DRAINAGE STUDY

For

VALLEY CENTER STORAGE
COUNTY OF SAN DIEGO, CALIFORNIA
APN: 186-230-22

Prepared for:

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EXECUTIVE SUMMARY

Introduction

The purpose of this report is to demonstrate that the proposed gravel parking lot acting as a basin plus the downstream infiltration basin to be built on the Valley Center Storage project will reduce the peak flows from the 100-year storm event when compared to existing conditions.

For Drainage analysis, three (3) points of compliance (POC) have been designated within the project site for hydrologic analysis purposes. However, only POC-1 will be analyzed in detail this report because in post-developed conditions, the entire pre-development areas draining to POC-2 (0.18 ac) and POC-3 (0.83 ac) will be significantly reduced in post-development conditions as 100% of POC-1 area (0.18 ac) and 76% of POC-3 area (0.63 ac) will be routed to POC-1, so that (a) no area drains to POC-2 in post-development conditions, and (b) a reduced area without any impervious surface (0.20 ac) will drain to POC-3.

It is important to emphasize that the project site lies outside any FEMA 100-year floodplain zone. Therefore, no Letters of Map Revision will be required.

Per County of San Diego drainage criteria, the Modified Rational Method should be used to determine peak design flowrates when the contributing drainage area is less than 1.0 square mile. Since the total watershed area discharging from the site is less than 1.0 square mile, peak flows will be calculated using Rational Method (no need to use AES model as the time of concentration in post-development conditions is less than 5 minutes for the areas draining to the gravel layer acting as detention basin and also for the entire area draining to the infiltration basin).

Methodology used for the computation of design rainfall events, runoff coefficients, and rainfall intensity values are consistent with criteria set forth in the “County of San Diego Hydrology Manual” (CSD-HM). A more detailed explanation of methodology used for this analysis is listed in Appendix 3 of this report. The basic assumptions for peak flow calculations can be summarized as follows:

- Pre-development time of concentration is associated with an initial area 100% pervious, plus a travel time defined by Kirpich equation (section 3.1.4.2(a) of the CSD-HM). This increases Tc in pre-development conditions and reduces intensity, minimizing pre-development peak flow (conservative assumption, see calculations in Appendix 5)
- Post-development time of concentration is tied to a highly impervious initial sub-area and a high velocity in the pipes flowing to the infiltration basin, so conservatively the Tc is as small as possible (5 min). This increases the intensity and the unrouted peak flow (see calculations in Appendix 6).

Pre and post-developed condition peak flows were calculated using CSD-HM formulas. The corresponding post-development hydrographs were generated using the Rick RatHydro program by Rick Engineering based on the contributing area, the C coefficient, the peak flow, and the time interval associated with the time of concentration (a 5-minute time interval was used for all hydrographs, maximizing the peak flow). Hydraulic Modified-Puls detention basin routing of the Rat-Hydro hydrographs was performed using the Army Corps of Engineers HEC-HMS software.

The six-hour, 100-year storm depth P6 has been obtained from NOAA website at the coordinates of the project. (See Appendix 2).

Hydrologic Soil Group (HSG) information has been obtained from USDA web site at the project area (Appendix 2). The project site contains type B soil. Runoff Index values will be determined with this information in conjunction with the methodology presented in the CSD-HM.

Project Description

The proposed Valley Center Storage project is a commercial project that will be constructed in Valley Center, California. The project includes the construction of commercial storage buildings, roads (mostly gravel), associated landscaping, and an infiltration basin to mitigate peak runoff.

The Valley Center Storage project site is located east of Old Road and west of Valley Center Road in Valley Center, California.

Pre-Development Conditions

Under pre-development conditions, the Valley Center Storage project site is partially developed containing 2 existing building and some impervious driveways and parking lots which is the extent of the impervious area (about 50% of the site). The other half of the site is pervious including sparse vegetation, landscape, and some gravel roads/parking areas. In pre-developed conditions, there are three (3) POCs. However in this report, only (1) POC, POC-1, will be analyzed because the entire area (0.179 ac) draining to POC-2 in pre-developed conditions will be routed to POC-1 in post-developed conditions and the area draining to POC-3 (0.83 acres with considerable impervious percentage) will reduce to 0.20 acres with no impervious area in post-development conditions.

Table 1– SUMMARY OF EXISTING CONDITIONS FLOWS

Discharge Location	Drainage Area (Ac)	Weighted Runoff Coefficient (C)	Time of Concentr. (min)	100-Year Peak Flow (cfs)
100-101	0.06	0.25	7.71(1)	0.10
101-102	1.02	0.49	9.31(2)	3.01
102-1000	2.20	0.54	11.69(2)	6.19
POC-1	**3.28**	**0.519**	**11.69(2)**	**8.87**
POC-2	**0.18**	**0.25**	**(not needed)**	**> post-dev.**
POC-3	**0.86**	**0.72**	**(not needed)**	**> post-dev.(3)**

Notes: (1): Initial time of concentration from Fig. 3-3 of CSD-HM (formula in Fig. 3-3)
(2): Addition of Kirpich travel time (per 3.1.4.1B(b) of CSD-HM, conservative approach) to (1)
(3): Even if Tc = 11.69 min, Q3-Pre would be 3.23 cfs, larger than Q3-Post.

Post-Development Conditions

The post-development improvements include commercial buildings, gravel driveways, and associated landscaping. The site is split into the following parts: first DMA-1A composed of areas draining to the proposed gravel pavement that will act as a detention basin. The discharge of the gravel pavement will get into the infiltration basin located in DMA-1Ba where it will confluence with DMA-1Bb (both areas modeled as DMA-1B for hydrograph determination purposes). From there, the infiltration basin discharge (BMP-1) will join the hydrograph by-passing the BMP (slopes) to generate a post-dev. peak flow.

For calculation purposes, a conservative approach will be used to model the gravel layer: it will be considered similar to an impervious area because there will be placed above an impervious liner; the retention capacity of the gravel will be neglected (conservative approach) and only the detention capacity of the void spaces will be used (routing will be considered). As there are over 30 underground orifices draining the gravel layer with identical invert, the initial elevation will be the invert of the orifices. Regarding the infiltration basin, the initial elevation will correspond with the invert of the orifice in the gravel layer, and all volume underneath (that will infiltrate into the soil) will be considered full of water at the start of the storm event.

The bypass area consists of 12% of the POC-1 total area. This by-pass area is about 96% pervious. Runoff from the bypass area will overland flow to Old Road prior to discharging to POC-1 where it will confluence with the flows from the treated flow from the detention system. Please refer to the project WQMP for water quality analysis and results as water quality considerations are outside the scope of this report.

Table 2– SUMMARY OF DEVELOPED CONDITIONS FLOWS-UNMITIGATED

Discharge Location	Drainage[(1)] Area (Ac)	Weighted Runoff Coefficient (C)	Time of Concentr. (min)	100-Year Peak Flow (cfs)
100-101	0.25	0.87	5	1.96
101-102	3.13	0.75	5	21.16
103-104	0.19	0.25	5	0.43
120-121	0.11	0.48	5	0.48
121-122 (piped to BMP-1)	0.13	0.57	5	0.67
130-1000 (bypass)	0.53	0.28	5	1.32
POC-1 (to be routed)	**3.81**	**0.72**	**5[(2)]**	**24.69**
POC-1	**4.34**	**0.67**	**5**	**26.01**
POC-2	**0**	**-**	**-**	**0, < pre-dev.**
POC-3	**0.20**	**0.25**	**5**	**< pre-dev.[(3)]**

Notes: (1) Increase in total area due to area previously draining to POC-2 or POC-3 now routed to POC-1.
(2) Conservative approach: Tc = 5 min for all sub-areas (I = 9.01 in/hr).
(3) Even it tc = 5 min, Q3-post would be 0.45 cfs, less than Q3-Pre.

Prior to discharging from the project site, runoff will be captured in the gravel layer and released slowly into the infiltration basin which discharges runoff eventually to one (1) POC in accordance with standards set forth by the Regional Water Quality Control Board and the County of San Diego's BMP Design Manual (see Project's SWQMP).

The multi-purpose infiltration basin is located within the project site and is responsible for addressing water quality. Combined with the gravel pavement acting as a detention basin, it is responsible for hydromodification prevention, and flood control requirements for the project.

In developed conditions, the basin will have a surface depth and a riser spillway structure. Flows will infiltrate through the surface of the facility. The riser structure will act as a spillway such that peak flows can be safely discharged to the receiving storm drain system. Tables 3, 4 and 5 provide a summary of the BMPs and riser structure.

TABLE 3 – SUMMARY OF GRAVEL LAYER (AS STORAGE)

BMP	Gravel Pavement			Outlets			
	Area (sq-ft)	Depth (in)	n	Number - orifices	D (in)	Number - weirs	Perimeter (ft)
Up-DET	57,210	18	0.40	35	$^{7}/_{16}$	16 @ inv. 1.50	6

TABLE 4 – SUMMARY OF BMP INFILTRATION BASIN DIMENSIONS

BMP	Tributary Area (Ac)	DIMENSIONS			
		BMP Area(1) (ft^2)	Gravel thickness (ft)	Depth (ft) (gravel + surface)	Total Basin Surface Depth(2) (ft)
1	3.81	5,625	2.50	5.50	3.00

Notes: (1) Area at bottom of surface slope (6" of the slope covered by gravel).
(2) Total surface depth of BMP from top crest elevation to the surface of the basin

TABLE 5 – SUMMARY OF OUTLET DETAILS

BMP	Low Flow Orifice		Emergency Overflow	
	Number & D (in)	Invert (ft)	L(1) (ft)	Invert (ft)
1	4, 1" each	3.25	16	3.917 (3'11")

Notes:

The developed condition peak flow was calculated using the modified rational method. The corresponding hydrograph was generated using the RickRat-Hydro program by Rick Engineering. This hydrographs was then routed through the proposed on-site detention facilities in HEC-HMS (first, the gravel layer and then the infiltration basin, where the small hydrograph from DMA-1B is also added downstream of the gravel layer). HMS also combined the by-passed hydrograph (also obtained with RickRat-Hydro) with the runoff hydrograph exiting the infiltration basin, to determine the maximum peak flow released by the system. The HMS routing results are summarized in Table 6. HMS hydrograph combination (by-pass + routing) are included in Table 7.

Table 6– SUMMARY OF DETENTION BASINS ROUTING

Detention Basin	100-Year Peak Inflow (cfs)	100-Year Peak Outflow (cfs)	Peak Water Surface Elevation (ft)
Gravel Pavement	23.12	0.201	1.28 ft
Infiltration Basin (BMP-1)	1.744	0.195	3.92 ft

Rational method hydrograph, stage-storage, stage-discharge relationships and HEC-HMS model outputs are provided in Appendix 7 of this report.

Summary of Results and Conclusions

Table 7 summarizes developed and existing condition drainage areas and resultant 100-year peak flow rates at the POC from the Valley Center Storage project (mitigated peak includes small area not routed thru BMP).

Table 7– SUMMARY OF PEAK FLOWS

Discharge Location	Area (ac)			
	Existing	Unmitigated	Mitigated	Difference
POC-1	3.28	4.34	4.34	+1.06
Discharge Location	**100 year Peak Flow (cfs)**			
	Existing	**Unmitigated**	**Mitigated**	**Difference**
POC-1	8.87	26.01	1.38	-7.49

As shown in the above table, even with the conservative approach used for Tc (in both pre- and post-development conditions) the proposed Valley Center Storage project site will result in a significant net decrease of peak flow discharged from the POC. POC-1 has decreased by approximately 7.49 cfs to a value of 1.38 cfs, only 16% of the pre-development peak flow value. All developed runoffs will receive water quality treatment in accordance with the site specific SWQMP.

Certifying Statement:

The runoff peak flow from the proposed development will be significantly reduced when compared with the runoff peak flow from the existing conditions (1.38 cfs after development vs 8.87 cfs before development, for the 6 hour- 100-year storm analyzed). Velocity of runoff will also be reduced, because even if the geometry of the receiving channel is unknown and the velocity cannot be calculated with precision at the receiving system downstream, discharge velocity reduces when the peak flow significantly reduces. Therefore, there will not be adverse impacts to downstream landowners or facilities regarding flooding or erosion.

ADDITIONAL INFORMATION

Hydraulic Sizing

There is an unusual occurrence because of the gravel pavement incorporated in the project and the 35 small orifices draining its void space: even though the bottom of the gravel layer is impervious, it is at least 18" thick, and the amount of volume in the voids of the gravel is so large that the 6 hour – 100 year storm event associated with the contributing area of the gravel pavement does not reach the grated inlet invert elevation according to the HEC-HMS results. Therefore, *there is no peak flow to design the pipes under standard conditions* (recall that the peak will not reach the inlet from the top as water will permeate through the gravel).

Nonetheless, continuous simulation shows that ponding can indeed reach the top of the gravel because very large-duration storm events (or few consecutive storm events) might have enough volume to compensate for the long time it takes the gravel system to draw-down to level 0.00 (about 91 hours once is 100% full).

The largest peak flow observed leaving the gravel area was about 2.314 cfs in 57 years of continuous simulation results on 1/29/1980 at 5:00 am. The largest peak flow observed leaving the infiltration area was about 1.767 cfs on 12/6/1966 at 8:00 pm. However, those two peaks are hourly, with a Cunane's Return Period of 95.33 years, and the magnitude of the peak for shorter duration cannot be determined from an hourly continuous simulation analysis. The author of this report decided to use the following conservative approach, as there is no specific guidance or standard for this specific case when the design peak flow is not associated with a standard 6 hour-100 year storm but rather with an hourly peak coming from continuous simulation: first, extrapolate the peak to obtain the 100-year continuous simulation value (approximately 2.34 cfs and 1.79 cfs respectively). Second, let's assume that the hourly peak is proportional to the hourly 100-year rainfall NOAA intensity and then let's assume that the maximum peak is proportional to the NOAA 5-min-100-year rainfall intensity (this conservative assumption implies that the max. 5-min intensity has happened when the maximum 1-hr peak occurred). Therefore, the peak flows will be (a) $Q \approx 2.34$ cfs /NOAA 1-hr intensity x NOAA 5 min intensity = $2.34 \cdot 4.404/1.43 = 7.21$ cfs (out of gravel layer) and (b) $1.79 \cdot 4.404/1.43 = 5.51$ cfs (out of infiltration basin). The first value results in a peak flow of 0.45 cfs per grated inlet. Therefore, all pipes will be sized assuming each grated inlet overflows 0.45 cfs. The two (2) largest pipes (entering the infiltration pond and discharging out of the infiltration pond) will be designed with a peak flow of 7.21 cfs and 5.51 cfs respectively.

Hydraulic sizing guidance Table for pipe selection is shown in Appendix 4. For simplification purposes, all pipes will have a slope of 0.5% for pipe selection. Hydraulic sizing of 18" pipes is detailed in next section.

Confirmation of Pipe Sizes (only pipes 18" or larger)

Table 8 shows the results of Q (cfs), v (ft/s), HGL = h (depth of flow, ft), EGL = H (energy of flow, ft), for the 2 pipes with D ≥ 18 inches (1.5 ft). Manning's equation is applied. Detailed HGL for gradually varied profiles is not necessary given the excess of capacity for the pipes (the energy level EGL is less than 110% the diameter of the pipe, and the water depth is less than 67% of the diameter of the pipe, see Table 8).

Table 8 – DESIGN OF D = 18" PIPES

Pipe	D	s (ft/ft)	Q (cfs)	h (ft) = HGL	R_H (ft)	v (ft/s)	H (ft) = EGL
23	18"	0.0097	7.21	0.92 < 1.50	0.421	6.33	1.54 (< 1.1·D)
28	18"	0.0171	5.51	0.66 < 1.65	0.345	7.35	1.50 (< 1.1·D)

Infiltration Basin Freeboard

Regarding free board for the unmitigated Q_{100} discharging into the infiltration basin, the unmitigated 100-year peak flow that could enter the infiltration basin would be 26.01 cfs if the gravel basin did not exist. However, not only it exists, but is also tied to 35 small orifices that will cause the standard 6hr – 100yr storm event to start occurring into an empty gravel layer, whose volume exceeds the runoff volume of the 6hr-100yr storm (it is practically impossible that all 35 orifices tied to 35 different French Drains draining to 16 different inlet structures will be clogged at the same time). In this case, the maximum peak flow entering the infiltration basin from a 6hr-100yr storm will be the peak flow from the area not draining to the gravel area (1.58 cfs) plus the discharge of the gravel layer at the depth when 2/3 of the storm has occurred (this depth is 0.86' at t = 4:05 hr and the corresponding discharge is 0.16 cfs, per HEC-HMS results). Thus, the maximum peak flow would be 1.58 + 0.16 = 1.74 cfs. In this case, the infiltration basin water elevation would be about 4.02' and the freeboard about 1.48'.

Analyzing continuous simulation peak flow results, the largest hourly peak flow entering the infiltration basin is 2.567 cfs with a Cunnane's Return Period of 95.33 years while the second largest is 2.213 cfs with a Cunnane's Return Period of 35.75 years. The approximate 100-year hourly peak flow will be, using extrapolation, about 2.595 cfs. Assuming that the 60-min peak flow is proportional to the 1 hr – 100 yr NOAA intensity (1.43 in/hr), and assuming conservatively that the 5-min peak flow is proportional to the 5 min – 100 yr NOAA intensity (4.404 in/hr) the total peak flow would be calculated as 2.595 · 4.404 / 1.43 = 7.99 cfs. This peak flow is larger than the peak flow obtained with a simpler 6hr – 100yr approach. The level of the infiltration basin required to discharge 7.99 cfs (unmitigated) is 4.22 ft, which generates a freeboard of 1.27'. **Both scenarios satisfy Freeboard > 1.00 ft.**

Drawdown

Drawdown calculations are included in the area-volume-elevation-discharge tables, ignoring infiltration for the gravel layer, and including infiltration for the infiltration basin. Total drawdown times are 91 hours for gravel layer (last 0.1 ft takes 25 hours to drain) and 89 hours for the infiltration basin (74 hours for the infiltration part below level 3.25 ft, ignoring contribution of water pressure over the bottom soil).

References

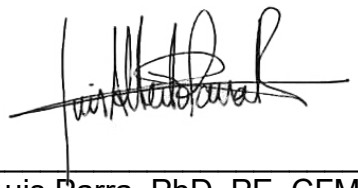
"*County of San Diego Hydrology Manual*", June 2003

"*Technical Memorandum: SWMM Modeling for Valley Center Storage*", by REC Consultants

Declaration of Responsible Charge

I HEREBY DECLARE THAT I AM THE ENGINEER OF WORK FOR THIS PROJECT, THAT I HAVE EXERCISED RESPONSIBLE CHARGE OVER THE DESIGN OF THE PROJECT AS DEFINED IN SECTION 6703 OF THE BUSINESS AND PROFESSIONS CODE, AND THAT THE DESIGN IS CONSISTENT WITH THE CURRENT STANDARDS.

I UNDERSTAND THAT THE CHECK OF PROJECT DRAWINGS AND SPECIFICATIONS BY THE COUNTY OF SAN DIEGO IS CONFINED TO A REVIEW ONLY AND DOES NOT RELIEVE ME, AS ENGINEER OF WORK, OF MY RESPONSIBILITIES FOR PROJECT DESIGN.



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APPENDIX LIST

Appendix 1: Maps

Appendix 2: NOAA Precipitation
USDA Hydrologic Soil Type

Appendix 3: Methodology

Appendix 4: Hydraulic Sizing

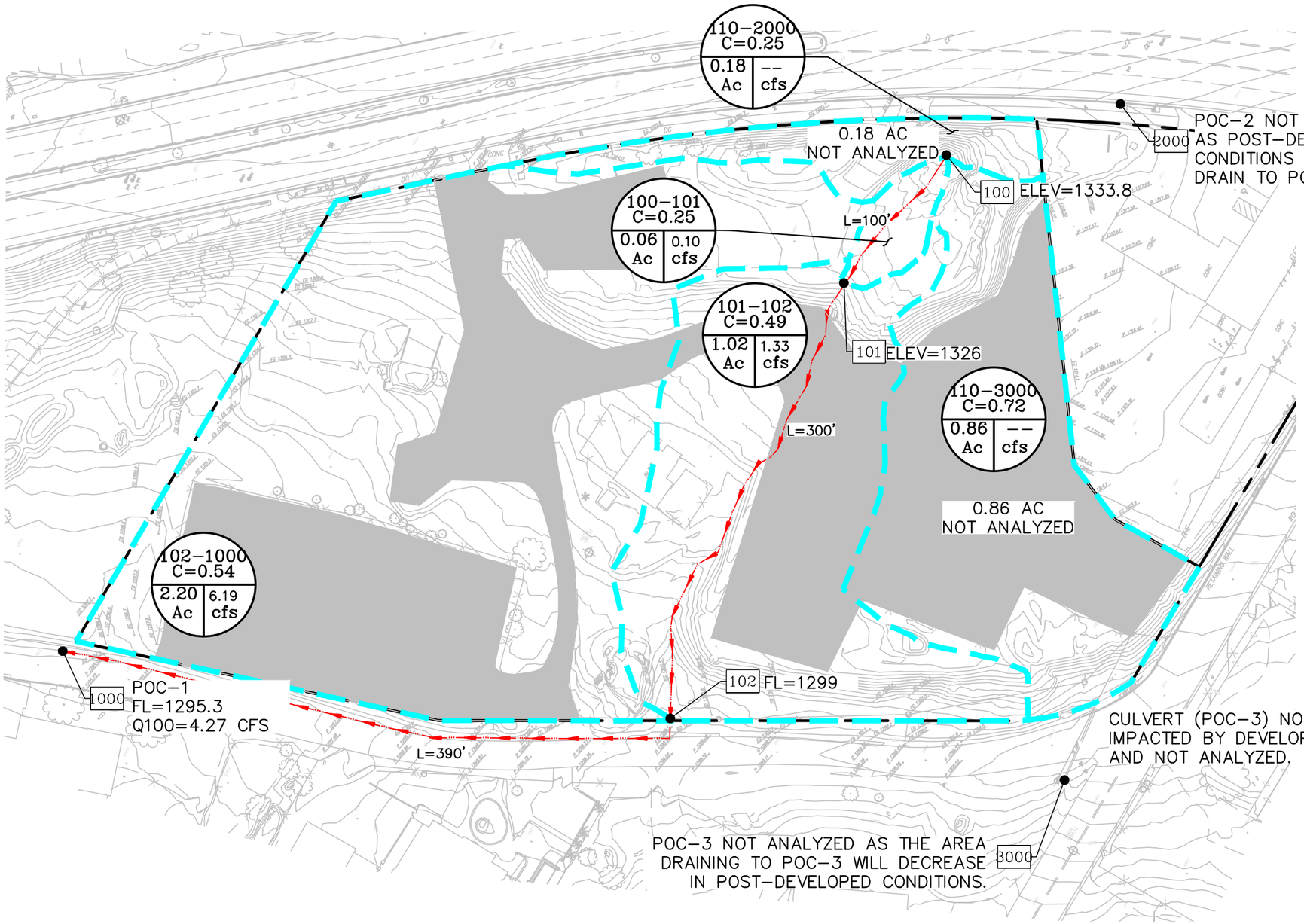
Appendix 5: 100 Year Hydrologic Analysis for Existing Conditions

Appendix 6: 100 Year Hydrologic Analysis for Unmitigated Post Developed Conditions

Appendix 7: Modified-Puls Detention Routing

Appendix 8: 100 Year Hydrologic Analysis for Mitigated Post Developed Conditions (Addition of Hydrographs)

APPENDIX 1: MAPS



LEGEND

BASIN LIMITS

PROJECT BOUNDARY

FLOW–LINE

IMPERVIOUS AREA

NOTE: TYPE B SOIL UNDERLYING ENTIRE SITE

70 35 0 70 140 210

SCALE: 1" = 70'

PRE DEVELOPED DRAINAGE

VALLEY CENTER STORAGE
13630 OLD RD
VALLEY CENTER, CA 92082

SHEET 1 OF 1

REC Consultants, Inc.

Civil Engineering ~ Land Surveying
Water Resources

2970 Fifth Avenue, Unit 340
San Diego, CA 92103
(619)232–9200 (619)232–9210 Fax

SAVE DATE: 1/20/2026 ~ PLOT DATE: 1/20/2026 ~ FILE NAME: P:\Acad\7032 Alidade\026 Valley Center Storage\Drainage\Drainage Exhibit_PRE_01–05–26.dwg

LEGEND

BASIN LIMITS

PROJECT BOUNDARY

FLOW–LINE

UPSTREAM DETENTION GRAVEL ACTING AS DETENTION BASIN

VALLEY CENTER ROAD

VALLEY CENTER ROAD

OLD ROAD (PUBLIC)

100–101 C=0.87 | 0.25 Ac | 1.96 cfs

100 ELEV=1319

2000 POC–2 NOT ANALYZED AS POST–DEVELOPMENT CONDITIONS WILL NOT DRAIN TO POC–2.

L=100'

ELEV=1317 101

L=64'

ELEV=1316.35 FL=1310.35 102

120 ELEV=1319

120–121 C=0.48 | 0.11 Ac | 0.48 cfs

101–102 C=0.75 | 3.13 Ac | 21.16 cfs

121 ELEV=1315.65

L=100'

122 ELEV=1315 IE=1312

L=29'

L=488'

121–122 C=0.57 | 0.13 Ac | 0.67 cfs

104 FL=1297

ELEV=1317 110

L=545'

L=100'

ELEV=1317 130

103 FG=1302

L=33'

L=200'

1000 POC–1 FL=1295.3

110–111 C=0.25 | 0.20 Ac | 0.45 cfs

L=640'

L=80'

111 ELEV=1302

130–1000 C=0.28 | 0.53 Ac | 1.32 cfs

CULVERT (POC–3) NOT IMPACTED BY DEVELOPMENT AND NOT ANALYZED.

103–104 C=0.25 | 0.19 Ac | 0.43 cfs

TOT. INF. C=0.72 | 3.81 Ac | 24.69 cfs

BMP-1
INFILTRATION BASIN

POC–3 NOT ANALYZED AS THE AREA DRAINING TO POC–3 WILL DECREASE IN POST–DEVELOPED CONDITIONS.

3000

NOTE: FLOWS CROSSING AS 110-111 IS SURFACE FLOW, WHILE FLOW FROM 122 IS PIPED TO INFILTRATION BASIN.

NOTE: TYPE B SOIL UNDERLYING ENTIRE SITE

Q100 = 1.354 CFS (MITIGATED)

NOTE:
THERE IS NOT UNMITIGATED FLOW AS THE 6 HR – 100 YEAR STORM IS DETAINED IN THE GRAVEL

70 35 0 70 140 210

SCALE: 1" = 70'

NOTE:
DOWNSTREAM OF NODE 100, DRAINAGE IS COLLECTED IN AN EXISTING DOWNSTREAM CULVERT AND MITIGATED PEAK FLOW HAS NO ADVERSE IMPACT IN THAT FACILITY.

PROPOSED DRAINAGE

VALLEY CENTER STORAGE
13630 OLD RD
VALLEY CENTER, CA 92082

SHEET 1 OF 1

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Civil Engineering ~ Land Surveying
Water Resources

2970 Fifth Avenue, Unit 340
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(619)232–9200 (619)232–9210 Fax

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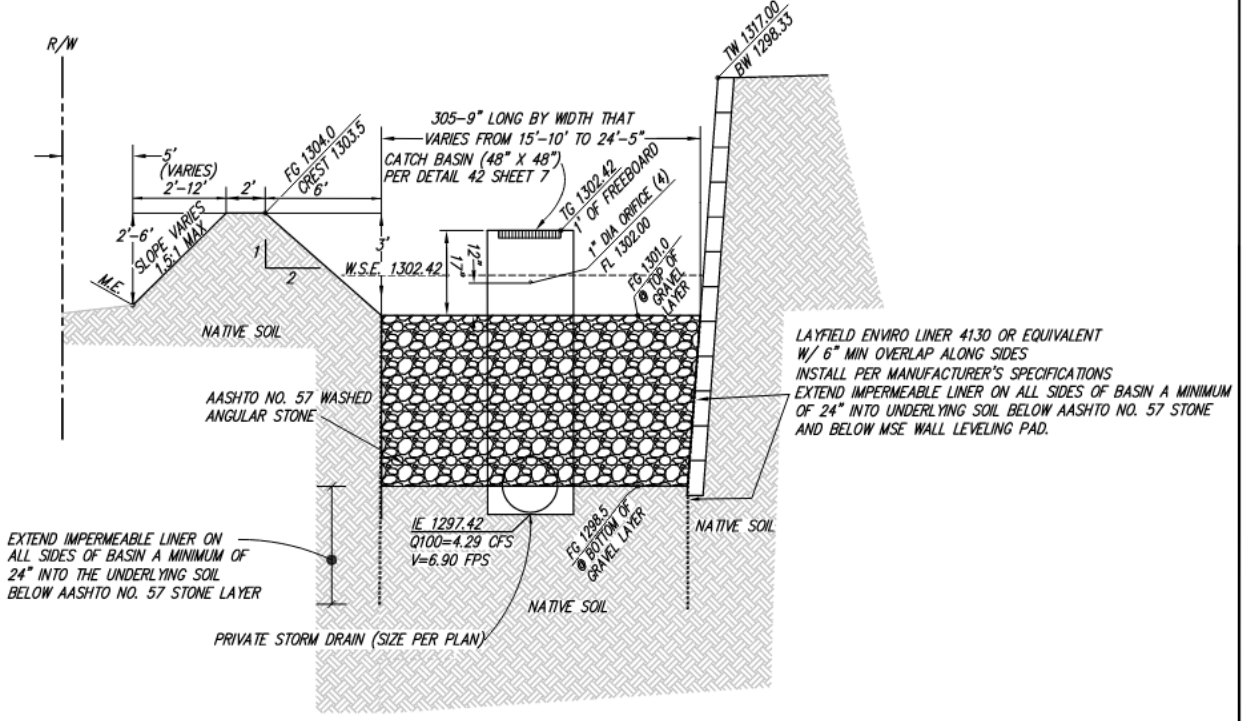
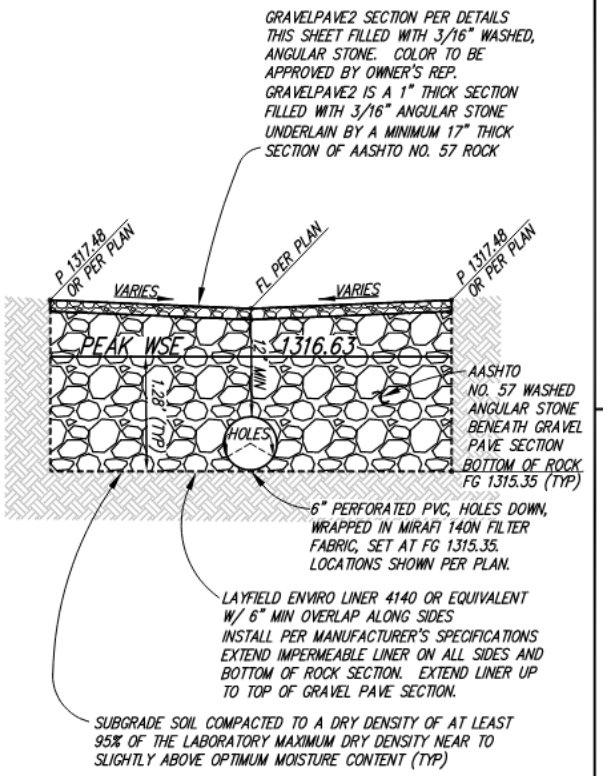
INFILTRATION BASIN DETAILS



DETAIL: INFILTRATION BASIN INF1 – SECTION 'C' – 'C' (PVT)

NOT TO SCALE



DETAIL: GRAVELPAVE2 DETENTION AREA (PVT)

NOT TO SCALE

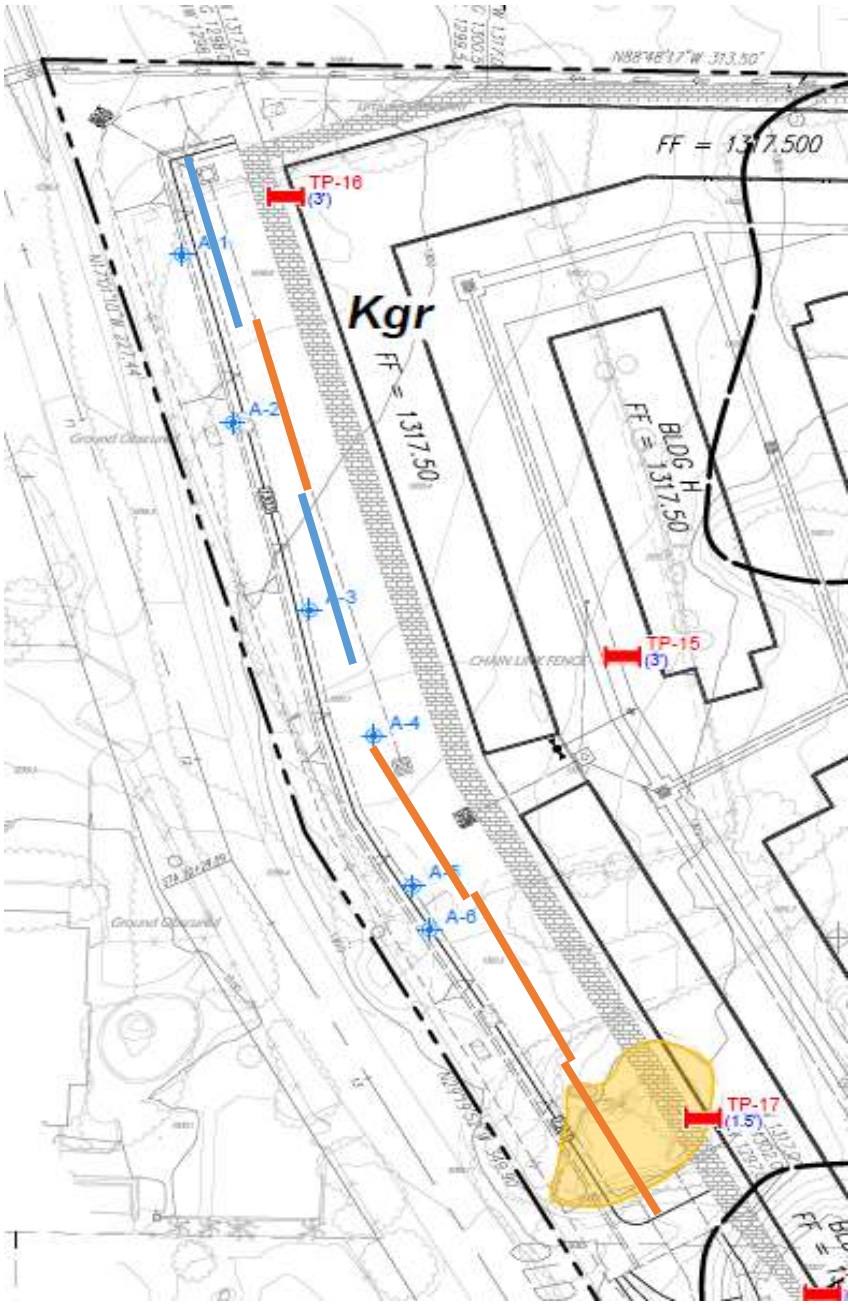
APPENDIX 2: PRECIPITATION AND SOIL INFORMATION

- **NOAA PRECIPITATION**
- **USDA HYDROLOGIC SOIL TYPE**

INFILTRATION RATE FOR DESIGN

Point	f (in/hr)	Elev.	% bottom
A-1	0.141	1300	15.0%
A-2	0.337	1301	15.0%
A-3	0.606	1300	25.0%
A-4	*Not performed*		
A-5	1.463	1301	22.5%
A-6	0.353	1301	22.5%

ALL: 0.632
(NO SAFETY FACTOR)



SF of Design

Inf. Test method:	1
(5 tests performed)	
Soil Texture class:	1
(Rocky coarse sandy loam)	
Soil variability:	2
(moderately homogeneous)	
Depth of GW:	1
(not encountered)	

S_A: 1.25

Pretreatment:	2
No runoff from unpaved areas	
Resiliency:	1
Protection gravel included	
Compaction:	2
Low likelihood	

S_B: 1.75

SF: 2.19

INFILTRATION FOR DESIGN PURPOSES: (0.632 / 2.19) **0.289 in/hr**

NOAA Atlas 14, Volume 6, Version 2
Location name: Valley Center, California, USA*
Latitude: 33.2197°, Longitude: -117.0353°
Elevation: 1312 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.125 (0.105-0.150)	0.156 (0.131-0.188)	0.199 (0.167-0.239)	0.235 (0.195-0.285)	0.285 (0.229-0.359)	0.325 (0.255-0.419)	0.367 (0.281-0.486)	0.413 (0.306-0.562)	0.476 (0.338-0.679)	0.528 (0.361-0.781)
10-min	0.179 (0.151-0.215)	0.224 (0.188-0.269)	0.285 (0.239-0.343)	0.336 (0.280-0.408)	0.408 (0.328-0.514)	0.466 (0.366-0.600)	0.527 (0.402-0.696)	0.591 (0.438-0.806)	0.683 (0.484-0.973)	0.757 (0.518-1.12)
15-min	0.216 (0.182-0.260)	0.271 (0.228-0.325)	0.344 (0.289-0.415)	0.407 (0.338-0.494)	0.494 (0.396-0.622)	0.564 (0.442-0.726)	0.637 (0.487-0.842)	0.715 (0.530-0.974)	0.826 (0.586-1.18)	0.916 (0.626-1.35)
30-min	0.314 (0.264-0.376)	0.392 (0.330-0.471)	0.499 (0.419-0.601)	0.589 (0.490-0.716)	0.716 (0.574-0.901)	0.817 (0.641-1.05)	0.923 (0.705-1.22)	1.04 (0.768-1.41)	1.20 (0.849-1.70)	1.33 (0.907-1.96)
60-min	0.487 (0.410-0.584)	0.609 (0.512-0.731)	0.774 (0.650-0.933)	0.914 (0.760-1.11)	1.11 (0.891-1.40)	1.27 (0.994-1.63)	1.43 (1.09-1.89)	1.61 (1.19-2.19)	1.86 (1.32-2.64)	2.06 (1.41-3.04)
2-hr	0.697 (0.587-0.835)	0.862 (0.725-1.03)	1.09 (0.912-1.31)	1.28 (1.06-1.56)	1.55 (1.25-1.96)	1.78 (1.39-2.29)	2.01 (1.54-2.66)	2.26 (1.68-3.08)	2.62 (1.86-3.74)	2.92 (2.00-4.31)
3-hr	0.848 (0.715-1.02)	1.05 (0.880-1.26)	1.32 (1.11-1.59)	1.55 (1.29-1.88)	1.88 (1.51-2.37)	2.15 (1.69-2.77)	2.44 (1.86-3.22)	2.75 (2.04-3.74)	3.19 (2.26-4.55)	3.56 (2.43-5.26)
6-hr	1.18 (0.996-1.42)	1.46 (1.23-1.75)	1.84 (1.54-2.22)	2.17 (1.80-2.63)	2.64 (2.11-3.32)	3.02 (2.36-3.88)	3.42 (2.61-4.52)	3.86 (2.86-5.26)	4.48 (3.18-6.38)	5.00 (3.42-7.39)
12-hr	1.63 (1.37-1.95)	2.03 (1.71-2.44)	2.58 (2.17-3.11)	3.05 (2.54-3.71)	3.72 (2.98-4.68)	4.25 (3.33-5.48)	4.82 (3.68-6.37)	5.42 (4.02-7.38)	6.27 (4.45-8.94)	6.97 (4.76-10.3)
24-hr	2.10 (1.86-2.43)	2.67 (2.35-3.09)	3.43 (3.02-3.98)	4.08 (3.56-4.76)	4.98 (4.21-6.01)	5.70 (4.73-7.02)	6.46 (5.24-8.13)	7.26 (5.73-9.39)	8.40 (6.37-11.3)	9.31 (6.84-12.9)
2-day	2.57 (2.27-2.98)	3.30 (2.91-3.82)	4.29 (3.77-4.97)	5.12 (4.47-5.99)	6.31 (5.34-7.61)	7.26 (6.02-8.93)	8.26 (6.70-10.4)	9.33 (7.37-12.1)	10.8 (8.23-14.6)	12.1 (8.88-16.8)
3-day	2.84 (2.51-3.28)	3.67 (3.24-4.25)	4.80 (4.22-5.57)	5.76 (5.03-6.74)	7.14 (6.04-8.61)	8.24 (6.84-10.1)	9.41 (7.63-11.9)	10.7 (8.42-13.8)	12.5 (9.46-16.8)	13.9 (10.2-19.3)
4-day	3.11 (2.75-3.60)	4.04 (3.56-4.67)	5.30 (4.67-6.15)	6.38 (5.57-7.46)	7.93 (6.70-9.56)	9.17 (7.61-11.3)	10.5 (8.50-13.2)	11.9 (9.40-15.4)	13.9 (10.6-18.7)	15.6 (11.4-21.7)
7-day	3.65 (3.22-4.22)	4.77 (4.21-5.52)	6.29 (5.54-7.30)	7.59 (6.62-8.87)	9.43 (7.98-11.4)	10.9 (9.05-13.4)	12.5 (10.1-15.7)	14.2 (11.2-18.3)	16.6 (12.6-22.3)	18.5 (13.6-25.7)
10-day	3.99 (3.52-4.61)	5.24 (4.62-6.06)	6.93 (6.10-8.04)	8.37 (7.31-9.78)	10.4 (8.80-12.6)	12.0 (9.99-14.8)	13.8 (11.2-17.3)	15.6 (12.3-20.2)	18.3 (13.9-24.6)	20.4 (15.0-28.4)
20-day	4.83 (4.27-5.59)	6.42 (5.66-7.42)	8.56 (7.53-9.93)	10.4 (9.06-12.1)	12.9 (10.9-15.6)	15.0 (12.4-18.5)	17.2 (13.9-21.6)	19.5 (15.4-25.2)	22.8 (17.3-30.7)	25.5 (18.7-35.5)
30-day	5.84 (5.16-6.75)	7.79 (6.87-9.01)	10.4 (9.18-12.1)	12.7 (11.1-14.8)	15.8 (13.4-19.1)	18.4 (15.2-22.6)	21.1 (17.1-26.5)	23.9 (18.9-31.0)	28.1 (21.3-37.7)	31.4 (23.1-43.7)
45-day	6.94 (6.13-8.02)	9.26 (8.17-10.7)	12.4 (10.9-14.4)	15.1 (13.2-17.6)	18.9 (16.0-22.8)	21.9 (18.2-27.0)	25.2 (20.4-31.7)	28.7 (22.6-37.1)	33.7 (25.5-45.3)	37.8 (27.7-52.5)
60-day	8.05 (7.11-9.30)	10.7 (9.44-12.4)	14.3 (12.6-16.6)	17.4 (15.2-20.4)	21.8 (18.4-26.3)	25.4 (21.0-31.2)	29.1 (23.6-36.7)	33.2 (26.2-43.0)	39.1 (29.7-52.6)	44.0 (32.3-61.2)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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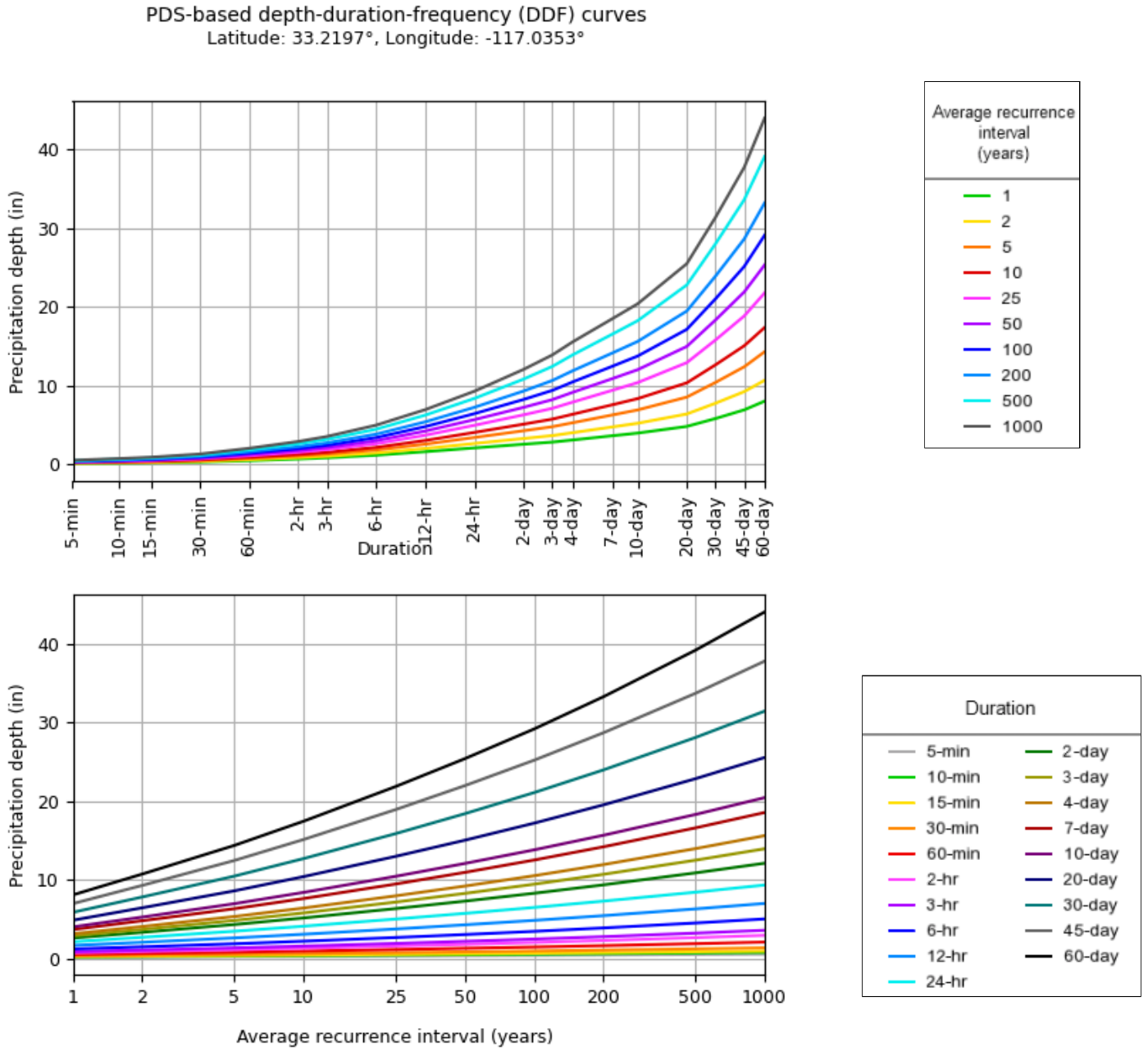
PF graphical



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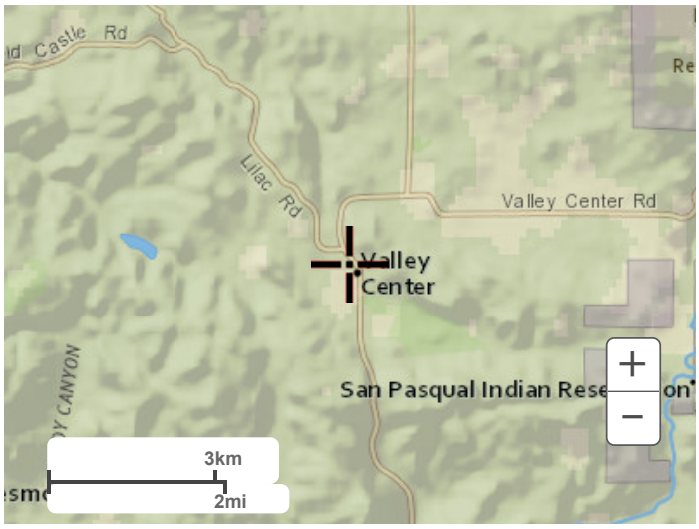
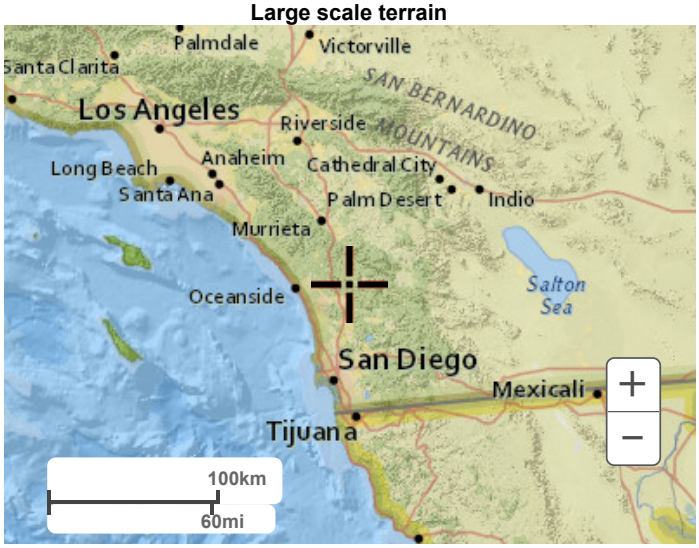
Maps & aerials

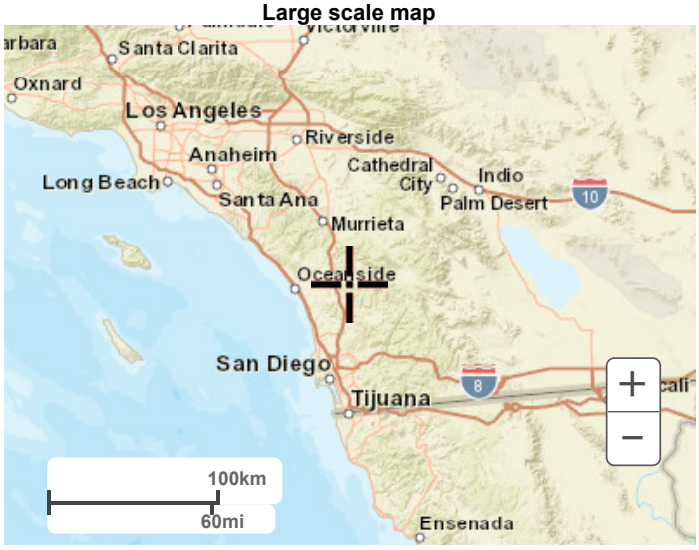
Small scale terrain



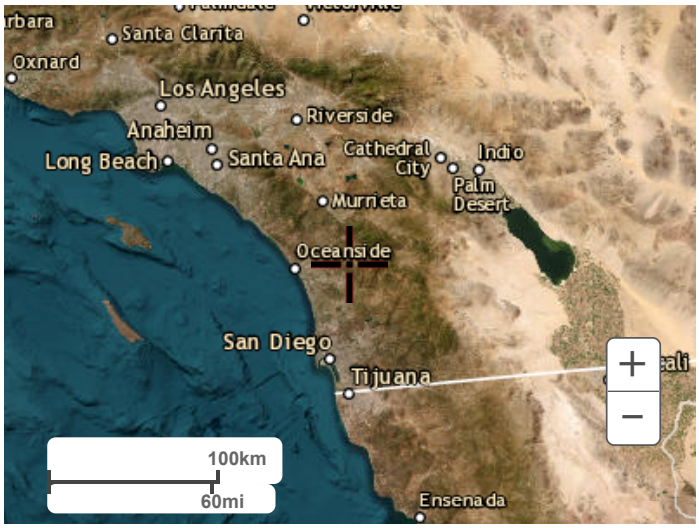
Large scale terrain



Large scale map



Large scale aerial



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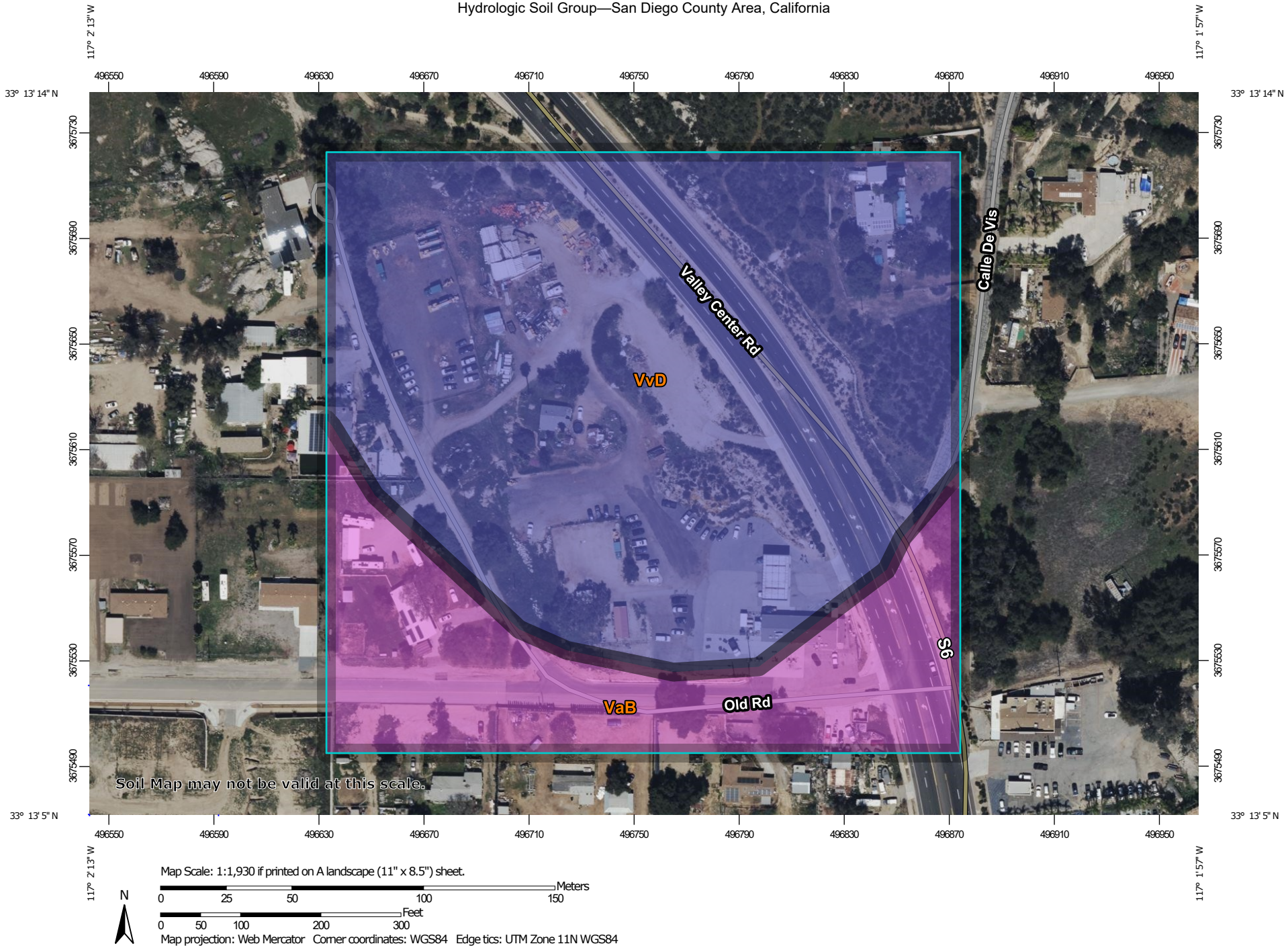
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117° 1' 57" W
33° 13' 14" N
33° 13' 5" N
496550
496590
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496750
496790
496830
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3675730
3675690
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3675570
3675530
3675490
Valley Center Rd
Calle De Vis
VvD
VaB
Old Rd
Soil Map may not be valid at this scale.
Map Scale: 1:1,930 if printed on A landscape (11" x 8.5") sheet.
N
Meters
0 25 50 100 150
Feet
0 50 100 200 300
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: San Diego County Area, California
Survey Area Data: Version 19, Aug 30, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 14, 2022—Mar 17, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
VaB	Visalia sandy loam, 2 to 5 percent slopes	A	3.5	26.0%
VvD	Vista rocky coarse sandy loam, 5 to 15 percent slopes	B	10.1	74.0%
Totals for Area of Interest			**13.6**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

APPENDIX 3: METHODOLOGY

SECTION 3
RATIONAL METHOD AND MODIFIED RATIONAL METHOD

3.1 THE RATIONAL METHOD

The Rational Method (RM) is a mathematical formula used to determine the maximum runoff rate from a given rainfall. It has particular application in urban storm drainage, where it is used to estimate peak runoff rates from small urban and rural watersheds for the design of storm drains and small drainage structures. The RM is recommended for analyzing the runoff response from drainage areas up to approximately 1 square mile in size. It should not be used in instances where there is a junction of independent drainage systems or for drainage areas greater than approximately 1 square mile in size. In these instances, the Modified Rational Method (MRM) should be used for junctions of independent drainage systems in watersheds up to approximately 1 square mile in size (see Section 3.4); or the NRCS Hydrologic Method should be used for watersheds greater than approximately 1 square mile in size (see Section 4).

The RM can be applied using any design storm frequency (e.g., 100-year, 50-year, 10-year, etc.). The local agency determines the design storm frequency that must be used based on the type of project and specific local requirements. A discussion of design storm frequency is provided in Section 2.3 of this manual. A procedure has been developed that converts the 6-hour and 24-hour precipitation isopluvial map data to an Intensity-Duration curve that can be used for the rainfall intensity in the RM formula as shown in Figure 3-1. The RM is applicable to a 6-hour storm duration because the procedure uses Intensity-Duration Design Charts that are based on a 6-hour storm duration.

3.1.1 Rational Method Formula

The RM formula estimates the peak rate of runoff at any location in a watershed as a function of the drainage area (A), runoff coefficient (C), and rainfall intensity (I) for a duration equal to the time of concentration (T_c), which is the time required for water to

Post-Development Time of Concentration

S:	2%		Travel Time		
L:	100	ft	L:	450	ft (pipe)
C:	0.87		v:	5	ft/s
Tc:	3.29	min	Tt:	90	sec
Tc-TOT:	4.79	min (≈5 min)	Tt:	1.5	min
P6:	3.42	in			
I:	9.01	in/hr			

Note: as the total Tc is less than 5 min, I = 9.01 inc will be used for all sub-areas.

POST-DEVELOPMENT AREAS AND FLOWS

HMP name	Drainage	Area	C	I (in/hr)	Q (cfs)	
portion 1A	100-101	0.25	0.87	9.01	1.96	
portion 1A	101-102	3.13	0.75	9.01	21.16	
1B	103-104	0.19	0.25	9.01	0.43	
portion 1C	120-121	0.11	0.48	9.01	0.48	
portion 1C	121-122	0.13	0.57	9.01	0.67	
POC-2		**0.00**			**0.00**	(no need to analyze)
POC-3	110-111	**0.20**	0.25	9.01	**0.45**	(no need to analyze)
DMA 3+4+5	111-1000	0.53	0.28	9.01	1.32	
1A + 1B = POC-1		3.81	0.72	9.01	24.69	
ALL		**4.54**				

Pre-Development Time of Concentration

S:	7.8%		Travel Time: Kirpich (conservative)		
L:	100	ft	L:	690	ft (pipe)
C:	0.25		ΔE :	30.7	ft (pipe)
Tc:	7.71	min	Tt:	0.07	hr (Kirpich)
P6:	3.42	in	Tt:	3.97	min
I:	6.81	in/hr (initial area)	(remaining length)		
Ai:	0.06	acres	Tc:	11.69	min (all area to POC1)
Qi:	0.10	cfs	P6:	3.42	in
			I:	5.21	in/hr (Applied to each POC)

PRE-DEVELOPMENT AREAS AND FLOWS

HMP name	Drainage	Area	C[(2)]	I (in/hr)	Q (cfs)	
DMA-1	100-1000	**3.28**	0.519	5.21	**8.87**	
-	*100-101*	*0.06*	*0.25*	*5.21*	*0.08*	
-	*101-102*	*1.02*	*0.49*	*5.21*	*2.60*	
-	*102-1000*	*2.2*	*0.54*	*5.21*	*6.19*	
POC-2[(1)]	N/A	**0.18**	0.25	5.21	**0.23**	(no need to analyze)
POC-3[(2)]	N/A	**0.86**	0.72	5.21	**3.23**	(no need to analyze)
TOTAL		**4.32**				

(1): small estimate of peak with large time of concentration and smalles possible C

(2): smallest possible C assuming 100% B soil, 0% impervious

Note that the Initial Time of Concentration should be reflective of the general land-use at the upstream end of a drainage basin. A single lot with an area of two or less acres does not have a significant effect where the drainage basin area is 20 to 600 acres.

Table 3-2 provides limits of the length (Maximum Length (L_M)) of sheet flow to be used in hydrology studies. Initial T_i values based on average C values for the Land Use Element are also included. These values can be used in planning and design applications as described below. Exceptions may be approved by the "Regulating Agency" when submitted with a detailed study.

Table 3-2

MAXIMUM OVERLAND FLOW LENGTH (L_M)
& INITIAL TIME OF CONCENTRATION (T_i)

Element*	DU/ Acre	.5%		1%		2%		3%		5%		10%	
		L_M	T_i	L_M	T_i	L_M	T_i	L_M	T_i	L_M	T_i	L_M	T_i
Natural		50	13.2	70	12.5	85	10.9	100	10.3	100	8.7	100	6.9
LDR	1	50	12.2	70	11.5	85	10.0	100	9.5	100	8.0	100	6.4
LDR	2	50	11.3	70	10.5	85	9.2	100	8.8	100	7.4	100	5.8
LDR	2.9	50	10.7	70	10.0	85	8.8	95	8.1	100	7.0	100	5.6
MDR	4.3	50	10.2	70	9.6	80	8.1	95	7.8	100	6.7	100	5.3
MDR	7.3	50	9.2	65	8.4	80	7.4	95	7.0	100	6.0	100	4.8
MDR	10.9	50	8.7	65	7.9	80	6.9	90	6.4	100	5.7	100	4.5
MDR	14.5	50	8.2	65	7.4	80	6.5	90	6.0	100	5.4	100	4.3
HDR	24	50	6.7	65	6.1	75	5.1	90	4.9	95	4.3	100	3.5
HDR	43	50	5.3	65	4.7	75	4.0	85	3.8	95	3.4	100	2.7
N. Com		50	5.3	60	4.5	75	4.0	85	3.8	95	3.4	100	2.7
G. Com		50	4.7	60	4.1	75	3.6	85	3.4	90	2.9	100	2.4
O.P./Com		50	4.2	60	3.7	70	3.1	80	2.9	90	2.6	100	2.2
Limited I.		50	4.2	60	3.7	70	3.1	80	2.9	90	2.6	100	2.2
General I.		50	3.7	60	3.2	70	2.7	80	2.6	90	2.3	100	1.9

*See Table 3-1 for more detailed description

3.2 DEVELOPING INPUT DATA FOR THE RATIONAL METHOD

This section describes the development of the necessary data to perform RM calculations. Section 3.3 describes the RM calculation process. Input data for calculating peak flows and T_c's with the RM should be developed as follows:

1. On a topographic base map, outline the overall drainage area boundary, showing adjacent drains, existing and proposed drains, and overland flow paths.

2. Verify the accuracy of the drainage map in the field.

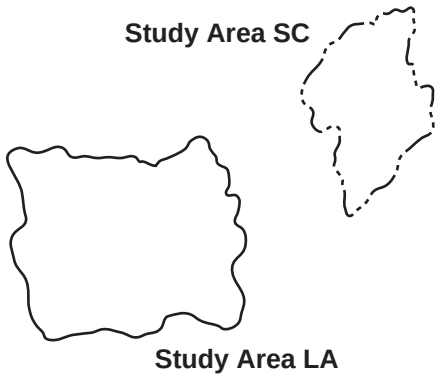
3. Divide the drainage area into subareas by locating significant points of interest. These divisions should be based on topography, soil type, and land use. Ensure that an appropriate first subarea is delineated. For natural areas, the first subarea flow path length should be less than or equal to 4,000 feet plus the overland flow length (Table 3-2). For developed areas, the initial subarea flow path length should be consistent with Table 3-2. The topography and slope within the initial subarea should be generally uniform.

4. Working from upstream to downstream, assign a number representing each subarea in the drainage system to each point of interest. Figure 3-8 provides guidelines for node numbers for geographic information system (GIS)-based studies.

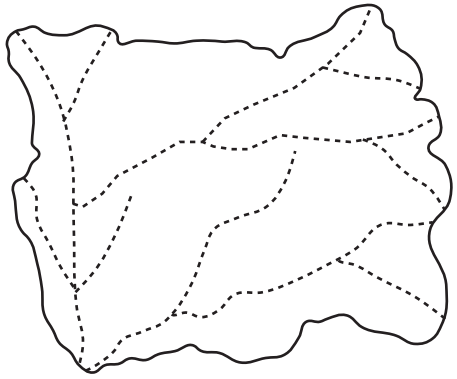
5. Measure each subarea in the drainage area to determine its size in acres (A).

6. Determine the length and effective slope of the flow path in each subarea.

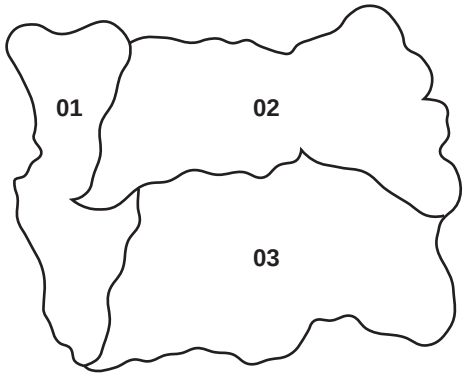
7. Identify the soil type for each subarea.



1 Define Study Areas (Two-Letter ID)

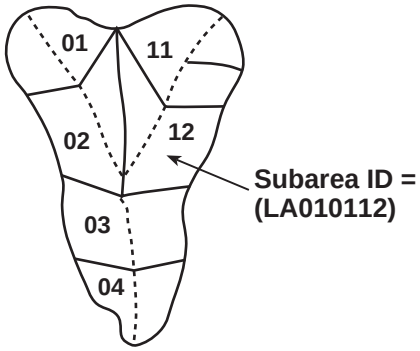


2 Define Major Flowpaths in Study Area

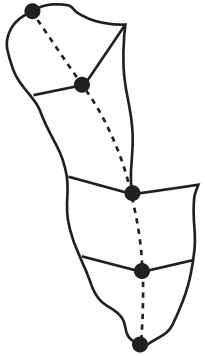


3 Define Regions on Study Area Basis

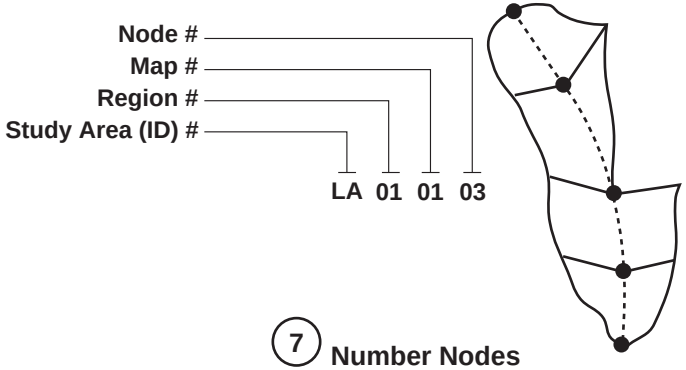
4 Define Maps (or Subregions on Region Basis)



5 Define Model Subareas on Map Basis



6 Define Model Nodes (Intersection of Subarea Boundaries with Flowpath Lines)



7 Number Nodes

GIS/Hydrologic Model
Data Base Linkage Setup:
Nodes, Subareas, Links

FIGURE
3-8

8. Determine the runoff coefficient (C) for each subarea based on Table 3-1. If the subarea contains more than one type of development classification, use a proportionate average for C. In determining C for the subarea, use future land use taken from the applicable community plan, Multiple Species Conservation Plan, National Forest land use plan, etc.

9. Calculate the CA value for the subarea.

10. Calculate the Σ(CA) value(s) for the subareas upstream of the point(s) of interest.

11. Determine P_6 and P_{24} for the study using the isopluvial maps provided in Appendix B. If necessary, adjust the value for P_6 to be within 45% to 65% of the value for P_{24}.

See Section 3.3 for a description of the RM calculation process.

3.3 PERFORMING RATIONAL METHOD CALCULATIONS

This section describes the RM calculation process. Using the input data, calculation of peak flows and T_c's should be performed as follows:

1. Determine T_i for the first subarea. Use Table 3-2 or Figure 3-3 as discussed in Section 3.1.4. If the watershed is natural, the travel time to the downstream end of the first subarea can be added to T_i to obtain the T_c. Refer to paragraph 3.1.4.2 (a).

2. Determine I for the subarea using Figure 3-1. If T_i was less than 5 minutes, use the 5 minute time to determine intensity for calculating the flow.

3. Calculate the peak discharge flow rate for the subarea, where $Q_p = \Sigma(CA)\, I$.
   In case that the downstream flow rate is less than the upstream flow rate, due to the long travel time that is not offset by the additional subarea runoff, use the upstream peak flow for design purposes until downstream flows increase again.

4. Estimate the T_t to the next point of interest.

5. Add the T_t to the previous T_c to obtain a new T_c.

6. Continue with step 2, above, until the final point of interest is reached.

Note: The MRM should be used to calculate the peak discharge when there is a junction from independent subareas into the drainage system.

3.4 MODIFIED RATIONAL METHOD (FOR JUNCTION ANALYSIS)

The purpose of this section is to describe the steps necessary to develop a hydrology report for a small watershed using the MRM. It is necessary to use the MRM if the watershed contains junctions of independent drainage systems. The process is based on the design manuals of the City/County of San Diego. The general process description for using this method, including an example of the application of this method, is described below.

The engineer should only use the MRM for drainage areas up to approximately 1 square mile in size. If the watershed will significantly exceed 1 square mile then the NRCS method described in Section 4 should be used. The engineer may choose to use either the RM or the MRM for calculations for up to an approximately 1-square-mile area and then transition the study to the NRCS method for additional downstream areas that exceed approximately 1 square mile. The transition process is described in Section 4.

3.4.1 Modified Rational Method General Process Description

The general process for the MRM differs from the RM only when a junction of independent drainage systems is reached. The peak Q, T_c, and I for each of the independent drainage systems at the point of the junction are calculated by the RM. The independent drainage systems are then combined using the MRM procedure described below. The peak Q, T_c, and I for each of the independent drainage systems at the point of the junction must be calculated prior to using the MRM procedure to combine the independent drainage systems, as these

values will be used for the MRM calculations. After the independent drainage systems have been combined, RM calculations are continued to the next point of interest.

3.4.2 Procedure for Combining Independent Drainage Systems at a Junction

Calculate the peak Q, T_c, and I for each of the independent drainage systems at the point of the junction. These values will be used for the MRM calculations.

At the junction of two or more independent drainage systems, the respective peak flows are combined to obtain the maximum flow out of the junction at T_c. Based on the approximation that total runoff increases directly in proportion to time, a general equation may be written to determine the maximum Q and its corresponding T_c using the peak Q, T_c, and I for each of the independent drainage systems at the point immediately before the junction. The general equation requires that contributing Q's be numbered in order of increasing T_c.

Let Q_1, T_1, and I_1 correspond to the tributary area with the shortest T_c. Likewise, let Q_2, T_2, and I_2 correspond to the tributary area with the next longer T_c; Q_3, T_3, and I_3 correspond to the tributary area with the next longer T_c; and so on. When only two independent drainage systems are combined, leave Q_3, T_3, and I_3 out of the equation. Combine the independent drainage systems using the junction equation below:

Junction Equation: $T_1 < T_2 < T_3$

$$Q_{T1} = Q_1 + \frac{T_1}{T_2} Q_2 + \frac{T_1}{T_3} Q_3$$

$$Q_{T2} = Q_2 + \frac{I_2}{I_1} Q_1 + \frac{T_2}{T_3} Q_3$$

$$Q_{T3} = Q_3 + \frac{I_3}{I_1} Q_1 + \frac{I_3}{I_2} Q_2$$

Calculate Q_{T1}, Q_{T2}, and Q_{T3}. Select the largest Q and use the T_c associated with that Q for further calculations (see the three Notes for options). If the largest calculated Q's are equal (e.g., $Q_{T1} = Q_{T2} > Q_{T3}$), use the shorter of the T_c's associated with that Q.

This equation may be expanded for a junction of more than three independent drainage systems using the same concept. The concept is that when Q from a selected subarea (e.g., Q_2) is combined with Q from another subarea with a shorter T_c (e.g., Q_1), the Q from the subarea with the shorter T_c is reduced by the ratio of the I's (I_2/I_1); and when Q from a selected subarea (e.g., Q_2) is combined with Q from another subarea with a longer T_c (e.g., Q_3), the Q from the subarea with the longer T_c is reduced by the ratio of the T_c's (T_2/T_3).

Note #1: At a junction of two independent drainage systems that have the same T_c, the tributary flows may be added to obtain the Q_p.

$$Q_p = Q_1 + Q_2 \text{ ; when } T_1 = T_2 \text{; and } T_c = T_1 = T_2$$

This can be verified by using the junction equation above. Let Q_3, T_3, and $I_3 = 0$. When T_1 and T_2 are the same, I_1 and I_2 are also the same, and T_1/T_2 and $I_2/I_1 = 1$. T_1/T_2 and I_2/I_1 are cancelled from the equations. At this point, $Q_{T1} = Q_{T2} = Q_1 + Q_2$.

Note #2: In the upstream part of a watershed, a conservative computation is acceptable. When the times of concentration (T_c's) are relatively close in magnitude (within 10%), use the shorter T_c for the intensity and the equation $Q = \Sigma(CA)I$.

Note #3: . An optional method of determining the T_c is to use the equation

$$T_c = [(\Sigma (CA)7.44\ P_6)/Q]^{1.55}$$

This equation is from $Q = \Sigma(CA)I = \Sigma(CA)(7.44\ P_6/T_c^{.645})$ and solving for T_c. The advantage in this option is that the T_c is consistent with the peak flow Q, and avoids inappropriate fluctuation in downstream flows in some cases.

APPENDIX 4: HYDRAULIC SIZING

100 YEAR PEAK FLOW DISTRIBUTION

Note: peak flow from continuous simulation extrapolation, as standard 6 hr storm does not generates peak in pipe system.

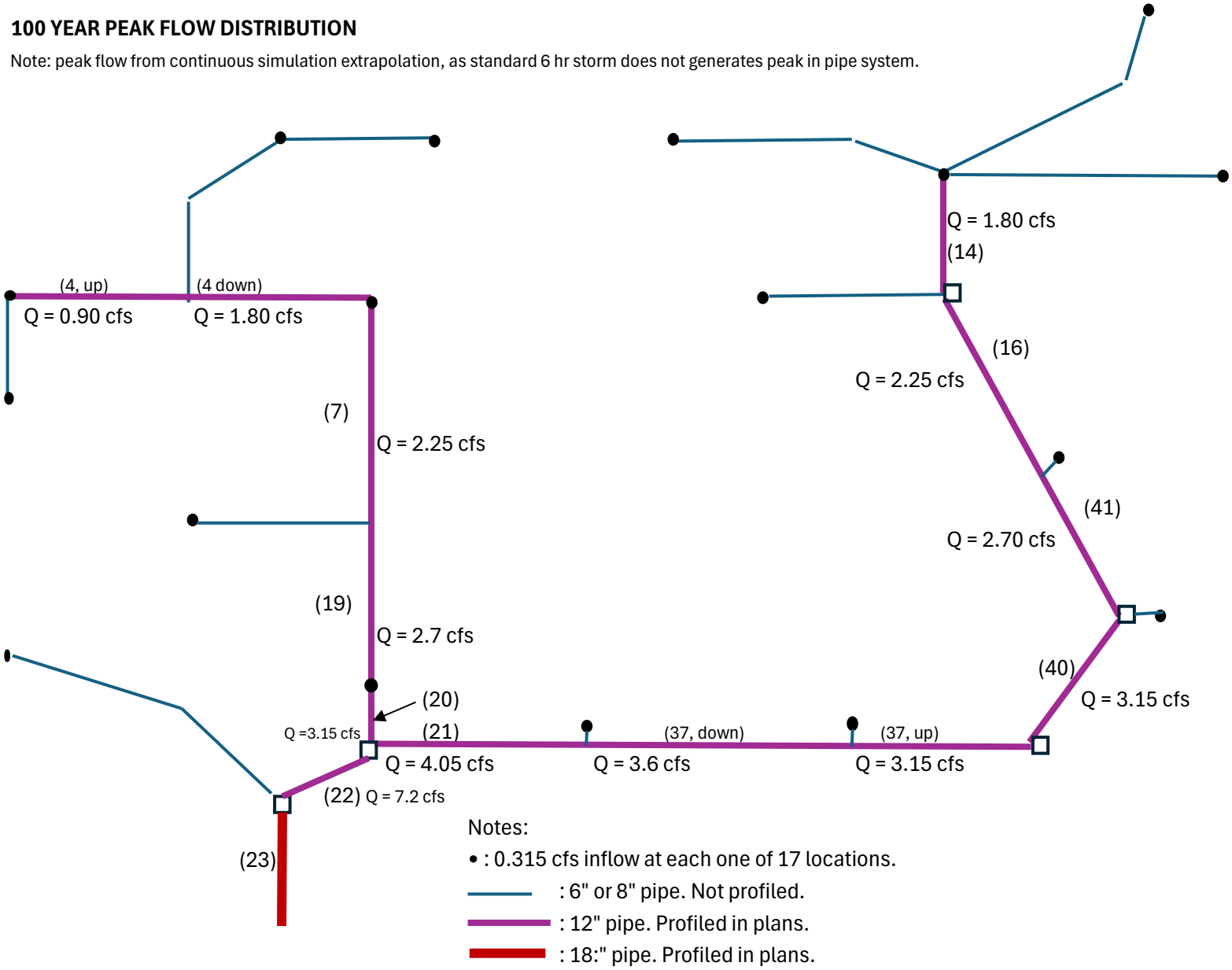


FIGURE 1: FLOW SCHEMATICS

MANNINGS VELOCITY AND DISCHARGE PER PIPE

Pipe	s (ft/ft)	Q (cfs)	ß (rad)	A (ft^2)[(1)]	Rh (ft)	Q_M (cfs)	v (ft/s)	HGL[(2)] (ft)
4 up	0.0107	0.9	2.476	0.232	0.188	0.900	3.9	0.34
4 down	0.0107	1.8	3.114	0.386	0.248	1.800	4.7	0.49
7	0.0116	2.25	3.344	0.443	0.265	2.250	5.1	0.55
19	0.0116	2.7	3.621	0.510	0.282	2.700	5.3	0.62
20	0.0857	3.15	2.644	0.271	0.205	3.150	11.6	0.38
14	0.01	1.8	3.154	0.396	0.251	1.800	4.5	0.50
16	0.01	2.25	3.449	0.469	0.272	2.250	4.8	0.58
41	0.01	2.7	3.755	0.541	0.288	2.700	5.0	0.65
40	0.01	3.15	4.101	0.615	0.300	3.150	5.1	0.73
37 up	0.0078	3.15	6.283	0.785	0.250	3.15	4.0	**1.00**
37 down	0.0102	3.6	6.283	0.785	0.250	3.60	4.6	**1.00**
21	0.0129	4.05	6.283	0.785	0.250	4.05	5.2	**1.00**
22	0.1205	7.2	3.334	0.441	0.264	7.200	16.3	0.55
23	**0.0097**	**7.21**	**3.605**	**1.140**	**0.421**	**7.213**	**6.3**	**0.92**
28	**0.0133**	**5.51**	**3.034**	**0.823**	**0.362**	**5.509**	**6.7**	**0.71**

(1): All diameters = 12", except pipes 23 & 28 (D = 1.5')

(2): HGL measured over invert of each pipe, ignoring gradually varied profiles and assuming Manning's depth representative in the entire pipe. (HGL = normal water depth).

Red values are in reference to pressure values and need to be corrected with the slope of the energy line > slope of pipe.

Blue value represents the downstream depth = HGL of the first pressurized pipe.

PRESSURIZED HGL

Pipe	L	ΔS[(1)]	HGL
21 (end)			1.00
37-down (end)	113	0.0029	1.33
37-up (end)	116	0.0002	1.35
37-up (start)	47	-0.0022	1.25
40 (end)			0.73[(2)]

(1): excess of energy slope over pipe slope (excess over 0.01).

(2): downstream end of pipe 40 is no longer under pressure as ΔH (0.31 ft) in manhole

> excess of HGL over soffit (0.25 ft).

APPENDIX 5: 100 YEAR HYDROLOGIC ANALYSIS FOR EXISTING CONDITIONS

PRE-DEVELOPMENT RESULTS

Pre-Development Time of Concentration

S:	7.8%	
L:	100	ft
C:	0.25	
Tc:	7.71	min
P6:	3.42	in
I:	6.81	in/hr (initial area)
Ai:	0.06	acres
Qi:	0.10	cfs

Travel Time: Kirpich (conservative)

L:	690	ft (pipe)
ΔE :	30.7	ft (pipe)
Tt:	0.07	hr (Kirpich)
Tt:	3.97	min
(remaining length)		
Tc:	11.69	min (all area to POC1)
P6:	3.42	in
I:	5.21	in/hr (Applied to each POC)

PRE-DEVELOPMENT AREAS AND FLOWS

HMP name	Drainage	Area	C[(2)]	I (in/hr)	Q (cfs)	
DMA-1	100-1000	**3.28**	0.519	5.21	**8.87**	
-	*100-101*	*0.06*	*0.25*	*5.21*	*0.08*	
-	*101-102*	*1.02*	*0.49*	*5.21*	*2.60*	
-	*102-1000*	*2.2*	*0.54*	*5.21*	*6.19*	
POC-2[(1)]	N/A	**0.18**	0.25	5.21	**0.23**	(no need to analyze)
POC-3[(2)]	N/A	**0.86**	0.72	5.21	**3.23**	(no need to analyze)
TOTAL		**4.32**				

(1): small estimate of peak with large time of concentration and smalles possible C

(2): smallest possible C assuming 100% B soil, 0% impervious

APPENDIX 6: 100 YEAR HYDROLOGIC ANALYSIS FOR UNMITIGATED POST-DEVELOPED CONDITIONS

POST-DEVELOPMENT RESULTS

Post-Development Time of Concentration

S:	2%		Travel Time		
L:	100	ft	L:	450	ft (pipe)
C:	0.87		v:	5	ft/s
Tc:	3.29	min	Tt:	90	sec
Tc-TOT:	4.79	min (≈5 min)	Tt:	1.5	min
P6:	3.42	in			
I:	9.01	in/hr			

Note: as the total Tc is less than 5 min, I = 9.01 inc will be used for all sub-areas.

POST-DEVELOPMENT AREAS AND FLOWS

HMP name	Drainage	Area	C	I (in/hr)	Q (cfs)	
portion 1A	100-101	0.25	0.87	9.01	1.96	
portion 1A	101-102	3.13	0.75	9.01	21.16	
1B	103-104	0.19	0.25	9.01	0.43	
portion 1C	120-121	0.11	0.48	9.01	0.48	
portion 1C	121-122	0.13	0.57	9.01	0.67	
POC-2		**0.00**			**0.00**	(no need to analyze)
POC-3	110-111	**0.20**	0.25	9.01	**0.45**	(no need to analyze)
DMA 3+4+5	111-1000	0.53	0.28	9.01	1.32	
1A + 1B = POC-1		3.81	0.72	9.01	24.69	
ALL		**4.54**				

APPENDIX 7: MODIFIED-PULS DETENTION ROUTINGS

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RUN DATE 10/30/2025
HYDROGRAPH FILE NAME Text1

DMA-1A

TIME OF CONCENTRATION 5 MIN.
6 HOUR RAINFALL 3.42 INCHES
BASIN AREA 3.46 ACRES
RUNOFF COEFFICIENT 0.78
PEAK DISCHARGE 24.19 CFS

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TIME (MIN) = 210	DISCHARGE (CFS) = 1.9
TIME (MIN) = 215	DISCHARGE (CFS) = 2.2
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RUN DATE 11/27/2024
HYDROGRAPH FILE NAME Text1

DMA-1B

TIME OF CONCENTRATION 5 MIN.
6 HOUR RAINFALL 3.42 INCHES
BASIN AREA 1.9 ACRES
RUNOFF COEFFICIENT 0.25
PEAK DISCHARGE 4.4 CFS

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TIME (MIN) = 325	DISCHARGE (CFS) = 0.1
TIME (MIN) = 330	DISCHARGE (CFS) = 0.1
TIME (MIN) = 335	DISCHARGE (CFS) = 0.1
TIME (MIN) = 340	DISCHARGE (CFS) = 0.1
TIME (MIN) = 345	DISCHARGE (CFS) = 0.1
TIME (MIN) = 350	DISCHARGE (CFS) = 0.1
TIME (MIN) = 355	DISCHARGE (CFS) = 0.1
TIME (MIN) = 360	DISCHARGE (CFS) = 0.1
TIME (MIN) = 365	DISCHARGE (CFS) = 0

Note: Peak Discharge and Area multiplied by 10 because the program only has 1 decimal place. Discharge values are then divided by 10.

RATIONAL METHOD HYDROGRAPH PROGRAM
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RUN DATE 10/30/2025
HYDROGRAPH FILE NAME Text1
TIME OF CONCENTRATION 12 MIN.
6 HOUR RAINFALL 3.42 INCHES
BASIN AREA 2.4 ACRES
RUNOFF COEFFICIENT 0.44
PEAK DISCHARGE 6.2 CFS

DMA-1C

TIME (MIN) = 0	DISCHARGE (CFS) = 0
TIME (MIN) = 12	DISCHARGE (CFS) = 0.2
TIME (MIN) = 24	DISCHARGE (CFS) = 0.2
TIME (MIN) = 36	DISCHARGE (CFS) = 0.2
TIME (MIN) = 48	DISCHARGE (CFS) = 0.2
TIME (MIN) = 60	DISCHARGE (CFS) = 0.3
TIME (MIN) = 72	DISCHARGE (CFS) = 0.3
TIME (MIN) = 84	DISCHARGE (CFS) = 0.3
TIME (MIN) = 96	DISCHARGE (CFS) = 0.3
TIME (MIN) = 108	DISCHARGE (CFS) = 0.3
TIME (MIN) = 120	DISCHARGE (CFS) = 0.3
TIME (MIN) = 132	DISCHARGE (CFS) = 0.3
TIME (MIN) = 144	DISCHARGE (CFS) = 0.4
TIME (MIN) = 156	DISCHARGE (CFS) = 0.4
TIME (MIN) = 168	DISCHARGE (CFS) = 0.4
TIME (MIN) = 180	DISCHARGE (CFS) = 0.5
TIME (MIN) = 192	DISCHARGE (CFS) = 0.5
TIME (MIN) = 204	DISCHARGE (CFS) = 0.6
TIME (MIN) = 216	DISCHARGE (CFS) = 0.7
TIME (MIN) = 228	DISCHARGE (CFS) = 1.1
TIME (MIN) = 240	DISCHARGE (CFS) = 0.7
TIME (MIN) = 252	DISCHARGE (CFS) = 6.2
TIME (MIN) = 264	DISCHARGE (CFS) = 0.9
TIME (MIN) = 276	DISCHARGE (CFS) = 0.6
TIME (MIN) = 288	DISCHARGE (CFS) = 0.4
TIME (MIN) = 300	DISCHARGE (CFS) = 0.4
TIME (MIN) = 312	DISCHARGE (CFS) = 0.3
TIME (MIN) = 324	DISCHARGE (CFS) = 0.3
TIME (MIN) = 336	DISCHARGE (CFS) = 0.3
TIME (MIN) = 348	DISCHARGE (CFS) = 0.2
TIME (MIN) = 360	DISCHARGE (CFS) = 0.2
TIME (MIN) = 372	DISCHARGE (CFS) = 0

Note: Peak Discharge and Area multiplied by 10 because the program only has 1 decimal place. Discharge values are then divided by 10.

RATIONAL METHOD HYDROGRAPH PROGRAM
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RUN DATE 10/30/2025
HYDROGRAPH FILE NAME Text1
TIME OF CONCENTRATION 13 MIN.
6 HOUR RAINFALL 3.42 INCHES
BASIN AREA 6.4 ACRES
RUNOFF COEFFICIENT 0.25
PEAK DISCHARGE 7.9 CFS

Bypass

TIME (MIN) = 0	DISCHARGE (CFS) = 0
TIME (MIN) = 13	DISCHARGE (CFS) = 0.2
TIME (MIN) = 26	DISCHARGE (CFS) = 0.3
TIME (MIN) = 39	DISCHARGE (CFS) = 0.3
TIME (MIN) = 52	DISCHARGE (CFS) = 0.4
TIME (MIN) = 65	DISCHARGE (CFS) = 0.4
TIME (MIN) = 78	DISCHARGE (CFS) = 0.4
TIME (MIN) = 91	DISCHARGE (CFS) = 0.4
TIME (MIN) = 104	DISCHARGE (CFS) = 0.4
TIME (MIN) = 117	DISCHARGE (CFS) = 0.5
TIME (MIN) = 130	DISCHARGE (CFS) = 0.5
TIME (MIN) = 143	DISCHARGE (CFS) = 0.5
TIME (MIN) = 156	DISCHARGE (CFS) = 0.6
TIME (MIN) = 169	DISCHARGE (CFS) = 0.6
TIME (MIN) = 182	DISCHARGE (CFS) = 0.7
TIME (MIN) = 195	DISCHARGE (CFS) = 0.8
TIME (MIN) = 208	DISCHARGE (CFS) = 0.9
TIME (MIN) = 221	DISCHARGE (CFS) = 1
TIME (MIN) = 234	DISCHARGE (CFS) = 1.5
TIME (MIN) = 247	DISCHARGE (CFS) = 2.1
TIME (MIN) = 260	DISCHARGE (CFS) = 7.9
TIME (MIN) = 273	DISCHARGE (CFS) = 1.2
TIME (MIN) = 286	DISCHARGE (CFS) = 0.8
TIME (MIN) = 299	DISCHARGE (CFS) = 0.6
TIME (MIN) = 312	DISCHARGE (CFS) = 0.5
TIME (MIN) = 325	DISCHARGE (CFS) = 0.5
TIME (MIN) = 338	DISCHARGE (CFS) = 0.4
TIME (MIN) = 351	DISCHARGE (CFS) = 0.4
TIME (MIN) = 364	DISCHARGE (CFS) = 0.4
TIME (MIN) = 377	DISCHARGE (CFS) = 0

Note: Peak Discharge and Area multiplied by 10 because the program only has 1 decimal place. Discharge values are then divided by 10.

GRAVEL LAYER Qinf (cfs): 0

Elevation	h (ft)	Area (ft)	V (cu-ft)	V (ac-ft)	Q (cfs)	Δt (hr)
1315.00	0	22884	0.0	0	0	
1315.10	0.1	22884	2288.4	0.05253	0.051	24.93
1315.20	0.2	22884	4576.8	0.10507	0.076	10.01
1315.30	0.3	22884	6865.2	0.15760	0.095	7.43
1315.40	0.4	22884	9153.6	0.21014	0.111	6.17
1315.50	0.5	22884	11442.0	0.26267	0.124	5.41
1315.60	0.6	22884	13730.4	0.31521	0.136	4.89
1315.70	0.7	22884	16018.8	0.36774	0.148	4.48
1315.80	0.8	22884	18307.2	0.42028	0.158	4.15
1315.90	0.9	22884	20595.6	0.47281	0.168	3.90
1316.00	1	22884	22884.0	0.52534	0.177	3.69
1316.10	1.1	22884	25172.4	0.57788	0.186	3.50
1316.20	1.2	22884	27460.8	0.63041	0.194	3.35
1316.30	1.3	22884	29749.2	0.68295	0.203	3.20
1316.40	1.4	22884	32037.6	0.73548	0.21	3.08
1316.50	1.5	22884	34326.0	0.78802	0.218	2.97
1316.53	1.525	314	34333.9	0.78820	1.396	
1316.55	1.55	1257	34353.5	0.78865	3.549	
1316.58	1.575	2827	34404.5	0.78982	6.336	
1316.60	1.6	5027	34502.7	0.79207	9.636	

Note: area of gravel (0 ft to 1.5 ft) has already being reduced by porosity.

Drawdown:

TOT (hr)	**91.2**

INFILTRATION BASIN (BMP-1 in SWMM) Qinf (cfs): 0.0376

Elevation	h (ft)	Area (ft)	V (cu-ft)	V (ac-ft)	Q (cfs)	Δt (hr)
1298.50	0.00	2250	0	0.00000		
1299.50	1.00	2250	2250	0.05165		16.61
1301.00	2.50	2250	5625	0.12913		24.91
1301.00	2.501	5625	5629	0.12922		0.03
1301.08	2.583	5688	6095	0.13991		3.44
1301.17	2.667	5753	6571	0.15086		3.52
1301.25	2.750	5815	7053	0.16192		3.56
1301.33	2.833	5880	7541	0.17311		3.60
1301.42	2.917	5948	8033	0.18442		3.64
1301.50	3.000	6014	8532	0.19587		3.68
1301.58	3.083	6082	9036	0.20744		3.72
1301.67	3.167	6151	9546	0.21914		3.76
1301.75	3.250	6220	10061	0.23097	0	3.80
1301.83	3.333	6291	10582	0.24294	0.021	3.01
1301.92	3.417	6363	11110	0.25504	0.038	2.18
1302.00	3.500	6435	11643	0.26728	0.049	1.83
1302.04	3.542	6470	11912	0.27346	0.053	0.84
1302.08	3.583	6509	12182	0.27966	0.058	0.81
1302.17	3.667	6583	12728	0.29219	0.065	1.53
1302.25	3.750	6658	13279	0.30485	0.072	1.44
1302.33	3.833	6735	13837	0.31766	0.079	1.37
1302.42	3.917	6812	14402	0.33062	0.084	1.32
1302.50	4.000	6890	14973	0.34373	1.283	0.22
1302.58	4.083	6969	15550	0.35698	3.470	0.07
1302.67	4.167	7049	16134	0.37039	6.300	0.03
1302.75	4.250	7130	16725	0.38395	9.650	0.02
1302.83	4.333	7211	17323	0.39767	13.45	0.01
1302.92	4.417	7294	17927	0.41155	17.65	0.01
1303.00	4.500	7378	18538	0.42558	22.22	0.01
1303.08	4.583	7462	19157	0.43978	27.12	0.01
1303.17	4.667	7548	19782	0.45413	32.34	0.01
1303.25	4.750	7634	20415	0.46866	37.86	0.01
1303.33	4.833	7722	21054	0.48334	43.66	0.00
1303.42	4.917	7810	21702	0.49820	49.74	0.00
1303.50	5.000	7899	22356	0.51323	56.07	0.00
1303.58	5.083	7989	23018	0.52843	62.65	0.00
1303.67	5.167	8080	23688	0.54380	69.46	0.00
1303.75	5.250	8172	24365	0.55934	76.51	0.00
1303.83	5.333	8265	25050	0.57506	83.79	0.00
1303.92	5.417	8359	25742	0.59097	91.28	0.00
1304.00	5.500	8454	26443	0.60705	98.98	0.00

Drawdown 0'-3.25':	
TOT (hr)	**74.3**

Drawdown:	
TOT (hr)	**89.0**

Outlet structure for Discharge of Gravel Pavement

Discharge vs Elevation Table

Low orifice:	**0.4375**	"	Lower slot			Emergency Weir	
Number:	35		Invert:	7.00	ft	Invert:	1.500 ft
Cg-low:	0.61		B	0.00	ft	B:	96 ft
			h	0.250	ft		
Middle orifice:	**1.25**	"	Upper slot				
number of orif:	0		Invert:	0.000	ft	Note: for explanations on the variables, see below table.	
Cg-middle:	0.61		B:	0.00	ft		
invert elev:	2.833	ft	h	0.000	ft		

h (ft)	H/D-low -	H/D-mid -	Qlow-orif (cfs)	Qlow-weir (cfs)	Qtot-low (cfs)	Qmid-orif (cfs)	Qmid-weir (cfs)	Qtot-med (cfs)	Qslot-low (cfs)	Qslot-upp (cfs)	Qemer (cfs)	Qtot (cfs)
0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.10	2.743	0.000	0.051	0.062	0.051	0.000	0.000	0.000	0.000	0.000	0.000	0.051
0.20	5.486	0.000	0.076	0.763	0.076	0.000	0.000	0.000	0.000	0.000	0.000	0.076
0.30	8.229	0.000	0.095	0.949	0.095	0.000	0.000	0.000	0.000	0.000	0.000	0.095
0.40	10.971	0.000	0.111	1.105	0.111	0.000	0.000	0.000	0.000	0.000	0.000	0.111
0.50	13.714	0.000	0.124	1.241	0.124	0.000	0.000	0.000	0.000	0.000	0.000	0.124
0.60	16.457	0.000	0.136	1.364	0.136	0.000	0.000	0.000	0.000	0.000	0.000	0.136
0.70	19.200	0.000	0.148	1.477	0.148	0.000	0.000	0.000	0.000	0.000	0.000	0.148
0.80	21.943	0.000	0.158	1.581	0.158	0.000	0.000	0.000	0.000	0.000	0.000	0.158
0.90	24.686	0.000	0.168	1.680	0.168	0.000	0.000	0.000	0.000	0.000	0.000	0.168
1.00	27.429	0.000	0.177	1.772	0.177	0.000	0.000	0.000	0.000	0.000	0.000	0.177
1.10	30.171	0.000	0.186	1.860	0.186	0.000	0.000	0.000	0.000	0.000	0.000	0.186
1.20	32.914	0.000	0.194	1.944	0.194	0.000	0.000	0.000	0.000	0.000	0.000	0.194
1.30	35.657	0.000	0.203	2.025	0.203	0.000	0.000	0.000	0.000	0.000	0.000	0.203
1.40	38.400	0.000	0.210	2.103	0.210	0.000	0.000	0.000	0.000	0.000	0.000	0.210
1.50	41.143	0.000	0.218	2.177	0.218	0.000	0.000	0.000	0.000	0.000	0.000	0.218
1.525	41.829	0.000	0.220	2.196	0.220	0.000	0.000	0.000	0.000	0.000	1.176	1.396
1.550	42.514	0.000	0.221	2.214	0.221	0.000	0.000	0.000	0.000	0.000	3.327	3.549
1.575	43.200	0.000	0.223	2.232	0.223	0.000	0.000	0.000	0.000	0.000	6.113	6.336
1.600	43.886	0.000	0.225	2.250	0.225	0.000	0.000	0.000	0.000	0.000	9.411	9.636
1.625	44.571	0.000	0.227	2.267	0.227	0.000	0.000	0.000	0.000	0.000	13.152	13.379
1.650	45.257	0.000	0.228	2.285	0.228	0.000	0.000	0.000	0.000	0.000	17.289	17.517
1.675	45.943	0.000	0.230	2.302	0.230	0.000	0.000	0.000	0.000	0.000	21.787	22.017

Note: There will be 35 - $^{7}/_{16}$" orifices all over the underground pavement, tied to French Drains
Also, there will be 16 - 8' perimeter grated inlets that will overflow over the pipe system (L = 128 ft)

Low oriffice: It is assumed at elevation 0.00. All elevations are measured from the invert of the low orifice. The diameter is given here.
Number: refers to the proposed number of low orifices (in this case = 35,as there are 35 horizontal French drains draining to boxes)
Cg low: discharge coefficient for low oriffice (Assumed Cg = 0.61)

Middle oriffice: diameter, number and discharge coefficient are given. If number = 0, it means there are no middle oriffices and this info is irrelevant.
Invert elevation: invert of oriffice from invert of low oriffice.

Lower slot: invert (ft), width (B, ft) and height (h, ft) are given. If either B or h = 0, then this information is irrelevant for calculations.

Upper slot: invert (ft), width (B, ft) and height (h, ft) are given. If either B or h = 0, then this information is irrelevant for calculations.

Emergency weir: B: typically equal to the perimeter of the overflow riser or width of rectangular weir at the top. Invert, as always, measured from invert of the low orifice. Note: in this case B = 128 because there are 16 risers, 8 ft in perimeter each, at same elevation (grated inlets)

NOTE: in this case, the invert of all low flow orifices is equal to the bottom of the gravel layer as there is no 3" requirement for gravel pavement.

Outlet structure for Discharge of BMP-1 (INFILTRATION BASIN)

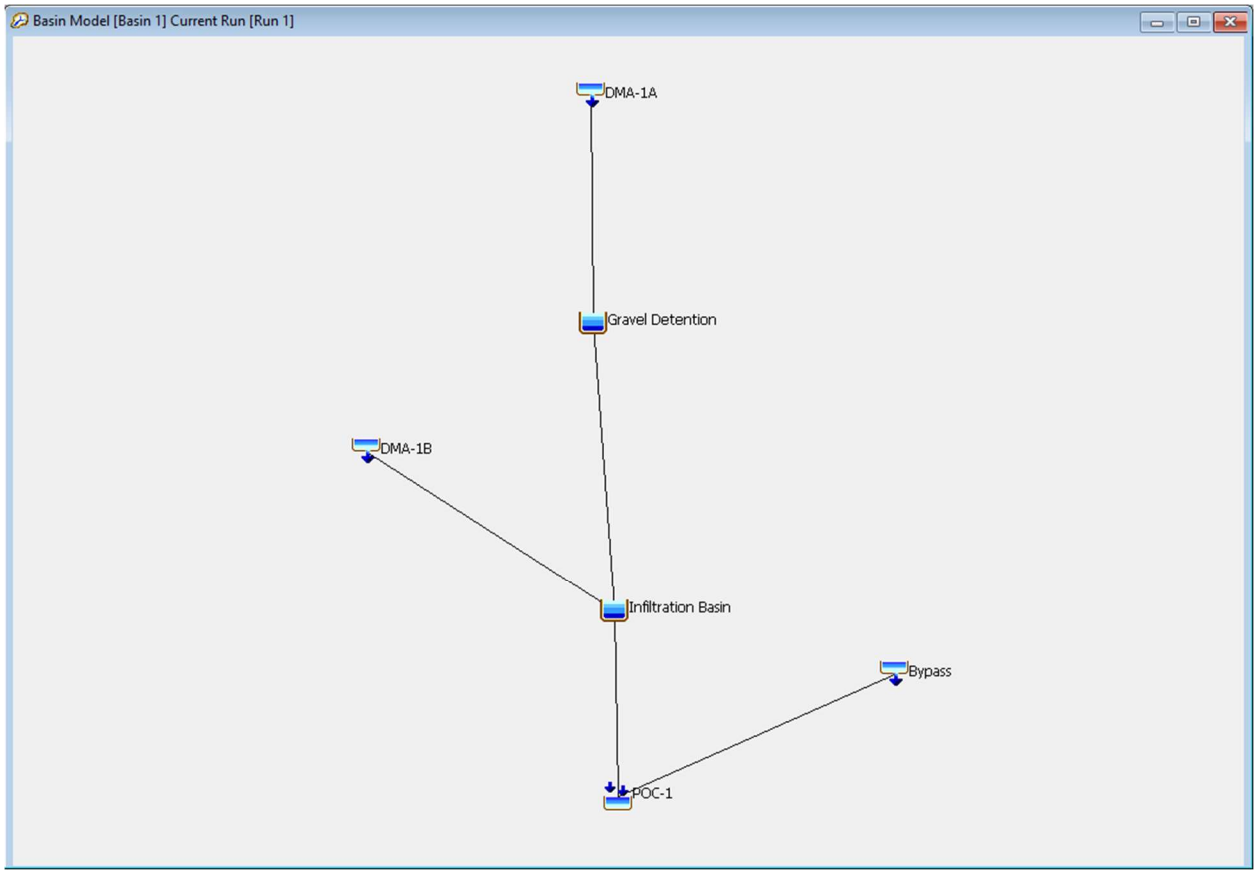
Discharge vs Elevation Table

Low orifice:	1	"	Lower slot			Emergency Weir	
Number:	0		Invert:	3.50	ft	Invert:	3.917 ft
Cg-low:	0.61		B	0.000	ft	B:	16 ft
			h	0.083	ft		
Middle orifice:	1	"	Upper slot				
number of orif:	4		Invert:	0.000	ft		
Cg-middle:	0.61		B:	0.00	ft		
invert elev:	3.250	ft	h	0.000	ft		

h (ft)	H/D-low -	H/D-mid -	Qlow-orif (cfs)	Qlow-weir (cfs)	Qtot-low (cfs)	Qmid-orif (cfs)	Qmid-weir (cfs)	Qtot-med (cfs)	Qslot-low (cfs)	Qslot-upp (cfs)	Qemer (cfs)	Qtot (cfs)
0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.0000
1.33	16.000	0.000	0.000	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.0000
1.42	17.000	0.000	0.000	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.0000
1.50	18.000	0.000	0.000	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.0000
1.58	19.000	0.000	0.000	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.0000
1.67	20.000	0.000	0.000	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.0000
1.75	21.000	0.000	0.000	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.0000
1.83	22.000	0.000	0.000	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.0000
1.92	23.000	0.000	0.000	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.0000
2.00	24.000	0.000	0.000	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.0000
2.08	25.000	0.000	0.000	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.0000
2.17	26.000	0.000	0.000	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.0000
2.25	27.000	0.000	0.000	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.0000
2.33	28.000	0.000	0.000	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.0000
2.42	29.000	0.000	0.000	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.0000
2.50	30.000	0.000	0.000	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.0000
2.58	31.000	0.000	0.000	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.0000
2.67	32.000	0.000	0.000	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.0000
2.75	33.000	0.000	0.000	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.0000
2.83	34.000	0.000	0.000	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.0000
2.92	35.000	0.000	0.000	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.0000
2.999	35.988	0.000	0.000	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.0000
3.00	36.000	0.000	0.000	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000
3.08	37.000	0.000	0.000	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000
3.17	38.000	0.000	0.000	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000
3.25	39.000	0.000	0.000	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000
3.33	40.000	1.000	0.000	0.000	0.000	0.022	0.02	0.021	0.000	0.000	0.000	0.021
3.42	41.000	2.000	0.000	0.000	0.000	0.038	0.05	0.038	0.000	0.000	0.000	0.038
3.50	42.000	3.000	0.000	0.000	0.000	0.049	0	0.049	0.000	0.000	0.000	0.049
3.54	42.500	3.500	0.000	0.000	0.000	0.053	0	0.053	0.000	0.000	0.000	0.053
3.58	43.000	4.000	0.000	0.000	0.000	0.058	0	0.058	0.000	0.000	0.000	0.058
3.67	44.000	5.000	0.000	0.000	0.000	0.065	0	0.065	0.000	0.000	0.000	0.065
3.75	45.000	6.000	0.000	0.000	0.000	0.072	1	0.072	0.000	0.000	0.000	0.072
3.83	46.000	7.000	0.000	0.000	0.000	0.079	4	0.079	0.000	0.000	0.000	0.079
3.92	47.000	8.000	0.000	0.000	0.000	0.084	9	0.084	0.000	0.000	0.000	0.084
4.00	48.000	9.000	0.000	0.000	0.000	0.090	18	0.090	0.000	0.000	1.193	1.283
4.08	49.000	10.000	0.000	0.000	0.000	0.095	34	0.095	0.000	0.000	3.375	3.470
4.17	50.000	11.000	0.000	0.000	0.000	0.100	59	0.100	0.000	0.000	6.200	6.300
4.25	51.000	12.000	0.000	0.000	0.000	0.105	97	0.105	0.000	0.000	9.546	9.650
4.33	52.000	13.000	0.000	0.000	0.000	0.109	152	0.109	0.000	0.000	13.340	13.449
4.42	53.000	14.000	0.000	0.000	0.000	0.113	230	0.113	0.000	0.000	17.536	17.650
4.50	54.000	15.000	0.000	0.000	0.000	0.117	335	0.117	0.000	0.000	22.098	22.216
4.58	55.000	16.000	0.000	0.000	0.000	0.121	477	0.121	0.000	0.000	26.999	27.120
4.67	56.000	17.000	0.000	0.000	0.000	0.125	661	0.125	0.000	0.000	32.216	32.341
4.75	57.000	18.000	0.000	0.000	0.000	0.129	899	0.129	0.000	0.000	37.732	37.861
4.83	58.000	19.000	0.000	0.000	0.000	0.133	1200	0.133	0.000	0.000	43.531	43.664
4.92	59.000	20.000	0.000	0.000	0.000	0.136	1577	0.136	0.000	0.000	49.600	49.736
5.00	60.000	21.000	0.000	0.000	0.000	0.140	2042	0.140	0.000	0.000	55.927	56.067
5.08	61.000	22.000	0.000	0.000	0.000	0.143	2611	0.143	0.000	0.000	62.503	62.646
5.17	62.000	23.000	0.000	0.000	0.000	0.146	3300	0.146	0.000	0.000	69.318	69.464
5.25	63.000	24.000	0.000	0.000	0.000	0.149	4126	0.149	0.000	0.000	76.364	76.514
5.33	64.000	25.000	0.000	0.000	0.000	0.153	5110	0.153	0.000	0.000	83.634	83.787
5.42	65.000	26.000	0.000	0.000	0.000	0.156	6273	0.156	0.000	0.000	91.121	91.277
5.50	66.000	27.000	0.000	0.000	0.000	0.159	7638	0.159	0.000	0.000	98.819	98.978

APPENDIX 8: 100 YEAR HYDROLOGIC ANALYSIS FOR MITIGATED POST-DEVELOPED CONDITIONS
(Addition of Hydrographs)

HEC-HMS MODIFIED-PULS DETENTION ROUTING RESULTS



HEC-HMS POST DEVELOPED RESULTS

GRAVEL DETENTION

Summary Results for Reservoir "Gravel Detention"

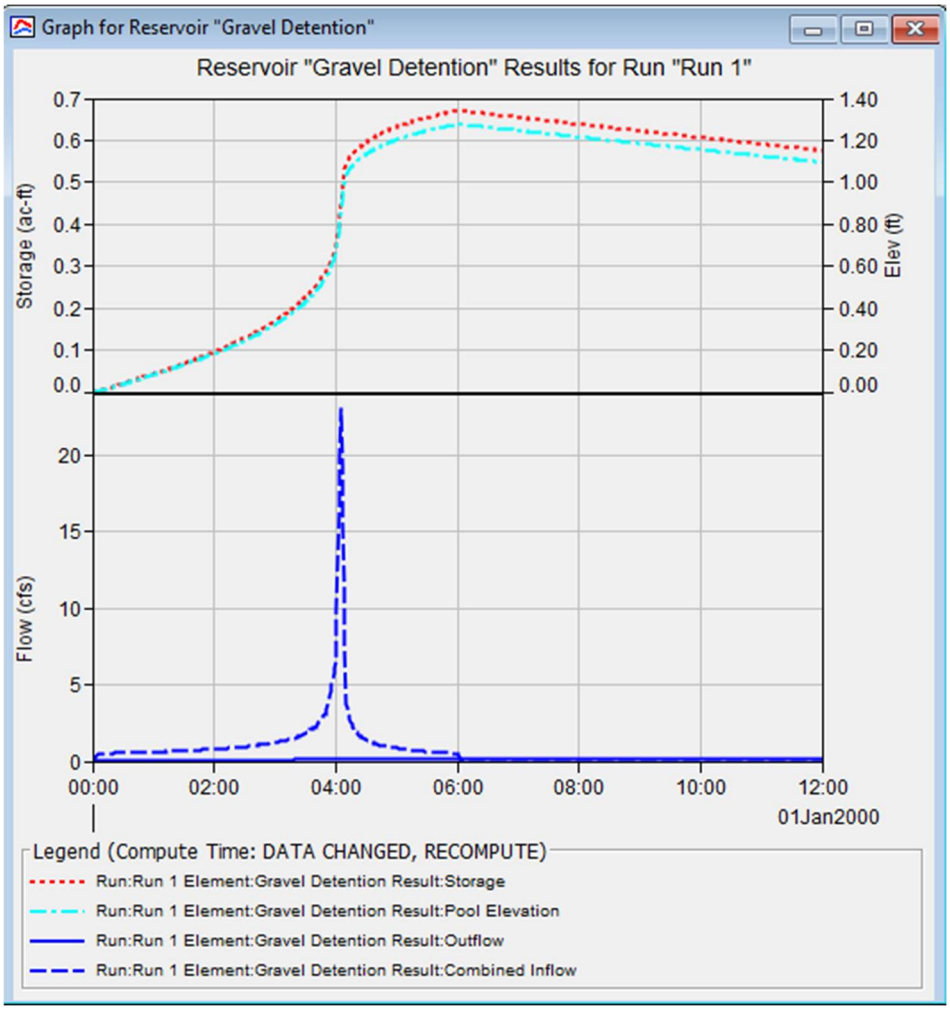
Project: Valley_Center_Storage Simulation Run: Run 1
Reservoir: Gravel Detention

Start of Run:	01Jan2000, 00:00	Basin Model:	Basin 1
End of Run:	01Jan2000, 12:00	Meteorologic Model:	Met 1
Compute Time:	DATA CHANGED, RECOMPUTE	Control Specifications:	Control 1

Volume Units: (•) IN ( ) ACRE-FT

Computed Results

Peak Inflow:	23.120 (CFS)	Date/Time of Peak Inflow:	01Jan2000, 04:05
Peak Discharge:	0.201 (CFS)	Date/Time of Peak Discharge:	01Jan2000, 06:03
Inflow Volume:	n/a	Peak Storage:	0.671 (ACRE-FT)
Discharge Volume:	n/a	Peak Elevation:	1.28 (FT)



INFILTRATION BASIN

Summary Results for Reservoir "Infiltration Basin"

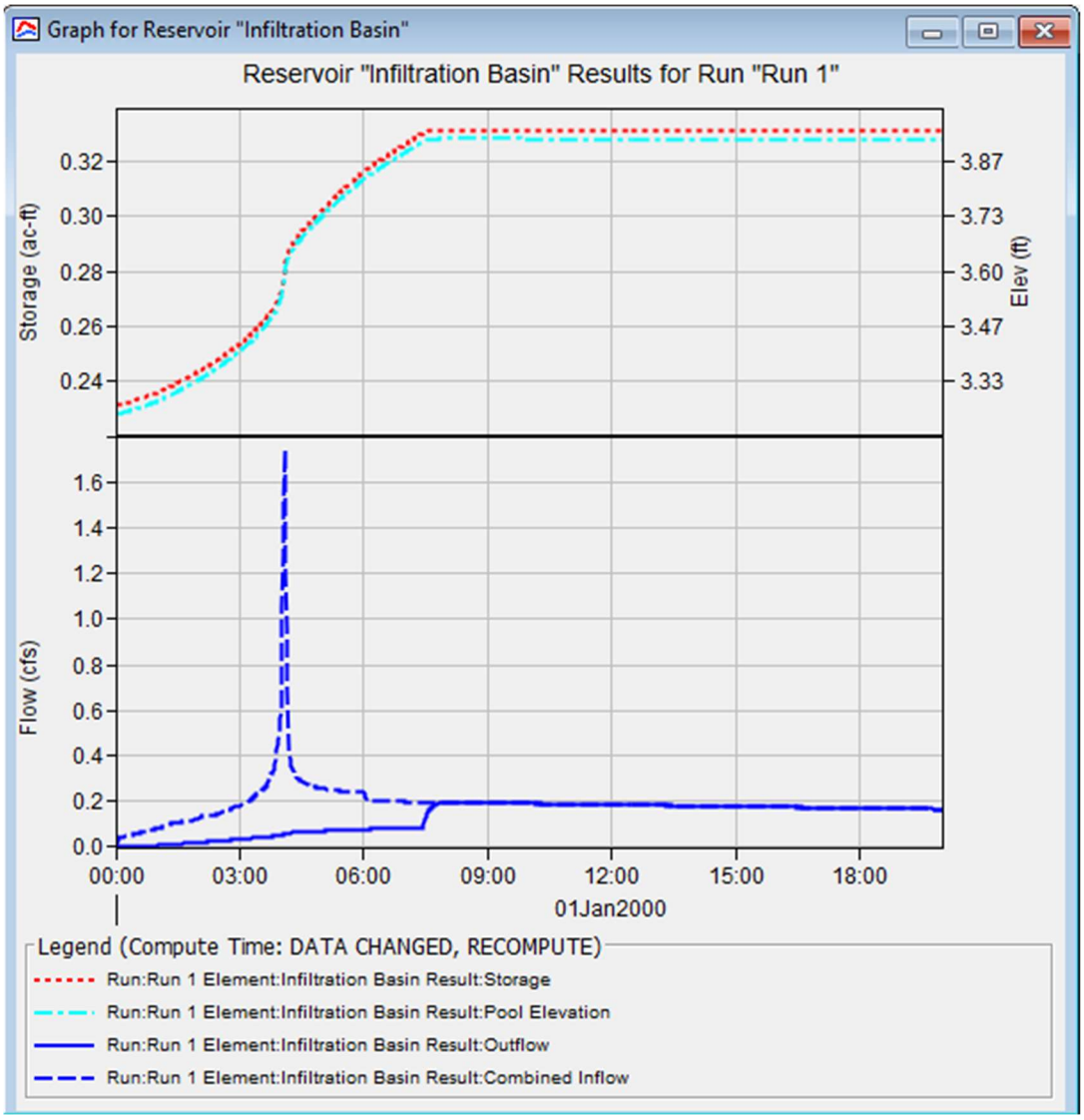
Project: Valley_Center_Storage Simulation Run: Run 1
Reservoir: Infiltration Basin

Start of Run:	01Jan2000, 00:00	Basin Model:	Basin 1
End of Run:	01Jan2000, 20:00	Meteorologic Model:	Met 1
Compute Time:	DATA CHANGED, RECOMPUTE	Control Specifications:	Control 1

Volume Units: (•) IN ( ) ACRE-FT

Computed Results

Peak Inflow:	1.744 (CFS)	Date/Time of Peak Inflow:	01Jan2000, 04:05
Peak Discharge:	0.195 (CFS)	Date/Time of Peak Discharge:	01Jan2000, 08:12
Inflow Volume:	n/a	Peak Storage:	0.332 (ACRE-FT)
Discharge Volume:	n/a	Peak Elevation:	3.92 (FT)



POC-1

Summary Results for Sink "POC-1"

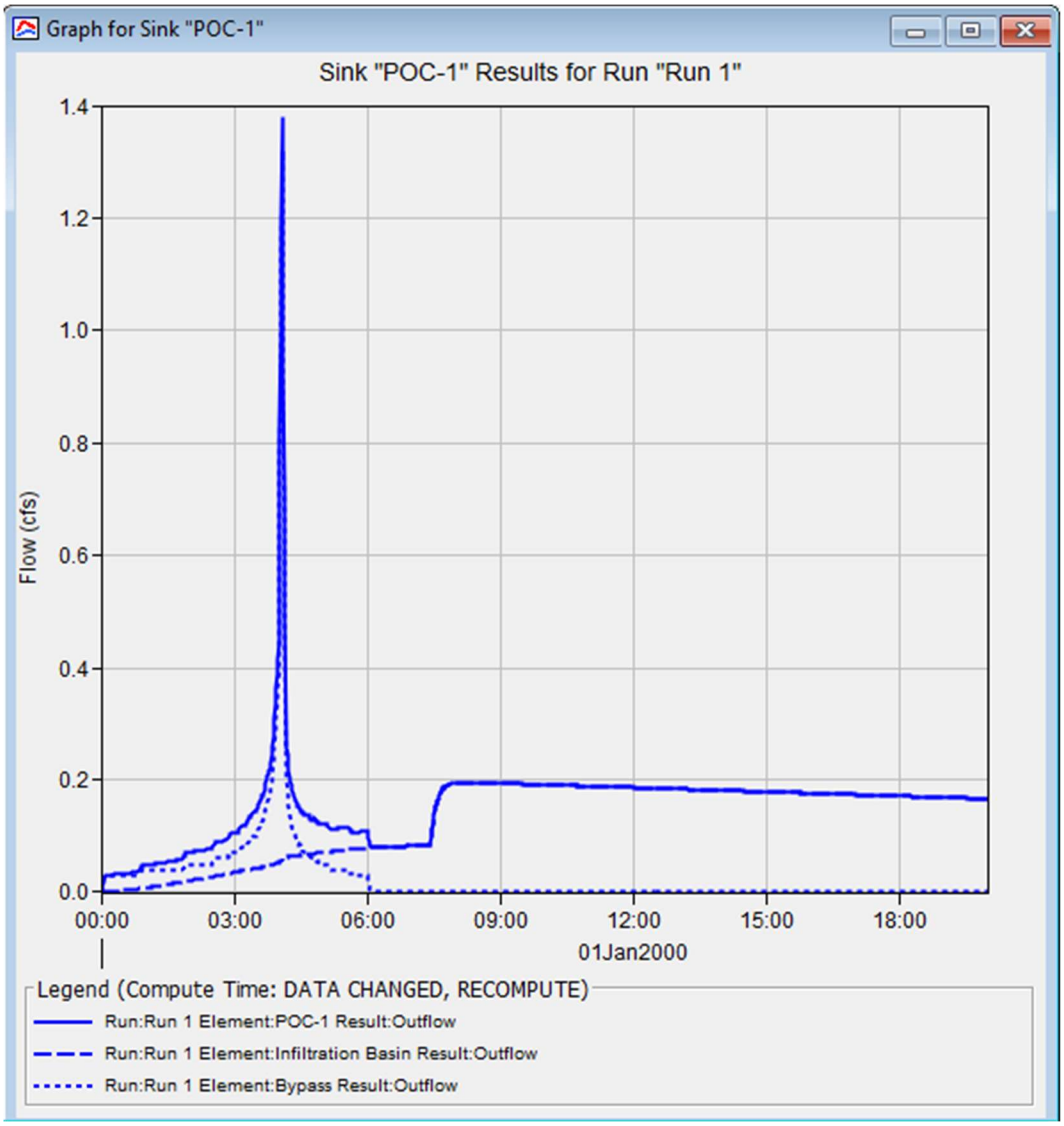
Project: Valley_Center_Storage Simulation Run: Run 1
Sink: POC-1

Start of Run:	01Jan2000, 00:00	Basin Model:	Basin 1
End of Run:	01Jan2000, 20:00	Meteorologic Model:	Met 1
Compute Time:	DATA CHANGED, RECOMPUTE	Control Specifications:	Control 1

Volume Units: (•) IN ( ) ACRE-FT

Computed Results

Peak Discharge: 1.378 (CFS) Date/Time of Peak Discharge 01Jan2000, 04:05
Volume: n/a



Time-Series Results - Gravel Detention

Project: Valley_Center_Storage Simulation Run: Run 1
Reservoir: Gravel Detention

Start of Run: 01Jan2000, 00:00 Basin Model: Basin 1
End of Run: 01Jan2000, 12:00 Meteorologic Model: Met 1
Compute Time: DATA CHANGED, RECOMPUTE Control Specifications: Control 1

Time	Inflow (cfs)	Storage (Acre-ft)	Elevation (ft)	Outflow (cfs)
0:00	0	0	0	0
0:01	0.1	0	0	0
0:02	0.2	0	0	0
0:03	0.3	0.001	0	0.001
0:04	0.4	0.001	0	0.001
0:05	0.5	0.002	0	0.002
0:06	0.5	0.002	0	0.002
0:07	0.5	0.003	0.01	0.003
0:08	0.5	0.004	0.01	0.004
0:09	0.5	0.004	0.01	0.004
0:10	0.5	0.005	0.01	0.005
0:11	0.5	0.006	0.01	0.006
0:12	0.5	0.007	0.01	0.006
0:13	0.5	0.007	0.01	0.007
0:14	0.5	0.008	0.01	0.008
0:15	0.5	0.009	0.02	0.008
0:16	0.5	0.009	0.02	0.009
0:17	0.5	0.01	0.02	0.01
0:18	0.5	0.011	0.02	0.01
0:19	0.5	0.011	0.02	0.011
0:20	0.5	0.012	0.02	0.012
0:21	0.52	0.013	0.02	0.012
0:22	0.54	0.013	0.03	0.013
0:23	0.56	0.014	0.03	0.014
0:24	0.58	0.015	0.03	0.014
0:25	0.6	0.016	0.03	0.015
0:26	0.6	0.016	0.03	0.016
0:27	0.6	0.017	0.03	0.017
0:28	0.6	0.018	0.03	0.018
0:29	0.6	0.019	0.04	0.018
0:30	0.6	0.02	0.04	0.019
0:31	0.6	0.02	0.04	0.02
0:32	0.6	0.021	0.04	0.021
0:33	0.6	0.022	0.04	0.021
0:34	0.6	0.023	0.04	0.022
0:35	0.6	0.024	0.04	0.023
0:36	0.6	0.024	0.05	0.024

Time	Inflow (cfs)	Storage (Acre-ft)	Elevation (ft)	Outflow (cfs)
0:37	0.6	0.025	0.05	0.025
0:38	0.6	0.026	0.05	0.025
0:39	0.6	0.027	0.05	0.026
0:40	0.6	0.028	0.05	0.027
0:41	0.6	0.028	0.05	0.028
0:42	0.6	0.029	0.06	0.028
0:43	0.6	0.03	0.06	0.029
0:44	0.6	0.031	0.06	0.03
0:45	0.6	0.032	0.06	0.031
0:46	0.6	0.032	0.06	0.031
0:47	0.6	0.033	0.06	0.032
0:48	0.6	0.034	0.06	0.033
0:49	0.6	0.035	0.07	0.034
0:50	0.6	0.035	0.07	0.034
0:51	0.6	0.036	0.07	0.035
0:52	0.6	0.037	0.07	0.036
0:53	0.6	0.038	0.07	0.037
0:54	0.6	0.039	0.07	0.037
0:55	0.6	0.039	0.07	0.038
0:56	0.6	0.04	0.08	0.039
0:57	0.6	0.041	0.08	0.04
0:58	0.6	0.042	0.08	0.041
0:59	0.6	0.042	0.08	0.041
1:00	0.6	0.043	0.08	0.042
1:01	0.6	0.044	0.08	0.043
1:02	0.6	0.045	0.09	0.043
1:03	0.6	0.045	0.09	0.044
1:04	0.6	0.046	0.09	0.045
1:05	0.6	0.047	0.09	0.046
1:06	0.6	0.048	0.09	0.046
1:07	0.6	0.049	0.09	0.047
1:08	0.6	0.049	0.09	0.048
1:09	0.6	0.05	0.1	0.049
1:10	0.6	0.051	0.1	0.049
1:11	0.62	0.052	0.1	0.05
1:12	0.64	0.052	0.1	0.051
1:13	0.66	0.053	0.1	0.051
1:14	0.68	0.054	0.1	0.052
1:15	0.7	0.055	0.1	0.052
1:16	0.7	0.056	0.11	0.053
1:17	0.7	0.057	0.11	0.053
1:18	0.7	0.058	0.11	0.054
1:19	0.7	0.058	0.11	0.054
1:20	0.7	0.059	0.11	0.054
1:21	0.7	0.06	0.11	0.055

Time	Inflow (cfs)	Storage (Acre-ft)	Elevation (ft)	Outflow (cfs)
1:22	0.7	0.061	0.12	0.055
1:23	0.7	0.062	0.12	0.056
1:24	0.7	0.063	0.12	0.056
1:25	0.7	0.064	0.12	0.057
1:26	0.7	0.065	0.12	0.057
1:27	0.7	0.066	0.12	0.057
1:28	0.7	0.066	0.13	0.058
1:29	0.7	0.067	0.13	0.058
1:30	0.7	0.068	0.13	0.059
1:31	0.7	0.069	0.13	0.059
1:32	0.7	0.07	0.13	0.059
1:33	0.7	0.071	0.13	0.06
1:34	0.7	0.072	0.14	0.06
1:35	0.7	0.073	0.14	0.061
1:36	0.7	0.074	0.14	0.061
1:37	0.7	0.074	0.14	0.062
1:38	0.7	0.075	0.14	0.062
1:39	0.7	0.076	0.14	0.062
1:40	0.7	0.077	0.15	0.063
1:41	0.7	0.078	0.15	0.063
1:42	0.7	0.079	0.15	0.064
1:43	0.7	0.08	0.15	0.064
1:44	0.7	0.081	0.15	0.065
1:45	0.7	0.081	0.15	0.065
1:46	0.72	0.082	0.16	0.065
1:47	0.74	0.083	0.16	0.066
1:48	0.76	0.084	0.16	0.066
1:49	0.78	0.085	0.16	0.067
1:50	0.8	0.086	0.16	0.067
1:51	0.8	0.087	0.17	0.068
1:52	0.8	0.088	0.17	0.068
1:53	0.8	0.089	0.17	0.069
1:54	0.8	0.09	0.17	0.069
1:55	0.8	0.091	0.17	0.07
1:56	0.8	0.092	0.18	0.07
1:57	0.8	0.093	0.18	0.071
1:58	0.8	0.094	0.18	0.071
1:59	0.8	0.095	0.18	0.072
2:00	0.8	0.096	0.18	0.072
2:01	0.8	0.097	0.18	0.073
2:02	0.8	0.098	0.19	0.073
2:03	0.8	0.099	0.19	0.073
2:04	0.8	0.1	0.19	0.074
2:05	0.8	0.101	0.19	0.074
2:06	0.8	0.102	0.19	0.075

Time	Inflow (cfs)	Storage (Acre-ft)	Elevation (ft)	Outflow (cfs)
2:07	0.8	0.103	0.2	0.075
2:08	0.8	0.104	0.2	0.076
2:09	0.8	0.105	0.2	0.076
2:10	0.8	0.106	0.2	0.077
2:11	0.82	0.107	0.2	0.077
2:12	0.84	0.108	0.21	0.077
2:13	0.86	0.109	0.21	0.078
2:14	0.88	0.11	0.21	0.078
2:15	0.9	0.111	0.21	0.079
2:16	0.9	0.113	0.21	0.079
2:17	0.9	0.114	0.22	0.079
2:18	0.9	0.115	0.22	0.08
2:19	0.9	0.116	0.22	0.08
2:20	0.9	0.117	0.22	0.081
2:21	0.9	0.118	0.23	0.081
2:22	0.9	0.119	0.23	0.081
2:23	0.9	0.121	0.23	0.082
2:24	0.9	0.122	0.23	0.082
2:25	0.9	0.123	0.23	0.083
2:26	0.9	0.124	0.24	0.083
2:27	0.9	0.125	0.24	0.083
2:28	0.9	0.126	0.24	0.084
2:29	0.9	0.127	0.24	0.084
2:30	0.9	0.128	0.24	0.085
2:31	0.92	0.13	0.25	0.085
2:32	0.94	0.131	0.25	0.085
2:33	0.96	0.132	0.25	0.086
2:34	0.98	0.133	0.25	0.086
2:35	1	0.134	0.26	0.087
2:36	1	0.136	0.26	0.087
2:37	1	0.137	0.26	0.088
2:38	1	0.138	0.26	0.088
2:39	1	0.139	0.27	0.088
2:40	1	0.141	0.27	0.089
2:41	1.02	0.142	0.27	0.089
2:42	1.04	0.143	0.27	0.09
2:43	1.06	0.145	0.28	0.09
2:44	1.08	0.146	0.28	0.091
2:45	1.1	0.147	0.28	0.091
2:46	1.1	0.149	0.28	0.092
2:47	1.1	0.15	0.29	0.092
2:48	1.1	0.151	0.29	0.093
2:49	1.1	0.153	0.29	0.093
2:50	1.1	0.154	0.29	0.094
2:51	1.12	0.156	0.3	0.094

Time	Inflow (cfs)	Storage (Acre-ft)	Elevation (ft)	Outflow (cfs)
2:52	1.14	0.157	0.3	0.095
2:53	1.16	0.158	0.3	0.095
2:54	1.18	0.16	0.3	0.096
2:55	1.2	0.161	0.31	0.096
2:56	1.2	0.163	0.31	0.096
2:57	1.2	0.164	0.31	0.097
2:58	1.2	0.166	0.32	0.097
2:59	1.2	0.168	0.32	0.098
3:00	1.2	0.169	0.32	0.098
3:01	1.22	0.171	0.32	0.099
3:02	1.24	0.172	0.33	0.099
3:03	1.26	0.174	0.33	0.1
3:04	1.28	0.175	0.33	0.1
3:05	1.3	0.177	0.34	0.101
3:06	1.3	0.179	0.34	0.101
3:07	1.3	0.18	0.34	0.102
3:08	1.3	0.182	0.35	0.102
3:09	1.3	0.184	0.35	0.103
3:10	1.3	0.185	0.35	0.103
3:11	1.34	0.187	0.36	0.104
3:12	1.38	0.189	0.36	0.104
3:13	1.42	0.19	0.36	0.105
3:14	1.46	0.192	0.37	0.105
3:15	1.5	0.194	0.37	0.106
3:16	1.5	0.196	0.37	0.106
3:17	1.5	0.198	0.38	0.107
3:18	1.5	0.2	0.38	0.107
3:19	1.5	0.202	0.38	0.108
3:20	1.5	0.204	0.39	0.109
3:21	1.54	0.206	0.39	0.109
3:22	1.58	0.208	0.4	0.11
3:23	1.62	0.21	0.4	0.11
3:24	1.66	0.212	0.4	0.111
3:25	1.7	0.214	0.41	0.112
3:26	1.72	0.216	0.41	0.112
3:27	1.74	0.218	0.42	0.113
3:28	1.76	0.221	0.42	0.113
3:29	1.78	0.223	0.42	0.114
3:30	1.8	0.225	0.43	0.114
3:31	1.86	0.228	0.43	0.115
3:32	1.92	0.23	0.44	0.116
3:33	1.98	0.233	0.44	0.116
3:34	2.04	0.235	0.45	0.117
3:35	2.1	0.238	0.45	0.118
3:36	2.12	0.241	0.46	0.118

Time	Inflow (cfs)	Storage (Acre-ft)	Elevation (ft)	Outflow (cfs)
3:37	2.14	0.243	0.46	0.119
3:38	2.16	0.246	0.47	0.12
3:39	2.18	0.249	0.47	0.121
3:40	2.2	0.252	0.48	0.121
3:41	2.3	0.255	0.49	0.122
3:42	2.4	0.258	0.49	0.123
3:43	2.5	0.261	0.5	0.124
3:44	2.6	0.264	0.5	0.125
3:45	2.7	0.268	0.51	0.125
3:46	2.78	0.272	0.52	0.126
3:47	2.86	0.275	0.52	0.127
3:48	2.94	0.279	0.53	0.128
3:49	3.02	0.283	0.54	0.129
3:50	3.1	0.287	0.55	0.13
3:51	3.4	0.291	0.55	0.131
3:52	3.7	0.296	0.56	0.132
3:53	4	0.301	0.57	0.133
3:54	4.3	0.307	0.58	0.134
3:55	4.6	0.313	0.6	0.136
3:56	4.98	0.319	0.61	0.137
3:57	5.36	0.326	0.62	0.139
3:58	5.74	0.333	0.63	0.14
3:59	6.12	0.341	0.65	0.142
4:00	6.5	0.35	0.67	0.144
4:01	9.824	0.361	0.69	0.146
4:02	13.148	0.377	0.72	0.149
4:03	16.472	0.397	0.76	0.153
4:04	19.796	0.421	0.8	0.158
4:05	23.12	0.451	0.86	0.164
4:06	19.236	0.48	0.91	0.169
4:07	15.352	0.503	0.96	0.173
4:08	11.468	0.522	0.99	0.177
4:09	7.584	0.534	1.02	0.179
4:10	3.7	0.542	1.03	0.18
4:11	3.46	0.547	1.04	0.181
4:12	3.22	0.551	1.05	0.182
4:13	2.98	0.555	1.06	0.182
4:14	2.74	0.559	1.06	0.183
4:15	2.5	0.562	1.07	0.183
4:16	2.38	0.565	1.08	0.184
4:17	2.26	0.568	1.08	0.184
4:18	2.14	0.571	1.09	0.185
4:19	2.02	0.574	1.09	0.185
4:20	1.9	0.576	1.1	0.186
4:21	1.84	0.578	1.1	0.186

Time	Inflow (cfs)	Storage (Acre-ft)	Elevation (ft)	Outflow (cfs)
4:22	1.78	0.581	1.1	0.186
4:23	1.72	0.583	1.11	0.187
4:24	1.66	0.585	1.11	0.187
4:25	1.6	0.587	1.12	0.187
4:26	1.56	0.589	1.12	0.188
4:27	1.52	0.591	1.12	0.188
4:28	1.48	0.592	1.13	0.188
4:29	1.44	0.594	1.13	0.189
4:30	1.4	0.596	1.13	0.189
4:31	1.38	0.597	1.14	0.189
4:32	1.36	0.599	1.14	0.189
4:33	1.34	0.601	1.14	0.19
4:34	1.32	0.602	1.15	0.19
4:35	1.3	0.604	1.15	0.19
4:36	1.26	0.605	1.15	0.19
4:37	1.22	0.607	1.15	0.191
4:38	1.18	0.608	1.16	0.191
4:39	1.14	0.609	1.16	0.191
4:40	1.1	0.611	1.16	0.191
4:41	1.08	0.612	1.16	0.191
4:42	1.06	0.613	1.17	0.192
4:43	1.04	0.614	1.17	0.192
4:44	1.02	0.615	1.17	0.192
4:45	1	0.617	1.17	0.192
4:46	1	0.618	1.18	0.192
4:47	1	0.619	1.18	0.193
4:48	1	0.62	1.18	0.193
4:49	1	0.621	1.18	0.193
4:50	1	0.622	1.18	0.193
4:51	0.98	0.623	1.19	0.193
4:52	0.96	0.624	1.19	0.193
4:53	0.94	0.625	1.19	0.194
4:54	0.92	0.626	1.19	0.194
4:55	0.9	0.627	1.19	0.194
4:56	0.9	0.628	1.2	0.194
4:57	0.9	0.629	1.2	0.194
4:58	0.9	0.63	1.2	0.194
4:59	0.9	0.631	1.2	0.195
5:00	0.9	0.632	1.2	0.195
5:01	0.88	0.633	1.21	0.195
5:02	0.86	0.634	1.21	0.195
5:03	0.84	0.635	1.21	0.195
5:04	0.82	0.636	1.21	0.195
5:05	0.8	0.637	1.21	0.195
5:06	0.8	0.638	1.21	0.196

Time	Inflow (cfs)	Storage (Acre-ft)	Elevation (ft)	Outflow (cfs)
5:07	0.8	0.638	1.22	0.196
5:08	0.8	0.639	1.22	0.196
5:09	0.8	0.64	1.22	0.196
5:10	0.8	0.641	1.22	0.196
5:11	0.78	0.642	1.22	0.196
5:12	0.76	0.643	1.22	0.196
5:13	0.74	0.643	1.22	0.196
5:14	0.72	0.644	1.23	0.197
5:15	0.7	0.645	1.23	0.197
5:16	0.7	0.645	1.23	0.197
5:17	0.7	0.646	1.23	0.197
5:18	0.7	0.647	1.23	0.197
5:19	0.7	0.648	1.23	0.197
5:20	0.7	0.648	1.23	0.197
5:21	0.7	0.649	1.24	0.197
5:22	0.7	0.65	1.24	0.197
5:23	0.7	0.65	1.24	0.197
5:24	0.7	0.651	1.24	0.198
5:25	0.7	0.652	1.24	0.198
5:26	0.68	0.652	1.24	0.198
5:27	0.66	0.653	1.24	0.198
5:28	0.64	0.654	1.24	0.198
5:29	0.62	0.654	1.25	0.198
5:30	0.6	0.655	1.25	0.198
5:31	0.6	0.655	1.25	0.198
5:32	0.6	0.656	1.25	0.198
5:33	0.6	0.656	1.25	0.198
5:34	0.6	0.657	1.25	0.199
5:35	0.6	0.658	1.25	0.199
5:36	0.6	0.658	1.25	0.199
5:37	0.6	0.659	1.25	0.199
5:38	0.6	0.659	1.25	0.199
5:39	0.6	0.66	1.26	0.199
5:40	0.6	0.66	1.26	0.199
5:41	0.6	0.661	1.26	0.199
5:42	0.6	0.661	1.26	0.199
5:43	0.6	0.662	1.26	0.199
5:44	0.6	0.663	1.26	0.199
5:45	0.6	0.663	1.26	0.199
5:46	0.6	0.664	1.26	0.200
5:47	0.6	0.664	1.26	0.200
5:48	0.6	0.665	1.27	0.200
5:49	0.6	0.665	1.27	0.200
5:50	0.6	0.666	1.27	0.200
5:51	0.58	0.666	1.27	0.200

Time	Inflow (cfs)	Storage (Acre-ft)	Elevation (ft)	Outflow (cfs)
5:52	0.56	0.667	1.27	0.200
5:53	0.54	0.667	1.27	0.200
5:54	0.52	0.668	1.27	0.200
5:55	0.5	0.668	1.27	0.200
5:56	0.5	0.669	1.27	0.200
5:57	0.5	0.669	1.27	0.200
5:58	0.5	0.669	1.27	0.200
5:59	0.5	0.67	1.28	0.200
6:00	0.5	0.67	1.28	0.201
6:01	0.4	0.671	1.28	0.201
6:02	0.3	0.671	1.28	0.201
6:03	0.2	0.671	1.28	0.201
6:04	0.1	0.671	1.28	0.201
6:05	0	0.671	1.28	0.201

Time-Series Results - Infiltration Basin

Project: Valley_Center_Storage Simulation Run: Run 1
Reservoir: Infiltration Basin

Start of Run: 01Jan2000, 00:00 Basin Model: Basin 1
End of Run: 01Jan2000, 06:05 Meteorologic Model: Met 1
Compute Time: DATA CHANGED, RECOMPUTE Control Specifications: Control 1

Time	Inflow (cfs)	Storage (Acre-ft)	Elevation (ft)	Outflow (cfs)
0:00	0	0.231	3.25	0
0:01	0.008	0.231	3.25	0
0:02	0.016	0.231	3.25	0
0:03	0.025	0.231	3.25	0
0:04	0.033	0.231	3.25	0
0:05	0.042	0.231	3.25	0
0:06	0.042	0.231	3.25	0
0:07	0.043	0.231	3.25	0
0:08	0.044	0.231	3.25	0.001
0:09	0.044	0.231	3.25	0.001
0:10	0.045	0.231	3.25	0.001
0:11	0.046	0.231	3.25	0.001
0:12	0.046	0.232	3.25	0.001
0:13	0.047	0.232	3.25	0.001
0:14	0.048	0.232	3.25	0.001
0:15	0.048	0.232	3.26	0.001
0:16	0.049	0.232	3.26	0.001
0:17	0.05	0.232	3.26	0.002
0:18	0.05	0.232	3.26	0.002
0:19	0.051	0.232	3.26	0.002
0:20	0.052	0.232	3.26	0.002
0:21	0.052	0.232	3.26	0.002
0:22	0.053	0.232	3.26	0.002
0:23	0.054	0.232	3.26	0.002
0:24	0.054	0.232	3.26	0.002
0:25	0.055	0.232	3.26	0.003
0:26	0.056	0.232	3.26	0.003
0:27	0.057	0.233	3.26	0.003
0:28	0.058	0.233	3.26	0.003
0:29	0.058	0.233	3.26	0.003
0:30	0.059	0.233	3.26	0.003
0:31	0.06	0.233	3.26	0.003
0:32	0.061	0.233	3.26	0.003
0:33	0.061	0.233	3.26	0.004
0:34	0.062	0.233	3.26	0.004
0:35	0.063	0.233	3.27	0.004
0:36	0.064	0.233	3.27	0.004

Time	Inflow (cfs)	Storage (Acre-ft)	Elevation (ft)	Outflow (cfs)
0:37	0.065	0.233	3.27	0.004
0:38	0.065	0.233	3.27	0.004
0:39	0.066	0.234	3.27	0.004
0:40	0.067	0.234	3.27	0.005
0:41	0.068	0.234	3.27	0.005
0:42	0.068	0.234	3.27	0.005
0:43	0.069	0.234	3.27	0.005
0:44	0.07	0.234	3.27	0.005
0:45	0.071	0.234	3.27	0.005
0:46	0.071	0.234	3.27	0.006
0:47	0.072	0.234	3.27	0.006
0:48	0.073	0.234	3.27	0.006
0:49	0.074	0.234	3.27	0.006
0:50	0.074	0.234	3.27	0.006
0:51	0.075	0.235	3.28	0.006
0:52	0.076	0.235	3.28	0.007
0:53	0.077	0.235	3.28	0.007
0:54	0.077	0.235	3.28	0.007
0:55	0.078	0.235	3.28	0.007
0:56	0.079	0.235	3.28	0.007
0:57	0.08	0.235	3.28	0.007
0:58	0.081	0.235	3.28	0.008
0:59	0.081	0.235	3.28	0.008
1:00	0.082	0.235	3.28	0.008
1:01	0.083	0.236	3.28	0.008
1:02	0.083	0.236	3.28	0.008
1:03	0.084	0.236	3.28	0.008
1:04	0.085	0.236	3.28	0.009
1:05	0.086	0.236	3.28	0.009
1:06	0.086	0.236	3.29	0.009
1:07	0.087	0.236	3.29	0.009
1:08	0.088	0.236	3.29	0.009
1:09	0.089	0.236	3.29	0.01
1:10	0.089	0.237	3.29	0.01
1:11	0.09	0.237	3.29	0.01
1:12	0.091	0.237	3.29	0.01
1:13	0.091	0.237	3.29	0.01
1:14	0.092	0.237	3.29	0.011
1:15	0.092	0.237	3.29	0.011
1:16	0.095	0.237	3.29	0.011
1:17	0.097	0.237	3.29	0.011
1:18	0.1	0.237	3.29	0.011
1:19	0.102	0.238	3.3	0.012
1:20	0.104	0.238	3.3	0.012
1:21	0.105	0.238	3.3	0.012

Time	Inflow (cfs)	Storage (Acre-ft)	Elevation (ft)	Outflow (cfs)
1:22	0.105	0.238	3.3	0.012
1:23	0.106	0.238	3.3	0.012
1:24	0.106	0.238	3.3	0.013
1:25	0.107	0.238	3.3	0.013
1:26	0.107	0.238	3.3	0.013
1:27	0.107	0.239	3.3	0.013
1:28	0.108	0.239	3.3	0.014
1:29	0.108	0.239	3.3	0.014
1:30	0.109	0.239	3.31	0.014
1:31	0.109	0.239	3.31	0.014
1:32	0.109	0.239	3.31	0.015
1:33	0.11	0.239	3.31	0.015
1:34	0.11	0.24	3.31	0.015
1:35	0.111	0.24	3.31	0.015
1:36	0.111	0.24	3.31	0.015
1:37	0.112	0.24	3.31	0.016
1:38	0.112	0.24	3.31	0.016
1:39	0.112	0.24	3.31	0.016
1:40	0.113	0.24	3.31	0.016
1:41	0.113	0.24	3.32	0.017
1:42	0.114	0.241	3.32	0.017
1:43	0.114	0.241	3.32	0.017
1:44	0.115	0.241	3.32	0.017
1:45	0.115	0.241	3.32	0.018
1:46	0.115	0.241	3.32	0.018
1:47	0.116	0.241	3.32	0.018
1:48	0.116	0.241	3.32	0.018
1:49	0.117	0.242	3.32	0.018
1:50	0.117	0.242	3.32	0.019
1:51	0.118	0.242	3.32	0.019
1:52	0.118	0.242	3.33	0.019
1:53	0.119	0.242	3.33	0.019
1:54	0.119	0.242	3.33	0.02
1:55	0.12	0.242	3.33	0.02
1:56	0.12	0.242	3.33	0.02
1:57	0.121	0.243	3.33	0.02
1:58	0.121	0.243	3.33	0.021
1:59	0.122	0.243	3.33	0.021
2:00	0.122	0.243	3.33	0.021
2:01	0.125	0.243	3.33	0.021
2:02	0.127	0.243	3.34	0.021
2:03	0.129	0.243	3.34	0.022
2:04	0.132	0.244	3.34	0.022
2:05	0.134	0.244	3.34	0.022
2:06	0.135	0.244	3.34	0.022

Time	Inflow (cfs)	Storage (Acre-ft)	Elevation (ft)	Outflow (cfs)
2:07	0.135	0.244	3.34	0.023
2:08	0.136	0.244	3.34	0.023
2:09	0.136	0.244	3.34	0.023
2:10	0.137	0.245	3.34	0.023
2:11	0.137	0.245	3.35	0.023
2:12	0.137	0.245	3.35	0.024
2:13	0.138	0.245	3.35	0.024
2:14	0.138	0.245	3.35	0.024
2:15	0.139	0.245	3.35	0.024
2:16	0.139	0.245	3.35	0.025
2:17	0.139	0.246	3.35	0.025
2:18	0.14	0.246	3.35	0.025
2:19	0.14	0.246	3.35	0.025
2:20	0.141	0.246	3.35	0.025
2:21	0.141	0.246	3.36	0.026
2:22	0.141	0.246	3.36	0.026
2:23	0.142	0.247	3.36	0.026
2:24	0.142	0.247	3.36	0.026
2:25	0.143	0.247	3.36	0.027
2:26	0.143	0.247	3.36	0.027
2:27	0.143	0.247	3.36	0.027
2:28	0.144	0.247	3.36	0.027
2:29	0.144	0.248	3.36	0.027
2:30	0.145	0.248	3.37	0.028
2:31	0.147	0.248	3.37	0.028
2:32	0.149	0.248	3.37	0.028
2:33	0.152	0.248	3.37	0.028
2:34	0.154	0.248	3.37	0.029
2:35	0.157	0.249	3.37	0.029
2:36	0.157	0.249	3.37	0.029
2:37	0.158	0.249	3.37	0.029
2:38	0.158	0.249	3.38	0.03
2:39	0.158	0.249	3.38	0.03
2:40	0.159	0.249	3.38	0.03
2:41	0.159	0.25	3.38	0.03
2:42	0.16	0.25	3.38	0.031
2:43	0.16	0.25	3.38	0.031
2:44	0.161	0.25	3.38	0.031
2:45	0.161	0.25	3.38	0.031
2:46	0.164	0.25	3.39	0.032
2:47	0.166	0.251	3.39	0.032
2:48	0.169	0.251	3.39	0.032
2:49	0.171	0.251	3.39	0.032
2:50	0.174	0.251	3.39	0.033
2:51	0.174	0.251	3.39	0.033

Time	Inflow (cfs)	Storage (Acre-ft)	Elevation (ft)	Outflow (cfs)
2:52	0.175	0.252	3.39	0.033
2:53	0.175	0.252	3.39	0.033
2:54	0.176	0.252	3.4	0.034
2:55	0.176	0.252	3.4	0.034
2:56	0.176	0.252	3.4	0.034
2:57	0.177	0.253	3.4	0.035
2:58	0.177	0.253	3.4	0.035
2:59	0.178	0.253	3.4	0.035
3:00	0.178	0.253	3.4	0.035
3:01	0.181	0.253	3.41	0.036
3:02	0.183	0.254	3.41	0.036
3:03	0.186	0.254	3.41	0.036
3:04	0.188	0.254	3.41	0.037
3:05	0.191	0.254	3.41	0.037
3:06	0.191	0.254	3.41	0.037
3:07	0.192	0.255	3.41	0.037
3:08	0.192	0.255	3.42	0.038
3:09	0.193	0.255	3.42	0.038
3:10	0.193	0.255	3.42	0.038
3:11	0.196	0.255	3.42	0.038
3:12	0.198	0.256	3.42	0.039
3:13	0.201	0.256	3.42	0.039
3:14	0.203	0.256	3.42	0.039
3:15	0.206	0.256	3.43	0.039
3:16	0.208	0.257	3.43	0.039
3:17	0.211	0.257	3.43	0.04
3:18	0.213	0.257	3.43	0.04
3:19	0.216	0.257	3.43	0.04
3:20	0.219	0.258	3.43	0.04
3:21	0.221	0.258	3.44	0.041
3:22	0.224	0.258	3.44	0.041
3:23	0.226	0.258	3.44	0.041
3:24	0.229	0.259	3.44	0.041
3:25	0.232	0.259	3.44	0.041
3:26	0.232	0.259	3.44	0.042
3:27	0.233	0.259	3.45	0.042
3:28	0.233	0.26	3.45	0.042
3:29	0.234	0.26	3.45	0.042
3:30	0.234	0.26	3.45	0.043
3:31	0.239	0.26	3.45	0.043
3:32	0.244	0.261	3.46	0.043
3:33	0.248	0.261	3.46	0.043
3:34	0.253	0.261	3.46	0.044
3:35	0.258	0.262	3.46	0.044
3:36	0.26	0.262	3.46	0.044

Time	Inflow (cfs)	Storage (Acre-ft)	Elevation (ft)	Outflow (cfs)
3:37	0.263	0.262	3.47	0.044
3:38	0.266	0.262	3.47	0.045
3:39	0.269	0.263	3.47	0.045
3:40	0.271	0.263	3.47	0.045
3:41	0.28	0.263	3.47	0.046
3:42	0.289	0.264	3.48	0.046
3:43	0.298	0.264	3.48	0.046
3:44	0.307	0.264	3.48	0.046
3:45	0.315	0.265	3.48	0.047
3:46	0.32	0.265	3.49	0.047
3:47	0.325	0.266	3.49	0.047
3:48	0.33	0.266	3.49	0.048
3:49	0.335	0.266	3.49	0.048
3:50	0.34	0.267	3.5	0.048
3:51	0.361	0.267	3.5	0.049
3:52	0.382	0.268	3.5	0.049
3:53	0.403	0.268	3.51	0.049
3:54	0.424	0.269	3.51	0.05
3:55	0.446	0.269	3.51	0.05
3:56	0.475	0.27	3.52	0.051
3:57	0.505	0.27	3.52	0.051
3:58	0.534	0.271	3.52	0.051
3:59	0.564	0.272	3.53	0.052
4:00	0.594	0.272	3.53	0.052
4:01	0.822	0.273	3.54	0.053
4:02	1.051	0.274	3.55	0.054
4:03	1.281	0.276	3.56	0.055
4:04	1.512	0.278	3.57	0.056
4:05	1.744	0.28	3.58	0.058
4:06	1.483	0.282	3.6	0.059
4:07	1.221	0.284	3.61	0.06
4:08	0.959	0.285	3.62	0.061
4:09	0.695	0.286	3.63	0.062
4:10	0.43	0.287	3.63	0.062
4:11	0.415	0.288	3.64	0.062
4:12	0.4	0.288	3.64	0.063
4:13	0.384	0.288	3.64	0.063
4:14	0.369	0.289	3.64	0.063
4:15	0.353	0.289	3.65	0.063
4:16	0.346	0.29	3.65	0.064
4:17	0.338	0.29	3.65	0.064
4:18	0.331	0.29	3.66	0.064
4:19	0.323	0.291	3.66	0.064
4:20	0.316	0.291	3.66	0.064
4:21	0.312	0.292	3.66	0.065

Time	Inflow (cfs)	Storage (Acre-ft)	Elevation (ft)	Outflow (cfs)
4:22	0.308	0.292	3.66	0.065
4:23	0.305	0.292	3.67	0.065
4:24	0.301	0.293	3.67	0.065
4:25	0.297	0.293	3.67	0.065
4:26	0.296	0.293	3.67	0.066
4:27	0.294	0.293	3.68	0.066
4:28	0.292	0.294	3.68	0.066
4:29	0.291	0.294	3.68	0.066
4:30	0.289	0.294	3.68	0.066
4:31	0.287	0.295	3.68	0.066
4:32	0.285	0.295	3.69	0.067
4:33	0.284	0.295	3.69	0.067
4:34	0.282	0.296	3.69	0.067
4:35	0.28	0.296	3.69	0.067
4:36	0.278	0.296	3.69	0.067
4:37	0.277	0.296	3.7	0.067
4:38	0.275	0.297	3.7	0.068
4:39	0.273	0.297	3.7	0.068
4:40	0.271	0.297	3.7	0.068
4:41	0.269	0.298	3.7	0.068
4:42	0.268	0.298	3.7	0.068
4:43	0.266	0.298	3.71	0.068
4:44	0.264	0.298	3.71	0.068
4:45	0.262	0.299	3.71	0.069
4:46	0.262	0.299	3.71	0.069
4:47	0.263	0.299	3.71	0.069
4:48	0.263	0.3	3.71	0.069
4:49	0.263	0.3	3.72	0.069
4:50	0.263	0.3	3.72	0.069
4:51	0.261	0.3	3.72	0.069
4:52	0.259	0.301	3.72	0.07
4:53	0.258	0.301	3.72	0.07
4:54	0.256	0.301	3.73	0.07
4:55	0.254	0.301	3.73	0.07
4:56	0.254	0.302	3.73	0.07
4:57	0.254	0.302	3.73	0.07
4:58	0.254	0.302	3.73	0.07
4:59	0.255	0.302	3.73	0.071
5:00	0.255	0.303	3.74	0.071
5:01	0.255	0.303	3.74	0.071
5:02	0.255	0.303	3.74	0.071
5:03	0.255	0.303	3.74	0.071
5:04	0.255	0.304	3.74	0.071
5:05	0.255	0.304	3.74	0.071
5:06	0.254	0.304	3.75	0.072

Time	Inflow (cfs)	Storage (Acre-ft)	Elevation (ft)	Outflow (cfs)
5:07	0.252	0.304	3.75	0.072
5:08	0.25	0.305	3.75	0.072
5:09	0.248	0.305	3.75	0.072
5:10	0.246	0.305	3.75	0.072
5:11	0.246	0.305	3.75	0.072
5:12	0.246	0.306	3.75	0.072
5:13	0.246	0.306	3.76	0.073
5:14	0.247	0.306	3.76	0.073
5:15	0.247	0.306	3.76	0.073
5:16	0.247	0.307	3.76	0.073
5:17	0.247	0.307	3.76	0.073
5:18	0.247	0.307	3.76	0.073
5:19	0.247	0.307	3.77	0.073
5:20	0.247	0.307	3.77	0.073
5:21	0.247	0.308	3.77	0.074
5:22	0.247	0.308	3.77	0.074
5:23	0.247	0.308	3.77	0.074
5:24	0.248	0.308	3.77	0.074
5:25	0.248	0.309	3.77	0.074
5:26	0.246	0.309	3.78	0.074
5:27	0.244	0.309	3.78	0.074
5:28	0.242	0.309	3.78	0.074
5:29	0.24	0.31	3.78	0.075
5:30	0.238	0.31	3.78	0.075
5:31	0.238	0.31	3.78	0.075
5:32	0.238	0.31	3.79	0.075
5:33	0.238	0.311	3.79	0.075
5:34	0.239	0.311	3.79	0.075
5:35	0.239	0.311	3.79	0.075
5:36	0.239	0.311	3.79	0.075
5:37	0.239	0.311	3.79	0.076
5:38	0.239	0.312	3.79	0.076
5:39	0.239	0.312	3.8	0.076
5:40	0.239	0.312	3.8	0.076
5:41	0.239	0.312	3.8	0.076
5:42	0.239	0.313	3.8	0.076
5:43	0.239	0.313	3.8	0.076
5:44	0.239	0.313	3.8	0.076
5:45	0.239	0.313	3.8	0.077
5:46	0.24	0.313	3.81	0.077
5:47	0.24	0.314	3.81	0.077
5:48	0.24	0.314	3.81	0.077
5:49	0.24	0.314	3.81	0.077
5:50	0.24	0.314	3.81	0.077
5:51	0.24	0.315	3.81	0.077

Time	Inflow (cfs)	Storage (Acre-ft)	Elevation (ft)	Outflow (cfs)
5:52	0.24	0.315	3.81	0.077
5:53	0.24	0.315	3.82	0.078
5:54	0.24	0.315	3.82	0.078
5:55	0.24	0.315	3.82	0.078
5:56	0.24	0.316	3.82	0.078
5:57	0.24	0.316	3.82	0.078
5:58	0.24	0.316	3.82	0.078
5:59	0.24	0.316	3.82	0.078
6:00	0.241	0.317	3.83	0.078
6:01	0.233	0.317	3.83	0.079
6:02	0.225	0.317	3.83	0.079
6:03	0.217	0.317	3.83	0.079
6:04	0.209	0.317	3.83	0.079
6:05	0.201	0.318	3.83	0.079
6:06	0.201	0.318	3.83	0.079
6:07	0.201	0.318	3.83	0.079
6:08	0.2	0.318	3.84	0.079
6:09	0.2	0.318	3.84	0.079
6:10	0.2	0.318	3.84	0.079
6:11	0.2	0.319	3.84	0.079
6:12	0.2	0.319	3.84	0.079
6:13	0.2	0.319	3.84	0.079
6:14	0.2	0.319	3.84	0.08
6:15	0.2	0.319	3.84	0.08
6:16	0.2	0.319	3.84	0.08
6:17	0.2	0.32	3.85	0.08
6:18	0.2	0.32	3.85	0.08
6:19	0.2	0.32	3.85	0.08
6:20	0.2	0.32	3.85	0.08
6:21	0.2	0.32	3.85	0.08
6:22	0.2	0.32	3.85	0.08
6:23	0.2	0.321	3.85	0.08
6:24	0.2	0.321	3.85	0.08
6:25	0.2	0.321	3.85	0.08
6:26	0.2	0.321	3.85	0.08
6:27	0.2	0.321	3.86	0.08
6:28	0.2	0.321	3.86	0.08
6:29	0.2	0.322	3.86	0.08
6:30	0.2	0.322	3.86	0.081
6:31	0.2	0.322	3.86	0.081
6:32	0.199	0.322	3.86	0.081
6:33	0.199	0.322	3.86	0.081
6:34	0.199	0.322	3.86	0.081
6:35	0.199	0.323	3.86	0.081
6:36	0.199	0.323	3.87	0.081

Time	Inflow (cfs)	Storage (Acre-ft)	Elevation (ft)	Outflow (cfs)
6:37	0.199	0.323	3.87	0.081
6:38	0.199	0.323	3.87	0.081
6:39	0.199	0.323	3.87	0.081
6:40	0.199	0.323	3.87	0.081
6:41	0.199	0.323	3.87	0.081
6:42	0.199	0.324	3.87	0.081
6:43	0.199	0.324	3.87	0.081
6:44	0.199	0.324	3.87	0.081
6:45	0.199	0.324	3.88	0.082
6:46	0.199	0.324	3.88	0.082
6:47	0.199	0.324	3.88	0.082
6:48	0.199	0.325	3.88	0.082
6:49	0.199	0.325	3.88	0.082
6:50	0.199	0.325	3.88	0.082
6:51	0.199	0.325	3.88	0.082
6:52	0.199	0.325	3.88	0.082
6:53	0.199	0.325	3.88	0.082
6:54	0.199	0.326	3.88	0.082
6:55	0.198	0.326	3.89	0.082
6:56	0.198	0.326	3.89	0.082
6:57	0.198	0.326	3.89	0.082
6:58	0.198	0.326	3.89	0.082
6:59	0.198	0.326	3.89	0.082
7:00	0.198	0.327	3.89	0.082
7:01	0.198	0.327	3.89	0.082
7:02	0.198	0.327	3.89	0.083
7:03	0.198	0.327	3.89	0.083
7:04	0.198	0.327	3.89	0.083
7:05	0.198	0.327	3.9	0.083
7:06	0.198	0.328	3.9	0.083
7:07	0.198	0.328	3.9	0.083
7:08	0.198	0.328	3.9	0.083
7:09	0.198	0.328	3.9	0.083
7:10	0.198	0.328	3.9	0.083
7:11	0.198	0.328	3.9	0.083
7:12	0.198	0.328	3.9	0.083
7:13	0.198	0.329	3.9	0.083
7:14	0.198	0.329	3.91	0.083
7:15	0.198	0.329	3.91	0.083
7:16	0.198	0.329	3.91	0.083
7:17	0.198	0.329	3.91	0.083
7:18	0.198	0.329	3.91	0.084
7:19	0.197	0.33	3.91	0.084
7:20	0.197	0.33	3.91	0.084
7:21	0.197	0.33	3.91	0.084

Time	Inflow (cfs)	Storage (Acre-ft)	Elevation (ft)	Outflow (cfs)
7:22	0.197	0.33	3.91	0.084
7:23	0.197	0.33	3.91	0.084
7:24	0.197	0.33	3.92	0.084
7:25	0.197	0.33	3.92	0.084
7:26	0.197	0.331	3.92	0.087
7:27	0.197	0.331	3.92	0.1
7:28	0.197	0.331	3.92	0.112
7:29	0.197	0.331	3.92	0.122
7:30	0.197	0.331	3.92	0.131
7:31	0.197	0.331	3.92	0.138
7:32	0.197	0.331	3.92	0.145
7:33	0.197	0.331	3.92	0.151
7:34	0.197	0.331	3.92	0.157
7:35	0.197	0.331	3.92	0.162
7:36	0.197	0.332	3.92	0.166
7:37	0.197	0.332	3.92	0.169
7:38	0.197	0.332	3.92	0.173
7:39	0.197	0.332	3.92	0.176
7:40	0.197	0.332	3.92	0.178
7:41	0.197	0.332	3.92	0.18
7:42	0.197	0.332	3.92	0.182
7:43	0.196	0.332	3.92	0.184
7:44	0.196	0.332	3.92	0.185
7:45	0.196	0.332	3.92	0.187
7:46	0.196	0.332	3.92	0.188
7:47	0.196	0.332	3.92	0.189
7:48	0.196	0.332	3.92	0.19
7:49	0.196	0.332	3.92	0.19
7:50	0.196	0.332	3.92	0.191
7:51	0.196	0.332	3.92	0.192
7:52	0.196	0.332	3.92	0.192
7:53	0.196	0.332	3.92	0.193
7:54	0.196	0.332	3.92	0.193
7:55	0.196	0.332	3.92	0.193
7:56	0.196	0.332	3.92	0.194
7:57	0.196	0.332	3.92	0.194
7:58	0.196	0.332	3.92	0.194
7:59	0.196	0.332	3.92	0.194
8:00	0.196	0.332	3.92	0.195
8:01	0.196	0.332	3.92	0.195
8:02	0.196	0.332	3.92	0.195
8:03	0.196	0.332	3.92	0.195
8:04	0.196	0.332	3.92	0.195
8:05	0.196	0.332	3.92	0.195
8:06	0.196	0.332	3.92	0.195

Time	Inflow (cfs)	Storage (Acre-ft)	Elevation (ft)	Outflow (cfs)
8:07	0.195	0.332	3.92	0.195
8:08	0.195	0.332	3.92	0.195
8:09	0.195	0.332	3.92	0.195
8:10	0.195	0.332	3.92	0.195
8:11	0.195	0.332	3.92	0.195
8:12	0.195	0.332	3.92	0.195
8:13	0.195	0.332	3.92	0.195
8:14	0.195	0.332	3.92	0.195
8:15	0.195	0.332	3.92	0.195
8:16	0.195	0.332	3.92	0.195
8:17	0.195	0.332	3.92	0.195
8:18	0.195	0.332	3.92	0.195
8:19	0.195	0.332	3.92	0.195
8:20	0.195	0.332	3.92	0.195
8:21	0.195	0.332	3.92	0.195
8:22	0.195	0.332	3.92	0.195
8:23	0.195	0.332	3.92	0.195
8:24	0.195	0.332	3.92	0.195
8:25	0.195	0.332	3.92	0.195
8:26	0.195	0.332	3.92	0.195
8:27	0.195	0.332	3.92	0.195
8:28	0.195	0.332	3.92	0.195
8:29	0.195	0.332	3.92	0.195
8:30	0.195	0.332	3.92	0.195
8:31	0.194	0.332	3.92	0.195
8:32	0.194	0.332	3.92	0.195
8:33	0.194	0.332	3.92	0.195
8:34	0.194	0.332	3.92	0.195
8:35	0.194	0.332	3.92	0.195
8:36	0.194	0.332	3.92	0.195
8:37	0.194	0.332	3.92	0.195
8:38	0.194	0.332	3.92	0.195
8:39	0.194	0.332	3.92	0.194
8:40	0.194	0.332	3.92	0.194
8:41	0.194	0.332	3.92	0.194
8:42	0.194	0.332	3.92	0.194
8:43	0.194	0.332	3.92	0.194
8:44	0.194	0.332	3.92	0.194
8:45	0.194	0.332	3.92	0.194
8:46	0.194	0.332	3.92	0.194
8:47	0.194	0.332	3.92	0.194
8:48	0.194	0.332	3.92	0.194
8:49	0.194	0.332	3.92	0.194
8:50	0.194	0.332	3.92	0.194
8:51	0.194	0.332	3.92	0.194

Time	Inflow (cfs)	Storage (Acre-ft)	Elevation (ft)	Outflow (cfs)
8:52	0.194	0.332	3.92	0.194
8:53	0.194	0.332	3.92	0.194
8:54	0.193	0.332	3.92	0.194
8:55	0.193	0.332	3.92	0.194
8:56	0.193	0.332	3.92	0.194
8:57	0.193	0.332	3.92	0.194
8:58	0.193	0.332	3.92	0.194
8:59	0.193	0.332	3.92	0.194
9:00	0.193	0.332	3.92	0.194
9:01	0.193	0.332	3.92	0.194
9:02	0.193	0.332	3.92	0.193
9:03	0.193	0.332	3.92	0.193
9:04	0.193	0.332	3.92	0.193
9:05	0.193	0.332	3.92	0.193
9:06	0.193	0.332	3.92	0.193
9:07	0.193	0.332	3.92	0.193
9:08	0.193	0.332	3.92	0.193
9:09	0.193	0.332	3.92	0.193
9:10	0.193	0.332	3.92	0.193
9:11	0.193	0.332	3.92	0.193
9:12	0.193	0.332	3.92	0.193
9:13	0.193	0.332	3.92	0.193
9:14	0.193	0.332	3.92	0.193
9:15	0.193	0.332	3.92	0.193
9:16	0.193	0.332	3.92	0.193
9:17	0.193	0.332	3.92	0.193
9:18	0.192	0.332	3.92	0.193
9:19	0.192	0.332	3.92	0.193
9:20	0.192	0.332	3.92	0.193
9:21	0.192	0.332	3.92	0.193
9:22	0.192	0.332	3.92	0.193
9:23	0.192	0.332	3.92	0.193
9:24	0.192	0.332	3.92	0.193
9:25	0.192	0.332	3.92	0.193
9:26	0.192	0.332	3.92	0.192
9:27	0.192	0.332	3.92	0.192
9:28	0.192	0.332	3.92	0.192
9:29	0.192	0.332	3.92	0.192
9:30	0.192	0.332	3.92	0.192
9:31	0.192	0.332	3.92	0.192
9:32	0.192	0.332	3.92	0.192
9:33	0.192	0.332	3.92	0.192
9:34	0.192	0.332	3.92	0.192
9:35	0.192	0.332	3.92	0.192
9:36	0.192	0.332	3.92	0.192

Time	Inflow (cfs)	Storage (Acre-ft)	Elevation (ft)	Outflow (cfs)
9:37	0.192	0.332	3.92	0.192
9:38	0.192	0.332	3.92	0.192
9:39	0.192	0.332	3.92	0.192
9:40	0.192	0.332	3.92	0.192
9:41	0.192	0.332	3.92	0.192
9:42	0.191	0.332	3.92	0.192
9:43	0.191	0.332	3.92	0.192
9:44	0.191	0.332	3.92	0.192
9:45	0.191	0.332	3.92	0.192
9:46	0.191	0.332	3.92	0.192
9:47	0.191	0.332	3.92	0.192
9:48	0.191	0.332	3.92	0.192
9:49	0.191	0.332	3.92	0.192
9:50	0.191	0.332	3.92	0.191
9:51	0.191	0.332	3.92	0.191
9:52	0.191	0.332	3.92	0.191
9:53	0.191	0.332	3.92	0.191
9:54	0.191	0.332	3.92	0.191
9:55	0.191	0.332	3.92	0.191
9:56	0.191	0.332	3.92	0.191
9:57	0.191	0.332	3.92	0.191
9:58	0.191	0.332	3.92	0.191
9:59	0.191	0.332	3.92	0.191
10:00	0.191	0.332	3.92	0.191
10:01	0.191	0.332	3.92	0.191
10:02	0.191	0.332	3.92	0.191
10:03	0.191	0.332	3.92	0.191
10:04	0.191	0.332	3.92	0.191
10:05	0.19	0.332	3.92	0.191
10:06	0.19	0.332	3.92	0.191
10:07	0.19	0.332	3.92	0.191
10:08	0.19	0.332	3.92	0.191
10:09	0.19	0.332	3.92	0.191
10:10	0.19	0.332	3.92	0.191
10:11	0.19	0.332	3.92	0.191
10:12	0.19	0.332	3.92	0.191
10:13	0.19	0.332	3.92	0.19
10:14	0.19	0.332	3.92	0.19
10:15	0.19	0.332	3.92	0.19
10:16	0.19	0.332	3.92	0.19
10:17	0.19	0.332	3.92	0.19
10:18	0.19	0.332	3.92	0.19
10:19	0.19	0.332	3.92	0.19
10:20	0.19	0.332	3.92	0.19
10:21	0.19	0.332	3.92	0.19

Time	Inflow (cfs)	Storage (Acre-ft)	Elevation (ft)	Outflow (cfs)
10:22	0.19	0.332	3.92	0.19
10:23	0.19	0.332	3.92	0.19
10:24	0.19	0.332	3.92	0.19
10:25	0.19	0.332	3.92	0.19
10:26	0.19	0.332	3.92	0.19
10:27	0.19	0.332	3.92	0.19
10:28	0.19	0.332	3.92	0.19
10:29	0.189	0.332	3.92	0.19
10:30	0.189	0.332	3.92	0.19
10:31	0.189	0.332	3.92	0.19
10:32	0.189	0.332	3.92	0.19
10:33	0.189	0.332	3.92	0.19
10:34	0.189	0.332	3.92	0.19
10:35	0.189	0.332	3.92	0.19
10:36	0.189	0.332	3.92	0.19
10:37	0.189	0.332	3.92	0.189
10:38	0.189	0.332	3.92	0.189
10:39	0.189	0.332	3.92	0.189
10:40	0.189	0.332	3.92	0.189
10:41	0.189	0.332	3.92	0.189
10:42	0.189	0.332	3.92	0.189
10:43	0.189	0.332	3.92	0.189
10:44	0.189	0.332	3.92	0.189
10:45	0.189	0.332	3.92	0.189
10:46	0.189	0.332	3.92	0.189
10:47	0.189	0.332	3.92	0.189
10:48	0.189	0.332	3.92	0.189
10:49	0.189	0.332	3.92	0.189
10:50	0.189	0.332	3.92	0.189
10:51	0.189	0.332	3.92	0.189
10:52	0.189	0.332	3.92	0.189
10:53	0.188	0.332	3.92	0.189
10:54	0.188	0.332	3.92	0.189
10:55	0.188	0.332	3.92	0.189
10:56	0.188	0.332	3.92	0.189
10:57	0.188	0.332	3.92	0.189
10:58	0.188	0.332	3.92	0.189
10:59	0.188	0.332	3.92	0.189
11:00	0.188	0.332	3.92	0.189
11:01	0.188	0.332	3.92	0.188
11:02	0.188	0.332	3.92	0.188
11:03	0.188	0.332	3.92	0.188
11:04	0.188	0.332	3.92	0.188
11:05	0.188	0.332	3.92	0.188
11:06	0.188	0.332	3.92	0.188

Time	Inflow (cfs)	Storage (Acre-ft)	Elevation (ft)	Outflow (cfs)
11:07	0.188	0.332	3.92	0.188
11:08	0.188	0.332	3.92	0.188
11:09	0.188	0.332	3.92	0.188
11:10	0.188	0.332	3.92	0.188
11:11	0.188	0.332	3.92	0.188
11:12	0.188	0.332	3.92	0.188
11:13	0.188	0.332	3.92	0.188
11:14	0.188	0.332	3.92	0.188
11:15	0.188	0.332	3.92	0.188
11:16	0.188	0.332	3.92	0.188
11:17	0.187	0.332	3.92	0.188
11:18	0.187	0.332	3.92	0.188
11:19	0.187	0.332	3.92	0.188
11:20	0.187	0.332	3.92	0.188
11:21	0.187	0.332	3.92	0.188
11:22	0.187	0.332	3.92	0.188
11:23	0.187	0.332	3.92	0.188
11:24	0.187	0.332	3.92	0.188
11:25	0.187	0.332	3.92	0.187
11:26	0.187	0.332	3.92	0.187
11:27	0.187	0.332	3.92	0.187
11:28	0.187	0.332	3.92	0.187
11:29	0.187	0.332	3.92	0.187
11:30	0.187	0.332	3.92	0.187
11:31	0.187	0.332	3.92	0.187
11:32	0.187	0.332	3.92	0.187
11:33	0.187	0.332	3.92	0.187
11:34	0.187	0.332	3.92	0.187
11:35	0.187	0.332	3.92	0.187
11:36	0.187	0.332	3.92	0.187
11:37	0.187	0.332	3.92	0.187
11:38	0.187	0.332	3.92	0.187
11:39	0.187	0.332	3.92	0.187
11:40	0.187	0.332	3.92	0.187
11:41	0.187	0.332	3.92	0.187
11:42	0.186	0.332	3.92	0.187
11:43	0.186	0.332	3.92	0.187
11:44	0.186	0.332	3.92	0.187
11:45	0.186	0.332	3.92	0.187
11:46	0.186	0.332	3.92	0.187
11:47	0.186	0.332	3.92	0.187
11:48	0.186	0.332	3.92	0.187
11:49	0.186	0.332	3.92	0.187
11:50	0.186	0.332	3.92	0.186
11:51	0.186	0.332	3.92	0.186

Time	Inflow (cfs)	Storage (Acre-ft)	Elevation (ft)	Outflow (cfs)
11:52	0.186	0.332	3.92	0.186
11:53	0.186	0.332	3.92	0.186
11:54	0.186	0.332	3.92	0.186
11:55	0.186	0.332	3.92	0.186
11:56	0.186	0.332	3.92	0.186
11:57	0.186	0.332	3.92	0.186
11:58	0.186	0.332	3.92	0.186
11:59	0.186	0.332	3.92	0.186
12:00	0.186	0.332	3.92	0.186

Time-Series Results - POC-1

Project: Valley_Center_Storage Simulation Run: Run 1
Sink: POC-1

Start of Run: 01Jan2000, 00:00 Basin Model: Basin 1
End of Run: 01Jan2000, 20:00 Meteorologic Model: Met 1
Compute Time: 09Jan2026, 11:04:13 Control Specifications: Control 1

Time	Inflow from Infiltration Basin (cfs)	Inflow from Bypass (cfs)	Total Inflow (cfs)
0:00	0	0	0
0:01	0	0.006	0.006
0:02	0	0.012	0.012
0:03	0	0.018	0.018
0:04	0	0.024	0.024
0:05	0	0.03	0.03
0:06	0	0.03	0.03
0:07	0	0.03	0.03
0:08	0.001	0.03	0.031
0:09	0.001	0.03	0.031
0:10	0.001	0.03	0.031
0:11	0.001	0.03	0.031
0:12	0.001	0.03	0.031
0:13	0.001	0.03	0.031
0:14	0.001	0.03	0.031
0:15	0.001	0.03	0.031
0:16	0.001	0.03	0.031
0:17	0.002	0.03	0.032
0:18	0.002	0.03	0.032
0:19	0.002	0.03	0.032
0:20	0.002	0.03	0.032
0:21	0.002	0.03	0.032
0:22	0.002	0.03	0.032
0:23	0.002	0.03	0.032
0:24	0.002	0.03	0.032
0:25	0.003	0.03	0.033
0:26	0.003	0.03	0.033
0:27	0.003	0.03	0.033
0:28	0.003	0.03	0.033
0:29	0.003	0.03	0.033
0:30	0.003	0.03	0.033
0:31	0.003	0.03	0.033
0:32	0.003	0.03	0.033
0:33	0.004	0.03	0.034
0:34	0.004	0.03	0.034
0:35	0.004	0.03	0.034

Time	Inflow from Infiltration Basin (cfs)	Inflow from Bypass (cfs)	Total Inflow (cfs)
0:36	0.004	0.03	0.034
0:37	0.004	0.03	0.034
0:38	0.004	0.03	0.034
0:39	0.004	0.03	0.034
0:40	0.005	0.03	0.035
0:41	0.005	0.03	0.035
0:42	0.005	0.03	0.035
0:43	0.005	0.03	0.035
0:44	0.005	0.03	0.035
0:45	0.005	0.03	0.035
0:46	0.006	0.03	0.036
0:47	0.006	0.03	0.036
0:48	0.006	0.03	0.036
0:49	0.006	0.03	0.036
0:50	0.006	0.03	0.036
0:51	0.006	0.032	0.038
0:52	0.007	0.034	0.041
0:53	0.007	0.036	0.043
0:54	0.007	0.038	0.045
0:55	0.007	0.04	0.047
0:56	0.007	0.04	0.047
0:57	0.007	0.04	0.047
0:58	0.008	0.04	0.048
0:59	0.008	0.04	0.048
1:00	0.008	0.04	0.048
1:01	0.008	0.04	0.048
1:02	0.008	0.04	0.048
1:03	0.008	0.04	0.048
1:04	0.009	0.04	0.049
1:05	0.009	0.04	0.049
1:06	0.009	0.04	0.049
1:07	0.009	0.04	0.049
1:08	0.009	0.04	0.049
1:09	0.01	0.04	0.05
1:10	0.01	0.04	0.05
1:11	0.01	0.04	0.05
1:12	0.01	0.04	0.05
1:13	0.01	0.04	0.05
1:14	0.011	0.04	0.051
1:15	0.011	0.04	0.051
1:16	0.011	0.04	0.051
1:17	0.011	0.04	0.051
1:18	0.011	0.04	0.051
1:19	0.012	0.04	0.052

Time	Inflow from Infiltration Basin (cfs)	Inflow from Bypass (cfs)	Total Inflow (cfs)
1:20	0.012	0.04	0.052
1:21	0.012	0.04	0.052
1:22	0.012	0.04	0.052
1:23	0.012	0.04	0.052
1:24	0.013	0.04	0.053
1:25	0.013	0.04	0.053
1:26	0.013	0.04	0.053
1:27	0.013	0.04	0.053
1:28	0.014	0.04	0.054
1:29	0.014	0.04	0.054
1:30	0.014	0.04	0.054
1:31	0.014	0.04	0.054
1:32	0.015	0.04	0.055
1:33	0.015	0.04	0.055
1:34	0.015	0.04	0.055
1:35	0.015	0.04	0.055
1:36	0.015	0.04	0.055
1:37	0.016	0.04	0.056
1:38	0.016	0.04	0.056
1:39	0.016	0.04	0.056
1:40	0.016	0.04	0.056
1:41	0.017	0.04	0.057
1:42	0.017	0.04	0.057
1:43	0.017	0.04	0.057
1:44	0.017	0.04	0.057
1:45	0.018	0.04	0.058
1:46	0.018	0.04	0.058
1:47	0.018	0.04	0.058
1:48	0.018	0.04	0.058
1:49	0.018	0.04	0.058
1:50	0.019	0.04	0.059
1:51	0.019	0.042	0.061
1:52	0.019	0.044	0.063
1:53	0.019	0.046	0.065
1:54	0.02	0.048	0.068
1:55	0.02	0.05	0.07
1:56	0.02	0.05	0.07
1:57	0.02	0.05	0.07
1:58	0.021	0.05	0.071
1:59	0.021	0.05	0.071
2:00	0.021	0.05	0.071
2:01	0.021	0.05	0.071
2:02	0.021	0.05	0.071
2:03	0.022	0.05	0.072

Time	Inflow from Infiltration Basin (cfs)	Inflow from Bypass (cfs)	Total Inflow (cfs)
2:04	0.022	0.05	0.072
2:05	0.022	0.05	0.072
2:06	0.022	0.05	0.072
2:07	0.023	0.05	0.073
2:08	0.023	0.05	0.073
2:09	0.023	0.05	0.073
2:10	0.023	0.05	0.073
2:11	0.023	0.05	0.073
2:12	0.024	0.05	0.074
2:13	0.024	0.05	0.074
2:14	0.024	0.05	0.074
2:15	0.024	0.05	0.074
2:16	0.025	0.05	0.075
2:17	0.025	0.05	0.075
2:18	0.025	0.05	0.075
2:19	0.025	0.05	0.075
2:20	0.025	0.05	0.075
2:21	0.026	0.05	0.076
2:22	0.026	0.05	0.076
2:23	0.026	0.05	0.076
2:24	0.026	0.05	0.076
2:25	0.027	0.05	0.077
2:26	0.027	0.05	0.077
2:27	0.027	0.05	0.077
2:28	0.027	0.05	0.077
2:29	0.027	0.05	0.077
2:30	0.028	0.05	0.078
2:31	0.028	0.052	0.08
2:32	0.028	0.054	0.082
2:33	0.028	0.056	0.084
2:34	0.029	0.058	0.087
2:35	0.029	0.06	0.089
2:36	0.029	0.06	0.089
2:37	0.029	0.06	0.089
2:38	0.03	0.06	0.09
2:39	0.03	0.06	0.09
2:40	0.03	0.06	0.09
2:41	0.03	0.06	0.09
2:42	0.031	0.06	0.091
2:43	0.031	0.06	0.091
2:44	0.031	0.06	0.091
2:45	0.031	0.06	0.091
2:46	0.032	0.06	0.092
2:47	0.032	0.06	0.092

Time	Inflow from Infiltration Basin (cfs)	Inflow from Bypass (cfs)	Total Inflow (cfs)
2:48	0.032	0.06	0.092
2:49	0.032	0.06	0.092
2:50	0.033	0.06	0.093
2:51	0.033	0.062	0.095
2:52	0.033	0.064	0.097
2:53	0.033	0.066	0.099
2:54	0.034	0.068	0.102
2:55	0.034	0.07	0.104
2:56	0.034	0.07	0.104
2:57	0.035	0.07	0.105
2:58	0.035	0.07	0.105
2:59	0.035	0.07	0.105
3:00	0.035	0.07	0.105
3:01	0.036	0.07	0.106
3:02	0.036	0.07	0.106
3:03	0.036	0.07	0.106
3:04	0.037	0.07	0.107
3:05	0.037	0.07	0.107
3:06	0.037	0.072	0.109
3:07	0.037	0.074	0.111
3:08	0.038	0.076	0.114
3:09	0.038	0.078	0.116
3:10	0.038	0.08	0.118
3:11	0.038	0.08	0.118
3:12	0.039	0.08	0.119
3:13	0.039	0.08	0.119
3:14	0.039	0.08	0.119
3:15	0.039	0.08	0.119
3:16	0.039	0.082	0.121
3:17	0.04	0.084	0.124
3:18	0.04	0.086	0.126
3:19	0.04	0.088	0.128
3:20	0.04	0.09	0.13
3:21	0.041	0.092	0.133
3:22	0.041	0.094	0.135
3:23	0.041	0.096	0.137
3:24	0.041	0.098	0.139
3:25	0.041	0.1	0.141
3:26	0.042	0.1	0.142
3:27	0.042	0.1	0.142
3:28	0.042	0.1	0.142
3:29	0.042	0.1	0.142
3:30	0.043	0.1	0.143
3:31	0.043	0.104	0.147

Time	Inflow from Infiltration Basin (cfs)	Inflow from Bypass (cfs)	Total Inflow (cfs)
3:32	0.043	0.108	0.151
3:33	0.043	0.112	0.155
3:34	0.044	0.116	0.16
3:35	0.044	0.12	0.164
3:36	0.044	0.122	0.166
3:37	0.044	0.124	0.168
3:38	0.045	0.126	0.171
3:39	0.045	0.128	0.173
3:40	0.045	0.13	0.175
3:41	0.046	0.136	0.182
3:42	0.046	0.142	0.188
3:43	0.046	0.148	0.194
3:44	0.046	0.154	0.2
3:45	0.047	0.16	0.207
3:46	0.047	0.164	0.211
3:47	0.047	0.168	0.215
3:48	0.048	0.172	0.22
3:49	0.048	0.176	0.224
3:50	0.048	0.18	0.228
3:51	0.049	0.196	0.245
3:52	0.049	0.212	0.261
3:53	0.049	0.228	0.277
3:54	0.05	0.244	0.294
3:55	0.05	0.26	0.31
3:56	0.051	0.286	0.337
3:57	0.051	0.312	0.363
3:58	0.051	0.338	0.389
3:59	0.052	0.364	0.416
4:00	0.052	0.39	0.442
4:01	0.053	0.576	0.629
4:02	0.054	0.762	0.816
4:03	0.055	0.948	1.003
4:04	0.056	1.134	1.19
4:05	0.058	1.32	1.378
4:06	0.059	1.098	1.157
4:07	0.06	0.876	0.936
4:08	0.061	0.654	0.715
4:09	0.062	0.432	0.494
4:10	0.062	0.21	0.272
4:11	0.062	0.196	0.258
4:12	0.063	0.182	0.245
4:13	0.063	0.168	0.231
4:14	0.063	0.154	0.217
4:15	0.063	0.14	0.203

Time	Inflow from Infiltration Basin (cfs)	Inflow from Bypass (cfs)	Total Inflow (cfs)
4:16	0.064	0.134	0.198
4:17	0.064	0.128	0.192
4:18	0.064	0.122	0.186
4:19	0.064	0.116	0.18
4:20	0.064	0.11	0.174
4:21	0.065	0.106	0.171
4:22	0.065	0.102	0.167
4:23	0.065	0.098	0.163
4:24	0.065	0.094	0.159
4:25	0.065	0.09	0.155
4:26	0.066	0.088	0.154
4:27	0.066	0.086	0.152
4:28	0.066	0.084	0.15
4:29	0.066	0.082	0.148
4:30	0.066	0.08	0.146
4:31	0.066	0.078	0.144
4:32	0.067	0.076	0.143
4:33	0.067	0.074	0.141
4:34	0.067	0.072	0.139
4:35	0.067	0.07	0.137
4:36	0.067	0.07	0.137
4:37	0.067	0.07	0.137
4:38	0.068	0.07	0.138
4:39	0.068	0.07	0.138
4:40	0.068	0.07	0.138
4:41	0.068	0.068	0.136
4:42	0.068	0.066	0.134
4:43	0.068	0.064	0.132
4:44	0.068	0.062	0.13
4:45	0.069	0.06	0.129
4:46	0.069	0.06	0.129
4:47	0.069	0.06	0.129
4:48	0.069	0.06	0.129
4:49	0.069	0.06	0.129
4:50	0.069	0.06	0.129
4:51	0.069	0.058	0.127
4:52	0.07	0.056	0.126
4:53	0.07	0.054	0.124
4:54	0.07	0.052	0.122
4:55	0.07	0.05	0.12
4:56	0.07	0.05	0.12
4:57	0.07	0.05	0.12
4:58	0.07	0.05	0.12
4:59	0.071	0.05	0.121

Time	Inflow from Infiltration Basin (cfs)	Inflow from Bypass (cfs)	Total Inflow (cfs)
5:00	0.071	0.05	0.121
5:01	0.071	0.05	0.121
5:02	0.071	0.05	0.121
5:03	0.071	0.05	0.121
5:04	0.071	0.05	0.121
5:05	0.071	0.05	0.121
5:06	0.072	0.048	0.12
5:07	0.072	0.046	0.118
5:08	0.072	0.044	0.116
5:09	0.072	0.042	0.114
5:10	0.072	0.04	0.112
5:11	0.072	0.04	0.112
5:12	0.072	0.04	0.112
5:13	0.073	0.04	0.113
5:14	0.073	0.04	0.113
5:15	0.073	0.04	0.113
5:16	0.073	0.04	0.113
5:17	0.073	0.04	0.113
5:18	0.073	0.04	0.113
5:19	0.073	0.04	0.113
5:20	0.073	0.04	0.113
5:21	0.074	0.04	0.114
5:22	0.074	0.04	0.114
5:23	0.074	0.04	0.114
5:24	0.074	0.04	0.114
5:25	0.074	0.04	0.114
5:26	0.074	0.04	0.114
5:27	0.074	0.04	0.114
5:28	0.074	0.04	0.114
5:29	0.075	0.04	0.115
5:30	0.075	0.04	0.115
5:31	0.075	0.04	0.115
5:32	0.075	0.04	0.115
5:33	0.075	0.04	0.115
5:34	0.075	0.04	0.115
5:35	0.075	0.04	0.115
5:36	0.075	0.038	0.113
5:37	0.076	0.036	0.112
5:38	0.076	0.034	0.11
5:39	0.076	0.032	0.108
5:40	0.076	0.03	0.106
5:41	0.076	0.03	0.106
5:42	0.076	0.03	0.106
5:43	0.076	0.03	0.106

Time	Inflow from Infiltration Basin (cfs)	Inflow from Bypass (cfs)	Total Inflow (cfs)
5:44	0.076	0.03	0.106
5:45	0.077	0.03	0.107
5:46	0.077	0.03	0.107
5:47	0.077	0.03	0.107
5:48	0.077	0.03	0.107
5:49	0.077	0.03	0.107
5:50	0.077	0.03	0.107
5:51	0.077	0.03	0.107
5:52	0.077	0.03	0.107
5:53	0.078	0.03	0.108
5:54	0.078	0.03	0.108
5:55	0.078	0.03	0.108
5:56	0.078	0.03	0.108
5:57	0.078	0.03	0.108
5:58	0.078	0.03	0.108
5:59	0.078	0.03	0.108
6:00	0.078	0.03	0.108
6:01	0.079	0.024	0.103
6:02	0.079	0.018	0.097
6:03	0.079	0.012	0.091
6:04	0.079	0.006	0.085
6:05	0.079	0	0.079
6:06	0.079	0	0.079
6:07	0.079	0	0.079
6:08	0.079	0	0.079
6:09	0.079	0	0.079
6:10	0.079	0	0.079
6:11	0.079	0	0.079
6:12	0.079	0	0.079
6:13	0.079	0	0.079
6:14	0.08	0	0.08
6:15	0.08	0	0.08
6:16	0.08	0	0.08
6:17	0.08	0	0.08
6:18	0.08	0	0.08
6:19	0.08	0	0.08
6:20	0.08	0	0.08
6:21	0.08	0	0.08
6:22	0.08	0	0.08
6:23	0.08	0	0.08
6:24	0.08	0	0.08
6:25	0.08	0	0.08
6:26	0.08	0	0.08
6:27	0.08	0	0.08

Time	Inflow from Infiltration Basin (cfs)	Inflow from Bypass (cfs)	Total Inflow (cfs)
6:28	0.08	0	0.08
6:29	0.08	0	0.08
6:30	0.081	0	0.081
6:31	0.081	0	0.081
6:32	0.081	0	0.081
6:33	0.081	0	0.081
6:34	0.081	0	0.081
6:35	0.081	0	0.081
6:36	0.081	0	0.081
6:37	0.081	0	0.081
6:38	0.081	0	0.081
6:39	0.081	0	0.081
6:40	0.081	0	0.081
6:41	0.081	0	0.081
6:42	0.081	0	0.081
6:43	0.081	0	0.081
6:44	0.081	0	0.081
6:45	0.082	0	0.082
6:46	0.082	0	0.082
6:47	0.082	0	0.082
6:48	0.082	0	0.082
6:49	0.082	0	0.082
6:50	0.082	0	0.082
6:51	0.082	0	0.082
6:52	0.082	0	0.082
6:53	0.082	0	0.082
6:54	0.082	0	0.082
6:55	0.082	0	0.082
6:56	0.082	0	0.082
6:57	0.082	0	0.082
6:58	0.082	0	0.082
6:59	0.082	0	0.082
7:00	0.082	0	0.082
7:01	0.082	0	0.082
7:02	0.083	0	0.083
7:03	0.083	0	0.083
7:04	0.083	0	0.083
7:05	0.083	0	0.083
7:06	0.083	0	0.083
7:07	0.083	0	0.083
7:08	0.083	0	0.083
7:09	0.083	0	0.083
7:10	0.083	0	0.083
7:11	0.083	0	0.083

Time	Inflow from Infiltration Basin (cfs)	Inflow from Bypass (cfs)	Total Inflow (cfs)
7:12	0.083	0	0.083
7:13	0.083	0	0.083
7:14	0.083	0	0.083
7:15	0.083	0	0.083
7:16	0.083	0	0.083
7:17	0.083	0	0.083
7:18	0.084	0	0.084
7:19	0.084	0	0.084
7:20	0.084	0	0.084
7:21	0.084	0	0.084
7:22	0.084	0	0.084
7:23	0.084	0	0.084
7:24	0.084	0	0.084
7:25	0.084	0	0.084
7:26	0.087	0	0.087
7:27	0.1	0	0.1
7:28	0.112	0	0.112
7:29	0.122	0	0.122
7:30	0.131	0	0.131
7:31	0.138	0	0.138
7:32	0.145	0	0.145
7:33	0.151	0	0.151
7:34	0.157	0	0.157
7:35	0.162	0	0.162
7:36	0.166	0	0.166
7:37	0.169	0	0.169
7:38	0.173	0	0.173
7:39	0.176	0	0.176
7:40	0.178	0	0.178
7:41	0.18	0	0.18
7:42	0.182	0	0.182
7:43	0.184	0	0.184
7:44	0.185	0	0.185
7:45	0.187	0	0.187
7:46	0.188	0	0.188
7:47	0.189	0	0.189
7:48	0.19	0	0.19
7:49	0.19	0	0.19
7:50	0.191	0	0.191
7:51	0.192	0	0.192
7:52	0.192	0	0.192
7:53	0.193	0	0.193
7:54	0.193	0	0.193
7:55	0.193	0	0.193

Time	Inflow from Infiltration Basin (cfs)	Inflow from Bypass (cfs)	Total Inflow (cfs)
7:56	0.194	0	0.194
7:57	0.194	0	0.194
7:58	0.194	0	0.194
7:59	0.194	0	0.194
8:00	0.195	0	0.195
8:01	0.195	0	0.195
8:02	0.195	0	0.195
8:03	0.195	0	0.195
8:04	0.195	0	0.195
8:05	0.195	0	0.195
8:06	0.195	0	0.195
8:07	0.195	0	0.195
8:08	0.195	0	0.195
8:09	0.195	0	0.195
8:10	0.195	0	0.195
8:11	0.195	0	0.195
8:12	0.195	0	0.195
8:13	0.195	0	0.195
8:14	0.195	0	0.195
8:15	0.195	0	0.195
8:16	0.195	0	0.195
8:17	0.195	0	0.195
8:18	0.195	0	0.195
8:19	0.195	0	0.195
8:20	0.195	0	0.195
8:21	0.195	0	0.195
8:22	0.195	0	0.195
8:23	0.195	0	0.195
8:24	0.195	0	0.195
8:25	0.195	0	0.195
8:26	0.195	0	0.195
8:27	0.195	0	0.195
8:28	0.195	0	0.195
8:29	0.195	0	0.195
8:30	0.195	0	0.195
8:31	0.195	0	0.195
8:32	0.195	0	0.195
8:33	0.195	0	0.195
8:34	0.195	0	0.195
8:35	0.195	0	0.195
8:36	0.195	0	0.195
8:37	0.195	0	0.195
8:38	0.195	0	0.195
8:39	0.194	0	0.194

Time	Inflow from Infiltration Basin (cfs)	Inflow from Bypass (cfs)	Total Inflow (cfs)
8:40	0.194	0	0.194
8:41	0.194	0	0.194
8:42	0.194	0	0.194
8:43	0.194	0	0.194
8:44	0.194	0	0.194
8:45	0.194	0	0.194
8:46	0.194	0	0.194
8:47	0.194	0	0.194
8:48	0.194	0	0.194
8:49	0.194	0	0.194
8:50	0.194	0	0.194
8:51	0.194	0	0.194
8:52	0.194	0	0.194
8:53	0.194	0	0.194
8:54	0.194	0	0.194
8:55	0.194	0	0.194
8:56	0.194	0	0.194
8:57	0.194	0	0.194
8:58	0.194	0	0.194
8:59	0.194	0	0.194
9:00	0.194	0	0.194
9:01	0.194	0	0.194
9:02	0.193	0	0.193
9:03	0.193	0	0.193
9:04	0.193	0	0.193
9:05	0.193	0	0.193
9:06	0.193	0	0.193
9:07	0.193	0	0.193
9:08	0.193	0	0.193
9:09	0.193	0	0.193
9:10	0.193	0	0.193
9:11	0.193	0	0.193
9:12	0.193	0	0.193
9:13	0.193	0	0.193
9:14	0.193	0	0.193
9:15	0.193	0	0.193
9:16	0.193	0	0.193
9:17	0.193	0	0.193
9:18	0.193	0	0.193
9:19	0.193	0	0.193
9:20	0.193	0	0.193
9:21	0.193	0	0.193
9:22	0.193	0	0.193
9:23	0.193	0	0.193

Time	Inflow from Infiltration Basin (cfs)	Inflow from Bypass (cfs)	Total Inflow (cfs)
9:24	0.193	0	0.193
9:25	0.193	0	0.193
9:26	0.192	0	0.192
9:27	0.192	0	0.192
9:28	0.192	0	0.192
9:29	0.192	0	0.192
9:30	0.192	0	0.192
9:31	0.192	0	0.192
9:32	0.192	0	0.192
9:33	0.192	0	0.192
9:34	0.192	0	0.192
9:35	0.192	0	0.192
9:36	0.192	0	0.192
9:37	0.192	0	0.192
9:38	0.192	0	0.192
9:39	0.192	0	0.192
9:40	0.192	0	0.192
9:41	0.192	0	0.192
9:42	0.192	0	0.192
9:43	0.192	0	0.192
9:44	0.192	0	0.192
9:45	0.192	0	0.192
9:46	0.192	0	0.192
9:47	0.192	0	0.192
9:48	0.192	0	0.192
9:49	0.192	0	0.192
9:50	0.191	0	0.191
9:51	0.191	0	0.191
9:52	0.191	0	0.191
9:53	0.191	0	0.191
9:54	0.191	0	0.191
9:55	0.191	0	0.191
9:56	0.191	0	0.191
9:57	0.191	0	0.191
9:58	0.191	0	0.191
9:59	0.191	0	0.191
10:00	0.191	0	0.191
10:01	0.191	0	0.191
10:02	0.191	0	0.191
10:03	0.191	0	0.191
10:04	0.191	0	0.191
10:05	0.191	0	0.191
10:06	0.191	0	0.191
10:07	0.191	0	0.191

Time	Inflow from Infiltration Basin (cfs)	Inflow from Bypass (cfs)	Total Inflow (cfs)
10:08	0.191	0	0.191
10:09	0.191	0	0.191
10:10	0.191	0	0.191
10:11	0.191	0	0.191
10:12	0.191	0	0.191
10:13	0.19	0	0.19
10:14	0.19	0	0.19
10:15	0.19	0	0.19
10:16	0.19	0	0.19
10:17	0.19	0	0.19
10:18	0.19	0	0.19
10:19	0.19	0	0.19
10:20	0.19	0	0.19
10:21	0.19	0	0.19
10:22	0.19	0	0.19
10:23	0.19	0	0.19
10:24	0.19	0	0.19
10:25	0.19	0	0.19
10:26	0.19	0	0.19
10:27	0.19	0	0.19
10:28	0.19	0	0.19
10:29	0.19	0	0.19
10:30	0.19	0	0.19
10:31	0.19	0	0.19
10:32	0.19	0	0.19
10:33	0.19	0	0.19
10:34	0.19	0	0.19
10:35	0.19	0	0.19
10:36	0.19	0	0.19
10:37	0.189	0	0.189
10:38	0.189	0	0.189
10:39	0.189	0	0.189
10:40	0.189	0	0.189
10:41	0.189	0	0.189
10:42	0.189	0	0.189
10:43	0.189	0	0.189
10:44	0.189	0	0.189
10:45	0.189	0	0.189
10:46	0.189	0	0.189
10:47	0.189	0	0.189
10:48	0.189	0	0.189
10:49	0.189	0	0.189
10:50	0.189	0	0.189
10:51	0.189	0	0.189

Time	Inflow from Infiltration Basin (cfs)	Inflow from Bypass (cfs)	Total Inflow (cfs)
10:52	0.189	0	0.189
10:53	0.189	0	0.189
10:54	0.189	0	0.189
10:55	0.189	0	0.189
10:56	0.189	0	0.189
10:57	0.189	0	0.189
10:58	0.189	0	0.189
10:59	0.189	0	0.189
11:00	0.189	0	0.189
11:01	0.188	0	0.188
11:02	0.188	0	0.188
11:03	0.188	0	0.188
11:04	0.188	0	0.188
11:05	0.188	0	0.188
11:06	0.188	0	0.188
11:07	0.188	0	0.188
11:08	0.188	0	0.188
11:09	0.188	0	0.188
11:10	0.188	0	0.188
11:11	0.188	0	0.188
11:12	0.188	0	0.188
11:13	0.188	0	0.188
11:14	0.188	0	0.188
11:15	0.188	0	0.188
11:16	0.188	0	0.188
11:17	0.188	0	0.188
11:18	0.188	0	0.188
11:19	0.188	0	0.188
11:20	0.188	0	0.188
11:21	0.188	0	0.188
11:22	0.188	0	0.188
11:23	0.188	0	0.188
11:24	0.188	0	0.188
11:25	0.187	0	0.187
11:26	0.187	0	0.187
11:27	0.187	0	0.187
11:28	0.187	0	0.187
11:29	0.187	0	0.187
11:30	0.187	0	0.187
11:31	0.187	0	0.187
11:32	0.187	0	0.187
11:33	0.187	0	0.187
11:34	0.187	0	0.187
11:35	0.187	0	0.187

Time	Inflow from Infiltration Basin (cfs)	Inflow from Bypass (cfs)	Total Inflow (cfs)
11:36	0.187	0	0.187
11:37	0.187	0	0.187
11:38	0.187	0	0.187
11:39	0.187	0	0.187
11:40	0.187	0	0.187
11:41	0.187	0	0.187
11:42	0.187	0	0.187
11:43	0.187	0	0.187
11:44	0.187	0	0.187
11:45	0.187	0	0.187
11:46	0.187	0	0.187
11:47	0.187	0	0.187
11:48	0.187	0	0.187
11:49	0.187	0	0.187
11:50	0.186	0	0.186
11:51	0.186	0	0.186
11:52	0.186	0	0.186
11:53	0.186	0	0.186
11:54	0.186	0	0.186
11:55	0.186	0	0.186
11:56	0.186	0	0.186
11:57	0.186	0	0.186
11:58	0.186	0	0.186
11:59	0.186	0	0.186