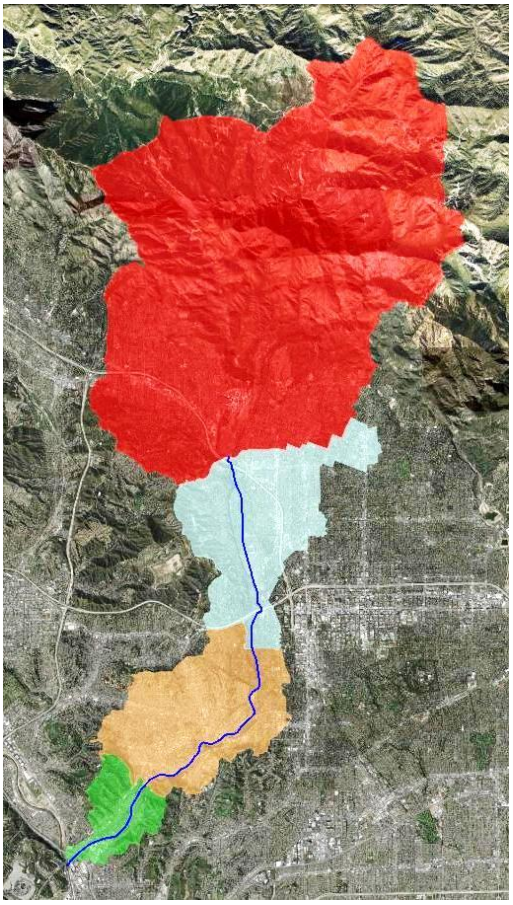
Hydrologic Analysis of Devils Gate Dam & Arroyo Seco Channel Tributaries

Devils Gate Reservoir Sediment Removal and Management Project



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Prepared for:

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Engineer's Certification

This report was prepared under the supervision of Charles S. Mohrlock, a Registered Civil Engineer in the State of California. The Registered Civil Engineer attests to the technical information contained herein and the engineering data upon which recommendations, conclusions, and decisions are based.

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Acronyms

LACFCD – Los Angeles County Flood Control District

DDE – Design Debris Event

BF – Bulking Factor

WMS – Watershed Modeling System

HEC-HMS – Hydrologic Engineering Center – Hydrologic Modeling System

MODRAT – Modified Rational Method

Abbreviations

yr – year

yd – yard

ft – foot

ac – acre

cfs – cubic feet per second

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1 Introduction

1.1 Purpose

This Hydrologic Analysis of the Devils Gate Dam and Arroyo Seco Channel Tributaries has been prepared per the request of the Los Angeles County Flood Control District (LACFCD) in order to analyze stormwater runoff characteristics of the Arroyo Seco Channel. This analysis has been performed considering the existing Dam condition, which currently has limited available storage for flood control due to the accumulation of sediment within the reservoir. Ultimately, the hydrologic information produced in this report will be utilized to perform a separate hydraulic analysis that identifies potential areas of flood inundation along the downstream Arroyo Seco Channel and may later be used for the development of a flood hazard warning and contingency plan for potentially impacted areas. However, this report will focus on the hydrologic study, analyzing the Devils Gate Dam and Arroyo Seco Channel Tributaries in order to determine the anticipated peak Capital Storm Event flow rates generated within the Arroyo Seco Channel.

This hydrologic analysis includes preparation of bulked outflow hydrographs for the Dam based on two different Dam outflow conditions: Condition 1, which assumes that the Dam spillway ports are clogged and do not allow stormwater discharge, and Condition 2, which assumes that the Dam spillway ports are not clogged and do allow stormwater discharge. Additional details about the assumed outflow conditions are provided in Section 2.1. Bulked outflow hydrographs for Condition 1 will be routed through the downstream Arroyo Seco Channel in order to analyze peak flow rates while the hydrograph generated for Condition 2 will be provided to LACFCD for informational purposes only.

1.2 Project Description

The Devils Gate Dam is located in the Los Angeles River Watershed in the City of Pasadena, CA. Situated immediately north of Interstate Highway 210, near the Rose Bowl, the Dam separates the upper and lower watersheds of the Arroyo Seco Channel and provides significant storage capacity for stormwater runoff originating north of the Dam in the San Gabriel Mountains.

The Dam was the first flood control facility built by Los Angeles County Flood Control District and was completed in 1920 for flood control and groundwater recharge purposes. In 1971, the Dam was damaged by the Sylmar earthquake and was subsequently renovated and repaired in 1997 in order to perform its primary role of flood control for the downstream communities of Pasadena, South Pasadena, and Los Angeles. The Arroyo Seco Channel flows through the reservoir, now called Hahamongna Watershed Park, and proceeds through the outlet of the Dam.

Figure 1-1: Vicinity Map

In 2009, the Station fires burned through more than 160,000 acres of Los Angeles County. Approximately 68% of the 31.9 square mile Arroyo Seco Channel watershed tributary to the Devils Gate facility was burned during this event. Due to the denuding of this large natural tributary area, excessive sediment loads (in excess of 1 million cubic yards) have been deposited within the Dam and adjacent Hahamongna Watershed Park.

Due to the volume of sediment deposited within the Dam reservoir, the Dam discharge structures are under direct threat of inundation. The sediment deposits have also allowed for native and foreign vegetation to establish itself within the Dam reservoir, creating a natural habitat that is currently the focus of an Environmental Impact Report.

The Devils Gate Dam directly discharges runoff to the Arroyo Seco Channel. The Channel is a natural creek for several hundred feet downstream of the Devils Gate Dam; however, this rapidly converts to an engineered concrete lined flood control channel constructed in 1935. The Arroyo Seco Channel continues to flow in a southerly direction through Pasadena, meandering through Brookside Park and around the Rose Bowl Stadium, ultimately draining to the Los Angeles River located approximately nine (9) miles downstream of Devils Gate Dam.

The Arroyo Seco Channel lower watershed is approximately 95% urbanized with a large amount of developed areas located adjacent to the Arroyo Seco Channel. There are also several historic bridge crossings at Colorado Street and La Loma Street that were constructed prior to the development of the engineered flood control channel.

The LACFCD has requested a hydrologic and hydraulic analysis be performed for the existing Dam condition that currently has limited available storage for flood control due to the sediment contained within the reservoir. The results of the analysis will identify areas of flood inundation along the Arroyo Seco Channel, which can be used to development of a flood hazard warning and contingency plan.

2 Hydrologic Methodology

2.1 Approach

Much of the vegetation within the Arroyo Seco Watershed was burned away during the Station Fire of 2009 leaving behind large, bare, mountainous tributaries that are highly susceptible to erosion. During a large storm, such as the Capital Storm Event, peak stormwater flow rates and volumes generated by these burned tributaries are larger than normal due to the inclusion of increased sediment from these denuded areas. In order to accurately model the peak stormwater runoff rate and cumulative stormwater runoff volume entering the Devils Gate Basin during the 50-yr, 4-day storm, the unbulked inflow hydrographs provided by the LACFCD must be "bulked" per requirements set forth in the Los Angeles County Hydrology & Sedimentation Manuals. Detailed information related to the bulking of flows for this project can be found in Section 2.2 of this report.

Once the bulked capital inflow hydrograph for the Devils Gate Dam is identified, the discharge rates that the Dam produces during the Capital Storm Event can be calculated with HEC-HMS software by combining the bulked hydrograph information with the LACFCD provided elevation-storage-discharge relationship information for the Dam. Per the request of LACFCD, two different modeling conditions have been assumed for the Dam, Condition 1 and Condition 2. More detailed information regarding how these flows have been routed through the Devils Gate Dam can be found in Section 2.3.

- Condition 1 assumes that the sediment elevation in the Dam is at the spillway ports and can only discharge over the top of the spillway (clogged ports). Discharge rates from Condition 1 will be used to model hydrologic and hydraulic conditions of the Arroyo Seco Channel downstream of the Dam.

- Condition 2 assumes that sediment elevation in the Dam is at the spillway ports; however, the ports are able to flow without plugging with debris (non-clogged ports). Discharge rates for Condition 2 are provided to LACFCD for informational purposes only, and will not be used to model downstream hydrologic or hydraulic conditions.

As discussed above, the Devils Gate Dam discharge rates for Condition 1 will be routed through the Arroyo Seco Channel downstream of the Dam. As this flow travels downstream, it will confluence with stormwater flows generated from three additional downstream basins: Basin 1, Basin 2, and Basin 3 as illustrated in Figure 2-1. Stormwater runoff rates for these downstream basins will be generated through the execution of Watershed Modeling System 8.4 (WMS) software which generates hydrographs for the 50-yr, 24-hr storm. Given this fact, before the 50-yr, 4-day Devils Gate Dam outflow hydrograph can be routed through the Arroyo Seco Channel its duration must be limited in order to match those of the downstream, 50-yr, 24-hr basin hydrographs. The Los Angeles County Hydrology Manual defines the 50-yr, 24-hr storm as the 4th day of the 50-yr, 4-day storm, so in order to match the hydrograph durations, only the Dam outflow hydrograph values for the 4th day of discharge are modeled

downstream. More detailed information regarding how the Dam outflow hydrograph was limited to only represent the 4th day of discharge is described in Section 2.3.1 of this report.

After the Devils Gate Dam bulked outflow hydrograph for the 50-yr, 24-hr storm is determined, it will be modeled through the downstream Arroyo Seco Channel and confluenced with the downstream contributory areas by utilizing the MODRAT Hydrologic Modeling Module of the WMS software as described in Section 2.4 of this report. This model will produce hydrographs for critical points along the Arroyo Seco Channel. The peak flow rates indicated by these hydrographs will later be used in the hydraulics report in order to identify potential flooding impacts adjacent to the Channel.

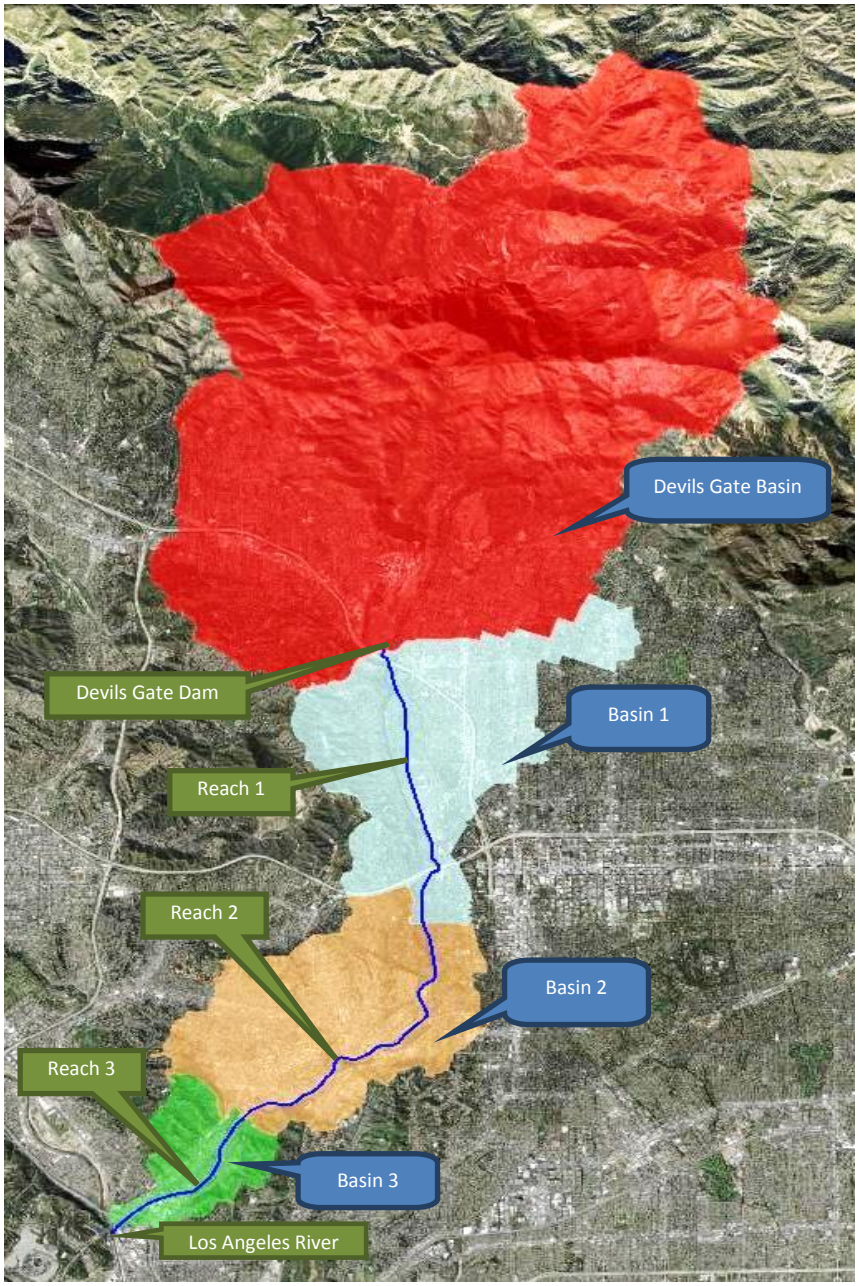


Figure 2-1: Basin Illustration

Reaches 1, 2 and 3 are associated with the portions of the Arroyo Seco Channel traveling through Basins 1, 2 and 3 respectively.

2.2 Modeling of Devils Gate Dam Inflow

In order to accurately model the peak stormwater runoff rate and cumulative stormwater runoff volume entering the Devils Gate Basin during the 50-yr, 4-day storm, the unbulked inflow hydrographs provided by the LACFCD must be "bulked" per requirements set forth in the Los Angeles County Hydrology & Sedimentation Manuals. Detailed information related to the bulking of flows for this project is included below.

2.2.1 Unbulked Devils Gate Dam Inflow Hydrograph

The LACFCD has provided the following hydrologic information pertaining to the Devils Gate Basin.

- Unbulked Capital Inflow Hydrograph Data (HMS format)
- Design Debris Event (DDE) Volume: 2,000,394 yd^3
- Bulking Factor (BF): 1.65
- Unbulked Capital Peak Inflow (Q_w): 13,969 cfs

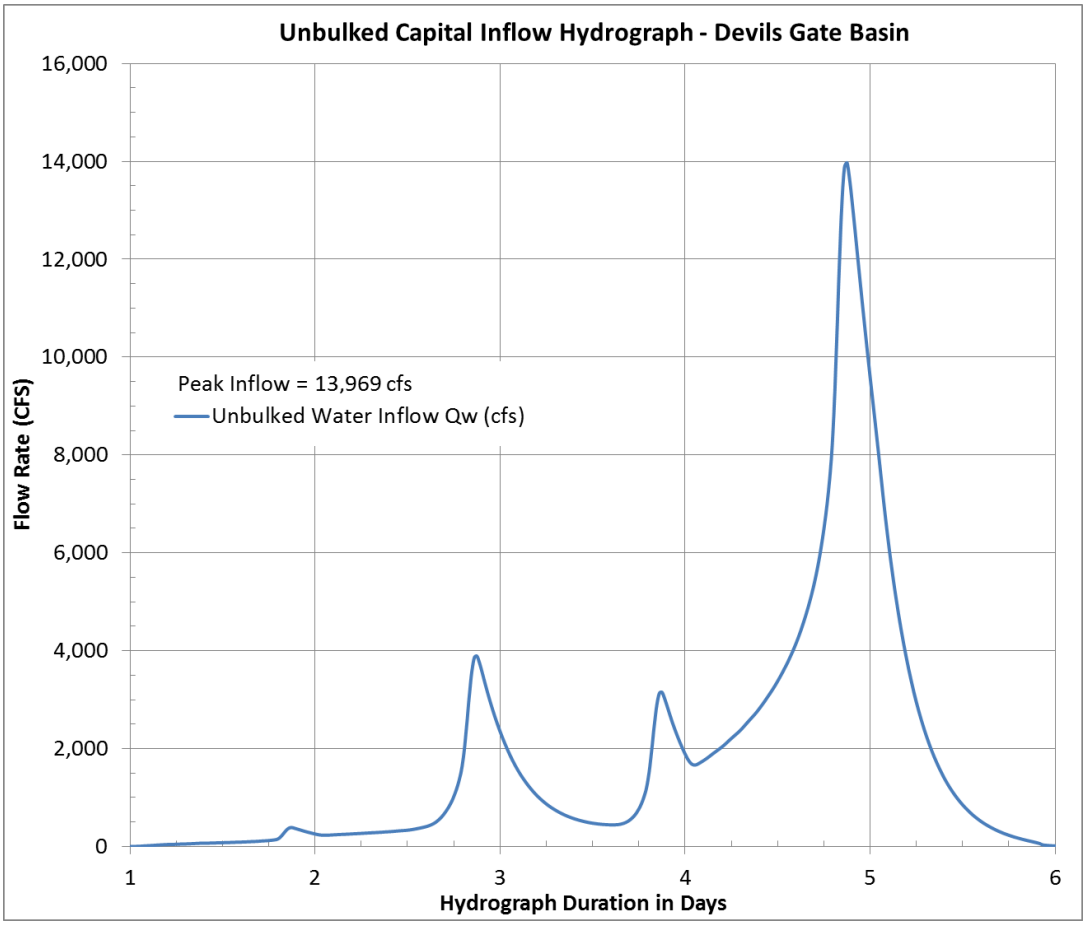


Figure 2-2: Unbulked Capital Inflow Hydrograph – Devils Gate Basin

Unbulked capital inflow hydrograph data provided by the LACFCD in HEC-HMS format has been digitized and graphed in Microsoft Excel to aid in the bulking analysis.

2.2.2 Bulked Devils Gate Inflow Hydrograph

In order to accurately model the peak stormwater runoff rate and cumulative stormwater runoff volume entering the Devils Gate Basin during the 50-yr, 4-day storm, the LACFCD provided unbulked inflow hydrograph must be "bulked" per requirements set forth in the Los Angeles County Hydrology and Sedimentation Manuals.

2.2.2.1 Bulking Peak Inflow at Devils Gate Basin

As identified in *Section 3.4 of the Los Angeles County Sedimentation Manual*, the peak bulking factor represents the proportion of the bulked flow rate to the burned flow rate during the peak of the flood hydrograph. Therefore, multiplying the unbulked capital peak inflow, as identified in the Devils Gate Basin Inflow Hydrograph, by the provided bulking factor provides the bulked peak inflow.

13,969 x 1.65 = 23,049 cfs Bulked Peak Inflow

This bulked peak inflow consists of a peak water inflow of 13,969 cfs and a peak sediment inflow of 9,080 cfs.

2.2.2.2 Design Debris Event (DDE)

As identified in *Section 3.1 of the Los Angeles County Sedimentation Manual*, the design debris event (DDE) is defined as the quantity of sediment produced by a saturated watershed significantly recovered from a burn (after four years) as a result of a 50-year, 24-hour rainfall amount. Per information provided by LACFCD, the DDE value for the Devils Gate Basin Watershed is 2,000,394 cubic yards.

2,000,394 yd^3 x (27 ft^3/yd^3) = 54,010,638 ft^3 Debris Generated

2.2.2.3 Applying Bulking to Devils Gate Basin Inflow Hydrograph

In order to correctly distribute the effects of the bulking factor throughout the LACFCD provided inflow hydrograph, two elements are considered: the peak sediment inflow rate and the DDE volume. The proper distribution of the bulking factor throughout the hydrograph must be such that it produces a peak sediment inflow rate of 9,080 cfs while also generating a total sediment volume of 54,010,638 ft^3 over the peak 24-hour storm period.

As identified in *Section 3.4 of the Los Angeles County Sedimentation Manual*, Equations 3.4.8 and 3.4.9 were utilized to distribute the effects of the bulking factor throughout

the inflow hydrograph for the Devils Gate Basin. These equations assume that the peak of the sediment hydrograph coincides with the peak of the inflow hydrograph.

$Q_b = Q_s + Q_w$ Equation 3.4.8

$Q_s = a \times (Q_w)^n$ Equation 3.4.9

Where:

Q_b = Bulked flow discharge (cfs)

Q_s = Sediment inflow rate (cfs)

Q_w = Water discharge per LACFCD Hydrographs (cfs)

a = Bulking constant (deduced iteratively)

n = Bulking exponent (deduced iteratively)

To aid in the execution of the formulas above, a table of the information utilized to create the LACFCD inflow hydrograph has been developed. This table consists of unbulked water inflow rates for the Dam reservoir at 20 minute intervals and has been modified by adding new columns for information such as sediment inflow rate, incremental sediment volume, and cumulative sediment volume. The Devils Gate Dam Calculation Table developed for this project is provided in Appendix A.

The sediment flow rate (Q_s) at any given 20 minute interval is determined by Equation 3.4.9 above, and is a function of the water inflow rate (Q_w), as identified within the LACFCD inflow hydrograph, as well as a bulking constant (a) and bulking exponent (n) which are further discussed below.

The incremental sediment volume is calculated by multiplying the sediment inflow rate (Q_s) by 1,200 seconds (equal to 20 minutes) in order to obtain the volume of sediment in ft^3 generated during a particular 20 minute interval.

The cumulative sediment volume is simply the sum of all prior incremental sediment volumes at any point during the storm.

Knowing that for the 50-yr, 24-hr storm event, the cumulative sediment volume must equal 54,010,638 ft^3, and that the peak sediment inflow rate must equal 9,080 cfs, the bulking constant (a) and bulking exponent (n) are adjusted iteratively in Equation 3.4.9 until these values are matched. It has been found that a higher bulking constant distributes the sediment inflow more uniformly over the hydrograph while a higher bulking exponent concentrates sediment inflow to peak periods of water inflow; therefore, given the specified cumulative sediment volume, and peak sediment inflow values, it has been determined that the bulking constant 1.00E-36 and the bulking exponent 9.63961 best distribute the effects of bulking throughout the 50-yr, 24-hr hydrograph.

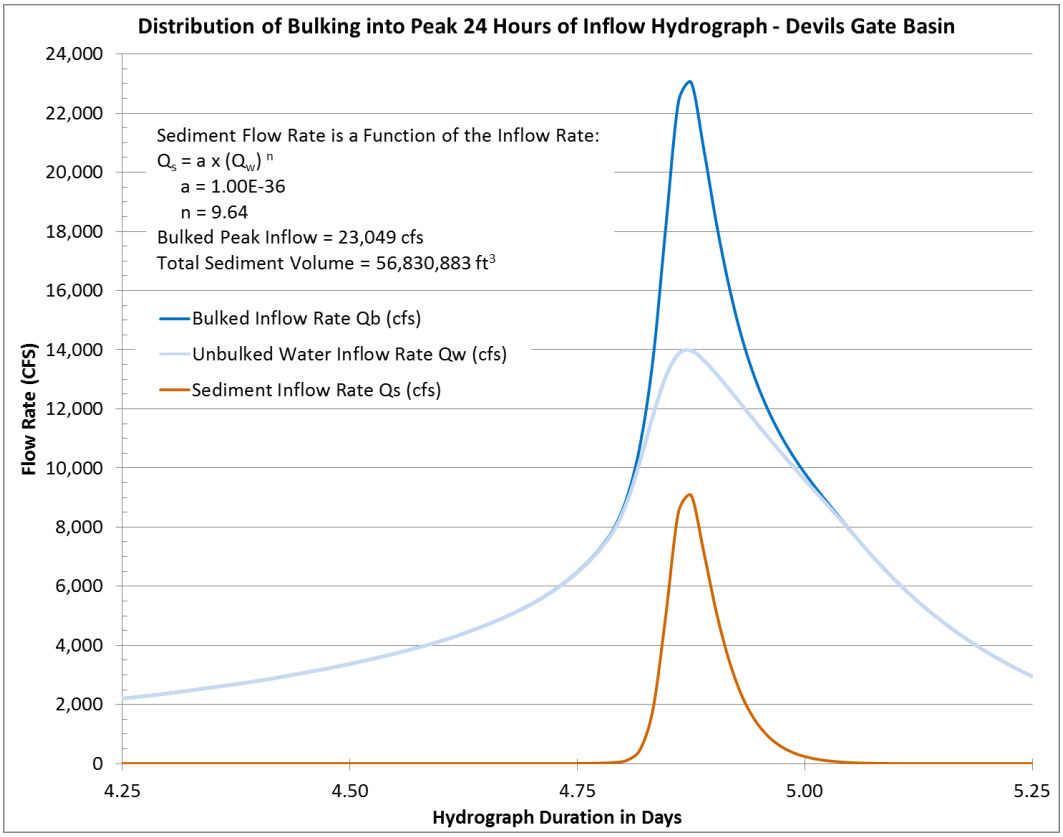


Figure 2-3: Distribution of Bulking into Peak 24 Hours of Inflow Hydrograph

The bulking constant (a) and bulking exponent (n) have been determined through analysis of the 50-yr, 24-hr storm event as illustrated above. Values of a and n have been adjusted such that the peak bulked inflow rate equals the LACFCD provided rate of 23,049 cfs and the total sediment volume, which is the area under the sediment inflow curve, closely matches the LACFCD provided design debris event (DDE) volume of 54,010,638 ft^3.

It should be noted that the "a" and "n" values used actually generate a slightly larger volume of sediment than what has been indicated by DDE values provided by LACFCD (+5%). Although the effects are largely negligible, distributing this larger sediment volume throughout the inflow hydrograph produces an inflow hydrograph with a slightly broadened crest and is a conservative assumption that is incorporated into this distribution of bulked flow.

In order to properly analyze the elevation, storage, and discharge rates of the Devils Gate Dam during the Capital Storm Event, which is a 4 day duration storm, the bulking constant and bulking exponent values determined through analysis of the 50-yr, 24-hr storm are then applied to the entire 4-day duration of the Capital Storm Event in order to generate the bulked Dam inflow hydrograph. However, it has been found that due to

the significantly lower water inflow rates during days 1 through 3, the bulking effects are negligible for all periods except the peak 24-hrs of the storm.

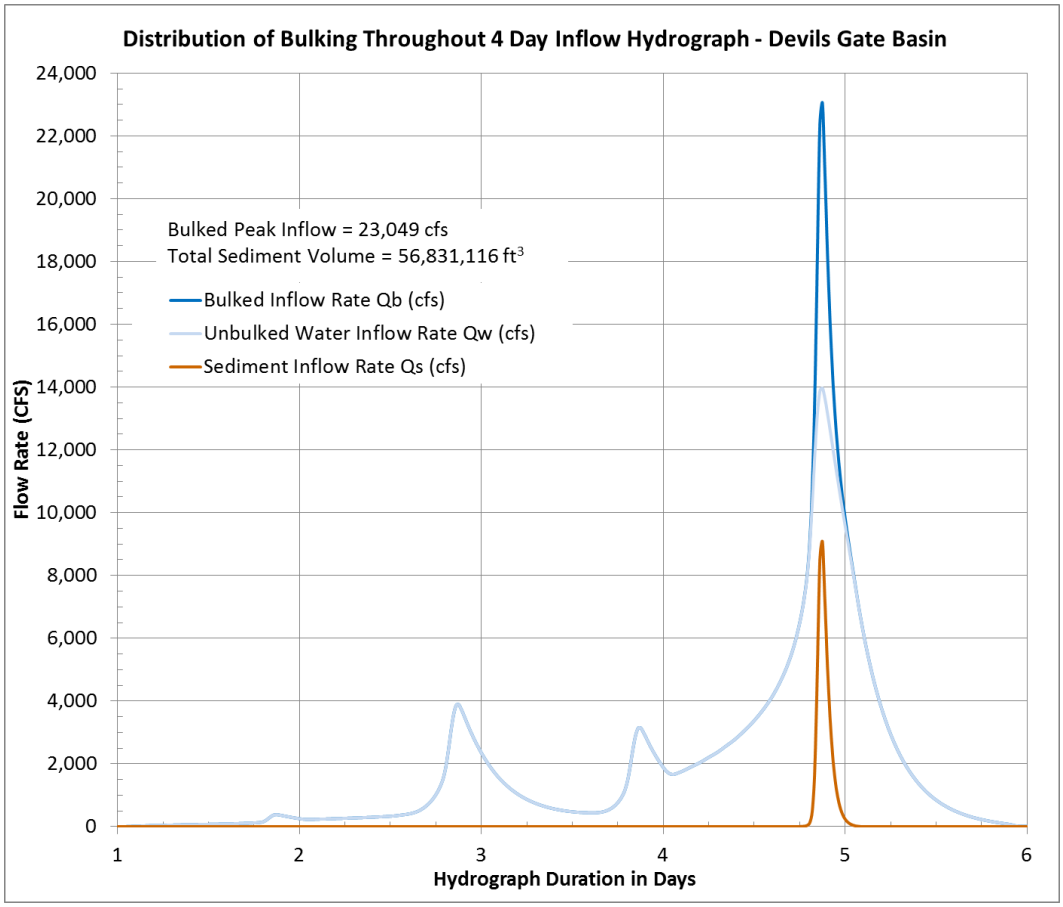


Figure 2-4: Distribution of Bulking Throughout 4 Day Inflow Hydrograph

The bulking constant (a) and bulking exponent (n) determined per Section 2.2.2.3 have been applied to the entire 50-yr, 4-day storm hydrograph. The effects of sediment bulking for days 1 through 3 are negligible due to significantly reduced water inflow rates at this time.

HEC-HMS is then utilized to combine the sediment inflow hydrograph, as determined per Equation 3.4.9, with the LACFCD provided unbulked inflow hydrograph and produce the bulked capital inflow hydrograph for the Devils Gate Dam. In order to accurately route this inflow hydrograph through the Devils Gate Dam, more detailed information about the Dam and the Dam Reservoir will be required and is further discussed in Section 2.3.

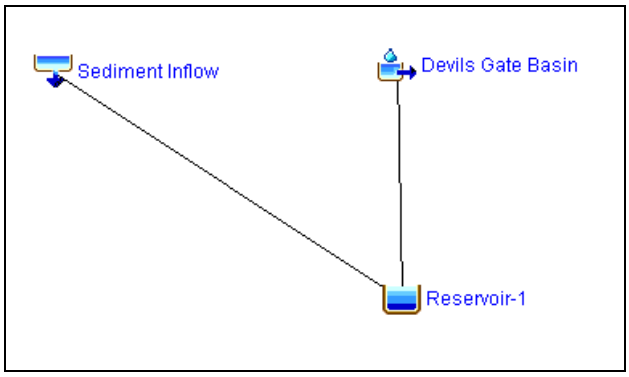
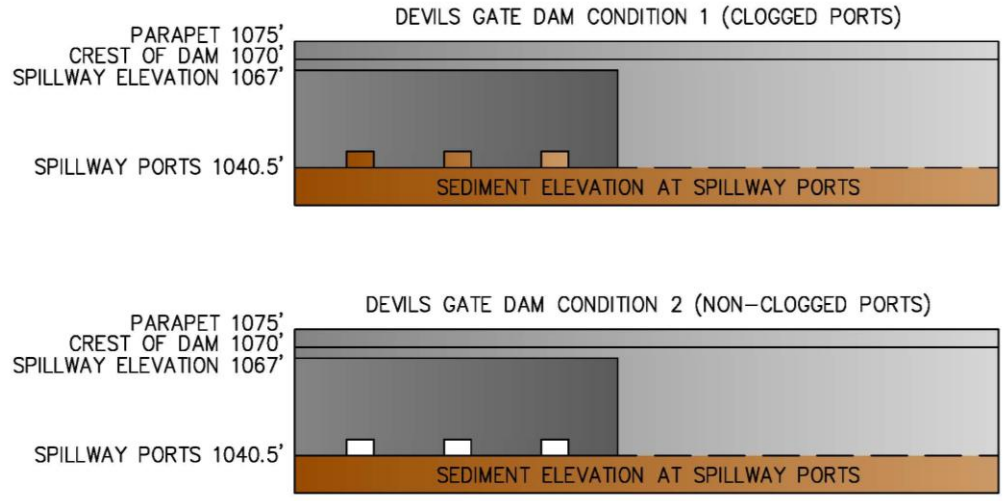


Figure 2-5: HEC-HMS Exhibit

The bulked capital inflow hydrograph is generated by routing the LACFCD provided "Devils Gate Basin" hydrograph and the calculated "Sediment Inflow" hydrograph data to a common reservoir.

2.3 Devils Gate Dam Outflow Hydrograph

LACFCD has provided Elevation-Storage-Relationships for the Devils Gate Dam on the next page. This information has been utilized to create a model of the Devils Gate Dam in HEC-HMS and simulate the bulked capital storm Dam outflow based on two different conditions: Condition 1, which assumes that the Dam spillway ports are clogged and do not allow stormwater discharge, and Condition 2, which assumes that the Dam spillway ports are not clogged and do allow stormwater discharge. These conditions are illustrated in Figure 2-6 below and are described in more detail in Sections 2.3.1 and 2.3.2.



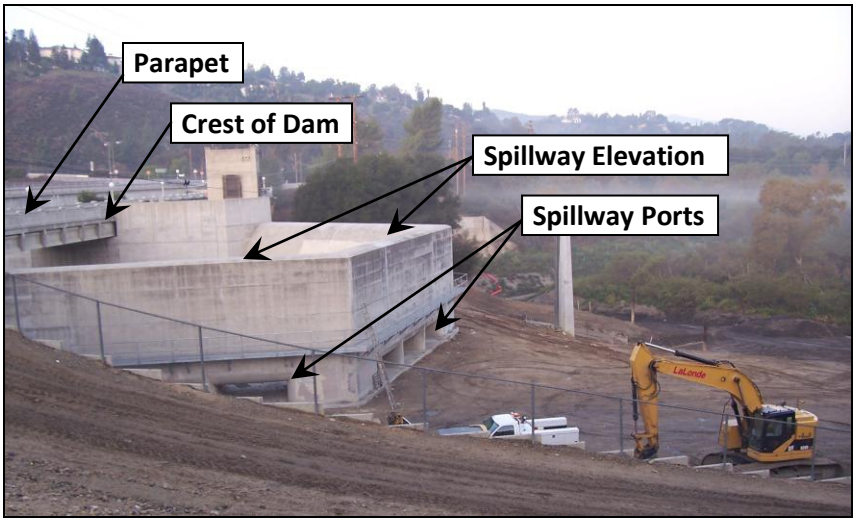


Figure 2-6: Illustration of Dam Outflow Conditions

Elevation-Storage-Discharge Relationship

	Water Surface Elevation (ft)	LACFCD Storage (ac-ft)	Modified Storage (ac-ft)	Port Discharge (cfs)		Condition 1 (Clogged Ports)	Condition 2 (Open Ports)
				Weir Discharge	Orifice Discharge	Spillway Discharge (cfs)	Port + Spillway Discharge (cfs)
Ports (1040.5)	1,040	1,322	0	0	0	0	0
	1,041	1,416	94	113	0	0	113
	1,042	1,512	190	589	0	0	589
	1,043	1,608	286	1,266	0	0	1,266
	1,044	1,706	384	2,098	2,797	0	2,098
	1,045	1,806	484	3,059	3,955	0	3,059
	1,046	1,908	586	4,133	4,844	0	4,133
	1,047	2,015	693	5,310	5,593	0	5,310
	1,048	2,126	804	6,581	6,254	0	6,254
	1,049	2,242	920	7,940	6,850	0	6,850
	1,050	2,363	1,041	9,382	7,399	0	7,399
	1,051	2,484	1,162	10,901	7,910	0	7,910
	1,052	2,614	1,292	12,495	8,390	0	8,390
	1,053	2,744	1,422	14,160	8,844	0	8,844
	1,054	2,877	1,555	15,893	9,276	0	9,276
	1,055	3,017	1,695	17,691	9,688	0	9,688
	1,056	3,162	1,840	19,552	10,084	0	10,084
	1,057	3,313	1,991	21,474	10,464	0	10,464
	1,058	3,469	2,147	23,456	10,832	0	10,832
	1,059	3,630	2,308	25,495	11,187	0	11,187
	1,060	3,794	2,472	27,590	11,531	0	11,531
	1,061	3,962	2,640	29,739	11,865	0	11,865
	1,062	4,133	2,811	31,941	12,191	0	12,191
	1,063	4,307	2,985	34,195	12,507	0	12,507
	1,064	4,484	3,162	36,500	12,816	0	12,816
	1,065	4,665	3,343	38,855	13,118	0	13,118
	1,066	4,847	3,525	41,257	13,412	0	13,412
Spillway Elev.	1,067	5,033	3,711	43,708	13,701	0	13,701
	1,068	5,221	3,898	46,205	13,983	506	14,489
	1,069	5,411	4,089	48,748	14,260	1,707	15,967
Crest of Dam	1,070	5,605	4,283	51,336	14,532	3,312	17,844
	1,071	5,803	4,481	53,969	14,799	5,236	20,034
	1,072	6,005	4,683	56,645	15,061	7,433	22,494
	1,073	6,245	4,923	59,363	15,318	9,873	25,191
	1,074	6,495	5,173	62,124	15,571	12,533	28,105
Parapet	1,075	6,754	5,432	64,926	15,821	15,397	31,218
	1,076	7,025	5,703	67,770	16,066	18,451	34,517
	1,077	7,306	5,984	70,653	16,307	21,684	37,991
	1,078	7,598	6,276	73,577	16,545	25,086	41,632
	1,079	7,902	6,580	76,539	16,780	28,650	45,430
	1,080	8,218	6,896	79,540	17,012	32,368	49,379

Table 2-1: Elevation-Storage-Discharge Relationship Information Provided by LACFCD

All Elevation-Storage-Discharge relationships, with the exception of the Modified Storage volumes, have been provided by the LACFCD. The Modified Storage volume represents the storage volume provided by the Dam under the assumption that the sediment elevation is at the bottom of the spillway ports (elevation 1040), as requested by the LACFCD. This value has been obtained by subtracting 1,322 ac-ft from the storage values indicated by the LACFCD.

2.3.1 Devils Gate Dam Condition 1 (Clogged Ports)

Devils Gate Dam Condition 1 assumes that the sediment elevation in the Dam is at the spillway ports and can only discharge over the spillway (ports are assumed to be plugged with debris). Discharge rates from Condition 1 will be used to model hydrologic and hydraulic conditions of the Arroyo Seco Channel downstream of the Dam.

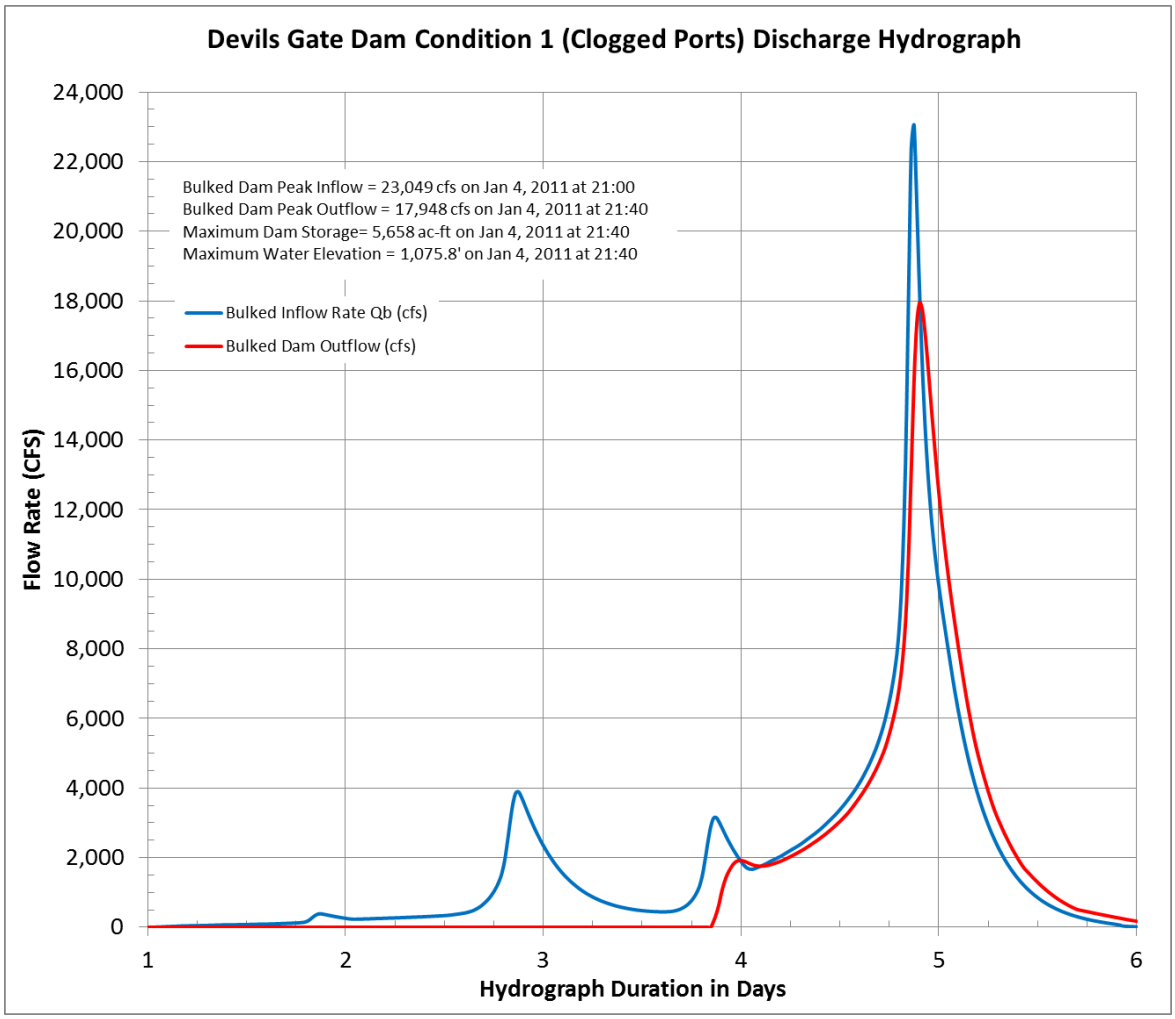


Figure 2-7: Devils Gate Dam Condition 1 – 4 Day Discharge Hydrograph

When the Devils Gate Dam spillway ports are assumed to be clogged with debris during a 50-yr, 4-day Capital Storm Event, no stormwater discharges from the Dam until almost the 4th day. See Figure 2.8 for a close up of the 4th day.

For the purposes of correctly modeling the elevation, storage, and discharge values of the Devils Gate Dam, it is necessary to route runoff generated by the 50-yr, 4-day storm event through the Dam as shown above. However, in order to route the Devils Gate Dam Outflow Hydrograph through the downstream Arroyo Seco Channel and incorporate additional stormwater runoff from

the downstream contributory basins, it is necessary to match the duration of the Devils Gate Dam Outflow Hydrograph with the duration of the 50-yr, 24-hr storm hydrographs that are generated by the downstream watersheds (see Section 2.4 for more information on this modeling approach). Therefore, only data from the 4th day of the Devils Gate Dam Outflow Hydrograph is routed through the Dam and into the downstream Arroyo Seco Channel. Figure 2.8 illustrates the hydrograph of the 4th day Dam outflow.

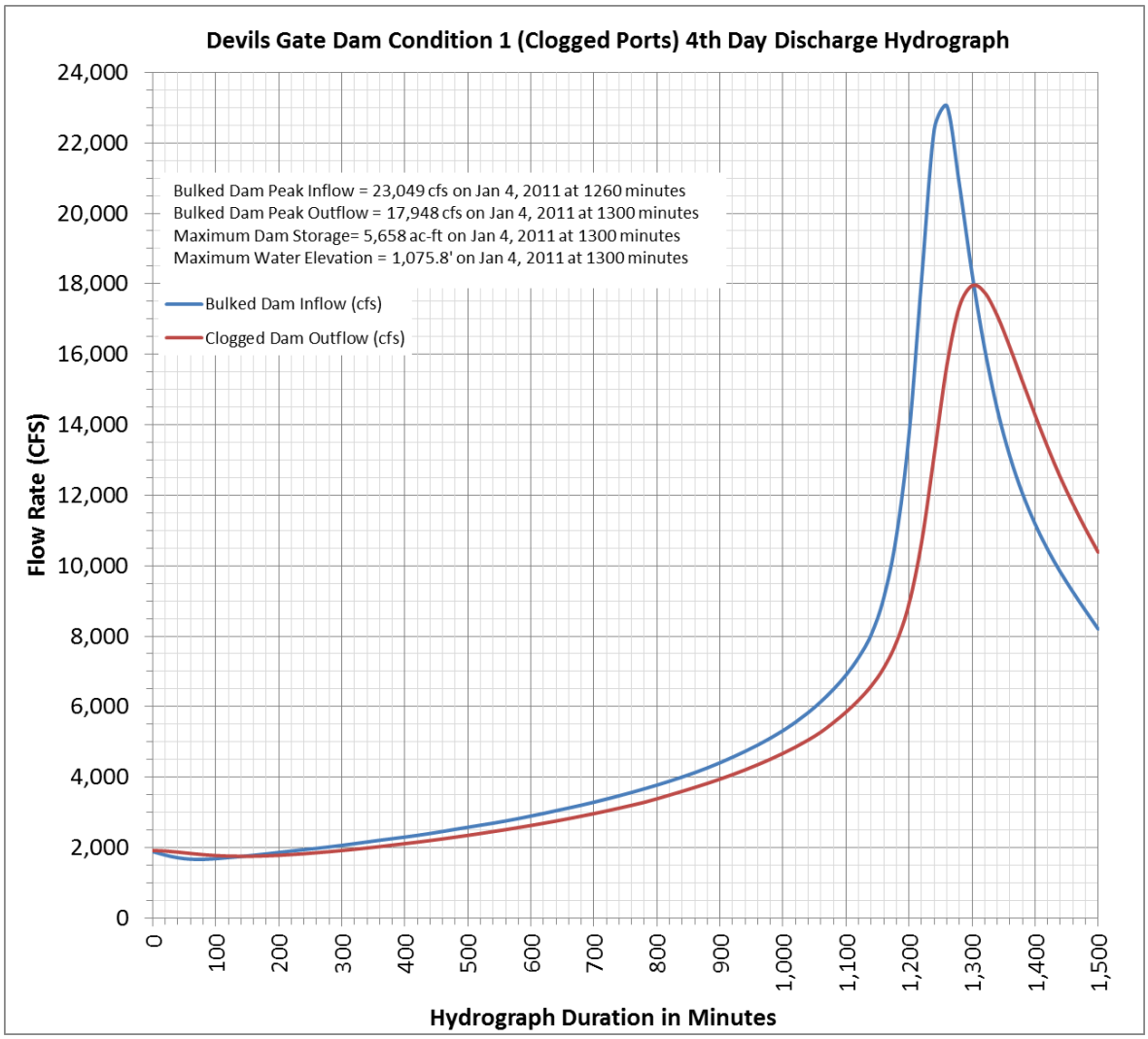


Figure 2-8: Devils Gate Dam Condition 1 – 4th Day Discharge Hydrograph

The peak Devils Gate Dam discharge occurs during the 4th day of the Capital Storm, as illustrated above. The outflow hydrograph for this time-frame will be routed through the downstream Arroyo Seco Channel watershed to determine peak flow rates in the channel during the 50-yr, 24-hr storm.

2.3.2 Devils Gate Dam Condition 2 (Non-Clogged Ports)

Devils Gate Dam Condition 2 assumes that sediment elevation in the Dam is at the spillway ports; however, the ports are able to flow without plugging with debris. Discharge rates for Condition 2 are provided to LACFCD for informational purposes only, and will not be used to model downstream hydrologic or hydraulic conditions.

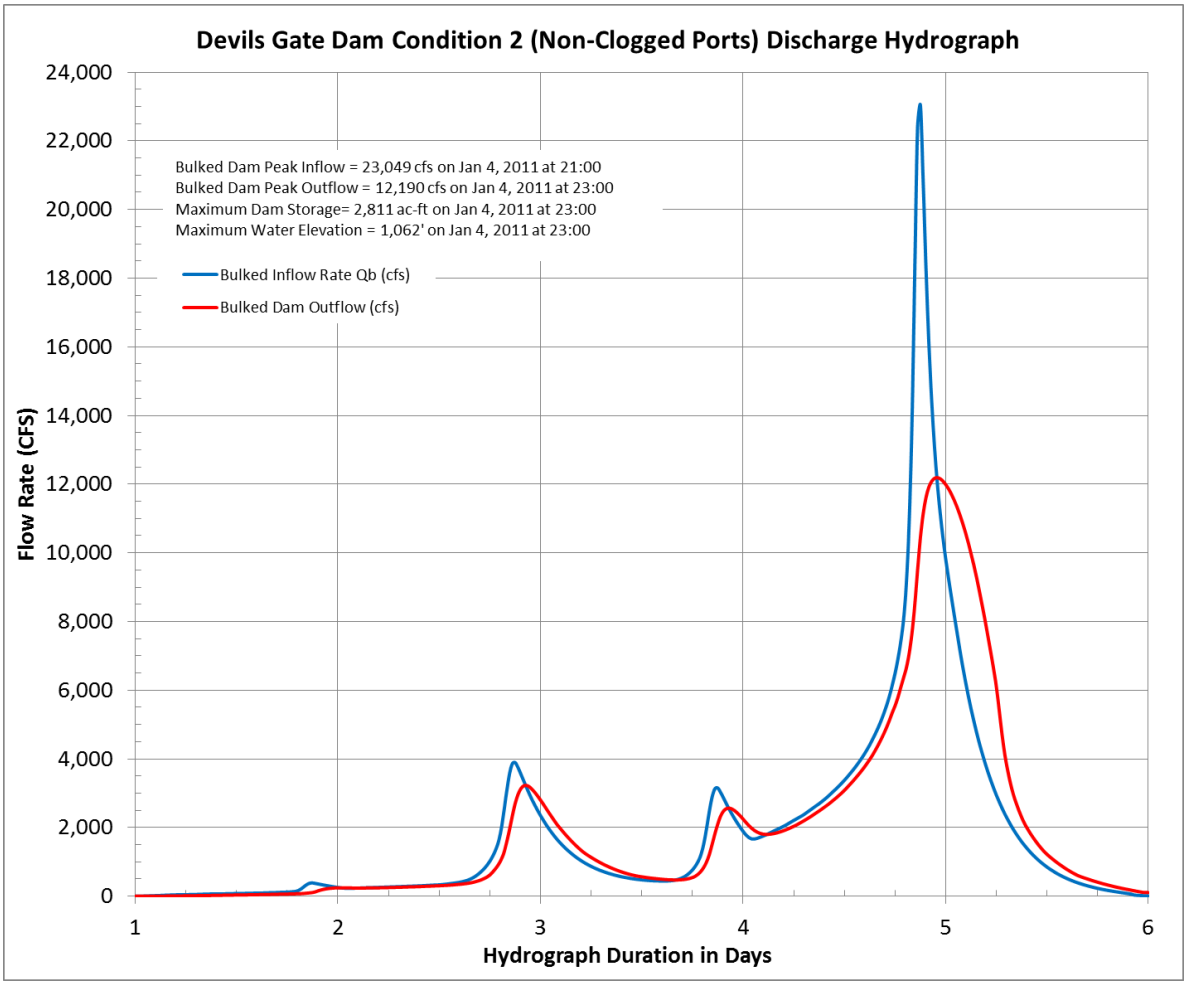


Figure 2-9: Devils Gate Dam Condition 2 – 4 Day Discharge Hydrograph

When the Devils Gate Dam spillway ports are assumed to operate effectively during a 50-yr, 4-day Capital Storm, the Dam outflow hydrograph closely mimics the inflow hydrograph but provides significant flow reduction during the peak period.

2.4 Modeling of Arroyo Seco Channel

LACFCD has provided "Watershed Modeling Software" (WMS) hydrologic models of the watershed downstream of the Devils Gate Dam. These models consist of watershed information such as basin area, soil type, bulked soil type, % impervious, 50-yr 24-hr rainfall depth, time of concentration, and temporal hydrograph distribution as well as routing information such as conveyance system type, slope, length and Manning's roughness coefficient. These models were provided as three separate sets of WMS files titled Reach 1, Reach 2 and Reach 3 and contained data for Arroyo Seco Channel contributory basin areas as identified in Figure 2-10.

The Reach 1 files represent the most upstream portion of the Arroyo Seco Channel (Basin 1) and consist of information from miles 9.6 to 6.0 of the Arroyo Seco Channel and its associated 4,198 acre watershed.

The Reach 2 files represent the middle portion of the Arroyo Seco Channel (Basin 2) and consist of information from miles 6.0 to 2.1 of the Arroyo Seco Channel and its associated 4,113 acre watershed.

The Reach 3 files represent the most downstream portion of the Arroyo Seco Channel (Basin 3) and consist of information from miles 2.1 to 0.0 of the Arroyo Seco Channel and its associated 1,173 acre watershed.

The MODRAT platform incorporated into the Hydrologic Modeling component of the WMS software has been utilized to generate surface stormwater runoff and appropriately route flows downstream through the length of the watershed.

On the pages below, Figures 2-10 through 2-17 illustrate how the Devils Gate Dam bulked outflow hydrograph is routed through the downstream Arroyo Seco Channel and confluenced with the downstream contributory areas (Basins 1, 2 and 3) by utilizing the MODRAT Hydrologic Modeling Module of the WMS 8.4 software. Hydrographs have been determined for critical points along the Arroyo Seco Channel and the peak flow rates indicated by these hydrographs will later be used in the hydraulics report in order to identify potential flooding impacts adjacent to the Channel.

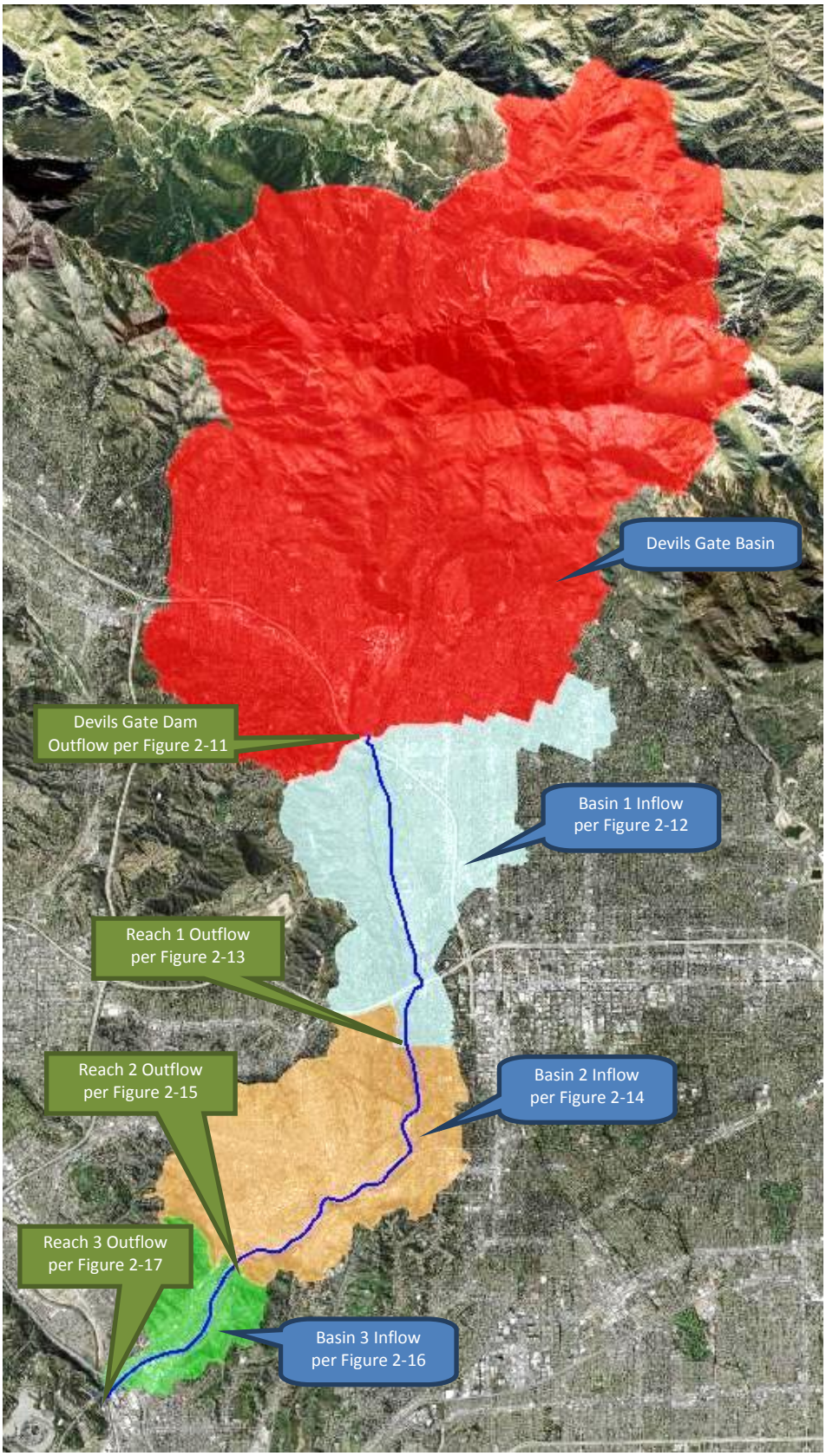


Figure 2-10: MODRAT Flow Routing Exhibit

Reference the figures identified at left for calculated hydrograph information at specific locations along the Arroyo Seco Channel.

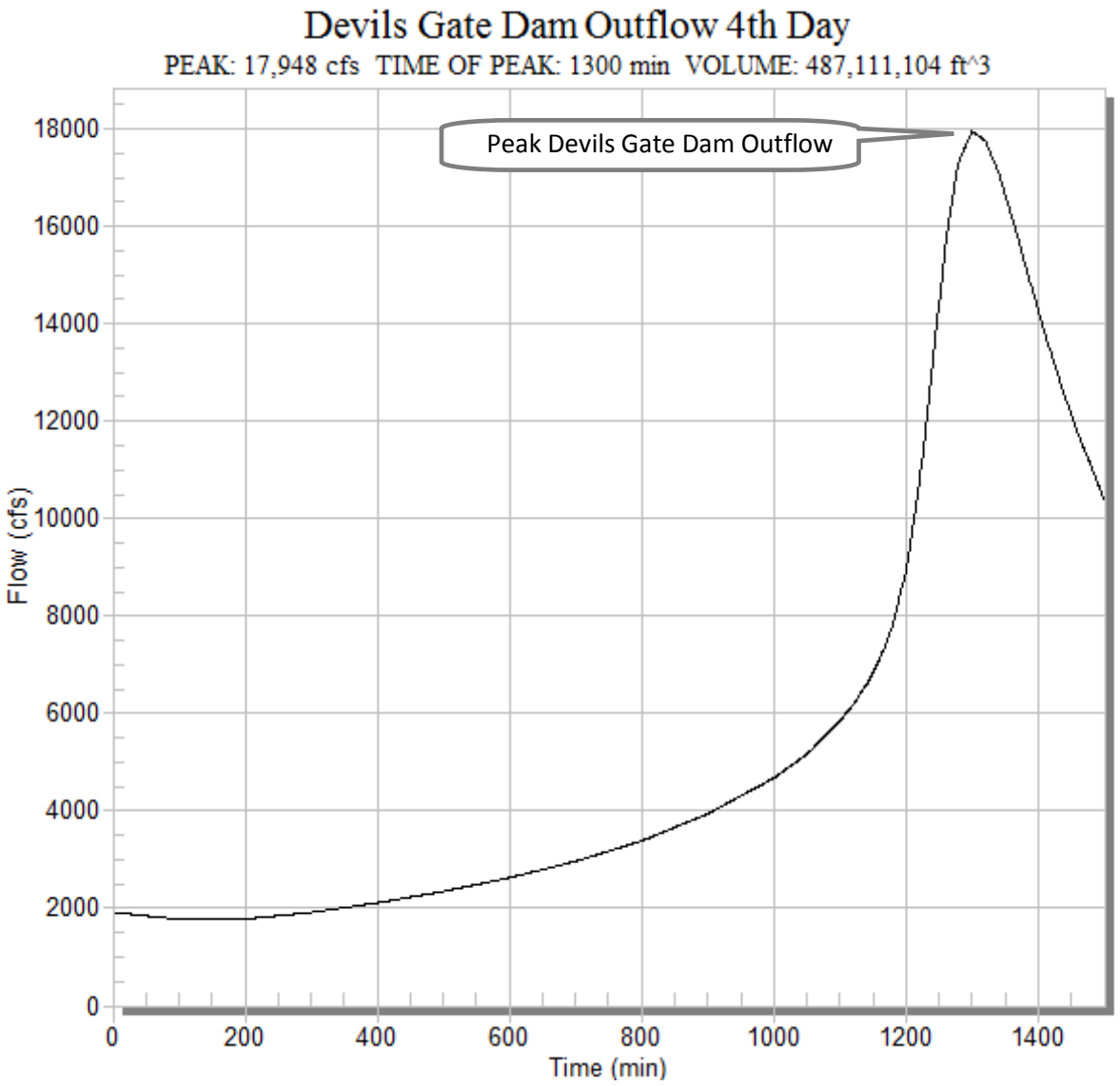


Figure 2-11: Devils Gate Dam Outflow – 4th Day

A peak discharge of 17,948 cfs passes through the Devils Gate Dam during the 1300th minute of the 4th day of the storm. This hydrograph will be input into the most upstream outlet of the Reach 1 WMS file in order to model the effects of the peak Dam discharge on the downstream Arroyo Seco Channel.

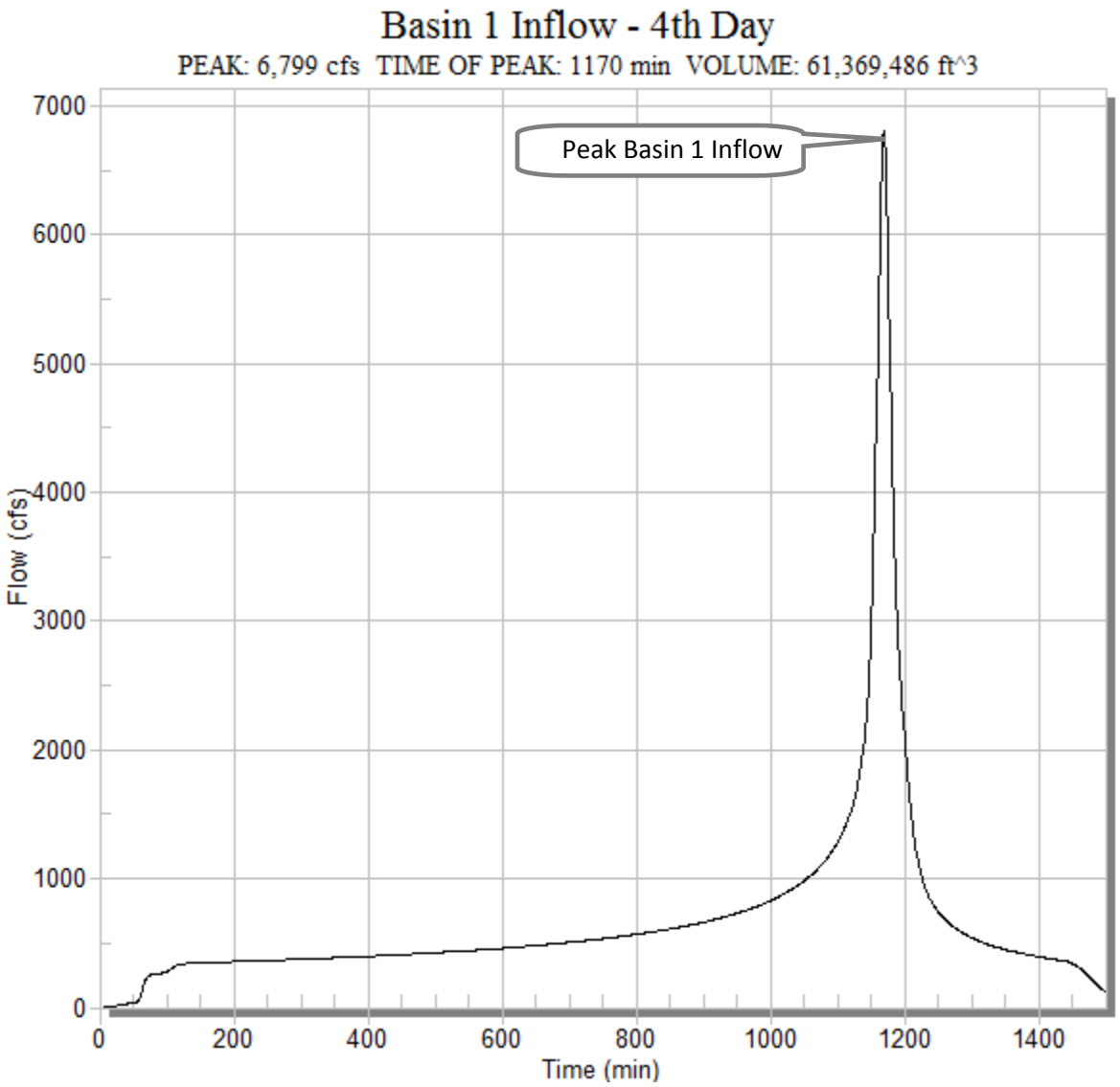


Figure 2-12: Basin 1 Inflow – 4th Day

A peak inflow of 6,799 cfs from Basin 1 enters the Arroyo Seco Channel during the 1170th minute of the 4th day of the storm. The MODRAT Hydrologic Modeling Module of WMS 8.4 has been utilized to generate the inflow hydrograph for this Basin and will also be utilized to combine the Devils Gate Dam Outflow Hydrograph and Basin 1 Inflow Hydrograph as illustrated in Figure 2-13.

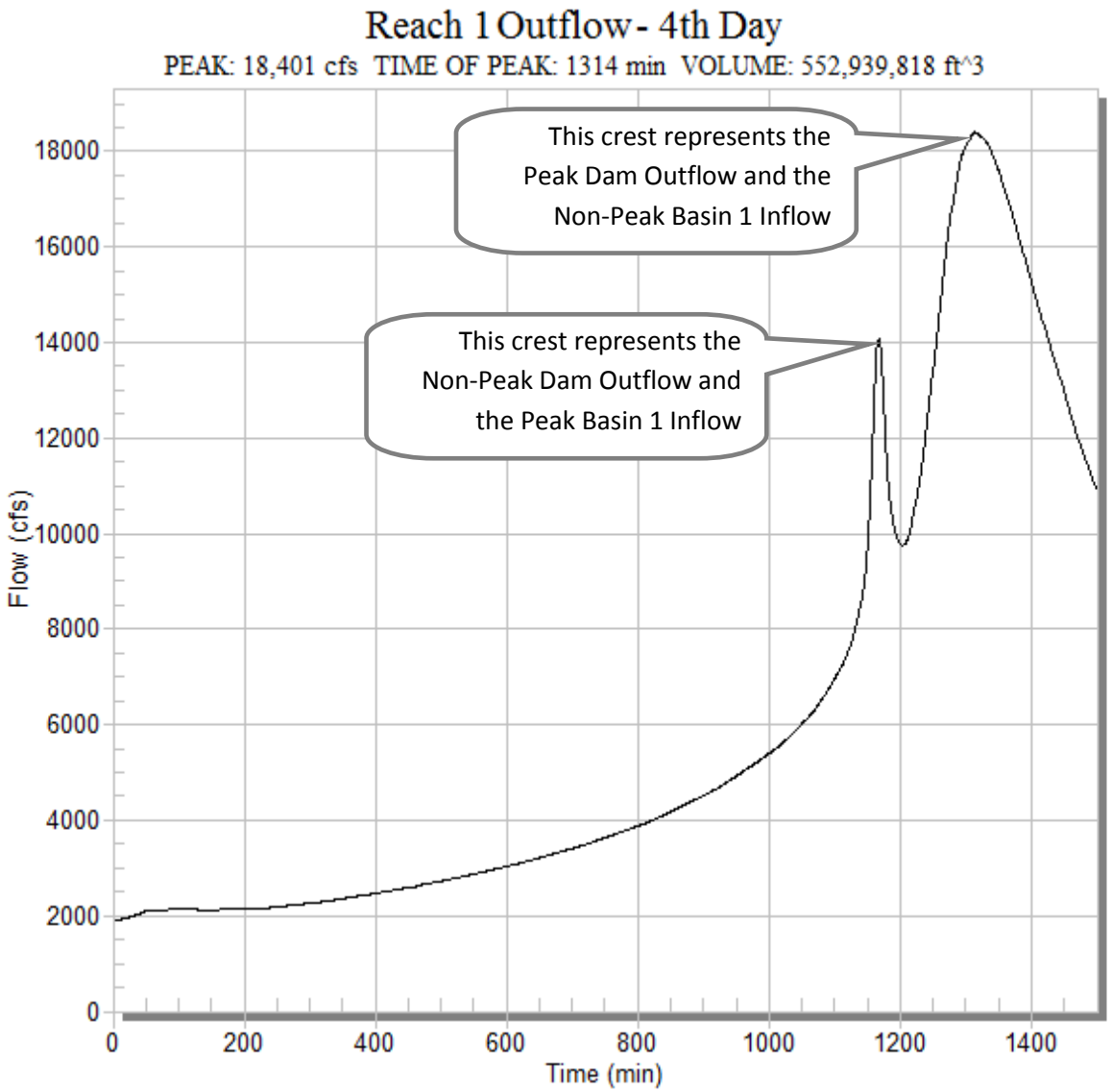


Figure 2-13: Reach 1 Outflow – 4th Day

A peak outflow of 18,401 cfs flows through the Arroyo Seco Channel at the most downstream point of Reach 1 during the 1314th minute of the 4th day of the storm. This Hydrograph has been generated by utilizing the MODRAT Hydrologic Modeling Module of WMS 8.4 to combine the Devils Gate Dam Outflow Hydrograph with the Basin 1 Inflow Hydrograph.

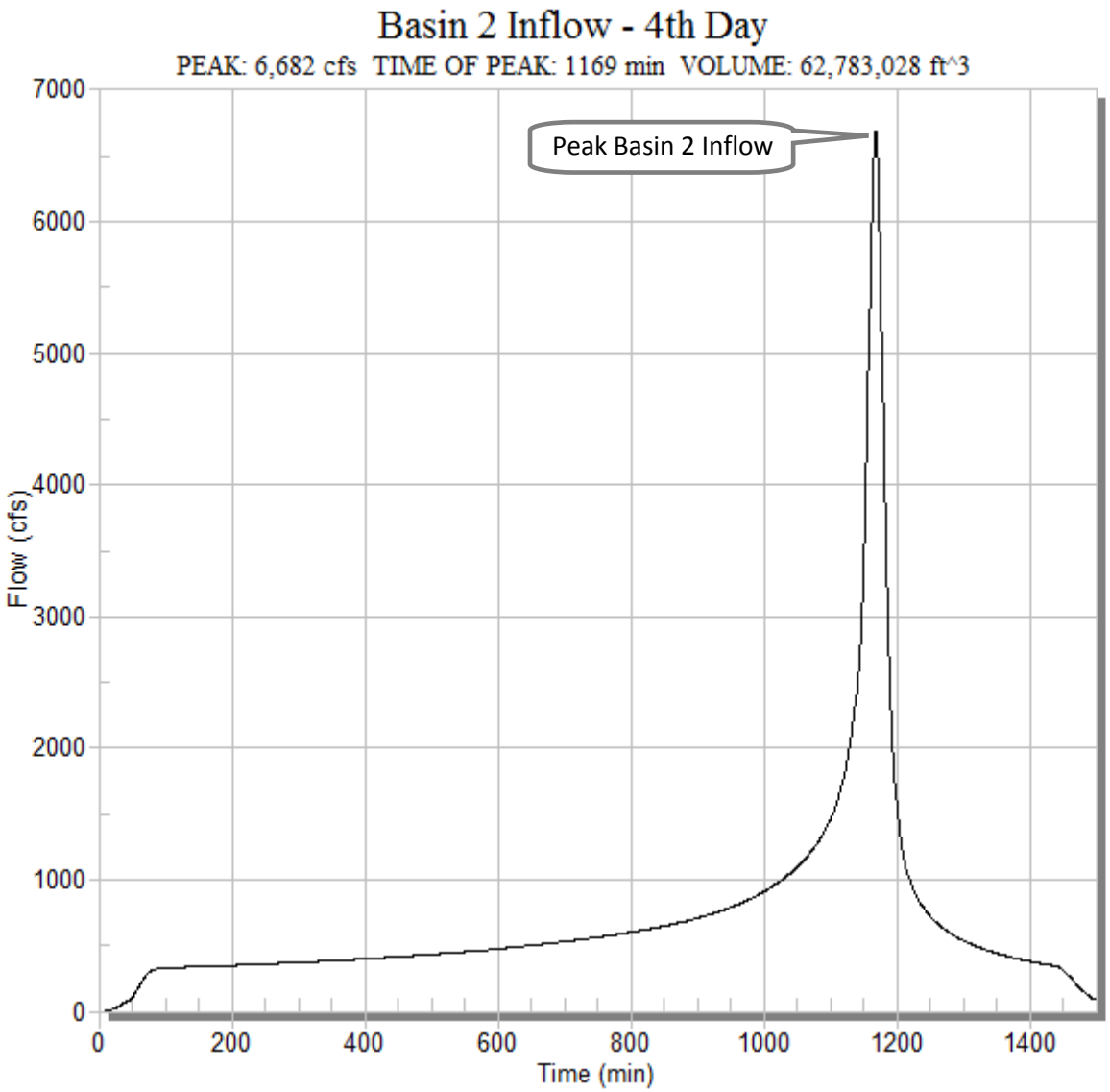


Figure 2-14: Basin 2 Inflow – 4th Day

A peak inflow of 6,682 cfs from Basin 2 enters the Arroyo Seco Channel during the 1169th minute of the 4th day of the storm. The MODRAT Hydrologic Modeling Module of WMS 8.4 has been utilized to generate the inflow hydrograph for this Basin and will also be utilized to combine the Reach 1 Outflow and Basin 2 Inflow Hydrographs as illustrated in Figure 2-15.

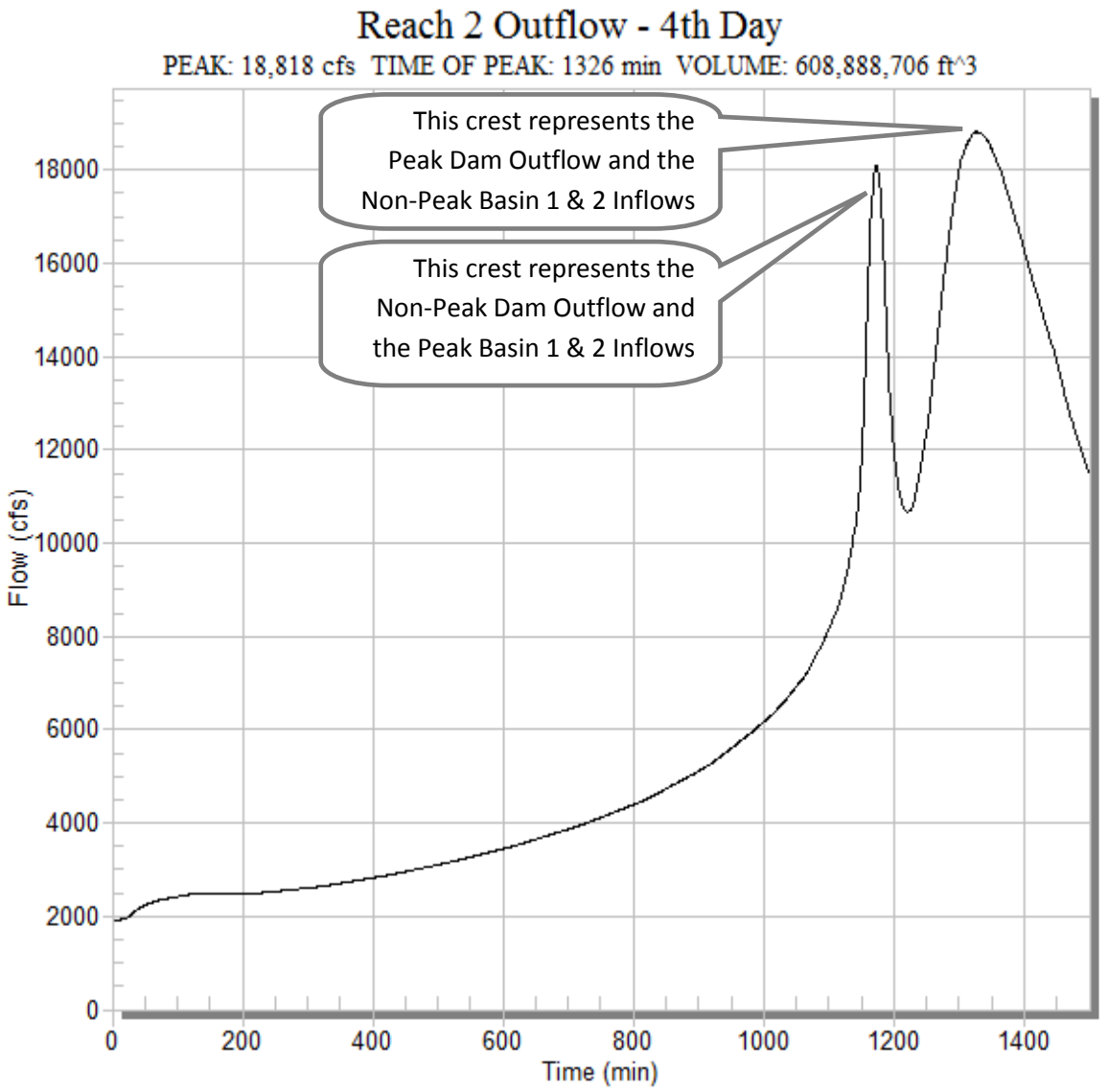


Figure 2-15: Reach 2 Outflow – 4th Day

A peak outflow of 18,818 cfs flows through the Arroyo Seco Channel at the most downstream point of Reach 2 during the 1326th minute of the 4th day of the storm. This Hydrograph has been generated by utilizing the MODRAT Hydrologic Modeling Module of WMS 8.4 to combine the stormwater runoff from the Reach 1 Outflow Hydrograph with the Basin 2 Inflow Hydrograph.

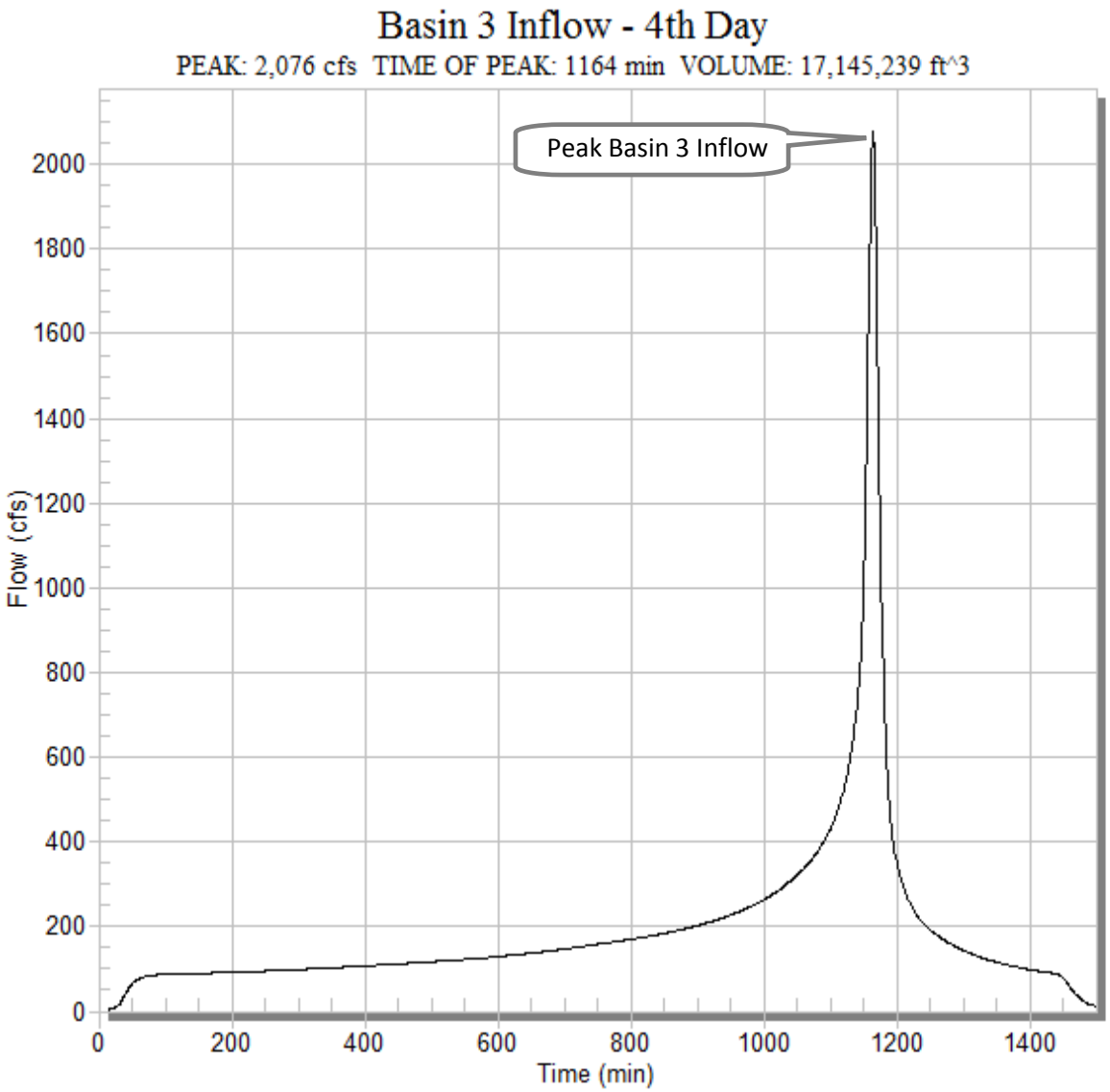


Figure 2-16: Basin 3 Inflow – 4th Day

A peak inflow of 2,076 cfs from Basin 3 enters the Arroyo Seco Channel during the 1164th minute of the 4th day of the storm. The MODRAT Hydrologic Modeling Module of WMS 8.4 has been utilized to generate the inflow hydrograph for this Basin and will also be utilized to combine the Reach 2 Outflow and Basin 3 Inflow Hydrographs as illustrated in Figure 2-17.

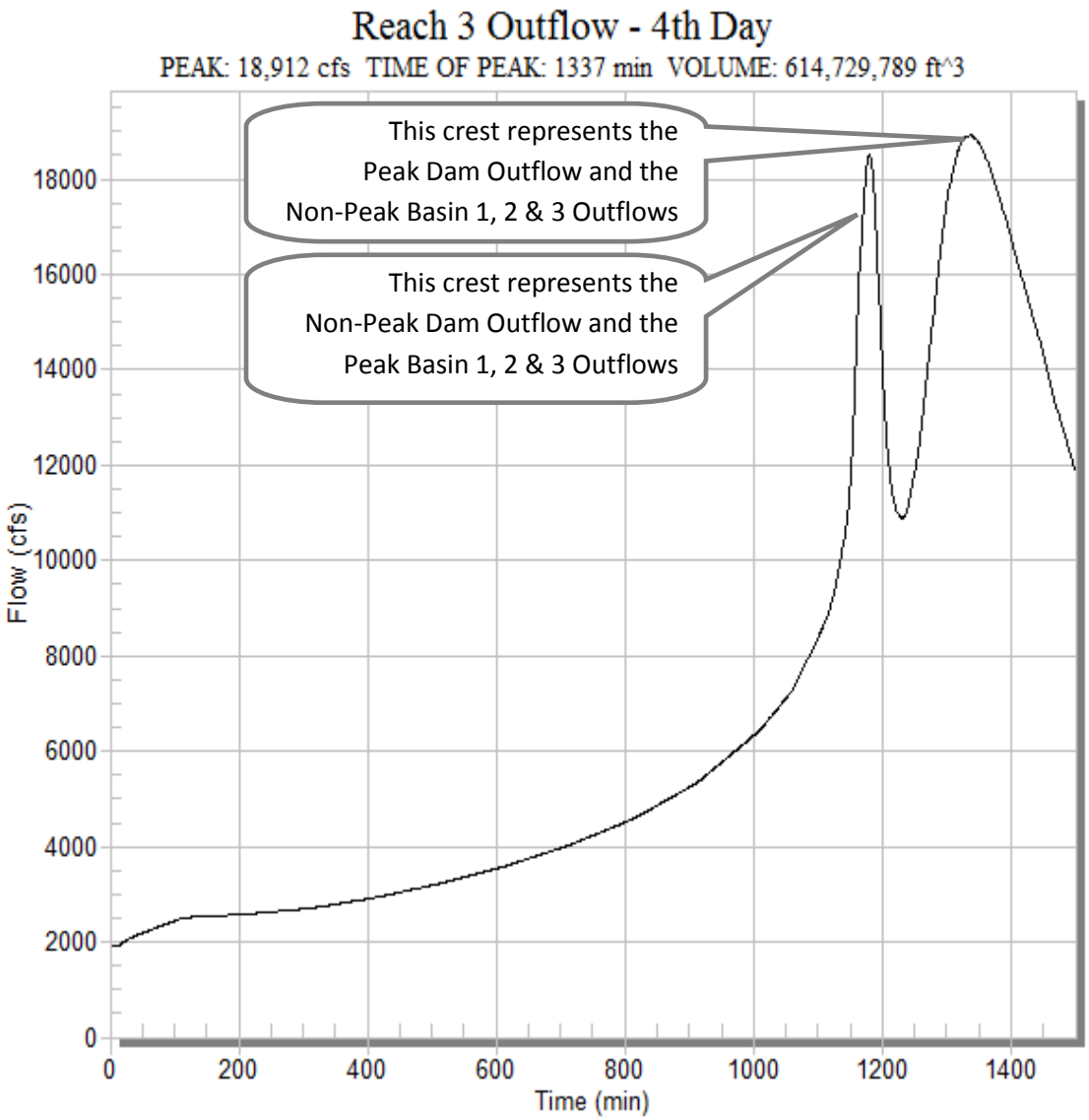


Figure 2-17: Reach 3 Outflow – 4th Day

A peak outflow of 18,912 cfs flows through the Arroyo Seco Channel at the most downstream point of Reach 3 during the 1337th minute of the 4th day of the storm. This Hydrograph has been generated by utilizing the MODRAT Hydrologic Modeling Module of WMS 8.4 to combine the stormwater runoff from the Reach 2 Outflow Hydrograph with the Basin 3 Inflow Hydrograph.

3 Conclusion

3.1 Findings

3.1.1 Devils Gate Dam Condition 1 (Clogged Ports)

Under the assumption that the sediment elevation in the Dam is at the spillway ports and stormwater can only discharge over the top of the spillway (clogged ports), it has been found that the Devils Gate Dam is overtopped during the Capital Storm Event. Stormwater overtops the parapet of the Dam on the 4th day from 1260 minutes to 1300 minutes. The total volume of stormwater discharged over the top of the parapet during this time is approximately 2,800 ac-ft, with a peak outflow of 17,948 cfs.

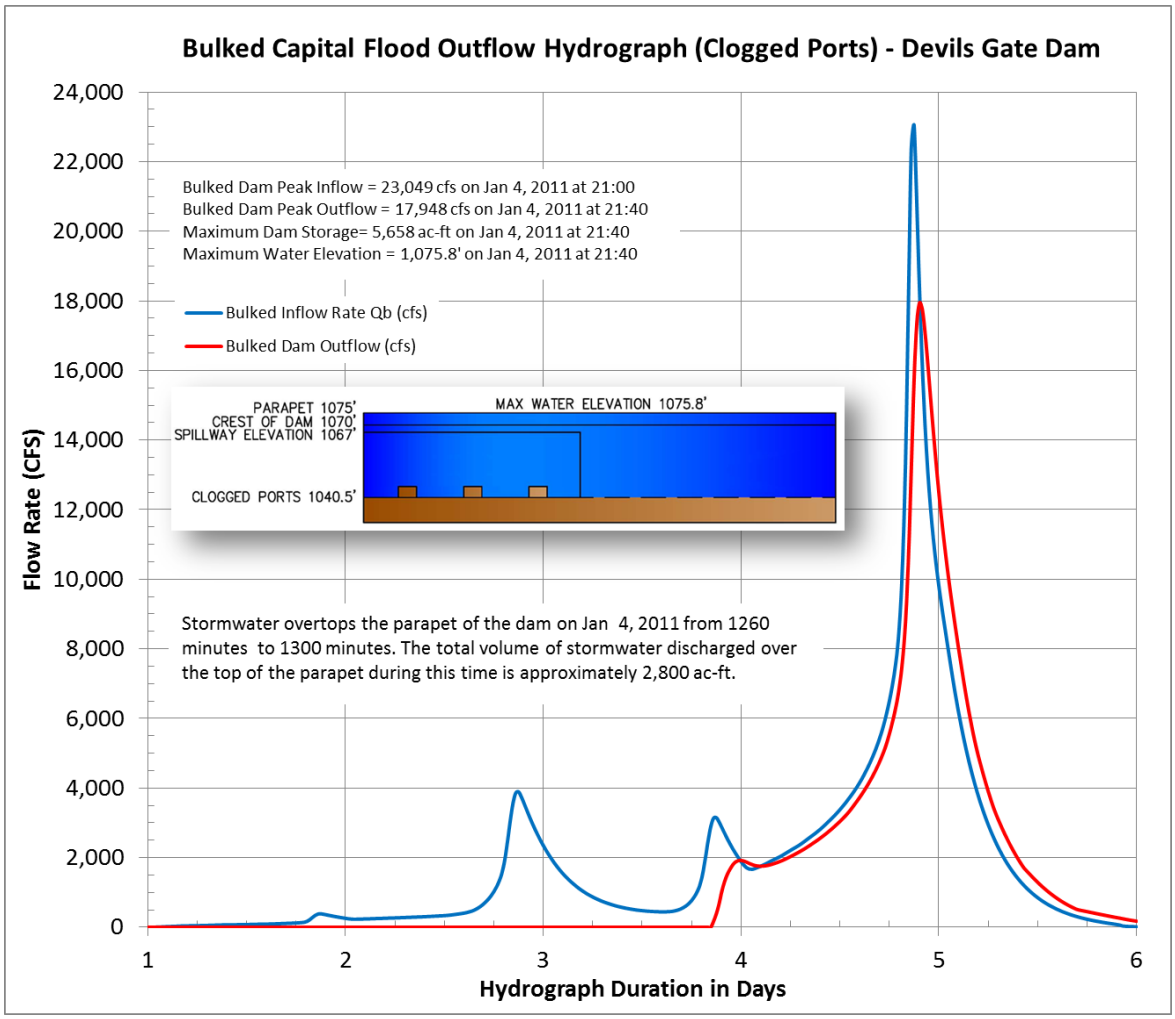


Figure 3-1: Dam Discharge Hydrograph for Condition 1

By utilizing the MODRAT Hydrologic Modeling Module of the WMS software, the Arroyo Seco Channel was found to convey the following peak flow rates in reaches 1-3 during a Capital Storm Event.

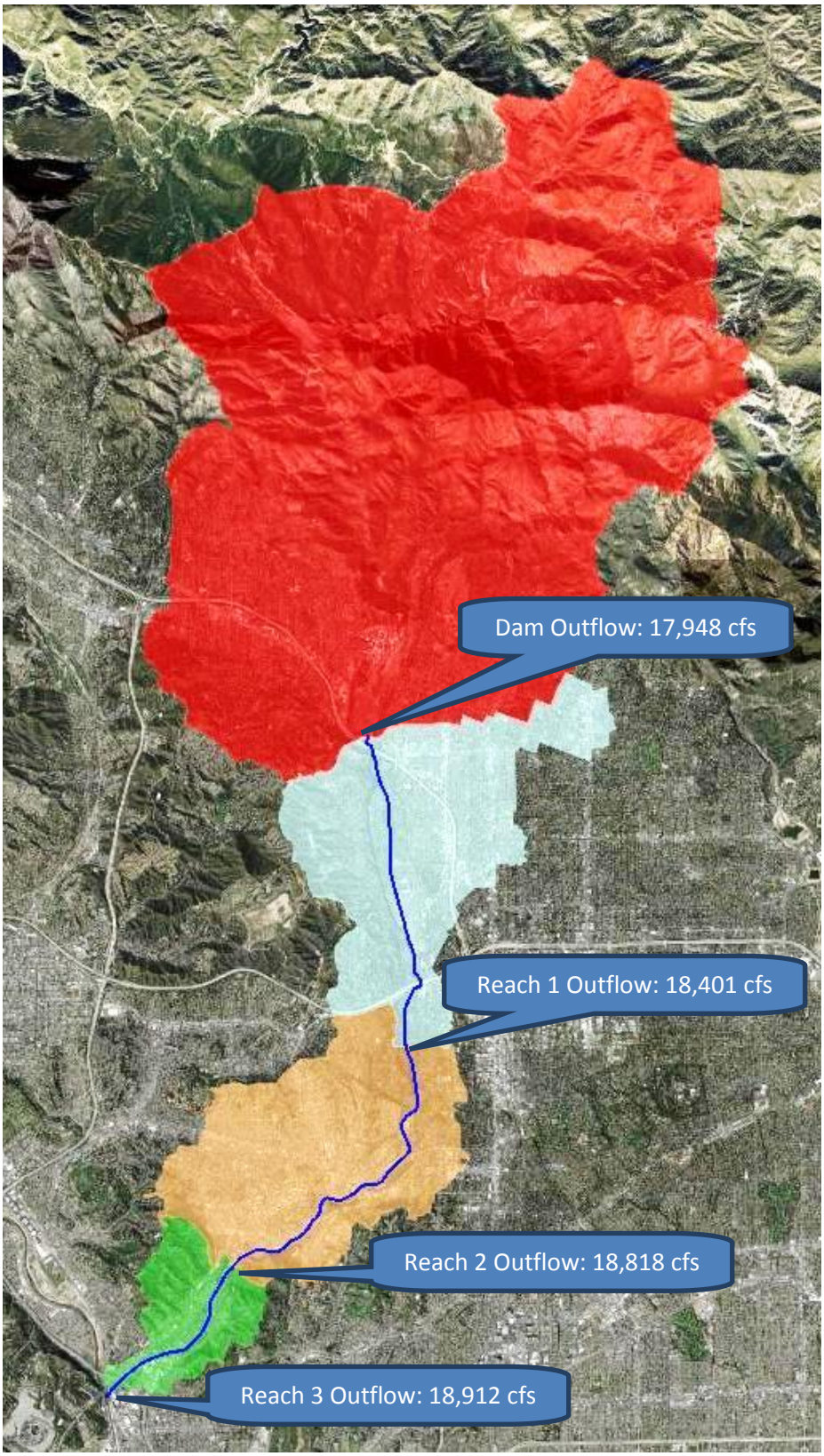


Figure 3-2: Arroyo Seco Channel Flows Illustration – 4th Day

Peak flow rates within the Arroyo Seco Channel remain relatively constant throughout all three reaches. This is due to the fact that the peak outflows are governed by the peak Devils Gate Dam discharge which occurs after the peak outflows from the downstream contributory basins. See Figures 2-13, 2-15, and 2-17 for outflow hydrographs at these locations.

3.1.2 Devils Gate Dam Condition 2 (Non-Clogged Ports)

Under the assumption that the sediment elevation in the Dam is at the spillway ports and stormwater is able to discharge through the spillway ports as well as over the top of the spillway ports (ports are not assumed to plug with debris), it has been found that the Devils Gate Dam produces a discharge hydrograph that closely mimics the inflow hydrograph while providing a significant flow reduction during the peak period. The hydrograph illustrating the discharge rates for Condition 2 are provided to LACFCD for informational purposes only, and will not be used to model downstream hydrologic or hydraulic conditions.

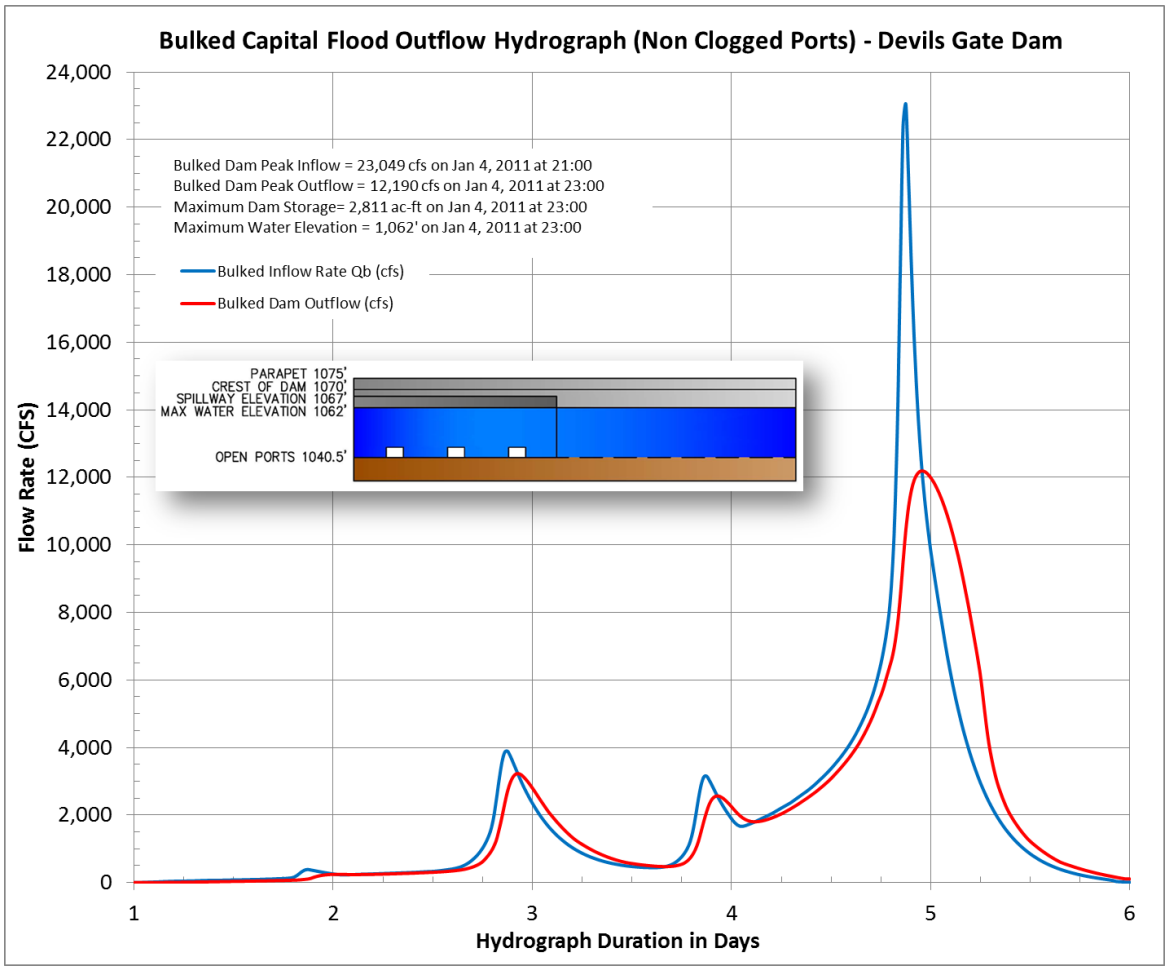


Figure 3-3: Dam Discharge Hydrograph for Condition 2

3.2 References

Los Angeles County Hydrology Manual, January 2006.

Los Angeles County Sedimentation Manual, January 2006.

Los Angeles County Flood Control District - Devil's Gate Dam and Reservoir Post-Fire Sediment Removal - Short Term Solution Report for Sediment Accumulation Along the Face of the Dam, March 2011.

Los Angeles County Flood Control District – Devils Gate Dam Background/Reference Information.

4 Appendices

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Appendix A

Devils Gate Dam Calculations Table

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Data from Capital Flood Input Hydrograph									Calculated Sediment Information			Total Inflow	Clogged Ports Dam Outflow (HMS)			Open Ports Dam Outflow (HMS)		
Date	Time of Day	Day Number	Precip (in)	Loss (in)	Excess (in)	Direct (in)	Base (in)	Unbulked Water Inflow Rate Qw (cfs)	Sediment Inflow Rate Qs (cfs)	Incremental Sediment Volume (ft^3)	Cumulative Sediment Volume (ft^3)	Bulked Inflow Rate Qb (cfs)	Dam Storage Volume (ac-ft)	Elev (ft)	Bulked Dam Outflow (cfs)	Dam Storage Volume (ac-ft)	Elev (ft)	Bulked Dam Outflow (cfs)
1-Jan-11	0:00	1.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	1,040.0	0	0	1,040.0	0
1-Jan-11	0:20	1.01	0.01	0.01	0.00	0.30	0.00	0	0	0	0	0	0	1,040.0	0	0	1,040.0	0
1-Jan-11	0:40	1.03	0.01	0.01	0.00	1.50	0.00	2	0	0	0	2	0	1,040.0	0	0	1,040.0	0
1-Jan-11	1:00	1.04	0.01	0.01	0.00	3.80	0.00	4	0	0	0	4	0	1,040.0	0	0	1,040.0	0
1-Jan-11	1:20	1.06	0.00	0.00	0.00	7.00	0.00	7	0	0	0	7	0	1,040.0	0	0	1,040.0	0
1-Jan-11	1:40	1.07	0.01	0.01	0.00	10.50	0.00	11	0	0	0	11	1	1,040.0	0	1	1,040.0	1
1-Jan-11	2:00	1.08	0.01	0.01	0.00	13.80	0.00	14	0	0	0	14	1	1,040.0	0	1	1,040.0	1
1-Jan-11	2:20	1.10	0.01	0.01	0.00	16.90	0.00	17	0	0	0	17	1	1,040.0	0	1	1,040.0	1
1-Jan-11	2:40	1.11	0.01	0.01	0.00	20.10	0.00	20	0	0	0	20	2	1,040.0	0	2	1,040.0	2
1-Jan-11	3:00	1.13	0.01	0.01	0.00	23.60	0.00	24	0	0	0	24	2	1,040.0	0	2	1,040.0	3
1-Jan-11	3:20	1.14	0.01	0.01	0.00	27.30	0.00	27	0	0	0	27	3	1,040.0	0	3	1,040.0	3
1-Jan-11	3:40	1.15	0.01	0.01	0.00	30.90	0.00	31	0	0	0	31	4	1,040.0	0	4	1,040.0	4
1-Jan-11	4:00	1.17	0.01	0.01	0.00	34.20	0.00	34	0	0	0	34	5	1,040.1	0	4	1,040.0	5
1-Jan-11	4:20	1.18	0.01	0.01	0.00	37.20	0.00	37	0	0	0	37	6	1,040.1	0	5	1,040.1	6
1-Jan-11	4:40	1.19	0.00	0.00	0.00	39.80	0.00	40	0	0	0	40	7	1,040.1	0	6	1,040.1	7
1-Jan-11	5:00	1.21	0.01	0.01	0.00	41.60	0.00	42	0	0	0	42	8	1,040.1	0	7	1,040.1	8
1-Jan-11	5:20	1.22	0.01	0.01	0.00	42.90	0.00	43	0	0	0	43	9	1,040.1	0	8	1,040.1	9
1-Jan-11	5:40	1.24	0.01	0.01	0.00	44.10	0.00	44	0	0	0	44	10	1,040.1	0	9	1,040.1	11
1-Jan-11	6:00	1.25	0.01	0.01	0.00	45.50	0.00	46	0	0	0	46	12	1,040.1	0	10	1,040.1	12
1-Jan-11	6:20	1.26	0.01	0.01	0.00	47.30	0.00	47	0	0	0	47	13	1,040.1	0	11	1,040.1	13
1-Jan-11	6:40	1.28	0.01	0.01	0.00	49.50	0.00	50	0	0	0	50	14	1,040.2	0	12	1,040.1	14
1-Jan-11	7:00	1.29	0.01	0.01	0.00	51.50	0.00	52	0	0	0	52	16	1,040.2	0	13	1,040.1	15
1-Jan-11	7:20	1.31	0.01	0.01	0.00	53.50	0.00	54	0	0	0	54	17	1,040.2	0	14	1,040.1	16
1-Jan-11	7:40	1.32	0.02	0.02	0.00	55.60	0.00	56	0	0	0	56	19	1,040.2	0	15	1,040.2	18
1-Jan-11	8:00	1.33	0.01	0.01	0.00	58.10	0.00	58	0	0	0	58	20	1,040.2	0	16	1,040.2	19
1-Jan-11	8:20	1.35	0.01	0.01	0.00	60.90	0.00	61	0	0	0	61	22	1,040.2	0	17	1,040.2	20
1-Jan-11	8:40	1.36	0.01	0.01	0.00	63.50	0.00	64	0	0	0	64	23	1,040.2	0	18	1,040.2	22
1-Jan-11	9:00	1.38	0.01	0.01	0.00	65.70	0.00	66	0	0	0	66	25	1,040.3	0	19	1,040.2	23
1-Jan-11	9:20	1.39	0.01	0.01	0.00	67.10	0.00	67	0	0	0	67	27	1,040.3	0	20	1,040.2	24
1-Jan-11	9:40	1.40	0.01	0.01	0.00	68.10	0.00	68	0	0	0	68	29	1,040.3	0	21	1,040.2	26
1-Jan-11	10:00	1.42	0.01	0.01	0.00	68.90	0.00	69	0	0	0	69	31	1,040.3	0	23	1,040.2	27
1-Jan-11	10:20	1.43	0.02	0.02	0.00	70.00	0.00	70	0	0	0	70	33	1,040.3	0	24	1,040.3	29
1-Jan-11	10:40	1.44	0.01	0.01	0.00	71.60	0.00	72	0	0	0	72	35	1,040.4	0	25	1,040.3	30
1-Jan-11	11:00	1.46	0.01	0.01	0.00	73.40	0.00	73	0	0	0	73	37	1,040.4	0	26	1,040.3	31
1-Jan-11	11:20	1.47	0.01	0.01	0.00	75.20	0.00	75	0	0	0	75	39	1,040.4	0	27	1,040.3	33
1-Jan-11	11:40	1.49	0.01	0.01	0.00	76.60	0.00	77	0	0	0	77	41	1,040.4	0	28	1,040.3	34
1-Jan-11	12:00	1.50	0.02	0.02	0.00	77.70	0.00	78	0	0	0	78	43	1,040.5	0	30	1,040.3	36
1-Jan-11	12:20	1.51	0.01	0.01	0.00	78.80	0.00	79	0	0	0	79	45	1,040.5	0	31	1,040.3	37
1-Jan-11	12:40	1.53	0.02	0.02	0.00	80.50	0.00	81	0	0	0	81	47	1,040.5	0	32	1,040.3	38
1-Jan-11	13:00	1.54	0.01	0.01	0.00	82.70	0.00	83	0	0	0	83	50	1,040.5	0	33	1,040.4	40
1-Jan-11	13:20	1.56	0.01	0.01	0.00	84.90	0.00	85	0	0	0	85	52	1,040.6	0	34	1,040.4	41
1-Jan-11	13:40	1.57	0.02	0.02	0.00	86.70	0.00	87	0	0	0	87	54	1,040.6	0	35	1,040.4	43
1-Jan-11	14:00	1.58	0.01	0.01	0.00	88.30	0.00	88	0	0	0	88	57	1,040.6	0	37	1,040.4	44
1-Jan-11	14:20	1.60	0.02	0.02	0.00	89.80	0.00	90	0	0	0	90	59	1,040.6	0	38	1,040.4	46
1-Jan-11	14:40	1.61	0.02	0.02	0.00	91.80	0.00	92	0	0	0	92	62	1,040.7	0	39	1,040.4	47
1-Jan-11	15:00	1.63	0.01	0.01	0.00	94.20	0.00	94	0	0	0	94	64	1,040.7	0	40	1,040.4	49
1-Jan-11	15:20	1.64	0.02	0.02	0.00	96.70	0.00	97	0	0	0	97	67	1,040.7	0	42	1,040.4	50
1-Jan-11	15:40	1.65	0.02	0.02	0.00	99.20	0.00	99	0	0	0	99	69	1,040.7	0	43	1,040.5	52
1-Jan-11	16:00	1.67	0.02	0.02	0.00	101.90	0.00	102	0	0	0	102	72	1,040.8	0	44	1,040.5	53
1-Jan-11	16:20	1.68	0.02	0.02	0.00	104.80	0.00	105	0	0	0	105	75	1,040.8	0	46	1,040.5	55
1-Jan-11	16:40	1.69	0.02	0.02	0.00	108.10	0.00	108	0	0	0	108	78	1,040.8	0	47	1,040.5	57
1-Jan-11	17:00	1.71	0.02	0.02	0.00	111.60	0.00	112	0	0	0	112	81	1,040.9	0	48	1,040.5	58
1-Jan-11	17:20	1.72	0.02	0.02	0.00	114.90	0.00	115	0	0	0	115	84	1,040.9	0	50	1,040.5	60
1-Jan-11	17:40	1.74	0.03	0.03	0.00	118.20	0.00	118	0	0	0	118	87	1,040.9	0	52	1,040.5	62
1-Jan-11	18:00	1.75	0.03	0.03	0.00	122.30	0.00	122	0	0	0	122	91	1,041.0	0	53	1,040.6	64
1-Jan-11	18:20	1.76	0.03	0.03	0.00	127.30	0.00	127	0	0	0	127	94	1,041.0	0	55	1,040.6	66
1-Jan-11	18:40	1.78	0.04	0.03	0.01	133.60	0.00	134	0	0	0	134	98	1,041.0	0	57	1,040.6	68

Data from Capital Flood Input Hydrograph									Calculated Sediment Information			Total Inflow	Clogged Ports Dam Outflow (HMS)			Open Ports Dam Outflow (HMS)		
Date	Time of Day	Day Number	Precip (in)	Loss (in)	Excess (in)	Direct (in)	Base (in)	Unbulked Water Inflow Rate Qw (cfs)	Sediment Inflow Rate Qs (cfs)	Incremental Sediment Volume (ft^3)	Cumulative Sediment Volume (ft^3)	Bulked Inflow Rate Qb (cfs)	Dam Storage Volume (ac-ft)	Elev (ft)	Bulked Dam Outflow (cfs)	Dam Storage Volume (ac-ft)	Elev (ft)	Bulked Dam Outflow (cfs)
1-Jan-11	19:00	1.79	0.06	0.05	0.01	142.60	0.00	143	0	0	0	143	102	1,041.1	0	58	1,040.6	70
1-Jan-11	19:20	1.81	0.11	0.05	0.06	167.90	0.00	168	0	0	0	168	106	1,041.1	0	61	1,040.6	73
1-Jan-11	19:40	1.82	0.03	0.03	0.00	217.90	0.00	218	0	0	0	218	111	1,041.2	0	64	1,040.7	77
1-Jan-11	20:00	1.83	0.03	0.03	0.00	282.00	0.00	282	0	0	0	282	118	1,041.2	0	69	1,040.7	83
1-Jan-11	20:20	1.85	0.01	0.01	0.00	341.70	0.00	342	0	0	0	342	127	1,041.3	0	75	1,040.8	90
1-Jan-11	20:40	1.86	0.02	0.02	0.00	379.80	0.00	380	0	0	0	380	137	1,041.4	0	82	1,040.9	99
1-Jan-11	21:00	1.88	0.01	0.01	0.00	386.90	0.00	387	0	0	0	387	147	1,041.6	0	90	1,041.0	108
1-Jan-11	21:20	1.89	0.02	0.02	0.00	373.60	0.00	374	0	0	0	374	158	1,041.7	0	97	1,041.0	128
1-Jan-11	21:40	1.90	0.01	0.01	0.00	357.50	0.00	358	0	0	0	358	168	1,041.8	0	103	1,041.1	159
1-Jan-11	22:00	1.92	0.01	0.01	0.00	341.60	0.00	342	0	0	0	342	177	1,041.9	0	108	1,041.1	183
1-Jan-11	22:20	1.93	0.01	0.01	0.00	326.20	0.00	326	0	0	0	326	186	1,042.0	0	112	1,041.2	202
1-Jan-11	22:40	1.94	0.01	0.01	0.00	311.10	0.00	311	0	0	0	311	195	1,042.1	0	115	1,041.2	217
1-Jan-11	23:00	1.96	0.01	0.01	0.00	296.30	0.00	296	0	0	0	296	204	1,042.1	0	117	1,041.2	228
1-Jan-11	23:20	1.97	0.01	0.01	0.00	282.10	0.00	282	0	0	0	282	212	1,042.2	0	119	1,041.3	236
1-Jan-11	23:40	1.99	0.01	0.01	0.00	268.80	0.00	269	0	0	0	269	219	1,042.3	0	120	1,041.3	241
2-Jan-11	0:00	2.00	0.00	0.00	0.00	256.10	0.00	256	0	0	0	256	226	1,042.4	0	120	1,041.3	244
2-Jan-11	0:20	2.01	0.04	0.03	0.01	244.50	0.00	245	0	0	0	245	233	1,042.5	0	121	1,041.3	245
2-Jan-11	0:40	2.03	0.03	0.03	0.00	235.70	0.00	236	0	0	0	236	240	1,042.5	0	120	1,041.3	244
2-Jan-11	1:00	2.04	0.04	0.03	0.01	230.60	0.00	231	0	0	0	231	246	1,042.6	0	120	1,041.3	243
2-Jan-11	1:20	2.06	0.03	0.03	0.00	229.40	0.00	229	0	0	0	229	253	1,042.7	0	120	1,041.3	241
2-Jan-11	1:40	2.07	0.04	0.03	0.01	231.40	0.00	231	0	0	0	231	259	1,042.7	0	120	1,041.3	240
2-Jan-11	2:00	2.08	0.03	0.03	0.00	234.60	0.00	235	0	0	0	235	265	1,042.8	0	119	1,041.3	239
2-Jan-11	2:20	2.10	0.04	0.03	0.01	237.70	0.00	238	0	0	0	238	272	1,042.9	0	119	1,041.3	239
2-Jan-11	2:40	2.11	0.03	0.03	0.00	240.70	0.00	241	0	0	0	241	279	1,042.9	0	119	1,041.3	239
2-Jan-11	3:00	2.13	0.04	0.03	0.01	243.40	0.00	243	0	0	0	243	285	1,043.0	0	119	1,041.3	239
2-Jan-11	3:20	2.14	0.03	0.03	0.00	246.00	0.00	246	0	0	0	246	292	1,043.1	0	120	1,041.3	240
2-Jan-11	3:40	2.15	0.04	0.03	0.01	248.40	0.00	248	0	0	0	248	299	1,043.1	0	120	1,041.3	241
2-Jan-11	4:00	2.17	0.04	0.03	0.01	250.90	0.00	251	0	0	0	251	306	1,043.2	0	120	1,041.3	242
2-Jan-11	4:20	2.18	0.04	0.03	0.01	253.80	0.00	254	0	0	0	254	313	1,043.3	0	120	1,041.3	243
2-Jan-11	4:40	2.19	0.03	0.03	0.00	257.00	0.00	257	0	0	0	257	320	1,043.3	0	121	1,041.3	245
2-Jan-11	5:00	2.21	0.04	0.03	0.01	260.00	0.00	260	0	0	0	260	327	1,043.4	0	121	1,041.3	247
2-Jan-11	5:20	2.22	0.04	0.03	0.01	262.70	0.00	263	0	0	0	263	334	1,043.5	0	121	1,041.3	248
2-Jan-11	5:40	2.24	0.04	0.03	0.01	265.30	0.00	265	0	0	0	265	341	1,043.6	0	122	1,041.3	250
2-Jan-11	6:00	2.25	0.04	0.03	0.01	268.10	0.00	268	0	0	0	268	349	1,043.6	0	122	1,041.3	253
2-Jan-11	6:20	2.26	0.04	0.03	0.01	271.20	0.00	271	0	0	0	271	356	1,043.7	0	123	1,041.3	255
2-Jan-11	6:40	2.28	0.04	0.03	0.01	274.50	0.00	275	0	0	0	275	363	1,043.8	0	123	1,041.3	257
2-Jan-11	7:00	2.29	0.04	0.03	0.01	277.70	0.00	278	0	0	0	278	371	1,043.9	0	124	1,041.3	259
2-Jan-11	7:20	2.31	0.04	0.03	0.01	280.60	0.00	281	0	0	0	281	379	1,043.9	0	124	1,041.3	262
2-Jan-11	7:40	2.32	0.04	0.03	0.01	283.40	0.00	283	0	0	0	283	387	1,044.0	0	125	1,041.3	265
2-Jan-11	8:00	2.33	0.05	0.04	0.01	286.30	0.00	286	0	0	0	286	394	1,044.1	0	125	1,041.3	267
2-Jan-11	8:20	2.35	0.04	0.03	0.01	289.50	0.00	290	0	0	0	290	402	1,044.2	0	126	1,041.3	270
2-Jan-11	8:40	2.36	0.04	0.03	0.01	293.00	0.00	293	0	0	0	293	410	1,044.3	0	126	1,041.3	273
2-Jan-11	9:00	2.38	0.05	0.04	0.01	296.50	0.00	297	0	0	0	297	418	1,044.3	0	127	1,041.3	275
2-Jan-11	9:20	2.39	0.04	0.03	0.01	300.10	0.00	300	0	0	0	300	427	1,044.4	0	127	1,041.3	278
2-Jan-11	9:40	2.40	0.05	0.04	0.01	303.60	0.00	304	0	0	0	304	435	1,044.5	0	128	1,041.4	281
2-Jan-11	10:00	2.42	0.05	0.04	0.01	307.40	0.00	307	0	0	0	307	443	1,044.6	0	129	1,041.4	284
2-Jan-11	10:20	2.43	0.05	0.04	0.01	311.90	0.00	312	0	0	0	312	452	1,044.7	0	129	1,041.4	288
2-Jan-11	10:40	2.44	0.04	0.03	0.01	316.50	0.00	317	0	0	0	317	461	1,044.8	0	130	1,041.4	291
2-Jan-11	11:00	2.46	0.05	0.04	0.01	320.90	0.00	321	0	0	0	321	469	1,044.9	0	131	1,041.4	295
2-Jan-11	11:20	2.47	0.05	0.04	0.01	325.00	0.00	325	0	0	0	325	478	1,044.9	0	131	1,041.4	298
2-Jan-11	11:40	2.49	0.05	0.04	0.01	328.80	0.00	329	0	0	0	329	487	1,045.0	0	132	1,041.4	302
2-Jan-11	12:00	2.50	0.06	0.05	0.01	333.50	0.00	334	0	0	0	334	496	1,045.1	0	133	1,041.4	306
2-Jan-11	12:20	2.51	0.05	0.04	0.01	340.10	0.00	340	0	0	0	340	506	1,045.2	0	134	1,041.4	310
2-Jan-11	12:40	2.53	0.06	0.05	0.01	348.60	0.00	349	0	0	0	349	515	1,045.3	0	135	1,041.4	314
2-Jan-11	13:00	2.54	0.05	0.04	0.01	358.30	0.00	358	0	0	0	358	525	1,045.4	0	136	1,041.4	319
2-Jan-11	13:20	2.56	0.06	0.05	0.01	368.50	0.00	369	0	0	0	369	535	1,045.5	0	137	1,041.4	325
2-Jan-11	13:40	2.57	0.06	0.05	0.01	379.10	0.00	379	0	0	0	379	545	1,045.6	0	138	1,041.5	331

Data from Capital Flood Input Hydrograph									Calculated Sediment Information			Total Inflow	Clogged Ports Dam Outflow (HMS)			Open Ports Dam Outflow (HMS)		
Date	Time of Day	Day Number	Precip (in)	Loss (in)	Excess (in)	Direct (in)	Base (in)	Unbulked Water Inflow Rate Qw (cfs)	Sediment Inflow Rate Qs (cfs)	Incremental Sediment Volume (ft^3)	Cumulative Sediment Volume (ft^3)	Bulked Inflow Rate Qb (cfs)	Dam Storage Volume (ac-ft)	Elev (ft)	Bulked Dam Outflow (cfs)	Dam Storage Volume (ac-ft)	Elev (ft)	Bulked Dam Outflow (cfs)
2-Jan-11	14:00	2.58	0.06	0.05	0.01	390.50	0.00	391	0	0	0	391	556	1,045.7	0	139	1,041.5	338
2-Jan-11	14:20	2.60	0.06	0.05	0.01	403.10	0.00	403	0	0	0	403	567	1,045.8	0	141	1,041.5	345
2-Jan-11	14:40	2.61	0.07	0.05	0.02	419.00	0.00	419	0	0	0	419	578	1,045.9	0	143	1,041.5	354
2-Jan-11	15:00	2.62	0.06	0.05	0.01	439.30	0.00	439	0	0	0	439	590	1,046.0	0	145	1,041.5	364
2-Jan-11	15:20	2.64	0.07	0.05	0.02	464.00	0.00	464	0	0	0	464	602	1,046.2	0	147	1,041.5	375
2-Jan-11	15:40	2.65	0.08	0.05	0.03	496.40	0.00	496	0	0	0	496	616	1,046.3	0	150	1,041.6	388
2-Jan-11	16:00	2.67	0.07	0.05	0.02	538.60	0.00	539	0	0	0	539	630	1,046.4	0	153	1,041.6	405
2-Jan-11	16:20	2.68	0.08	0.05	0.03	589.30	0.00	589	0	0	0	589	645	1,046.6	0	157	1,041.7	425
2-Jan-11	16:40	2.69	0.09	0.05	0.04	650.90	0.00	651	0	0	0	651	662	1,046.7	0	162	1,041.7	450
2-Jan-11	17:00	2.71	0.08	0.05	0.03	723.40	0.00	723	0	0	0	723	681	1,046.9	0	168	1,041.8	480
2-Jan-11	17:20	2.72	0.10	0.05	0.05	805.30	0.00	805	0	0	0	805	702	1,047.1	0	175	1,041.8	517
2-Jan-11	17:40	2.74	0.11	0.05	0.06	902.70	0.00	903	0	0	0	903	726	1,047.3	0	184	1,041.9	560
2-Jan-11	18:00	2.75	0.11	0.05	0.06	1020.80	0.00	1,021	0	0	0	1,021	752	1,047.5	0	194	1,042.0	620
2-Jan-11	18:20	2.76	0.13	0.05	0.08	1162.20	0.00	1,162	0	0	0	1,162	783	1,047.8	0	206	1,042.2	703
2-Jan-11	18:40	2.78	0.16	0.05	0.11	1337.60	0.00	1,338	0	0	0	1,338	817	1,048.1	0	220	1,042.3	800
2-Jan-11	19:00	2.79	0.22	0.05	0.17	1570.00	0.00	1,570	0	0	0	1,570	857	1,048.5	0	236	1,042.5	916
2-Jan-11	19:20	2.81	0.46	0.05	0.41	1938.40	0.00	1,938	0	0	0	1,938	905	1,048.9	0	257	1,042.7	1,064
2-Jan-11	19:40	2.82	0.13	0.05	0.08	2470.90	0.00	2,471	0	1	1	2,471	966	1,049.4	0	286	1,043.0	1,266
2-Jan-11	20:00	2.83	0.09	0.05	0.04	3065.30	0.00	3,065	0	5	6	3,065	1,042	1,050.0	0	323	1,043.4	1,581
2-Jan-11	20:20	2.85	0.07	0.05	0.02	3570.00	0.00	3,570	0	21	27	3,570	1,134	1,050.8	0	366	1,043.8	1,944
2-Jan-11	20:40	2.86	0.06	0.05	0.01	3860.60	0.00	3,861	0	45	72	3,861	1,236	1,051.6	0	409	1,044.3	2,341
2-Jan-11	21:00	2.87	0.06	0.05	0.01	3891.50	0.00	3,892	0	49	120	3,892	1,343	1,052.4	0	447	1,044.6	2,700
2-Jan-11	21:20	2.89	0.05	0.04	0.01	3750.20	0.00	3,750	0	34	154	3,750	1,448	1,053.2	0	474	1,044.9	2,962
2-Jan-11	21:40	2.90	0.04	0.03	0.01	3561.70	0.00	3,562	0	21	175	3,562	1,549	1,054.0	0	491	1,045.1	3,129
2-Jan-11	22:00	2.92	0.05	0.04	0.01	3364.80	0.00	3,365	0	12	187	3,365	1,644	1,054.6	0	499	1,045.1	3,214
2-Jan-11	22:20	2.93	0.04	0.03	0.01	3171.10	0.00	3,171	0	7	194	3,171	1,734	1,055.3	0	500	1,045.2	3,228
2-Jan-11	22:40	2.94	0.04	0.03	0.01	2987.20	0.00	2,987	0	4	197	2,987	1,819	1,055.9	0	496	1,045.1	3,190
2-Jan-11	23:00	2.96	0.04	0.03	0.01	2813.10	0.00	2,813	0	2	200	2,813	1,899	1,056.4	0	490	1,045.1	3,117
2-Jan-11	23:20	2.97	0.04	0.03	0.01	2649.70	0.00	2,650	0	1	201	2,650	1,974	1,056.9	0	480	1,045.0	3,022
2-Jan-11	23:40	2.99	0.03	0.03	0.00	2496.10	0.00	2,496	0	1	201	2,496	2,045	1,057.3	0	469	1,044.9	2,917
3-Jan-11	0:00	3.00	0.03	0.03	0.00	2351.40	0.00	2,351	0	0	202	2,351	2,112	1,057.8	0	457	1,044.7	2,802
3-Jan-11	0:20	3.01	0.03	0.03	0.00	2214.90	0.00	2,215	0	0	202	2,215	2,175	1,058.2	0	445	1,044.6	2,681
3-Jan-11	0:40	3.03	0.03	0.03	0.00	2086.10	0.00	2,086	0	0	202	2,086	2,234	1,058.5	0	432	1,044.5	2,557
3-Jan-11	1:00	3.04	0.03	0.03	0.00	1964.80	0.00	1,965	0	0	202	1,965	2,290	1,058.9	0	419	1,044.3	2,432
3-Jan-11	1:20	3.06	0.03	0.03	0.00	1851.00	0.00	1,851	0	0	202	1,851	2,342	1,059.2	0	406	1,044.2	2,310
3-Jan-11	1:40	3.07	0.03	0.03	0.00	1744.70	0.00	1,745	0	0	202	1,745	2,392	1,059.5	0	394	1,044.1	2,190
3-Jan-11	2:00	3.08	0.03	0.03	0.00	1645.40	0.00	1,645	0	0	202	1,645	2,439	1,059.8	0	382	1,044.0	2,077
3-Jan-11	2:20	3.10	0.04	0.03	0.01	1553.00	0.00	1,553	0	0	202	1,553	2,483	1,060.1	0	370	1,043.9	1,977
3-Jan-11	2:40	3.11	0.03	0.03	0.00	1467.30	0.00	1,467	0	0	202	1,467	2,524	1,060.3	0	358	1,043.7	1,879
3-Jan-11	3:00	3.12	0.03	0.03	0.00	1387.60	0.00	1,388	0	0	202	1,388	2,564	1,060.5	0	347	1,043.6	1,785
3-Jan-11	3:20	3.14	0.03	0.03	0.00	1313.20	0.00	1,313	0	0	202	1,313	2,601	1,060.8	0	336	1,043.5	1,694
3-Jan-11	3:40	3.15	0.03	0.03	0.00	1243.40	0.00	1,243	0	0	202	1,243	2,636	1,061.0	0	326	1,043.4	1,607
3-Jan-11	4:00	3.17	0.03	0.03	0.00	1177.60	0.00	1,178	0	0	202	1,178	2,669	1,061.2	0	316	1,043.3	1,524
3-Jan-11	4:20	3.18	0.04	0.03	0.01	1116.10	0.00	1,116	0	0	202	1,116	2,701	1,061.4	0	307	1,043.2	1,445
3-Jan-11	4:40	3.19	0.03	0.03	0.00	1059.10	0.00	1,059	0	0	202	1,059	2,731	1,061.5	0	298	1,043.1	1,370
3-Jan-11	5:00	3.21	0.03	0.03	0.00	1006.40	0.00	1,006	0	0	202	1,006	2,759	1,061.7	0	290	1,043.0	1,299
3-Jan-11	5:20	3.22	0.04	0.03	0.01	957.40	0.00	957	0	0	202	957	2,786	1,061.9	0	282	1,043.0	1,238
3-Jan-11	5:40	3.24	0.03	0.03	0.00	912.00	0.00	912	0	0	202	912	2,812	1,062.0	0	274	1,042.9	1,184
3-Jan-11	6:00	3.25	0.04	0.03	0.01	869.70	0.00	870	0	0	202	870	2,837	1,062.1	0	267	1,042.8	1,132
3-Jan-11	6:20	3.26	0.03	0.03	0.00	830.40	0.00	830	0	0	202	830	2,860	1,062.3	0	260	1,042.7	1,082
3-Jan-11	6:40	3.28	0.04	0.03	0.01	794.00	0.00	794	0	0	202	794	2,882	1,062.4	0	253	1,042.7	1,035
3-Jan-11	7:00	3.29	0.03	0.03	0.00	760.10	0.00	760	0	0	202	760	2,904	1,062.5	0	247	1,042.6	989
3-Jan-11	7:20	3.31	0.04	0.03	0.01	728.50	0.00	729	0	0	202	729	2,924	1,062.7	0	241	1,042.5	946
3-Jan-11	7:40	3.32	0.04	0.03	0.01	699.20	0.00	699	0	0	202	699	2,944	1,062.8	0	235	1,042.5	905
3-Jan-11	8:00	3.33	0.03	0.03	0.00	672.20	0.00	672	0	0	202	672	2,963	1,062.9	0	229	1,042.4	866
3-Jan-11	8:20	3.35	0.04	0.03	0.01	647.00	0.00	647	0	0	202	647	2,981	1,063.0	0	224	1,042.4	829
3-Jan-11	8:40	3.36	0.04	0.03	0.01	623.80	0.00	624	0	0	202	624	2,999	1,063.1	0	219	1,042.3	795

Data from Capital Flood Input Hydrograph									Calculated Sediment Information			Total Inflow	Clogged Ports Dam Outflow (HMS)			Open Ports Dam Outflow (HMS)		
Date	Time of Day	Day Number	Precip (in)	Loss (in)	Excess (in)	Direct (in)	Base (in)	Unbulked Water Inflow Rate Qw (cfs)	Sediment Inflow Rate Qs (cfs)	Incremental Sediment Volume (ft^3)	Cumulative Sediment Volume (ft^3)	Bulked Inflow Rate Qb (cfs)	Dam Storage Volume (ac-ft)	Elev (ft)	Bulked Dam Outflow (cfs)	Dam Storage Volume (ac-ft)	Elev (ft)	Bulked Dam Outflow (cfs)
3-Jan-11	9:00	3.37	0.04	0.03	0.01	602.40	0.00	602	0	0	202	602	3,015	1,063.2	0	215	1,042.3	763
3-Jan-11	9:20	3.39	0.04	0.03	0.01	582.80	0.00	583	0	0	202	583	3,032	1,063.3	0	210	1,042.2	733
3-Jan-11	9:40	3.40	0.04	0.03	0.01	565.00	0.00	565	0	0	202	565	3,048	1,063.4	0	206	1,042.2	705
3-Jan-11	10:00	3.42	0.04	0.03	0.01	548.90	0.00	549	0	0	202	549	3,063	1,063.4	0	203	1,042.1	678
3-Jan-11	10:20	3.43	0.04	0.03	0.01	533.80	0.00	534	0	0	202	534	3,078	1,063.5	0	199	1,042.1	654
3-Jan-11	10:40	3.44	0.04	0.03	0.01	519.80	0.00	520	0	0	202	520	3,092	1,063.6	0	196	1,042.1	632
3-Jan-11	11:00	3.46	0.05	0.04	0.01	507.00	0.00	507	0	0	202	507	3,107	1,063.7	0	193	1,042.0	611
3-Jan-11	11:20	3.47	0.04	0.03	0.01	495.60	0.00	496	0	0	202	496	3,120	1,063.8	0	190	1,042.0	591
3-Jan-11	11:40	3.49	0.05	0.04	0.01	485.60	0.00	486	0	0	202	486	3,134	1,063.8	0	188	1,042.0	578
3-Jan-11	12:00	3.50	0.04	0.03	0.01	476.90	0.00	477	0	0	202	477	3,147	1,063.9	0	185	1,042.0	565
3-Jan-11	12:20	3.51	0.05	0.04	0.01	469.30	0.00	469	0	0	202	469	3,160	1,064.0	0	183	1,041.9	554
3-Jan-11	12:40	3.53	0.05	0.04	0.01	462.40	0.00	462	0	0	202	462	3,173	1,064.1	0	181	1,041.9	542
3-Jan-11	13:00	3.54	0.05	0.04	0.01	456.60	0.00	457	0	0	202	457	3,186	1,064.1	0	179	1,041.9	532
3-Jan-11	13:20	3.56	0.05	0.04	0.01	451.90	0.00	452	0	0	202	452	3,198	1,064.2	0	177	1,041.9	522
3-Jan-11	13:40	3.57	0.05	0.04	0.01	448.10	0.00	448	0	0	202	448	3,211	1,064.3	0	175	1,041.8	513
3-Jan-11	14:00	3.58	0.05	0.04	0.01	445.00	0.00	445	0	0	202	445	3,223	1,064.3	0	173	1,041.8	504
3-Jan-11	14:20	3.60	0.06	0.05	0.01	442.90	0.00	443	0	0	202	443	3,235	1,064.4	0	171	1,041.8	497
3-Jan-11	14:40	3.61	0.05	0.04	0.01	442.60	0.00	443	0	0	202	443	3,247	1,064.5	0	170	1,041.8	490
3-Jan-11	15:00	3.62	0.06	0.05	0.01	444.20	0.00	444	0	0	202	444	3,259	1,064.5	0	169	1,041.8	484
3-Jan-11	15:20	3.64	0.06	0.05	0.01	448.40	0.00	448	0	0	202	448	3,272	1,064.6	0	168	1,041.8	479
3-Jan-11	15:40	3.65	0.07	0.05	0.02	457.30	0.00	457	0	0	202	457	3,284	1,064.7	0	167	1,041.8	476
3-Jan-11	16:00	3.67	0.06	0.05	0.01	472.10	0.00	472	0	0	202	472	3,297	1,064.7	0	167	1,041.8	474
3-Jan-11	16:20	3.68	0.07	0.05	0.02	493.10	0.00	493	0	0	202	493	3,310	1,064.8	0	167	1,041.8	475
3-Jan-11	16:40	3.69	0.08	0.05	0.03	523.40	0.00	523	0	0	202	523	3,324	1,064.9	0	168	1,041.8	480
3-Jan-11	17:00	3.71	0.07	0.05	0.02	563.60	0.00	564	0	0	202	564	3,339	1,065.0	0	170	1,041.8	488
3-Jan-11	17:20	3.72	0.09	0.05	0.04	614.80	0.00	615	0	0	202	615	3,356	1,065.1	0	172	1,041.8	501
3-Jan-11	17:40	3.74	0.09	0.05	0.04	681.10	0.00	681	0	0	202	681	3,373	1,065.2	0	176	1,041.9	520
3-Jan-11	18:00	3.75	0.10	0.05	0.05	766.00	0.00	766	0	0	202	766	3,393	1,065.3	0	181	1,041.9	546
3-Jan-11	18:20	3.76	0.12	0.05	0.07	873.10	0.00	873	0	0	202	873	3,416	1,065.4	0	188	1,042.0	581
3-Jan-11	18:40	3.78	0.14	0.05	0.09	1013.50	0.00	1,014	0	0	202	1,014	3,442	1,065.5	0	198	1,042.1	642
3-Jan-11	19:00	3.79	0.19	0.05	0.14	1206.70	0.00	1,207	0	0	202	1,207	3,472	1,065.7	0	209	1,042.2	725
3-Jan-11	19:20	3.81	0.40	0.05	0.35	1518.90	0.00	1,519	0	0	202	1,519	3,510	1,065.9	0	225	1,042.4	838
3-Jan-11	19:40	3.82	0.11	0.05	0.06	1971.20	0.00	1,971	0	0	202	1,971	3,558	1,066.2	0	248	1,042.6	998
3-Jan-11	20:00	3.83	0.08	0.05	0.03	2473.00	0.00	2,473	0	1	203	2,473	3,619	1,066.5	0	279	1,042.9	1,215
3-Jan-11	20:20	3.85	0.06	0.05	0.01	2894.50	0.00	2,895	0	3	206	2,895	3,693	1,066.9	0	315	1,043.3	1,513
3-Jan-11	20:40	3.86	0.06	0.05	0.01	3132.70	0.00	3,133	0	6	212	3,133	3,774	1,067.3	170	352	1,043.7	1,827
3-Jan-11	21:00	3.87	0.04	0.03	0.01	3151.00	0.00	3,151	0	6	218	3,151	3,853	1,067.8	384	385	1,044.0	2,103
3-Jan-11	21:20	3.89	0.05	0.04	0.01	3026.10	0.00	3,026	0	4	223	3,026	3,923	1,068.1	666	409	1,044.2	2,334
3-Jan-11	21:40	3.90	0.04	0.03	0.01	2866.30	0.00	2,866	0	3	225	2,866	3,981	1,068.4	1,029	423	1,044.4	2,477
3-Jan-11	22:00	3.92	0.04	0.03	0.01	2702.90	0.00	2,703	0	1	227	2,703	4,026	1,068.7	1,309	431	1,044.5	2,549
3-Jan-11	22:20	3.93	0.04	0.03	0.01	2541.00	0.00	2,541	0	1	227	2,541	4,059	1,068.8	1,519	433	1,044.5	2,566
3-Jan-11	22:40	3.94	0.03	0.03	0.00	2393.80	0.00	2,394	0	0	228	2,394	4,083	1,069.0	1,670	430	1,044.5	2,543
3-Jan-11	23:00	3.96	0.03	0.03	0.00	2255.50	0.00	2,256	0	0	228	2,256	4,099	1,069.1	1,793	425	1,044.4	2,492
3-Jan-11	23:20	3.97	0.04	0.03	0.01	2125.40	0.00	2,125	0	0	228	2,125	4,109	1,069.1	1,875	418	1,044.3	2,421
3-Jan-11	23:40	3.99	0.03	0.03	0.00	2003.20	0.00	2,003	0	0	228	2,003	4,114	1,069.1	1,913	409	1,044.2	2,338
4-Jan-11	0:00	4.00	0.03	0.03	0.00	1888.50	0.00	1,889	0	0	228	1,889	4,115	1,069.1	1,920	399	1,044.2	2,246
4-Jan-11	0:20	4.01	0.08	0.05	0.03	1787.20	0.00	1,787	0	0	228	1,787	4,113	1,069.1	1,903	390	1,044.1	2,151
4-Jan-11	0:40	4.03	0.09	0.05	0.04	1712.20	0.00	1,712	0	0	228	1,712	4,109	1,069.1	1,872	380	1,044.0	2,061
4-Jan-11	1:00	4.04	0.08	0.05	0.03	1671.60	0.00	1,672	0	0	228	1,672	4,105	1,069.1	1,835	371	1,043.9	1,984
4-Jan-11	1:20	4.06	0.09	0.05	0.04	1665.70	0.00	1,666	0	0	228	1,666	4,100	1,069.1	1,801	363	1,043.8	1,918
4-Jan-11	1:40	4.07	0.08	0.05	0.03	1685.60	0.00	1,686	0	0	228	1,686	4,097	1,069.0	1,775	357	1,043.7	1,867
4-Jan-11	2:00	4.08	0.09	0.05	0.04	1716.60	0.00	1,717	0	0	228	1,717	4,095	1,069.0	1,760	353	1,043.7	1,832
4-Jan-11	2:20	4.10	0.09	0.05	0.04	1749.40	0.00	1,749	0	0	228	1,749	4,095	1,069.0	1,755	350	1,043.7	1,812
4-Jan-11	2:40	4.11	0.09	0.05	0.04	1784.50	0.00	1,785	0	0	228	1,785	4,095	1,069.0	1,757	349	1,043.6	1,802
4-Jan-11	3:00	4.12	0.09	0.05	0.04	1822.60	0.00	1,823	0	0	228	1,823	4,096	1,069.0	1,767	349	1,043.6	1,803
4-Jan-11	3:20	4.14	0.09	0.05	0.04	1863.10	0.00	1,863	0	0	228	1,863	4,098	1,069.0	1,782	350	1,043.7	1,811
4-Jan-11	3:40	4.15	0.09	0.05	0.04	1904.00	0.00	1,904	0	0	229	1,904	4,101	1,069.1	1,803	352	1,043.7	1,826

Data from Capital Flood Input Hydrograph									Calculated Sediment Information			Total Inflow	Clogged Ports Dam Outflow (HMS)			Open Ports Dam Outflow (HMS)		
Date	Time of Day	Day Number	Precip (in)	Loss (in)	Excess (in)	Direct (in)	Base (in)	Unbulked Water Inflow Rate Qw (cfs)	Sediment Inflow Rate Qs (cfs)	Incremental Sediment Volume (ft^3)	Cumulative Sediment Volume (ft^3)	Bulked Inflow Rate Qb (cfs)	Dam Storage Volume (ac-ft)	Elev (ft)	Bulked Dam Outflow (cfs)	Dam Storage Volume (ac-ft)	Elev (ft)	Bulked Dam Outflow (cfs)
4-Jan-11	4:00	4.17	0.09	0.05	0.04	1942.60	0.00	1,943	0	0	229	1,943	4,104	1,069.1	1,828	354	1,043.7	1,847
4-Jan-11	4:20	4.18	0.10	0.05	0.05	1981.00	0.00	1,981	0	0	229	1,981	4,107	1,069.1	1,855	357	1,043.7	1,871
4-Jan-11	4:40	4.19	0.09	0.05	0.04	2021.20	0.00	2,021	0	0	229	2,021	4,111	1,069.1	1,885	360	1,043.8	1,898
4-Jan-11	5:00	4.21	0.10	0.05	0.05	2064.20	0.00	2,064	0	0	229	2,064	4,114	1,069.1	1,917	364	1,043.8	1,928
4-Jan-11	5:20	4.22	0.10	0.05	0.05	2111.50	0.00	2,112	0	0	229	2,112	4,119	1,069.2	1,952	368	1,043.8	1,962
4-Jan-11	5:40	4.24	0.09	0.05	0.04	2160.80	0.00	2,161	0	0	229	2,161	4,123	1,069.2	1,990	372	1,043.9	1,998
4-Jan-11	6:00	4.25	0.10	0.05	0.05	2208.50	0.00	2,209	0	0	229	2,209	4,128	1,069.2	2,030	377	1,043.9	2,037
4-Jan-11	6:20	4.26	0.10	0.05	0.05	2254.60	0.00	2,255	0	0	230	2,255	4,133	1,069.2	2,071	382	1,044.0	2,078
4-Jan-11	6:40	4.28	0.10	0.05	0.05	2300.40	0.00	2,300	0	0	230	2,300	4,138	1,069.3	2,113	387	1,044.0	2,122
4-Jan-11	7:00	4.29	0.11	0.05	0.06	2348.20	0.00	2,348	0	0	230	2,348	4,143	1,069.3	2,156	391	1,044.1	2,170
4-Jan-11	7:20	4.31	0.10	0.05	0.05	2401.60	0.00	2,402	0	0	231	2,402	4,149	1,069.3	2,201	396	1,044.1	2,218
4-Jan-11	7:40	4.32	0.11	0.05	0.06	2460.10	0.00	2,460	0	1	231	2,460	4,154	1,069.3	2,248	402	1,044.2	2,267
4-Jan-11	8:00	4.33	0.10	0.05	0.05	2519.90	0.00	2,520	0	1	232	2,520	4,160	1,069.4	2,298	407	1,044.2	2,319
4-Jan-11	8:20	4.35	0.11	0.05	0.06	2578.90	0.00	2,579	0	1	233	2,579	4,167	1,069.4	2,349	413	1,044.3	2,373
4-Jan-11	8:40	4.36	0.11	0.05	0.06	2636.70	0.00	2,637	0	1	234	2,637	4,173	1,069.4	2,402	418	1,044.3	2,428
4-Jan-11	9:00	4.38	0.11	0.05	0.06	2695.10	0.00	2,695	0	1	236	2,695	4,180	1,069.5	2,456	424	1,044.4	2,484
4-Jan-11	9:20	4.39	0.12	0.05	0.07	2757.50	0.00	2,758	0	2	237	2,758	4,186	1,069.5	2,511	430	1,044.5	2,540
4-Jan-11	9:40	4.40	0.11	0.05	0.06	2824.80	0.00	2,825	0	2	240	2,825	4,193	1,069.5	2,569	436	1,044.5	2,599
4-Jan-11	10:00	4.42	0.12	0.05	0.07	2896.30	0.00	2,896	0	3	242	2,896	4,200	1,069.6	2,628	443	1,044.6	2,660
4-Jan-11	10:20	4.43	0.12	0.05	0.07	2970.60	0.00	2,971	0	4	246	2,971	4,208	1,069.6	2,691	449	1,044.7	2,724
4-Jan-11	10:40	4.44	0.12	0.05	0.07	3047.50	0.00	3,048	0	5	251	3,048	4,216	1,069.7	2,756	456	1,044.7	2,791
4-Jan-11	11:00	4.46	0.12	0.05	0.07	3125.20	0.00	3,125	0	6	256	3,125	4,224	1,069.7	2,824	463	1,044.8	2,860
4-Jan-11	11:20	4.47	0.13	0.05	0.08	3204.90	0.00	3,205	0	7	264	3,205	4,232	1,069.7	2,893	471	1,044.9	2,931
4-Jan-11	11:40	4.49	0.13	0.05	0.08	3289.20	0.00	3,289	0	10	274	3,289	4,241	1,069.8	2,966	478	1,044.9	3,005
4-Jan-11	12:00	4.50	0.13	0.05	0.08	3378.10	0.00	3,378	0	12	286	3,378	4,250	1,069.8	3,041	486	1,045.0	3,084
4-Jan-11	12:20	4.51	0.13	0.05	0.08	3471.40	0.00	3,471	0	16	302	3,471	4,260	1,069.9	3,120	495	1,045.1	3,170
4-Jan-11	12:40	4.53	0.14	0.05	0.09	3568.80	0.00	3,569	0	21	323	3,569	4,270	1,069.9	3,202	503	1,045.2	3,259
4-Jan-11	13:00	4.54	0.14	0.05	0.09	3670.00	0.00	3,670	0	28	351	3,670	4,280	1,070.0	3,287	512	1,045.3	3,350
4-Jan-11	13:20	4.56	0.14	0.05	0.09	3774.80	0.00	3,775	0	36	387	3,775	4,291	1,070.0	3,386	521	1,045.4	3,445
4-Jan-11	13:40	4.57	0.15	0.05	0.10	3885.20	0.00	3,885	0	48	435	3,885	4,301	1,070.1	3,491	530	1,045.4	3,542
4-Jan-11	14:00	4.58	0.15	0.05	0.10	4002.90	0.00	4,003	0	64	499	4,003	4,312	1,070.1	3,598	540	1,045.5	3,644
4-Jan-11	14:20	4.60	0.16	0.05	0.11	4128.70	0.00	4,129	0	86	585	4,129	4,324	1,070.2	3,708	550	1,045.6	3,751
4-Jan-11	14:40	4.61	0.16	0.05	0.11	4263.40	0.00	4,263	0	117	702	4,263	4,336	1,070.3	3,824	560	1,045.7	3,864
4-Jan-11	15:00	4.63	0.17	0.05	0.12	4409.30	0.00	4,409	0	162	864	4,409	4,348	1,070.3	3,945	572	1,045.9	3,983
4-Jan-11	15:20	4.64	0.17	0.05	0.12	4566.10	0.00	4,566	0	227	1,091	4,566	4,361	1,070.4	4,073	584	1,046.0	4,111
4-Jan-11	15:40	4.65	0.18	0.05	0.13	4733.00	0.00	4,733	0	321	1,411	4,733	4,375	1,070.5	4,209	597	1,046.1	4,252
4-Jan-11	16:00	4.67	0.19	0.05	0.14	4911.80	0.00	4,912	0	458	1,870	4,912	4,390	1,070.5	4,354	611	1,046.2	4,402
4-Jan-11	16:20	4.68	0.20	0.05	0.15	5105.90	0.00	5,106	1	666	2,536	5,106	4,406	1,070.6	4,509	625	1,046.4	4,562
4-Jan-11	16:40	4.69	0.21	0.05	0.16	5319.90	0.00	5,320	1	990	3,525	5,321	4,423	1,070.7	4,675	641	1,046.5	4,734
4-Jan-11	17:00	4.71	0.23	0.05	0.18	5559.50	0.00	5,560	1	1,513	5,038	5,561	4,442	1,070.8	4,856	658	1,046.7	4,920
4-Jan-11	17:20	4.72	0.24	0.05	0.19	5830.50	0.00	5,831	2	2,394	7,432	5,832	4,462	1,070.9	5,054	676	1,046.8	5,124
4-Jan-11	17:40	4.74	0.26	0.05	0.21	6136.90	0.00	6,137	3	3,922	11,355	6,140	4,485	1,071.0	5,278	697	1,047.0	5,343
4-Jan-11	18:00	4.75	0.29	0.05	0.24	6485.60	0.00	6,486	6	6,682	18,036	6,491	4,510	1,071.1	5,549	721	1,047.3	5,547
4-Jan-11	18:20	4.76	0.33	0.05	0.28	6890.50	0.00	6,891	10	11,979	30,015	6,900	4,537	1,071.3	5,848	749	1,047.5	5,788
4-Jan-11	18:40	4.78	0.40	0.05	0.35	7377.20	0.00	7,377	19	23,128	53,144	7,396	4,568	1,071.4	6,187	783	1,047.8	6,073
4-Jan-11	19:00	4.79	0.55	0.05	0.50	8004.50	0.00	8,005	42	50,793	103,937	8,047	4,605	1,071.6	6,587	824	1,048.2	6,358
4-Jan-11	19:20	4.81	1.15	0.05	1.10	8973.60	0.00	8,974	127	152,841	256,777	9,101	4,653	1,071.9	7,105	881	1,048.7	6,651
4-Jan-11	19:40	4.82	0.32	0.05	0.27	10345.80	0.00	10,346	502	602,478	859,255	10,848	4,722	1,072.2	7,828	967	1,049.4	7,064
4-Jan-11	20:00	4.83	0.21	0.05	0.16	11858.40	0.00	11,858	1,871	2,244,936	3,104,191	13,729	4,830	1,072.6	8,924	1,103	1,050.5	7,660
4-Jan-11	20:20	4.85	0.18	0.05	0.13	13135.50	0.00	13,136	5,014	6,017,282	9,121,473	18,150	4,999	1,073.3	10,679	1,320	1,052.2	8,486
4-Jan-11	20:40	4.86	0.16	0.05	0.11	13875.90	0.00	13,876	8,507	10,208,534	19,330,006	22,383	5,229	1,074.2	13,150	1,630	1,054.5	9,497
4-Jan-11	21:00	4.88	0.14	0.05	0.09	13969.90	0.00	13,970	9,079	10,895,019	30,225,026	23,049	5,458	1,075.1	15,684	1,981	1,056.9	10,440
4-Jan-11	21:20	4.89	0.12	0.05	0.07	13631.60	0.00	13,632	7,168	8,602,016	38,827,042	20,800	5,606	1,075.6	17,361	2,288	1,058.9	11,143
4-Jan-11	21:40	4.90	0.12	0.05	0.07	13165.00	0.00	13,165	5,124	6,148,820	44,975,862	18,289	5,658	1,075.8	17,948	2,513	1,060.2	11,613
4-Jan-11	22:00	4.92	0.11	0.05	0.06	12654.90	0.00	12,655	3,501	4,201,026	49,176,889	16,156	5,641	1,075.8	17,753	2,663	1,061.1	11,910
4-Jan-11	22:20	4.93	0.11	0.05	0.06	12123.00	0.00	12,123	2,314	2,777,091	51,953,979	14,437	5,583	1,075.6	17,093	2,754	1,061.7	12,083
4-Jan-11	22:40	4.94	0.10	0.05	0.05	11596.00	0.00	11,596	1,508	1,809,370	53,763,349	13,104	5,503	1,075.3	16,200	2,800	1,061.9	12,169

Data from Capital Flood Input Hydrograph									Calculated Sediment Information			Total Inflow	Clogged Ports Dam Outflow (HMS)			Open Ports Dam Outflow (HMS)		
Date	Time of Day	Day Number	Precip (in)	Loss (in)	Excess (in)	Direct (in)	Base (in)	Unbulked Water Inflow Rate Qw (cfs)	Sediment Inflow Rate Qs (cfs)	Incremental Sediment Volume (ft^3)	Cumulative Sediment Volume (ft^3)	Bulked Inflow Rate Qb (cfs)	Dam Storage Volume (ac-ft)	Elev (ft)	Bulked Dam Outflow (cfs)	Dam Storage Volume (ac-ft)	Elev (ft)	Bulked Dam Outflow (cfs)
4-Jan-11	23:00	4.96	0.09	0.05	0.04	11077.10	0.00	11,077	970	1,163,781	54,927,130	12,047	5,417	1,074.9	15,229	2,811	1,062.0	12,190
4-Jan-11	23:20	4.97	0.09	0.05	0.04	10567.70	0.00	10,568	616	739,237	55,666,367	11,184	5,330	1,074.6	14,273	2,795	1,061.9	12,161
4-Jan-11	23:40	4.99	0.09	0.05	0.04	10068.30	0.00	10,068	386	463,572	56,129,939	10,455	5,248	1,074.3	13,360	2,759	1,061.7	12,092
5-Jan-11	0:00	5.00	0.09	0.05	0.04	9583.50	0.00	9,584	240	288,085	56,418,024	9,824	5,171	1,074.0	12,510	2,707	1,061.4	11,992
5-Jan-11	0:20	5.01	0.00	0.00	0.00	9109.70	0.00	9,110	147	176,708	56,594,732	9,257	5,100	1,073.7	11,750	2,641	1,061.0	11,867
5-Jan-11	0:40	5.03	0.00	0.00	0.00	8636.30	0.00	8,636	88	105,644	56,700,376	8,724	5,033	1,073.4	11,045	2,564	1,060.5	11,713
5-Jan-11	1:00	5.04	0.00	0.00	0.00	8154.50	0.00	8,155	51	60,747	56,761,124	8,205	4,971	1,073.2	10,385	2,477	1,060.0	11,540
5-Jan-11	1:20	5.06	0.00	0.00	0.00	7663.40	0.00	7,663	28	33,380	56,794,504	7,691	4,913	1,073.0	9,767	2,381	1,059.4	11,339
5-Jan-11	1:40	5.07	0.00	0.00	0.00	7173.10	0.00	7,173	15	17,648	56,812,152	7,188	4,856	1,072.7	9,195	2,276	1,058.8	11,117
5-Jan-11	2:00	5.08	0.00	0.00	0.00	6700.80	0.00	6,701	8	9,153	56,821,304	6,708	4,802	1,072.5	8,643	2,165	1,058.1	10,871
5-Jan-11	2:20	5.10	0.00	0.00	0.00	6258.10	0.00	6,258	4	4,736	56,826,040	6,262	4,750	1,072.3	8,113	2,048	1,057.4	10,598
5-Jan-11	2:40	5.11	0.00	0.00	0.00	5844.70	0.00	5,845	2	2,451	56,828,491	5,847	4,700	1,072.1	7,607	1,927	1,056.6	10,302
5-Jan-11	3:00	5.13	0.00	0.00	0.00	5458.60	0.00	5,459	1	1,268	56,829,759	5,460	4,653	1,071.9	7,109	1,803	1,055.7	9,983
5-Jan-11	3:20	5.14	0.00	0.00	0.00	5097.50	0.00	5,098	1	656	56,830,415	5,098	4,609	1,071.6	6,632	1,678	1,054.9	9,638
5-Jan-11	3:40	5.15	0.00	0.00	0.00	4760.00	0.00	4,760	0	339	56,830,754	4,760	4,569	1,071.4	6,188	1,553	1,054.0	9,271
5-Jan-11	4:00	5.17	0.00	0.00	0.00	4445.00	0.00	4,445	0	175	56,830,929	4,445	4,531	1,071.2	5,775	1,430	1,053.1	8,871
5-Jan-11	4:20	5.18	0.00	0.00	0.00	4150.60	0.00	4,151	0	90	56,831,019	4,151	4,495	1,071.1	5,390	1,310	1,052.1	8,453
5-Jan-11	4:40	5.19	0.00	0.00	0.00	3875.90	0.00	3,876	0	47	56,831,066	3,876	4,462	1,070.9	5,051	1,194	1,051.2	8,027
5-Jan-11	5:00	5.21	0.00	0.00	0.00	3619.10	0.00	3,619	0	24	56,831,090	3,619	4,430	1,070.7	4,743	1,082	1,050.3	7,572
5-Jan-11	5:20	5.22	0.00	0.00	0.00	3379.30	0.00	3,379	0	12	56,831,103	3,379	4,400	1,070.6	4,449	976	1,049.5	7,105
5-Jan-11	5:40	5.24	0.00	0.00	0.00	3155.30	0.00	3,155	0	6	56,831,109	3,155	4,371	1,070.4	4,170	877	1,048.6	6,629
5-Jan-11	6:00	5.25	0.00	0.00	0.00	2946.10	0.00	2,946	0	3	56,831,112	2,946	4,344	1,070.3	3,906	786	1,047.8	6,099
5-Jan-11	6:20	5.26	0.00	0.00	0.00	2750.70	0.00	2,751	0	2	56,831,114	2,751	4,318	1,070.2	3,656	706	1,047.1	5,417
5-Jan-11	6:40	5.28	0.00	0.00	0.00	2568.30	0.00	2,568	0	1	56,831,115	2,568	4,294	1,070.1	3,421	639	1,046.5	4,719
5-Jan-11	7:00	5.29	0.00	0.00	0.00	2397.90	0.00	2,398	0	0	56,831,115	2,398	4,271	1,069.9	3,215	586	1,046.0	4,131
5-Jan-11	7:20	5.31	0.00	0.00	0.00	2238.50	0.00	2,239	0	0	56,831,116	2,239	4,249	1,069.8	3,031	542	1,045.6	3,672
5-Jan-11	7:40	5.32	0.00	0.00	0.00	2089.90	0.00	2,090	0	0	56,831,116	2,090	4,228	1,069.7	2,854	506	1,045.2	3,290
5-Jan-11	8:00	5.33	0.00	0.00	0.00	1950.90	0.00	1,951	0	0	56,831,116	1,951	4,207	1,069.6	2,683	475	1,044.9	2,975
5-Jan-11	8:20	5.35	0.00	0.00	0.00	1821.00	0.00	1,821	0	0	56,831,116	1,821	4,187	1,069.5	2,520	449	1,044.6	2,721
5-Jan-11	8:40	5.36	0.00	0.00	0.00	1700.00	0.00	1,700	0	0	56,831,116	1,700	4,169	1,069.4	2,365	425	1,044.4	2,496
5-Jan-11	9:00	5.38	0.00	0.00	0.00	1586.70	0.00	1,587	0	0	56,831,116	1,587	4,151	1,069.3	2,217	405	1,044.2	2,297
5-Jan-11	9:20	5.39	0.00	0.00	0.00	1480.90	0.00	1,481	0	0	56,831,116	1,481	4,134	1,069.2	2,077	386	1,044.0	2,118
5-Jan-11	9:40	5.40	0.00	0.00	0.00	1382.10	0.00	1,382	0	0	56,831,116	1,382	4,118	1,069.1	1,945	369	1,043.8	1,972
5-Jan-11	10:00	5.42	0.00	0.00	0.00	1289.70	0.00	1,290	0	0	56,831,116	1,290	4,103	1,069.1	1,821	354	1,043.7	1,839
5-Jan-11	10:20	5.43	0.00	0.00	0.00	1203.50	0.00	1,204	0	0	56,831,116	1,204	4,089	1,069.0	1,704	339	1,043.5	1,715
5-Jan-11	10:40	5.44	0.00	0.00	0.00	1122.80	0.00	1,123	0	0	56,831,116	1,123	4,075	1,068.9	1,618	325	1,043.4	1,600
5-Jan-11	11:00	5.46	0.00	0.00	0.00	1047.70	0.00	1,048	0	0	56,831,116	1,048	4,061	1,068.9	1,533	313	1,043.3	1,492
5-Jan-11	11:20	5.47	0.00	0.00	0.00	977.30	0.00	977	0	0	56,831,116	977	4,048	1,068.8	1,450	301	1,043.2	1,392
5-Jan-11	11:40	5.49	0.00	0.00	0.00	911.60	0.00	912	0	0	56,831,116	912	4,035	1,068.7	1,369	290	1,043.0	1,298
5-Jan-11	12:00	5.50	0.00	0.00	0.00	850.20	0.00	850	0	0	56,831,116	850	4,023	1,068.7	1,292	279	1,042.9	1,219
5-Jan-11	12:20	5.51	0.00	0.00	0.00	792.70	0.00	793	0	0	56,831,116	793	4,011	1,068.6	1,217	269	1,042.8	1,149
5-Jan-11	12:40	5.53	0.00	0.00	0.00	739.20	0.00	739	0	0	56,831,116	739	4,000	1,068.5	1,145	260	1,042.7	1,081
5-Jan-11	13:00	5.54	0.00	0.00	0.00	689.00	0.00	689	0	0	56,831,116	689	3,989	1,068.5	1,076	251	1,042.6	1,016
5-Jan-11	13:20	5.56	0.00	0.00	0.00	642.10	0.00	642	0	0	56,831,116	642	3,978	1,068.4	1,011	242	1,042.5	954
5-Jan-11	13:40	5.57	0.00	0.00	0.00	598.30	0.00	598	0	0	56,831,116	598	3,968	1,068.4	948	233	1,042.5	895
5-Jan-11	14:00	5.58	0.00	0.00	0.00	557.40	0.00	557	0	0	56,831,116	557	3,959	1,068.3	889	225	1,042.4	839
5-Jan-11	14:20	5.60	0.00	0.00	0.00	519.10	0.00	519	0	0	56,831,116	519	3,950	1,068.3	833	218	1,042.3	786
5-Jan-11	14:40	5.61	0.00	0.00	0.00	483.20	0.00	483	0	0	56,831,116	483	3,942	1,068.2	780	211	1,042.2	735
5-Jan-11	15:00	5.63	0.00	0.00	0.00	449.70	0.00	450	0	0	56,831,116	450	3,934	1,068.2	730	204	1,042.1	688
5-Jan-11	15:20	5.64	0.00	0.00	0.00	418.50	0.00	419	0	0	56,831,116	419	3,926	1,068.1	683	198	1,042.1	643
5-Jan-11	15:40	5.65	0.00	0.00	0.00	389.10	0.00	389	0	0	56,831,116	389	3,919	1,068.1	639	192	1,042.0	600
5-Jan-11	16:00	5.67	0.00	0.00	0.00	361.60	0.00	362	0	0	56,831,116	362	3,912	1,068.1	597	186	1,042.0	569
5-Jan-11	16:20	5.68	0.00	0.00	0.00	336.00	0.00	336	0	0	56,831,116	336	3,906	1,068.0	557	180	1,041.9	540
5-Jan-11	16:40	5.69	0.00	0.00	0.00	311.80	0.00	312	0	0	56,831,116	312	3,900	1,068.0	520	175	1,041.8	513
5-Jan-11	17:00	5.71	0.00	0.00	0.00	289.30	0.00	289	0	0	56,831,116	289	3,895	1,068.0	497	169	1,041.8	486
5-Jan-11	17:20	5.72	0.00	0.00	0.00	268.00	0.00	268	0	0	56,831,116	268	3,889	1,068.0	481	164	1,041.7	459
5-Jan-11	17:40	5.74	0.00	0.00	0.00	248.20	0.00	248	0	0	56,831,116	248	3,883	1,067.9	465	159	1,041.7	433

Data from Capital Flood Input Hydrograph									Calculated Sediment Information			Total Inflow	Clogged Ports Dam Outflow (HMS)			Open Ports Dam Outflow (HMS)		
Date	Time of Day	Day Number	Precip (in)	Loss (in)	Excess (in)	Direct (in)	Base (in)	Unbulked Water Inflow Rate Qw (cfs)	Sediment Inflow Rate Qs (cfs)	Incremental Sediment Volume (ft^3)	Cumulative Sediment Volume (ft^3)	Bulked Inflow Rate Qb (cfs)	Dam Storage Volume (ac-ft)	Elev (ft)	Bulked Dam Outflow (cfs)	Dam Storage Volume (ac-ft)	Elev (ft)	Bulked Dam Outflow (cfs)
5-Jan-11	18:00	5.75	0.00	0.00	0.00	229.50	0.00	230	0	0	56,831,116	230	3,877	1,067.9	449	154	1,041.6	409
5-Jan-11	18:20	5.76	0.00	0.00	0.00	212.00	0.00	212	0	0	56,831,116	212	3,871	1,067.9	432	149	1,041.6	385
5-Jan-11	18:40	5.78	0.00	0.00	0.00	195.40	0.00	195	0	0	56,831,116	195	3,865	1,067.8	416	144	1,041.5	361
5-Jan-11	19:00	5.79	0.00	0.00	0.00	179.80	0.00	180	0	0	56,831,116	180	3,859	1,067.8	399	140	1,041.5	339
5-Jan-11	19:20	5.81	0.00	0.00	0.00	165.00	0.00	165	0	0	56,831,116	165	3,853	1,067.8	383	135	1,041.4	318
5-Jan-11	19:40	5.82	0.00	0.00	0.00	151.00	0.00	151	0	0	56,831,116	151	3,847	1,067.7	367	131	1,041.4	297
5-Jan-11	20:00	5.83	0.00	0.00	0.00	137.50	0.00	138	0	0	56,831,116	138	3,841	1,067.7	351	127	1,041.3	278
5-Jan-11	20:20	5.85	0.00	0.00	0.00	124.70	0.00	125	0	0	56,831,116	125	3,835	1,067.7	335	124	1,041.3	259
5-Jan-11	20:40	5.86	0.00	0.00	0.00	112.40	0.00	112	0	0	56,831,116	112	3,829	1,067.6	320	120	1,041.3	241
5-Jan-11	21:00	5.88	0.00	0.00	0.00	100.30	0.00	100	0	0	56,831,116	100	3,823	1,067.6	304	116	1,041.2	224
5-Jan-11	21:20	5.89	0.00	0.00	0.00	88.20	0.00	88	0	0	56,831,116	88	3,818	1,067.6	289	113	1,041.2	207
5-Jan-11	21:40	5.90	0.00	0.00	0.00	75.50	0.00	76	0	0	56,831,116	76	3,812	1,067.5	274	110	1,041.2	191
5-Jan-11	22:00	5.92	0.00	0.00	0.00	60.80	0.00	61	0	0	56,831,116	61	3,807	1,067.5	259	107	1,041.1	176
5-Jan-11	22:20	5.93	0.00	0.00	0.00	35.40	0.00	35	0	0	56,831,116	35	3,801	1,067.5	244	103	1,041.1	159
5-Jan-11	22:40	5.94	0.00	0.00	0.00	27.80	0.00	28	0	0	56,831,116	28	3,796	1,067.5	229	100	1,041.1	143
5-Jan-11	23:00	5.96	0.00	0.00	0.00	22.80	0.00	23	0	0	56,831,116	23	3,790	1,067.4	214	97	1,041.0	128
5-Jan-11	23:20	5.97	0.00	0.00	0.00	18.80	0.00	19	0	0	56,831,116	19	3,785	1,067.4	200	94	1,041.0	114
5-Jan-11	23:40	5.99	0.00	0.00	0.00	15.40	0.00	15	0	0	56,831,116	15	3,780	1,067.4	187	92	1,041.0	110
6-Jan-11	0:00	6.00	0.00	0.00	0.00	12.60	0.00	13	0	0	56,831,116	13	3,776	1,067.3	175	89	1,040.9	107

Peak Values
Water Surface Elevations Above Parapet

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Appendix B

HEC-HMS Information

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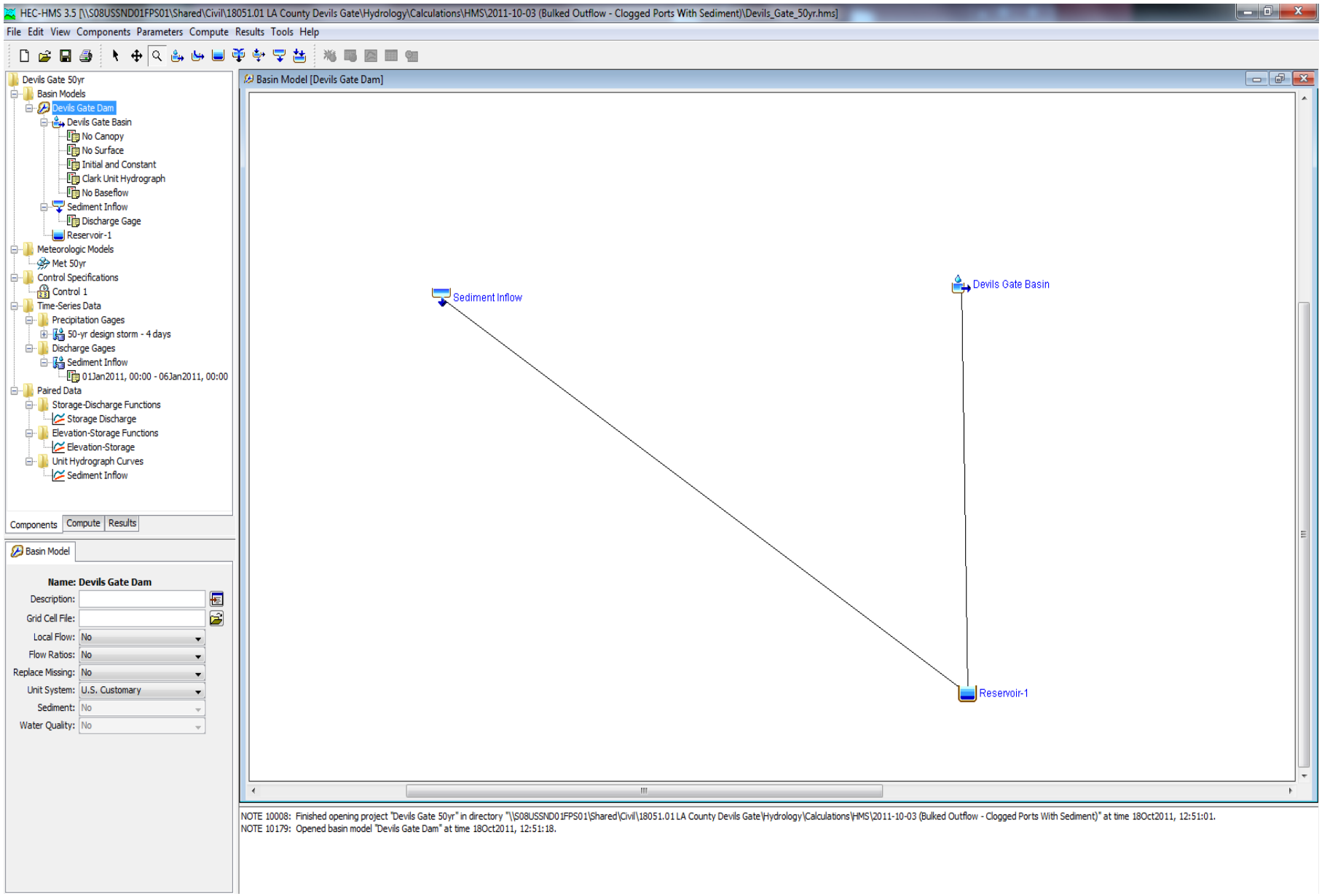
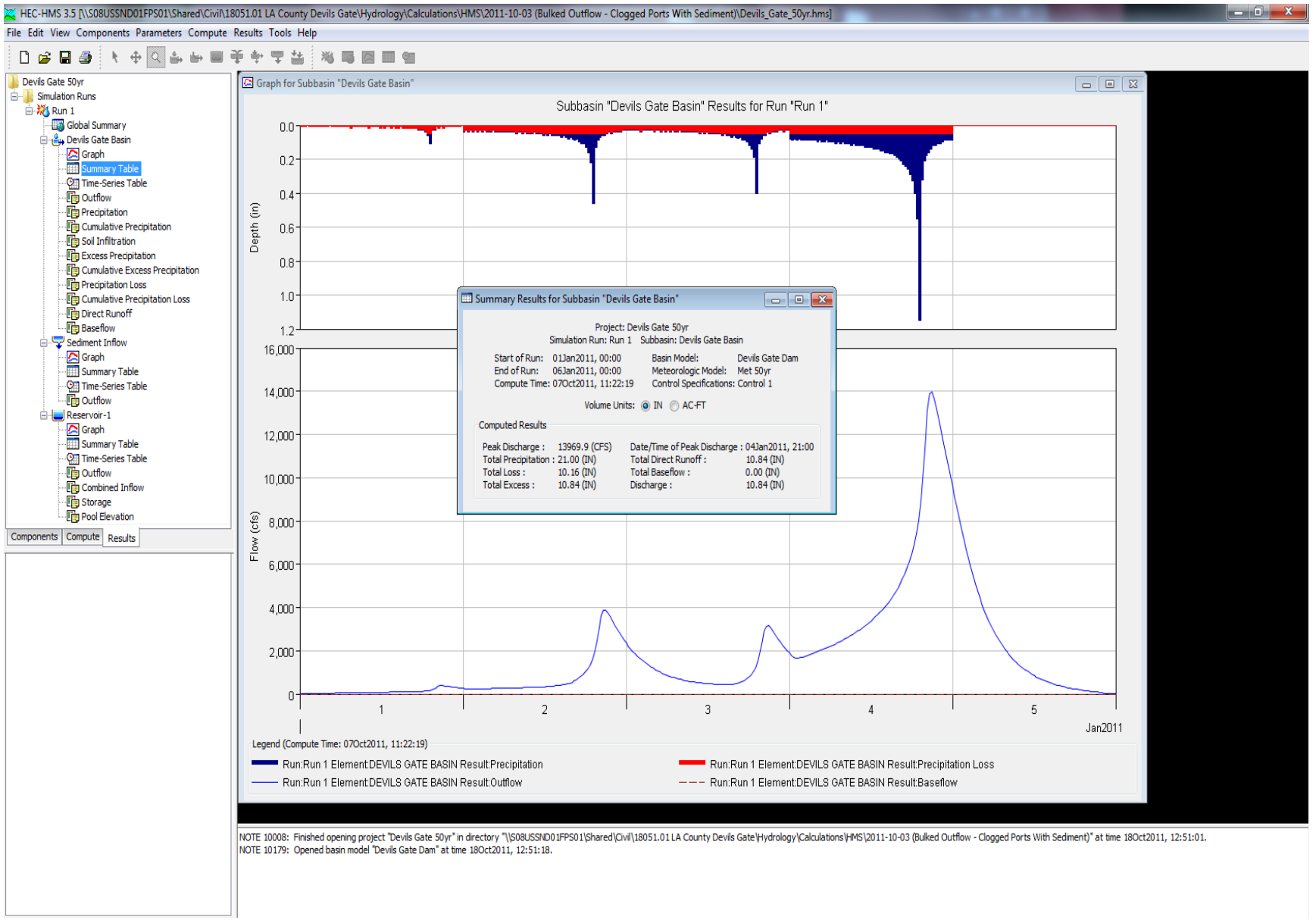
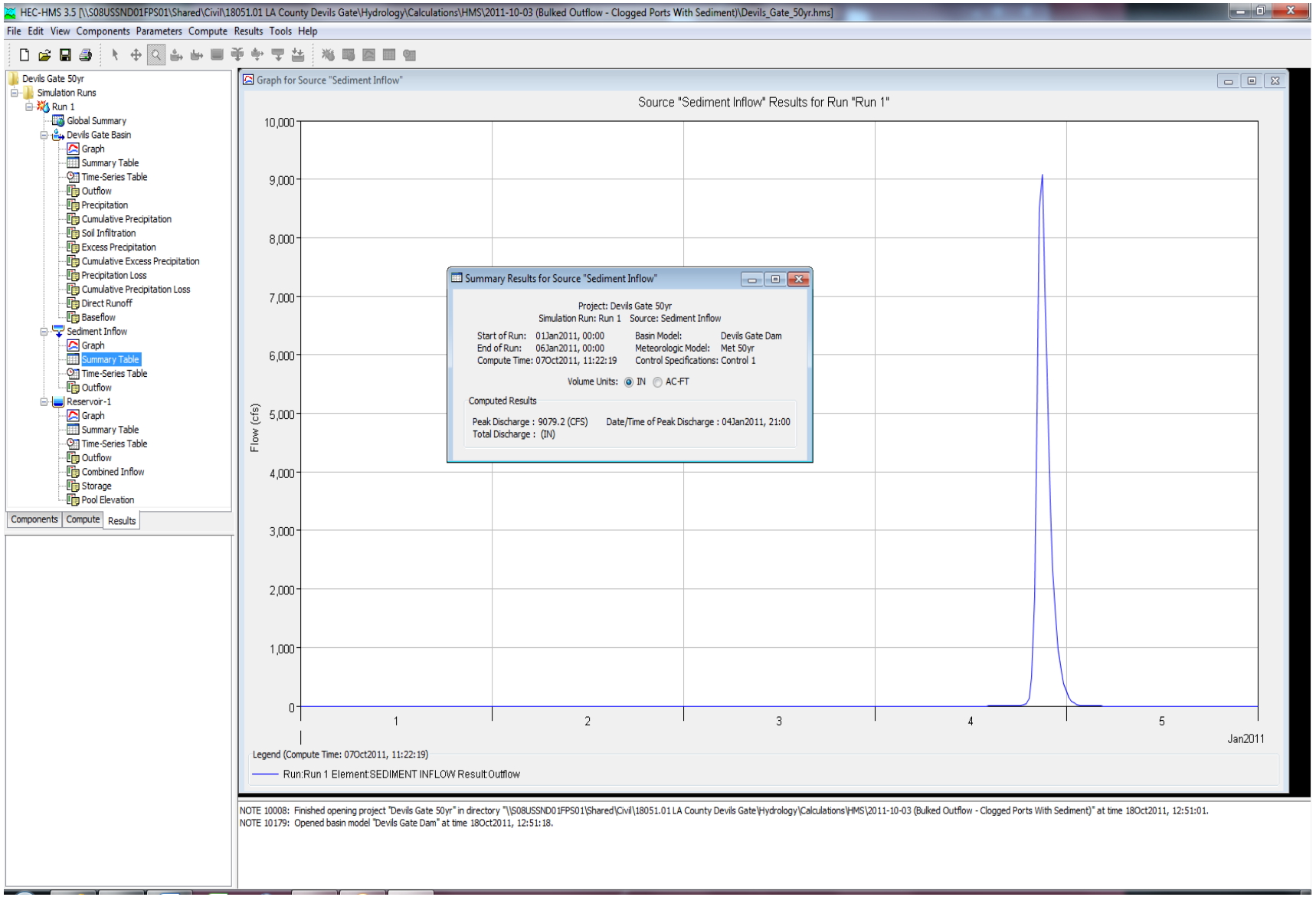
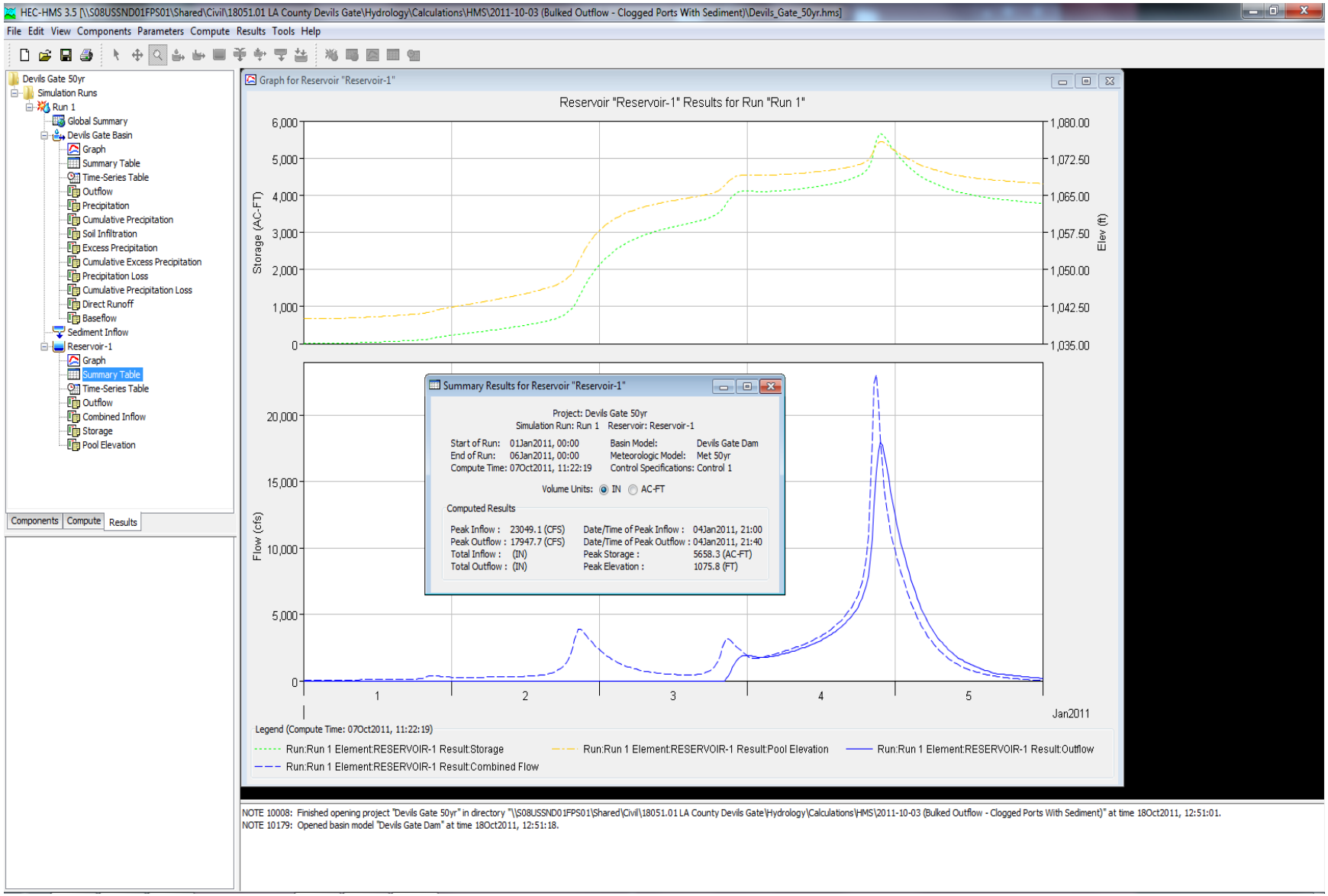

HEC-HMS 3.5 [\\S08USSND01FPS01\Shared\Civil\18051.01 LA County Devils Gate\Hydrology\Calculations\HMS\2011-10-03 (Bulked Outflow - Clogged Ports With Sediment)\Devils_Gate_50yr.hms]
File Edit View Components Parameters Compute Results Tools Help
Devils Gate 50yr
Basin Models
Devils Gate Dam
Devils Gate Basin
No Canopy
No Surface
Initial and Constant
Clark Unit Hydrograph
No Baseflow
Sediment Inflow
Discharge Gage
Reservoir-1
Meteorologic Models
Met 50yr
Control Specifications
Control 1
Time-Series Data
Precipitation Gages
50-yr design storm - 4 days
Discharge Gages
Sediment Inflow
01Jan2011, 00:00 - 06Jan2011, 00:00
Paired Data
Storage-Discharge Functions
Storage Discharge
Elevation-Storage Functions
Elevation-Storage
Unit Hydrograph Curves
Sediment Inflow
Components Compute Results
Basin Model
Name: Devils Gate Dam
Description:
Grid Cell File:
Local Flow: No
Flow Ratios: No
Replace Missing: No
Unit System: U.S. Customary
Sediment: No
Water Quality: No
Basin Model [Devils Gate Dam]
Sediment Inflow
Devils Gate Basin
Reservoir-1
NOTE 10008: Finished opening project "Devils Gate 50yr" in directory "\\S08USSND01FPS01\Shared\Civil\18051.01 LA County Devils Gate\Hydrology\Calculations\HMS\2011-10-03 (Bulked Outflow - Clogged Ports With Sediment)" at time 18Oct2011, 12:51:01.
NOTE 10179: Opened basin model "Devils Gate Dam" at time 18Oct2011, 12:51:18.


HEC-HMS 3.5 [\\S08USSND01FPS01\Shared\Civil\18051.01 LA County Devils Gate\Hydrology\Calculations\HMS\2011-10-03 (Bulked Outflow - Clogged Ports With Sediment)\Devils_Gate_50yr.hms]
File Edit View Components Parameters Compute Results Tools Help
Devils Gate 50yr
Simulation Runs
Run 1
Global Summary
Devils Gate Basin
Graph
Summary Table
Time-Series Table
Outflow
Precipitation
Cumulative Precipitation
Soil Infiltration
Excess Precipitation
Cumulative Excess Precipitation
Precipitation Loss
Cumulative Precipitation Loss
Direct Runoff
Baseflow
Sediment Inflow
Graph
Summary Table
Time-Series Table
Outflow
Reservoir-1
Graph
Summary Table
Time-Series Table
Outflow
Combined Inflow
Storage
Pool Elevation
Components
Compute
Results
Graph for Subbasin "Devils Gate Basin"
Subbasin "Devils Gate Basin" Results for Run "Run 1"
Depth (in)
Flow (cfs)
Jan2011
Summary Results for Subbasin "Devils Gate Basin"
Project: Devils Gate 50yr
Simulation Run: Run 1 Subbasin: Devils Gate Basin
Start of Run: 01Jan2011, 00:00
End of Run: 06Jan2011, 00:00
Compute Time: 07Oct2011, 11:22:19
Basin Model: Devils Gate Dam
Meteorologic Model: Met 50yr
Control Specifications: Control 1
Volume Units: IN AC-FT
Computed Results
Peak Discharge : 13969.9 (CFS)
Date/Time of Peak Discharge : 04Jan2011, 21:00
Total Precipitation : 21.00 (IN)
Total Direct Runoff : 10.84 (IN)
Total Loss : 10.16 (IN)
Total Baseflow : 0.00 (IN)
Total Excess : 10.84 (IN)
Discharge : 10.84 (IN)
Legend (Compute Time: 07Oct2011, 11:22:19)
Run:Run 1 Element:DEVILS GATE BASIN Result:Precipitation
Run:Run 1 Element:DEVILS GATE BASIN Result:Precipitation Loss
Run:Run 1 Element:DEVILS GATE BASIN Result:Outflow
Run:Run 1 Element:DEVILS GATE BASIN Result:Baseflow
NOTE 10008: Finished opening project "Devils Gate 50yr" in directory "\\S08USSND01FPS01\Shared\Civil\18051.01 LA County Devils Gate\Hydrology\Calculations\HMS\2011-10-03 (Bulked Outflow - Clogged Ports With Sediment)" at time 18Oct2011, 12:51:01.
NOTE 10179: Opened basin model "Devils Gate Dam" at time 18Oct2011, 12:51:18.


HEC-HMS 3.5 [\\S08USSND01FPS01\Shared\Civil\18051.01 LA County Devils Gate\Hydrology\Calculations\HMS\2011-10-03 (Bulked Outflow - Clogged Ports With Sediment)\Devils_Gate_50yr.hms]
File Edit View Components Parameters Compute Results Tools Help
Devils Gate 50yr
Simulation Runs
Run 1
Global Summary
Devils Gate Basin
Graph
Summary Table
Time-Series Table
Outflow
Precipitation
Cumulative Precipitation
Soil Infiltration
Excess Precipitation
Cumulative Excess Precipitation
Precipitation Loss
Cumulative Precipitation Loss
Direct Runoff
Baseflow
Sediment Inflow
Graph
Summary Table
Time-Series Table
Outflow
Reservoir-1
Graph
Summary Table
Time-Series Table
Outflow
Combined Inflow
Storage
Pool Elevation
Components
Compute
Results
Graph for Source "Sediment Inflow"
Source "Sediment Inflow" Results for Run "Run 1"
Flow (cfs)
10,000
9,000
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
1
2
3
4
5
Jan2011
Summary Results for Source "Sediment Inflow"
Project: Devils Gate 50yr
Simulation Run: Run 1 Source: Sediment Inflow
Start of Run: 01Jan2011, 00:00
End of Run: 06Jan2011, 00:00
Compute Time: 07Oct2011, 11:22:19
Basin Model: Devils Gate Dam
Meteorologic Model: Met 50yr
Control Specifications: Control 1
Volume Units: IN AC-FT
Computed Results
Peak Discharge : 9079.2 (CFS)
Total Discharge : (IN)
Date/Time of Peak Discharge : 04Jan2011, 21:00
Legend (Compute Time: 07Oct2011, 11:22:19)
Run:Run 1 Element:SEDIMENT INFLOW Result:Outflow
NOTE 10008: Finished opening project "Devils Gate 50yr" in directory "\\S08USSND01FPS01\Shared\Civil\18051.01 LA County Devils Gate\Hydrology\Calculations\HMS\2011-10-03 (Bulked Outflow - Clogged Ports With Sediment)" at time 18Oct2011, 12:51:01.
NOTE 10179: Opened basin model "Devils Gate Dam" at time 18Oct2011, 12:51:18.


HEC-HMS 3.5 [\\S08USSND01FPS01\Shared\Civil\18051.01 LA County Devils Gate\Hydrology\Calculations\HMS\2011-10-03 (Bulked Outflow - Clogged Ports With Sediment)\Devils_Gate_50yr.hms]
File Edit View Components Parameters Compute Results Tools Help
Devils Gate 50yr
Simulation Runs
Run 1
Global Summary
Devils Gate Basin
Graph
Summary Table
Time-Series Table
Outflow
Precipitation
Cumulative Precipitation
Soil Infiltration
Excess Precipitation
Cumulative Excess Precipitation
Precipitation Loss
Cumulative Precipitation Loss
Direct Runoff
Baseflow
Sediment Inflow
Reservoir-1
Graph
Summary Table
Time-Series Table
Outflow
Combined Inflow
Storage
Pool Elevation
Components
Compute
Results
Graph for Reservoir "Reservoir-1"
Reservoir "Reservoir-1" Results for Run "Run 1"
Storage (AC-FT)
Elev (ft)
Flow (cfs)
Jan2011
Summary Results for Reservoir "Reservoir-1"
Project: Devils Gate 50yr
Simulation Run: Run 1 Reservoir: Reservoir-1
Start of Run: 01Jan2011, 00:00
End of Run: 06Jan2011, 00:00
Compute Time: 07Oct2011, 11:22:19
Basin Model: Devils Gate Dam
Meteorologic Model: Met 50yr
Control Specifications: Control 1
Volume Units: IN AC-FT
Computed Results
Peak Inflow : 23049.1 (CFS)
Peak Outflow : 17947.7 (CFS)
Total Inflow : (IN)
Total Outflow : (IN)
Date/Time of Peak Inflow : 04Jan2011, 21:00
Date/Time of Peak Outflow : 04Jan2011, 21:40
Peak Storage : 5658.3 (AC-FT)
Peak Elevation : 1075.8 (FT)
Legend (Compute Time: 07Oct2011, 11:22:19)
Run:Run 1 Element:RESERVOIR-1 Result:Storage
Run:Run 1 Element:RESERVOIR-1 Result:Pool Elevation
Run:Run 1 Element:RESERVOIR-1 Result:Outflow
Run:Run 1 Element:RESERVOIR-1 Result:Combined Flow
NOTE 10008: Finished opening project "Devils Gate 50yr" in directory "\\S08USSND01FPS01\Shared\Civil\18051.01 LA County Devils Gate\Hydrology\Calculations\HMS\2011-10-03 (Bulked Outflow - Clogged Ports With Sediment)" at time 18Oct2011, 12:51:01.
NOTE 10179: Opened basin model "Devils Gate Dam" at time 18Oct2011, 12:51:18.

Appendix C

WMS Information

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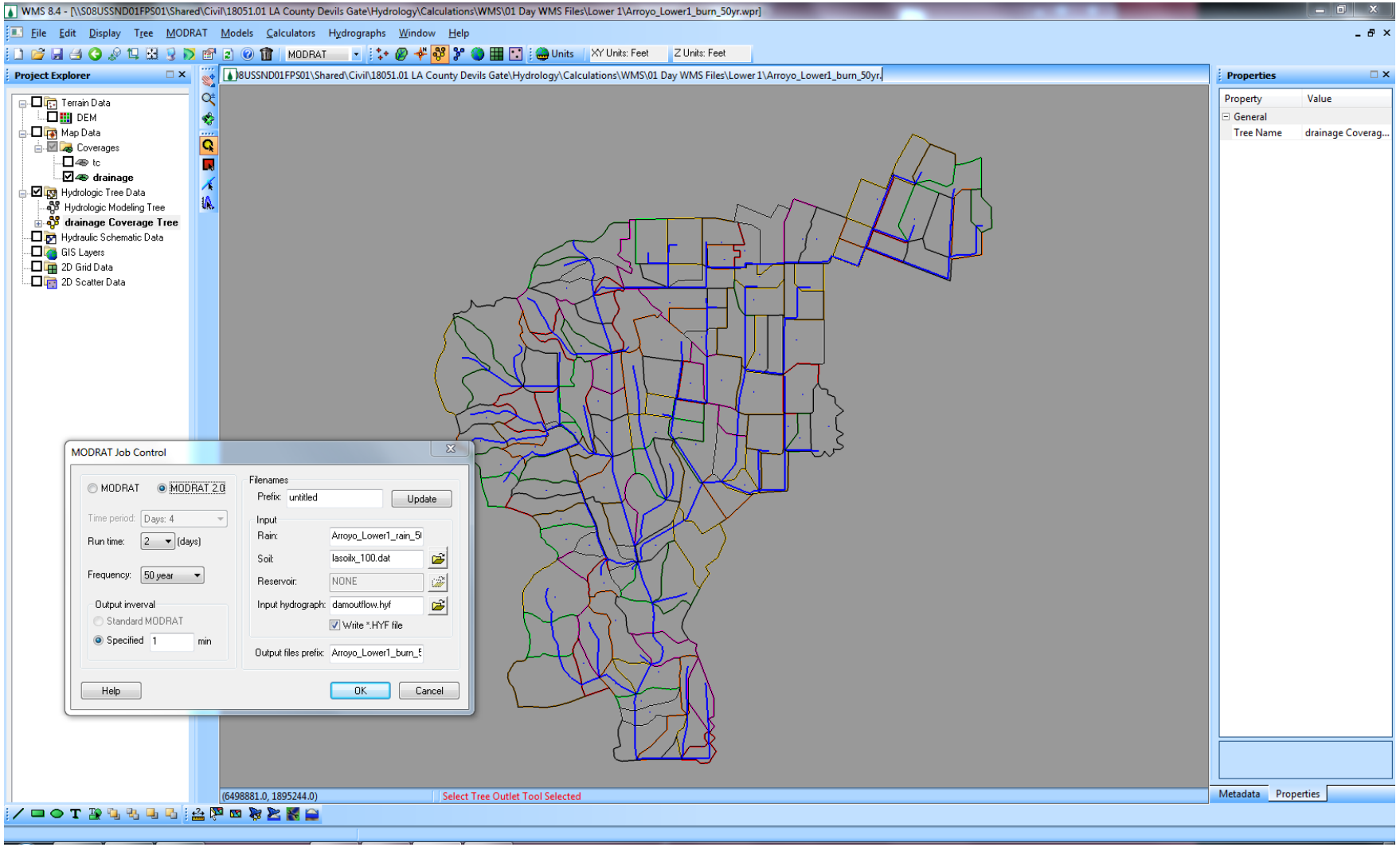
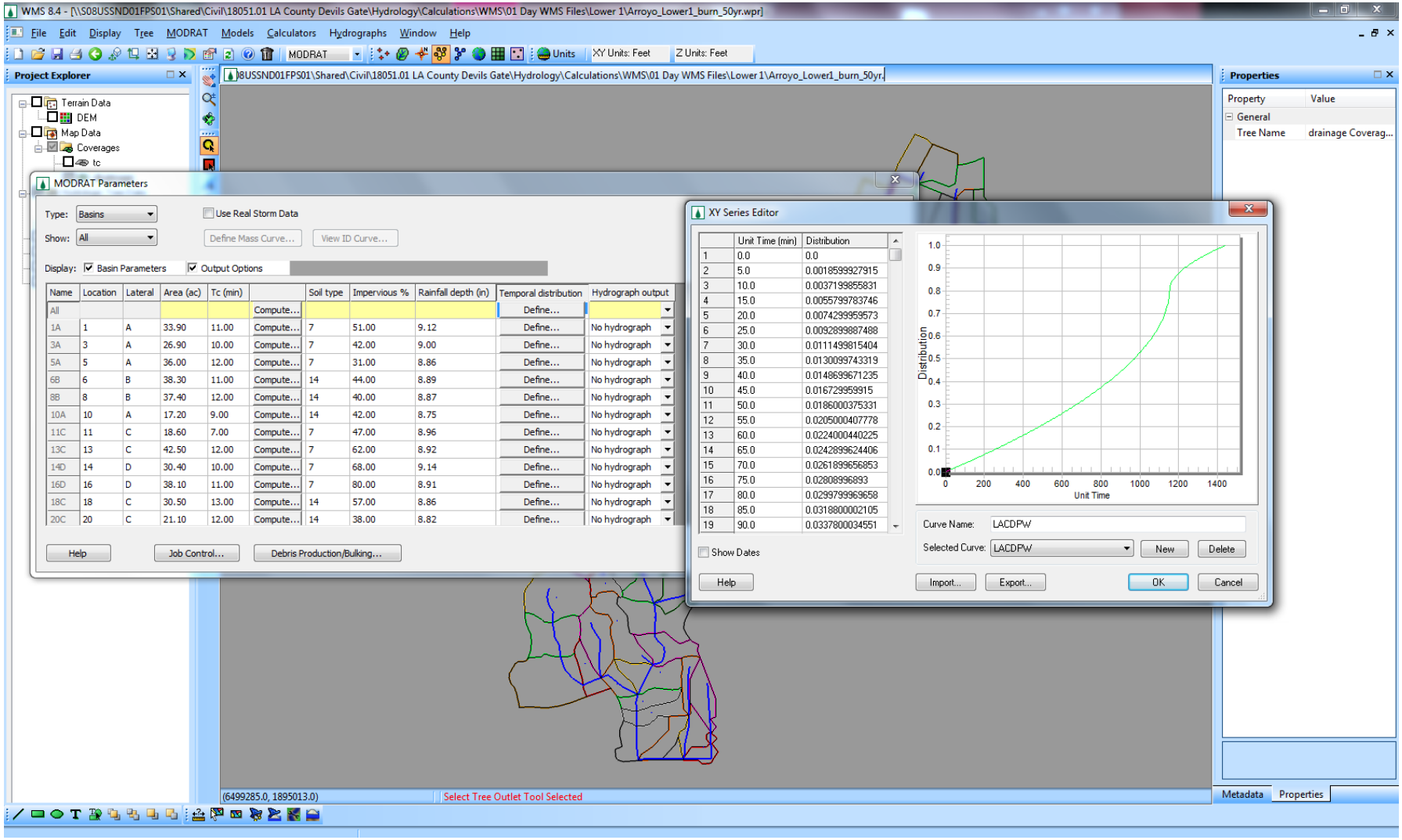

WMS 8.4 - [\\S08USSND01FPS01\Shared\Civil\18051.01 LA County Devils Gate\Hydrology\Calculations\WMS\01 Day WMS Files\Lower 1\Arroyo_Lower1_burn_50yr.wpr]
File Edit Display Tree MODRAT Models Calculators Hydrographs Window Help
Project Explorer
Terrain Data
DEM
Map Data
Coverages
tc
drainage
Hydrologic Tree Data
Hydrologic Modeling Tree
drainage Coverage Tree
Hydraulic Schematic Data
GIS Layers
2D Grid Data
2D Scatter Data
MODRAT Job Control
MODRAT
MODRAT 2.0
Time period: Days: 4
Run time: 2 (days)
Frequency: 50 year
Output inverval
Standard MODRAT
Specified 1 min
Filenames
Prefix: untitled
Update
Input
Rain: Arroyo_Lower1_rain_5
Soil: lasoilx_100.dat
Reservoir: NONE
Input hydrograph: damoutflow.hyf
Write *.HYF file
Output files prefix: Arroyo_Lower1_burn_5
Help
OK
Cancel
Properties
Property
Value
General
Tree Name
drainage Coverag...
Metadata
Properties
(6498881.0, 1895244.0)
Select Tree Outlet Tool Selected


WMS 8.4 - [\\S08USSND01FPS01\Shared\Civil\18051.01 LA County Devils Gate\Hydrology\Calculations\WMS\01 Day WMS Files\Lower 1\Arroyo_Lower1_burn_50yr.wpr]
File Edit Display Tree MODRAT Models Calculators Hydrographs Window Help
Project Explorer
Terrain Data
DEM
Map Data
Coverages
tc
MODRAT Parameters
Type: Basins
Use Real Storm Data
Show: All
Define Mass Curve...
View ID Curve...
Display: Basin Parameters Output Options
Name Location Lateral Area (ac) Tc (min) Soil type Impervious % Rainfall depth (in) Temporal distribution Hydrograph output
All Compute... Define...
1A 1 A 33.90 11.00 Compute... 7 51.00 9.12 Define... No hydrograph
3A 3 A 26.90 10.00 Compute... 7 42.00 9.00 Define... No hydrograph
5A 5 A 36.00 12.00 Compute... 7 31.00 8.86 Define... No hydrograph
6B 6 B 38.30 11.00 Compute... 14 44.00 8.89 Define... No hydrograph
8B 8 B 37.40 12.00 Compute... 14 40.00 8.87 Define... No hydrograph
10A 10 A 17.20 9.00 Compute... 14 42.00 8.75 Define... No hydrograph
11C 11 C 18.60 7.00 Compute... 7 47.00 8.96 Define... No hydrograph
13C 13 C 42.50 12.00 Compute... 7 62.00 8.92 Define... No hydrograph
14D 14 D 30.40 10.00 Compute... 7 68.00 9.14 Define... No hydrograph
16D 16 D 38.10 11.00 Compute... 7 80.00 8.91 Define... No hydrograph
18C 18 C 30.50 13.00 Compute... 14 57.00 8.86 Define... No hydrograph
20C 20 C 21.10 12.00 Compute... 14 38.00 8.82 Define... No hydrograph
Help
Job Control...
Debris Production/Bulking...
XY Series Editor
Unit Time (min) Distribution
1 0.0 0.0
2 5.0 0.0018599927915
3 10.0 0.0037199855831
4 15.0 0.0055799783746
5 20.0 0.0074299959573
6 25.0 0.0092899887488
7 30.0 0.0111499815404
8 35.0 0.0130099743319
9 40.0 0.0148699671235
10 45.0 0.016729959915
11 50.0 0.0186000375331
12 55.0 0.0205000407778
13 60.0 0.0224000440225
14 65.0 0.0242899624406
15 70.0 0.0261899656853
16 75.0 0.02808996893
17 80.0 0.0299799969658
18 85.0 0.0318800002105
19 90.0 0.0337800034551
Distribution
Unit Time
Curve Name: LACDPW
Selected Curve: LACDPW
New
Delete
Show Dates
Help
Import...
Export...
OK
Cancel
Properties
Property Value
General
Tree Name drainage Coverag...
Metadata
Properties
(6499285.0, 1895013.0)
Select Tree Outlet Tool Selected

File name: \\S08USSND01FPS01\Shared\Civil\18051.01 LA County Devils Gate\Hydrology\Calculations\WMS\01 Day WMS Files\Lower 1\untitled.lac Run date: Mon Oct 10 09:27:23 2011

Los Angeles County Flood Control District
Modified Rational Method Hydrology

Storm Day 1 Storm Frequency 50

LOCATION		SUBAREA AREA (ACRES)	SUBAREA Q (CFS)	TOTAL AREA (ACRES)	TOTAL Q (CFS)	TOTAL VOLUME (AC-FT)	CONV TYPE	CONV LNGTH (FT)	CONV SLOPE (FT/FT)	CONV SIZE	CONV Z	CONTROL Q (CFS)	SOIL NAME	TC (MIN)	RAIN (IN)	PCT IMPV
1	1A	33.9	102.05	33.9	102.05	13.884	0	0	0.00000	0.00	0.00	0	7	11	9.12	0.51
1	2A	0.0	0.00	33.9	102.05	13.884	4	826	0.00258	4.50	0.00	0	7	0	9.12	0.00
1	3A	26.9	82.50	60.8	164.27	23.408	0	0	0.00000	0.00	0.00	0	7	10	9.00	0.42
1	4A	0.0	0.00	60.8	164.27	23.408	4	2005	0.06943	3.00	0.00	0	7	0	9.00	0.00
1	5A	36.0	95.00	96.8	251.08	33.833	0	0	0.00000	0.00	0.00	0	7	12	8.86	0.31
1	6B	38.3	115.88	38.3	115.88	13.937	0	0	0.00000	0.00	0.00	0	14	11	8.89	0.44
1	7B	0.0	0.00	38.3	115.88	13.937	4	1300	0.00073	6.00	0.00	0	14	0	8.89	0.00
1	8B	37.4	107.21	75.7	179.74	26.622	0	0	0.00000	0.00	0.00	0	14	12	8.87	0.40
1	9AB	75.7	179.74	172.5	430.82	60.456	4	684	0.06615	4.25	0.00	0	14	0	8.87	0.00
1	10A	17.2	54.04	189.7	470.48	66.399	0	0	0.00000	0.00	0.00	0	14	9	8.75	0.42
1	11C	18.6	59.31	18.6	59.31	7.092	0	0	0.00000	0.00	0.00	0	7	7	8.96	0.47
1	12C	0.0	0.00	18.6	59.31	7.092	4	1902	0.03677	2.25	0.00	0	7	0	8.96	0.00
1	13C	42.5	122.20	61.1	175.06	26.553	0	0	0.00000	0.00	0.00	0	7	12	8.92	0.62
1	14D	30.4	100.11	30.4	100.11	15.301	0	0	0.00000	0.00	0.00	0	7	10	9.14	0.68
1	15D	0.0	0.00	30.4	100.11	15.301	4	2059	0.06657	2.50	0.00	0	7	0	9.14	0.00
1	16D	38.1	118.92	68.5	208.38	36.359	0	0	0.00000	0.00	0.00	0	7	11	8.91	0.80
1	17CD	68.5	208.38	129.6	383.44	62.912	4	2409	0.02085	5.00	0.00	0	7	0	8.91	0.00
1	18C	30.5	86.03	160.1	447.08	75.877	0	0	0.00000	0.00	0.00	0	14	13	8.86	0.57
1	19C	0.0	0.00	160.1	447.08	75.877	4	1413	0.00636	6.50	0.00	0	14	0	8.86	0.00
1	20C	21.1	59.87	181.2	474.86	82.636	0	0	0.00000	0.00	0.00	0	14	12	8.82	0.38
1	21AC	181.2	474.86	370.9	920.73	149.035	4	1650	0.01598	7.25	0.00	0	14	0	8.82	0.00
1	22A	15.4	42.58	386.3	945.45	155.218	0	0	0.00000	0.00	0.00	0	14	13	8.72	0.56
1	23A	0.0	0.00	386.3	945.45	155.218	4	1306	0.01500	7.50	0.00	0	14	0	8.72	0.00
1	24A	46.1	129.28	432.4	1029.78	176.828	0	0	0.00000	0.00	0.00	0	14	13	8.69	0.67
1	25A	0.0	0.00	432.4	1029.78	176.828	5	502	0.00881	11.00	0.00	0	14	0	8.69	0.00
1	26A	38.1	104.92	470.5	1100.62	195.795	0	0	0.00000	0.00	0.00	0	7	13	8.67	0.73
1	27A	0.0	0.00	470.5	1100.62	195.795	5	821	0.02177	9.00	0.00	0	7	0	8.67	0.00
1	28A	49.7	118.55	520.2	1190.04	213.696	0	0	0.00000	0.00	0.00	0	7	15	8.62	0.47
1	29A	0.0	0.00	520.2	1190.04	213.696	5	1039	0.01278	11.00	0.00	0	7	0	8.62	0.00
1	30A	24.8	59.81	545.0	1227.14	221.726	0	0	0.00000	0.00	0.00	0	7	14	8.57	0.42
1	31A	0.0	0.00	545.0	1227.14	221.726	5	983	0.00566	13.00	0.00	0	7	0	8.57	0.00
1	32A	18.9	55.28	563.9	1240.28	228.581	0	0	0.00000	0.00	0.00	0	7	10	8.49	0.52
1	33A	29.8	75.76	593.7	1289.32	241.843	0	0	0.00000	0.00	0.00	0	7	14	8.50	0.64
1	34A	0.0	0.00	593.7	1289.32	241.843	5	2042	0.00681	12.00	0.00	0	7	0	8.50	0.00
1	35A	24.4	53.16	618.1	1316.59	250.394	0	0	0.00000	0.00	0.00	0	14	19	8.47	0.52
1	36E	44.1	108.54	44.1	108.54	16.621	0	0	0.00000	0.00	0.00	0	14	15	8.42	0.51
1	37E	39.8	93.28	83.9	201.82	31.459	0	0	0.00000	0.00	0.00	0	14	16	8.34	0.51
1	38E	0.0	0.00	83.9	201.82	31.459	4	810	0.01905	4.00	0.00	0	14	0	8.34	0.00
1	39E	30.1	84.84	114.0	281.13	45.889	0	0	0.00000	0.00	0.00	0	14	12	8.38	0.72
1	40AE	114.0	281.13	732.1	1492.42	296.282	5	1559	0.00025	24.00	0.00	0	14	0	8.38	0.00
1	41A	29.8	77.40	761.9	1441.33	307.761	0	0	0.00000	0.00	0.00	0	14	14	8.31	0.71
1	42A	0.0	0.00	761.9	1441.33	307.761	5	1187	0.10432	8.00	0.00	0	14	0	8.31	0.00
1	43A	8.1	25.60	770.0	1443.40	311.376	0	0	0.00000	0.00	0.00	0	14	6	8.20	0.72
1	44F	0.0	0.00	0.0	17948.00	10231.440	5	942	0.06523	21.00	0.00	0	14	0	8.20	0.00
1	45F	53.1	155.10	53.1	17948.91	10243.836	0	0	0.00000	0.00	0.00	0	14	9	8.18	0.44
1	46F	24.0	68.91	77.1	17951.07	10251.203	0	0	0.00000	0.00	0.00	0	268	10	8.06	0.15
1	47F	0.0	0.00	77.1	17951.07	10251.203	5	767	0.01261	32.00	0.00	0	268	0	8.06	0.00
1	48F	25.8	75.78	102.9	17953.01	10251.482	0	0	0.00000	0.00	0.00	0	14	8	8.18	0.41
1	49F	0.0	0.00	102.9	17953.01	10251.482	5	519	0.00385	51.00	0.00	0	14	0	8.18	0.00
1	50F	29.6	85.31	132.5	17951.49	10249.800	0	0	0.00000	0.00	0.00	0	207	9	8.12	0.06
1	51AF	132.5	17951.49	902.5	18075.58	10561.177	5	1050	0.02176	26.00	0.00	0	207	0	8.12	0.00

1	52A	27.7	79.54	930.2	18076.05	10557.655	0	0	0.00000	0.00	0.00	0	14	7	8.17	0.16
1	53A	0.0	0.00	930.2	18076.05	10557.655	5	1075	0.01852	28.00	0.00	0	14	0	8.17	0.00
1	54A	45.2	110.74	975.4	18078.50	10563.254	0	0	0.00000	0.00	0.00	0	14	14	8.24	0.45
1	55A	37.7	85.81	1013.1	18080.78	10570.769	0	0	0.00000	0.00	0.00	0	7	12	8.13	0.18
1	56G	37.3	96.01	37.3	96.01	9.014	0	0	0.00000	0.00	0.00	0	68	9	7.98	0.24
1	57G	0.0	0.00	37.3	96.01	9.014	4	1191	0.09861	2.25	0.00	0	68	0	7.98	0.00
1	58G	16.1	42.91	53.4	134.36	13.808	0	0	0.00000	0.00	0.00	0	7	9	8.01	0.39
1	59G	0.0	0.00	53.4	134.36	13.808	4	1213	0.03948	3.00	0.00	0	7	0	8.01	0.00
1	60G	20.9	49.39	74.3	176.83	17.725	0	0	0.00000	0.00	0.00	0	7	11	8.08	0.16
1	61AG	74.3	176.83	1087.4	18086.27	10588.494	5	1411	0.01477	30.00	0.00	0	7	0	8.08	0.00
1	62A	30.0	77.70	1117.4	18086.34	10582.413	0	0	0.00000	0.00	0.00	0	207	12	8.09	0.14
1	63A	0.0	0.00	1117.4	18086.34	10582.413	5	928	0.02120	26.00	0.00	0	207	0	8.09	0.00
1	64A	28.9	77.40	1146.3	18087.35	10580.705	0	0	0.00000	0.00	0.00	0	207	11	8.07	0.03
1	65A	0.0	0.00	1146.3	18087.35	10580.705	5	1246	0.01579	29.00	0.00	0	207	0	8.07	0.00
1	66A	33.5	82.30	1179.8	18087.05	10575.992	0	0	0.00000	0.00	0.00	0	207	13	8.09	0.03
1	67H	68.3	151.60	68.3	151.60	15.977	0	0	0.00000	0.00	0.00	0	268	13	7.39	0.03
1	68H	0.0	0.00	68.3	151.60	15.977	4	1373	0.05496	3.00	0.00	0	268	0	7.39	0.00
1	69H	70.2	164.74	138.5	307.70	35.193	0	0	0.00000	0.00	0.00	0	11	13	7.62	0.25
1	70H	79.4	140.57	217.9	446.89	50.821	0	0	0.00000	0.00	0.00	0	68	17	7.78	0.16
1	71H	0.0	0.00	217.9	446.89	50.821	4	1251	0.03626	4.75	0.00	0	68	0	7.78	0.00
1	72H	37.7	88.53	255.6	527.13	62.294	0	0	0.00000	0.00	0.00	0	7	12	7.85	0.42
1	73H	30.8	67.09	286.4	591.86	71.613	0	0	0.00000	0.00	0.00	0	7	14	7.91	0.41
1	74H	0.0	0.00	286.4	591.86	71.613	4	1343	0.01058	6.75	0.00	0	7	0	7.91	0.00
1	75H	22.2	53.67	308.6	627.65	79.165	0	0	0.00000	0.00	0.00	0	7	12	7.89	0.50
1	76I	29.0	73.39	29.0	73.39	7.729	0	0	0.00000	0.00	0.00	0	268	11	7.59	0.10
1	77I	0.0	0.00	29.0	73.39	7.729	4	1299	0.05871	2.25	0.00	0	268	0	7.59	0.00
1	78I	35.7	72.78	64.7	141.76	16.417	0	0	0.00000	0.00	0.00	0	7	14	7.73	0.30
1	79J	29.9	79.58	29.9	79.58	7.794	0	0	0.00000	0.00	0.00	0	268	9	7.53	0.09
1	80J	0.0	0.00	29.9	79.58	7.794	4	1674	0.07070	2.25	0.00	0	268	0	7.53	0.00
1	81J	19.6	44.60	49.5	119.99	11.915	0	0	0.00000	0.00	0.00	0	7	11	7.72	0.23
1	82IJ	49.5	119.99	114.2	261.05	28.333	4	473	0.05983	3.50	0.00	0	7	0	7.72	0.00
1	83I	2.2	6.19	116.4	263.64	28.999	0	0	0.00000	0.00	0.00	0	7	5	7.88	0.42
1	84HI	116.4	263.64	425.0	878.35	108.164	4	962	0.05140	5.75	0.00	0	7	0	7.88	0.00
1	85H	6.2	16.82	431.2	884.27	110.018	0	0	0.00000	0.00	0.00	0	7	7	7.92	0.42
1	86K	24.8	73.68	24.8	73.68	8.992	0	0	0.00000	0.00	0.00	0	208	7	7.56	0.05
1	87K	0.0	0.00	24.8	73.68	8.992	4	691	0.10009	2.00	0.00	0	208	0	7.56	0.00
1	88K	30.9	83.34	55.7	155.81	17.541	0	0	0.00000	0.00	0.00	0	268	9	7.59	0.13
1	89K	0.0	0.00	55.7	155.81	17.541	4	2108	0.07509	2.75	0.00	0	268	0	7.59	0.00
1	90K	31.7	70.89	87.4	218.56	27.135	0	0	0.00000	0.00	0.00	0	7	13	7.81	0.42
1	91HK	87.4	218.56	518.6	1092.99	137.153	4	706	0.06728	6.00	0.00	0	7	0	7.81	0.00
1	92H	7.9	21.29	526.5	1099.98	139.301	0	0	0.00000	0.00	0.00	0	7	7	7.99	0.35
1	93H	48.3	73.26	574.8	1172.24	148.438	0	0	0.00000	0.00	0.00	0	7	22	8.01	0.17
1	94H	0.0	0.00	574.8	1172.24	148.438	4	628	0.04675	6.50	0.00	0	7	0	8.01	0.00
1	95H	24.1	56.96	598.9	1214.05	153.543	0	0	0.00000	0.00	0.00	0	7	11	7.97	0.22
1	96AH	598.9	1214.05	1778.7	18133.85	10729.535	5	1635	0.01203	33.00	0.00	0	7	0	7.97	0.00
1	97A	48.9	124.95	1827.6	18135.74	10724.676	0	0	0.00000	0.00	0.00	0	207	12	7.98	0.15
1	98A	0.0	0.00	1827.6	18135.74	10724.676	5	1583	0.01549	30.00	0.00	0	207	0	7.98	0.00
1	99A	32.2	81.57	1859.8	18138.77	10722.588	0	0	0.00000	0.00	0.00	0	7	12	7.92	0.65
1	100L	35.9	93.90	35.9	93.90	7.427	0	0	0.00000	0.00	0.00	0	214	13	8.16	0.02
1	101L	0.0	0.00	35.9	93.90	7.427	4	1186	0.02032	3.00	0.00	0	214	0	8.16	0.00
1	102L	31.3	87.58	67.2	169.32	14.420	0	0	0.00000	0.00	0.00	0	14	10	8.16	0.22
1	103L	0.0	0.00	67.2	169.32	14.420	4	1923	0.01188	4.25	0.00	0	14	0	8.16	0.00
1	104L	30.2	77.92	97.4	227.61	23.344	0	0	0.00000	0.00	0.00	0	14	12	8.16	0.37
1	105L	29.4	74.98	126.8	296.67	31.719	0	0	0.00000	0.00	0.00	0	14	12	8.11	0.35
1	106L	0.0	0.00	126.8	296.67	31.719	4	2111	0.01883	4.75	0.00	0	14	0	8.11	0.00
1	107L	56.4	126.71	183.2	408.75	56.134	0	0	0.00000	0.00	0.00	0	14	17	8.02	0.67
1	108AL	183.2	408.75	2043.0	18157.38	10778.722	5	576	0.00434	49.00	0.00	0	14	0	8.02	0.00
1	109A	6.8	17.44	2049.8	18157.07	10770.783	0	0	0.00000	0.00	0.00	0	7	7	7.93	0.20
1	110M	21.5	63.53	21.5	63.53	8.144	0	0	0.00000	0.00	0.00	0	14	11	8.65	0.49
1	111M	0.0	0.00	21.5	63.53	8.144	4	1506	0.01591	2.75	0.00	0	14	0	8.65	0.00
1	112M	39.9	113.61	61.4	167.56	25.185	0	0	0.00000	0.00	0.00	0	14	12	8.61	0.59
1	113M	0.0	0.00	61.4	167.56	25.185	4	1946	0.01931	3.75	0.00	0	14	0	8.61	0.00
1	114M	53.7	131.48	115.1	286.52	47.850	0	0	0.00000	0.00	0.00	0	14	16	8.54	0.59

1	115M	0.0	0.00	115.1	286.52	47.850	4	647	0.03413	4.25	0.00	0	14	0	8.54	0.00
1	116M	24.7	65.55	139.8	343.00	57.209	0	0	0.00000	0.00	0.00	0	14	13	8.48	0.51
1	117M	0.0	0.00	139.8	343.00	57.209	4	681	0.03928	4.25	0.00	0	14	0	8.48	0.00
1	118M	23.5	61.24	163.3	396.33	65.020	0	0	0.00000	0.00	0.00	0	14	13	8.46	0.42
1	119N	26.3	73.16	26.3	73.16	9.468	0	0	0.00000	0.00	0.00	0	14	12	8.58	0.46
1	120N	0.0	0.00	26.3	73.16	9.468	4	960	0.02935	2.50	0.00	0	14	0	8.58	0.00
1	121N	37.4	99.40	63.7	167.32	22.854	0	0	0.00000	0.00	0.00	0	14	13	8.55	0.46
1	122N	0.0	0.00	63.7	167.32	22.854	4	1875	0.02223	3.75	0.00	0	14	0	8.55	0.00
1	123N	49.3	115.22	113.0	273.17	39.437	0	0	0.00000	0.00	0.00	0	14	16	8.44	0.43
1	124MN	113.0	273.17	276.3	669.51	104.457	4	1507	0.01940	6.25	0.00	0	14	0	8.44	0.00
1	125M	52.9	138.23	329.2	778.65	123.655	0	0	0.00000	0.00	0.00	0	14	13	8.39	0.49
1	126M	0.0	0.00	329.2	778.65	123.655	4	806	0.01963	6.50	0.00	0	14	0	8.39	0.00
1	127M	19.3	52.01	348.5	814.26	130.732	0	0	0.00000	0.00	0.00	0	14	12	8.30	0.51
1	128M	0.0	0.00	348.5	814.26	130.732	4	1788	0.02315	6.50	0.00	0	14	0	8.30	0.00
1	129M	38.2	99.76	386.7	885.17	149.701	0	0	0.00000	0.00	0.00	0	14	14	8.25	0.78
1	130O	41.8	114.56	41.8	114.56	20.080	0	0	0.00000	0.00	0.00	0	14	13	8.46	0.71
1	131O	0.0	0.00	41.8	114.56	20.080	4	1291	0.03302	3.00	0.00	0	14	0	8.46	0.00
1	132O	11.6	36.54	53.4	143.51	26.053	0	0	0.00000	0.00	0.00	0	14	9	8.40	0.79
1	133P	46.6	122.28	46.6	122.28	16.498	0	0	0.00000	0.00	0.00	0	14	13	8.46	0.46
1	134P	0.0	0.00	46.6	122.28	16.498	4	914	0.00358	4.50	0.00	0	14	0	8.46	0.00
1	135P	17.0	47.68	63.6	159.46	24.298	0	0	0.00000	0.00	0.00	0	14	12	8.39	0.68
1	136OP	63.6	159.46	117.0	302.14	50.351	4	2285	0.01004	5.25	0.00	0	14	0	8.39	0.00
1	137O	28.8	69.43	145.8	349.71	60.566	0	0	0.00000	0.00	0.00	0	14	15	8.30	0.49
1	138Q	37.8	108.59	37.8	108.59	15.972	0	0	0.00000	0.00	0.00	0	14	11	8.32	0.61
1	139Q	0.0	0.00	37.8	108.59	15.972	4	1398	0.01408	3.50	0.00	0	14	0	8.32	0.00
1	140Q	13.8	35.10	51.6	136.92	20.501	0	0	0.00000	0.00	0.00	0	14	13	8.28	0.43
1	141OQ	51.6	136.92	197.4	474.48	81.067	4	1416	0.01852	5.50	0.00	0	14	0	8.28	0.00
1	142O	13.7	37.76	211.1	496.45	87.210	0	0	0.00000	0.00	0.00	0	14	12	8.24	0.69
1	143MO	211.1	496.45	597.8	1380.17	236.912	4	658	0.02375	7.75	0.00	0	14	0	8.24	0.00
1	144M	25.8	59.93	623.6	1428.17	246.863	0	0	0.00000	0.00	0.00	0	14	16	8.19	0.56
1	145R	11.0	30.38	11.0	30.38	4.210	0	0	0.00000	0.00	0.00	0	7	11	8.46	0.52
1	146R	36.5	89.50	47.5	119.88	21.515	0	0	0.00000	0.00	0.00	0	14	16	8.37	0.71
1	147R	0.0	0.00	47.5	119.88	21.515	4	790	0.02971	3.00	0.00	0	14	0	8.37	0.00
1	148R	34.1	95.96	81.6	210.94	37.707	0	0	0.00000	0.00	0.00	0	14	12	8.38	0.71
1	149R	0.0	0.00	81.6	210.94	37.707	4	902	0.02497	4.00	0.00	0	14	0	8.38	0.00
1	150R	16.8	54.18	98.4	255.62	45.272	0	0	0.00000	0.00	0.00	0	13	9	8.37	0.64
1	151R	0.0	0.00	98.4	255.62	45.272	4	1610	0.02183	4.25	0.00	0	13	0	8.37	0.00
1	152R	54.8	137.86	153.2	380.55	70.250	0	0	0.00000	0.00	0.00	0	14	15	8.33	0.68
1	153R	0.0	0.00	153.2	380.55	70.250	4	1092	0.00227	7.50	0.00	0	14	0	8.33	0.00
1	154R	25.9	69.80	179.1	419.03	79.909	0	0	0.00000	0.00	0.00	0	14	12	8.27	0.53
1	155S	52.7	153.13	52.7	153.13	19.869	0	0	0.00000	0.00	0.00	0	13	12	8.27	0.49
1	156S	0.0	0.00	52.7	153.13	19.869	4	1307	0.02759	3.50	0.00	0	13	0	8.27	0.00
1	157S	37.3	87.62	90.0	234.88	31.726	0	0	0.00000	0.00	0.00	0	14	15	8.23	0.41
1	158RS	90.0	234.88	269.1	638.27	111.634	4	700	0.02324	6.00	0.00	0	14	0	8.23	0.00
1	159R	16.4	43.32	285.5	670.70	116.972	0	0	0.00000	0.00	0.00	0	14	12	8.25	0.43
1	160R	16.0	41.81	301.5	705.40	122.059	0	0	0.00000	0.00	0.00	0	14	12	8.20	0.41
1	161R	0.0	0.00	301.5	705.40	122.059	4	793	0.02468	6.00	0.00	0	14	0	8.20	0.00
1	162R	18.2	45.74	319.7	740.71	127.847	0	0	0.00000	0.00	0.00	0	14	13	8.21	0.42
1	163R	0.0	0.00	319.7	740.71	127.847	4	1791	0.01663	6.75	0.00	0	14	0	8.21	0.00
1	164R	46.6	108.97	366.3	828.50	146.110	0	0	0.00000	0.00	0.00	0	14	16	8.23	0.57
1	165MR	366.3	828.50	989.9	2255.89	392.973	5	1484	0.04519	11.00	0.00	0	14	0	8.23	0.00
1	166M	49.4	112.24	1039.3	2341.08	410.036	0	0	0.00000	0.00	0.00	0	14	16	8.14	0.49
1	167M	0.0	0.00	1039.3	2341.08	410.036	5	436	0.02655	12.00	0.00	0	14	0	8.14	0.00
1	168M	55.5	139.00	1094.8	2431.73	429.174	0	0	0.00000	0.00	0.00	0	14	13	8.10	0.48
1	169M	0.0	0.00	1094.8	2431.73	429.174	5	1915	0.01285	14.00	0.00	0	14	0	8.10	0.00
1	170M	21.2	54.12	1116.0	2446.88	435.276	0	0	0.00000	0.00	0.00	0	14	12	7.98	0.46
1	171T	36.3	81.23	36.3	81.23	8.511	0	0	0.00000	0.00	0.00	0	68	12	7.80	0.24
1	172T	0.0	0.00	36.3	81.23	8.511	4	327	0.04536	2.50	0.00	0	68	0	7.80	0.00
1	173T	26.8	66.98	63.1	145.85	16.332	0	0	0.00000	0.00	0.00	0	268	12	7.77	0.15
1	174T	0.0	0.00	63.1	145.85	16.332	4	420	0.03098	3.25	0.00	0	268	0	7.77	0.00
1	175T	32.3	67.22	95.4	211.03	23.325	0	0	0.00000	0.00	0.00	0	68	13	7.69	0.21
1	176T	0.0	0.00	95.4	211.03	23.325	4	850	0.00213	6.25	0.00	0	68	0	7.69	0.00
1	177T	26.5	64.05	121.9	254.85	30.992	0	0	0.00000	0.00	0.00	0	68	11	7.76	0.37

1	178T	0.0	0.00	121.9	254.85	30.992	4	226	0.05981	3.50	0.00	0	68	0	7.76	0.00
1	179T	29.2	70.91	151.1	309.50	37.358	0	0	0.00000	0.00	0.00	0	68	10	7.72	0.21
1	180T	0.0	0.00	151.1	309.50	37.358	4	845	0.03349	4.25	0.00	0	68	0	7.72	0.00
1	181T	13.8	37.03	164.9	334.61	41.697	0	0	0.00000	0.00	0.00	0	68	7	7.80	0.42
1	182T	0.0	0.00	164.9	334.61	41.697	4	216	0.04988	4.00	0.00	0	68	0	7.80	0.00
1	183T	20.0	50.67	184.9	374.60	46.630	0	0	0.00000	0.00	0.00	0	68	8	7.76	0.27
1	184T	18.9	46.73	203.8	413.32	50.605	0	0	0.00000	0.00	0.00	0	68	8	7.74	0.19
1	185T	0.0	0.00	203.8	413.32	50.605	4	1064	0.06352	4.25	0.00	0	68	0	7.74	0.00
1	186T	29.1	56.13	232.9	466.90	59.284	0	0	0.00000	0.00	0.00	0	7	17	7.85	0.41
1	187T	12.3	34.02	245.2	492.63	63.228	0	0	0.00000	0.00	0.00	0	68	6	7.89	0.42
1	188AM	1116.0	2446.88	3165.8	18315.80	11206.059	0	0	0.00000	0.00	0.00	0	68	0	7.89	0.00
1	189AT	245.2	492.63	3411.0	18335.39	11269.287	5	1507	0.02587	26.00	0.00	0	68	0	7.89	0.00
1	190A	50.8	116.21	3461.8	18339.28	11273.309	0	0	0.00000	0.00	0.00	0	14	15	8.00	0.44
1	191A	38.8	78.27	3500.6	18343.17	11284.868	0	0	0.00000	0.00	0.00	0	7	16	7.92	0.40
1	192A	0.0	0.00	3500.6	18343.17	11284.868	5	1050	0.00121	83.00	0.00	0	7	0	7.92	0.00
1	193A	54.9	153.82	3555.5	18347.40	11274.844	0	0	0.00000	0.00	0.00	0	14	10	7.88	0.51
1	194A	0.0	0.00	3555.5	18347.40	11274.844	2	1450	0.02959	0.00	0.00	0	14	0	7.88	0.00
1	195A	35.4	100.50	3590.9	18351.37	11273.048	0	0	0.00000	0.00	0.00	0	14	10	7.88	0.60
1	196A	49.0	97.64	3639.9	18354.97	11285.099	0	0	0.00000	0.00	0.00	0	68	15	7.76	0.27
1	197A	0.0	0.00	3639.9	18354.97	11285.099	5	1144	0.00098	91.00	0.00	0	68	0	7.76	0.00
1	198A	43.0	110.61	3682.9	18356.42	11262.511	0	0	0.00000	0.00	0.00	0	14	11	7.80	0.40
1	199U	81.6	197.56	81.6	197.56	22.505	0	0	0.00000	0.00	0.00	0	268	12	7.58	0.13
1	200U	0.0	0.00	81.6	197.56	22.505	2	1223	0.05600	0.00	0.00	0	268	0	7.58	0.00
1	201U	52.2	125.15	133.8	312.33	36.860	0	0	0.00000	0.00	0.00	0	268	12	7.51	0.14
1	202U	0.0	0.00	133.8	312.33	36.860	2	1315	0.01994	0.00	0.00	0	268	0	7.51	0.00
1	203U	90.1	215.40	223.9	499.40	69.256	0	0	0.00000	0.00	0.00	0	2	14	7.43	0.27
1	204U	0.0	0.00	223.9	499.40	69.256	4	676	0.04738	4.75	0.00	0	2	0	7.43	0.00
1	205U	46.0	99.07	269.9	575.03	78.567	0	0	0.00000	0.00	0.00	0	68	12	7.68	0.18
1	206U	22.3	64.77	292.2	621.58	86.937	0	0	0.00000	0.00	0.00	0	2	9	7.60	0.28
1	207U	0.0	0.00	292.2	621.58	86.937	4	1509	0.11467	4.50	0.00	0	2	0	7.60	0.00
1	208U	18.4	47.16	310.6	651.10	92.249	0	0	0.00000	0.00	0.00	0	68	8	7.65	0.38
1	209AU	310.6	651.10	3993.5	18384.14	11354.760	5	588	0.01971	27.00	0.00	0	68	0	7.65	0.00
1	210A	24.2	63.57	4017.7	18385.52	11354.519	0	0	0.00000	0.00	0.00	0	14	10	7.76	0.23
1	211A	0.0	0.00	4017.7	18385.52	11354.519	5	535	0.04527	23.00	0.00	0	14	0	7.76	0.00
1	212A	25.5	59.65	4043.2	18386.69	11356.105	0	0	0.00000	0.00	0.00	0	14	12	7.73	0.21
1	213A	0.0	0.00	4043.2	18386.69	11356.105	5	1190	0.00201	67.00	0.00	0	14	0	7.73	0.00
1	214A	40.2	90.47	4083.4	18387.18	11338.657	0	0	0.00000	0.00	0.00	0	207	14	7.68	0.14
1	215V	31.6	75.03	31.6	75.03	13.682	0	0	0.00000	0.00	0.00	0	14	15	7.91	0.68
1	216V	0.0	0.00	31.6	75.03	13.682	4	1908	0.02764	2.75	0.00	0	14	0	7.91	0.00
1	217V	14.2	40.79	45.8	107.35	19.585	0	0	0.00000	0.00	0.00	0	13	11	7.86	0.63
1	218W	15.4	36.65	15.4	36.65	5.837	0	0	0.00000	0.00	0.00	0	14	14	7.87	0.57
1	219W	0.0	0.00	15.4	36.65	5.837	4	1517	0.04291	2.00	0.00	0	14	0	7.87	0.00
1	220W	23.7	70.82	39.1	102.26	14.215	0	0	0.00000	0.00	0.00	0	13	10	7.81	0.49
1	221VW	39.1	102.26	84.9	206.18	33.800	4	717	0.07214	3.25	0.00	0	13	0	7.81	0.00
1	222V	6.1	18.95	91.0	221.37	35.746	0	0	0.00000	0.00	0.00	0	13	6	7.79	0.42
1	223V	0.0	0.00	91.0	221.37	35.746	4	861	0.07650	3.25	0.00	0	13	0	7.79	0.00
1	224V	23.5	52.73	114.5	271.07	42.304	0	0	0.00000	0.00	0.00	0	14	14	7.76	0.37
1	225AV	114.5	271.07	4197.9	18401.53	11380.961	0	0	0.00000	0.00	0.00	0	14	0	7.76	0.00

File name: \\S08USSND01FPS01\Shared\Civil\18051.01 LA County Devils Gate\Hydrology\Calculations\WMS\01 Day WMS Files\Lower 1\untitled.lac Run date: Mon Oct 10 09:27:23 2011

Los Angeles County Flood Control District
Modified Rational Method Hydrology

Storm Day 2 Storm Frequency 50

LOCATION		SUBAREA AREA (ACRES)	SUBAREA Q (CFS)	TOTAL AREA (ACRES)	TOTAL Q (CFS)	TOTAL VOLUME (AC-FT)	CONV TYPE	CONV LNGTH (FT)	CONV SLOPE (FT/FT)	CONV SIZE	CONV Z	CONTROL Q (CFS)	SOIL NAME	TC (MIN)	RAIN (IN)	PCT IMPV
1	1A	33.9	3.51	33.9	3.51	0.026	0	0	0.00000	0.00	0.00	0	7	11	9.12	0.51
1	2A	0.0	0.00	33.9	3.51	0.026	4	826	0.00258	4.50	0.00	0	7	0	9.12	0.00
1	3A	26.9	2.35	60.8	5.90	0.084	0	0	0.00000	0.00	0.00	0	7	10	9.00	0.42

1	4A	0.0	0.00	60.8	5.90	0.084	4	2005	0.06943	3.00	0.00	0	7	0	9.00	0.00
1	5A	36.0	2.48	96.8	8.42	0.146	0	0	0.00000	0.00	0.00	0	7	12	8.86	0.31
1	6B	38.3	3.44	38.3	3.44	0.026	0	0	0.00000	0.00	0.00	0	14	11	8.89	0.44
1	7B	0.0	0.00	38.3	3.44	0.026	4	1300	0.00073	6.00	0.00	0	14	0	8.89	0.00
1	8B	37.4	3.11	75.7	6.65	0.155	0	0	0.00000	0.00	0.00	0	14	12	8.87	0.40
1	9AB	75.7	6.65	172.5	15.07	0.302	4	684	0.06615	4.25	0.00	0	14	0	8.87	0.00
1	10A	17.2	1.46	189.7	16.56	0.339	0	0	0.00000	0.00	0.00	0	14	9	8.75	0.42
1	11C	18.6	1.77	18.6	1.77	0.008	0	0	0.00000	0.00	0.00	0	7	7	8.96	0.47
1	12C	0.0	0.00	18.6	1.77	0.008	4	1902	0.03677	2.25	0.00	0	7	0	8.96	0.00
1	13C	42.5	5.05	61.1	6.83	0.071	0	0	0.00000	0.00	0.00	0	7	12	8.92	0.62
1	14D	30.4	3.99	30.4	3.99	0.027	0	0	0.00000	0.00	0.00	0	7	10	9.14	0.68
1	15D	0.0	0.00	30.4	3.99	0.027	4	2059	0.06657	2.50	0.00	0	7	0	9.14	0.00
1	16D	38.1	5.61	68.5	9.63	0.103	0	0	0.00000	0.00	0.00	0	7	11	8.91	0.80
1	17CD	68.5	9.63	129.6	16.46	0.174	4	2409	0.02085	5.00	0.00	0	7	0	8.91	0.00
1	18C	30.5	3.36	160.1	19.99	0.380	0	0	0.00000	0.00	0.00	0	14	13	8.86	0.57
1	19C	0.0	0.00	160.1	19.99	0.380	4	1413	0.00636	6.50	0.00	0	14	0	8.86	0.00
1	20C	21.1	1.68	181.2	21.85	0.580	0	0	0.00000	0.00	0.00	0	14	12	8.82	0.38
1	21AC	181.2	21.85	370.9	38.41	0.919	4	1650	0.01598	7.25	0.00	0	14	0	8.82	0.00
1	22A	15.4	1.65	386.3	40.29	1.185	0	0	0.00000	0.00	0.00	0	14	13	8.72	0.56
1	23A	0.0	0.00	386.3	40.29	1.185	4	1306	0.01500	7.50	0.00	0	14	0	8.72	0.00
1	24A	46.1	5.70	432.4	46.18	1.447	0	0	0.00000	0.00	0.00	0	14	13	8.69	0.67
1	25A	0.0	0.00	432.4	46.18	1.447	5	502	0.00881	11.00	0.00	0	14	0	8.69	0.00
1	26A	38.1	5.05	470.5	51.35	1.634	0	0	0.00000	0.00	0.00	0	7	13	8.67	0.73
1	27A	0.0	0.00	470.5	51.35	1.634	5	821	0.02177	9.00	0.00	0	7	0	8.67	0.00
1	28A	49.7	4.57	520.2	56.06	1.856	0	0	0.00000	0.00	0.00	0	7	15	8.62	0.47
1	29A	0.0	0.00	520.2	56.06	1.856	5	1039	0.01278	11.00	0.00	0	7	0	8.62	0.00
1	30A	24.8	2.07	545.0	58.40	2.174	0	0	0.00000	0.00	0.00	0	7	14	8.57	0.42
1	31A	0.0	0.00	545.0	58.40	2.174	5	983	0.00566	13.00	0.00	0	7	0	8.57	0.00
1	32A	18.9	1.85	563.9	60.62	2.588	0	0	0.00000	0.00	0.00	0	7	10	8.49	0.52
1	33A	29.8	3.47	593.7	64.08	2.621	0	0	0.00000	0.00	0.00	0	7	14	8.50	0.64
1	34A	0.0	0.00	593.7	64.08	2.621	5	2042	0.00681	12.00	0.00	0	7	0	8.50	0.00
1	35A	24.4	2.40	618.1	67.18	3.469	0	0	0.00000	0.00	0.00	0	14	19	8.47	0.52
1	36E	44.1	4.22	44.1	4.22	0.043	0	0	0.00000	0.00	0.00	0	14	15	8.42	0.51
1	37E	39.8	3.78	83.9	8.00	0.085	0	0	0.00000	0.00	0.00	0	14	16	8.34	0.51
1	38E	0.0	0.00	83.9	8.00	0.085	4	810	0.01905	4.00	0.00	0	14	0	8.34	0.00
1	39E	30.1	3.81	114.0	11.85	0.152	0	0	0.00000	0.00	0.00	0	14	12	8.38	0.72
1	40AE	114.0	11.85	732.1	79.03	3.621	5	1559	0.00025	24.00	0.00	0	14	0	8.38	0.00
1	41A	29.8	3.70	761.9	85.04	6.234	0	0	0.00000	0.00	0.00	0	14	14	8.31	0.71
1	42A	0.0	0.00	761.9	85.04	6.234	5	1187	0.10432	8.00	0.00	0	14	0	8.31	0.00
1	43A	8.1	1.00	770.0	86.22	6.438	0	0	0.00000	0.00	0.00	0	14	6	8.20	0.72
1	44F	0.0	0.00	0.0	12552.50	951.092	5	942	0.06523	21.00	0.00	0	14	0	8.20	0.00
1	45F	53.1	4.37	53.1	12569.79	963.116	0	0	0.00000	0.00	0.00	0	14	9	8.18	0.44
1	46F	24.0	1.40	77.1	12571.19	963.125	0	0	0.00000	0.00	0.00	0	268	10	8.06	0.15
1	47F	0.0	0.00	77.1	12571.19	963.125	5	767	0.01261	32.00	0.00	0	268	0	8.06	0.00
1	48F	25.8	2.01	102.9	12592.61	975.312	0	0	0.00000	0.00	0.00	0	14	8	8.18	0.41
1	49F	0.0	0.00	102.9	12592.61	975.312	5	519	0.00385	51.00	0.00	0	14	0	8.18	0.00
1	50F	29.6	1.15	132.5	12613.84	987.670	0	0	0.00000	0.00	0.00	0	207	9	8.12	0.06
1	51AF	132.5	12613.84	902.5	12700.06	994.108	5	1050	0.02176	26.00	0.00	0	207	0	8.12	0.00
1	52A	27.7	1.15	930.2	12723.16	1006.488	0	0	0.00000	0.00	0.00	0	14	7	8.17	0.16
1	53A	0.0	0.00	930.2	12723.16	1006.488	5	1075	0.01852	28.00	0.00	0	14	0	8.17	0.00
1	54A	45.2	3.83	975.4	12750.67	1019.998	0	0	0.00000	0.00	0.00	0	14	14	8.24	0.45
1	55A	37.7	1.67	1013.1	12752.34	1020.011	0	0	0.00000	0.00	0.00	0	7	12	8.13	0.18
1	56G	37.3	1.94	37.3	1.94	0.012	0	0	0.00000	0.00	0.00	0	68	9	7.98	0.24
1	57G	0.0	0.00	37.3	1.94	0.012	4	1191	0.09861	2.25	0.00	0	68	0	7.98	0.00
1	58G	16.1	1.18	53.4	3.13	0.029	0	0	0.00000	0.00	0.00	0	7	9	8.01	0.39
1	59G	0.0	0.00	53.4	3.13	0.029	4	1213	0.03948	3.00	0.00	0	7	0	8.01	0.00
1	60G	20.9	0.86	74.3	4.01	0.055	0	0	0.00000	0.00	0.00	0	7	11	8.08	0.16
1	61AG	74.3	4.01	1087.4	12756.35	1020.066	5	1411	0.01477	30.00	0.00	0	7	0	8.08	0.00
1	62A	30.0	1.48	1117.4	12791.24	1039.299	0	0	0.00000	0.00	0.00	0	207	12	8.09	0.14
1	63A	0.0	0.00	1117.4	12791.24	1039.299	5	928	0.02120	26.00	0.00	0	207	0	8.09	0.00
1	64A	28.9	1.01	1146.3	12811.67	1050.367	0	0	0.00000	0.00	0.00	0	207	11	8.07	0.03
1	65A	0.0	0.00	1146.3	12811.67	1050.367	5	1246	0.01579	29.00	0.00	0	207	0	8.07	0.00
1	66A	33.5	1.18	1179.8	12841.58	1066.968	0	0	0.00000	0.00	0.00	0	207	13	8.09	0.03

1	67H	68.3	2.65	68.3	2.65	0.020	0	0	0.00000	0.00	0.00	0	268	13	7.39	0.03
1	68H	0.0	0.00	68.3	2.65	0.020	4	1373	0.05496	3.00	0.00	0	268	0	7.39	0.00
1	69H	70.2	3.59	138.5	6.27	0.069	0	0	0.00000	0.00	0.00	0	11	13	7.62	0.25
1	70H	79.4	3.16	217.9	9.43	0.106	0	0	0.00000	0.00	0.00	0	68	17	7.78	0.16
1	71H	0.0	0.00	217.9	9.43	0.106	4	1251	0.03626	4.75	0.00	0	68	0	7.78	0.00
1	72H	37.7	2.88	255.6	12.36	0.177	0	0	0.00000	0.00	0.00	0	7	12	7.85	0.42
1	73H	30.8	2.33	286.4	14.69	0.200	0	0	0.00000	0.00	0.00	0	7	14	7.91	0.41
1	74H	0.0	0.00	286.4	14.69	0.200	4	1343	0.01058	6.75	0.00	0	7	0	7.91	0.00
1	75H	22.2	1.96	308.6	16.77	0.330	0	0	0.00000	0.00	0.00	0	7	12	7.89	0.50
1	76I	29.0	1.40	29.0	1.40	0.009	0	0	0.00000	0.00	0.00	0	268	11	7.59	0.10
1	77I	0.0	0.00	29.0	1.40	0.009	4	1299	0.05871	2.25	0.00	0	268	0	7.59	0.00
1	78I	35.7	2.10	64.7	3.52	0.039	0	0	0.00000	0.00	0.00	0	7	14	7.73	0.30
1	79J	29.9	1.39	29.9	1.39	0.008	0	0	0.00000	0.00	0.00	0	268	9	7.53	0.09
1	80J	0.0	0.00	29.9	1.39	0.008	4	1674	0.07070	2.25	0.00	0	268	0	7.53	0.00
1	81J	19.6	0.96	49.5	2.37	0.026	0	0	0.00000	0.00	0.00	0	7	11	7.72	0.23
1	82IJ	49.5	2.37	114.2	5.88	0.065	4	473	0.05983	3.50	0.00	0	7	0	7.72	0.00
1	83I	2.2	0.17	116.4	6.06	0.076	0	0	0.00000	0.00	0.00	0	7	5	7.88	0.42
1	84HI	116.4	6.06	425.0	22.84	0.406	4	962	0.05140	5.75	0.00	0	7	0	7.88	0.00
1	85H	6.2	0.48	431.2	23.38	0.471	0	0	0.00000	0.00	0.00	0	7	7	7.92	0.42
1	86K	24.8	1.23	24.8	1.23	0.005	0	0	0.00000	0.00	0.00	0	208	7	7.56	0.05
1	87K	0.0	0.00	24.8	1.23	0.005	4	691	0.10009	2.00	0.00	0	208	0	7.56	0.00
1	88K	30.9	1.60	55.7	2.83	0.017	0	0	0.00000	0.00	0.00	0	268	9	7.59	0.13
1	89K	0.0	0.00	55.7	2.83	0.017	4	2108	0.07509	2.75	0.00	0	268	0	7.59	0.00
1	90K	31.7	2.41	87.4	5.29	0.064	0	0	0.00000	0.00	0.00	0	7	13	7.81	0.42
1	91HK	87.4	5.29	518.6	28.66	0.534	4	706	0.06728	6.00	0.00	0	7	0	7.81	0.00
1	92H	7.9	0.53	526.5	29.25	0.586	0	0	0.00000	0.00	0.00	0	7	7	7.99	0.35
1	93H	48.3	2.06	574.8	31.31	0.617	0	0	0.00000	0.00	0.00	0	7	22	8.01	0.17
1	94H	0.0	0.00	574.8	31.31	0.617	4	628	0.04675	6.50	0.00	0	7	0	8.01	0.00
1	95H	24.1	1.18	598.9	32.55	0.680	0	0	0.00000	0.00	0.00	0	7	11	7.97	0.22
1	96AH	598.9	32.55	1778.7	12874.13	1067.648	5	1635	0.01203	33.00	0.00	0	7	0	7.97	0.00
1	97A	48.9	2.45	1827.6	12918.38	1091.974	0	0	0.00000	0.00	0.00	0	207	12	7.98	0.15
1	98A	0.0	0.00	1827.6	12918.38	1091.974	5	1583	0.01549	30.00	0.00	0	207	0	7.98	0.00
1	99A	32.2	3.53	1859.8	12958.84	1113.370	0	0	0.00000	0.00	0.00	0	7	12	7.92	0.65
1	100L	35.9	1.14	35.9	1.14	0.009	0	0	0.00000	0.00	0.00	0	214	13	8.16	0.02
1	101L	0.0	0.00	35.9	1.14	0.009	4	1186	0.02032	3.00	0.00	0	214	0	8.16	0.00
1	102L	31.3	1.57	67.2	2.73	0.030	0	0	0.00000	0.00	0.00	0	14	10	8.16	0.22
1	103L	0.0	0.00	67.2	2.73	0.030	4	1923	0.01188	4.25	0.00	0	14	0	8.16	0.00
1	104L	30.2	2.18	97.4	4.97	0.090	0	0	0.00000	0.00	0.00	0	14	12	8.16	0.37
1	105L	29.4	2.02	126.8	6.99	0.107	0	0	0.00000	0.00	0.00	0	14	12	8.11	0.35
1	106L	0.0	0.00	126.8	6.99	0.107	4	2111	0.01883	4.75	0.00	0	14	0	8.11	0.00
1	107L	56.4	6.46	183.2	13.53	0.265	0	0	0.00000	0.00	0.00	0	14	17	8.02	0.67
1	108AL	183.2	13.53	2043.0	12972.36	1113.635	5	576	0.00434	49.00	0.00	0	14	0	8.02	0.00
1	109A	6.8	0.31	2049.8	12993.69	1126.716	0	0	0.00000	0.00	0.00	0	7	7	7.93	0.20
1	110M	21.5	2.04	21.5	2.04	0.015	0	0	0.00000	0.00	0.00	0	14	11	8.65	0.49
1	111M	0.0	0.00	21.5	2.04	0.015	4	1506	0.01591	2.75	0.00	0	14	0	8.65	0.00
1	112M	39.9	4.39	61.4	6.46	0.076	0	0	0.00000	0.00	0.00	0	14	12	8.61	0.59
1	113M	0.0	0.00	61.4	6.46	0.076	4	1946	0.01931	3.75	0.00	0	14	0	8.61	0.00
1	114M	53.7	5.88	115.1	12.41	0.212	0	0	0.00000	0.00	0.00	0	14	16	8.54	0.59
1	115M	0.0	0.00	115.1	12.41	0.212	4	647	0.03413	4.25	0.00	0	14	0	8.54	0.00
1	116M	24.7	2.38	139.8	14.83	0.265	0	0	0.00000	0.00	0.00	0	14	13	8.48	0.51
1	117M	0.0	0.00	139.8	14.83	0.265	4	681	0.03928	4.25	0.00	0	14	0	8.48	0.00
1	118M	23.5	1.94	163.3	16.80	0.318	0	0	0.00000	0.00	0.00	0	14	13	8.46	0.42
1	119N	26.3	2.36	26.3	2.36	0.019	0	0	0.00000	0.00	0.00	0	14	12	8.58	0.46
1	120N	0.0	0.00	26.3	2.36	0.019	4	960	0.02935	2.50	0.00	0	14	0	8.58	0.00
1	121N	37.4	3.35	63.7	5.72	0.063	0	0	0.00000	0.00	0.00	0	14	13	8.55	0.46
1	122N	0.0	0.00	63.7	5.72	0.063	4	1875	0.02223	3.75	0.00	0	14	0	8.55	0.00
1	123N	49.3	4.14	113.0	9.92	0.168	0	0	0.00000	0.00	0.00	0	14	16	8.44	0.43
1	124MN	113.0	9.92	276.3	26.72	0.486	4	1507	0.01940	6.25	0.00	0	14	0	8.44	0.00
1	125M	52.9	4.88	329.2	31.77	0.692	0	0	0.00000	0.00	0.00	0	14	13	8.39	0.49
1	126M	0.0	0.00	329.2	31.77	0.692	4	806	0.01963	6.50	0.00	0	14	0	8.39	0.00
1	127M	19.3	1.82	348.5	33.67	0.805	0	0	0.00000	0.00	0.00	0	14	12	8.30	0.51
1	128M	0.0	0.00	348.5	33.67	0.805	4	1788	0.02315	6.50	0.00	0	14	0	8.30	0.00
1	129M	38.2	5.10	386.7	38.98	1.069	0	0	0.00000	0.00	0.00	0	14	14	8.25	0.78

1	130	41.8	5.28	41.8	5.28	0.047	0	0	0.00000	0.00	0.00	0	14	13	8.46	0.71
1	131	0.0	0.00	41.8	5.28	0.047	4	1291	0.03302	3.00	0.00	0	14	0	8.46	0.00
1	132	11.6	1.59	53.4	6.90	0.091	0	0	0.00000	0.00	0.00	0	14	9	8.40	0.79
1	133P	46.6	4.12	46.6	4.12	0.037	0	0	0.00000	0.00	0.00	0	14	13	8.46	0.46
1	134P	0.0	0.00	46.6	4.12	0.037	4	914	0.00358	4.50	0.00	0	14	0	8.46	0.00
1	135P	17.0	2.05	63.6	6.22	0.099	0	0	0.00000	0.00	0.00	0	14	12	8.39	0.68
1	136OP	63.6	6.22	117.0	13.13	0.190	4	2285	0.01004	5.25	0.00	0	14	0	8.39	0.00
1	137O	28.8	2.63	145.8	15.93	0.403	0	0	0.00000	0.00	0.00	0	14	15	8.30	0.49
1	138Q	37.8	4.13	37.8	4.13	0.031	0	0	0.00000	0.00	0.00	0	14	11	8.32	0.61
1	139Q	0.0	0.00	37.8	4.13	0.031	4	1398	0.01408	3.50	0.00	0	14	0	8.32	0.00
1	140Q	13.8	1.13	51.6	5.30	0.083	0	0	0.00000	0.00	0.00	0	14	13	8.28	0.43
1	141OQ	51.6	5.30	197.4	21.24	0.486	4	1416	0.01852	5.50	0.00	0	14	0	8.28	0.00
1	142O	13.7	1.65	211.1	23.00	0.628	0	0	0.00000	0.00	0.00	0	14	12	8.24	0.69
1	143MO	211.1	23.00	597.8	61.98	1.697	4	658	0.02375	7.75	0.00	0	14	0	8.24	0.00
1	144M	25.8	2.60	623.6	64.69	1.848	0	0	0.00000	0.00	0.00	0	14	16	8.19	0.56
1	145R	11.0	1.07	11.0	1.07	0.008	0	0	0.00000	0.00	0.00	0	7	11	8.46	0.52
1	146R	36.5	4.57	47.5	5.65	0.058	0	0	0.00000	0.00	0.00	0	14	16	8.37	0.71
1	147R	0.0	0.00	47.5	5.65	0.058	4	790	0.02971	3.00	0.00	0	14	0	8.37	0.00
1	148R	34.1	4.26	81.6	9.93	0.116	0	0	0.00000	0.00	0.00	0	14	12	8.38	0.71
1	149R	0.0	0.00	81.6	9.93	0.116	4	902	0.02497	4.00	0.00	0	14	0	8.38	0.00
1	150R	16.8	1.92	98.4	11.88	0.170	0	0	0.00000	0.00	0.00	0	13	9	8.37	0.64
1	151R	0.0	0.00	98.4	11.88	0.170	4	1610	0.02183	4.25	0.00	0	13	0	8.37	0.00
1	152R	54.8	6.59	153.2	18.56	0.328	0	0	0.00000	0.00	0.00	0	14	15	8.33	0.68
1	153R	0.0	0.00	153.2	18.56	0.328	4	1092	0.00227	7.50	0.00	0	14	0	8.33	0.00
1	154R	25.9	2.51	179.1	21.26	0.548	0	0	0.00000	0.00	0.00	0	14	12	8.27	0.53
1	155S	52.7	4.79	52.7	4.79	0.039	0	0	0.00000	0.00	0.00	0	13	12	8.27	0.49
1	156S	0.0	0.00	52.7	4.79	0.039	4	1307	0.02759	3.50	0.00	0	13	0	8.27	0.00
1	157S	37.3	2.94	90.0	7.76	0.103	0	0	0.00000	0.00	0.00	0	14	15	8.23	0.41
1	158RS	90.0	7.76	269.1	29.03	0.651	4	700	0.02324	6.00	0.00	0	14	0	8.23	0.00
1	159R	16.4	1.34	285.5	30.44	0.737	0	0	0.00000	0.00	0.00	0	14	12	8.25	0.43
1	160R	16.0	1.25	301.5	31.69	0.747	0	0	0.00000	0.00	0.00	0	14	12	8.20	0.41
1	161R	0.0	0.00	301.5	31.69	0.747	4	793	0.02468	6.00	0.00	0	14	0	8.20	0.00
1	162R	18.2	1.46	319.7	33.23	0.849	0	0	0.00000	0.00	0.00	0	14	13	8.21	0.42
1	163R	0.0	0.00	319.7	33.23	0.849	4	1791	0.01663	6.75	0.00	0	14	0	8.21	0.00
1	164R	46.6	4.78	366.3	38.23	1.142	0	0	0.00000	0.00	0.00	0	14	16	8.23	0.57
1	165MR	366.3	38.23	989.9	102.92	2.991	5	1484	0.04519	11.00	0.00	0	14	0	8.23	0.00
1	166M	49.4	4.44	1039.3	107.72	3.458	0	0	0.00000	0.00	0.00	0	14	16	8.14	0.49
1	167M	0.0	0.00	1039.3	107.72	3.458	5	436	0.02655	12.00	0.00	0	14	0	8.14	0.00
1	168M	55.5	4.87	1094.8	112.72	3.657	0	0	0.00000	0.00	0.00	0	14	13	8.10	0.48
1	169M	0.0	0.00	1094.8	112.72	3.657	5	1915	0.01285	14.00	0.00	0	14	0	8.10	0.00
1	170M	21.2	1.77	1116.0	115.27	4.614	0	0	0.00000	0.00	0.00	0	14	12	7.98	0.46
1	171T	36.3	1.85	36.3	1.85	0.015	0	0	0.00000	0.00	0.00	0	68	12	7.80	0.24
1	172T	0.0	0.00	36.3	1.85	0.015	4	327	0.04536	2.50	0.00	0	68	0	7.80	0.00
1	173T	26.8	1.50	63.1	3.35	0.030	0	0	0.00000	0.00	0.00	0	268	12	7.77	0.15
1	174T	0.0	0.00	63.1	3.35	0.030	4	420	0.03098	3.25	0.00	0	268	0	7.77	0.00
1	175T	32.3	1.49	95.4	4.84	0.051	0	0	0.00000	0.00	0.00	0	68	13	7.69	0.21
1	176T	0.0	0.00	95.4	4.84	0.051	4	850	0.00213	6.25	0.00	0	68	0	7.69	0.00
1	177T	26.5	1.82	121.9	6.72	0.122	0	0	0.00000	0.00	0.00	0	68	11	7.76	0.37
1	178T	0.0	0.00	121.9	6.72	0.122	4	226	0.05981	3.50	0.00	0	68	0	7.76	0.00
1	179T	29.2	1.35	151.1	8.08	0.137	0	0	0.00000	0.00	0.00	0	68	10	7.72	0.21
1	180T	0.0	0.00	151.1	8.08	0.137	4	845	0.03349	4.25	0.00	0	68	0	7.72	0.00
1	181T	13.8	1.04	164.9	9.15	0.172	0	0	0.00000	0.00	0.00	0	68	7	7.80	0.42
1	182T	0.0	0.00	164.9	9.15	0.172	4	216	0.04988	4.00	0.00	0	68	0	7.80	0.00
1	183T	20.0	1.09	184.9	10.25	0.184	0	0	0.00000	0.00	0.00	0	68	8	7.76	0.27
1	184T	18.9	0.82	203.8	11.07	0.189	0	0	0.00000	0.00	0.00	0	68	8	7.74	0.19
1	185T	0.0	0.00	203.8	11.07	0.189	4	1064	0.06352	4.25	0.00	0	68	0	7.74	0.00
1	186T	29.1	2.19	232.9	13.30	0.252	0	0	0.00000	0.00	0.00	0	7	17	7.85	0.41
1	187T	12.3	0.94	245.2	14.24	0.256	0	0	0.00000	0.00	0.00	0	68	6	7.89	0.42
1	188AM	1116.0	115.27	3165.8	13108.96	1131.330	0	0	0.00000	0.00	0.00	0	68	0	7.89	0.00
1	189AT	245.2	14.24	3411.0	13123.19	1131.586	5	1507	0.02587	26.00	0.00	0	68	0	7.89	0.00
1	190A	50.8	4.12	3461.8	13156.34	1148.551	0	0	0.00000	0.00	0.00	0	14	15	8.00	0.44
1	191A	38.8	2.89	3500.6	13159.24	1148.583	0	0	0.00000	0.00	0.00	0	7	16	7.92	0.40
1	192A	0.0	0.00	3500.6	13159.24	1148.583	5	1050	0.00121	83.00	0.00	0	7	0	7.92	0.00

1	193A	54.9	4.90	3555.5	13228.09	1190.034	0	0	0.00000	0.00	0.00	0	14	10	7.88	0.51
1	194A	0.0	0.00	3555.5	13228.09	1190.034	2	1450	0.02959	0.00	0.00	0	14	0	7.88	0.00
1	195A	35.4	3.61	3590.9	13265.45	1211.796	0	0	0.00000	0.00	0.00	0	14	10	7.88	0.60
1	196A	49.0	2.69	3639.9	13268.14	1211.824	0	0	0.00000	0.00	0.00	0	68	15	7.76	0.27
1	197A	0.0	0.00	3639.9	13268.14	1211.824	5	1144	0.00098	91.00	0.00	0	68	0	7.76	0.00
1	198A	43.0	3.14	3682.9	13347.26	1261.745	0	0	0.00000	0.00	0.00	0	14	11	7.80	0.40
1	199U	81.6	4.22	81.6	4.22	0.031	0	0	0.00000	0.00	0.00	0	268	12	7.58	0.13
1	200U	0.0	0.00	81.6	4.22	0.031	2	1223	0.05600	0.00	0.00	0	268	0	7.58	0.00
1	201U	52.2	2.73	133.8	7.01	0.095	0	0	0.00000	0.00	0.00	0	268	12	7.51	0.14
1	202U	0.0	0.00	133.8	7.01	0.095	2	1315	0.01994	0.00	0.00	0	268	0	7.51	0.00
1	203U	90.1	5.96	223.9	13.13	0.263	0	0	0.00000	0.00	0.00	0	2	14	7.43	0.27
1	204U	0.0	0.00	223.9	13.13	0.263	4	676	0.04738	4.75	0.00	0	2	0	7.43	0.00
1	205U	46.0	1.92	269.9	15.10	0.307	0	0	0.00000	0.00	0.00	0	68	12	7.68	0.18
1	206U	22.3	1.55	292.2	16.65	0.316	0	0	0.00000	0.00	0.00	0	2	9	7.60	0.28
1	207U	0.0	0.00	292.2	16.65	0.316	4	1509	0.11467	4.50	0.00	0	2	0	7.60	0.00
1	208U	18.4	1.27	310.6	18.00	0.380	0	0	0.00000	0.00	0.00	0	68	8	7.65	0.38
1	209AU	310.6	18.00	3993.5	13365.25	1262.125	5	588	0.01971	27.00	0.00	0	68	0	7.65	0.00
1	210A	24.2	1.19	4017.7	13378.98	1269.559	0	0	0.00000	0.00	0.00	0	14	10	7.76	0.23
1	211A	0.0	0.00	4017.7	13378.98	1269.559	5	535	0.04527	23.00	0.00	0	14	0	7.76	0.00
1	212A	25.5	1.18	4043.2	13388.59	1274.516	0	0	0.00000	0.00	0.00	0	14	12	7.73	0.21
1	213A	0.0	0.00	4043.2	13388.59	1274.516	5	1190	0.00201	67.00	0.00	0	14	0	7.73	0.00
1	214A	40.2	1.87	4083.4	13449.58	1312.599	0	0	0.00000	0.00	0.00	0	207	14	7.68	0.14
1	215V	31.6	3.60	31.6	3.60	0.037	0	0	0.00000	0.00	0.00	0	14	15	7.91	0.68
1	216V	0.0	0.00	31.6	3.60	0.037	4	1908	0.02764	2.75	0.00	0	14	0	7.91	0.00
1	217V	14.2	1.50	45.8	5.15	0.089	0	0	0.00000	0.00	0.00	0	13	11	7.86	0.63
1	218W	15.4	1.51	15.4	1.51	0.014	0	0	0.00000	0.00	0.00	0	14	14	7.87	0.57
1	219W	0.0	0.00	15.4	1.51	0.014	4	1517	0.04291	2.00	0.00	0	14	0	7.87	0.00
1	220W	23.7	2.03	39.1	3.55	0.042	0	0	0.00000	0.00	0.00	0	13	10	7.81	0.49
1	221VW	39.1	3.55	84.9	8.70	0.130	4	717	0.07214	3.25	0.00	0	13	0	7.81	0.00
1	222V	6.1	0.46	91.0	9.18	0.152	0	0	0.00000	0.00	0.00	0	13	6	7.79	0.42
1	223V	0.0	0.00	91.0	9.18	0.152	4	861	0.07650	3.25	0.00	0	13	0	7.79	0.00
1	224V	23.5	1.62	114.5	10.82	0.192	0	0	0.00000	0.00	0.00	0	14	14	7.76	0.37
1	225AV	114.5	10.82	4197.9	13460.40	1312.791	0	0	0.00000	0.00	0.00	0	14	0	7.76	0.00

Normal End of MODRAT

File name: \\S08USSND01FPS01\Shared\Civil\18051.01 LA County Devils Gate\Hydrology\Calculations\WMS\01 Day WMS Files\Lower 2\untitled.lac Run date: Mon Oct 10 09:56:50 2011

Los Angeles County Flood Control District
Modified Rational Method Hydrology

Storm Day 1 Storm Frequency 50

LOCATION		SUBAREA AREA (ACRES)	SUBAREA Q (CFS)	TOTAL AREA (ACRES)	TOTAL Q (CFS)	TOTAL VOLUME (AC-FT)	CONV TYPE	CONV LNGTH (FT)	CONV SLOPE (FT/FT)	CONV SIZE	CONV Z	CONTROL Q (CFS)	SOIL NAME	TC (MIN)	RAIN (IN)	PCT IMPV
1	1A	53.1	96.58	53.1	96.58	14.212	0	0	0.00000	0.00	0.00	0	68	17	7.54	0.34
1	2A	0.0	0.00	53.1	96.58	14.212	4	1183	0.00332	4.25	0.00	0	68	0	7.54	0.00
1	3A	45.9	107.04	99.0	191.49	32.725	0	0	0.00000	0.00	0.00	0	2	15	7.43	0.44
1	4A	44.3	112.82	143.3	296.10	50.197	0	0	0.00000	0.00	0.00	0	2	12	7.35	0.42
1	5A	0.0	0.00	143.3	296.10	50.197	4	1745	0.01856	4.75	0.00	0	2	0	7.35	0.00
1	6A	59.7	121.42	203.0	410.73	73.558	0	0	0.00000	0.00	0.00	0	2	19	7.34	0.42
1	7A	37.1	93.65	240.1	492.76	87.948	0	0	0.00000	0.00	0.00	0	2	12	7.29	0.41
1	8A	0.0	0.00	240.1	492.76	87.948	4	908	0.04391	4.75	0.00	0	2	0	7.29	0.00
1	9A	41.1	90.39	281.2	578.42	103.886	0	0	0.00000	0.00	0.00	0	2	17	7.51	0.36
1	10A	42.5	99.24	323.7	671.88	120.893	0	0	0.00000	0.00	0.00	0	2	15	7.44	0.42
1	11A	0.0	0.00	323.7	671.88	120.893	5	630	0.00100	14.00	0.00	0	2	0	7.44	0.00
1	12A	24.9	70.76	348.6	712.59	131.041	0	0	0.00000	0.00	0.00	0	2	9	7.43	0.49
1	13A	0.0	0.00	348.6	712.59	131.041	5	1045	0.04539	7.00	0.00	0	2	0	7.43	0.00
1	14A	54.8	155.85	403.4	817.49	152.539	0	0	0.00000	0.00	0.00	0	2	10	7.50	0.38
1	15A	0.0	0.00	403.4	817.49	152.539	5	1744	0.03861	8.00	0.00	0	2	0	7.50	0.00
1	16A	31.5	89.99	434.9	874.02	163.925	0	0	0.00000	0.00	0.00	0	2	10	7.54	0.27
1	17B	33.5	78.60	33.5	78.60	16.081	0	0	0.00000	0.00	0.00	0	13	17	7.80	0.78
1	18B	0.0	0.00	33.5	78.60	16.081	4	980	0.06323	2.25	0.00	0	13	0	7.80	0.00
1	19B	41.8	95.01	75.3	172.09	34.429	0	0	0.00000	0.00	0.00	0	13	18	7.78	0.69
1	20B	0.0	0.00	75.3	172.09	34.429	4	1733	0.04388	3.25	0.00	0	13	0	7.78	0.00
1	21B	37.2	86.79	112.5	253.14	50.234	0	0	0.00000	0.00	0.00	0	2	16	7.67	0.46
1	22C	32.1	90.72	32.1	90.72	13.718	0	0	0.00000	0.00	0.00	0	2	11	7.79	0.43
1	23C	0.0	0.00	32.1	90.72	13.718	4	917	0.07666	2.25	0.00	0	2	0	7.79	0.00
1	24C	35.1	95.33	67.2	182.11	24.294	0	0	0.00000	0.00	0.00	0	13	12	7.73	0.38
1	25D	0.0	0.00	0.0	18364.70	11393.887	5	1575	0.00429	49.00	0.00	0	13	0	7.73	0.00
1	26D	43.0	104.97	43.0	18364.88	11376.969	0	0	0.00000	0.00	0.00	0	14	11	7.63	0.26
1	27CD	43.0	18364.88	110.2	18372.56	11401.263	5	2342	0.01125	34.00	0.00	0	14	0	7.63	0.00
1	28C	43.0	109.04	153.2	18375.78	11389.384	0	0	0.00000	0.00	0.00	0	2	13	7.62	0.21
1	29AB	112.5	253.14	547.4	1126.14	214.159	0	0	0.00000	0.00	0.00	0	2	0	7.62	0.00
1	30AC	153.2	18375.78	700.6	18447.17	11603.542	5	1762	0.02480	26.00	0.00	0	2	0	7.62	0.00
1	31A	25.1	72.37	725.7	18449.14	11597.127	0	0	0.00000	0.00	0.00	0	2	8	7.49	0.23
1	32E	55.4	128.31	55.4	128.31	21.017	0	0	0.00000	0.00	0.00	0	2	15	7.40	0.35
1	33E	0.0	0.00	55.4	128.31	21.017	4	552	0.19968	2.25	0.00	0	2	0	7.40	0.00
1	34E	15.7	34.82	71.1	160.90	24.854	0	0	0.00000	0.00	0.00	0	7	11	7.37	0.33
1	35AE	71.1	160.90	796.8	18456.86	11621.981	5	1273	0.00235	63.00	0.00	0	7	0	7.37	0.00
1	36A	20.3	40.16	817.1	18457.11	11598.340	0	0	0.00000	0.00	0.00	0	7	13	7.43	0.25
1	37F	50.7	113.55	50.7	113.55	21.265	0	0	0.00000	0.00	0.00	0	2	17	7.61	0.45
1	38F	0.0	0.00	50.7	113.55	21.265	4	822	0.00100	5.50	0.00	0	2	0	7.61	0.00
1	39F	65.8	145.94	116.5	245.85	47.070	0	0	0.00000	0.00	0.00	0	2	17	7.57	0.36
1	40F	0.0	0.00	116.5	245.85	47.070	4	1283	0.04934	3.75	0.00	0	2	0	7.57	0.00
1	41F	49.7	75.71	166.2	318.90	58.657	0	0	0.00000	0.00	0.00	0	7	21	7.50	0.30
1	42AF	166.2	318.90	983.3	18476.06	11656.997	5	1111	0.03371	24.00	0.00	0	7	0	7.50	0.00
1	43A	17.7	45.96	1001.0	18478.29	11655.633	0	0	0.00000	0.00	0.00	0	7	10	7.33	0.71
1	44G	38.9	95.43	38.9	95.43	16.511	0	0	0.00000	0.00	0.00	0	13	14	7.45	0.70
1	45G	0.0	0.00	38.9	95.43	16.511	4	2029	0.01376	3.25	0.00	0	13	0	7.45	0.00
1	46G	39.3	65.47	78.2	154.79	29.586	0	0	0.00000	0.00	0.00	0	7	21	7.40	0.53
1	47G	0.0	0.00	78.2	154.79	29.586	4	935	0.07119	3.00	0.00	0	7	0	7.40	0.00
1	48G	15.6	37.81	93.8	181.20	33.207	0	0	0.00000	0.00	0.00	0	207	11	7.34	0.15
1	49AG	93.8	181.20	1094.8	18489.56	11688.840	5	1255	0.01641	29.00	0.00	0	207	0	7.34	0.00
1	50A	55.8	100.00	1150.6	18495.47	11694.405	0	0	0.00000	0.00	0.00	0	7	18	7.31	0.53
1	51H	18.2	51.62	18.2	51.62	5.836	0	0	0.00000	0.00	0.00	0	17	8	7.31	0.39

1	52H	47.0	99.93	65.2	151.54	22.133	0	0	0.00000	0.00	0.00	0	13	18	7.35	0.53
1	53H	0.0	0.00	65.2	151.54	22.133	4	2025	0.02808	3.50	0.00	0	13	0	7.35	0.00
1	54H	47.4	108.34	112.6	248.93	39.089	0	0	0.00000	0.00	0.00	0	17	15	7.23	0.51
1	55H	34.6	84.97	147.2	331.27	53.494	0	0	0.00000	0.00	0.00	0	17	13	7.28	0.66
1	56H	0.0	0.00	147.2	331.27	53.494	4	490	0.09155	3.75	0.00	0	17	0	7.28	0.00
1	57H	16.3	34.95	163.5	363.77	56.679	0	0	0.00000	0.00	0.00	0	207	13	7.23	0.06
1	58AH	163.5	363.77	1314.1	18513.01	11751.084	5	1303	0.00647	42.00	0.00	0	207	0	7.23	0.00
1	59A	37.7	68.07	1351.8	18515.97	11742.474	0	0	0.00000	0.00	0.00	0	7	16	7.17	0.43
1	60I	58.1	147.63	58.1	147.63	22.568	0	0	0.00000	0.00	0.00	0	2	12	7.34	0.40
1	61I	0.0	0.00	58.1	147.63	22.568	4	1411	0.04338	3.00	0.00	0	2	0	7.34	0.00
1	62I	39.9	96.95	98.0	237.03	37.026	0	0	0.00000	0.00	0.00	0	2	13	7.31	0.31
1	63I	0.0	0.00	98.0	237.03	37.026	4	1895	0.01240	4.75	0.00	0	2	0	7.31	0.00
1	64I	41.8	107.47	139.8	313.54	50.794	0	0	0.00000	0.00	0.00	0	16	11	7.26	0.49
1	65I	0.0	0.00	139.8	313.54	50.794	4	689	0.08501	3.50	0.00	0	16	0	7.26	0.00
1	66I	11.3	31.18	151.1	332.62	54.577	0	0	0.00000	0.00	0.00	0	16	7	7.19	0.51
1	67I	0.0	0.00	151.1	332.62	54.577	4	1897	0.01576	5.00	0.00	0	16	0	7.19	0.00
1	68I	30.4	74.47	181.5	384.02	66.876	0	0	0.00000	0.00	0.00	0	16	12	7.13	0.70
1	69J	40.8	110.61	40.8	110.61	14.537	0	0	0.00000	0.00	0.00	0	17	10	7.11	0.52
1	70J	0.0	0.00	40.8	110.61	14.537	4	877	0.05953	2.75	0.00	0	17	0	7.11	0.00
1	71J	51.0	115.94	91.8	221.46	34.476	0	0	0.00000	0.00	0.00	0	2	14	7.04	0.49
1	72AI	181.5	384.02	1533.3	18537.66	11809.350	0	0	0.00000	0.00	0.00	0	2	0	7.04	0.00
1	73AJ	91.8	221.46	1625.1	18548.26	11843.825	5	2245	0.01380	32.00	0.00	0	2	0	7.04	0.00
1	74A	44.9	107.32	1670.0	18552.39	11834.776	0	0	0.00000	0.00	0.00	0	16	12	7.04	0.57
1	75K	65.0	178.35	65.0	178.35	25.000	0	0	0.00000	0.00	0.00	0	2	8	7.12	0.44
1	76K	0.0	0.00	65.0	178.35	25.000	4	997	0.01694	4.00	0.00	0	2	0	7.12	0.00
1	77K	57.3	141.72	122.3	314.34	46.526	0	0	0.00000	0.00	0.00	0	2	12	7.16	0.40
1	78K	0.0	0.00	122.3	314.34	46.526	4	799	0.02449	4.50	0.00	0	2	0	7.16	0.00
1	79K	56.1	137.64	178.4	445.31	68.076	0	0	0.00000	0.00	0.00	0	2	12	7.10	0.45
1	80K	0.0	0.00	178.4	445.31	68.076	4	1009	0.02992	5.00	0.00	0	2	0	7.10	0.00
1	81K	38.2	100.63	216.6	525.80	80.498	0	0	0.00000	0.00	0.00	0	16	10	7.09	0.50
1	82L	37.3	90.28	37.3	90.28	14.202	0	0	0.00000	0.00	0.00	0	2	13	7.27	0.39
1	83L	0.0	0.00	37.3	90.28	14.202	4	1691	0.05007	2.50	0.00	0	2	0	7.27	0.00
1	84L	36.7	87.86	74.0	171.93	28.062	0	0	0.00000	0.00	0.00	0	2	13	7.19	0.40
1	85KL	74.0	171.93	290.6	697.73	108.560	4	1087	0.02306	6.25	0.00	0	2	0	7.19	0.00
1	86K	57.7	121.48	348.3	809.64	126.630	0	0	0.00000	0.00	0.00	0	16	16	7.19	0.46
1	87K	0.0	0.00	348.3	809.64	126.630	4	1882	0.01793	6.75	0.00	0	16	0	7.19	0.00
1	88K	74.9	154.38	423.2	942.58	155.716	0	0	0.00000	0.00	0.00	0	16	17	7.12	0.66
1	89K	0.0	0.00	423.2	942.58	155.716	4	2560	0.03438	6.50	0.00	0	16	0	7.12	0.00
1	90K	36.0	78.19	459.2	990.41	167.029	0	0	0.00000	0.00	0.00	0	6	14	7.04	0.48
1	91AK	459.2	990.41	2129.2	18606.61	12001.805	5	1638	0.01306	32.00	0.00	0	6	0	7.04	0.00
1	92A	26.1	58.02	2155.3	18608.87	11992.607	0	0	0.00000	0.00	0.00	0	2	14	6.92	0.40
1	93A	52.9	106.55	2208.2	18614.62	12010.713	0	0	0.00000	0.00	0.00	0	6	16	6.93	0.55
1	94M	59.1	140.03	59.1	140.03	19.709	0	0	0.00000	0.00	0.00	0	2	12	6.90	0.30
1	95M	0.0	0.00	59.1	140.03	19.709	4	904	0.06218	2.75	0.00	0	2	0	6.90	0.00
1	96M	12.0	31.46	71.1	165.73	24.439	0	0	0.00000	0.00	0.00	0	2	9	6.87	0.55
1	97AM	71.1	165.73	2279.3	18621.74	12035.152	5	1794	0.01129	34.00	0.00	0	2	0	6.87	0.00
1	98A	28.3	63.31	2307.6	18623.54	12021.868	0	0	0.00000	0.00	0.00	0	6	12	6.80	0.44
1	99N	38.9	101.09	38.9	101.09	15.032	0	0	0.00000	0.00	0.00	0	2	9	6.82	0.53
1	100N	67.7	141.49	106.6	242.58	37.995	0	0	0.00000	0.00	0.00	0	2	15	6.73	0.37
1	101N	0.0	0.00	106.6	242.58	37.995	4	1744	0.04137	3.75	0.00	0	2	0	6.73	0.00
1	102N	52.9	100.18	159.5	334.31	55.235	0	0	0.00000	0.00	0.00	0	2	18	6.73	0.32
1	103AN	159.5	334.31	2467.1	18639.95	12077.103	5	1543	0.00100	92.00	0.00	0	2	0	6.73	0.00
1	104A	24.5	63.67	2491.6	18640.73	12034.978	0	0	0.00000	0.00	0.00	0	2	7	6.71	0.33
1	105O	35.4	77.05	35.4	77.05	13.851	0	0	0.00000	0.00	0.00	0	13	15	6.83	0.71
1	106O	0.0	0.00	35.4	77.05	13.851	4	1270	0.02495	2.75	0.00	0	13	0	6.83	0.00
1	107O	34.8	68.90	70.2	142.53	28.591	0	0	0.00000	0.00	0.00	0	6	17	6.80	0.79
1	108O	0.0	0.00	70.2	142.53	28.591	4	778	0.00100	6.00	0.00	0	6	0	6.80	0.00
1	109O	35.9	71.92	106.1	203.58	42.084	0	0	0.00000	0.00	0.00	0	13	17	6.75	0.69
1	110AO	106.1	203.58	2597.7	18655.13	12077.061	5	857	0.03696	24.00	0.00	0	13	0	6.75	0.00
1	111A	4.7	11.49	2602.4	18655.44	12072.109	0	0	0.00000	0.00	0.00	0	7	6	6.69	0.69
1	112P	58.2	127.57	58.2	127.57	18.149	0	0	0.00000	0.00	0.00	0	13	15	6.90	0.50
1	113P	0.0	0.00	58.2	127.57	18.149	4	636	0.01327	3.75	0.00	0	13	0	6.90	0.00
1	114P	24.3	58.43	82.5	182.18	28.720	0	0	0.00000	0.00	0.00	0	13	12	6.84	0.82

1	115P	0.0	0.00	82.5	182.18	28.720	4	506	0.00870	4.50	0.00	0	13	0	6.84	0.00
1	116P	45.8	85.23	128.3	264.87	44.805	0	0	0.00000	0.00	0.00	0	13	20	6.84	0.61
1	117P	0.0	0.00	128.3	264.87	44.805	4	1439	0.01572	4.50	0.00	0	13	0	6.84	0.00
1	118P	51.0	92.47	179.3	349.89	64.733	0	0	0.00000	0.00	0.00	0	13	21	6.80	0.72
1	119P	69.9	114.73	249.2	463.64	86.305	0	0	0.00000	0.00	0.00	0	13	24	6.78	0.51
1	120P	0.0	0.00	249.2	463.64	86.305	4	1780	0.04051	4.75	0.00	0	13	0	6.78	0.00
1	121P	43.7	99.60	292.9	538.09	101.835	0	0	0.00000	0.00	0.00	0	13	13	6.73	0.64
1	122AP	292.9	538.09	2895.3	18689.52	12173.944	5	1554	0.01466	31.00	0.00	0	13	0	6.73	0.00
1	123A	71.0	166.03	2966.3	18695.33	12179.951	0	0	0.00000	0.00	0.00	0	202	12	6.65	0.09
1	124Q	74.8	138.42	74.8	138.42	25.722	0	0	0.00000	0.00	0.00	0	16	20	7.07	0.55
1	125Q	0.0	0.00	74.8	138.42	25.722	4	916	0.01143	3.75	0.00	0	16	0	7.07	0.00
1	126Q	35.2	94.30	110.0	218.07	36.587	0	0	0.00000	0.00	0.00	0	13	10	7.01	0.48
1	127Q	0.0	0.00	110.0	218.07	36.587	4	495	0.00100	7.25	0.00	0	13	0	7.01	0.00
1	128Q	52.7	120.75	162.7	328.50	50.437	0	0	0.00000	0.00	0.00	0	13	14	6.98	0.37
1	129Q	0.0	0.00	162.7	328.50	50.437	4	883	0.00709	5.75	0.00	0	13	0	6.98	0.00
1	130Q	44.6	101.69	207.3	418.28	63.857	0	0	0.00000	0.00	0.00	0	13	14	6.95	0.47
1	131Q	0.0	0.00	207.3	418.28	63.857	4	1880	0.00607	6.50	0.00	0	13	0	6.95	0.00
1	132Q	28.3	57.79	235.6	456.21	73.258	0	0	0.00000	0.00	0.00	0	13	17	6.90	0.57
1	133R	55.9	148.48	55.9	148.48	13.794	0	0	0.00000	0.00	0.00	0	13	10	6.95	0.33
1	134R	0.0	0.00	55.9	148.48	13.794	4	3836	0.02788	3.50	0.00	0	13	0	6.95	0.00
1	135R	61.5	120.66	117.4	248.36	31.150	0	0	0.00000	0.00	0.00	0	13	18	6.89	0.43
1	136QR	117.4	248.36	353.0	691.05	104.408	5	655	0.00486	11.00	0.00	0	13	0	6.89	0.00
1	137Q	2.0	5.28	355.0	690.54	105.238	0	0	0.00000	0.00	0.00	0	3	7	6.83	0.97
1	138S	21.3	53.61	21.3	53.61	5.540	0	0	0.00000	0.00	0.00	0	13	11	6.89	0.37
1	139S	0.0	0.00	21.3	53.61	5.540	4	358	0.01016	2.75	0.00	0	13	0	6.89	0.00
1	140S	39.4	103.87	60.7	154.36	15.250	0	0	0.00000	0.00	0.00	0	13	9	6.84	0.34
1	141S	0.0	0.00	60.7	154.36	15.250	4	1594	0.04786	3.00	0.00	0	13	0	6.84	0.00
1	142S	21.7	54.19	82.4	199.93	21.334	0	0	0.00000	0.00	0.00	0	13	11	6.83	0.43
1	143QS	82.4	199.93	437.4	843.17	126.571	5	730	0.00171	14.00	0.00	0	13	0	6.83	0.00
1	144Q	23.9	59.64	461.3	872.03	133.562	0	0	0.00000	0.00	0.00	0	13	11	6.83	0.49
1	145Q	0.0	0.00	461.3	872.03	133.562	5	1027	0.00100	15.00	0.00	0	13	0	6.83	0.00
1	146Q	8.2	21.18	469.5	863.16	136.104	0	0	0.00000	0.00	0.00	0	2	9	6.78	0.50
1	147T	32.2	78.47	32.2	78.47	9.984	0	0	0.00000	0.00	0.00	0	13	12	6.93	0.49
1	148T	0.0	0.00	32.2	78.47	9.984	4	1331	0.01548	3.00	0.00	0	13	0	6.93	0.00
1	149T	41.6	82.46	73.8	156.79	23.938	0	0	0.00000	0.00	0.00	0	13	18	6.91	0.56
1	150T	0.0	0.00	73.8	156.79	23.938	4	1287	0.00100	6.25	0.00	0	13	0	6.91	0.00
1	151T	48.7	93.33	122.5	229.54	40.998	0	0	0.00000	0.00	0.00	0	13	19	6.87	0.61
1	152T	0.0	0.00	122.5	229.54	40.998	4	1961	0.00100	7.25	0.00	0	13	0	6.87	0.00
1	153T	46.4	69.76	168.9	276.85	58.416	0	0	0.00000	0.00	0.00	0	2	30	6.83	0.52
1	154QT	168.9	276.85	638.4	1118.69	194.520	4	2663	0.01470	8.00	0.00	0	2	0	6.83	0.00
1	155Q	22.5	45.79	660.9	1125.10	201.986	0	0	0.00000	0.00	0.00	0	2	16	6.76	0.42
1	156Q	77.0	116.01	737.9	1232.55	229.323	0	0	0.00000	0.00	0.00	0	2	29	6.80	0.42
1	157U	62.4	134.36	62.4	134.36	21.472	0	0	0.00000	0.00	0.00	0	2	14	6.72	0.39
1	158U	0.0	0.00	62.4	134.36	21.472	4	2023	0.01189	3.75	0.00	0	2	0	6.72	0.00
1	159U	62.9	132.16	125.3	250.63	43.326	0	0	0.00000	0.00	0.00	0	2	15	6.75	0.40
1	160U	54.5	119.91	179.8	363.24	59.537	0	0	0.00000	0.00	0.00	0	2	13	6.70	0.21
1	161QU	179.8	363.24	917.7	1440.83	288.859	5	2994	0.00964	12.00	0.00	0	2	0	6.70	0.00
1	162Q	63.9	123.90	981.6	1496.58	310.662	0	0	0.00000	0.00	0.00	0	13	18	6.75	0.64
1	163Q	0.0	0.00	981.6	1496.58	310.662	5	794	0.05252	9.00	0.00	0	13	0	6.75	0.00
1	164Q	17.9	42.26	999.5	1506.41	318.641	0	0	0.00000	0.00	0.00	0	13	12	6.72	0.89
1	165V	66.0	151.88	66.0	151.88	21.532	0	0	0.00000	0.00	0.00	0	2	12	6.72	0.32
1	166V	0.0	0.00	66.0	151.88	21.532	4	660	0.01293	4.00	0.00	0	2	0	6.72	0.00
1	167V	31.7	47.33	97.7	196.74	31.899	0	0	0.00000	0.00	0.00	0	2	28	6.69	0.34
1	168V	0.0	0.00	97.7	196.74	31.899	4	749	0.03053	3.75	0.00	0	2	0	6.69	0.00
1	169V	18.7	26.80	116.4	222.29	38.101	0	0	0.00000	0.00	0.00	0	13	30	6.67	0.59
1	170QV	116.4	222.29	1115.9	1635.96	356.742	4	1128	0.03640	7.75	0.00	0	13	0	6.67	0.00
1	171Q	30.9	67.56	1146.8	1659.58	368.434	0	0	0.00000	0.00	0.00	0	13	14	6.68	0.72
1	172AQ	1146.8	1659.58	4113.1	18818.43	12548.386	0	0	0.00000	0.00	0.00	0	13	0	6.68	0.00

Los Angeles County Flood Control District
Modified Rational Method Hydrology

Storm Day 2 Storm Frequency 50

LOCATION		SUBAREA AREA (ACRES)	SUBAREA Q (CFS)	TOTAL AREA (ACRES)	TOTAL Q (CFS)	TOTAL VOLUME (AC-FT)	CONV TYPE	CONV LNGTH (FT)	CONV SLOPE (FT/FT)	CONV SIZE	CONV Z	CONTROL Q (CFS)	SOIL NAME	TC (MIN)	RAIN (IN)	PCT IMPV
1	1A	53.1	3.34	53.1	3.34	0.039	0	0	0.00000	0.00	0.00	0	68	17	7.54	0.34
1	2A	0.0	0.00	53.1	3.34	0.039	4	1183	0.00332	4.25	0.00	0	68	0	7.54	0.00
1	3A	45.9	3.93	99.0	7.32	0.128	0	0	0.00000	0.00	0.00	0	2	15	7.43	0.44
1	4A	44.3	3.62	143.3	10.95	0.155	0	0	0.00000	0.00	0.00	0	2	12	7.35	0.42
1	5A	0.0	0.00	143.3	10.95	0.155	4	1745	0.01856	4.75	0.00	0	2	0	7.35	0.00
1	6A	59.7	4.92	203.0	15.99	0.309	0	0	0.00000	0.00	0.00	0	2	19	7.34	0.42
1	7A	37.1	2.96	240.1	18.95	0.331	0	0	0.00000	0.00	0.00	0	2	12	7.29	0.41
1	8A	0.0	0.00	240.1	18.95	0.331	4	908	0.04391	4.75	0.00	0	2	0	7.29	0.00
1	9A	41.1	3.21	281.2	22.24	0.419	0	0	0.00000	0.00	0.00	0	2	17	7.51	0.36
1	10A	42.5	3.55	323.7	25.79	0.452	0	0	0.00000	0.00	0.00	0	2	15	7.44	0.42
1	11A	0.0	0.00	323.7	25.79	0.452	5	630	0.00100	14.00	0.00	0	2	0	7.44	0.00
1	12A	24.9	2.26	348.6	28.39	0.736	0	0	0.00000	0.00	0.00	0	2	9	7.43	0.49
1	13A	0.0	0.00	348.6	28.39	0.736	5	1045	0.04539	7.00	0.00	0	2	0	7.43	0.00
1	14A	54.8	4.35	403.4	32.88	0.867	0	0	0.00000	0.00	0.00	0	2	10	7.50	0.38
1	15A	0.0	0.00	403.4	32.88	0.867	5	1744	0.03861	8.00	0.00	0	2	0	7.50	0.00
1	16A	31.5	2.12	434.9	35.28	1.094	0	0	0.00000	0.00	0.00	0	2	10	7.54	0.27
1	17B	33.5	4.25	33.5	4.25	0.049	0	0	0.00000	0.00	0.00	0	13	17	7.80	0.78
1	18B	0.0	0.00	33.5	4.25	0.049	4	980	0.06323	2.25	0.00	0	13	0	7.80	0.00
1	19B	41.8	4.76	75.3	9.03	0.125	0	0	0.00000	0.00	0.00	0	13	18	7.78	0.69
1	20B	0.0	0.00	75.3	9.03	0.125	4	1733	0.04388	3.25	0.00	0	13	0	7.78	0.00
1	21B	37.2	3.43	112.5	12.51	0.220	0	0	0.00000	0.00	0.00	0	2	16	7.67	0.46
1	22C	32.1	2.89	32.1	2.89	0.020	0	0	0.00000	0.00	0.00	0	2	11	7.79	0.43
1	23C	0.0	0.00	32.1	2.89	0.020	4	917	0.07666	2.25	0.00	0	2	0	7.79	0.00
1	24C	35.1	2.45	67.2	5.36	0.051	0	0	0.00000	0.00	0.00	0	13	12	7.73	0.38
1	25D	0.0	0.00	0.0	13462.35	1008.775	5	1575	0.00429	49.00	0.00	0	13	0	7.73	0.00
1	26D	43.0	2.26	43.0	13525.58	1078.265	0	0	0.00000	0.00	0.00	0	14	11	7.63	0.26
1	27CD	43.0	13525.58	110.2	13530.94	1078.315	5	2342	0.01125	34.00	0.00	0	14	0	7.63	0.00
1	28C	43.0	2.66	153.2	13596.96	1115.776	0	0	0.00000	0.00	0.00	0	2	13	7.62	0.21
1	29AB	112.5	12.51	547.4	47.79	1.313	0	0	0.00000	0.00	0.00	0	2	0	7.62	0.00
1	30AC	153.2	13596.96	700.6	13644.75	1117.089	5	1762	0.02480	26.00	0.00	0	2	0	7.62	0.00
1	31A	25.1	1.55	725.7	13682.47	1137.745	0	0	0.00000	0.00	0.00	0	2	8	7.49	0.23
1	32E	55.4	4.15	55.4	4.15	0.038	0	0	0.00000	0.00	0.00	0	2	15	7.40	0.35
1	33E	0.0	0.00	55.4	4.15	0.038	4	552	0.19968	2.25	0.00	0	2	0	7.40	0.00
1	34E	15.7	0.94	71.1	5.10	0.051	0	0	0.00000	0.00	0.00	0	7	11	7.37	0.33
1	35AE	71.1	5.10	796.8	13687.57	1137.795	5	1273	0.00235	63.00	0.00	0	7	0	7.37	0.00
1	36A	20.3	1.01	817.1	13750.73	1176.510	0	0	0.00000	0.00	0.00	0	7	13	7.43	0.25
1	37F	50.7	4.57	50.7	4.57	0.048	0	0	0.00000	0.00	0.00	0	2	17	7.61	0.45
1	38F	0.0	0.00	50.7	4.57	0.048	4	822	0.00100	5.50	0.00	0	2	0	7.61	0.00
1	39F	65.8	5.20	116.5	9.87	0.174	0	0	0.00000	0.00	0.00	0	2	17	7.57	0.36
1	40F	0.0	0.00	116.5	9.87	0.174	4	1283	0.04934	3.75	0.00	0	2	0	7.57	0.00
1	41F	49.7	2.85	166.2	12.79	0.260	0	0	0.00000	0.00	0.00	0	7	21	7.50	0.30
1	42AF	166.2	12.79	983.3	13763.52	1176.770	5	1111	0.03371	24.00	0.00	0	7	0	7.50	0.00
1	43A	17.7	1.93	1001.0	13785.85	1188.485	0	0	0.00000	0.00	0.00	0	7	10	7.33	0.71
1	44G	38.9	4.28	38.9	4.28	0.041	0	0	0.00000	0.00	0.00	0	13	14	7.45	0.70
1	45G	0.0	0.00	38.9	4.28	0.041	4	2029	0.01376	3.25	0.00	0	13	0	7.45	0.00
1	46G	39.3	3.43	78.2	7.77	0.154	0	0	0.00000	0.00	0.00	0	7	21	7.40	0.53
1	47G	0.0	0.00	78.2	7.77	0.154	4	935	0.07119	3.00	0.00	0	7	0	7.40	0.00
1	48G	15.6	0.70	93.8	8.50	0.182	0	0	0.00000	0.00	0.00	0	207	11	7.34	0.15
1	49AG	93.8	8.50	1094.8	13794.35	1188.667	5	1255	0.01641	29.00	0.00	0	207	0	7.34	0.00
1	50A	55.8	4.80	1150.6	13828.99	1206.099	0	0	0.00000	0.00	0.00	0	7	18	7.31	0.53
1	51H	18.2	1.22	18.2	1.22	0.007	0	0	0.00000	0.00	0.00	0	17	8	7.31	0.39
1	52H	47.0	4.07	65.2	5.29	0.057	0	0	0.00000	0.00	0.00	0	13	18	7.35	0.53
1	53H	0.0	0.00	65.2	5.29	0.057	4	2025	0.02808	3.50	0.00	0	13	0	7.35	0.00
1	54H	47.4	3.90	112.6	9.24	0.153	0	0	0.00000	0.00	0.00	0	17	15	7.23	0.51
1	55H	34.6	3.54	147.2	12.78	0.184	0	0	0.00000	0.00	0.00	0	17	13	7.28	0.66
1	56H	0.0	0.00	147.2	12.78	0.184	4	490	0.09155	3.75	0.00	0	17	0	7.28	0.00

1	57H	16.3	0.55	163.5	13.34	0.205	0	0	0.00000	0.00	0.00	0	207	13	7.23	0.06
1	58AH	163.5	13.34	1314.1	13842.33	1206.304	5	1303	0.00647	42.00	0.00	0	207	0	7.23	0.00
1	59A	37.7	2.69	1351.8	13888.15	1232.508	0	0	0.00000	0.00	0.00	0	7	16	7.17	0.43
1	60I	58.1	4.61	58.1	4.61	0.034	0	0	0.00000	0.00	0.00	0	2	12	7.34	0.40
1	61I	0.0	0.00	58.1	4.61	0.034	4	1411	0.04338	3.00	0.00	0	2	0	7.34	0.00
1	62I	39.9	2.74	98.0	7.39	0.085	0	0	0.00000	0.00	0.00	0	2	13	7.31	0.31
1	63I	0.0	0.00	98.0	7.39	0.085	4	1895	0.01240	4.75	0.00	0	2	0	7.31	0.00
1	64I	41.8	3.33	139.8	10.87	0.202	0	0	0.00000	0.00	0.00	0	16	11	7.26	0.49
1	65I	0.0	0.00	139.8	10.87	0.202	4	689	0.08501	3.50	0.00	0	16	0	7.26	0.00
1	66I	11.3	0.92	151.1	11.82	0.227	0	0	0.00000	0.00	0.00	0	16	7	7.19	0.51
1	67I	0.0	0.00	151.1	11.82	0.227	4	1897	0.01576	5.00	0.00	0	16	0	7.19	0.00
1	68I	30.4	3.20	181.5	15.17	0.372	0	0	0.00000	0.00	0.00	0	16	12	7.13	0.70
1	69J	40.8	3.34	40.8	3.34	0.023	0	0	0.00000	0.00	0.00	0	17	10	7.11	0.52
1	70J	0.0	0.00	40.8	3.34	0.023	4	877	0.05953	2.75	0.00	0	17	0	7.11	0.00
1	71J	51.0	4.33	91.8	7.68	0.075	0	0	0.00000	0.00	0.00	0	2	14	7.04	0.49
1	72AI	181.5	15.17	1533.3	13903.32	1232.880	0	0	0.00000	0.00	0.00	0	2	0	7.04	0.00
1	73AJ	91.8	7.68	1625.1	13911.00	1232.955	5	2245	0.01380	32.00	0.00	0	2	0	7.04	0.00
1	74A	44.9	3.92	1670.0	13971.17	1266.499	0	0	0.00000	0.00	0.00	0	16	12	7.04	0.57
1	75K	65.0	5.20	65.0	5.20	0.026	0	0	0.00000	0.00	0.00	0	2	8	7.12	0.44
1	76K	0.0	0.00	65.0	5.20	0.026	4	997	0.01694	4.00	0.00	0	2	0	7.12	0.00
1	77K	57.3	4.38	122.3	9.62	0.092	0	0	0.00000	0.00	0.00	0	2	12	7.16	0.40
1	78K	0.0	0.00	122.3	9.62	0.092	4	799	0.02449	4.50	0.00	0	2	0	7.16	0.00
1	79K	56.1	4.55	178.4	14.21	0.162	0	0	0.00000	0.00	0.00	0	2	12	7.10	0.45
1	80K	0.0	0.00	178.4	14.21	0.162	4	1009	0.02992	5.00	0.00	0	2	0	7.10	0.00
1	81K	38.2	3.02	216.6	17.32	0.240	0	0	0.00000	0.00	0.00	0	16	10	7.09	0.50
1	82L	37.3	2.88	37.3	2.88	0.023	0	0	0.00000	0.00	0.00	0	2	13	7.27	0.39
1	83L	0.0	0.00	37.3	2.88	0.023	4	1691	0.05007	2.50	0.00	0	2	0	7.27	0.00
1	84L	36.7	2.83	74.0	5.74	0.069	0	0	0.00000	0.00	0.00	0	2	13	7.19	0.40
1	85KL	74.0	5.74	290.6	23.06	0.309	4	1087	0.02306	6.25	0.00	0	2	0	7.19	0.00
1	86K	57.7	4.35	348.3	27.55	0.454	0	0	0.00000	0.00	0.00	0	16	16	7.19	0.46
1	87K	0.0	0.00	348.3	27.55	0.454	4	1882	0.01793	6.75	0.00	0	16	0	7.19	0.00
1	88K	74.9	7.52	423.2	35.36	0.754	0	0	0.00000	0.00	0.00	0	16	17	7.12	0.66
1	89K	0.0	0.00	423.2	35.36	0.754	4	2560	0.03438	6.50	0.00	0	16	0	7.12	0.00
1	90K	36.0	2.74	459.2	38.44	1.054	0	0	0.00000	0.00	0.00	0	6	14	7.04	0.48
1	91AK	459.2	38.44	2129.2	14009.61	1267.552	5	1638	0.01306	32.00	0.00	0	6	0	7.04	0.00
1	92A	26.1	1.90	2155.3	14053.63	1292.632	0	0	0.00000	0.00	0.00	0	2	14	6.92	0.40
1	93A	52.9	4.44	2208.2	14058.07	1292.681	0	0	0.00000	0.00	0.00	0	6	16	6.93	0.55
1	94M	59.1	3.63	59.1	3.63	0.026	0	0	0.00000	0.00	0.00	0	2	12	6.90	0.30
1	95M	0.0	0.00	59.1	3.63	0.026	4	904	0.06218	2.75	0.00	0	2	0	6.90	0.00
1	96M	12.0	1.06	71.1	4.70	0.046	0	0	0.00000	0.00	0.00	0	2	9	6.87	0.55
1	97AM	71.1	4.70	2279.3	14062.78	1292.727	5	1794	0.01129	34.00	0.00	0	2	0	6.87	0.00
1	98A	28.3	1.94	2307.6	14113.25	1321.910	0	0	0.00000	0.00	0.00	0	6	12	6.80	0.44
1	99N	38.9	3.31	38.9	3.31	0.019	0	0	0.00000	0.00	0.00	0	2	9	6.82	0.53
1	100N	67.7	4.52	106.6	7.82	0.062	0	0	0.00000	0.00	0.00	0	2	15	6.73	0.37
1	101N	0.0	0.00	106.6	7.82	0.062	4	1744	0.04137	3.75	0.00	0	2	0	6.73	0.00
1	102N	52.9	3.26	159.5	11.17	0.154	0	0	0.00000	0.00	0.00	0	2	18	6.73	0.32
1	103AN	159.5	11.17	2467.1	14124.42	1322.064	5	1543	0.00100	92.00	0.00	0	2	0	6.73	0.00
1	104A	24.5	1.50	2491.6	14232.12	1391.813	0	0	0.00000	0.00	0.00	0	2	7	6.71	0.33
1	105O	35.4	3.62	35.4	3.62	0.037	0	0	0.00000	0.00	0.00	0	13	15	6.83	0.71
1	106O	0.0	0.00	35.4	3.62	0.037	4	1270	0.02495	2.75	0.00	0	13	0	6.83	0.00
1	107O	34.8	3.89	70.2	7.53	0.110	0	0	0.00000	0.00	0.00	0	6	17	6.80	0.79
1	108O	0.0	0.00	70.2	7.53	0.110	4	778	0.00100	6.00	0.00	0	6	0	6.80	0.00
1	109O	35.9	3.55	106.1	11.18	0.250	0	0	0.00000	0.00	0.00	0	13	17	6.75	0.69
1	110AO	106.1	11.18	2597.7	14243.30	1392.062	5	857	0.03696	24.00	0.00	0	13	0	6.75	0.00
1	111A	4.7	0.46	2602.4	14258.85	1401.006	0	0	0.00000	0.00	0.00	0	7	6	6.69	0.69
1	112P	58.2	4.50	58.2	4.50	0.046	0	0	0.00000	0.00	0.00	0	13	15	6.90	0.50
1	113P	0.0	0.00	58.2	4.50	0.046	4	636	0.01327	3.75	0.00	0	13	0	6.90	0.00
1	114P	24.3	2.81	82.5	7.33	0.090	0	0	0.00000	0.00	0.00	0	13	12	6.84	0.82
1	115P	0.0	0.00	82.5	7.33	0.090	4	506	0.00870	4.50	0.00	0	13	0	6.84	0.00
1	116P	45.8	4.15	128.3	11.50	0.174	0	0	0.00000	0.00	0.00	0	13	20	6.84	0.61
1	117P	0.0	0.00	128.3	11.50	0.174	4	1439	0.01572	4.50	0.00	0	13	0	6.84	0.00
1	118P	51.0	5.28	179.3	16.87	0.339	0	0	0.00000	0.00	0.00	0	13	21	6.80	0.72
1	119P	69.9	5.44	249.2	22.31	0.429	0	0	0.00000	0.00	0.00	0	13	24	6.78	0.51

1	120P	0.0	0.00	249.2	22.31	0.429	4	1780	0.04051	4.75	0.00	0	13	0	6.78	0.00
1	121P	43.7	4.02	292.9	26.45	0.591	0	0	0.00000	0.00	0.00	0	13	13	6.73	0.64
1	122AP	292.9	26.45	2895.3	14285.30	1401.597	5	1554	0.01466	31.00	0.00	0	13	0	6.73	0.00
1	123A	71.0	3.93	2966.3	14327.45	1424.702	0	0	0.00000	0.00	0.00	0	202	12	6.65	0.09
1	124Q	74.8	6.42	74.8	6.42	0.088	0	0	0.00000	0.00	0.00	0	16	20	7.07	0.55
1	125Q	0.0	0.00	74.8	6.42	0.088	4	916	0.01143	3.75	0.00	0	16	0	7.07	0.00
1	126Q	35.2	2.66	110.0	9.12	0.147	0	0	0.00000	0.00	0.00	0	13	10	7.01	0.48
1	127Q	0.0	0.00	110.0	9.12	0.147	4	495	0.00100	7.25	0.00	0	13	0	7.01	0.00
1	128Q	52.7	3.26	162.7	12.46	0.251	0	0	0.00000	0.00	0.00	0	13	14	6.98	0.37
1	129Q	0.0	0.00	162.7	12.46	0.251	4	883	0.00709	5.75	0.00	0	13	0	6.98	0.00
1	130Q	44.6	3.30	207.3	15.84	0.360	0	0	0.00000	0.00	0.00	0	13	14	6.95	0.47
1	131Q	0.0	0.00	207.3	15.84	0.360	4	1880	0.00607	6.50	0.00	0	13	0	6.95	0.00
1	132Q	28.3	2.44	235.6	18.49	0.600	0	0	0.00000	0.00	0.00	0	13	17	6.90	0.57
1	133R	55.9	3.15	55.9	3.15	0.022	0	0	0.00000	0.00	0.00	0	13	10	6.95	0.33
1	134R	0.0	0.00	55.9	3.15	0.022	4	3836	0.02788	3.50	0.00	0	13	0	6.95	0.00
1	135R	61.5	4.23	117.4	7.46	0.146	0	0	0.00000	0.00	0.00	0	13	18	6.89	0.43
1	136QR	117.4	7.46	353.0	25.95	0.746	5	655	0.00486	11.00	0.00	0	13	0	6.89	0.00
1	137Q	2.0	0.27	355.0	26.34	0.901	0	0	0.00000	0.00	0.00	0	3	7	6.83	0.97
1	138S	21.3	1.30	21.3	1.30	0.010	0	0	0.00000	0.00	0.00	0	13	11	6.89	0.37
1	139S	0.0	0.00	21.3	1.30	0.010	4	358	0.01016	2.75	0.00	0	13	0	6.89	0.00
1	140S	39.4	2.23	60.7	3.53	0.028	0	0	0.00000	0.00	0.00	0	13	9	6.84	0.34
1	141S	0.0	0.00	60.7	3.53	0.028	4	1594	0.04786	3.00	0.00	0	13	0	6.84	0.00
1	142S	21.7	1.47	82.4	5.03	0.066	0	0	0.00000	0.00	0.00	0	13	11	6.83	0.43
1	143QS	82.4	5.03	437.4	31.37	0.967	5	730	0.00171	14.00	0.00	0	13	0	6.83	0.00
1	144Q	23.9	1.79	461.3	33.43	1.279	0	0	0.00000	0.00	0.00	0	13	11	6.83	0.49
1	145Q	0.0	0.00	461.3	33.43	1.279	5	1027	0.00100	15.00	0.00	0	13	0	6.83	0.00
1	146Q	8.2	0.67	469.5	34.56	1.820	0	0	0.00000	0.00	0.00	0	2	9	6.78	0.50
1	147T	32.2	2.45	32.2	2.45	0.020	0	0	0.00000	0.00	0.00	0	13	12	6.93	0.49
1	148T	0.0	0.00	32.2	2.45	0.020	4	1331	0.01548	3.00	0.00	0	13	0	6.93	0.00
1	149T	41.6	3.54	73.8	6.02	0.090	0	0	0.00000	0.00	0.00	0	13	18	6.91	0.56
1	150T	0.0	0.00	73.8	6.02	0.090	4	1287	0.00100	6.25	0.00	0	13	0	6.91	0.00
1	151T	48.7	4.42	122.5	10.58	0.286	0	0	0.00000	0.00	0.00	0	13	19	6.87	0.61
1	152T	0.0	0.00	122.5	10.58	0.286	4	1961	0.00100	7.25	0.00	0	13	0	6.87	0.00
1	153T	46.4	4.00	168.9	14.88	0.685	0	0	0.00000	0.00	0.00	0	2	30	6.83	0.52
1	154QT	168.9	14.88	638.4	49.44	2.504	4	2663	0.01470	8.00	0.00	0	2	0	6.83	0.00
1	155Q	22.5	1.64	660.9	51.58	3.026	0	0	0.00000	0.00	0.00	0	2	16	6.76	0.42
1	156Q	77.0	5.75	737.9	57.33	3.131	0	0	0.00000	0.00	0.00	0	2	29	6.80	0.42
1	157U	62.4	4.29	62.4	4.29	0.038	0	0	0.00000	0.00	0.00	0	2	14	6.72	0.39
1	158U	0.0	0.00	62.4	4.29	0.038	4	2023	0.01189	3.75	0.00	0	2	0	6.72	0.00
1	159U	62.9	4.43	125.3	8.81	0.147	0	0	0.00000	0.00	0.00	0	2	15	6.75	0.40
1	160U	54.5	2.65	179.8	11.47	0.167	0	0	0.00000	0.00	0.00	0	2	13	6.70	0.21
1	161QU	179.8	11.47	917.7	68.80	3.298	5	2994	0.00964	12.00	0.00	0	2	0	6.70	0.00
1	162Q	63.9	5.93	981.6	75.96	4.493	0	0	0.00000	0.00	0.00	0	13	18	6.75	0.64
1	163Q	0.0	0.00	981.6	75.96	4.493	5	794	0.05252	9.00	0.00	0	13	0	6.75	0.00
1	164Q	17.9	2.18	999.5	78.31	4.674	0	0	0.00000	0.00	0.00	0	13	12	6.72	0.89
1	165V	66.0	4.01	66.0	4.01	0.030	0	0	0.00000	0.00	0.00	0	2	12	6.72	0.32
1	166V	0.0	0.00	66.0	4.01	0.030	4	660	0.01293	4.00	0.00	0	2	0	6.72	0.00
1	167V	31.7	2.03	97.7	6.07	0.084	0	0	0.00000	0.00	0.00	0	2	28	6.69	0.34
1	168V	0.0	0.00	97.7	6.07	0.084	4	749	0.03053	3.75	0.00	0	2	0	6.69	0.00
1	169V	18.7	1.62	116.4	7.73	0.140	0	0	0.00000	0.00	0.00	0	13	30	6.67	0.59
1	170QV	116.4	7.73	1115.9	86.03	4.813	4	1128	0.03640	7.75	0.00	0	13	0	6.67	0.00
1	171Q	30.9	3.12	1146.8	89.42	5.073	0	0	0.00000	0.00	0.00	0	13	14	6.68	0.72
1	172AQ	1146.8	89.42	4113.1	14416.87	1429.776	0	0	0.00000	0.00	0.00	0	13	0	6.68	0.00

Normal End of MODRAT

File name: \\S08USSND01FPS01\Shared\Civil\18051.01 LA County Devils Gate\Hydrology\Calculations\WMS\01 Day WMS Files\Lower 3\untitled.lac Run date: Mon Oct 10 09:57:36 2011

Los Angeles County Flood Control District
Modified Rational Method Hydrology

Storm Day 1 Storm Frequency 50

LOCATION		SUBAREA AREA (ACRES)	SUBAREA Q (CFS)	TOTAL AREA (ACRES)	TOTAL Q (CFS)	TOTAL VOLUME (AC-FT)	CONV TYPE	CONV LNGTH (FT)	CONV SLOPE (FT/FT)	CONV SIZE	CONV Z	CONTROL Q (CFS)	SOIL NAME	TC (MIN)	RAIN (IN)	PCT IMPV
1	1A	40.4	101.58	40.4	101.58	12.416	0	0	0.00000	0.00	0.00	0	2	9	6.65	0.26
1	2A	0.0	0.00	40.4	101.58	12.416	4	975	0.07325	2.50	0.00	0	2	0	6.65	0.00
1	3A	44.3	110.74	84.7	208.97	27.012	0	0	0.00000	0.00	0.00	0	2	10	6.65	0.35
1	4A	0.0	0.00	84.7	208.97	27.012	4	2753	0.05518	3.50	0.00	0	2	0	6.65	0.00
1	5A	40.8	89.33	125.5	283.72	40.921	0	0	0.00000	0.00	0.00	0	2	13	6.62	0.41
1	6B	38.7	99.42	38.7	99.42	12.192	0	0	0.00000	0.00	0.00	0	202	8	6.61	0.04
1	7B	0.0	0.00	38.7	99.42	12.192	4	1451	0.08979	2.25	0.00	0	202	0	6.61	0.00
1	8B	48.0	111.38	86.7	206.93	28.231	0	0	0.00000	0.00	0.00	0	202	12	6.60	0.15
1	9C	0.0	0.00	0.0	18807.60	12561.399	5	1338	0.02519	26.00	0.00	0	202	0	6.60	0.00
1	10C	29.7	52.65	29.7	18807.16	12557.078	0	0	0.00000	0.00	0.00	0	7	14	6.61	0.45
1	11AB	86.7	206.93	212.2	486.81	69.151	0	0	0.00000	0.00	0.00	0	7	0	6.61	0.00
1	12AC	29.7	18807.16	241.9	18826.00	12626.229	5	1540	0.00100	93.00	0.00	0	7	0	6.61	0.00
1	13A	26.4	49.01	268.3	18825.84	12583.309	0	0	0.00000	0.00	0.00	0	7	14	6.58	0.58
1	14D	58.2	130.61	58.2	130.61	17.446	0	0	0.00000	0.00	0.00	0	2	12	6.58	0.25
1	15D	28.4	70.76	86.6	201.37	26.445	0	0	0.00000	0.00	0.00	0	2	8	6.53	0.33
1	16D	0.0	0.00	86.6	201.37	26.445	4	1347	0.05772	3.25	0.00	0	2	0	6.53	0.00
1	17D	34.6	81.55	121.2	275.37	38.509	0	0	0.00000	0.00	0.00	0	2	11	6.57	0.45
1	18E	55.9	137.72	55.9	137.72	17.036	0	0	0.00000	0.00	0.00	0	2	10	6.58	0.27
1	19E	0.0	0.00	55.9	137.72	17.036	4	941	0.07879	2.75	0.00	0	2	0	6.58	0.00
1	20E	25.0	63.27	80.9	193.04	24.862	0	0	0.00000	0.00	0.00	0	2	7	6.55	0.31
1	21E	0.0	0.00	80.9	193.04	24.862	4	2036	0.02922	3.75	0.00	0	2	0	6.55	0.00
1	22E	39.9	82.35	120.8	265.09	41.233	0	0	0.00000	0.00	0.00	0	2	15	6.54	0.71
1	23AD	121.2	275.37	389.5	18836.26	12621.817	0	0	0.00000	0.00	0.00	0	2	0	6.54	0.00
1	24AE	120.8	265.09	510.3	18848.17	12663.050	5	1788	0.00757	40.00	0.00	0	2	0	6.54	0.00
1	25A	49.9	85.78	560.2	18852.46	12654.547	0	0	0.00000	0.00	0.00	0	7	17	6.50	0.68
1	26A	61.5	149.09	621.7	18857.15	12672.908	0	0	0.00000	0.00	0.00	0	2	10	6.48	0.27
1	27A	0.0	0.00	621.7	18857.15	12672.908	5	1719	0.01529	31.00	0.00	0	2	0	6.48	0.00
1	28A	23.6	45.53	645.3	18859.19	12662.506	0	0	0.00000	0.00	0.00	0	7	14	6.44	0.74
1	29F	29.2	72.61	29.2	72.61	9.193	0	0	0.00000	0.00	0.00	0	202	8	6.40	0.12
1	30F	0.0	0.00	29.2	72.61	9.193	4	1934	0.03084	2.50	0.00	0	202	0	6.40	0.00
1	31F	48.3	105.55	77.5	171.08	24.724	0	0	0.00000	0.00	0.00	0	2	12	6.39	0.39
1	32G	48.5	118.82	48.5	118.82	13.725	0	0	0.00000	0.00	0.00	0	2	9	6.51	0.20
1	33G	0.0	0.00	48.5	118.82	13.725	4	1470	0.06743	2.75	0.00	0	2	0	6.51	0.00
1	34G	36.0	89.38	84.5	201.33	25.584	0	0	0.00000	0.00	0.00	0	2	8	6.50	0.39
1	35G	0.0	0.00	84.5	201.33	25.584	4	2480	0.02834	3.75	0.00	0	2	0	6.50	0.00
1	36G	47.5	78.13	132.0	267.79	40.470	0	0	0.00000	0.00	0.00	0	7	17	6.47	0.59
1	37H	27.7	65.19	27.7	65.19	8.944	0	0	0.00000	0.00	0.00	0	202	11	6.44	0.15
1	38H	0.0	0.00	27.7	65.19	8.944	4	1864	0.05277	2.25	0.00	0	202	0	6.44	0.00
1	39H	34.0	78.24	61.7	136.55	19.763	0	0	0.00000	0.00	0.00	0	2	11	6.45	0.36
1	40GH	61.7	136.55	193.7	397.86	60.233	4	1104	0.02382	5.00	0.00	0	2	0	6.45	0.00
1	41G	8.1	18.28	201.8	409.50	63.134	0	0	0.00000	0.00	0.00	0	7	10	6.43	0.72
1	42AF	77.5	171.08	722.8	18865.85	12687.230	0	0	0.00000	0.00	0.00	0	7	0	6.43	0.00
1	43AG	201.8	409.50	924.6	18884.06	12750.365	5	1142	0.01836	29.00	0.00	0	7	0	6.43	0.00
1	44A	33.4	66.43	958.0	18887.38	12751.026	0	0	0.00000	0.00	0.00	0	7	13	6.38	0.76
1	45I	31.3	75.85	31.3	75.85	9.916	0	0	0.00000	0.00	0.00	0	2	9	6.42	0.36
1	46I	0.0	0.00	31.3	75.85	9.916	4	1543	0.03284	2.50	0.00	0	2	0	6.42	0.00
1	47I	31.8	54.13	63.1	125.38	20.075	0	0	0.00000	0.00	0.00	0	7	16	6.42	0.61
1	48AI	63.1	125.38	1021.1	18893.46	12771.101	5	1810	0.01191	34.00	0.00	0	7	0	6.42	0.00
1	49A	33.8	67.52	1054.9	18897.49	12762.968	0	0	0.00000	0.00	0.00	0	7	14	6.34	0.88
1	50J	36.3	77.08	36.3	77.08	12.974	0	0	0.00000	0.00	0.00	0	6	12	6.30	0.69
1	51J	0.0	0.00	36.3	77.08	12.974	4	1606	0.02443	2.75	0.00	0	6	0	6.30	0.00

1	52J	30.2	57.68	66.5	129.99	25.626	0	0	0.00000	0.00	0.00	0	6	16	6.30	0.87
1	53AJ	66.5	129.99	1121.4	18905.92	12788.594	5	1915	0.00733	41.00	0.00	0	6	0	6.30	0.00
1	54A	51.4	96.78	1172.8	18912.32	12782.089	0	0	0.00000	0.00	0.00	0	7	16	6.26	0.92
1	55A	0.0	0.00	1172.8	18912.32	12782.089	0	0	0.00000	0.00	0.00	0	7	0	6.26	0.00

File name: \\S08USSND01FPS01\Shared\Civil\18051.01 LA County Devils Gate\Hydrology\Calculations\WMS\01 Day WMS Files\Lower 3\untitled.lac Run date: Mon Oct 10 09:57:36 2011

Los Angeles County Flood Control District
Modified Rational Method Hydrology

Storm Day 2 Storm Frequency 50

LOCATION		SUBAREA AREA (ACRES)	SUBAREA Q (CFS)	TOTAL AREA (ACRES)	TOTAL Q (CFS)	TOTAL VOLUME (AC-FT)	CONV TYPE	CONV LNGTH (FT)	CONV SLOPE (FT/FT)	CONV SIZE	CONV Z	CONTROL Q (CFS)	SOIL NAME	TC (MIN)	RAIN (IN)	PCT IMPV
1	1A	40.4	2.14	40.4	2.14	0.012	0	0	0.00000	0.00	0.00	0	2	9	6.65	0.26
1	2A	0.0	0.00	40.4	2.14	0.012	4	975	0.07325	2.50	0.00	0	2	0	6.65	0.00
1	3A	44.3	2.79	84.7	4.95	0.039	0	0	0.00000	0.00	0.00	0	2	10	6.65	0.35
1	4A	0.0	0.00	84.7	4.95	0.039	4	2753	0.05518	3.50	0.00	0	2	0	6.65	0.00
1	5A	40.8	2.82	125.5	7.87	0.118	0	0	0.00000	0.00	0.00	0	2	13	6.62	0.41
1	6B	38.7	1.94	38.7	1.94	0.008	0	0	0.00000	0.00	0.00	0	202	8	6.61	0.04
1	7B	0.0	0.00	38.7	1.94	0.008	4	1451	0.08979	2.25	0.00	0	202	0	6.61	0.00
1	8B	48.0	2.87	86.7	4.83	0.040	0	0	0.00000	0.00	0.00	0	202	12	6.60	0.15
1	9C	0.0	0.00	0.0	14418.26	1072.738	5	1338	0.02519	26.00	0.00	0	202	0	6.60	0.00
1	10C	29.7	2.02	29.7	14448.23	1100.268	0	0	0.00000	0.00	0.00	0	7	14	6.61	0.45
1	11AB	86.7	4.83	212.2	12.69	0.158	0	0	0.00000	0.00	0.00	0	7	0	6.61	0.00
1	12AC	29.7	14448.23	241.9	14460.92	1100.425	5	1540	0.00100	93.00	0.00	0	7	0	6.61	0.00
1	13A	26.4	2.19	268.3	14572.01	1184.396	0	0	0.00000	0.00	0.00	0	7	14	6.58	0.58
1	14D	58.2	2.99	58.2	2.99	0.022	0	0	0.00000	0.00	0.00	0	2	12	6.58	0.25
1	15D	28.4	1.67	86.6	4.66	0.030	0	0	0.00000	0.00	0.00	0	2	8	6.53	0.33
1	16D	0.0	0.00	86.6	4.66	0.030	4	1347	0.05772	3.25	0.00	0	2	0	6.53	0.00
1	17D	34.6	2.51	121.2	7.21	0.074	0	0	0.00000	0.00	0.00	0	2	11	6.57	0.45
1	18E	55.9	2.98	55.9	2.98	0.018	0	0	0.00000	0.00	0.00	0	2	10	6.58	0.27
1	19E	0.0	0.00	55.9	2.98	0.018	4	941	0.07879	2.75	0.00	0	2	0	6.58	0.00
1	20E	25.0	1.43	80.9	4.42	0.036	0	0	0.00000	0.00	0.00	0	2	7	6.55	0.31
1	21E	0.0	0.00	80.9	4.42	0.036	4	2036	0.02922	3.75	0.00	0	2	0	6.55	0.00
1	22E	39.9	4.01	120.8	8.51	0.125	0	0	0.00000	0.00	0.00	0	2	15	6.54	0.71
1	23AD	121.2	7.21	389.5	14579.22	1184.470	0	0	0.00000	0.00	0.00	0	2	0	6.54	0.00
1	24AE	120.8	8.51	510.3	14587.74	1184.594	5	1788	0.00757	40.00	0.00	0	2	0	6.54	0.00
1	25A	49.9	4.69	560.2	14649.68	1219.650	0	0	0.00000	0.00	0.00	0	7	17	6.50	0.68
1	26A	61.5	3.19	621.7	14652.87	1219.670	0	0	0.00000	0.00	0.00	0	2	10	6.48	0.27
1	27A	0.0	0.00	621.7	14652.87	1219.670	5	1719	0.01529	31.00	0.00	0	2	0	6.48	0.00
1	28A	23.6	2.35	645.3	14697.76	1245.299	0	0	0.00000	0.00	0.00	0	7	14	6.44	0.74
1	29F	29.2	1.57	29.2	1.57	0.007	0	0	0.00000	0.00	0.00	0	202	8	6.40	0.12
1	30F	0.0	0.00	29.2	1.57	0.007	4	1934	0.03084	2.50	0.00	0	202	0	6.40	0.00
1	31F	48.3	3.07	77.5	4.67	0.051	0	0	0.00000	0.00	0.00	0	2	12	6.39	0.39
1	32G	48.5	2.17	48.5	2.17	0.012	0	0	0.00000	0.00	0.00	0	2	9	6.51	0.20
1	33G	0.0	0.00	48.5	2.17	0.012	4	1470	0.06743	2.75	0.00	0	2	0	6.51	0.00
1	34G	36.0	2.33	84.5	4.53	0.038	0	0	0.00000	0.00	0.00	0	2	8	6.50	0.39
1	35G	0.0	0.00	84.5	4.53	0.038	4	2480	0.02834	3.75	0.00	0	2	0	6.50	0.00
1	36G	47.5	3.95	132.0	8.58	0.144	0	0	0.00000	0.00	0.00	0	7	17	6.47	0.59
1	37H	27.7	1.58	27.7	1.58	0.010	0	0	0.00000	0.00	0.00	0	202	11	6.44	0.15
1	38H	0.0	0.00	27.7	1.58	0.010	4	1864	0.05277	2.25	0.00	0	202	0	6.44	0.00
1	39H	34.0	2.08	61.7	3.69	0.041	0	0	0.00000	0.00	0.00	0	2	11	6.45	0.36
1	40GH	61.7	3.69	193.7	12.27	0.185	4	1104	0.02382	5.00	0.00	0	2	0	6.45	0.00
1	41G	8.1	0.79	201.8	13.14	0.250	0	0	0.00000	0.00	0.00	0	7	10	6.43	0.72
1	42AF	77.5	4.67	722.8	14702.43	1245.350	0	0	0.00000	0.00	0.00	0	7	0	6.43	0.00
1	43AG	201.8	13.14	924.6	14715.57	1245.600	5	1142	0.01836	29.00	0.00	0	7	0	6.43	0.00
1	44A	33.4	3.37	958.0	14745.36	1261.553	0	0	0.00000	0.00	0.00	0	7	13	6.38	0.76
1	45I	31.3	1.89	31.3	1.89	0.011	0	0	0.00000	0.00	0.00	0	2	9	6.42	0.36
1	46I	0.0	0.00	31.3	1.89	0.011	4	1543	0.03284	2.50	0.00	0	2	0	6.42	0.00
1	47I	31.8	2.69	63.1	4.61	0.059	0	0	0.00000	0.00	0.00	0	7	16	6.42	0.61

1	48AI	63.1	4.61	1021.1	14749.97	1261.611	5	1810	0.01191	34.00	0.00	0	7	0	6.42	0.00
1	49A	33.8	3.85	1054.9	14802.67	1291.521	0	0	0.00000	0.00	0.00	0	7	14	6.34	0.88
1	50J	36.3	3.33	36.3	3.33	0.027	0	0	0.00000	0.00	0.00	0	6	12	6.30	0.69
1	51J	0.0	0.00	36.3	3.33	0.027	4	1606	0.02443	2.75	0.00	0	6	0	6.30	0.00
1	52J	30.2	3.39	66.5	6.76	0.098	0	0	0.00000	0.00	0.00	0	6	16	6.30	0.87
1	53AJ	66.5	6.76	1121.4	14809.43	1291.619	5	1915	0.00733	41.00	0.00	0	6	0	6.30	0.00
1	54A	51.4	6.04	1172.8	14877.19	1330.165	0	0	0.00000	0.00	0.00	0	7	16	6.26	0.92
1	55A	0.0	0.00	1172.8	14877.19	1330.165	0	0	0.00000	0.00	0.00	0	7	0	6.26	0.00

Normal End of MODRAT

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Appendix D

HEC-HMS, WMS, and Microsoft Excel Calculation Files (CD Format)

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