | | |
| + | | CE02A | 12. | 4.47 | 3. | 1. | 0. | 0.06 | |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SB01A | 24. | 4.35 | 5. | 1. | 1. | 0.12 | |
| | 6 COMBINED AT | | | | | | | | |
| + | | CLEAR | 79. | 4.37 | 16. | 4. | 3. | 0.58 | |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SBW14A | 8. | 4.05 | 0. | 0. | 0. | 0.01 | |
| | ROUTED TO | | | | | | | | |
| + | | DBW14A | 0. | 0.00 | 0. | 0. | 0. | 0.01 | |
| + | | | | | | | | 1.62 | 6.08 |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SBW13A | 1. | 4.02 | 0. | 0. | 0. | 0.00 | |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SBW12A | 15. | 4.05 | 1. | 0. | 0. | 0.02 | |
| | ROUTED TO | | | | | | | | |
| + | | DBW12A | 0. | 0.00 | 0. | 0. | 0. | 0.02 | |
| + | | | | | | | | 2.75 | 6.35 |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SBW11A | 1. | 4.00 | 0. | 0. | 0. | 0.00 | |
| | 5 COMBINED AT | | | | | | | | |
| + | | CLEAR | 79. | 4.37 | 16. | 4. | 3. | 0.61 | |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SB10C1 | 6. | 4.07 | 1. | 0. | 0. | 0.01 | |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SB10C2 | 5. | 4.08 | 1. | 0. | 0. | 0.01 | |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SB10C3 | 2. | 4.13 | 0. | 0. | 0. | 0.00 | |
| | 3 COMBINED AT | | | | | | | | |
| + | | CW10C | 13. | 4.08 | 2. | 0. | 0. | 0.02 | |
| | ROUTED TO | | | | | | | | |
| + | | DB10C | 10. | 4.22 | 2. | 0. | 0. | 0.02 | |
| + | | | | | | | | 2768.02 | 4.22 |
| | ROUTED TO | | | | | | | | |
| + | | RW10C | 10. | 4.32 | 2. | 0. | 0. | 0.02 | |
| + | | | | | | | | 2752.91 | 4.32 |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SB10B | 7. | 4.07 | 1. | 0. | 0. | 0.01 | |
| | 2 COMBINED AT | | | | | | | | |
| + | | CW10B | 14. | 4.25 | 2. | 1. | 0. | 0.03 | |
| | ROUTED TO | | | | | | | | |
| + | | DBW10B | 0. | 6.52 | 0. | 0. | 0. | 0.03 | |
| + | | | | | | | | 7.25 | 6.55 |
| | ROUTED TO | | | | | | | | |
| + | | RW10B | 0. | 6.67 | 0. | 0. | 0. | 0.03 | |
| + | | | | | | | | 2721.39 | 6.70 |
| | HYDROGRAPH AT | | | | | | | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| + | | SB10AW | 24. | 4.07 | 2. | 1. | 0. | 0.03 | |
| | 2 COMBINED AT | | | | | | | | |
| + | | CW10A | 24. | 4.07 | 2. | 1. | 0. | 0.06 | |
| | ROUTED TO | | | | | | | | |
| + | | DBW10A | 0. | 0.00 | 0. | 0. | 0. | 0.06 | |
| + | | | | | | | | | 2.96 13.78 |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SB09E | 1. | 4.17 | 0. | 0. | 0. | 0.00 | |
| | ROUTED TO | | | | | | | | |
| + | | DB09E | 1. | 4.42 | 0. | 0. | 0. | 0.00 | |
| + | | | | | | | | | 2826.35 4.43 |
| | ROUTED TO | | | | | | | | |
| + | | RW09E | 1. | 4.62 | 0. | 0. | 0. | 0.00 | |
| + | | | | | | | | | 2800.85 4.62 |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SB09D1 | 8. | 4.05 | 1. | 0. | 0. | 0.01 | |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SB09D2 | 3. | 4.08 | 0. | 0. | 0. | 0.00 | |
| | 3 COMBINED AT | | | | | | | | |
| + | | CW09DI | 11. | 4.05 | 1. | 0. | 0. | 0.02 | |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SB09C | 8. | 4.28 | 1. | 0. | 0. | 0.04 | |
| | 2 COMBINED AT | | | | | | | | |
| + | | CW09D | 15. | 4.08 | 3. | 1. | 1. | 0.05 | |
| | ROUTED TO | | | | | | | | |
| + | | DBW09C | 0. | 0.00 | 0. | 0. | 0. | 0.05 | |
| + | | | | | | | | | 2.85 8.48 |
| | ROUTED TO | | | | | | | | |
| + | | RW09D | 0. | 0.25 | 0. | 0. | 0. | 0.05 | |
| + | | | | | | | | | 2779.00 0.18 |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SBW09B | 5. | 4.03 | 0. | 0. | 0. | 0.00 | |
| | 2 COMBINED AT | | | | | | | | |
| + | | CW09B | 5. | 4.03 | 0. | 0. | 0. | 0.06 | |
| | ROUTED TO | | | | | | | | |
| + | | DBW09B | 0. | 0.00 | 0. | 0. | 0. | 0.06 | |
| + | | | | | | | | | 1.80 6.75 |
| | ROUTED TO | | | | | | | | |
| + | | RW09B | 0. | 0.53 | 0. | 0. | 0. | 0.06 | |
| + | | | | | | | | | 2763.00 0.33 |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SBW09A | 6. | 4.07 | 1. | 0. | 0. | 0.01 | |
| | 2 COMBINED AT | | | | | | | | |
| + | | CW09A | 6. | 4.07 | 1. | 0. | 0. | 0.07 | |
| | ROUTED TO | | | | | | | | |
| + | | DBW09A | 0. | 0.00 | 0. | 0. | 0. | 0.07 | |
| + | | | | | | | | | 3.13 7.50 |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SBW08A | 8. | 4.03 | 1. | 0. | 0. | 0.01 | |
| | ROUTED TO | | | | | | | | |
| + | | DBW08A | 0. | 0.00 | 0. | 0. | 0. | 0.01 | |
| + | | | | | | | | | 2.05 6.35 |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SBW07C | 2. | 4.10 | 0. | 0. | 0. | 0.00 | |
| | ROUTED TO | | | | | | | | |
| + | | DBW07C | 0. | 0.00 | 0. | 0. | 0. | 0.00 | |
| + | | | | | | | | | 3.01 6.03 |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SB07B | 2. | 4.18 | 0. | 0. | 0. | 0.01 | |
| | ROUTED TO | | | | | | | | |
| + | | DBW07B | 0. | 0.00 | 0. | 0. | 0. | 0.01 | |
| + | | | | | | | | | 3.02 7.40 |
| | 2 COMBINED AT | | | | | | | | |
| + | | CW07BC | 0. | 0.00 | 0. | 0. | 0. | 0.01 | |
| | ROUTED TO | | | | | | | | |
| + | | RW07BC | 0. | 0.98 | 0. | 0. | 0. | 0.01 | |
| + | | | | | | | | | 2793.00 0.58 |
| | HYDROGRAPH AT | | | | | | | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| + | | SBW07A | 9. | 4.07 | 1. | 0. | 0. | 0.01 | |
| | 2 COMBINED AT | | | | | | | | |
| + | | CW07A | 9. | 4.07 | 1. | 0. | 0. | 0.03 | |
| | ROUTED TO | | | | | | | | |
| + | | DBW07A | 0. | 0.00 | 0. | 0. | 0. | 0.03 | |
| + | | | | | | | | | 2.31 33.32 |
| | 5 COMBINED AT | | | | | | | | |
| + | | CLEAR | 79. | 4.37 | 16. | 4. | 3. | 0.77 | |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SBW06A | 3. | 4.03 | 0. | 0. | 0. | 0.00 | |
| | ROUTED TO | | | | | | | | |
| + | | DBW06A | 0. | 0.00 | 0. | 0. | 0. | 0.00 | |
| + | | | | | | | | | 1.95 6.12 |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SBW05A | 8. | 4.05 | 1. | 0. | 0. | 0.01 | |
| | ROUTED TO | | | | | | | | |
| + | | DBW05A | 0. | 0.00 | 0. | 0. | 0. | 0.01 | |
| + | | | | | | | | | 2.58 6.32 |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SBW04A | 2. | 4.03 | 0. | 0. | 0. | 0.00 | |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SBW02A | 3. | 4.12 | 0. | 0. | 0. | 0.01 | |
| | ROUTED TO | | | | | | | | |
| + | | DBW02A | 0. | 0.00 | 0. | 0. | 0. | 0.01 | |
| + | | | | | | | | | 3.46 6.12 |
| | HYDROGRAPH AT | | | | | | | | |
| + | | SBW01A | 1. | 4.08 | 0. | 0. | 0. | 0.00 | |
| | 6 COMBINED AT | | | | | | | | |
| + | | CLEAR | 80. | 4.35 | 17. | 4. | 3. | 0.79 | |

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

SLATER HANIFAN GROUP
CONSULTING ENGINEERS & PLANNERS

Project: SERENO CANYON PHASE 4
Project No.: TOL1702.000
Location: SCOTTSDALE, AZ

## HEC-1 Results - Proposed Conditions 2-yr, 6-hr

| HEC-1 ID | | Existing Condition Peak Discharge (A) | Developed Condition Peak Discharge (B) | (B) – (A) |
|---|---|---|---|---|
| Ex.Cond. | Prop.Cond. | [cfs] | [cfs] | [cfs] |
| CE01A | SB01A | 42 | 24 | -18 |
| CE04A | DBE04A | 8 | 10 | 2 |
| CE065A | CE065A | 19 | 26 | 7 |
| CE11A | CE11A | 9 | 7 | -2 |
| CE17A | DBE17A | 11 | 0 | -11 |
| CE23A | DBE23A | 26 | 0 | -26 |
| CE24A | DBE24A | 11 | 0 | -11 |
| CE25A | DBE25A | 5 | 0 | -5 |
| CW07A | DBW07A | 7 | 0 | -7 |
| CW09A | DBW09A | 18 | 0 | -18 |
| CW10A | DBW10A | 20 | 0 | -20 |
| SBE02A | CE02A | 13 | 12 | -1 |
| SBE03A | CE03A | 3 | 1 | -2 |
| SBE08A | SB08A | 1 | 1 | 0 |
| SBE09A | SB09A | 1 | 1 | 0 |
| SBE10A | SB10A | 1 | 1 | 0 |
| SBE12A | DBE12A | 1 | 0 | -1 |
| SBE13A | DBE13A | 1 | 0 | -1 |
| SBE16A | SBE16A | 0 | 1 | 1 |
| SBE18A | DBE18A | 1 | 0 | -1 |
| SBE19A | SBE19A | 1 | 1 | 0 |
| SBE20A | SBE20A | 1 | 1 | 0 |
| SBE21A | SBE21A | 1 | 1 | 0 |
| SBE26A | DBE26A | 3 | 0 | -3 |
| SBE27A | DBE27A | 1 | 0 | -1 |
| SBE28A | DBE28A | 4 | 0 | -4 |
| SBE29A | DBE29A | 6 | 0 | -6 |
| SBW01A | SBW01A | 1 | 1 | 0 |
| SBW02A | DBW02A | 3 | 0 | -3 |
| SBW04A | SBW04A | 1 | 2 | 1 |
| SBW05A | DBW05A | 4 | 0 | -4 |
| SBW06A | DBW06A | 2 | 0 | -2 |
| SBW08A | DBW08A | 4 | 0 | -4 |
| SBW11A | SBW11A | 1 | 1 | 0 |
| SBW12A | DBW12A | 8 | 0 | -8 |
| SBW13A | SBW13A | 1 | 1 | 0 |
| SBW14A | DBW14A | 5 | 0 | -5 |

SLATER HANIFAN GROUP
CONSULTING ENGINEERS & PLANNERS

Project: SERENO CANYON PHASE 4
Project No.: TOL1702.000
Location: SCOTTSDALE, AZ

# Stage-Storage Calculation - Average End Area Method

DB10C

| Elevation (ft) | Depth (ft) | Area ($ft^2$) | Incremental Volume (ac-ft) | Cumulative Volume (ac-ft) |
|---|---|---|---|---|
| 2767 | 0 | 5826.28 | 0 | 0.00 |
| 2768 | 1 | 7398.43 | 0.15 | 0.15 |
| 2769 | 2 | 9027.13 | 0.19 | 0.34 |
| 2770 | 3 | 10712.37 | 0.23 | 0.57 |
| **2771** | **4** | **12454.17** | **0.27** | **0.833** |

DB09E x

| Elevation (ft) | Depth (ft) | Area ($ft^2$) | Incremental Volume (ac-ft) | Cumulative Volume (ac-ft) |
|---|---|---|---|---|
| 2826 | 0 | 2189.86 | 0 | 0.00 |
| 2827 | 1 | 3019.17 | 0.06 | 0.06 |
| 2828 | 2 | 3947.82 | 0.08 | 0.14 |
| 2829 | 3 | 4973.69 | 0.10 | 0.24 |
| 2830 | 4 | 6097.62 | 0.13 | 0.37 |
| **2831** | **5** | **7332.13** | **0.15** | **0.523** |

DB11B

| Elevation (ft) | Depth (ft) | Area ($ft^2$) | Incremental Volume (ac-ft) | Cumulative Volume (ac-ft) |
|---|---|---|---|---|
| 2777.5 | 0 | 3896.77 | 0 | 0.00 |
| 2778 | 0.5 | 4291.79 | 0.05 | 0.05 |
| 2779 | 1.5 | 5122.88 | 0.11 | 0.16 |
| 2780 | 2.5 | 6027.52 | 0.13 | 0.28 |
| 2781 | 3.5 | 7008.77 | 0.15 | 0.43 |
| 2782 | 4.5 | 8063.77 | 0.17 | 0.61 |
| **2783** | **5.5** | **9146.72** | **0.20** | **0.803** |

DB06D1

| Elevation (ft) | Depth (ft) | Area ($ft^2$) | Incremental Volume (ac-ft) | Cumulative Volume (ac-ft) |
|---|---|---|---|---|
| 2795 | 0 | 4591.68 | 0 | 0.00 |
| 2796 | 1 | 5717.29 | 0.12 | 0.12 |
| 2797 | 2 | 6901.89 | 0.14 | 0.26 |
| 2798 | 3 | 8141.79 | 0.17 | 0.44 |
| **2799** | **4** | **9442.35** | **0.20** | **0.638** |

DB06C1

| Elevation (ft) | Depth (ft) | Area ($ft^2$) | Incremental Volume (ac-ft) | Cumulative Volume (ac-ft) |
|---|---|---|---|---|
| 2792 | 0 | 3277.8 | 0 | 0.00 |
| 2793 | 1 | 5014.92 | 0.10 | 0.10 |
| 2794 | 2 | 6863.05 | 0.14 | 0.23 |
| **2795** | **3** | **8819.56** | **0.18** | **0.412** |

DB06C2

| Elevation (ft) | Depth (ft) | Area ($ft^2$) | Incremental Volume (ac-ft) | Cumulative Volume (ac-ft) |
|---|---|---|---|---|
| 2788 | 0 | 3049.89 | 0 | 0.00 |
| 2789 | 1 | 4036.76 | 0.08 | 0.08 |
| 2790 | 2 | 5170.84 | 0.11 | 0.19 |
| 2791 | 3 | 6481.98 | 0.13 | 0.32 |
| **2792** | **4** | **8181.5** | **0.17** | **0.489** |

DB06A x

| Elevation (ft) | Depth (ft) | Area ($ft^2$) | Incremental Volume (ac-ft) | Cumulative Volume (ac-ft) |
|---|---|---|---|---|
| 2752.5 | 0 | 1865.51 | 0 | 0.00 |
| 2753 | 0.5 | 2167.24 | 0.02 | 0.02 |
| 2754 | 1.5 | 2991.85 | 0.06 | 0.08 |
| 2755 | 2.5 | 3907.64 | 0.08 | 0.16 |
| **2756** | **3.5** | **4981.27** | **0.10** | **0.264** |

DB05B3

| Elevation (ft) | Depth (ft) | Area ($ft^2$) | Incremental Volume (ac-ft) | Cumulative Volume (ac-ft) |
|---|---|---|---|---|
| 2782 | 0 | 43.3 | 0 | 0.00 |
| 2783 | 1 | 658.7 | 0.01 | 0.01 |
| 2784 | 2 | 1523.1 | 0.03 | 0.03 |
| **2785** | **3** | **2877.9** | **0.05** | **0.084** |

DB05B2

| Elevation (ft) | Depth (ft) | Area ($ft^2$) | Incremental Volume (ac-ft) | Cumulative Volume (ac-ft) |
|---|---|---|---|---|
| 2800 | 0 | 106 | 0 | 0.00 |
| 2801 | 1 | 386.19 | 0.01 | 0.01 |
| 2802 | 2 | 793.69 | 0.01 | 0.02 |
| **2803** | **3** | **1329.24** | **0.02** | **0.044** |

DB05B1

| Elevation (ft) | Depth (ft) | Area ($ft^2$) | Incremental Volume (ac-ft) | Cumulative Volume (ac-ft) |
|---|---|---|---|---|
| 2810 | 0 | 391.58 | 0 | 0.00 |
| 2811 | 1 | 739.48 | 0.01 | 0.01 |
| 2812 | 2 | 1211.2 | 0.02 | 0.04 |
| **2813** | **3** | **1788.83** | **0.03** | **0.070** |

DB04A x

| Elevation (ft) | Depth (ft) | Area ($ft^2$) | Incremental Volume (ac-ft) | Cumulative Volume (ac-ft) |
|---|---|---|---|---|
| 2738.5 | 0 | 3709.96 | 0 | 0.00 |
| 2739 | 0.5 | 4253.43 | 0.05 | 0.05 |
| 2740 | 1.5 | 5454.19 | 0.11 | 0.16 |
| 2741 | 2.5 | 6770.66 | 0.14 | 0.30 |
| 2742 | 3.5 | 8170.64 | 0.17 | 0.47 |
| **2743** | **4.5** | **9565.18** | **0.20** | **0.673** |

DB04B

| Elevation (ft) | Depth (ft) | Area ($ft^2$) | Incremental Volume (ac-ft) | Cumulative Volume (ac-ft) |
|---|---|---|---|---|
| 2755 | 0 | 2319.54 | 0 | 0.00 |
| 2756 | 1 | 3210.21 | 0.06 | 0.06 |
| 2757 | 2 | 4224.96 | 0.09 | 0.15 |
| **2758** | **3** | **5330.13** | **0.11** | **0.258** |

DB03A1

| Elevation (ft) | Depth (ft) | Area ($ft^2$) | Incremental Volume (ac-ft) | Cumulative Volume (ac-ft) |
|---|---|---|---|---|
| 2750 | 0 | 2882.64 | 0 | 0.00 |
| 2751 | 1 | 3548.31 | 0.07 | 0.07 |
| 2752 | 2 | 4271.17 | 0.09 | 0.16 |
| 2753 | 3 | 5051.23 | 0.11 | 0.27 |
| **2754** | **4** | **5888.48** | **0.13** | **0.396** |

DB02A2

| Elevation (ft) | Depth (ft) | Area ($ft^2$) | Incremental Volume (ac-ft) | Cumulative Volume (ac-ft) |
|---|---|---|---|---|
| 2762 | 0 | 5553.91 | 0 | 0.00 |
| 2763 | 1 | 6879.62 | 0.14 | 0.14 |
| 2764 | 2 | 8339.27 | 0.17 | 0.32 |
| **2765** | **3** | **9962.57** | **0.21** | **0.527** |

DB02A1

| Elevation (ft) | Depth (ft) | Area ($ft^2$) | Incremental Volume (ac-ft) | Cumulative Volume (ac-ft) |
|---|---|---|---|---|
| 2789.5 | 0 | 3129.3 | 0 | 0.00 |
| 2790 | 0.5 | 3659.87 | 0.04 | 0.04 |
| 2791 | 1.5 | 4939.9 | 0.10 | 0.14 |
| **2792** | **2.5** | **4940.9** | **0.11** | **0.251** |

# Appendix D: Hydraulics

**HEC-RAS Model Outputs**

**Supporting Hydraulic Documentation**

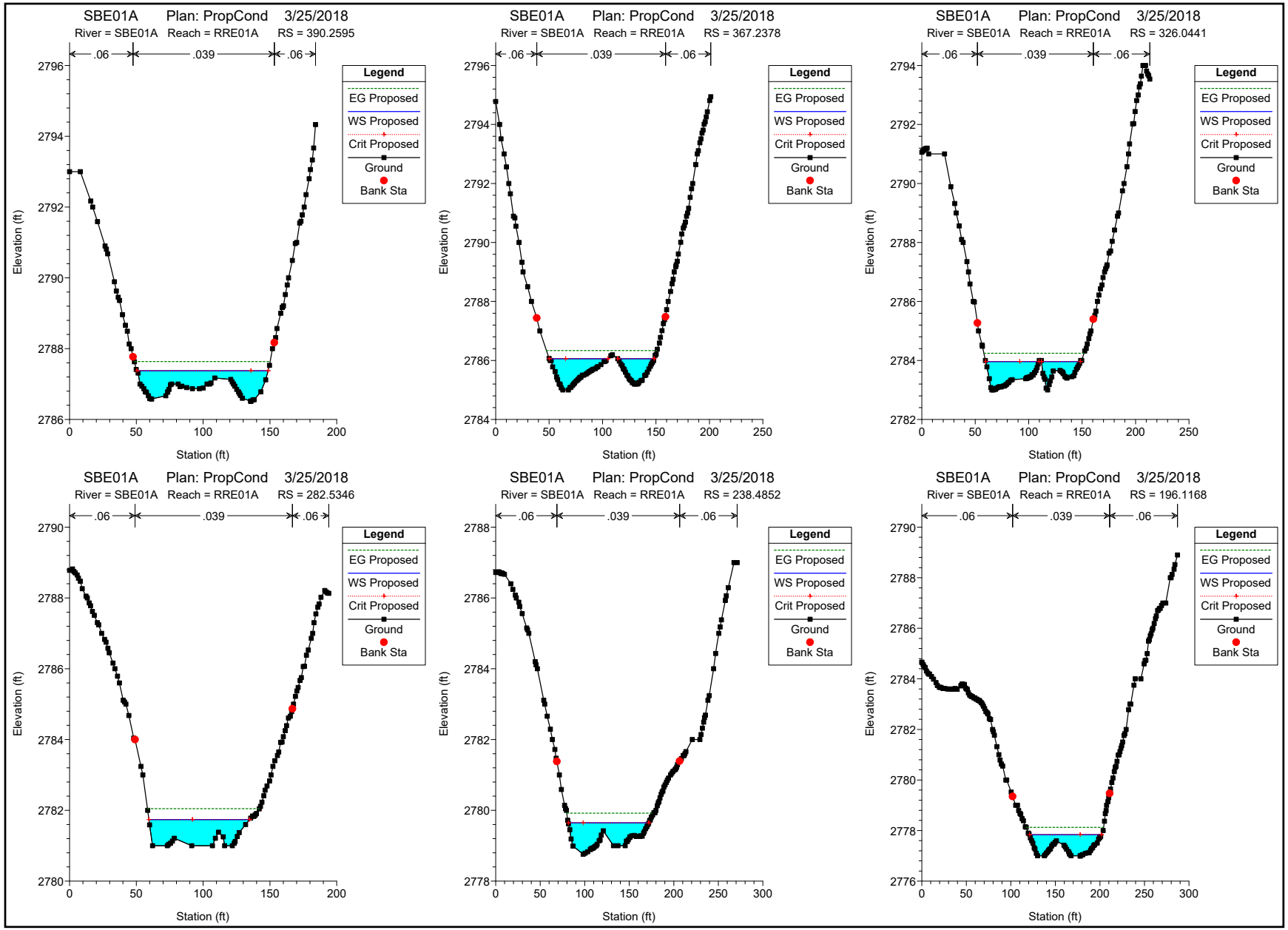
**HY-8 Outputs**

SLATER HANIFAN GROUP

*"The Benchmark of Our Profession."*

HEC-RAS Plan: PropCond River: SBE01A Reach: RRE01A Profile: Proposed

| Reach | River Sta | Profile | Q Total | Min Ch El | W.S. Elev | Crit W.S. | E.G. Elev | E.G. Slope | Vel Chnl | Flow Area | Top Width | Froude # Chl |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | (cfs) | (ft) | (ft) | (ft) | (ft) | (ft/ft) | (ft/s) | (sq ft) | (ft) | |
| RRE01A | 390.2595 | Proposed | 202.00 | 2786.51 | 2787.37 | 2787.37 | 2787.64 | 0.029060 | 4.10 | 49.27 | 98.12 | 1.02 |
| RRE01A | 367.2378 | Proposed | 202.00 | 2785.00 | 2786.06 | 2786.06 | 2786.34 | 0.027892 | 4.21 | 47.96 | 88.93 | 1.01 |
| RRE01A | 326.0441 | Proposed | 202.00 | 2783.00 | 2783.96 | 2783.96 | 2784.25 | 0.027775 | 4.26 | 47.47 | 86.10 | 1.01 |
| RRE01A | 282.5346 | Proposed | 202.00 | 2781.00 | 2781.74 | 2781.74 | 2782.05 | 0.026855 | 4.45 | 45.39 | 75.27 | 1.01 |
| RRE01A | 238.4852 | Proposed | 202.00 | 2778.76 | 2779.64 | 2779.64 | 2779.92 | 0.028312 | 4.20 | 48.06 | 90.42 | 1.02 |
| RRE01A | 196.1168 | Proposed | 202.00 | 2776.99 | 2777.84 | 2777.84 | 2778.13 | 0.027043 | 4.34 | 46.60 | 80.86 | 1.01 |
| RRE01A | 151.5204 | Proposed | 202.00 | 2774.63 | 2775.52 | 2775.52 | 2775.83 | 0.026883 | 4.45 | 45.38 | 75.36 | 1.01 |
| RRE01A | 105.6019 | Proposed | 202.00 | 2772.19 | 2773.36 | 2773.36 | 2773.70 | 0.025843 | 4.68 | 43.12 | 64.40 | 1.01 |
| RRE01A | 70.60451 | Proposed | 202.00 | 2770.33 | 2771.70 | 2771.70 | 2772.12 | 0.024429 | 5.17 | 39.11 | 48.18 | 1.01 |
| RRE01A | 29.99777 | Proposed | 202.00 | 2768.01 | 2769.21 | 2769.21 | 2769.58 | 0.025626 | 4.86 | 41.60 | 58.40 | 1.01 |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SBE01A Plan: PropCond 3/25/2018
River = SBE01A Reach = RRE01A RS = 367.2378
SBE01A Plan: PropCond 3/25/2018
River = SBE01A Reach = RRE01A RS = 326.0441
SBE01A Plan: PropCond 3/25/2018
River = SBE01A Reach = RRE01A RS = 282.5346
SBE01A Plan: PropCond 3/25/2018
River = SBE01A Reach = RRE01A RS = 238.4852
SBE01A Plan: PropCond 3/25/2018
River = SBE01A Reach = RRE01A RS = 196.1168
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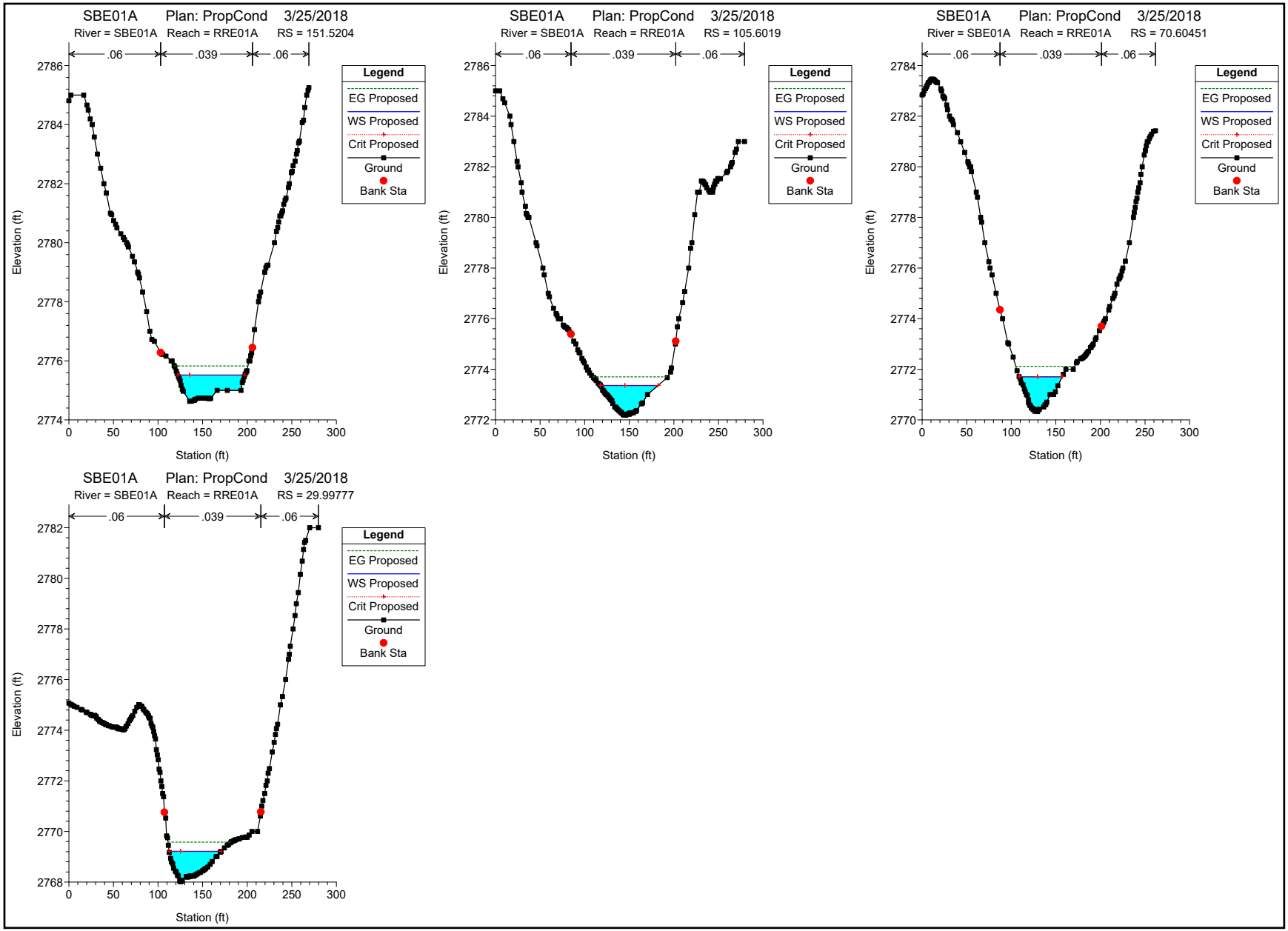
.039
.06
Legend
EG Proposed
WS Proposed
Crit Proposed
Ground
Bank Sta
Elevation (ft)
Station (ft)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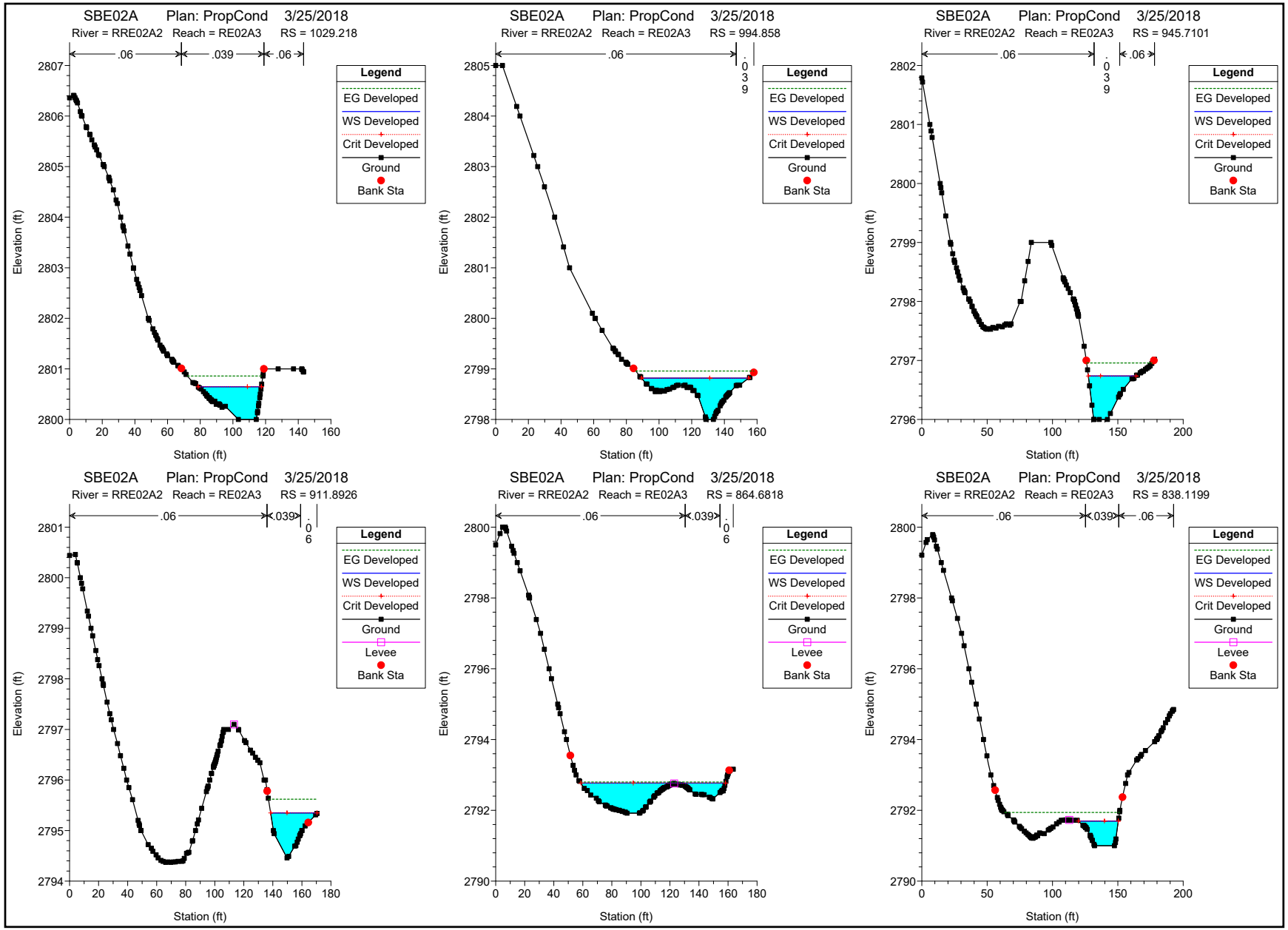
Legend
EG Proposed
WS Proposed
Crit Proposed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE01A Plan: PropCond 3/25/2018
River = SBE01A Reach = RRE01A RS = 105.6019
.06 .039 .06
Legend
EG Proposed
WS Proposed
Crit Proposed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE01A Plan: PropCond 3/25/2018
River = SBE01A Reach = RRE01A RS = 70.60451
.06 .039 .06
Legend
EG Proposed
WS Proposed
Crit Proposed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE01A Plan: PropCond 3/25/2018
River = SBE01A Reach = RRE01A RS = 29.99777
.06 .039 .06
Legend
EG Proposed
WS Proposed
Crit Proposed
Ground
Bank Sta
Elevation (ft)
Station (ft)

HEC-RAS Plan: PropCond River: RRE02A2 Reach: RE02A3 Profile: Developed

| Reach | River Sta | Profile | Q Total | Min Ch El | W.S. Elev | Crit W.S. | E.G. Elev | E.G. Slope | Vel Chnl | Flow Area | Top Width | Froude # Chl |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | (cfs) | (ft) | (ft) | (ft) | (ft) | (ft/ft) | (ft/s) | (sq ft) | (ft) | |
| RE02A3 | 1029.218 | Developed | 60.00 | 2800.00 | 2800.65 | 2800.65 | 2800.86 | 0.029876 | 3.69 | 16.27 | 38.75 | 1.00 |
| RE02A3 | 994.858 | Developed | 60.00 | 2798.00 | 2798.82 | 2798.82 | 2798.96 | 0.065523 | 3.00 | 19.97 | 65.58 | 0.96 |
| RE02A3 | 945.7101 | Developed | 60.00 | 2796.00 | 2796.74 | 2796.74 | 2796.96 | 0.024186 | 3.76 | 15.94 | 36.41 | 1.00 |
| RE02A3 | 911.8926 | Developed | 60.00 | 2794.46 | 2795.35 | 2795.35 | 2795.62 | 0.026868 | 4.21 | 14.73 | 31.89 | 1.00 |
| RE02A3 | 864.6818 | Developed | 60.00 | 2791.92 | 2792.77 | 2792.77 | 2792.80 | 0.009161 | 1.45 | 41.33 | 99.54 | 0.40 |
| RE02A3 | 838.1199 | Developed | 60.00 | 2791.00 | 2791.69 | 2791.69 | 2791.94 | 0.034821 | 3.99 | 15.05 | 30.65 | 1.00 |
| RE02A3 | 804.5301 | Developed | 60.00 | 2789.63 | 2790.29 | 2790.28 | 2790.46 | 0.055328 | 3.26 | 18.42 | 51.67 | 0.96 |
| RE02A3 | 761.161 | Developed | 60.00 | 2787.00 | 2787.96 | 2787.96 | 2788.19 | 0.049080 | 3.84 | 15.62 | 35.06 | 1.01 |
| RE02A3 | 728.2483 | Developed | 60.00 | 2785.50 | 2786.28 | 2786.28 | 2786.52 | 0.027768 | 3.94 | 15.23 | 31.89 | 1.00 |
| RE02A3 | 690.5784 | Developed | 60.00 | 2783.00 | 2784.03 | 2784.03 | 2784.37 | 0.025101 | 4.64 | 12.92 | 19.71 | 1.01 |
| RE02A3 | 643.2529 | Developed | 60.00 | 2781.00 | 2781.77 | 2781.77 | 2782.05 | 0.028956 | 4.25 | 14.13 | 25.45 | 1.00 |
| RE02A3 | 608.7449 | Developed | 60.00 | 2779.85 | 2780.56 | 2780.56 | 2780.79 | 0.031471 | 3.90 | 15.37 | 32.69 | 1.00 |
| RE02A3 | 584.4159 | Developed | 60.00 | 2778.34 | 2779.26 | 2779.26 | 2779.52 | 0.022754 | 4.10 | 14.64 | 28.42 | 1.01 |
| RE02A3 | 564.3704 | Developed | 60.00 | 2778.00 | 2778.60 | 2778.60 | 2778.83 | 0.035956 | 3.86 | 15.55 | 33.69 | 1.00 |
| RE02A3 | 551.3004 | Developed | 60.00 | 2777.00 | 2777.77 | 2777.77 | 2777.98 | 0.027643 | 3.74 | 16.06 | 37.27 | 1.00 |
| RE02A3 | 533.0886 | Developed | 60.00 | 2775.78 | 2776.69 | 2776.69 | 2776.88 | 0.022304 | 3.54 | 16.93 | 43.38 | 1.00 |
| RE02A3 | 506.2536 | Developed | 60.00 | 2774.22 | 2775.08 | 2775.08 | 2775.34 | 0.026429 | 4.10 | 14.63 | 28.37 | 1.01 |
| RE02A3 | 485.6959 | Developed | 60.00 | 2773.44 | 2774.32 | 2774.32 | 2774.55 | 0.027361 | 3.88 | 15.45 | 32.41 | 0.99 |
| RE02A3 | 466.4163 | Developed | 60.00 | 2772.60 | 2773.38 | 2773.38 | 2773.62 | 0.030770 | 3.94 | 15.23 | 31.56 | 1.00 |
| RE02A3 | 449.5786 | Developed | 60.00 | 2772.00 | 2772.60 | 2772.60 | 2772.84 | 0.038184 | 3.88 | 15.45 | 33.40 | 1.01 |
| RE02A3 | 400.0999 | Developed | 80.00 | 2765.00 | 2771.75 | 2771.75 | 2771.75 | 0.000012 | 0.16 | 496.72 | 206.00 | 0.02 |
| RE02A3 | 380.5951 | Developed | 80.00 | 2764.00 | 2770.23 | 2770.23 | 2770.23 | 0.000019 | 0.17 | 462.39 | 245.05 | 0.02 |
| RE02A3 | 343.1317 | Developed | 80.00 | 2762.39 | 2768.27 | 2768.27 | 2768.27 | 0.000011 | 0.15 | 526.74 | 236.59 | 0.02 |
| RE02A3 | 311.828 | Developed | 80.00 | 2762.00 | 2767.00 | 2767.00 | 2767.00 | 0.000015 | 0.17 | 460.44 | 210.34 | 0.02 |
| RE02A3 | 267.2574 | Developed | 80.00 | 2760.00 | 2765.12 | 2765.12 | 2765.12 | 0.000034 | 0.24 | 334.63 | 170.68 | 0.03 |
| RE02A3 | 241.6441 | Developed | 80.00 | 2759.73 | 2763.00 | 2763.00 | 2763.00 | 0.000269 | 0.47 | 171.10 | 145.68 | 0.08 |
| RE02A3 | 208.7667 | Developed | 80.00 | 2759.00 | 2761.64 | 2761.64 | 2761.99 | 0.032359 | 4.69 | 17.05 | 24.00 | 0.98 |
| RE02A3 | 180.2137 | Developed | 80.00 | 2758.00 | 2760.00 | 2760.00 | 2760.01 | 0.000681 | 0.70 | 113.83 | 107.76 | 0.12 |
| RE02A3 | 163.4412 | Developed | 80.00 | 2757.15 | 2759.01 | 2759.01 | 2759.02 | 0.001808 | 1.00 | 80.35 | 102.18 | 0.20 |
| RE02A3 | 138.1502 | Developed | 80.00 | 2756.34 | 2757.68 | 2757.68 | 2757.70 | 0.003585 | 1.21 | 66.13 | 101.72 | 0.26 |
| RE02A3 | 106.4526 | Developed | 80.00 | 2755.00 | 2756.09 | 2756.09 | 2756.19 | 0.038729 | 2.56 | 31.23 | 114.69 | 0.87 |
| RE02A3 | 78.27399 | Developed | 80.00 | 2754.00 | 2754.64 | 2754.60 | 2754.78 | 0.041223 | 3.00 | 26.67 | 69.82 | 0.86 |
| RE02A3 | 52.40903 | Developed | 80.00 | 2752.92 | 2753.38 | 2753.38 | 2753.52 | 0.058676 | 3.07 | 26.09 | 92.25 | 1.02 |
| RE02A3 | 28.76661 | Developed | 80.00 | 2751.00 | 2751.63 | 2751.58 | 2751.74 | 0.046606 | 2.67 | 29.93 | 93.95 | 0.83 |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WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
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WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
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Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
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Legend
EG Developed
WS Developed
Crit Developed
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
SBE02A Plan: PropCond 3/25/2018
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Legend
EG Developed
WS Developed
Crit Developed
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
SBE02A Plan: PropCond 3/25/2018
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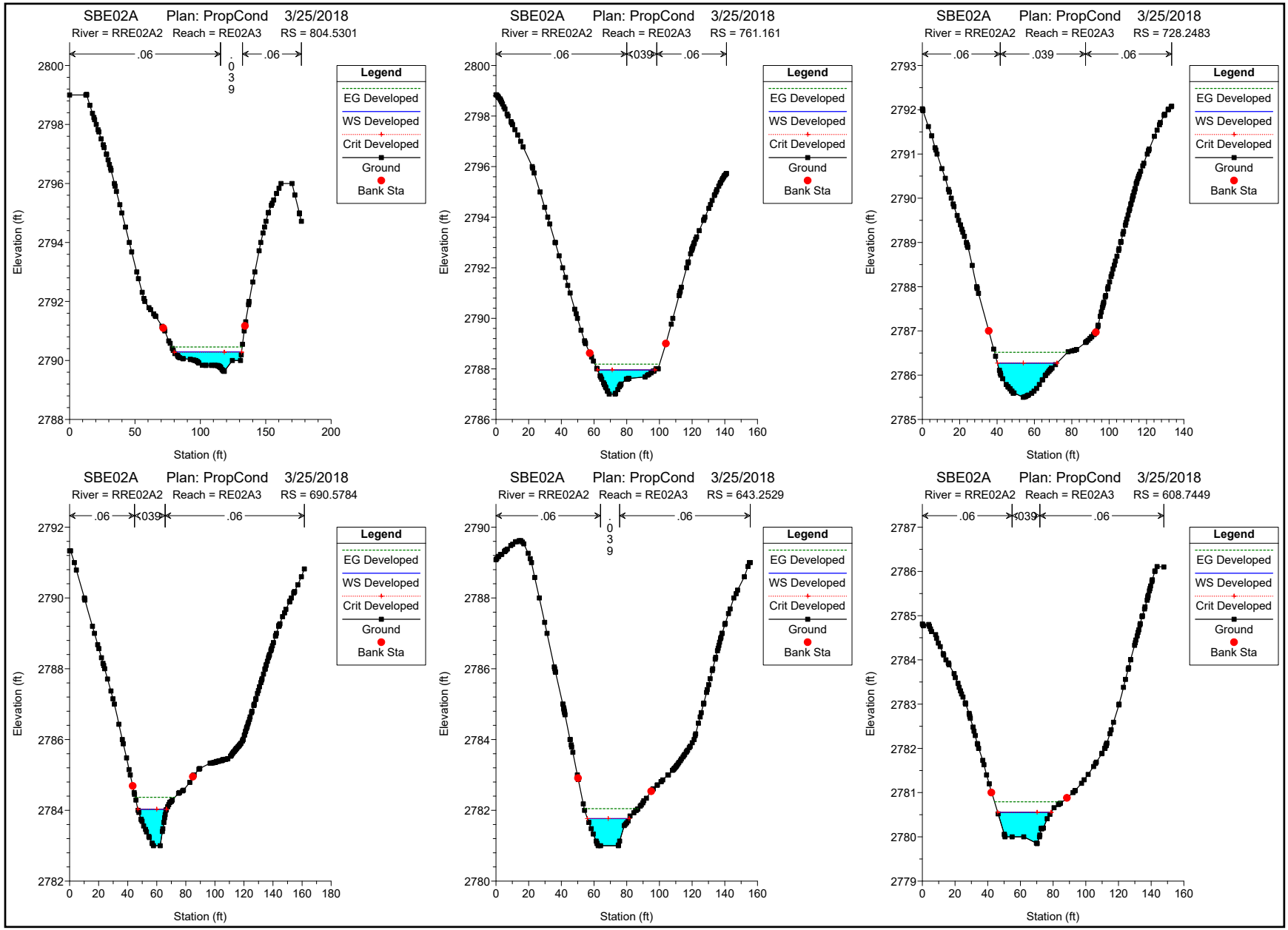
Legend
EG Developed
WS Developed
Crit Developed
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)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EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
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.039
.06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE02A Plan: PropCond 3/25/2018
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.06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
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Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE02A Plan: PropCond 3/25/2018
River = RRE02A2 Reach = RE02A3 RS = 643.2529
.06
.039
.06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE02A Plan: PropCond 3/25/2018
River = RRE02A2 Reach = RE02A3 RS = 608.7449
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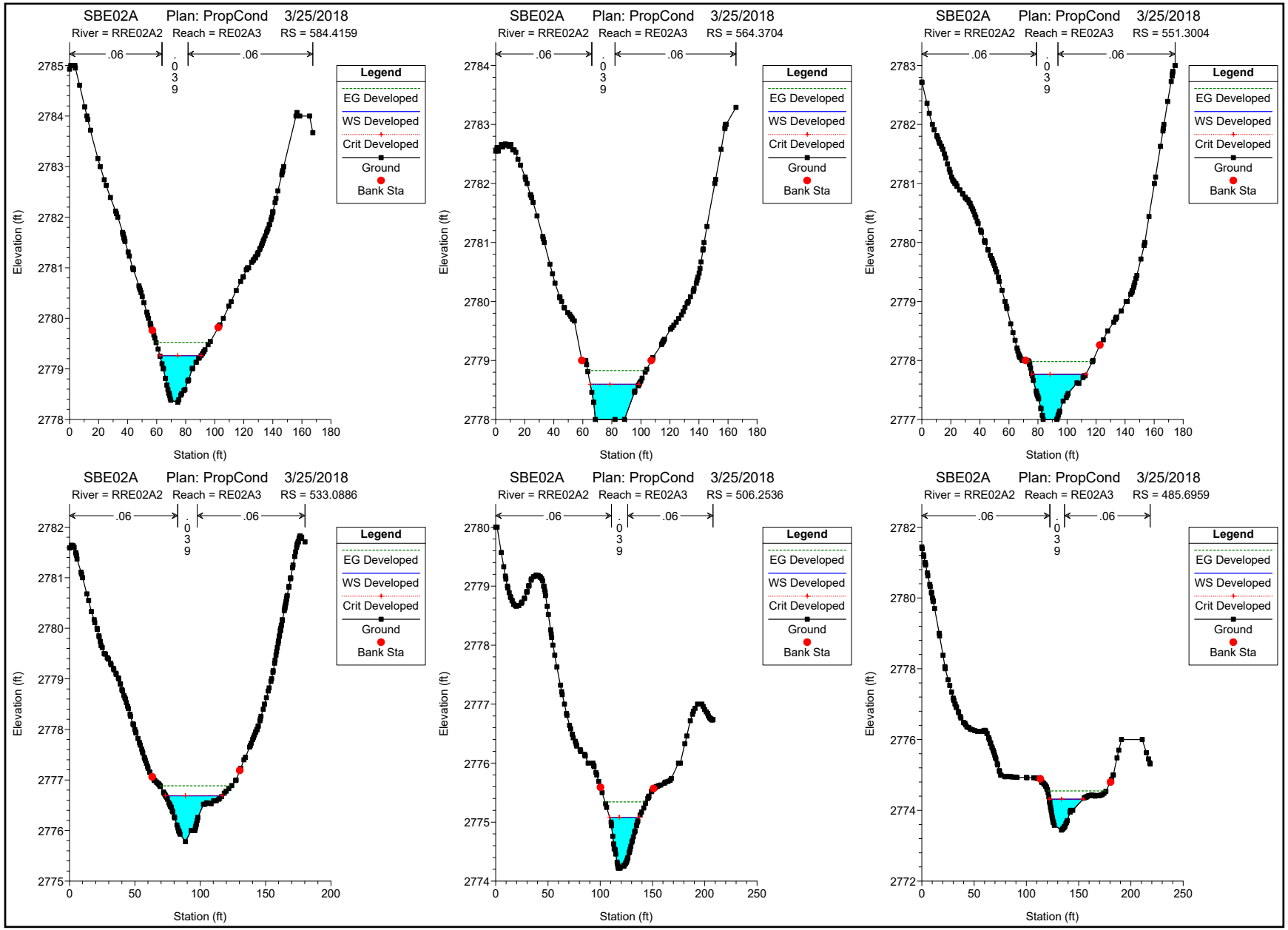
.039
.06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)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River = RRE02A2 Reach = RE02A3 RS = 533.0886
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River = RRE02A2 Reach = RE02A3 RS = 506.2536
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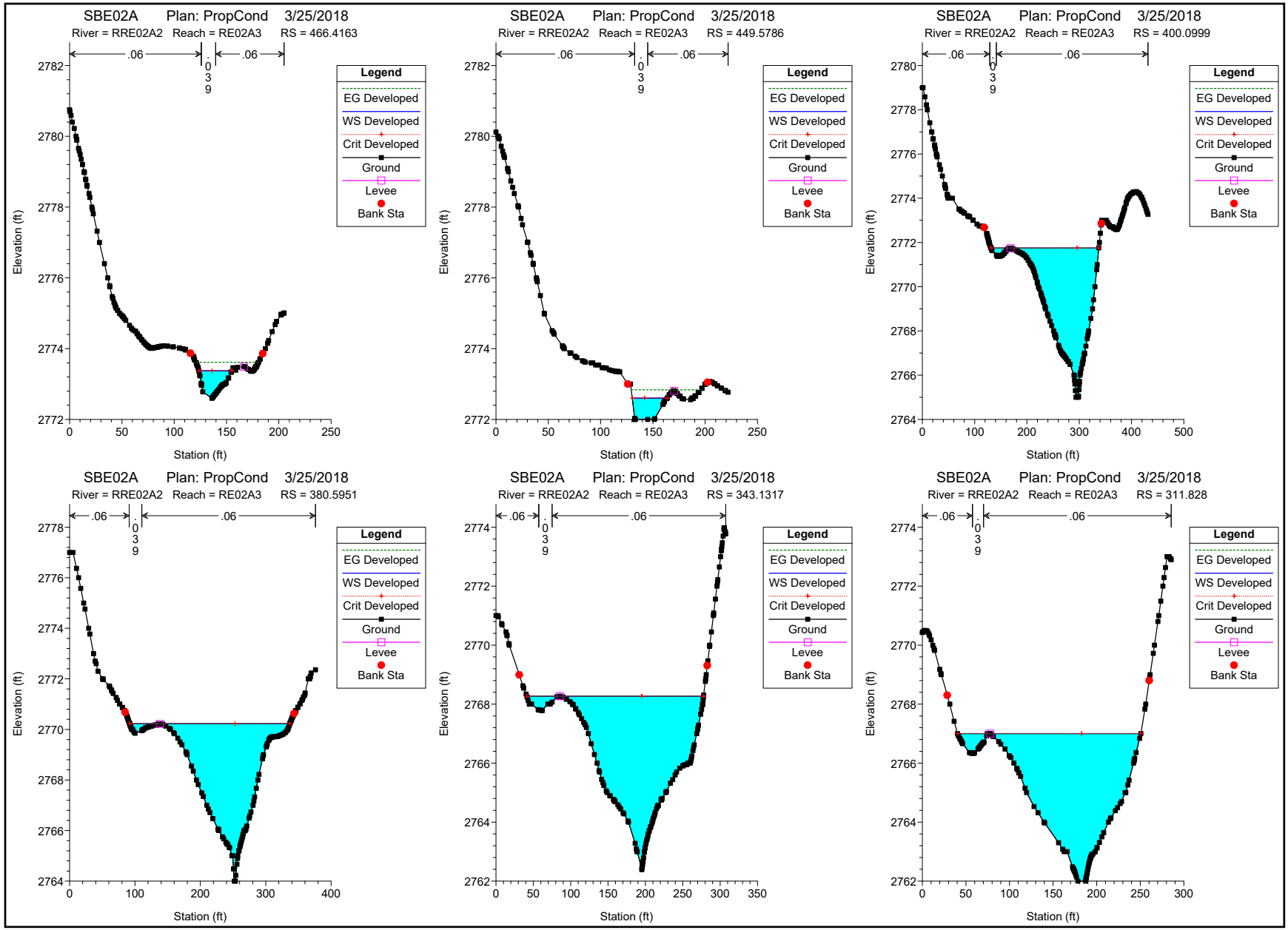
River = RRE02A2 Reach = RE02A3 RS = 485.6959
.06
.039
.06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)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River = RRE02A2 Reach = RE02A3 RS = 380.5951
SBE02A Plan: PropCond 3/25/2018
River = RRE02A2 Reach = RE02A3 RS = 343.1317
SBE02A Plan: PropCond 3/25/2018
River = RRE02A2 Reach = RE02A3 RS = 311.828
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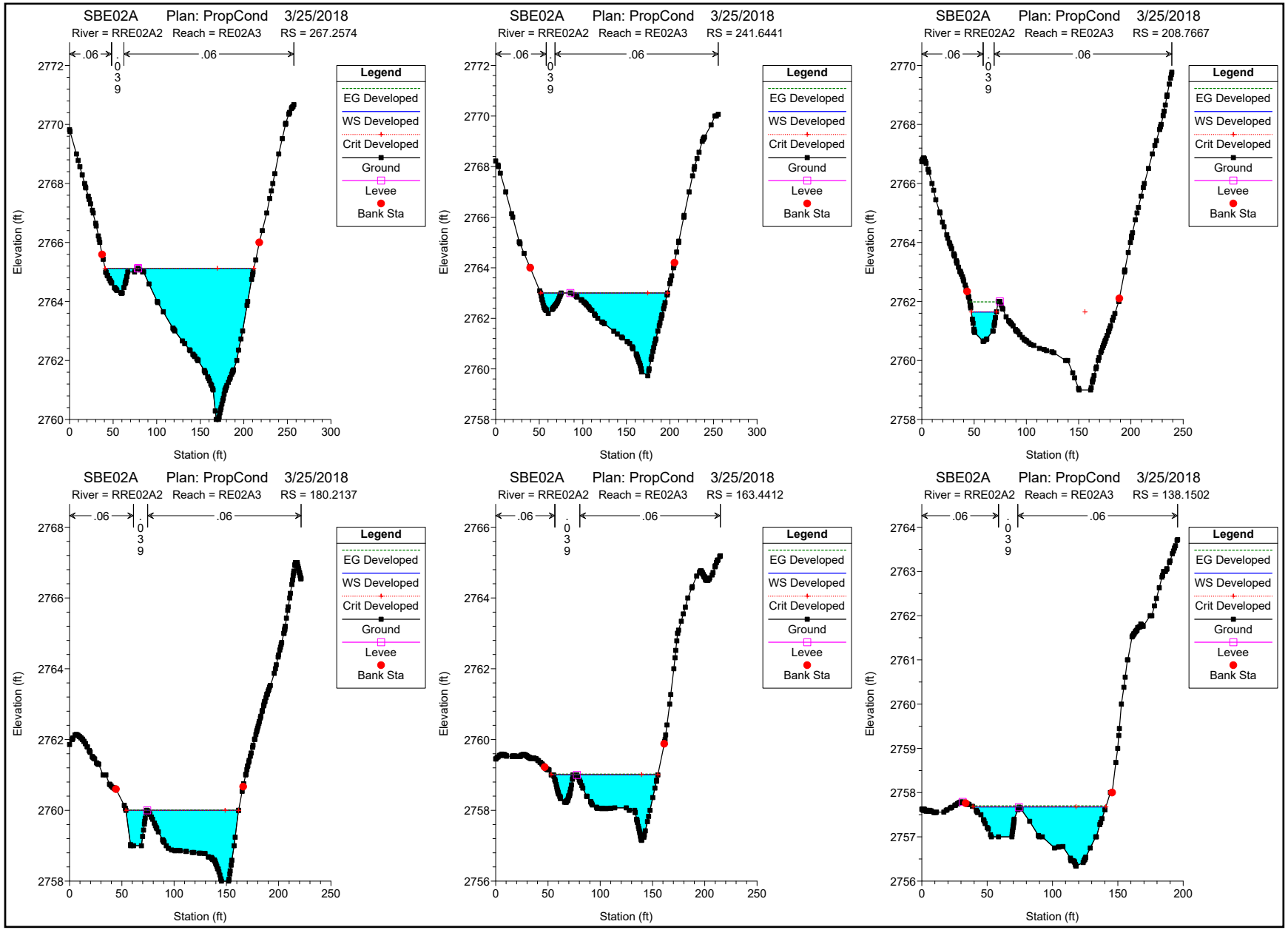
.039
Legend
EG Developed
WS Developed
Crit Developed
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)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River = RRE02A2 Reach = RE02A3 RS = 267.2574
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
SBE02A Plan: PropCond 3/25/2018
River = RRE02A2 Reach = RE02A3 RS = 241.6441
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
SBE02A Plan: PropCond 3/25/2018
River = RRE02A2 Reach = RE02A3 RS = 208.7667
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
SBE02A Plan: PropCond 3/25/2018
River = RRE02A2 Reach = RE02A3 RS = 180.2137
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
SBE02A Plan: PropCond 3/25/2018
River = RRE02A2 Reach = RE02A3 RS = 163.4412
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
SBE02A Plan: PropCond 3/25/2018
River = RRE02A2 Reach = RE02A3 RS = 138.1502
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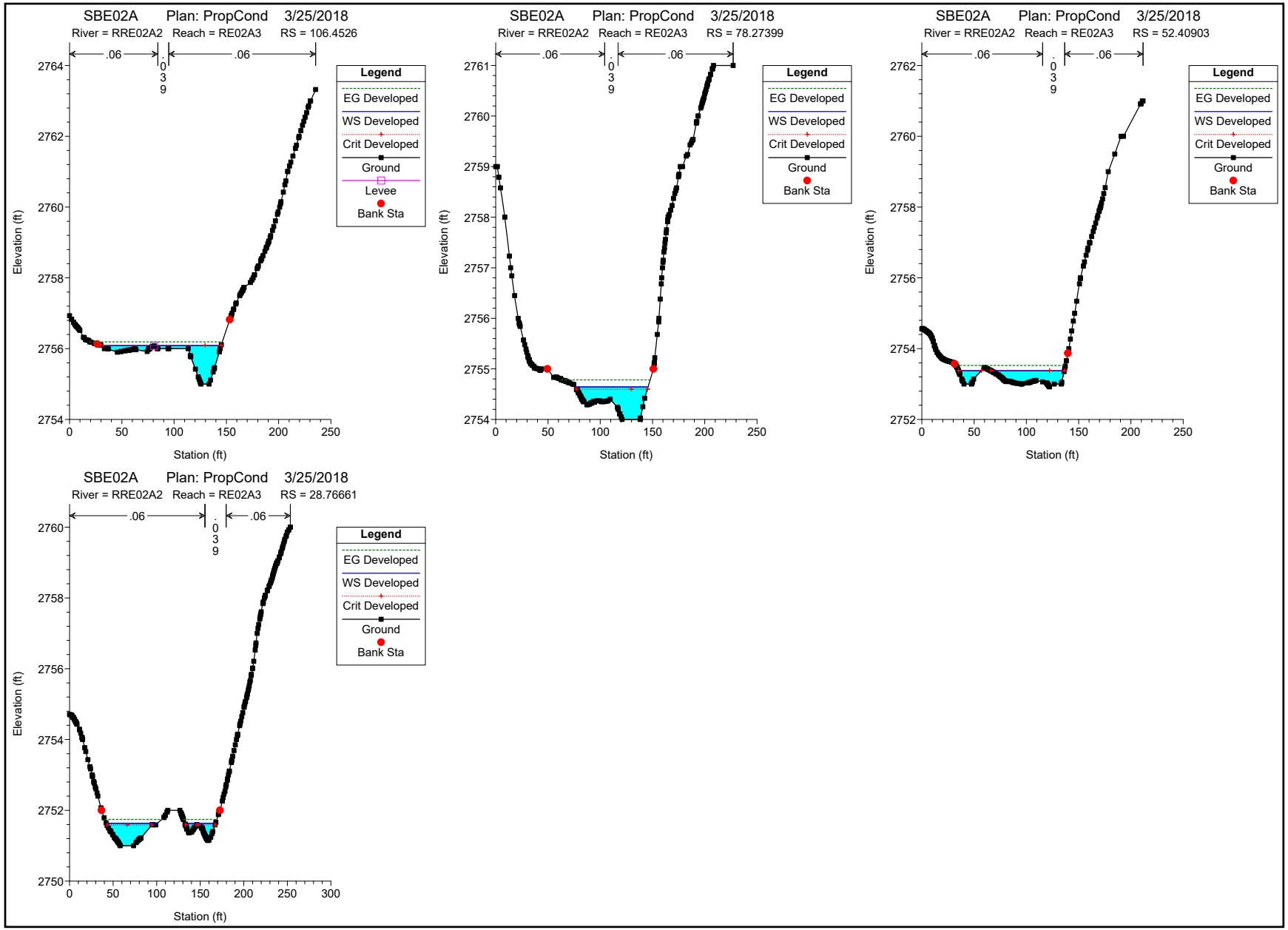
Legend
EG Developed
WS Developed
Crit Developed
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)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River = RRE02A2 Reach = RE02A3 RS = 106.4526
.06
.039
.06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
SBE02A Plan: PropCond 3/25/2018
River = RRE02A2 Reach = RE02A3 RS = 78.27399
.06
.039
.06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE02A Plan: PropCond 3/25/2018
River = RRE02A2 Reach = RE02A3 RS = 52.40903
.06
.039
.06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE02A Plan: PropCond 3/25/2018
River = RRE02A2 Reach = RE02A3 RS = 28.76661
.06
.039
.06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)

HEC-RAS Plan: PropCond River: RRE05A Reach: RE05A Profile: Developed

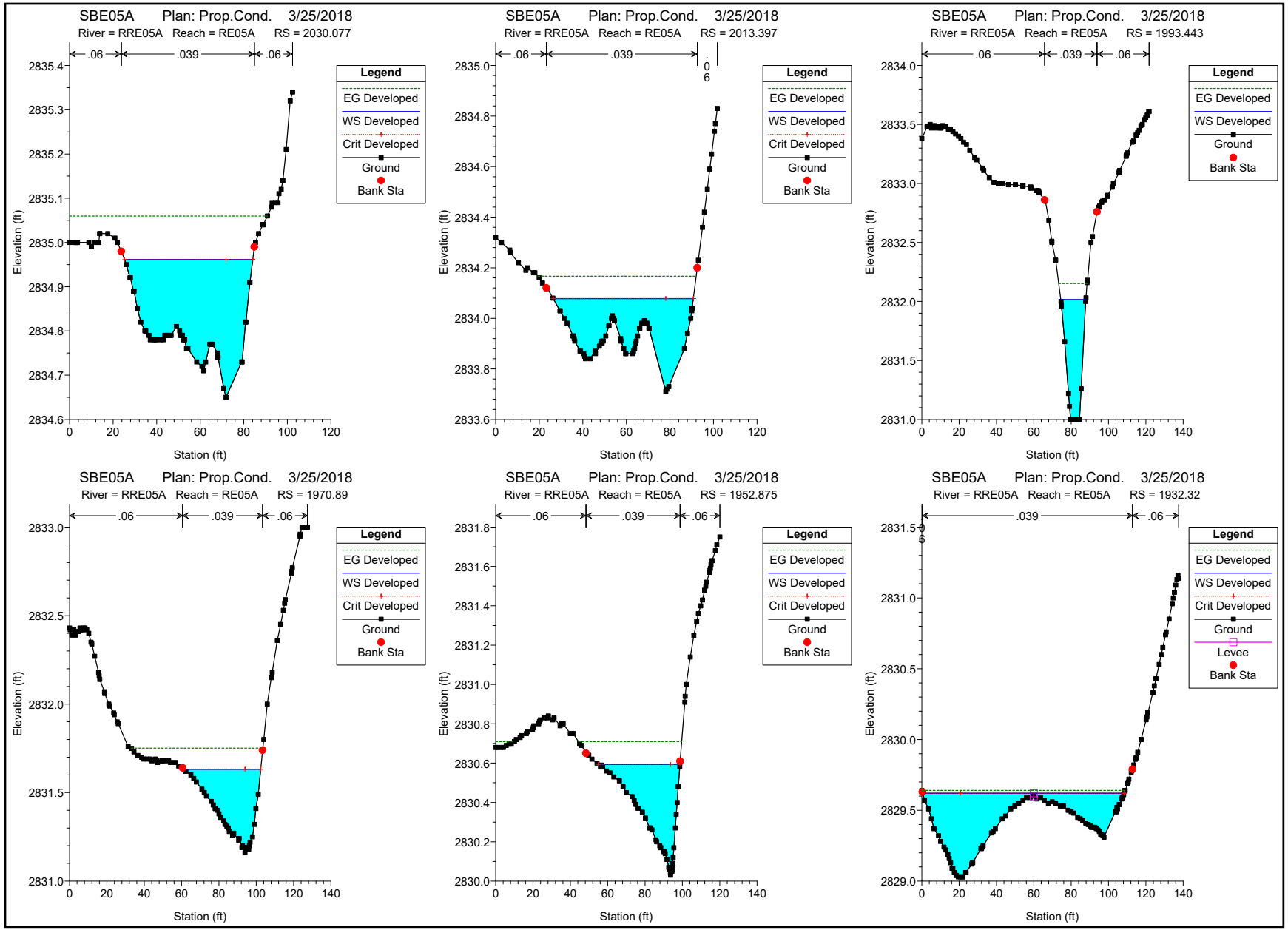
| Reach | River Sta | Profile | Q Total | Min Ch El | W.S. Elev | Crit W.S. | E.G. Elev | E.G. Slope | Vel Chnl | Flow Area | Top Width | Froude # Chl |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | (cfs) | (ft) | (ft) | (ft) | (ft) | (ft/ft) | (ft/s) | (sq ft) | (ft) | |
| RE05A | 2030.077 | Developed | 27.00 | 2834.65 | 2834.96 | 2834.96 | 2835.06 | 0.042256 | 2.52 | 10.73 | 58.87 | 1.04 |
| RE05A | 2013.397 | Developed | 27.00 | 2833.71 | 2834.08 | 2834.08 | 2834.17 | 0.040056 | 2.39 | 11.30 | 64.34 | 1.01 |
| RE05A | 1993.443 | Developed | 27.00 | 2831.00 | 2832.02 | | 2832.15 | 0.010368 | 2.96 | 9.12 | 13.42 | 0.63 |
| RE05A | 1970.89 | Developed | 27.00 | 2831.16 | 2831.63 | 2831.63 | 2831.75 | 0.036063 | 2.77 | 9.75 | 41.18 | 1.00 |
| RE05A | 1952.875 | Developed | 27.00 | 2830.03 | 2830.59 | 2830.59 | 2830.71 | 0.037278 | 2.73 | 9.90 | 43.77 | 1.01 |
| RE05A | 1932.32 | Developed | 27.00 | 2829.03 | 2829.62 | 2829.62 | 2829.64 | 0.006515 | 1.13 | 23.95 | 107.83 | 0.42 |
| RE05A | 1914.318 | Developed | 27.00 | 2827.93 | 2828.61 | 2828.61 | 2828.63 | 0.004956 | 1.09 | 24.76 | 95.50 | 0.38 |
| RE05A | 1876.131 | Developed | 27.00 | 2827.08 | 2827.41 | 2827.41 | 2827.49 | 0.051438 | 2.24 | 12.08 | 91.72 | 1.09 |
| RE05A | 1856.087 | Developed | 27.00 | 2826.26 | 2826.50 | 2826.50 | 2826.57 | 0.041658 | 2.19 | 12.35 | 82.92 | 1.00 |
| RE05A | 1834.734 | Developed | 27.00 | 2824.78 | 2825.06 | 2825.06 | 2825.15 | 0.038755 | 2.43 | 11.09 | 59.95 | 1.00 |
| RE05A | 1812.881 | Developed | 27.00 | 2823.49 | 2823.82 | 2823.82 | 2823.93 | 0.040107 | 2.59 | 10.43 | 52.76 | 1.03 |
| RE05A | 1795.388 | Developed | 27.00 | 2822.65 | 2823.13 | 2823.13 | 2823.25 | 0.034611 | 2.76 | 9.78 | 40.26 | 0.99 |
| RE05A | 1786.057 | Developed | 27.00 | 2822.22 | 2822.72 | 2822.72 | 2822.84 | 0.033389 | 2.85 | 9.47 | 36.13 | 0.98 |
| RE05A | 1772.376 | Developed | 27.00 | 2821.56 | 2822.03 | 2822.03 | 2822.14 | 0.035261 | 2.70 | 10.01 | 43.21 | 0.99 |
| RE05A | 1753.942 | Developed | 27.00 | 2820.59 | 2821.14 | 2821.14 | 2821.23 | 0.038206 | 2.48 | 10.90 | 56.82 | 1.00 |
| RE05A | 1736.229 | Developed | 27.00 | 2819.34 | 2819.96 | 2819.96 | 2820.12 | 0.032362 | 3.19 | 8.47 | 26.62 | 1.00 |
| RE05A | 1721.935 | Developed | 27.00 | 2818.52 | 2819.34 | 2819.34 | 2819.47 | 0.039686 | 2.85 | 9.46 | 41.39 | 1.05 |
| RE05A | 1699.208 | Developed | 27.00 | 2816.00 | 2816.71 | 2816.71 | 2816.98 | 0.027749 | 4.13 | 6.53 | 12.23 | 1.00 |
| RE05A | 1677.488 | Developed | 27.00 | 2815.00 | 2815.71 | 2815.71 | 2815.96 | 0.028903 | 4.06 | 6.66 | 13.29 | 1.01 |
| RE05A | 1663.736 | Developed | 27.00 | 2814.00 | 2814.87 | 2814.87 | 2815.13 | 0.029261 | 4.15 | 6.51 | 12.67 | 1.02 |
| RE05A | 1646.829 | Developed | 27.00 | 2812.38 | 2813.54 | 2813.54 | 2813.86 | 0.027793 | 4.53 | 5.97 | 9.60 | 1.01 |
| RE05A | 1629.522 | Developed | 27.00 | 2811.72 | 2812.44 | 2812.44 | 2812.69 | 0.028353 | 4.01 | 6.73 | 13.49 | 1.00 |
| RE05A | 1612.588 | Developed | 27.00 | 2810.00 | 2811.09 | | 2811.29 | 0.017839 | 3.59 | 7.52 | 12.45 | 0.81 |
| RE05A | 1596.76 | Developed | 27.00 | 2810.00 | 2810.68 | 2810.68 | 2810.93 | 0.028546 | 4.02 | 6.72 | 13.49 | 1.00 |
| RE05A | 1581.033 | Developed | 27.00 | 2809.00 | 2809.95 | 2809.95 | 2810.22 | 0.028482 | 4.16 | 6.50 | 12.33 | 1.01 |
| RE05A | 1559.571 | Developed | 27.00 | 2808.32 | 2808.97 | 2808.97 | 2809.17 | 0.030346 | 3.58 | 7.55 | 19.04 | 1.00 |
| RE05A | 1540.258 | Developed | 27.00 | 2807.00 | 2807.73 | 2807.73 | 2807.96 | 0.029260 | 3.78 | 7.15 | 16.09 | 1.00 |
| RE05A | 1517.522 | Developed | 27.00 | 2806.00 | 2806.61 | 2806.61 | 2806.77 | 0.034915 | 3.17 | 8.51 | 28.51 | 1.02 |
| RE05A | 1500.326 | Developed | 27.00 | 2805.00 | 2805.70 | 2805.70 | 2805.94 | 0.025290 | 3.96 | 6.99 | 20.05 | 0.95 |
| RE05A | 1478.489 | Developed | 27.00 | 2803.39 | 2804.26 | 2804.26 | 2804.44 | 0.025681 | 3.61 | 8.85 | 25.76 | 0.94 |
| RE05A | 1455.882 | Developed | 27.00 | 2802.08 | 2803.18 | 2803.18 | 2803.46 | 0.028032 | 4.25 | 6.35 | 11.43 | 1.01 |
| RE05A | 1438.869 | Developed | 27.00 | 2801.82 | 2802.57 | 2802.57 | 2802.80 | 0.029192 | 3.78 | 7.15 | 16.01 | 1.00 |
| RE05A | 1420.858 | Developed | 27.00 | 2801.00 | 2801.61 | 2801.61 | 2801.82 | 0.029652 | 3.66 | 7.37 | 17.55 | 1.00 |
| RE05A | 1400 | Developed | 27.00 | 2800.00 | 2800.54 | 2800.54 | 2800.72 | 0.031223 | 3.43 | 7.87 | 21.60 | 1.00 |
| RE05A | 1382.409 | Developed | 27.00 | 2799.00 | 2799.60 | 2799.60 | 2799.81 | 0.028071 | 3.77 | 7.70 | 20.51 | 0.98 |
| RE05A | 1364.183 | Developed | 27.00 | 2798.00 | 2798.79 | 2798.79 | 2798.94 | 0.025325 | 3.13 | 9.69 | 41.11 | 0.90 |
| RE05A | 1347.634 | Developed | 27.00 | 2797.45 | 2798.00 | 2798.00 | 2798.10 | 0.026997 | 2.77 | 12.18 | 56.06 | 0.90 |
| RE05A | 1326.271 | Developed | 27.00 | 2796.39 | 2796.86 | 2796.86 | 2796.94 | 0.030314 | 2.68 | 13.89 | 68.32 | 0.93 |

HEC-RAS Plan: PropCond River: RRE05A Reach: RE05A Profile: Developed (Continued)

| Reach | River Sta | Profile | Q Total | Min Ch El | W.S. Elev | Crit W.S. | E.G. Elev | E.G. Slope | Vel Chnl | Flow Area | Top Width | Froude # Chl |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | (cfs) | (ft) | (ft) | (ft) | (ft) | (ft/ft) | (ft/s) | (sq ft) | (ft) | |
| RE05A | 1300.879 | Developed | 27.00 | 2795.00 | 2795.46 | 2795.46 | 2795.54 | 0.036097 | 2.29 | 11.79 | 66.28 | 0.96 |
| RE05A | 1278.891 | Developed | 27.00 | 2794.00 | 2794.43 | 2794.43 | 2794.54 | 0.037993 | 2.66 | 10.16 | 47.44 | 1.01 |
| RE05A | 1260.282 | Developed | 27.00 | 2793.00 | 2793.46 | 2793.46 | 2793.58 | 0.035232 | 2.77 | 9.75 | 40.42 | 0.99 |
| RE05A | 1240.093 | Developed | 27.00 | 2792.02 | 2792.49 | 2792.49 | 2792.60 | 0.036157 | 2.68 | 10.07 | 44.65 | 1.00 |
| RE05A | 1219.81 | Developed | 27.00 | 2791.12 | 2791.61 | 2791.61 | 2791.72 | 0.035480 | 2.71 | 9.97 | 42.99 | 0.99 |
| RE05A | 1196.936 | Developed | 27.00 | 2790.18 | 2790.60 | 2790.60 | 2790.69 | 0.037053 | 2.51 | 10.74 | 53.46 | 0.99 |
| RE05A | 1182.851 | Developed | 27.00 | 2787.00 | 2789.83 | 2789.83 | 2789.83 | 0.000019 | 0.17 | 156.51 | 149.37 | 0.03 |
| RE05A | 1160.708 | Developed | 27.00 | 2786.63 | 2788.51 | 2788.51 | 2788.51 | 0.000053 | 0.24 | 114.77 | 145.77 | 0.05 |
| RE05A | 1137.745 | Developed | 27.00 | 2785.80 | 2787.15 | 2787.15 | 2787.15 | 0.000190 | 0.36 | 75.82 | 135.65 | 0.08 |
| RE05A | 1119.686 | Developed | 27.00 | 2785.23 | 2786.02 | 2786.02 | 2786.03 | 0.003478 | 0.92 | 29.21 | 110.66 | 0.32 |
| RE05A | 1092.72 | Developed | 27.00 | 2784.45 | 2784.68 | 2784.68 | 2784.76 | 0.043784 | 2.33 | 11.57 | 73.02 | 1.03 |
| RE05A | 1072.903 | Developed | 27.00 | 2783.24 | 2783.50 | 2783.50 | 2783.60 | 0.039821 | 2.47 | 10.92 | 58.81 | 1.01 |
| RE05A | 1053.457 | Developed | 27.00 | 2782.14 | 2782.44 | 2782.44 | 2782.54 | 0.037575 | 2.58 | 10.49 | 50.92 | 1.00 |
| RE05A | 1032.514 | Developed | 27.00 | 2780.76 | 2781.22 | 2781.22 | 2781.35 | 0.034631 | 2.85 | 9.48 | 37.17 | 0.99 |
| RE05A | 1017.779 | Developed | 21.00 | 2780.00 | 2780.40 | 2780.40 | 2780.53 | 0.034251 | 2.98 | 7.04 | 25.52 | 1.00 |
| RE05A | 997.6763 | Developed | 21.00 | 2779.33 | 2779.67 | 2779.67 | 2779.80 | 0.034968 | 2.86 | 7.35 | 28.94 | 1.00 |
| RE05A | 976.6082 | Developed | 21.00 | 2778.35 | 2778.80 | 2778.80 | 2778.93 | 0.034199 | 2.92 | 7.20 | 27.03 | 1.00 |
| RE05A | 960.0924 | Developed | 21.00 | 2777.70 | 2778.08 | 2778.08 | 2778.21 | 0.034575 | 2.88 | 7.28 | 28.01 | 1.00 |
| RE05A | 941.7241 | Developed | 21.00 | 2776.89 | 2777.29 | 2777.29 | 2777.42 | 0.034367 | 2.94 | 7.15 | 26.61 | 1.00 |
| RE05A | 922.4426 | Developed | 21.00 | 2775.73 | 2776.06 | 2776.06 | 2776.18 | 0.038946 | 2.74 | 7.66 | 34.75 | 1.03 |
| RE05A | 899.1575 | Developed | 21.00 | 2774.50 | 2774.84 | 2774.84 | 2774.95 | 0.037088 | 2.64 | 7.95 | 36.80 | 1.00 |
| RE05A | 880.3698 | Developed | 21.00 | 2773.58 | 2773.89 | 2773.89 | 2774.00 | 0.036987 | 2.66 | 7.89 | 35.98 | 1.00 |
| RE05A | 859.8353 | Developed | 21.00 | 2772.67 | 2773.07 | 2773.07 | 2773.19 | 0.037204 | 2.71 | 7.75 | 34.64 | 1.01 |
| RE05A | 840.9258 | Developed | 21.00 | 2771.83 | 2772.19 | 2772.19 | 2772.27 | 0.036126 | 2.27 | 9.27 | 52.92 | 0.95 |
| RE05A | 824.8497 | Developed | 21.00 | 2771.00 | 2771.27 | 2771.27 | 2771.35 | 0.039637 | 2.31 | 9.07 | 53.80 | 0.99 |
| RE05A | 802.7906 | Developed | 21.00 | 2769.66 | 2770.04 | 2770.04 | 2770.13 | 0.033775 | 2.34 | 8.97 | 46.33 | 0.94 |
| RE05A | 781.2918 | Developed | 21.00 | 2768.73 | 2769.11 | 2769.11 | 2769.22 | 0.038824 | 2.64 | 7.94 | 37.97 | 1.02 |
| RE05A | 760.4289 | Developed | 21.00 | 2767.84 | 2768.27 | 2768.27 | 2768.40 | 0.034384 | 2.94 | 7.14 | 26.57 | 1.00 |
| RE05A | 738.1452 | Developed | 21.00 | 2767.00 | 2767.36 | 2767.36 | 2767.50 | 0.033618 | 3.01 | 6.97 | 24.58 | 1.00 |
| RE05A | 718.6221 | Developed | 21.00 | 2766.00 | 2766.40 | 2766.40 | 2766.55 | 0.033210 | 3.07 | 6.85 | 23.28 | 1.00 |
| RE05A | 699.2011 | Developed | 21.00 | 2765.00 | 2765.40 | 2765.40 | 2765.54 | 0.033216 | 3.08 | 6.82 | 23.06 | 1.00 |
| RE05A | 678.9603 | Developed | 21.00 | 2764.00 | 2764.42 | 2764.40 | 2764.56 | 0.027209 | 3.00 | 6.99 | 21.11 | 0.92 |
| RE05A | 655.1843 | Developed | 21.00 | 2763.20 | 2763.68 | 2763.68 | 2763.83 | 0.034365 | 3.05 | 6.89 | 24.27 | 1.01 |
| RE05A | 635.5899 | Developed | 21.00 | 2762.51 | 2762.92 | 2762.92 | 2763.06 | 0.034887 | 2.96 | 7.09 | 26.42 | 1.01 |
| RE05A | 617.7419 | Developed | 21.00 | 2761.54 | 2762.17 | 2762.17 | 2762.34 | 0.033702 | 3.26 | 6.44 | 20.18 | 1.02 |
| RE05A | 599.4559 | Developed | 21.00 | 2761.00 | 2761.43 | 2761.43 | 2761.61 | 0.031910 | 3.33 | 6.30 | 18.33 | 1.00 |
| RE05A | 574.9504 | Developed | 21.00 | 2759.99 | 2760.37 | 2760.37 | 2760.52 | 0.033213 | 3.08 | 6.82 | 23.03 | 1.00 |
| RE05A | 556.356 | Developed | 21.00 | 2759.00 | 2759.42 | 2759.42 | 2759.57 | 0.032606 | 3.15 | 6.67 | 21.49 | 1.00 |

HEC-RAS Plan: PropCond River: RRE05A Reach: RE05A Profile: Developed (Continued)

| Reach | River Sta | Profile | Q Total | Min Ch El | W.S. Elev | Crit W.S. | E.G. Elev | E.G. Slope | Vel Chnl | Flow Area | Top Width | Froude # Chl |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | (cfs) | (ft) | (ft) | (ft) | (ft) | (ft/ft) | (ft/s) | (sq ft) | (ft) | |
| RE05A | 542.4001 | Developed | 21.00 | 2758.40 | 2758.85 | 2758.85 | 2758.99 | 0.034881 | 3.03 | 6.93 | 24.93 | 1.01 |
| RE05A | 524.1107 | Developed | 21.00 | 2757.66 | 2758.13 | 2758.13 | 2758.27 | 0.034344 | 3.01 | 6.98 | 25.05 | 1.01 |
| RE05A | 506.3732 | Developed | 21.00 | 2756.98 | 2757.38 | 2757.38 | 2757.51 | 0.035027 | 2.85 | 7.37 | 29.11 | 1.00 |
| RE05A | 487.7664 | Developed | 21.00 | 2756.00 | 2756.29 | 2756.29 | 2756.41 | 0.035647 | 2.74 | 7.66 | 32.49 | 1.00 |
| RE05A | 465.2938 | Developed | 21.00 | 2754.81 | 2755.23 | 2755.21 | 2755.34 | 0.028253 | 2.63 | 7.99 | 30.37 | 0.90 |
| RE05A | 442.6021 | Developed | 21.00 | 2754.05 | 2754.51 | 2754.51 | 2754.64 | 0.034441 | 2.88 | 7.28 | 27.96 | 1.00 |
| RE05A | 415.7166 | Developed | 21.00 | 2753.00 | 2753.38 | 2753.38 | 2753.52 | 0.033292 | 3.04 | 6.92 | 23.94 | 1.00 |
| RE05A | 392.9352 | Developed | 21.00 | 2752.05 | 2752.45 | 2752.45 | 2752.57 | 0.035264 | 2.78 | 7.56 | 31.20 | 1.00 |
| RE05A | 372.6946 | Developed | 21.00 | 2751.00 | 2751.44 | 2751.44 | 2751.55 | 0.036526 | 2.70 | 7.79 | 34.51 | 1.00 |
| RE05A | 355.0608 | Developed | 21.00 | 2750.03 | 2750.58 | 2750.58 | 2750.68 | 0.038922 | 2.58 | 8.15 | 40.53 | 1.01 |
| RE05A | 338.2482 | Developed | 21.00 | 2749.00 | 2749.75 | 2749.75 | 2749.84 | 0.047306 | 2.49 | 8.42 | 50.92 | 1.08 |
| RE05A | 283.6252 | Developed | 78.00 | 2746.00 | 2747.72 | 2747.67 | 2748.01 | 0.021658 | 4.27 | 18.26 | 27.18 | 0.92 |
| RE05A | 263.5783 | Developed | 78.00 | 2746.00 | 2747.23 | 2747.23 | 2747.46 | 0.033170 | 3.78 | 20.62 | 51.03 | 1.05 |
| RE05A | 246.5995 | Developed | 78.00 | 2745.00 | 2746.44 | 2746.44 | 2746.68 | 0.026570 | 3.91 | 19.96 | 39.72 | 0.97 |
| RE05A | 223.052 | Developed | 78.00 | 2744.00 | 2745.50 | 2745.50 | 2745.77 | 0.027876 | 4.19 | 18.60 | 34.34 | 1.01 |
| RE05A | 200.9467 | Developed | 78.00 | 2744.00 | 2744.62 | 2744.62 | 2744.83 | 0.029842 | 3.73 | 20.92 | 48.68 | 1.00 |
| RE05A | 180.0231 | Developed | 78.00 | 2742.67 | 2743.95 | | 2744.14 | 0.013603 | 3.51 | 22.23 | 31.22 | 0.73 |
| RE05A | 162.1025 | Developed | 78.00 | 2742.81 | 2743.45 | 2743.45 | 2743.65 | 0.030437 | 3.66 | 21.32 | 52.18 | 1.01 |
| RE05A | 141.3555 | Developed | 78.00 | 2741.75 | 2742.77 | | 2742.90 | 0.009852 | 2.92 | 26.71 | 39.26 | 0.62 |
| RE05A | 126.5741 | Developed | 78.00 | 2741.50 | 2742.45 | 2742.40 | 2742.68 | 0.021508 | 3.85 | 20.28 | 35.45 | 0.90 |
| RE05A | 102.4123 | Developed | 78.00 | 2741.00 | 2741.81 | 2741.81 | 2742.09 | 0.027510 | 4.26 | 18.32 | 32.99 | 1.01 |
| RE05A | 81.78598 | Developed | 78.00 | 2740.00 | 2741.00 | 2741.00 | 2741.26 | 0.025809 | 4.10 | 19.00 | 34.46 | 0.97 |
| RE05A | 51.81187 | Developed | 78.00 | 2738.86 | 2739.76 | | 2739.88 | 0.008784 | 2.79 | 27.95 | 40.31 | 0.59 |
| RE05A | 27.80642 | Developed | 78.00 | 2738.00 | 2739.15 | 2739.15 | 2739.52 | 0.025404 | 4.86 | 16.06 | 22.20 | 1.01 |
| RE05A | 4.071425 | Developed | 78.00 | 2737.00 | 2738.29 | 2738.29 | 2738.69 | 0.024808 | 5.06 | 15.41 | 19.64 | 1.01 |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Crit Developed
Ground
Bank Sta
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Station (ft)
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WS Developed
Crit Developed
Ground
Bank Sta
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Station (ft)
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WS Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
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WS Developed
Crit Developed
Ground
Bank Sta
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Station (ft)
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Legend
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WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
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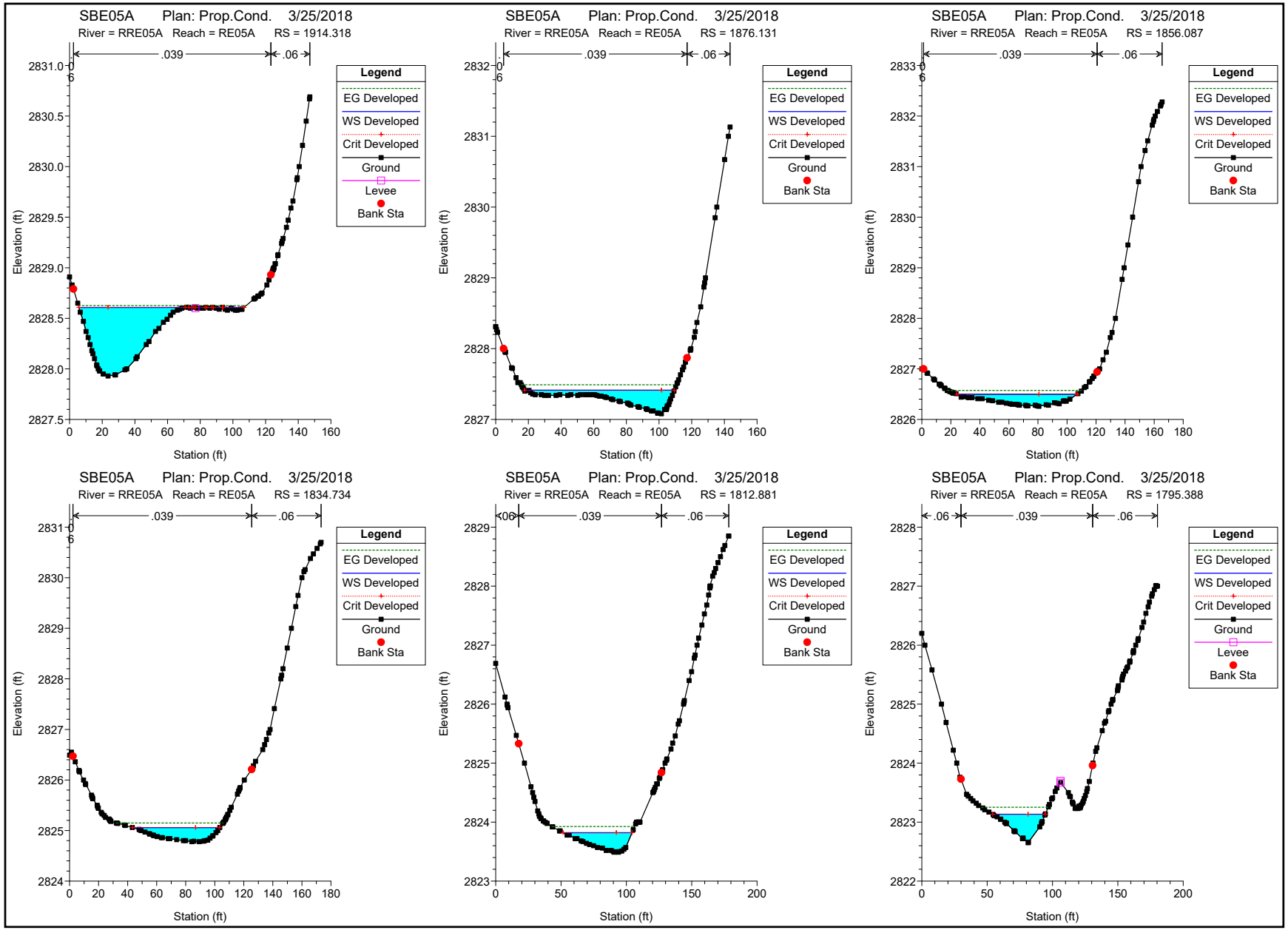
WS Developed
Crit Developed
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)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WS Developed
Crit Developed
Ground
Levee
Bank Sta
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Station (ft)
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Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
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River = RRE05A Reach = RE05A RS = 1856.087
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EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
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River = RRE05A Reach = RE05A RS = 1834.734
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WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
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River = RRE05A Reach = RE05A RS = 1812.881
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WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
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River = RRE05A Reach = RE05A RS = 1795.388
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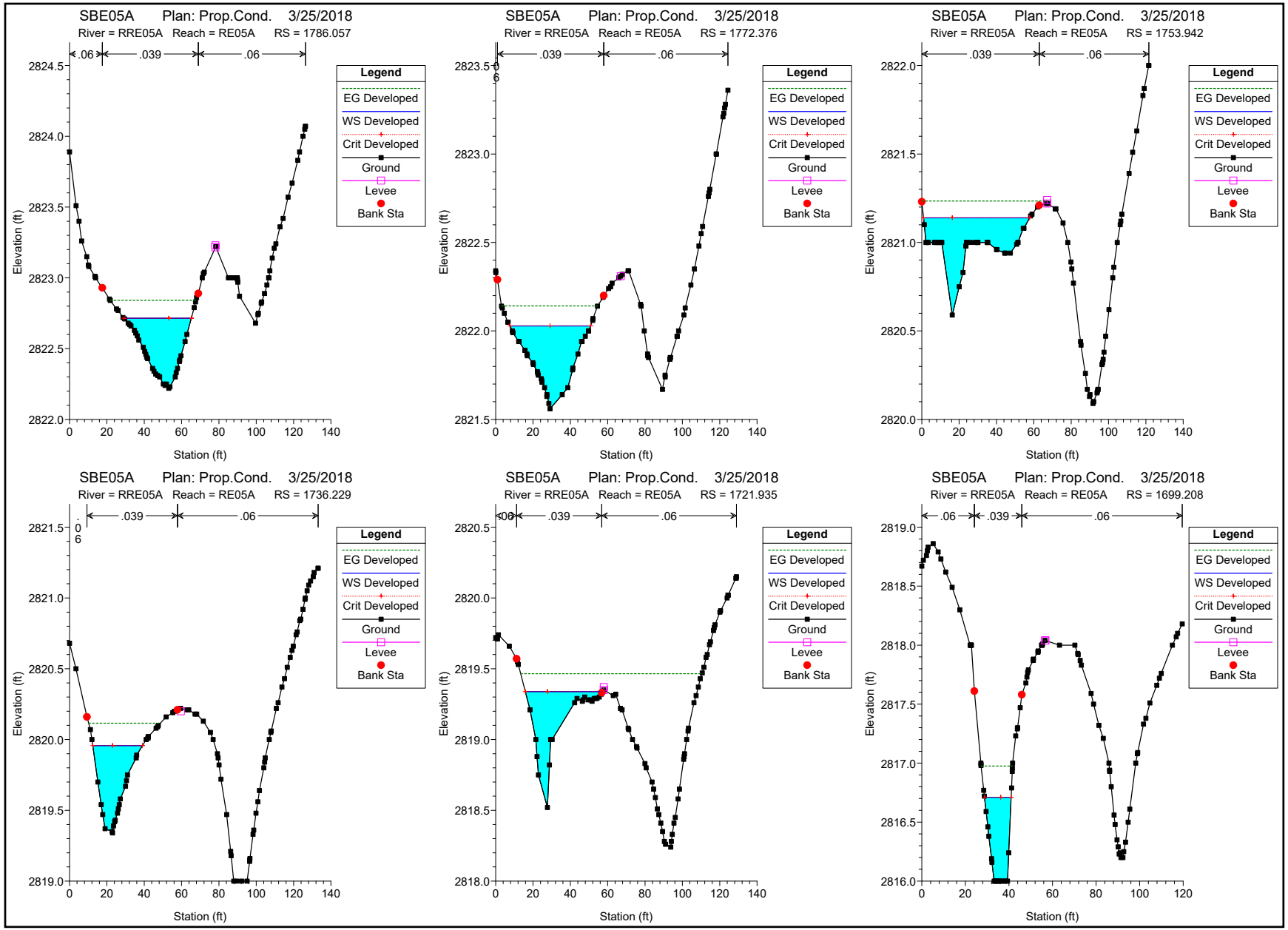
WS Developed
Crit Developed
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)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Crit Developed
Ground
Levee
Bank Sta
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Station (ft)
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Crit Developed
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
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EG Developed
WS Developed
Crit Developed
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
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River = RRE05A Reach = RE05A RS = 1736.229
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.06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
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River = RRE05A Reach = RE05A RS = 1721.935
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Legend
EG Developed
WS Developed
Crit Developed
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
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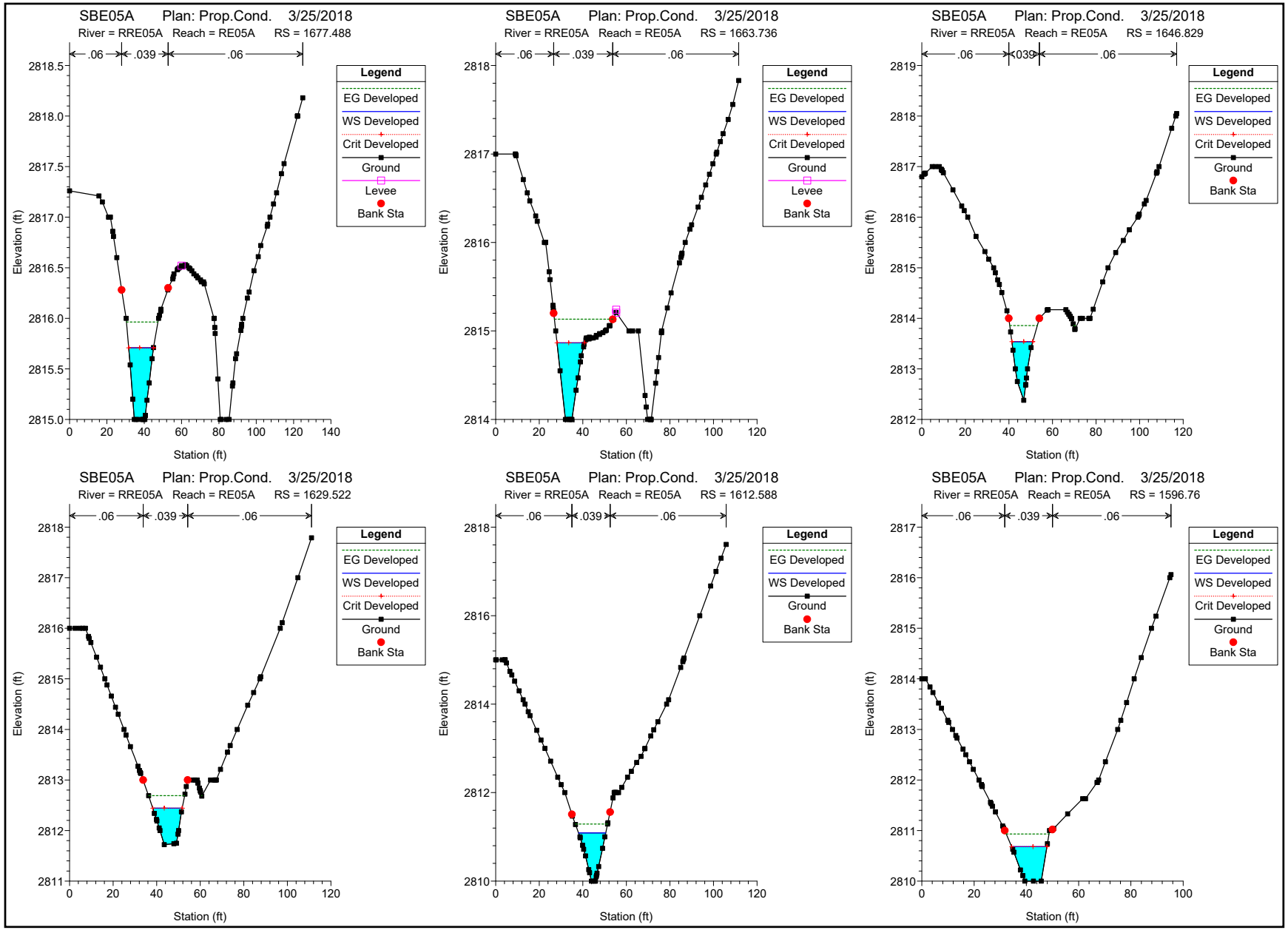
WS Developed
Crit Developed
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)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Crit Developed
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
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River = RRE05A Reach = RE05A RS = 1663.736
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Legend
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WS Developed
Crit Developed
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
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River = RRE05A Reach = RE05A RS = 1646.829
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Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
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River = RRE05A Reach = RE05A RS = 1629.522
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Legend
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WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
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River = RRE05A Reach = RE05A RS = 1612.588
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Legend
EG Developed
WS Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
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River = RRE05A Reach = RE05A RS = 1596.76
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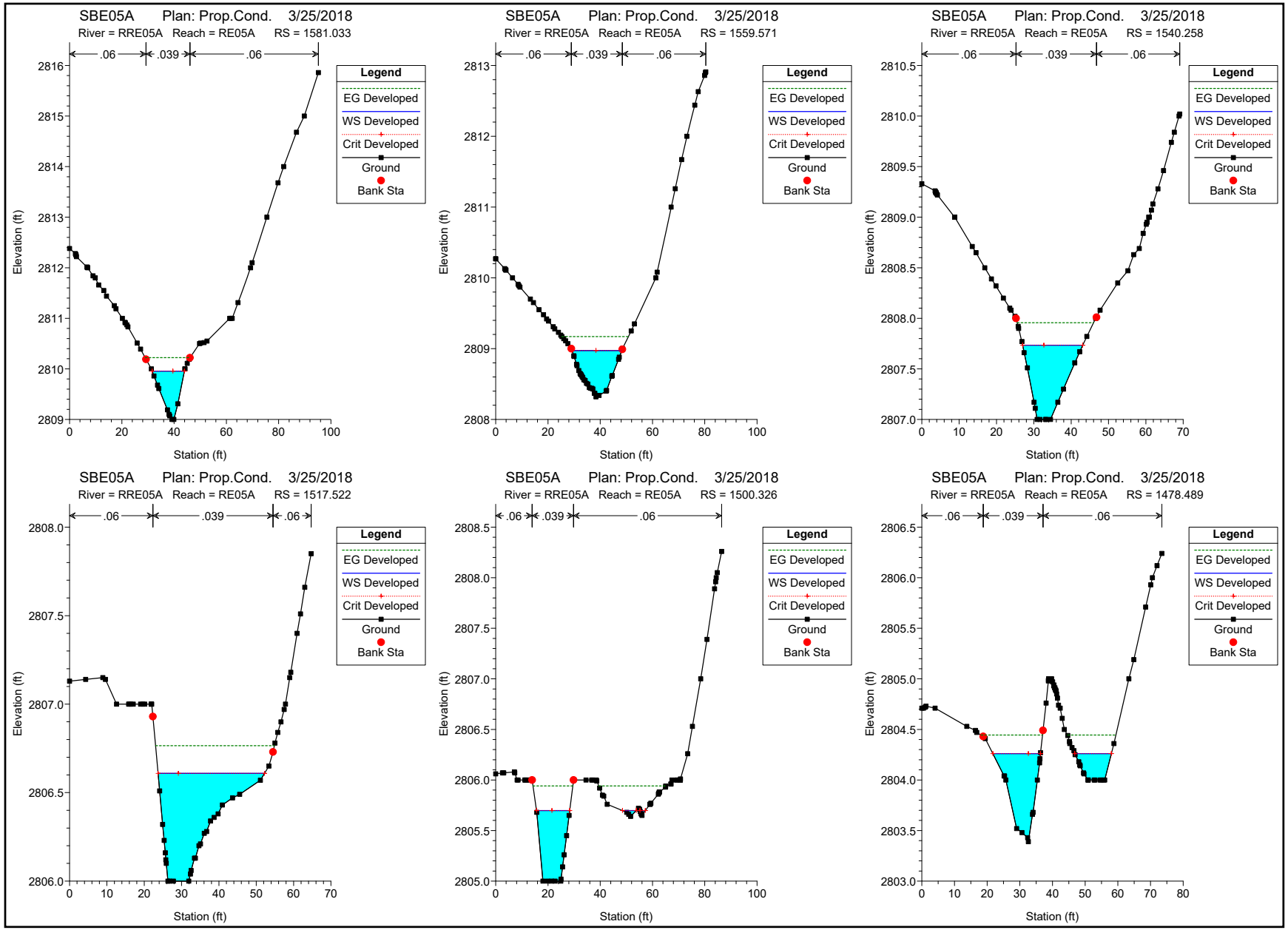
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)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Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
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Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
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River = RRE05A Reach = RE05A RS = 1540.258
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Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 1517.522
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Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 1500.326
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Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
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River = RRE05A Reach = RE05A RS = 1478.489
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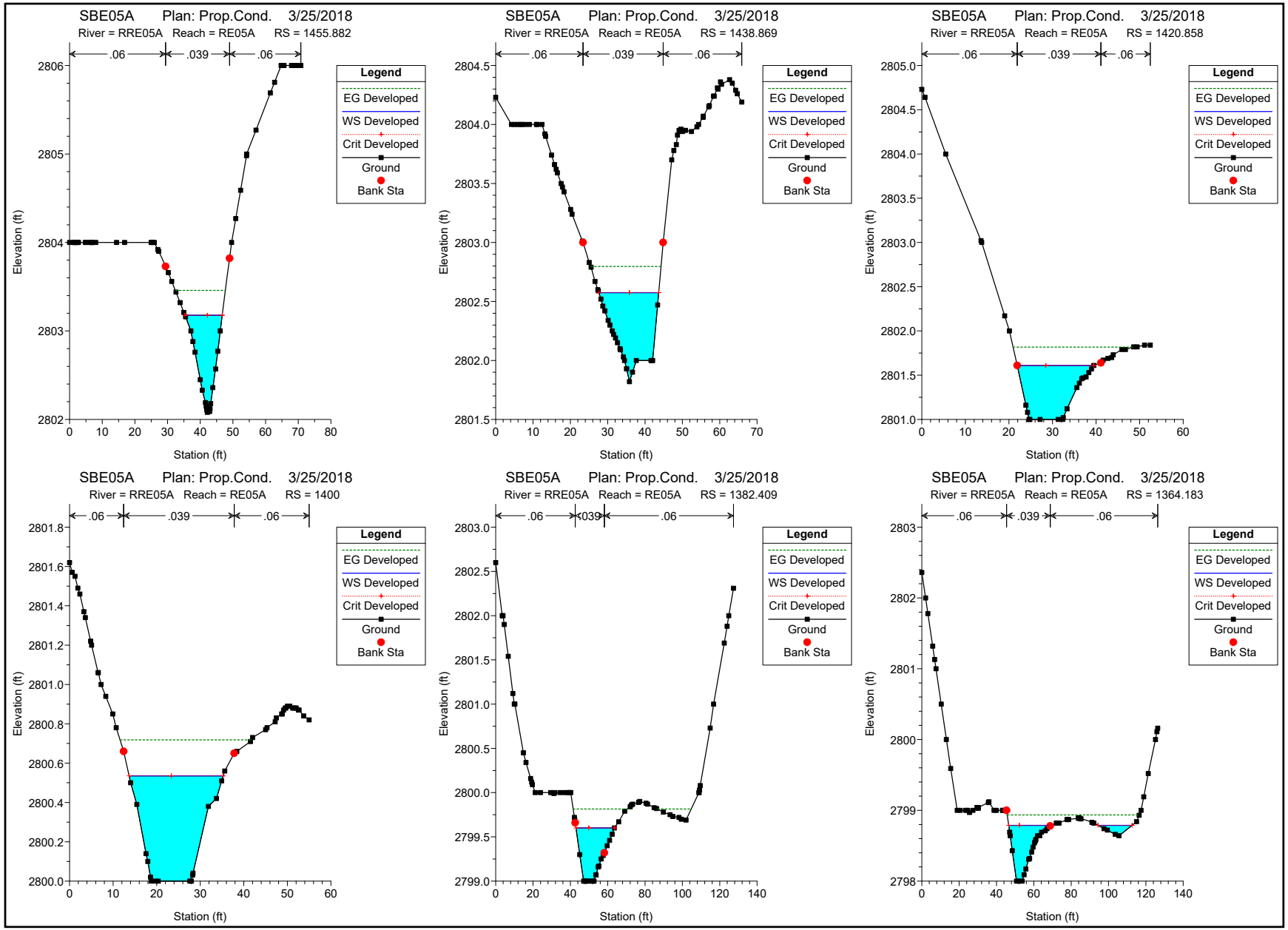
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)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WS Developed
Crit Developed
Ground
Bank Sta
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Station (ft)
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River = RRE05A Reach = RE05A RS = 1438.869
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WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
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River = RRE05A Reach = RE05A RS = 1420.858
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
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River = RRE05A Reach = RE05A RS = 1400
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
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River = RRE05A Reach = RE05A RS = 1382.409
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
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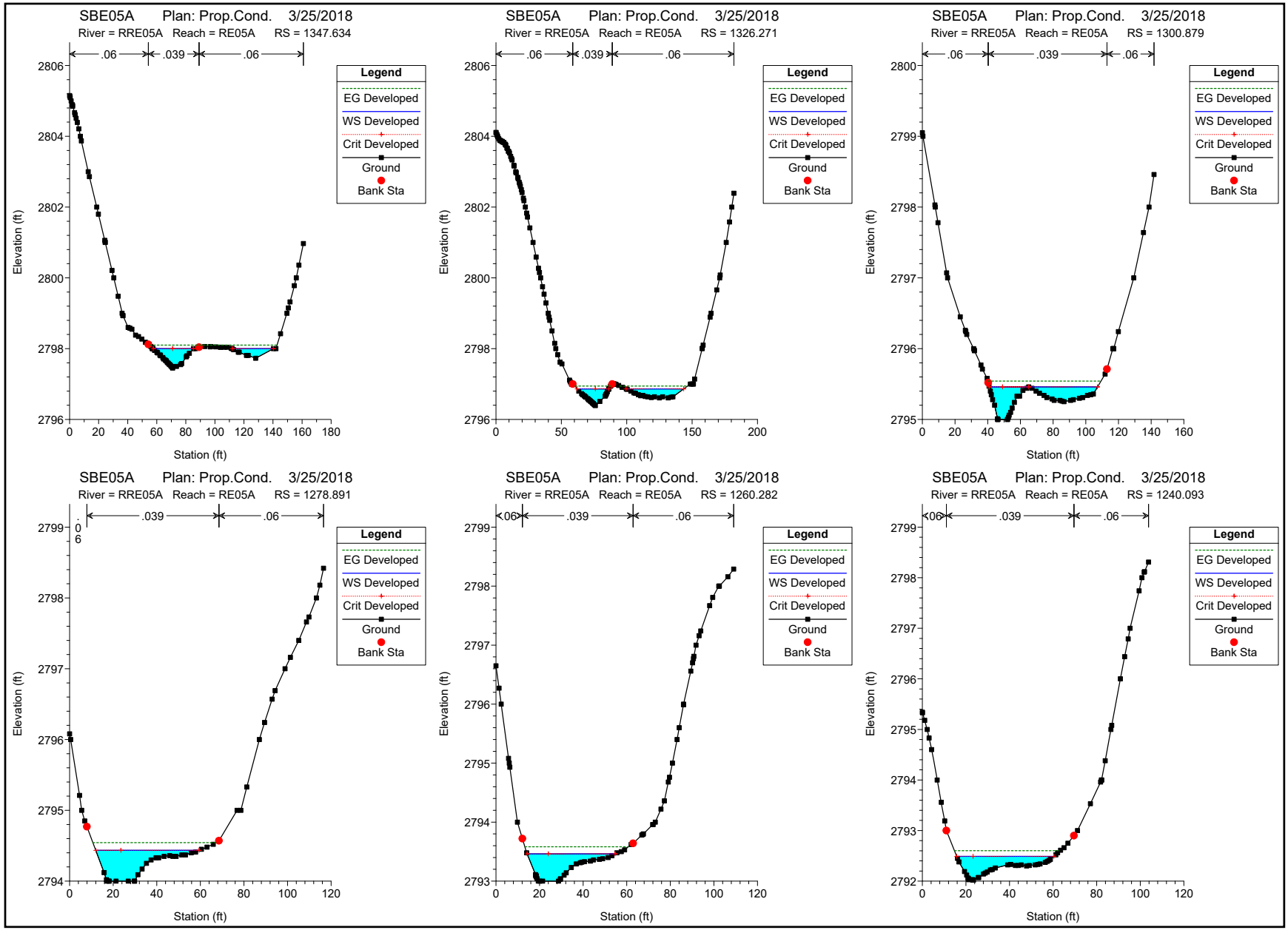
Station (ft)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Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
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River = RRE05A Reach = RE05A RS = 1326.271
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Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
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River = RRE05A Reach = RE05A RS = 1300.879
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Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
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River = RRE05A Reach = RE05A RS = 1278.891
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Legend
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WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
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River = RRE05A Reach = RE05A RS = 1260.282
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EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
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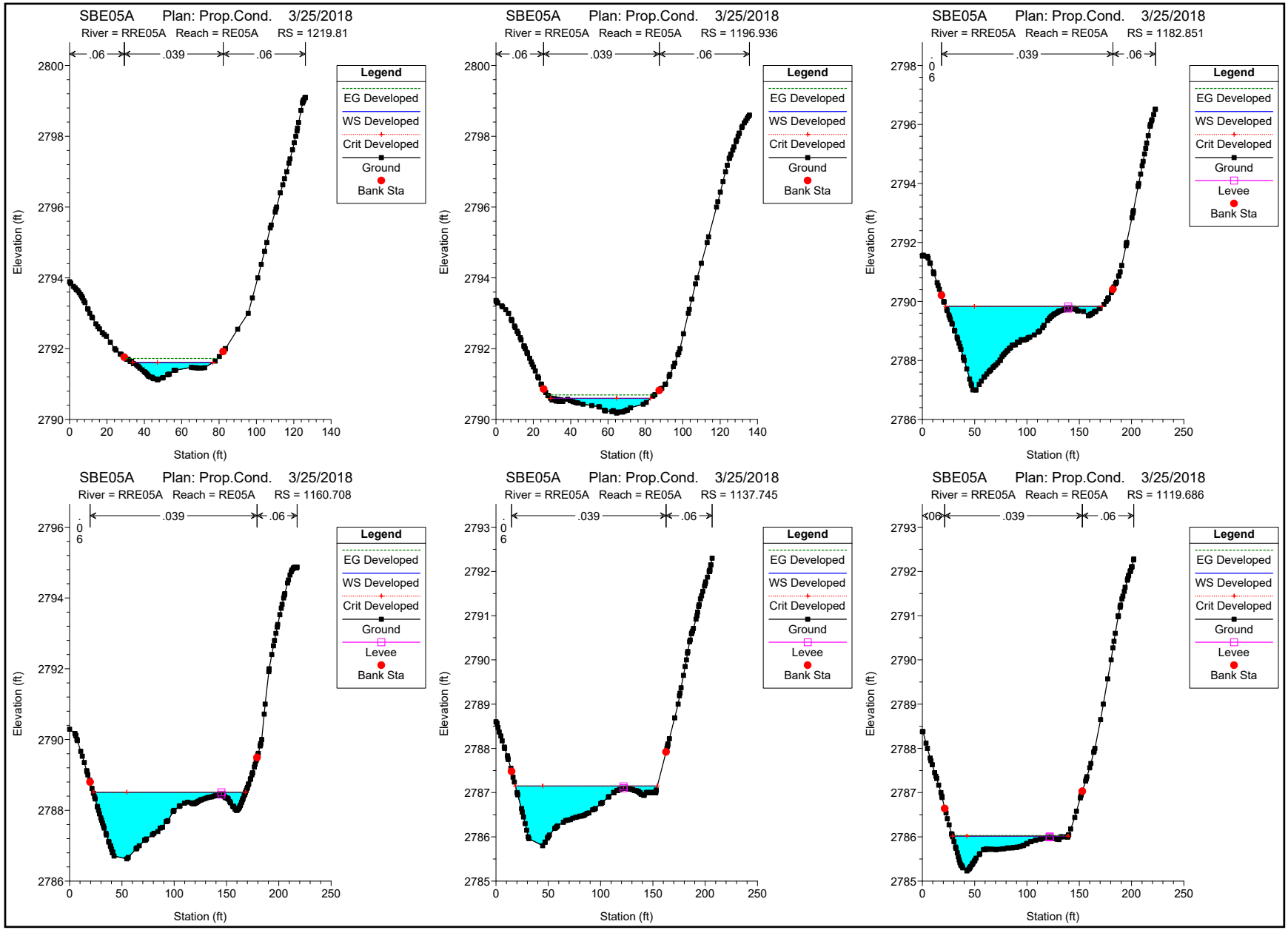
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Crit Developed
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Crit Developed
Ground
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Elevation (ft)
Station (ft)
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Crit Developed
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Bank Sta
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Station (ft)
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Crit Developed
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
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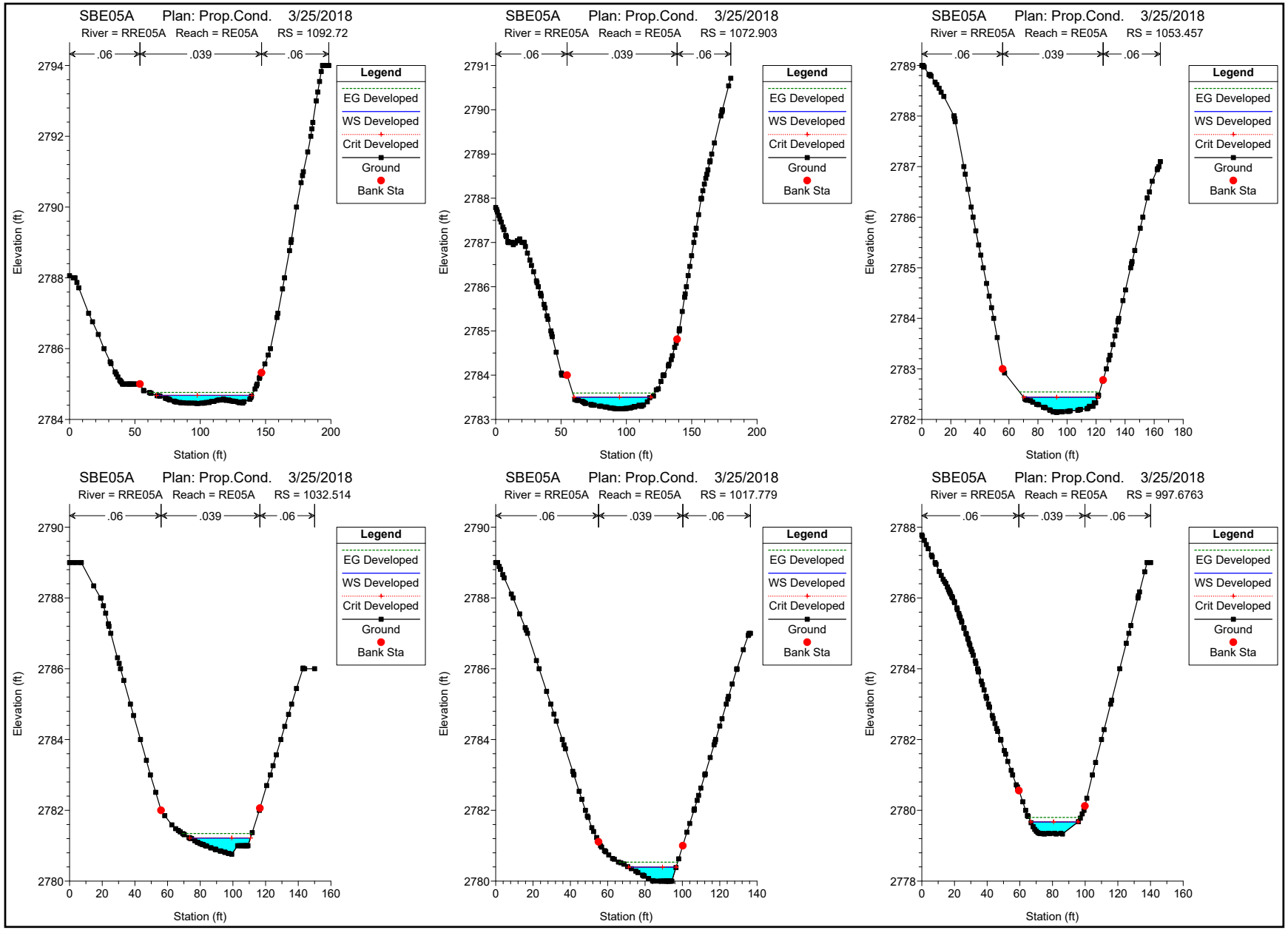
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Elevation (ft)
Station (ft)
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Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
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Elevation (ft)
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Crit Developed
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Bank Sta
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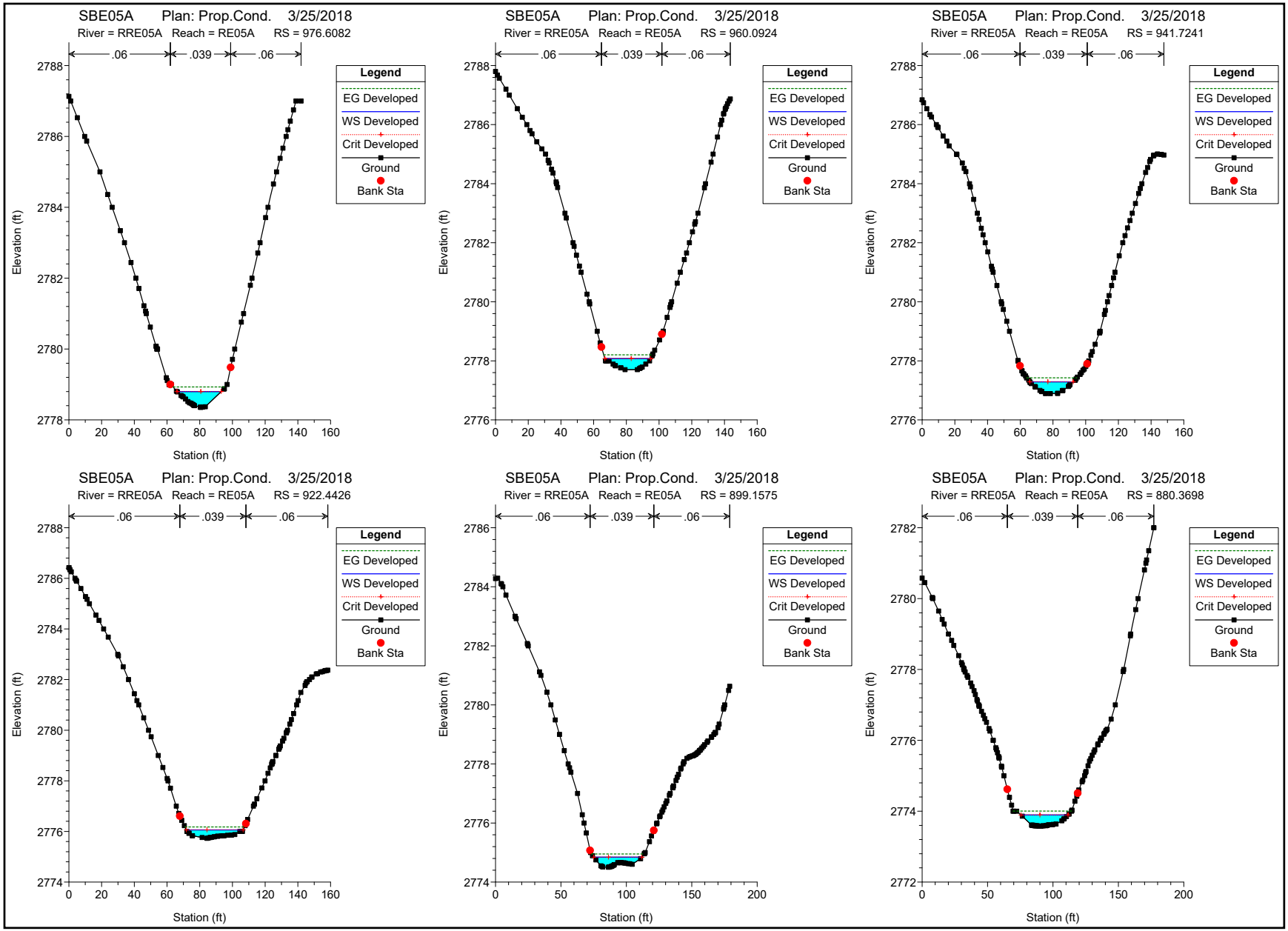
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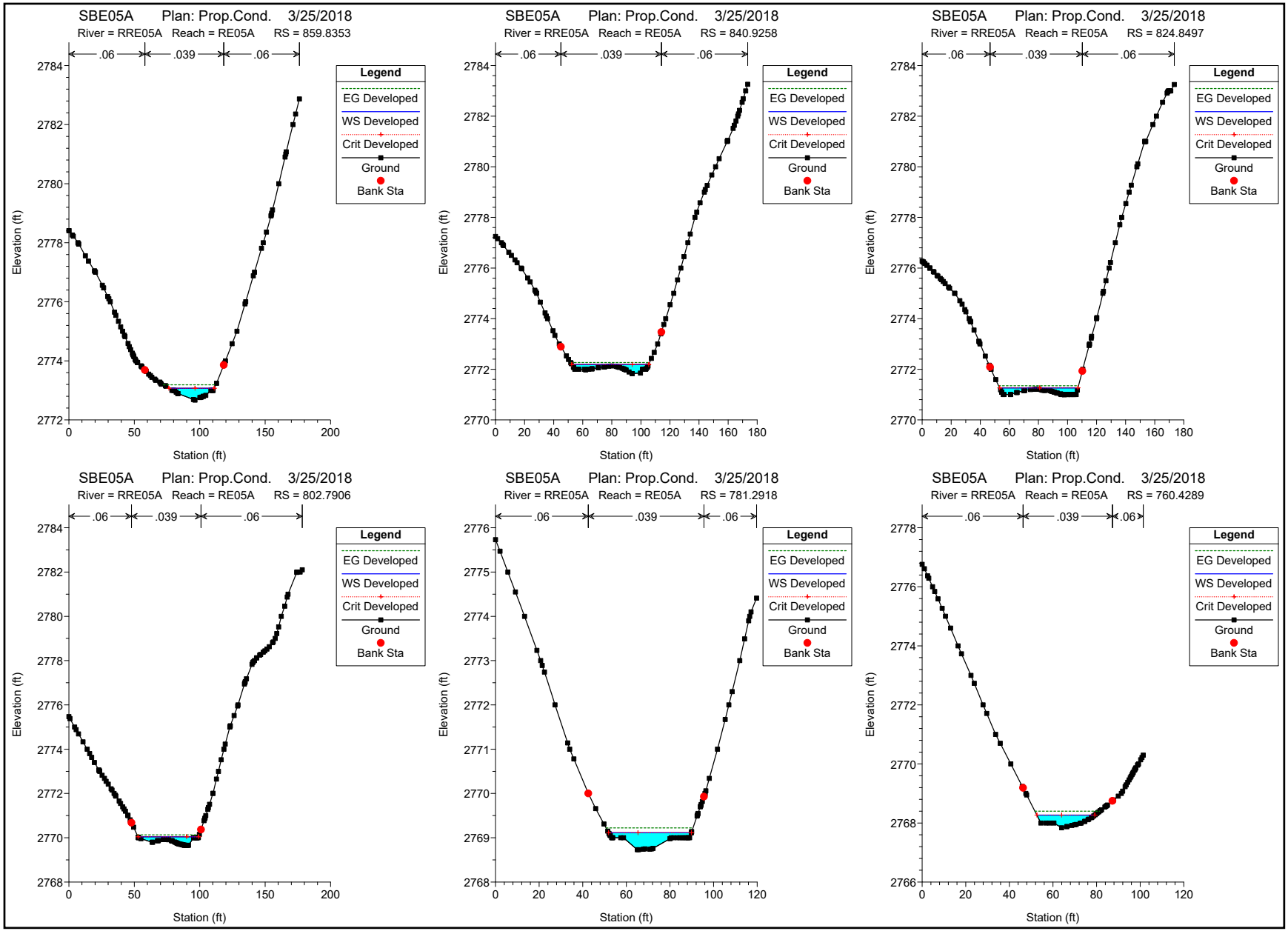
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Crit Developed
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Station (ft)
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Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
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River = RRE05A Reach = RE05A RS = 781.2918
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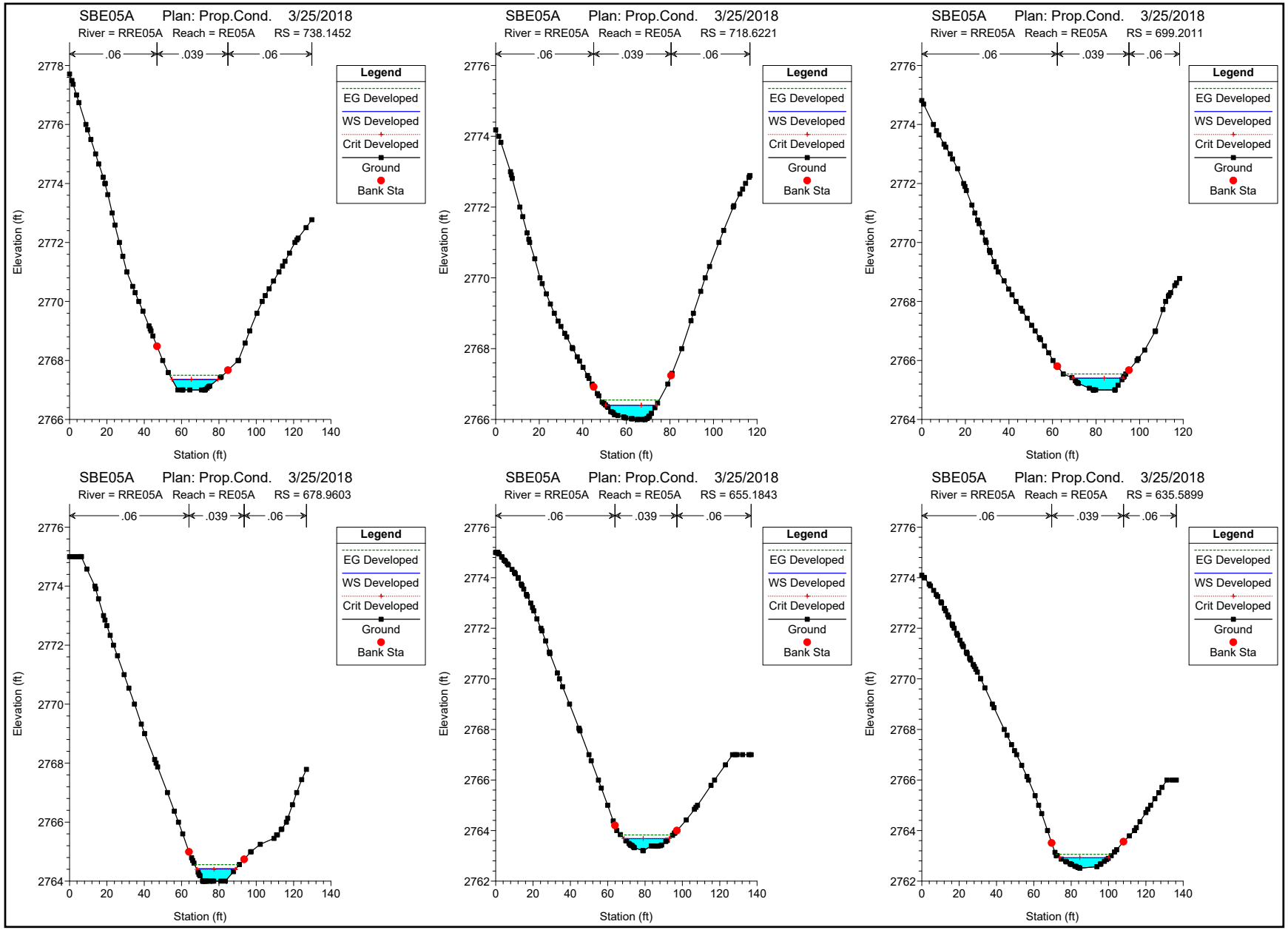
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Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
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Legend
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WS Developed
Crit Developed
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Bank Sta
Elevation (ft)
Station (ft)
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Legend
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WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
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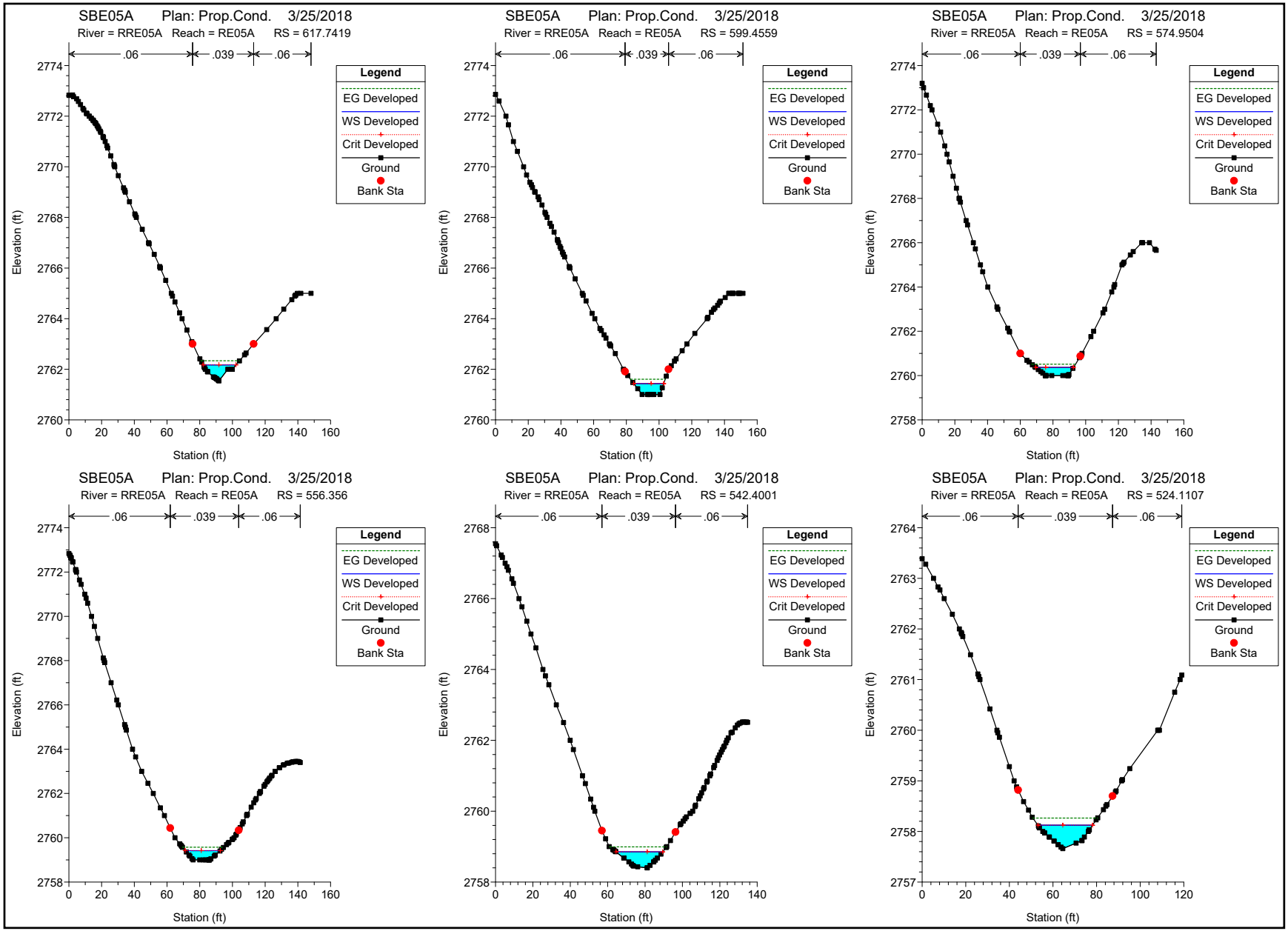
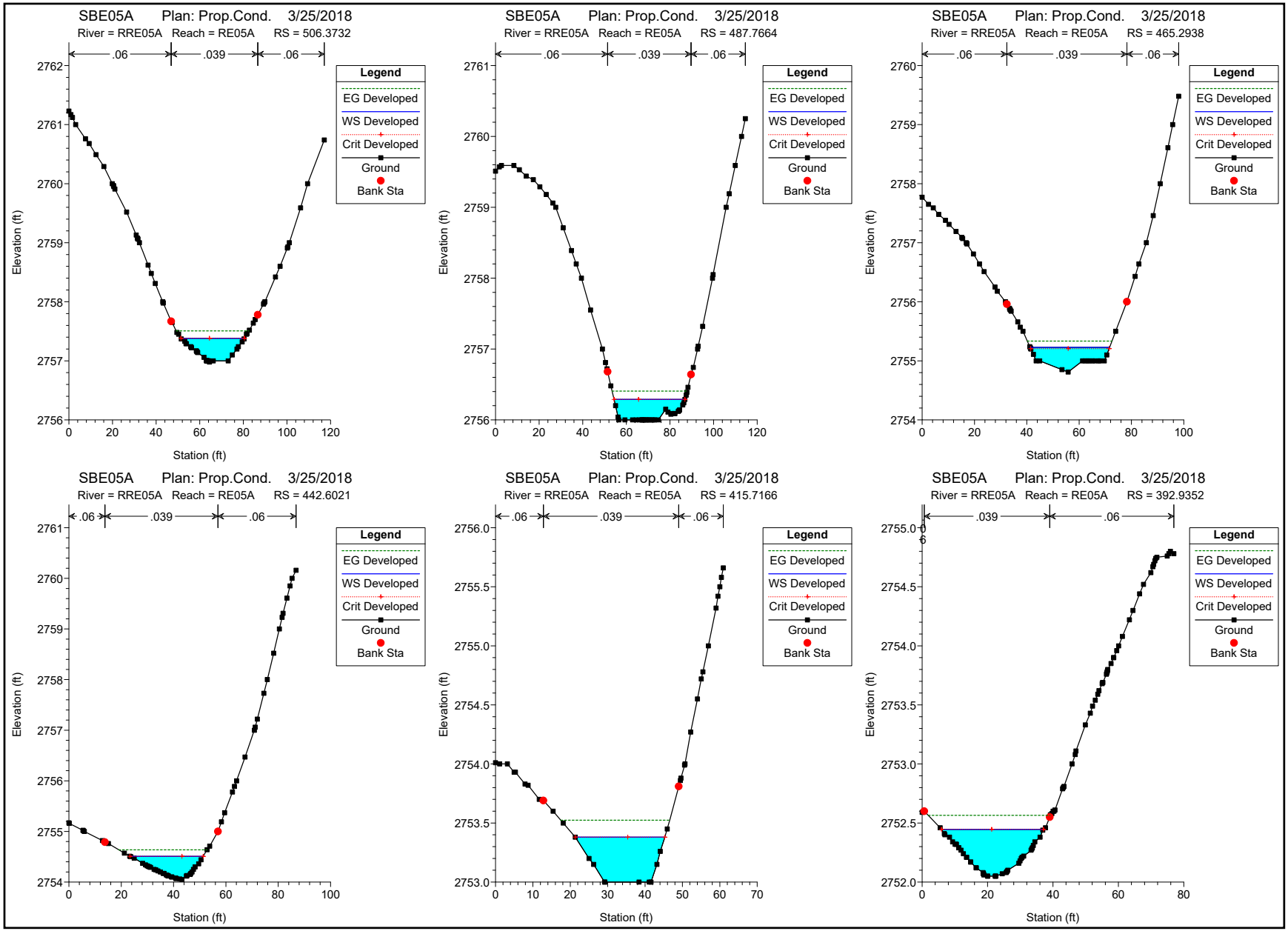
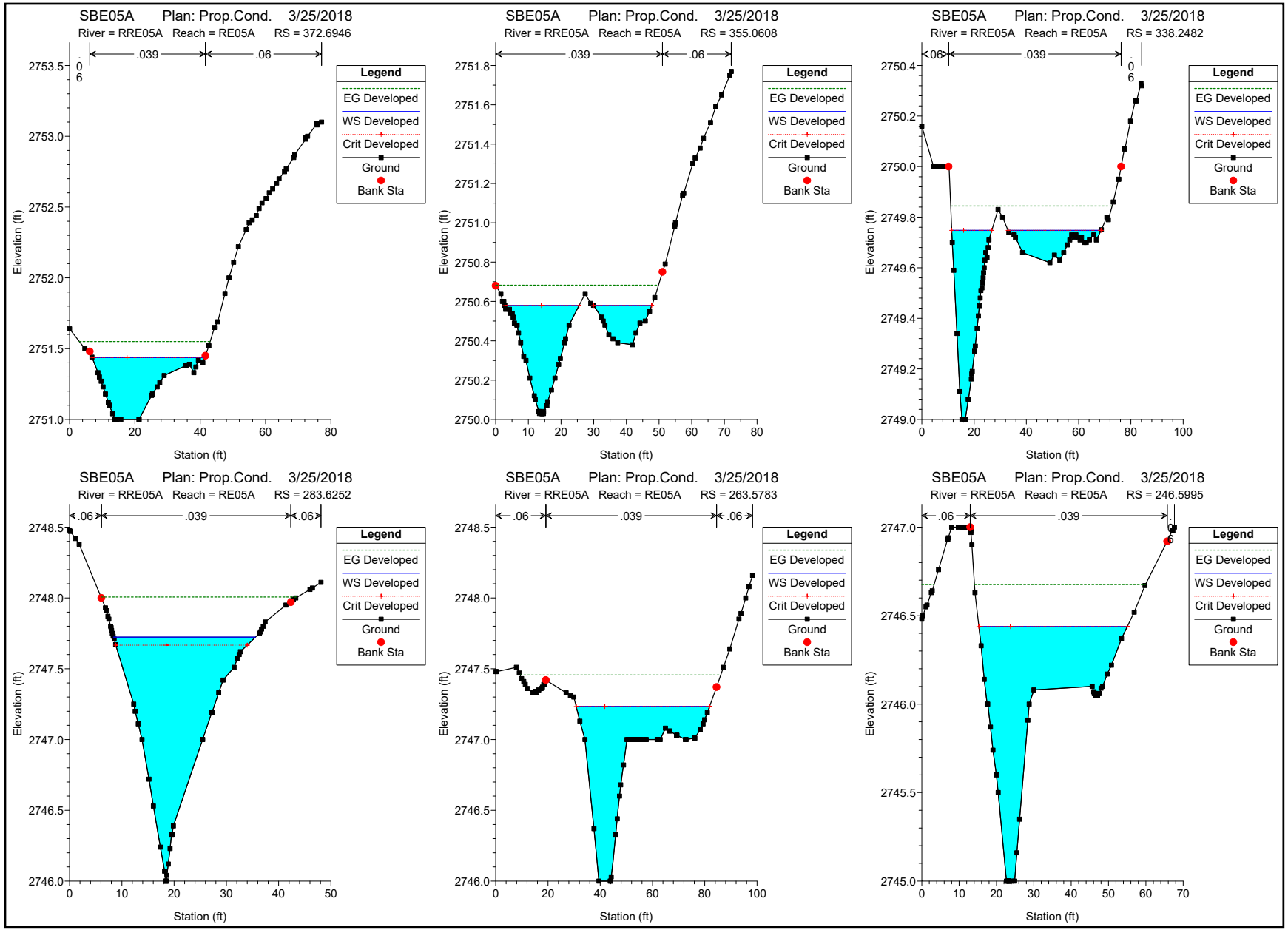
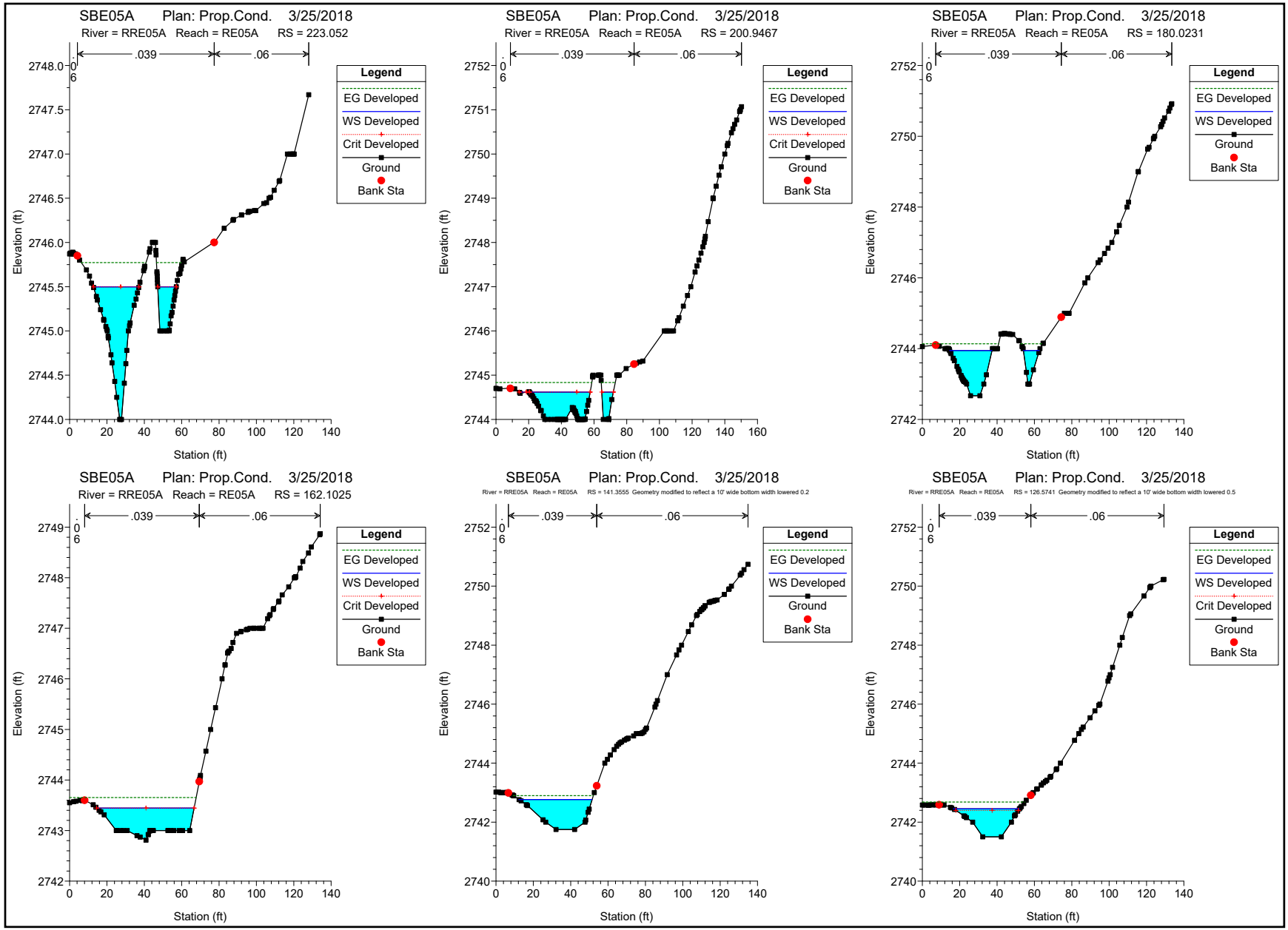
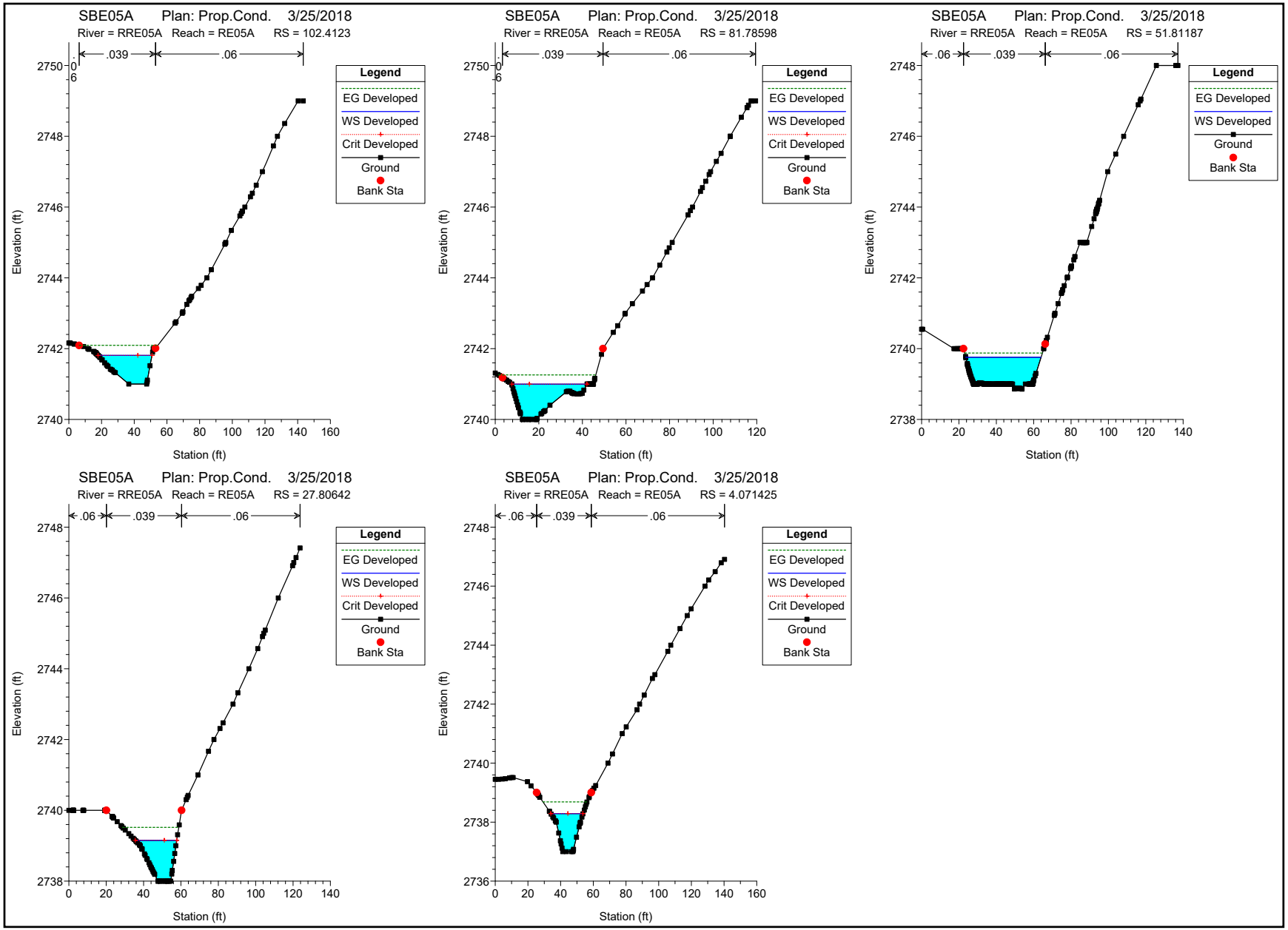
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 635.5899
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)


SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 617.7419
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 599.4559
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 574.9504
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 556.356
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 542.4001
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 524.1107
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)


SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 506.3732
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 487.7664
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 465.2938
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 442.6021
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 415.7166
.06 .039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 392.9352
.039 .06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)


SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 372.6946
.06
.039
.06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 355.0608
.039
.06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 338.2482
.06
.039
.06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 283.6252
.06
.039
.06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 263.5783
.06
.039
.06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 246.5995
.06
.039
.06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)


SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 223.052
.039
.06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 200.9467
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 180.0231
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 162.1025
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 141.3555 Geometry modified to reflect a 10' wide bottom width lowered 0.2
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 126.5741 Geometry modified to reflect a 10' wide bottom width lowered 0.5


SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 102.4123
.039
.06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 81.78598
.039
.06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 51.81187
.06
.039
.06
Legend
EG Developed
WS Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 27.80642
.06
.039
.06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)
SBE05A Plan: Prop.Cond. 3/25/2018
River = RRE05A Reach = RE05A RS = 4.071425
.06
.039
.06
Legend
EG Developed
WS Developed
Crit Developed
Ground
Bank Sta
Elevation (ft)
Station (ft)

**Project:** **Master Drainage Plan Amendment- Sereno Canyon**

**Stream:** **Various**

**Location:** **Scottsdale, Arizona**

**Photo E1 : Typical photo of Sandy-bottomed Wash**

| Channel/Floodplain Conditions | | Manning's n Adjustment | | n Value |
|---|---|---|---|---|
| Channel/Floodplain Material | Concrete | $n_b$ | 0.012-0.018 | |
| | Firm Soil | | 0.025-0.032 | |
| | Coarse Sand | | 0.026-0.035 | |
| | Gravel | | 0.028-0.035 | 0.028 |
| | Cobble | | 0.030-0.050 | |
| | Boulder | | 0.040-0.070 | |
| Degree of Irregularity | Smooth | $n_1$ | 0.000 | |
| | Minor | | 0.001-0.005 | 0.001 |
| | Moderate | | 0.006-0.010 | |
| | Severe | | 0.011-0.020 | |
| Variations in Channel Cross Section | Gradual | $n_2$ | 0.000 | |
| | Alternating Occasionally | | 0.001-0.005 | |
| | Alternating Frequently | | 0.010-0.015 | |
| Effects of Obstruction | Negligible | $n_3$ | 0.000-0.004 | |
| | Minor | | 0.005-0.015 (0.019) | 0.005 |
| | Appreciable | | 0.020-0.030 | |
| | Severe | | 0.040-0.060 | |
| Amount of Vegetation | Negligible | $n_4$ | 0.000-0.002 (0.001) | |
| | Small | | (0.001) 0.002-0.010 | 0.005 |
| | Medium | | 0.010-0.025 | |
| | Large | | 0.025-0.050 | |
| | Very Large | | 0.050-0.100 | |
| | Extremely Large | | 0.100-0.200 | |
| Intermediate Sum | | | | 0.039 |
| Degree of Meandering | Minor | m | 1 | 1 |
| | Appreciable | | 1.15 | |
| | Severe | | 1.3 | |
| $n=(n_b+n_1+n_2+n_3+n_4)m$ | | | | **0.039** |

Note: Values in parenticies for floodplain n-value adjustment factor when it differs from the channel n-value adjustment factor

**Project:** **Master Drainage Plan Amendment- Sereno Canyon**

**Stream:** **Various**

**Location:** **Scottsdale, Arizona**

**Photo E2 : Typical photo of Swale/Overbank**

| Channel/Floodplain Conditions | | Manning's n Adjustment | | n Value |
|---|---|---|---|---|
| Channel/Floodplain Material | Concrete | $n_b$ | 0.012-0.018 | |
| | Firm Soil | | 0.025-0.032 | |
| | Coarse Sand | | 0.026-0.035 | |
| | Gravel | | 0.028-0.035 | 0.03 |
| | Cobble | | 0.030-0.050 | |
| | Boulder | | 0.040-0.070 | |
| Degree of Irregularity | Smooth | $n_1$ | 0.000 | |
| | Minor | | 0.001-0.005 | 0.005 |
| | Moderate | | 0.006-0.010 | |
| | Severe | | 0.011-0.020 | |
| Variations in Channel Cross Section | Gradual | $n_2$ | 0.000 | |
| | Alternating Occasionally | | 0.001-0.005 | |
| | Alternating Frequently | | 0.010-0.015 | |
| Effects of Obstruction | Negligible | $n_3$ | 0.000-0.004 | |
| | Minor | | 0.005-0.015 (0.019) | 0.01 |
| | Appreciable | | 0.020-0.030 | |
| | Severe | | 0.040-0.060 | |
| Amount of Vegetation | Negligible | $n_4$ | 0.000-0.002 (0.001) | |
| | Small | | (0.001) 0.002-0.010 | |
| | Medium | | 0.010-0.025 | 0.015 |
| | Large | | 0.025-0.050 | |
| | Very Large | | 0.050-0.100 | |
| | Extremely Large | | 0.100-0.200 | |
| Intermediate Sum | | | | 0.06 |
| Degree of Meandering | Minor | m | 1 | 1 |
| | Appreciable | | 1.15 | |
| | Severe | | 1.3 | |
| $n=(n_b+n_1+n_2+n_3+n_4)m$ | | | | **0.060** |

Note: Values in parenticies for floodplain n-value adjustment factor when it differs from the channel n-value adjustment factor

SLATER HANIFAN GROUP
CONSULTING ENGINEERS & PLANNERS

Project: SERENO CANYON PHASE 4
Project No.: TOL1702.000
Location: SCOTTSDALE, AZ

## Culvert Outlet Summary

| Culvert ID | Culvert Size |
|---|---|
| DB10C | 2 - 30-inch RCP |
| DB09E | 1 - 18-inch RCP |
| DB11B | 1 - 30-inch RCP |
| DB06D1 | 1 - 18-inch RCP |
| DB06C1 | 2 - 24-inch RCP |
| DB06C2 | 1 - 24-inch RCP |
| DB06A | 1 - 18-inch RCP |
| DB05B3 | 2 - 24-inch RCP |
| DB05B2 | 1 - 30-inch RCP |
| DB05B1 | 1 - 18-inch RCP |
| DB04A | 1 - 24-inch RCP |
| DB04B | 1 - 24-inch RCP |
| DB03A1 | 1 - 18-inch RCP |
| DB02A2 | 2 - 18-inch RCP |
| DB02A1 | 2 - 30-inch RCP |

Please note that all HY-8 Output summary tables with outlet control values showing a * simply indicates that the Full Flow Headwater Depth is below the inlet invert elevation

# HY-8 Analysis Results

## Culvert Summary Table - Culvert 1

Culvert Crossing: DB10C

| Total Discharge (cfs) | Culvert Discharge (cfs) | Headwater Elevation (ft) | Inlet Control Depth(ft) | Outlet Control Depth(ft) | Flow Type | Normal Depth (ft) | Critical Depth (ft) | Outlet Depth (ft) | Tailwater Depth (ft) | Outlet Velocity (ft/s) | Tailwater Velocity (ft/s) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 2767.00 | 0.00 | 0.0 | 0-NF | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4.70 | 4.70 | 2767.68 | 0.68 | 0.0* | 1-S2n | 0.38 | 0.50 | 0.39 | 0.31 | 4.60 | 2.99 |
| 9.40 | 9.40 | 2767.97 | 0.97 | 0.0* | 1-S2n | 0.53 | 0.71 | 0.55 | 0.49 | 5.65 | 3.85 |
| 14.10 | 14.10 | 2768.21 | 1.21 | 0.0* | 1-S2n | 0.65 | 0.88 | 0.68 | 0.63 | 6.32 | 4.45 |
| 18.80 | 18.80 | 2768.44 | 1.44 | 0.15 | 1-S2n | 0.76 | 1.02 | 0.79 | 0.77 | 6.84 | 4.91 |
| 23.50 | 23.50 | 2768.66 | 1.66 | 0.35 | 1-S2n | 0.85 | 1.15 | 0.89 | 0.89 | 7.26 | 5.29 |
| 28.20 | 28.20 | 2768.86 | 1.86 | 0.56 | 1-S2n | 0.94 | 1.26 | 0.98 | 1.01 | 7.62 | 5.61 |
| 32.90 | 32.90 | 2769.04 | 2.04 | 0.76 | 1-S2n | 1.02 | 1.37 | 1.07 | 1.12 | 7.93 | 5.89 |
| 37.60 | 37.60 | 2769.22 | 2.22 | 0.99 | 1-S2n | 1.10 | 1.47 | 1.16 | 1.22 | 8.20 | 6.14 |
| 42.30 | 42.30 | 2769.40 | 2.40 | 1.22 | 1-S2n | 1.18 | 1.56 | 1.24 | 1.33 | 8.44 | 6.37 |
| 47.00 | 47.00 | 2769.59 | 2.59 | 1.46 | 5-S2n | 1.26 | 1.65 | 1.32 | 1.43 | 8.67 | 6.58 |

# HY-8 Analysis Results

## Culvert Summary Table - Culvert 1

Culvert Crossing: DB09E

| Total Discharge (cfs) | Culvert Discharge (cfs) | Headwater Elevation (ft) | Inlet Control Depth(ft) | Outlet Control Depth(ft) | Flow Type | Normal Depth (ft) | Critical Depth (ft) | Outlet Depth (ft) | Tailwater Depth (ft) | Outlet Velocity (ft/s) | Tailwater Velocity (ft/s) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 2826.00 | 0.00 | 0.0 | 0-NF | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1.50 | 1.50 | 2826.61 | 0.61 | 0.0* | 1-S2n | 0.25 | 0.45 | 0.25 | 0.15 | 7.37 | 1.82 |
| 3.00 | 3.00 | 2826.92 | 0.92 | 0.0* | 1-S2n | 0.36 | 0.66 | 0.38 | 0.22 | 8.35 | 2.32 |
| 4.50 | 4.50 | 2827.19 | 1.19 | 0.0* | 1-S2n | 0.44 | 0.81 | 0.47 | 0.28 | 9.21 | 2.65 |
| 6.00 | 6.00 | 2827.44 | 1.44 | 0.0* | 1-S2n | 0.51 | 0.94 | 0.55 | 0.33 | 9.81 | 2.91 |
| 7.50 | 7.50 | 2827.70 | 1.70 | 0.0* | 5-S2n | 0.58 | 1.06 | 0.64 | 0.37 | 10.17 | 3.13 |
| 9.00 | 9.00 | 2828.01 | 2.01 | 0.24 | 5-S2n | 0.64 | 1.16 | 0.70 | 0.41 | 10.69 | 3.31 |
| 10.50 | 10.50 | 2828.37 | 2.37 | 0.62 | 5-S2n | 0.70 | 1.24 | 0.78 | 0.45 | 10.99 | 3.47 |
| 12.00 | 12.00 | 2828.79 | 2.79 | 1.03 | 5-S2n | 0.75 | 1.31 | 0.84 | 0.48 | 11.34 | 3.62 |
| 13.50 | 13.50 | 2829.28 | 3.28 | 1.49 | 5-S2n | 0.81 | 1.37 | 0.91 | 0.51 | 11.69 | 3.75 |
| 15.00 | 15.00 | 2829.83 | 3.83 | 2.00 | 5-S2n | 0.86 | 1.41 | 0.97 | 0.54 | 12.00 | 3.87 |

# HY-8 Analysis Results

## Culvert Summary Table - Culvert 1

Culvert Crossing: DB11B

| Total Discharge (cfs) | Culvert Discharge (cfs) | Headwater Elevation (ft) | Inlet Control Depth(ft) | Outlet Control Depth(ft) | Flow Type | Normal Depth (ft) | Critical Depth (ft) | Outlet Depth (ft) | Tailwater Depth (ft) | Outlet Velocity (ft/s) | Tailwater Velocity (ft/s) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 2777.50 | 0.00 | 0.0 | 0-NF | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4.10 | 4.10 | 2778.40 | 0.90 | 0.0* | 1-S2n | 0.46 | 0.66 | 0.46 | 0.32 | 6.29 | 2.04 |
| 8.20 | 8.20 | 2778.82 | 1.32 | 0.04 | 1-S2n | 0.66 | 0.95 | 0.69 | 0.47 | 7.20 | 2.53 |
| 12.30 | 12.30 | 2779.20 | 1.70 | 0.38 | 1-S2n | 0.81 | 1.18 | 0.86 | 0.59 | 7.96 | 2.86 |
| 16.40 | 16.40 | 2779.53 | 2.03 | 0.73 | 1-S2n | 0.95 | 1.36 | 1.01 | 0.68 | 8.53 | 3.11 |
| 20.50 | 20.50 | 2779.85 | 2.35 | 1.10 | 1-S2n | 1.07 | 1.54 | 1.15 | 0.77 | 9.00 | 3.31 |
| 24.60 | 24.60 | 2780.17 | 2.67 | 1.50 | 5-S2n | 1.19 | 1.69 | 1.28 | 0.84 | 9.39 | 3.49 |
| 28.70 | 28.70 | 2780.53 | 3.03 | 1.93 | 5-S2n | 1.30 | 1.82 | 1.41 | 0.91 | 9.74 | 3.64 |
| 32.80 | 32.80 | 2780.93 | 3.43 | 2.67 | 5-S2n | 1.41 | 1.95 | 1.53 | 0.98 | 10.07 | 3.78 |
| 36.90 | 36.90 | 2781.39 | 3.89 | 3.11 | 5-S2n | 1.53 | 2.06 | 1.65 | 1.03 | 10.40 | 3.90 |
| 41.00 | 41.00 | 2781.91 | 4.41 | 3.58 | 5-S2n | 1.64 | 2.15 | 1.77 | 1.09 | 10.70 | 4.02 |

# HY-8 Analysis Results

## Culvert Summary Table - Culvert 1

Culvert Crossing: DB06D1

| Total Discharge (cfs) | Culvert Discharge (cfs) | Headwater Elevation (ft) | Inlet Control Depth(ft) | Outlet Control Depth(ft) | Flow Type | Normal Depth (ft) | Critical Depth (ft) | Outlet Depth (ft) | Tailwater Depth (ft) | Outlet Velocity (ft/s) | Tailwater Velocity (ft/s) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 2795.00 | 0.00 | 0.0 | 0-NF | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3.10 | 3.10 | 2795.96 | 0.96 | 0.0* | 1-S2n | 0.54 | 0.67 | 0.54 | 0.63 | 5.28 | 0.99 |
| 6.20 | 6.20 | 2796.49 | 1.49 | 0.61 | 1-S2n | 0.80 | 0.96 | 0.82 | 0.99 | 6.09 | 1.25 |
| 9.30 | 9.30 | 2797.10 | 2.10 | 1.70 | 5-S2n | 1.05 | 1.18 | 1.05 | 1.31 | 6.85 | 1.42 |
| 12.40 | 12.40 | 2798.08 | 2.94 | 3.08 | 4-FFf | 1.50 | 1.33 | 1.50 | 1.61 | 7.02 | 1.54 |
| 15.50 | 14.29 | 2799.06 | 3.59 | 4.16 | 4-FFf | 1.50 | 1.39 | 1.50 | 1.89 | 8.09 | 1.64 |
| 18.60 | 14.42 | 2799.13 | 3.64 | 4.49 | 4-FFf | 1.50 | 1.39 | 1.50 | 2.15 | 8.16 | 1.73 |
| 21.70 | 14.52 | 2799.19 | 3.67 | 4.80 | 4-FFf | 1.50 | 1.39 | 1.50 | 2.42 | 8.22 | 1.80 |
| 24.80 | 14.61 | 2799.24 | 3.71 | 5.10 | 4-FFf | 1.50 | 1.39 | 1.50 | 2.67 | 8.27 | 1.86 |
| 27.90 | 14.69 | 2799.28 | 3.74 | 5.39 | 4-FFf | 1.50 | 1.40 | 1.50 | 2.92 | 8.31 | 1.91 |
| 31.00 | 14.76 | 2799.32 | 3.76 | 5.67 | 4-FFf | 1.50 | 1.40 | 1.50 | 3.17 | 8.35 | 1.96 |

# HY-8 Analysis Results

## Culvert Summary Table - Culvert 1

Culvert Crossing: DB06C1

| Total Discharge (cfs) | Culvert Discharge (cfs) | Headwater Elevation (ft) | Inlet Control Depth(ft) | Outlet Control Depth(ft) | Flow Type | Normal Depth (ft) | Critical Depth (ft) | Outlet Depth (ft) | Tailwater Depth (ft) | Outlet Velocity (ft/s) | Tailwater Velocity (ft/s) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 2792.00 | 0.00 | 0.0 | 0-NF | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4.70 | 4.70 | 2792.72 | 0.72 | 0.0* | 1-S2n | 0.38 | 0.53 | 0.38 | 0.31 | 5.38 | 2.99 |
| 9.40 | 9.40 | 2793.06 | 1.06 | 0.0* | 1-S2n | 0.55 | 0.76 | 0.55 | 0.49 | 6.55 | 3.85 |
| 14.10 | 14.10 | 2793.36 | 1.36 | 0.0* | 1-S2n | 0.67 | 0.94 | 0.67 | 0.63 | 7.32 | 4.45 |
| 18.80 | 18.80 | 2793.63 | 1.63 | 0.0* | 1-S2n | 0.79 | 1.09 | 0.79 | 0.77 | 7.92 | 4.91 |
| 23.50 | 23.50 | 2793.88 | 1.88 | 0.0* | 1-S2n | 0.89 | 1.23 | 0.92 | 0.89 | 8.08 | 5.29 |
| 28.20 | 28.20 | 2794.14 | 2.14 | 0.34 | 5-S2n | 0.99 | 1.35 | 1.02 | 1.01 | 8.43 | 5.61 |
| 32.90 | 32.90 | 2794.43 | 2.43 | 0.81 | 5-S2n | 1.09 | 1.46 | 1.09 | 1.12 | 9.13 | 5.89 |
| 37.60 | 37.60 | 2794.75 | 2.75 | 1.55 | 5-S2n | 1.18 | 1.56 | 1.22 | 1.22 | 9.06 | 6.14 |
| 42.30 | 41.42 | 2795.04 | 3.04 | 1.96 | 5-S2n | 1.26 | 1.63 | 1.31 | 1.33 | 9.23 | 6.37 |
| 47.00 | 42.53 | 2795.14 | 3.14 | 2.09 | 5-S2n | 1.29 | 1.65 | 1.29 | 1.43 | 9.65 | 6.58 |

# HY-8 Analysis Results

## Culvert Summary Table - Culvert 1

Culvert Crossing: DB06C2

| Total Discharge (cfs) | Culvert Discharge (cfs) | Headwater Elevation (ft) | Inlet Control Depth(ft) | Outlet Control Depth(ft) | Flow Type | Normal Depth (ft) | Critical Depth (ft) | Outlet Depth (ft) | Tailwater Depth (ft) | Outlet Velocity (ft/s) | Tailwater Velocity (ft/s) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 2788.00 | 0.00 | 0.0 | 0-NF | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2.20 | 2.20 | 2788.70 | 0.70 | 0.0* | 1-S2n | 0.43 | 0.51 | 0.43 | 0.20 | 4.23 | 2.25 |
| 4.40 | 4.40 | 2789.02 | 1.02 | 0.0* | 1-S2n | 0.62 | 0.73 | 0.62 | 0.30 | 5.14 | 2.92 |
| 6.60 | 6.60 | 2789.32 | 1.32 | 0.12 | 1-S2n | 0.77 | 0.91 | 0.77 | 0.39 | 5.76 | 3.39 |
| 8.80 | 8.80 | 2789.57 | 1.57 | 0.43 | 1-S2n | 0.90 | 1.06 | 0.90 | 0.47 | 6.21 | 3.76 |
| 11.00 | 11.00 | 2789.81 | 1.81 | 0.77 | 1-S2n | 1.03 | 1.19 | 1.03 | 0.54 | 6.56 | 4.08 |
| 13.20 | 13.20 | 2790.04 | 2.04 | 1.14 | 5-S2n | 1.15 | 1.30 | 1.15 | 0.61 | 6.85 | 4.35 |
| 15.40 | 15.40 | 2790.30 | 2.30 | 1.55 | 5-S2n | 1.27 | 1.41 | 1.27 | 0.67 | 7.07 | 4.59 |
| 17.60 | 17.60 | 2790.58 | 2.58 | 2.24 | 5-S2n | 1.41 | 1.51 | 1.45 | 0.73 | 7.03 | 4.80 |
| 19.80 | 19.80 | 2790.91 | 2.91 | 2.68 | 5-S2n | 1.57 | 1.60 | 1.57 | 0.79 | 7.32 | 4.99 |
| 22.00 | 22.00 | 2791.27 | 3.27~ | 3.08 | 7-M2c | 2.00 | 1.67 | 1.67 | 0.85 | 7.83 | 5.17 |

# HY-8 Analysis Results

## Culvert Summary Table - Culvert 1

Culvert Crossing: DB06A

| Total Discharge (cfs) | Culvert Discharge (cfs) | Headwater Elevation (ft) | Inlet Control Depth(ft) | Outlet Control Depth(ft) | Flow Type | Normal Depth (ft) | Critical Depth (ft) | Outlet Depth (ft) | Tailwater Depth (ft) | Outlet Velocity (ft/s) | Tailwater Velocity (ft/s) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 2752.50 | 0.00 | 0.0 | 0-NF | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1.60 | 1.60 | 2753.14 | 0.64 | 0.0* | 1-S2n | 0.31 | 0.47 | 0.31 | 0.16 | 5.96 | 1.99 |
| 3.20 | 3.20 | 2753.47 | 0.97 | 0.0* | 1-S2n | 0.44 | 0.68 | 0.46 | 0.25 | 6.75 | 2.59 |
| 4.80 | 4.80 | 2753.75 | 1.25 | 0.10 | 1-S2n | 0.54 | 0.84 | 0.57 | 0.32 | 7.44 | 3.01 |
| 6.40 | 6.40 | 2754.02 | 1.52 | 0.43 | 5-S2n | 0.63 | 0.97 | 0.68 | 0.38 | 7.96 | 3.35 |
| 8.00 | 8.00 | 2754.31 | 1.81 | 0.81 | 5-S2n | 0.72 | 1.09 | 0.78 | 0.44 | 8.39 | 3.64 |
| 9.60 | 9.60 | 2754.66 | 2.16 | 1.37 | 5-S2n | 0.80 | 1.20 | 0.87 | 0.49 | 8.76 | 3.88 |
| 11.20 | 11.20 | 2755.07 | 2.57 | 1.79 | 5-S2n | 0.88 | 1.28 | 0.96 | 0.55 | 9.09 | 4.10 |
| 12.80 | 12.80 | 2755.56 | 3.06 | 2.25 | 5-S2n | 0.97 | 1.34 | 1.05 | 0.60 | 9.41 | 4.30 |
| 14.40 | 14.12 | 2756.02 | 3.52 | 2.67 | 5-S2n | 1.04 | 1.38 | 1.13 | 0.64 | 9.66 | 4.48 |
| 16.00 | 14.27 | 2756.07 | 3.57 | 2.71 | 5-S2n | 1.05 | 1.39 | 1.14 | 0.69 | 9.68 | 4.65 |

# HY-8 Analysis Results

## Culvert Summary Table - Culvert 1

Culvert Crossing: DB05B3

| Total Discharge (cfs) | Culvert Discharge (cfs) | Headwater Elevation (ft) | Inlet Control Depth(ft) | Outlet Control Depth(ft) | Flow Type | Normal Depth (ft) | Critical Depth (ft) | Outlet Depth (ft) | Tailwater Depth (ft) | Outlet Velocity (ft/s) | Tailwater Velocity (ft/s) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 2782.00 | 0.00 | 0.0 | 0-NF | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3.60 | 3.60 | 2782.63 | 0.63 | 0.0* | 1-S2n | 0.39 | 0.46 | 0.39 | 0.27 | 4.08 | 2.71 |
| 7.20 | 7.20 | 2782.91 | 0.91 | 0.0* | 1-S2n | 0.55 | 0.66 | 0.56 | 0.41 | 4.77 | 3.50 |
| 10.80 | 10.80 | 2783.16 | 1.16 | 0.0* | 1-S2n | 0.68 | 0.82 | 0.70 | 0.53 | 5.37 | 4.05 |
| 14.40 | 14.40 | 2783.39 | 1.39 | 0.20 | 1-S2n | 0.79 | 0.95 | 0.81 | 0.64 | 5.80 | 4.48 |
| 18.00 | 18.00 | 2783.59 | 1.59 | 0.45 | 1-S2n | 0.90 | 1.07 | 0.93 | 0.74 | 6.12 | 4.84 |
| 21.60 | 21.60 | 2783.78 | 1.78 | 0.72 | 1-S2n | 1.00 | 1.17 | 1.00 | 0.84 | 6.67 | 5.14 |
| 25.20 | 25.20 | 2783.98 | 1.98 | 1.02 | 1-S2n | 1.10 | 1.27 | 1.10 | 0.93 | 6.92 | 5.41 |
| 28.80 | 28.80 | 2784.18 | 2.18 | 1.33 | 5-S2n | 1.19 | 1.36 | 1.19 | 1.02 | 7.13 | 5.65 |
| 32.40 | 32.40 | 2784.40 | 2.40 | 1.67 | 5-S2n | 1.30 | 1.45 | 1.33 | 1.10 | 7.07 | 5.87 |
| 36.00 | 36.00 | 2784.64 | 2.64 | 2.28 | 5-S2n | 1.40 | 1.53 | 1.40 | 1.19 | 7.44 | 6.06 |

# HY-8 Analysis Results

## Culvert Summary Table - Culvert 1

Culvert Crossing: DB05B2

| Total Discharge (cfs) | Culvert Discharge (cfs) | Headwater Elevation (ft) | Inlet Control Depth(ft) | Outlet Control Depth(ft) | Flow Type | Normal Depth (ft) | Critical Depth (ft) | Outlet Depth (ft) | Tailwater Depth (ft) | Outlet Velocity (ft/s) | Tailwater Velocity (ft/s) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 2800.00 | 0.00 | 0.0 | 0-NF | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2.40 | 2.40 | 2800.69 | 0.69 | 0.0* | 1-S2n | 0.47 | 0.50 | 0.47 | 0.53 | 3.62 | 0.90 |
| 4.80 | 4.80 | 2800.99 | 0.99 | 0.0* | 1-JS1t | 0.67 | 0.72 | 0.84 | 0.84 | 3.22 | 1.15 |
| 7.20 | 7.20 | 2801.23 | 1.23 | 0.21 | 1-JS1t | 0.82 | 0.89 | 1.10 | 1.10 | 3.35 | 1.31 |
| 9.00 | 9.00 | 2801.41 | 1.41 | 0.46 | 1-JS1t | 0.93 | 1.00 | 1.28 | 1.28 | 3.43 | 1.40 |
| 12.00 | 12.00 | 2801.69 | 1.69 | 0.88 | 1-JS1t | 1.08 | 1.16 | 1.57 | 1.57 | 3.59 | 1.53 |
| 14.40 | 14.40 | 2801.89 | 1.89 | 1.23 | 1-S2n | 1.20 | 1.28 | 1.20 | 1.79 | 5.95 | 1.61 |
| 16.80 | 16.80 | 2802.08 | 2.08 | 1.60 | 1-S2n | 1.32 | 1.38 | 1.32 | 2.00 | 6.18 | 1.68 |
| 19.20 | 19.20 | 2802.26 | 2.26 | 1.99 | 1-S2n | 1.44 | 1.48 | 1.44 | 2.21 | 6.37 | 1.74 |
| 21.60 | 21.60 | 2802.56 | 2.44 | 2.56 | 1-S1t | 1.55 | 1.58 | 2.41 | 2.41 | 4.40 | 1.79 |
| 24.00 | 24.00 | 2802.82 | 2.63 | 2.82 | 3-M1f | 1.67 | 1.66 | 2.50 | 2.61 | 4.89 | 1.84 |

# HY-8 Analysis Results

## Culvert Summary Table - Culvert 1

Culvert Crossing: DB05B1

| Total Discharge (cfs) | Culvert Discharge (cfs) | Headwater Elevation (ft) | Inlet Control Depth(ft) | Outlet Control Depth(ft) | Flow Type | Normal Depth (ft) | Critical Depth (ft) | Outlet Depth (ft) | Tailwater Depth (ft) | Outlet Velocity (ft/s) | Tailwater Velocity (ft/s) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 2810.00 | 0.00 | 0.0 | 0-NF | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1.40 | 1.40 | 2810.60 | 0.60 | 0.0* | 1-S2n | 0.27 | 0.44 | 0.28 | 0.38 | 6.07 | 0.74 |
| 2.80 | 2.80 | 2810.89 | 0.89 | 0.0* | 1-S2n | 0.39 | 0.63 | 0.39 | 0.59 | 7.56 | 0.95 |
| 4.20 | 4.20 | 2811.15 | 1.15 | 0.0* | 1-S2n | 0.47 | 0.78 | 0.49 | 0.77 | 8.19 | 1.10 |
| 5.60 | 5.60 | 2811.38 | 1.38 | 0.0* | 1-S2n | 0.55 | 0.91 | 0.57 | 0.93 | 8.80 | 1.21 |
| 7.00 | 7.00 | 2811.62 | 1.62 | 0.0* | 5-S2n | 0.63 | 1.02 | 0.65 | 1.08 | 9.31 | 1.30 |
| 8.40 | 8.40 | 2811.89 | 1.89 | 0.0* | 5-S2n | 0.69 | 1.12 | 0.72 | 1.22 | 9.71 | 1.37 |
| 9.80 | 9.80 | 2812.20 | 2.20 | 0.0* | 5-S2n | 0.76 | 1.21 | 0.76 | 1.36 | 10.57 | 1.44 |
| 11.20 | 11.20 | 2812.57 | 2.57 | 0.0* | 5-S2n | 0.82 | 1.28 | 0.86 | 1.49 | 10.42 | 1.50 |
| 12.60 | 12.60 | 2812.99 | 2.99 | 0.0* | 5-S2n | 0.89 | 1.34 | 0.89 | 1.63 | 11.20 | 1.55 |
| 14.00 | 14.00 | 2813.47 | 3.47 | 0.48 | 5-S2n | 0.95 | 1.38 | 0.95 | 1.75 | 11.45 | 1.60 |

# HY-8 Analysis Results

## Culvert Summary Table - Culvert 1

Culvert Crossing: DB04A

| Total Discharge (cfs) | Culvert Discharge (cfs) | Headwater Elevation (ft) | Inlet Control Depth(ft) | Outlet Control Depth(ft) | Flow Type | Normal Depth (ft) | Critical Depth (ft) | Outlet Depth (ft) | Tailwater Depth (ft) | Outlet Velocity (ft/s) | Tailwater Velocity (ft/s) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 2738.50 | 0.00 | 0.0 | 0-NF | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4.10 | 4.10 | 2739.39 | 0.89 | 0.0* | 1-S2n | 0.36 | 0.66 | 0.39 | 0.75 | 8.10 | 1.09 |
| 8.20 | 8.20 | 2739.79 | 1.29 | 0.0* | 1-S2n | 0.51 | 0.95 | 0.57 | 1.20 | 9.41 | 1.36 |
| 12.30 | 12.30 | 2740.18 | 1.68 | 0.28 | 1-S2n | 0.63 | 1.18 | 0.72 | 1.60 | 10.15 | 1.54 |
| 16.40 | 16.40 | 2740.51 | 2.01 | 0.78 | 1-S2n | 0.73 | 1.36 | 0.85 | 1.96 | 10.73 | 1.67 |
| 20.50 | 20.50 | 2740.82 | 2.32 | 1.31 | 1-S2n | 0.82 | 1.54 | 0.97 | 2.32 | 11.22 | 1.77 |
| 24.60 | 24.60 | 2741.14 | 2.64 | 1.87 | 5-S2n | 0.90 | 1.69 | 1.08 | 2.65 | 11.67 | 1.85 |
| 28.70 | 28.70 | 2741.50 | 3.00 | 2.45 | 5-JS1f | 0.98 | 1.82 | 2.50 | 2.98 | 5.85 | 1.92 |
| 32.80 | 32.80 | 2741.90 | 3.40 | 3.08 | 5-JS1f | 1.06 | 1.95 | 2.50 | 3.31 | 6.68 | 1.98 |
| 36.90 | 36.90 | 2742.36 | 3.86 | 3.75 | 5-S1f | 1.13 | 2.06 | 2.50 | 3.63 | 7.52 | 2.03 |
| 41.00 | 41.00 | 2742.88 | 4.38 | 2.44 | 5-JS1f | 1.20 | 2.15 | 2.50 | 3.94 | 8.35 | 2.08 |

# HY-8 Analysis Results

## Culvert Summary Table - Culvert 1

Culvert Crossing: DB04B

| Total Discharge (cfs) | Culvert Discharge (cfs) | Headwater Elevation (ft) | Inlet Control Depth(ft) | Outlet Control Depth(ft) | Flow Type | Normal Depth (ft) | Critical Depth (ft) | Outlet Depth (ft) | Tailwater Depth (ft) | Outlet Velocity (ft/s) | Tailwater Velocity (ft/s) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 2755.00 | 0.00 | 0.0 | 0-NF | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2.70 | 2.70 | 2755.73 | 0.73 | 0.04 | 1-S2n | 0.47 | 0.53 | 0.47 | 0.22 | 4.03 | 2.43 |
| 5.40 | 5.40 | 2756.05 | 1.05 | 0.31 | 1-S2n | 0.67 | 0.76 | 0.67 | 0.34 | 4.91 | 3.15 |
| 8.10 | 8.10 | 2756.32 | 1.32 | 0.54 | 1-S2n | 0.83 | 0.94 | 0.83 | 0.44 | 5.50 | 3.65 |
| 10.80 | 10.80 | 2756.58 | 1.58 | 0.77 | 1-S2n | 0.97 | 1.10 | 0.97 | 0.53 | 5.95 | 4.05 |
| 13.50 | 13.50 | 2756.81 | 1.81 | 1.00 | 1-S2n | 1.09 | 1.24 | 1.09 | 0.62 | 6.31 | 4.38 |
| 16.20 | 16.20 | 2757.03 | 2.03 | 1.23 | 1-S2n | 1.22 | 1.36 | 1.25 | 0.69 | 6.37 | 4.67 |
| 18.90 | 18.90 | 2757.24 | 2.24 | 1.48 | 1-S2n | 1.33 | 1.47 | 1.37 | 0.77 | 6.63 | 4.92 |
| 21.60 | 21.60 | 2757.44 | 2.44 | 1.75 | 1-S2n | 1.45 | 1.58 | 1.49 | 0.84 | 6.84 | 5.14 |
| 24.30 | 24.30 | 2757.66 | 2.66 | 2.03 | 5-S2n | 1.57 | 1.67 | 1.57 | 0.91 | 7.25 | 5.35 |
| 27.00 | 27.00 | 2757.89 | 2.89 | 2.32 | 5-S2n | 1.70 | 1.77 | 1.70 | 0.98 | 7.40 | 5.53 |

# HY-8 Analysis Results

## Culvert Summary Table - Culvert 1

Culvert Crossing: DB03A1

| Total Discharge (cfs) | Culvert Discharge (cfs) | Headwater Elevation (ft) | Inlet Control Depth(ft) | Outlet Control Depth(ft) | Flow Type | Normal Depth (ft) | Critical Depth (ft) | Outlet Depth (ft) | Tailwater Depth (ft) | Outlet Velocity (ft/s) | Tailwater Velocity (ft/s) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 2750.00 | 0.00 | 0.0 | 0-NF | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.20 | 0.20 | 2750.23 | 0.23 | 0.0* | 1-S2n | 0.13 | 0.16 | 0.13 | 0.05 | 3.09 | 0.88 |
| 0.40 | 0.40 | 2750.32 | 0.32 | 0.0* | 1-S2n | 0.18 | 0.23 | 0.18 | 0.07 | 3.38 | 1.16 |
| 0.60 | 0.60 | 2750.39 | 0.39 | 0.0* | 1-S2n | 0.21 | 0.28 | 0.22 | 0.09 | 3.65 | 1.36 |
| 0.80 | 0.80 | 2750.45 | 0.45 | 0.0* | 1-S2n | 0.25 | 0.33 | 0.25 | 0.11 | 4.09 | 1.52 |
| 1.00 | 1.00 | 2750.51 | 0.51 | 0.0* | 1-S2n | 0.27 | 0.37 | 0.27 | 0.12 | 4.41 | 1.66 |
| 1.20 | 1.20 | 2750.56 | 0.56 | 0.0* | 1-S2n | 0.30 | 0.41 | 0.30 | 0.13 | 4.61 | 1.78 |
| 1.40 | 1.40 | 2750.60 | 0.60 | 0.0* | 1-S2n | 0.32 | 0.44 | 0.32 | 0.15 | 4.81 | 1.89 |
| 1.60 | 1.60 | 2750.65 | 0.65 | 0.0* | 1-S2n | 0.35 | 0.47 | 0.35 | 0.16 | 5.01 | 1.99 |
| 1.80 | 1.80 | 2750.69 | 0.69 | 0.0* | 1-S2n | 0.37 | 0.50 | 0.37 | 0.17 | 5.17 | 2.08 |
| 2.00 | 2.00 | 2750.73 | 0.73 | 0.0* | 1-S2n | 0.39 | 0.53 | 0.39 | 0.18 | 5.34 | 2.17 |

# HY-8 Analysis Results

## Culvert Summary Table - Culvert 1

Culvert Crossing: DB02A2

| Total Discharge (cfs) | Culvert Discharge (cfs) | Headwater Elevation (ft) | Inlet Control Depth(ft) | Outlet Control Depth(ft) | Flow Type | Normal Depth (ft) | Critical Depth (ft) | Outlet Depth (ft) | Tailwater Depth (ft) | Outlet Velocity (ft/s) | Tailwater Velocity (ft/s) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 2762.00 | 0.00 | 0.0 | 0-NF | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.80 | 0.80 | 2762.31 | 0.31 | 0.0* | 1-S2n | 0.15 | 0.23 | 0.15 | 0.12 | 4.22 | 1.16 |
| 1.60 | 1.60 | 2762.45 | 0.45 | 0.0* | 1-S2n | 0.21 | 0.33 | 0.21 | 0.19 | 5.00 | 1.49 |
| 2.40 | 2.40 | 2762.55 | 0.55 | 0.0* | 1-S2n | 0.26 | 0.41 | 0.26 | 0.24 | 5.62 | 1.71 |
| 3.20 | 3.20 | 2762.64 | 0.64 | 0.0* | 1-S2n | 0.30 | 0.47 | 0.30 | 0.28 | 6.10 | 1.88 |
| 4.00 | 4.00 | 2762.72 | 0.72 | 0.0* | 1-S2n | 0.34 | 0.53 | 0.35 | 0.32 | 6.13 | 2.02 |
| 4.80 | 4.80 | 2762.81 | 0.81 | 0.0* | 1-S2n | 0.37 | 0.58 | 0.39 | 0.35 | 6.43 | 2.14 |
| 5.60 | 5.60 | 2762.89 | 0.89 | 0.0* | 1-S2n | 0.40 | 0.63 | 0.42 | 0.38 | 6.66 | 2.25 |
| 6.40 | 6.40 | 2762.97 | 0.97 | 0.0* | 1-S2n | 0.43 | 0.68 | 0.45 | 0.41 | 6.89 | 2.34 |
| 7.20 | 7.20 | 2763.05 | 1.05 | 0.0* | 1-S2n | 0.46 | 0.72 | 0.48 | 0.44 | 7.07 | 2.43 |
| 8.00 | 8.00 | 2763.12 | 1.12 | 0.0* | 1-S2n | 0.48 | 0.77 | 0.51 | 0.46 | 7.23 | 2.51 |

# HY-8 Analysis Results

## Culvert Summary Table - Culvert 1

Culvert Crossing: DB02A1

| Total Discharge (cfs) | Culvert Discharge (cfs) | Headwater Elevation (ft) | Inlet Control Depth(ft) | Outlet Control Depth(ft) | Flow Type | Normal Depth (ft) | Critical Depth (ft) | Outlet Depth (ft) | Tailwater Depth (ft) | Outlet Velocity (ft/s) | Tailwater Velocity (ft/s) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 2789.50 | 0.00 | 0.0 | 0-NF | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6.90 | 6.90 | 2790.31 | 0.81 | 0.0* | 1-S2n | 0.34 | 0.61 | 0.36 | 0.35 | 7.80 | 3.04 |
| 13.80 | 13.80 | 2790.67 | 1.17 | 0.0* | 1-S2n | 0.48 | 0.87 | 0.51 | 0.52 | 9.37 | 3.77 |
| 20.70 | 20.70 | 2791.00 | 1.50 | 0.0* | 1-S2n | 0.59 | 1.07 | 0.59 | 0.64 | 11.38 | 4.25 |
| 27.60 | 27.60 | 2791.30 | 1.80 | 0.0* | 1-S2n | 0.68 | 1.25 | 0.74 | 0.75 | 10.97 | 4.62 |
| 34.50 | 34.50 | 2791.57 | 2.07 | 0.0* | 1-S2n | 0.76 | 1.40 | 0.84 | 0.84 | 11.54 | 4.92 |
| 41.40 | 41.40 | 2791.84 | 2.34 | 0.0* | 1-S2n | 0.84 | 1.54 | 0.93 | 0.92 | 12.03 | 5.18 |
| 48.30 | 48.30 | 2792.11 | 2.61 | 0.0* | 5-S2n | 0.91 | 1.67 | 1.02 | 1.00 | 12.47 | 5.40 |
| 55.20 | 55.20 | 2792.40 | 2.90 | 0.31 | 5-S2n | 0.98 | 1.79 | 1.10 | 1.06 | 12.82 | 5.60 |
| 62.10 | 62.10 | 2792.73 | 3.23 | 0.99 | 5-S2n | 1.04 | 1.90 | 1.18 | 1.13 | 13.13 | 5.78 |
| 69.00 | 68.15 | 2793.04 | 3.54 | 1.30 | 5-S2n | 1.10 | 1.98 | 1.25 | 1.19 | 13.40 | 5.95 |

## Appendix E: Maps

**Sereno Canyon Soils Data Map (from approved Master Drainage Report)**

**Sereno Canyon Existing Conditions HEC-1 Schematic (from approved Master Drainage Report)**

**Map A: Sereno Canyon Phase 4 – Proposed Conditions Land Use Map**

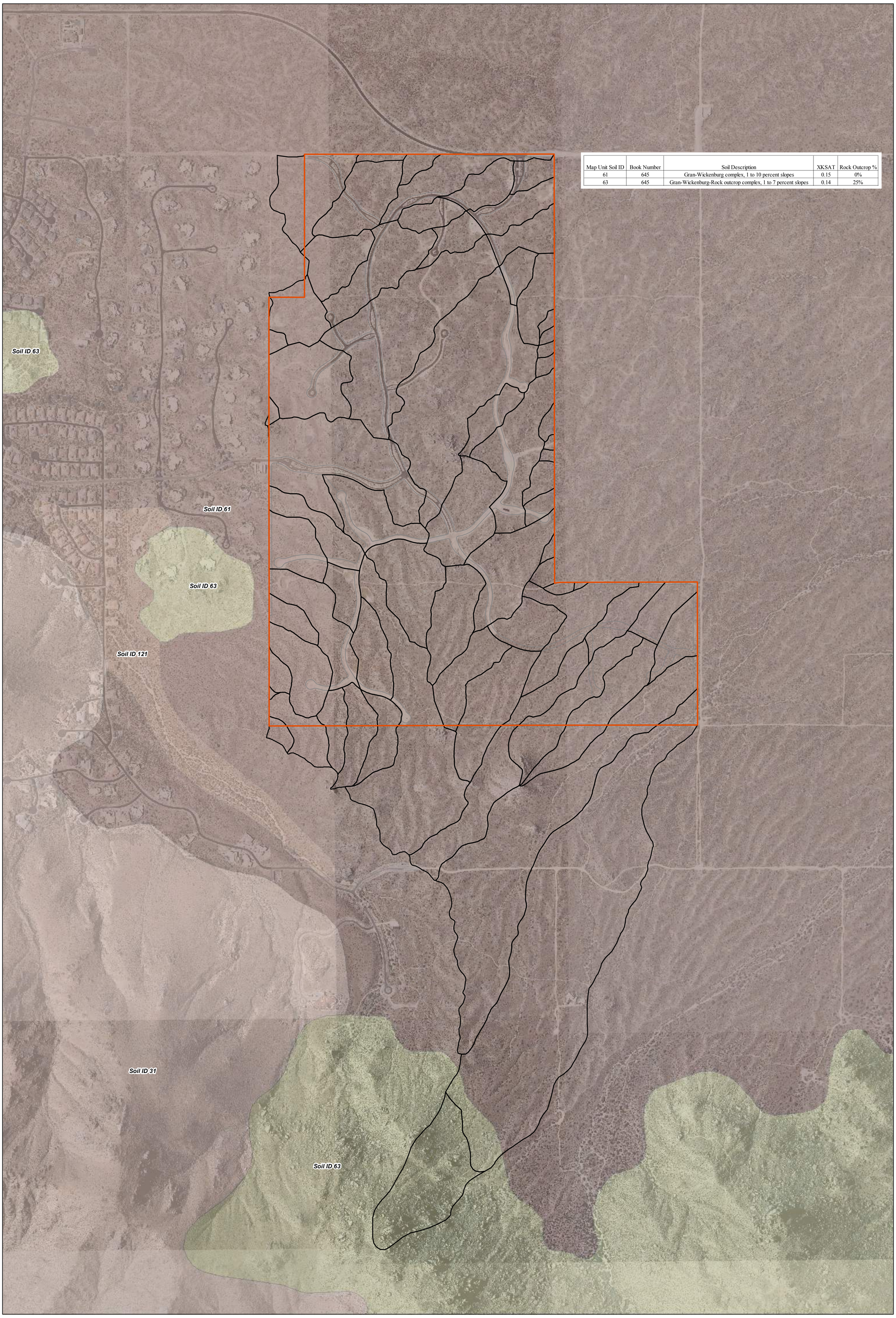
**Map B: Sereno Canyon Phase 4 – Proposed Conditions Hydrology Map**

**Map C: Sereno Canyon Phase 4 – Proposed Development Layout**

**Map D: Sereno Canyon Phase 4 – Proposed Conditions HEC-1 Schematic**

**Map E: Sereno Canyon Phase 4 – Proposed Conditions HEC-RAS Cross Sections and Floodplains**

| Map Unit Soil ID | Book Number | Soil Description | XKSAT | Rock Outcrop % |
|---|---|---|---|---|
| 61 | 645 | Gran-Wickenburg complex, 1 to 10 percent slopes | 0.15 | 0% |
| 63 | 645 | Gran-Wickenburg-Rock outcrop complex, 1 to 7 percent slopes | 0.14 | 25% |

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400 200 0 400
Feet

Sheet 1 of 1

CITY OF SCOTTSDALE

**SERENO CANYON**
**SOILS DATA**

**SCOTTSDALE, ARIZONA**

**JANUARY 2012**

**Legend**

- Sereno Canyon Project Boundary
- Sub-Basins
- Roads

| HEC-1 ID | Type | Q100 (cfs) |
|---|---|---|
| SBE29A | BASIN | 29 |
| SBE28A | BASIN | 23 |
| SBE27A | BASIN | 4 |
| SBE26A | BASIN | 15 |
| SBE25C | BASIN | 11 |
| RE25C | ROUTE | 10 |
| SBE25B | BASIN | 10 |
| CE25B | COMBINE | 20 |
| RE25B | ROUTE | 20 |
| SBE25A | BASIN | 6 |
| CE25A | COMBINE | 25 |
| SBE24D | BASIN | 22 |
| RE24D | ROUTE | 21 |
| SBE24C | BASIN | 24 |
| CE24C | COMBINE | 45 |
| RE24C | ROUTE | 44 |
| SBE24B | BASIN | 8 |
| CE24B | COMBINE | 52 |
| RE24B | ROUTE | 51 |
| SBE24A | BASIN | 11 |
| CE24A | COMBINE | 60 |
| SBE23D | BASIN | 56 |
| RE23D | ROUTE | 56 |
| SBE23E | BASIN | 9 |
| RE23E | ROUTE | 8 |
| SBE23C | BASIN | 72 |
| CE23C | COMBINE | 81 |
| RE23C | ROUTE | 80 |
| SBE23B | BASIN | 8 |
| CE23B | COMBINE | 85 |
| RE23B | ROUTE | 85 |
| CE23AI | COMBINE | 141 |
| RE23BD | ROUTE | 140 |
| SBE23A | BASIN | 11 |
| CE23A | COMBINE | 148 |
| SBE22A | BASIN | 12 |
| SBE21A | BASIN | 2 |
| SBE20A | BASIN | 3 |
| SBE19A | BASIN | 3 |
| SBE18A | BASIN | 2 |
| SBE17B | BASIN | 31 |
| RE17B | ROUTE | 30 |
| SBE17A | BASIN | 29 |
| CE17A | COMBINE | 57 |
| SBE16A | BASIN | 2 |
| SBE13A | BASIN | 7 |
| SBE12A | BASIN | 4 |
| SBE11B | BASIN | 24 |
| RE11B | ROUTE | 23 |
| SBE11A | BASIN | 26 |
| CE11A | COMBINE | 49 |
| SBE10A | BASIN | 2 |
| SBE09A | BASIN | 6 |
| SBE08A | BASIN | 2 |
| SBE06D | BASIN | 19 |
| RE06D | ROUTE | 18 |
| SBE06C | BASIN | 28 |
| RE06C | ROUTE | 27 |
| SBE06B | BASIN | 18 |
| CE06B | COMBINE | 60 |
| RE06B | ROUTE | 60 |
| SBE06A | BASIN | 20 |
| CE06A | COMBINE | 79 |
| SBE05B | BASIN | 23 |
| RE05B | ROUTE | 23 |
| SBE05A | BASIN | 11 |
| CE05A | COMBINE | 31 |
| CE065A | COMBINE | 108 |
| SBE04C | BASIN | 17 |
| RE04C | ROUTE | 17 |
| SBE04B | BASIN | 20 |
| RE04B | ROUTE | 20 |
| CE04AI | COMBINE | 37 |
| RE04CB | ROUTE | 37 |
| SBE04A | BASIN | 12 |
| CE04A | COMBINE | 46 |
| SBE03A | BASIN | 14 |
| SBE02A | BASIN | 75 |
| SBE01B | BASIN | 61 |
| RE01B | ROUTE | 55 |
| SBE01A | BASIN | 150 |
| CE01A | COMBINE | 201 |
| SBW14A | BASIN | 23 |
| SBW13A | BASIN | 3 |
| SBW12A | BASIN | 38 |
| SBW11A | BASIN | 3 |
| SBW10C | BASIN | 31 |
| RW10C | ROUTE | 30 |
| SBW10B | BASIN | 20 |
| CW10B | COMBINE | 49 |
| RW10B | ROUTE | 49 |
| SBW10A | BASIN | 59 |
| CW10A | COMBINE | 107 |
| SBW09E | BASIN | 10 |
| RW09E | ROUTE | 10 |
| SBW09D | BASIN | 15 |
| CW09DI | COMBINE | 24 |
| SBW09C | BASIN | 63 |
| CW09D | COMBINE | 85 |
| RW09D | ROUTE | 85 |
| SBW09B | BASIN | 12 |
| CW09B | COMBINE | 91 |
| RW09B | ROUTE | 90 |
| SBW09A | BASIN | 13 |
| CW09A | COMBINE | 101 |
| SBW08A | BASIN | 19 |
| SBW07C | BASIN | 9 |
| SBW07B | BASIN | 11 |
| CW07BC | COMBINE | 20 |
| RW07BC | ROUTE | 20 |
| SBW07A | BASIN | 19 |
| CW07A | COMBINE | 39 |
| SBW06A | BASIN | 8 |
| SBW05A | BASIN | 19 |
| SBW04A | BASIN | 5 |
| SBW02A | BASIN | 13 |
| SBW01A | BASIN | 5 |

Aerial Imagery dated 2007

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200 100 0 200
Feet

Sheet 1 of 1

CITY OF SCOTTSDALE

# SERENO CANYON
# EXISTING CONDITION DRAINAGE EXHIBIT

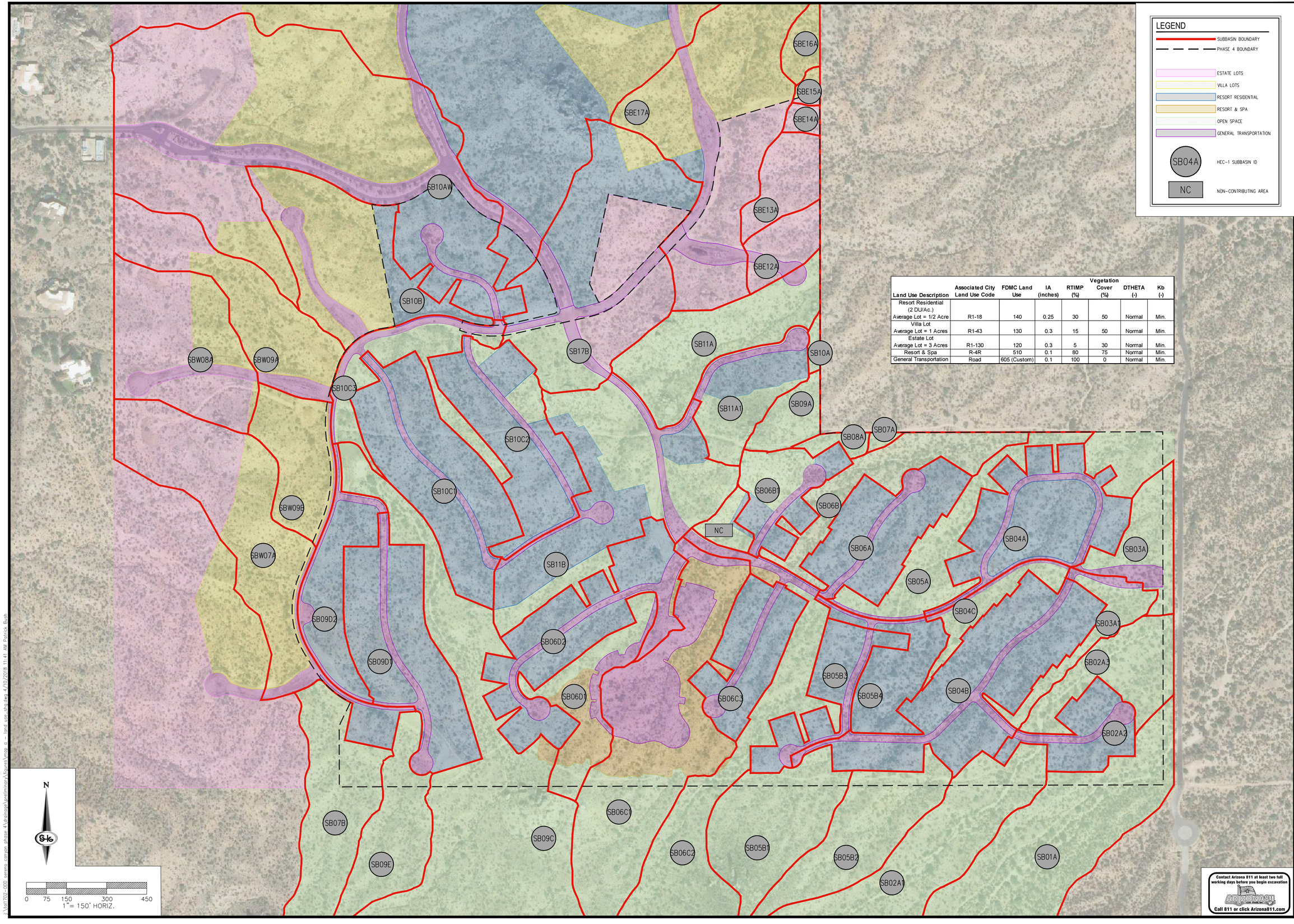
## SCOTTSDALE, ARIZONA

## JANUARY 2012

## Legend

- Concentration Points
- Existing Floodplains
- Sub-Basins
- 1-Foot Contour Interval Limits
- Sereno_Canyon_Project_Boundary

Sub-Basin Flowline
*Type*
- Route
- TC
- TC and Route




| Land Use Description | Associated City Land Use Code | FDMC Land Use | IA (inches) | RTIMP (%) | Vegetation Cover (%) | DTHETA (-) | Kb (-) |
|---|---|---|---|---|---|---|---|
| Resort Residential (2 DU/Ac.) Average Lot = 1/2 Acre | R1-18 | 140 | 0.25 | 30 | 50 | Normal | Min. |
| Villa Lot Average Lot = 1 Acres | R1-43 | 130 | 0.3 | 15 | 50 | Normal | Min. |
| Estate Lot Average Lot = 3 Acres | R1-130 | 120 | 0.3 | 5 | 30 | Normal | Min. |
| Resort & Spa | R-4R | 510 | 0.1 | 80 | 75 | Normal | Min. |
| General Transportation | Road | 605 (Custom) | 0.1 | 100 | 0 | Normal | Min. |

N

0 75 150 300 450
1"= 150' HORIZ.

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CONSULTING ENGINEERS & PLANNERS
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PHONE (602) 687-9664

| NO. | DESCRIPTION | DATE | BY | APP. DATE | APP. |
|---|---|---|---|---|---|
| | | | | | |

SCOTTSDALE, ARIZONA

TOLL BROTHERS INC.

SERENO CANYON - PHASE 4

LAND USE MAP

DATE: APRIL 2018
DRAFTER: PWB
DESIGNER: NAS
CHECKED: JKM

PROJECT NO.
TOL1702.000

MAP A
SHEET 1 OF 1

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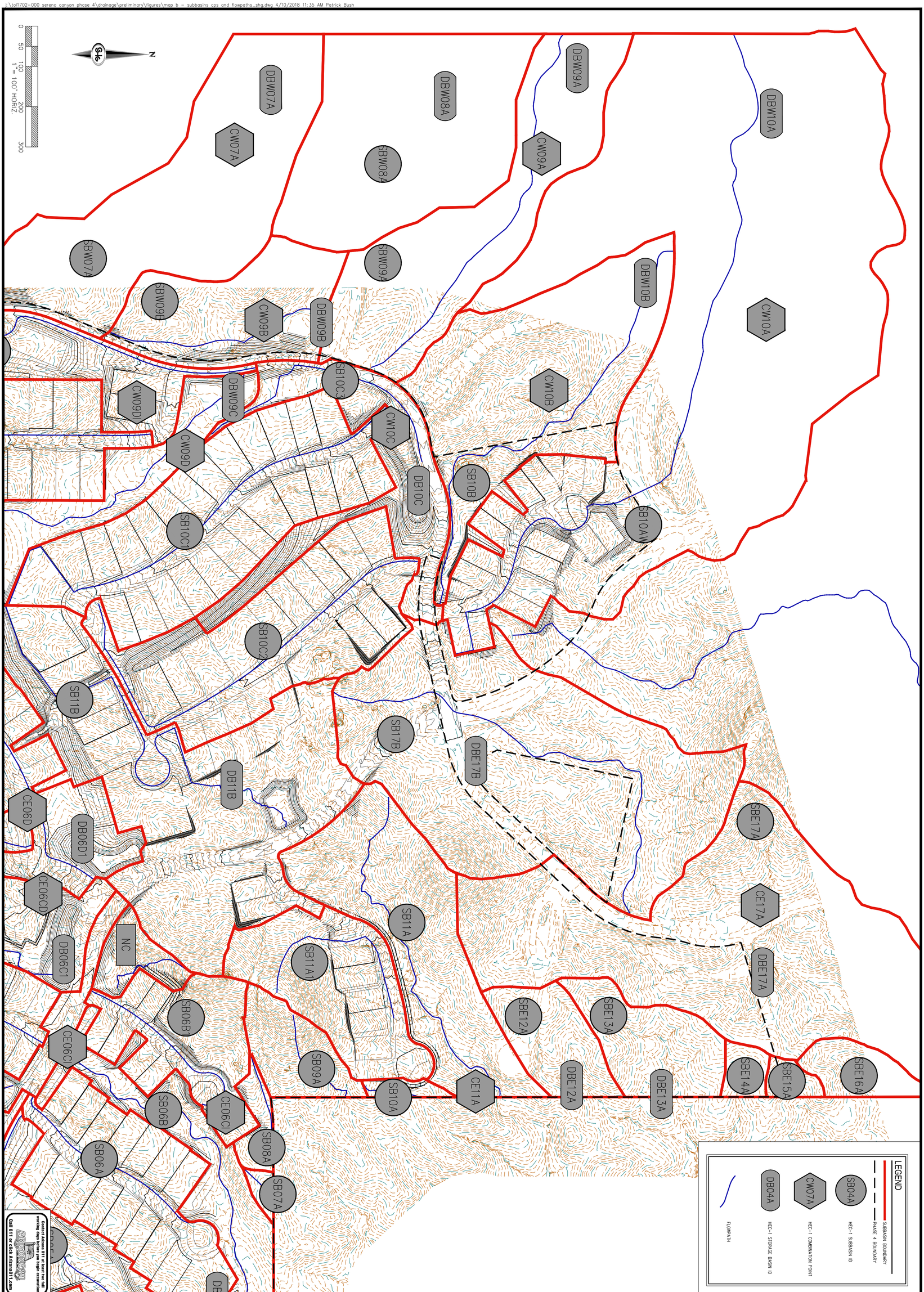


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MAP B
SHEET 1 OF 3

PROJECT NO. TOL1702.000

CHECKED: JKM
DESIGNER: NAS
DRAFTER: PWB
DATE: APRIL 2018

SCOTTSDALE, ARIZONA

# TOLL BROTHERS INC.

## SERENO CANYON - PHASE 4

## SUBBASINS, COMBINATION POINTS, AND FLOWPATHS

| NO. | DESCRIPTION | DATE | BY | APP. DATE | APP. |
|---|---|---|---|---|---|
| | | | | | |

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SBE12A
SB10B
DBE17B
CE11A
DB10C
CW10C
SB17B
SB11A
SB10A
SB11A1
SB09A
SB10C2
SB08A
SB07A
CE065A
CE06A
DB11B
CE06CI
DB04A
DB06A
CW09D
SB10C1
SB06B
CE04A
SB06B
NC
SB06A
SB04A
CE03A
SB03A
SB11B
DB06D1
DB06C1
CE06CI
DB04B
CE06CD
SB05A
DB03A1
CE06D
CE04B
SB04C
DB06C2
DB05B3
SB03A1
CE02A
SB06D2
SB09D
CE05B3
SB02A3
CE04A
SB05B3
SB04B
SB06D1
SB06C3
SB05B4
DB09E
DB05B2
SB02A2
CE05B
DB05B1
SB06C1
SB09C

0 50 100 200 300
1"= 100' HORIZ.

N

LEGEND
- SUBBASIN BOUNDARY
- PHASE 4 BOUNDARY
- SB04A — HEC-1 SUBBASIN ID
- CW07A — HEC-1 COMBINATION POINT
- DB04A — HEC-1 STORAGE BASIN ID
- FLOWPATH

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| NO. | DESCRIPTION | DATE | BY | APP. DATE | APP. |
|---|---|---|---|---|---|

SCOTTSDALE, ARIZONA

TOLL BROTHERS INC.

SERENO CANYON - PHASE 4

SUBBASINS, COMBINATION POINTS, AND FLOWPATHS

DATE: APRIL 2018
DRAFTER: PWB
DESIGNER: NAS
CHECKED: JKM
PROJECT NO.
TOL1702.000

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MAP B
SHEET 2 OF 3

J:\tol1702-000_sereno_canyon_phase_4\drainage\preliminar\figures\map_b_-_subbasins_cps_and_flowpaths_sbp.dwg 4/10/2018 11:35 AM Patrick Bush

LEGEND

- SUBBASIN BOUNDARY
- PHASE 4 BOUNDARY
- SB04A — HEC-1 SUBBASIN ID
- CW07A — HEC-1 COMBINATION POINT
- DB04A — HEC-1 STORAGE BASIN ID
- FLOWPATH

0 100 200 400 600
1"= 200' HORIZ.

N

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|---|---|---|---|---|---|

SCOTTSDALE, ARIZONA

TOLL BROTHERS INC.

# SERENO CANYON - PHASE 4
## SUBBASINS, COMBINATION POINTS, AND FLOWPATHS

DATE: APRIL 2018
DRAFTER: PWB
DESIGNER: NAS
CHECKED: JKM
PROJECT NO.
TOL1702.000

**MAP B**
SHEET 3 OF 3

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# MAP C
SHEET 1 OF 3

PROJECT NO. TOL1702.000

DESIGNER: NAS
DRAFTER: PWB
CHECKED: KKM
DATE: APRIL 2018

SCOTTSDALE, ARIZONA

## TOLL BROTHERS INC.

## SERENO CANYON - PHASE 4

## PROPOSED DEVELOPMENT LAYOUT

| NO. | DESCRIPTION | DATE | BY | APP. DATE | APP. |
|---|---|---|---|---|---|

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| NO. | DESCRIPTION | DATE | BY | APP. DATE | APP. |
|---|---|---|---|---|---|

SCOTTSDALE, ARIZONA

TOLL BROTHERS INC.

# SERENO CANYON - PHASE 4
# PROPOSED DEVELOPMENT LAYOUT

DATE: APRIL 2018
DRAFTER: PWB
DESIGNER: NAS
CHECKED: JKM
PROJECT NO.
TOL1702.000

**MAP C**
SHEET 2 OF 3

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N

0 50 100 200 300
1"= 100' HORIZ.

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| NO. | DESCRIPTION | DATE | BY | APP. DATE | APP. |
|---|---|---|---|---|---|

SCOTTSDALE, ARIZONA

TOLL BROTHERS INC.

# SERENO CANYON - PHASE 4
# PROPOSED DEVELOPMENT LAYOUT

DATE: APRIL 2018
DRAFTER: PWB
DESIGNER: NAS
CHECKED: JKM

PROJECT NO.
TOL1702.000

**MAP C**
SHEET 3 OF 3

N

0 50 100 200 300
1"= 100' HORIZ.

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125TH PLACE
ALAMEDA ROAD
128TH STREET

0 75 150 300 450
1"= 150' HORIZ.

N

LEGEND

- SUBBASIN BOUNDARY
- PHASE 4 BOUNDARY
- SB04A — HEC-1 SUBBASIN ID
- CP04A — HEC-1 COMBINATION POINT
- DB04A — HEC-1 STORAGE BASIN ID
- R04A — HEC-1 ROUTE ID

NC

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| NO. | DESCRIPTION | DATE | BY | APP. DATE | APP. |
|---|---|---|---|---|---|

SCOTTSDALE, ARIZONA

TOLL BROTHERS INC.

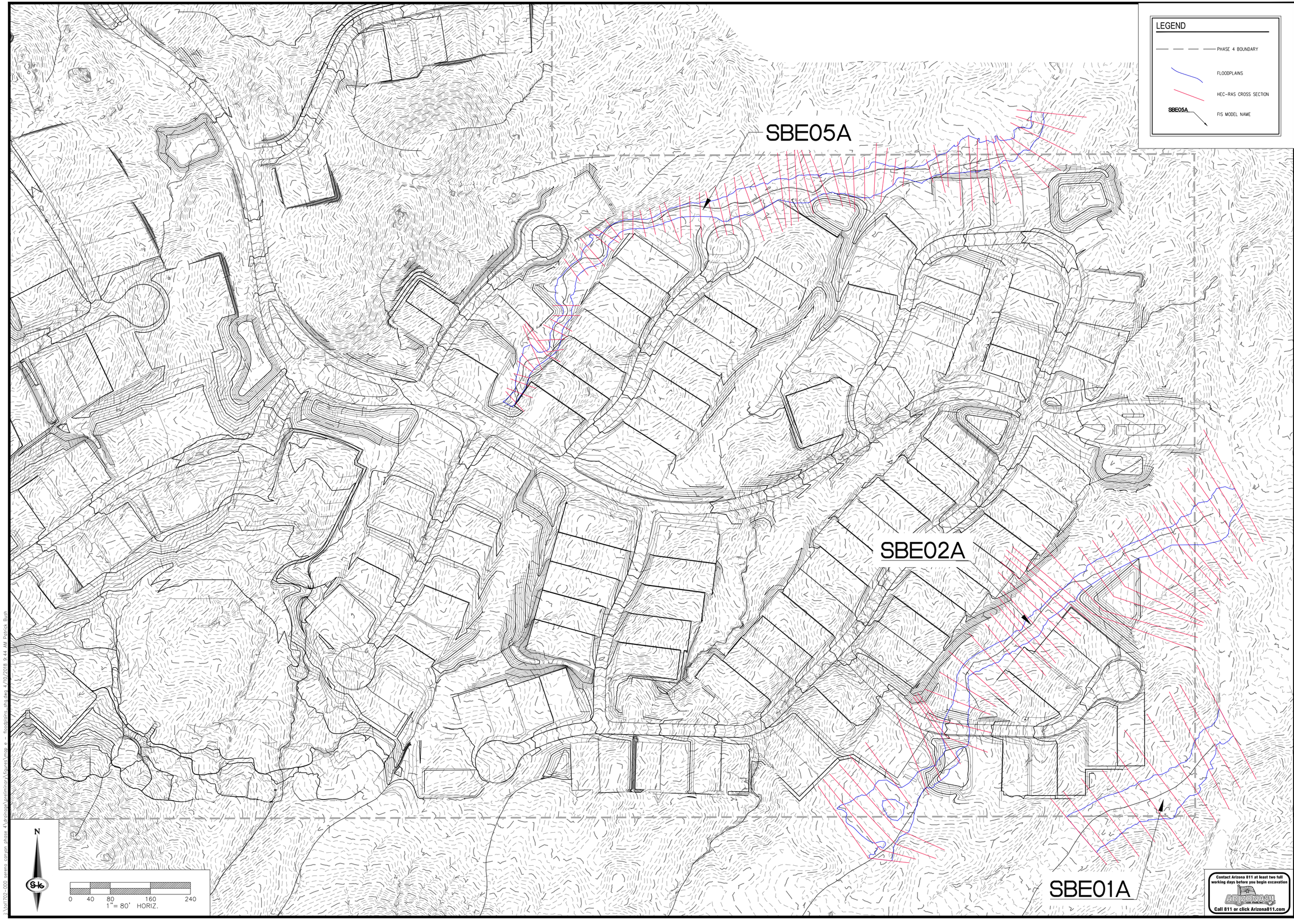
SERENO CANYON - PHASE 4

HEC-1 SCHEMATIC

DATE: APRIL 2018
DRAFTER: PWB
DESIGNER: NAS
CHECKED: JKM

PROJECT NO.
TOL1702.000

MAP D
SHEET 1 OF 1

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|---|---|---|---|---|---|
| | | | | | |

TOLL BROTHERS INC.
SCOTTSDALE, ARIZONA

# SERENO CANYON - PHASE 4
## HEC-RAS CROSS SECTIONS AND FLOODPLAINS

| | |
|---|---|
| DATE: | APRIL 2018 |
| DRAFTER: | PWB |
| DESIGNER: | NAS |
| CHECKED: | JKM |
| PROJECT NO. | TOL1702.000 |

**MAP E**
SHEET 1 OF 1

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J:\tol1702.000 - sereno canyon phase 4\drawings\exhibits\floods\floods - floodplains.dwg, 4/9/2018 9:44 AM, Patrick Burr